

## **GEOSYNTHETICS**

Geosynthetics are polymeric materials used in combination with soil and rock as an integral component of a construction project, structure, or system. Geotextiles and geogrids are two specific types of geosynthetic. Most are made from polypropylene, polyester, and polyethylene.

### **GEOTEXTILES – NON-WOVEN/WOVEN**

Geotextiles are fabrics manufactured either from individual fibers (monofilaments), or from yarns which comprise many fibers (multifilaments). The round filament may be long (a continuous monofilament) or short (a staple fiber). Some continuous monofilaments are produced as tape (a slit-film monofilament).

**Nonwoven geotextiles** consist of continuous monofilaments or staple fibers. Needle-punched nonwoven geotextiles are composed of random fibers that are physically entangled by punching with needles. Heat-bonded nonwovens comprise random fibers that are pressed and melted together at the contact points.

**Woven geotextiles** consist of continuous monofilaments, staple fibers, multifilament yarns, or slit films that are woven into a fabric.

### **GEOTEXTILE FOR MATERIAL SEPERATIONS AND FILTRATION**

Geotextile for material separation and filtration is used to prevent mixing of a subgrade soil and an aggregate cover material but allow water to flow through.

Any product that meets the requirements of Alberta Transportation Standard Specifications for Highway Construction, Section 5.31.4.1 Separation and Filtration Geotextile Applications qualifies under this section.

### **GEOTEXTILE FOR STABILIZATION**

Geotextile for stabilization is used in wet, saturated conditions to provide the coincident functions of separation, filtration, confinement, and reinforcement of embankment.

Any product that meets the requirements of Alberta Transportation Standard Specifications for Highway Construction, Section 5.31.4.2 Stabilization Geotextile Applications qualifies under this section.

### **GEOTEXTILE FOR SUBSURFACE DRAINAGE**

Geotextile for subsurface drainage is used in an application in which a geosynthetic is placed against a soil to allow long-term passage of water into a subsurface drain system while retaining the in-situ soil. The primary function of the geotextile is to provide filtration.

Any product that meets the requirements of Alberta Transportation Standard Specification for Highway Construction, Specification 5.31.4.3 Subsurface Drainage Geotextile Applications qualifies under this section.

### **GEOTEXTILE FOR EROSION AND SEDIMENT CONTROL**

Geotextile for erosion and sediment control is used in an application in which a geotextile is placed between an energy absorbing hard-armour system (e.g., rip/rap or cable concrete mattress) and the in-situ soil to prevent soil loss (scour) and to prevent hydraulic uplift pressures causing instability of the permanent erosion control system.

Any product that meets the requirements of Alberta Transportation Standard Specifications for Highway Construction, Section 5.31.4.4 Erosion Control Geotextile Applications or Alberta Transportation Specifications for Bridge Construction, Section 10 Heavy Rock Riprap qualifies under this section.

**Filter Material (for Perforated Pipe Subdrains)**

Filter material shall be composed of hard, durable mineral particles free from organic matter, clay balls, soft particles and other deleterious materials.

PROVEN PRODUCTS	TRIAL PRODUCTS	POTENTIAL PRODUCTS
Designation 8 Class 25		

**GEOGRIDS**

Geogrids consist of a regular network of tensile elements (longitudinal and transverse ribs) and open apertures. Uniaxial geogrids exhibit rectangular apertures. Biaxial geogrids exhibit approximately square apertures. TriAx geogrids consist of 3 principal directions of elements as well as open apertures which may be triangular or with the combination of other shapes.

- **Extruded geogrids** are made from extrusion and drawing of perforated sheet, yielding a relatively inflexible grid with rigid junctions.
- **Woven and knitted geogrids** are made from interweaving the junctions of oriented fibres or yarns, which are then coated, yielding a relatively flexible grid with deformable junctions.
- All geogrid applications must be properly designed by a Professional Engineer (registration with APEGGA). The use of extensible reinforcement in MSE Bridge abutments and wingwall applications shall conform to requirements of Alberta Transportation *Standard Specifications for Bridge Construction, Section 25*, Mechanically Stabilized Earth Wall.

**PAVEMENT APPLICATION**

Unpaved design – the design must be based on the Giroud-Han Method. Proper calibration and in-situ validation testing must be performed for the geogrid reinforcement utilized in the mechanically Stabilized Layer.

Paved Design – The design must be based on the AASHTO 1993 Pavement Design Guide and utilizes modified layer coefficients that have been properly calibrated, tested in-situ and validated for the geogrid reinforcement utilized in the Mechanically Stabilized Layer.

