

## **Stormwater Protector Inlet Filter Lite Technical Specifications**

### **1.0 Description of Work:**

- 1.1** The work covered shall consist of supplying, installing, and maintaining/cleaning the YQ STORMWATER PROTECTOR INLET FILTER LITE assembly. The purpose of the YQ STORMWATER PROTECTOR INLET FILTER LITE system is to collect pollutants in stormwater runoff including trash, debris, vegetation, hydrocarbons, heavy metals, phosphorus, nitrogen, and sediment at drainage locations shown on the plans or as directed by the engineer.

### **2.0 Material:**

- 2.1** The YQ STORMWATER PROTECTOR INLET FILTER LITE system is comprised of 304 stainless steel frame and assembly which secures a replaceable geotextile filter bag attached to the assembly. The filter bag is securely suspended from the 304 stainless steel frame in an assembly that allows full stormwater flow into the inlet filter and the catch basin drainage structure in all conditions.
- 2.2** The YQ STORMWATER PROTECTOR INLET FILTER LITE system includes:
- 2.2.1** 304 Stainless Steel Lower Frame
  - 2.2.2** 304 Stainless Steel Perimeter Protector
  - 2.2.3** 304 Stainless Steel Center Protector
  - 2.2.4** Oil Absorbent Booms
  - 2.2.5** Standard or Premium Protector Filter Bag
    - 2.2.5.1** Standard Protector Filter Bag with Skaps GT-180

Skaps' robust, yet flexible geotextiles engineered for drainage applications ensure excellent filtration properties.

The three-dimensional structure of SKA needle-punched non-woven geotextiles allows water to pass through the plane while filtering soils and other solid particles from compromising the overall drainage system. The geotextile drainage fabric must have the ability to retain fine particles of soil while permitting an unimpeded flow of water into a selected drainage media.

The Standard Protector Filter Bag is ideal for areas where hydrocarbons are not typically a concern, such as commercial and residential parking lots. It effectively captures trash, sediment, and other common pollutants, providing a reliable and cost-effective solution for maintaining stormwater quality in low-risk environments.

#### **2.2.5.2 Premium Protector Filter Bag with Ultra-Filter-Tex**

Ultra-Filter-Tex has a variety of uses as it pertains to stormwater and clean-up applications. It is made of a proprietary blend of fibers that are treated and naturally absorb oils and greases from water while allowing water to flow through the material.

Ultra-Filter-Tex will hold onto the oils and greases and will not release them back into the water.

Produced from recycled synthetic fibers. Utilizing state-of-the-art technology, materials are blended and processed into a lightweight fiber mass with an enormous surface area and interstitial spaces creating a high-performance sorbent and filter media.

Designed for use as a durable & long-lasting geotextile and filter media.

Allows large volumes of water to pass through while sorbing liquid hydrocarbons, including petroleum, animal, and vegetable oils.

Ultra-Filter-Tex absorbs an average of 13 times its weight of liquid hydrocarbons.

**2.2.5.2 (cont.)** The Premium Protector Filter Bag is designed for high-risk areas where hydrocarbons, oils, and other pollutants are prevalent, such as industrial sites or heavily trafficked locations. With advanced filtration capabilities, it ensures superior protection against contaminants, making it a vital solution for sites with frequent oil or fuel runoff.

**3.0 Standard and Premium Filter Fabric Specifications and Capabilities:**

**3.1** The filter fabric used in the YQ STORMWATER PROTECTOR INLET FILTER LITE system specifications and capabilities are taken from the filter fabric manufacturers and are as follows:

**3.1.1** Standard Protector Filter Bag with Skaps GT-180

Skaps GT-180			
Test	Method	Units	Result
Grab Tensile	ASTM D-4632	lbs (kN)	205 (0.911)
Grab Elongation	ASTM D-4632	%	50
Trapezoid Tear Strength	ASTM D-4533	lbs (kN)	85 (0.38)
CBR Puncture Resistance	ASTM D-4833	lbs (kN)	535 (2.37)
Flow Rate	ASTM D-4491	Gal/ft2/min (l/m2/min)	95 (3597)
Apparent Opening Size	ASTM D-4751	US Sieve (mm)	80 (0.18)
UV Resistance at 500 Hrs	ASTM D-4355	%	70

