BIOSWALES

Also known as infiltration swales, Bioswales are a form of bioretention designed to slow surface water runoff and help remove stormwater pollutants. These low-maintenance systems transport large volumes of stormwater to a discharge point, slowing the velocity and filtering the water.

As an added benefit, bioswales help recharge groundwater. Bioswales can be used in many applications, including pollutant removal, drainage retrofitting, and runoff management.

Material Properties

April **2023**

Bioswales – Enviro Liner® 1000

Rev	ASTM	**EL 1020**	**EL 1030**	**EL 1040N**	**EL 1040**
Thickness	D5199	20 mil 0.5 mm	30 mil 0.75 mm	36 mil 0.91 mm	40 mil 1.0 mm
Density (Typical)	D792	0.93	0.93	0.93	0.93
Tensile Strength at Break	D6693	76 ppi 13 N/mm	114 ppi 20 N/mm	136 ppi 24 N/mm	152 ppi 27 N/mm
Elongation	D6693	800%	800%	700%	800%
Tear Resistance	D1004	11 lbs 49 N	16 lbs 70 N	19 lbs 84 N	22 lbs 100 N
Puncture Resistance	D4833	28 lbs 120 N	42 lbs 190 N	54 lbs 240 N	56 lbs 250 N
Carbon Black Content	D6370	> 2.0%	> 2.0%	2.0%	> 2.0%
High Pressure OIT	D5885	400 min	400 min	N/A	400 min
Low Temperature Impact Resistance	D746	-69°F -56°C	-69°F -56°C	-40°F -40°C	-69°F -56°C
Service Temperatures	Max Continuous Use	140°F 60°C	140°F 60°C	140°F 60°C	140°F 60°C

INSTALLATION

When building a Bioswale the soils must be non-compacted to promote vegetation and to provide filtering and infiltration to treat stormwater runoff. The soils must be engineered with carbon and nutrients to filter out any toxins from the stormwater while also promoting plant growth. Under some conditions, infiltration is undesirable due to either the pollutants being removed or to the need to retain water for droughts, irrigation, or other applications. In this case, we recommend the use of a liner below the depth of the active growth media of soil. When choosing a filtering media, the following soil properties should be considered:

- Anion exchange capacity (AEC) or catIon exchange capacity (CEC), depending on pollutants of concerns
- Anion Exchange Capacity (depending on the pollutants of concern),
- pH
- Electrical Conductivity
- Air entrainment or soil compaction.

If the pollutants to be removed from the stormwater are positively charged (ions) metals such as Copper, Cadmium, Iron, Manganese, Aluminum, Mercury, etc., then an anionic (negatively charged) soil should be present. Most soils are negatively charged. The recommended CEC is at least 15 milliequivalent/100 grams of soil.

Bioswales are normally built with three basic vegetation types: high, middle, and low. It is highly recommended to use native plants to vegetate the bioswale so that they are more accustomed to the climate.