

EROSION AND SEDIMENT CONTROL SYSTEMS

DITCH BLOCKS/BARRIERS

Any product that meets the requirements of the Design Guidelines for Erosion and Sediment Control for Highways (2003) and Alberta Transportation Specifications qualifies under this section.

SYNTHETIC PERMEABLE BARRIERS

Permeable barriers are made of UV stabilized high density polyethylene, firmly anchored to the ground, and capable of reducing runoff for storm channels and highway ditches. Typical dimensions are, height=250 mm, length=1000 mm.

For high flow conditions, erosion control matting must be used in conjunction with the barriers to reduce runoff and erosion.

Any product that meets the requirements of the Design Guidelines for Erosion and Sediment Control for Highways (2003), Best Management Practices, BMP #10 qualifies under this section.

PROPRIETARY

<u>PROVEN PRODUCTS</u>	<u>TRIAL PRODUCTS</u>	<u>POTENTIAL PRODUCTS</u>
EnviroBerm	BMP Spring Berm	
GeoRidge	GeoRidge Bio (Expiry Date: April 2013)	

STRAW ROLL (FIBRE ROLL)

Straw roll consists of bundled straw (or natural fibre) wrapped in photo-degradable open-weave plastic netting staked into the soil along contours as a grade break to reduce erosion potential.

Any product that meets the requirements of Alberta Transportation Erosion and Sedimentation Control Manual (2003), Best Management Practices, BMP #28a qualifies under this section.

<u>PROVEN PRODUCTS</u>	<u>TRIAL PRODUCTS</u>	<u>POTENTIAL PRODUCTS</u>
Stenlog REPORT		
Curlex Sediment Log REPORT		AEC Premier Straw Wattles (Expiry Date: Sept 2012)

Sediment STOP REPORT		Bio 3 Fiber Roll (Expiry Date: Sept 2012)
		Bio 4 Fiber Roll (Expiry Date: Sept 2012)
		EC Wattle (12" diameter 100% straw) (Expiry Date: June 2013)

SILT FENCE

Geotextile Fence Barrier shall comprise a low fence made from geotextile material and place at locations to retain silt and preventing silt contamination during construction. Minimum height of silt fence shall be 750 mm. Minimum embedment depth of the fabric shall be 150 mm.

Any product that meets the requirements of the Design Guidelines for Erosion and Sediment Control, Best Management Practices, BMP #1, qualifies under this section.

Material: Woven or non-woven geotextile

Property	Test Method	Geotextile Requirements
Maximum post spacing (m)	ASTM D 4632	2
Elongation	ASTM D 4632	<50%
Grab Strength (N)	ASTM D 4632	
Machine direction		550
X-Machine direction		450
Permittivity (sec ⁻¹)	ASTM D 4491	0.05
Apparent Opening Size (mm)	ASTM D 4751	0.60 max. avg. roll value
Ultraviolet stability (% retained strength)	ASTM D 4355	70% after 500 hrs. of exposure

Note: All numeric values represent MARV (Minimum Average Roll Value) in the weaker principal direction.

PROPRIETARY

<i>PROVEN PRODUCTS</i>	<i>TRIAL PRODUCTS</i>	<i>POTENTIAL PRODUCTS</i>
Nilex Amoco 2130		
Layfield Wire Back Silt Fence (SF135)		Silt Fence Style 1210 (Expiry Date: Sept 2012)
Layfield Silt Fence (SF135)		Alberta1 Silt Fence (Expiry Date: Nov 2013)
AGES Premium Silt Fence and Premium Page Wire Backed Silt Fence		Layfield Silt Fence SF124 (Expiry Date: March 2014)

Armtec Silt Fence (2130)		BWI SF25 (Expiry Date: Sept 2014)
		BWI SF30 (Expiry Date: Sept 2014)
		QRM5 24" Silt Fence (Expiry Date: Nov 2014)
		BWISF30WB (Expiry Date: Feb 2014)

CELLULAR CONFINEMENT SYSTEM

Cellular confinement systems are 3-dimensional plastic matting with open cells that are filled with topsoil or aggregates. As a matting unit placed on channels or slopes, the structure is used to stabilize the slopes, and at the same time permit surface drainage. Shall be constructed of high density polyethylene (HDPE) that has been welded together to form a series of honeycomb cells. It is usually supplied in collapsed form. It comes in various cell depths and cell sizes, perforated or unperforated.

Any product that meets the requirements of the Design Guidelines for Erosion and Sediment Control for Highways (2003), Best Management Practices, BMP #15 qualifies under this section.

PROPRIETARY

<u>PROVEN PRODUCTS</u>	<u>TRIAL PRODUCTS</u>	<u>POTENTIAL PRODUCTS</u>
Geocell/Geo Cell/Envirogrid REPORT		Neoweb (Expiry Date: May 2014)
Geoweb		

GABIONS AND MATS

Gabions and Mats are made of hexagonal double twisted wire mesh, filled with stone. They are divided into cells with diaphragms, whose function is to reinforce the structures.