**3.1.2** Premium Protector Filter Bag with Ultra-Filter-Tex

Ultra-Filter-Tex			
Test	Method	Units	Result
Mass Per Unit Area	ASTM 5261	oz/yd (g/m)	11.0 (341.16)
Grab Tensile MD	ASTM D-4632	lbs (kg)	118 (53.5)
Grab Tensile TD	ASTM D-4632	%	89
Elongation at Peak MD	ASTM D-4632	%	131
Elongation at Peak TD	ASTM D-4632	%	172
Wide Width Tensile MD	ASTM D-4595	lbs/in (kg/cm)	33 (5.89)
Wide Width Tensile TD	ASTM D-4595	lbs/in (kg/cm)	23 (4.11)
Elongation at Break MD	ASTM D-4595	%	110
Elongation at Break TD	ASTM D-4595	%	156
Mullen Burst	ASTM D-3786	lbs/sq.in (kg/cm2)	214 (15)
Puncture Resistance	ASTM D-4833	lbs (kg)	72 (32.7)
Permeability	ASTM D-4491	cm/sec	0.72
Flow Rate	ASTM D-4491	gal/ft2/min (l/m2/min)	151 (6152)
Apparent Opening Size	ASTM D-4751	US Sieve (μ)	100 (140)
Hydrocarbon Capacity		gal/yds (l/m2)	1.5 (6.79)

**4.0 Pollutant Removal**

Pollutant	Units	Result
TSS Capture	%	95
Metals (attached to TSS)*	%	50
Phosphorus (attached to TSS)*	%	50
Nitrogen (attached to TSS)*	%	50
Phosphorus (leaf capture and attached to TSS)**	%	84
Nitrogen (leaf capture and attached to TSS)**	%	74

\*based on Phosphorus and Nitrogen attached to TSS

*“Distribution of Phosphorus in Particulate Matter Transported in Urban Rainfall-Runoff”*

J. Ma and J. Sansalone, Civil and Environmental Engineering Department, LSU

*“Pollutant Associations with Particulates in Stormwater”* Morquecho, Renee (2005)

\*\*based on 100% capture of leaves, vegetation, and organic detritus and routine maintenance practices involving removal of Inlet Filter Fabric with captured material.

*“Evaluation of Leaf Removal...in Urban Stormwater”* William R. Selbig Science of Total Environment, Volume 571, 15 November 2016, pp 124-133

## 5.0 Identification of Drainage Structures to Determine YQ STORMWATER PROTECTOR INLET FILTER LITE system:

5.1 The Installer (Contractor) shall inspect the plans and/or worksite to determine the catch basin drainage structure casting type. The exact grate size and clear opening size will provide the information necessary to properly size the YQ STORMWATER PROTECTOR INLET FILTER LITE system. The YQ STORMWATER PROTECTOR INLET FILTER LITE systems are supplied to the field pre-configured to fit the specified drainage structure.

## 6.0 Installation Into Standard Grated Inlet Drainage Structures:

6.1 The contractor shall furnish all measurements, equipment, materials, labor, and incidentals to install the YQ STORMWATER PROTECTOR INLET FILTER LITE systems in accordance with the drawings, installation manual, and these specifications.

6.2 The installation should be inspected and approved by the local governing agency.

6.2.1 Take the Lower Frame and the first Protector Filter Bag and starting with the Middle Protector Hooks, slip on the corresponding Protector Filter Bag Loops onto the Middle Protector Hooks for each side of the Protector Filter Bag. Now take the remaining Protector Filter Bag Loops and slip them onto the corresponding Corner Protector Hooks. Repeat this process for the second Protector Filter Bag.

6.2.2 Remove the Inlet Grate from the Inlet Top Unit. Clean the recessed ledge (lip) of the Casting Frame to ensure it is free of stone and dirt. Place the Lower Frame with the previously installed Protector Filter Bags through the clear opening of the structure and be sure the frame rests firmly on the inside ledge (lip) of the Casting Frame.

6.2.3 Place the Perimeter Protector on top of the Lower Frame Assembly. Then place the Center Protector across the middle support section of the Lower Frame Assembly. Place 2 Oil Absorbent Booms into each Protector Filter Bags and carefully place the Standard Inlet Grate back into place.