**REVIEWED PROPRIETARY PRODUCTS - UNI-AXIAL GEOGRID**

Reviewed		
<a href="#">Tensor Uni-axial Series UX1100, UX1400, UX1500, UX1600, UX1700</a>	<a href="#">Maccaferri; WG Series (WG06, WG8, WG09, WG11, WG15 &amp; WG20)</a>	<a href="#">Hockgrid Geogrids (HKGX 300/30, HKGX 800/50, HKGX 800/100, HKGX 1200/100)</a>
<a href="#">Layfield Geogrid Uni-Axial (Pet) T-Series (LP 120T)</a>	<a href="#">Maccaferri ParaLink Series</a>	<a href="#">Strata Grid (SGU) Series</a>
<a href="#">Layfield E'grid Uni-Axial HDPE Series (170R)</a>	<a href="#">Maccaferri ParaGrid Series</a>	<a href="#">Synteen SF Series Uniaxial Geogrids</a>
<a href="#">Miragrid XT-Series</a>	<a href="#">Titan Pyramid Grid (UX50PET, UX70PET, UX100PET)</a>	

**REVIEWED PROPRIETARY PRODUCTS - BI-AXIAL GEOGRIDS**

Reviewed		
<a href="#">Tensar Biaxial Series (Type 1, Type 2)</a>	<a href="#">Alliance Geo BX type 2 Geogrids</a>	<a href="#">Tensar Amerigrad BX11 and BX12 Bi-Axial Geogrids</a>
<a href="#">TerraFix Biaxial Geogrids TBX1500</a>	<a href="#">MacGrid Geogrids EG Series</a>	<a href="#">Layfield E'Grid 2020 and 2030</a>
<a href="#">TerraFix Biaxial Geogrids TBX2000</a>	<a href="#">BOSTD SX1515, SX2020, SX3030 Geogrids</a>	<a href="#">Layfield RX Series Geogrid PP</a>
<a href="#">TerraFix Biaxial Geogrids TBX2500</a>	<a href="#">Tensar Amerigrad BX3030</a>	<a href="#">TerraFix Biaxial Geogrids TBX11</a>
<a href="#">TerraFix Biaxial Geogrids TBX3000</a>	<a href="#">CCIS -1515 and CCIS - 2525</a>	<a href="#">TerraFix Biaxial Geogrids TBX12</a>
<a href="#">Titan TE-BXPP (TE-BX15PP, 20PP, 25PP &amp; TE-BX30PP)</a>	<a href="#">Mirafi BXG110 and BXG120</a>	<a href="#">Alliance Geo BX type 1 Geogrids</a>

**REVIEWED PROPRIETARY PRODUCTS - TRI-AXIAL GEOGRIDS**

Reviewed		
<a href="#">Tensar TriAx Geogrids TX5, TX7, TX160</a>	<a href="#">Tensar Multiaxial Geogrids Inter Ax Series</a>	<a href="#">Tensar Multiaxial Geogrids H-Series</a>

**REVIEWED PROPRIETARY PRODUCTS - GEOGRID AND GEOTEXTILE COMPOSITE GEOSYNTHETICS**

Reviewed		
<a href="#">Naue Combigrid 30/30</a>	<a href="#">Titan TE-BXC Geogrid Composite (TE-BXC18 &amp; 30)</a>	<a href="#">SX3030GT and SX4040GT-E200 Composite</a>
<a href="#">MacGrid CG 20, 30 and 40</a>	<a href="#">Nilex EasyGrid 3-150GC</a>	<a href="#">CCIS - 3131</a>

**GEONET / GEOCOMPOSITE / WICK DRAIN**

**Geocomposite**

A manufactured material using geotextiles, geogrids, geonets, and/or geomembranes in laminated or composite form.

**Geonet**

A geosynthetic consisting of integrally connected parallel sets of ribs overlying similar sets at various angles for planar drainage of liquids or gases.

**Wick Drain**

Consists of a central plastic core, which functions as a free-draining water channel, surrounded by a thin geosynthetic filter jacket. It is used to create an artificial drainage path. It is also called prefabricated vertical drain or band drain.

PROVEN PRODUCTS	TRIAL PRODUCTS	POTENTIAL PRODUCTS
<a href="#">Multi-Flow Report</a>	<a href="#">Tencate Mirafi H2Ri</a> (Expiry Date: Sept. 2024)	<a href="#">NuDrain DN50-2 (JDR J-Drain 302)</a> (Expiry Date: Feb. 2025)
<a href="#">Wick Drain</a>		<a href="#">Maccaferri ParaDrain Series</a> (Expiry Date: Aug. 2024)

**GEOSYNTHETIC CLAY LINER (GCL)**

A geocomposite product of processed clay (typically bentonite) either bonded to a geomembrane or fixed between sheets of geotextile.

PROVEN PRODUCTS	TRIAL PRODUCTS	POTENTIAL PRODUCTS
		<a href="#">CETCO Bentomat GCL</a> (Expiry Date: Feb. 2025)

**GEOMEMBRANE**

A continuous sheet of material, whether prefabricated as a flexible polymeric sheeting or sprayed or coated in the field, such as a sprayed on asphalt.

**CANAL LINER**

PROVEN PRODUCTS	TRIAL PRODUCTS	POTENTIAL PRODUCTS
<a href="#">Coletanche ES</a>		
<a href="#">Reinforced Polyethylene Liner RPE11BB</a>		
<a href="#">Siplast Teranap Geomembrane REPORT</a>		

**GEOSYNTHETIC CELLULAR CONFINEMENT SYSTEMS**

See Cellular Confinement Systems category in [STABILIZATION \(Soil\)](#) for soil stabilization purpose or Cellular Confinement Systems category in [EROSION AND SEDIMENT CONTROL SYSTEMS](#) for erosion and sediment control purpose.