## 7.0 Inspection, Operation, and Maintenance Guidelines:

7.1 The frequency of maintenance will vary depending on the application (during construction, post-construction, or industrial use), the area of installation (relative to grade and runoff exposure), and the time of year relative to the geographic location (infrequent rain, year-round rain, rain, and snow conditions).

7.2 **Frequency of Inspections:** Construction site inspection should occur following each ½” or more rain event. Post-construction inspections should occur three times per year (every four months) in areas with year-round rainfall and four times per year (every three months) in areas with rainy seasons before and after the snowfall season. Industrial application site inspections (loading ramps, wash racks, maintenance facilities) should occur on a regularly scheduled basis no less than three times per year. Maintenance is required when the trash/sediment/debris is filled 50% to the top of the Interior Filter Fabric or when the filter fabric is blinding causing ponding to occur within the Protector Filter Bag.

### 7.3 General Maintenance for filter bags:

7.3.1 *Maintenance by Mechanical Means (vacator truck)* - Remove the Standard Inlet Grate. Using the vacuum boom, carefully remove the contents from both Protector Filter Bags. Be mindful of the powerful suction and take the necessary steps to keep the Lower Frame Assembly in place. Remove the Perimeter Protector and the Center Protector from the Lower Frame. Lift out the Lower Frame Assembly and examine the Protector Filter Bag. If it appears that there is blinding occurring, or if there is excessive hydrocarbon buildup, the Protector Filter Bag should be replaced. If the Protector Filter Bag can be re-used, carefully remove the Protector Filter Bag loops from the Lower Frame in reverse order found in. Take the Protector Filter Bag place each one inverted, over a trash can, and use a low-pressure washer to carefully wash out any fine sediment that is imbedded within the filter fabric. Re-install the Protector Filter Bags onto the Lower Frame by following the steps found in. Clean the recessed ledge (lip) of the Casting Frame and place the Lower Frame Assembly back onto the Casting Frame. Place the Perimeter Protector on top of the Lower Frame Assembly. Then place the Center Protector across the middle support section of the Lower Frame Assembly. Place 2 new Oil Absorbent Booms into each Protector Filter Bag and carefully place the Standard Inlet Grate back into place.

- 7.3.2** *Maintenance by Physical Means (by hand)* - Remove the Standard Inlet Grate. Remove the Perimeter Protector and the Center Protector from the Lower Frame. With the help of another worker, lift out the Lower Frame Assembly and carefully set it to the side of the inlet structure. Carefully remove the Protector Filter Bag loops from the Lower Frame in reverse order found in (6.2.1). Dump the contents of the Protector Filter Bags into trash cans or trash bags. Examine the Protector Filter Bags. If it appears that there is blinding occurring, or if there is excessive hydrocarbon buildup, the Protector Filter Bag should be replaced. If the Protector Filter Bag can be re-used, take the Protector Filter Bag and place each one inverted, over a trash can and use a low-pressure washer to carefully wash out any fine sediment that is imbedded within the filter fabric. Re-install the Protector Filter Bags onto the Lower Frame by following the steps found in (6.2.1). Clean the recessed ledge (lip) of the Casting Frame and place the Lower Frame Assembly back onto the Casting Frame. Place the Perimeter Protector on top of the Lower Frame Assembly. Then place the Center Protector across the middle support section of the Lower Frame Assembly. Place 2 new Oil Absorbent Booms into each Protector Filter Bag and carefully place the Standard Inlet Grate back into place.
- 7.3.3** The removed Protector Filter Bag shall be disposed of, along with its contents, at a DEP-approved disposal site.

**8.0 ASTM Standards:**

**8.1** YQ STORMWATER PROTECTOR INLET FILTER LITE in conjunction with the filter fabric manufacturers that supply the filter fabric complies with the following ASTM standards:

**ASTM D-3786** Standard Test Method for Bursting Strength of Textile Fabrics-Diaphragm Bursting Strength Tester Method

**ASTM D-4491** Standard Test Methods for Water Permeability of Geotextiles by Permittivity

**ASTM D-4595** Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method

**ASTM D-4632** Standard Test Method for Grab Breaking Load and Elongation of Geotextile

**ASTM D-4751** Standard Test Methods for Determining Apparent Opening Size of a Geotextile

**ASTM D-4833** Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products

**ASTM 5261** Standard Test Method for Measuring Mass per Unit Area of Geotextiles

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