Standards for the gabion materials and rocks can be found in Alberta Transportation Special Provisions SPE007 and the Design Guidelines for Erosion and Sediment Control for Highways, (2003), Best Management Practices BMP #2.

PROPRIETARY

<u>PROVEN PRODUCTS</u>	<u>TRIAL PRODUCTS</u>	<u>POTENTIAL PRODUCTS</u>
Maccaferri Gabions & Mats		
Modular Gabions & Mats		

ROLLED EROSION CONTROL PRODUCTS (RECP)

Rolled Erosion Control mats or blankets are made from straw or hay, coconut fibers, wood excelsior, jute, polypropylene or nylon fibers. They are used to reduce erosion and create conditions to assist the establishment of vegetation. Any product that meets the performance properties below and requirements of Design Guidelines for Erosion and Sediment Control for Highways, 2003 (BMP#13) qualifies under this section.

TEMPORARY RECPS - EROSION CONTROL BLANKETS (ECB) AND OPEN WEAVE TEXTILES (OWT)

Erosion Control Blankets are temporary degradable RECPS composed of processed degradable natural and/or polymer fibres mechanically bound together by a single or between two degrading, synthetic or natural fibre netting(s). For environmental friendly applications, some nettings may contain 100% biodegradable natural organic fibres.

Open Weave Textile is a temporary degradable RECP composed of processed natural or polymer yarns woven into a matrix, used to provide erosion control and facilitate vegetation establishment.

Material	Performance Properties for Slopes	Performance Properties for Channels
	Cover Factor, C ^{1,2}	Permissible Shear Stress ^{3,4} (N/m ²)
Type A: (<12 months Functional Longevity) Single-net Erosion Control Blankets and Open Weave Textiles	≤ 0.15 @ 3:1 (h:v) and flatter	72
Type B: (<12 months Functional Longevity) Double-net Erosion Control Blankets and Open Weave Textiles	≤ 0.20 @ 2:1 (h:v) and flatter	84
Type C: (>12 months Functional Longevity) Erosion Control Blankets and	≤ 0.25 @ 1:1 (h:v) and flatter	96

Open Weave Textiles		
---------------------	--	--

¹ C-factor calculated as ratio of soil loss from RECP protected slope to ratio of soil loss from unprotected (control) plot in large-scale testing. These performance test values should be supported by periodic bench testing under similar test conditions using ECTC Test Method #2.

² Acceptable large-scale testing protocol may include ASTM D6459 or other independent testing deemed acceptable by the department engineer.

³ Minimum shear stress RECP (unvegetated) can sustain without physical damage or excess erosion [>12.7 mm soil loss] during a 30-minute flow event in large-scale testing. These performance test values should be supported by periodic bench scale testing under similar test conditions using ECTC Test Method #2.

⁴ Acceptable large-scale testing protocol may include ASTM D6460 or other independent testing deemed acceptable by the department engineer.

<i><u>PROVEN PRODUCTS</u></i>	<i><u>TRIAL PRODUCTS</u></i>	<i><u>POTENTIAL PRODUCTS</u></i>
Type A:		
		Belton Anti-wash Geojute Open Weave Erosion Blanket (Expiry Date: June 2012)
North American Green: S75		Belton Casmat Geojute Stabilizer (Expiry Date: June 2012)
		Eastcoast ECS-1 , ECS-1B , ECSC-2B (Expiry Date: Sept 2012)
		AEC Premier Straw Single Net (Expiry Date: September 2011)
		Excel SR-1 (Expiry Date: Feb 2015)
		Excel SR-1 All Natural (Expiry Date: Feb 2015)
		Excel SR-1 Rapid Go (Expiry Date: Feb 2015)
		Excel Tackmats (Expiry Date: Feb 2015)
		Excel Tackmats Rapid Go (Expiry Date: Feb 2015)
Type B:		
North American Green: S150		Curlex Single Net (Curlex I CL) (Expiry Date: June 2012)
		Curlex Double Net (Curlex II CL) (Expiry Date: June 2012)

<i>PROVEN PRODUCTS</i>	<i>TRIAL PRODUCTS</i>	<i>POTENTIAL PRODUCTS</i>
ErosionControlBlankets.com S32		Eastcoast ECS-2 , ECS-2B , ECX-1 , ECC-2B (Expiry Date: Sept 2012)
Propex: Landlok S2 , REPORT		AEC Curlex I (Expiry Date: September 2012)
		AEC Premier Straw Double Net (Expiry Date: September 2012)
		Excel SS-2 (Expiry Date: Feb 2015)
		Excel SS-2 All Natural (Expiry Date: Feb 2015)
		Excel SS-2 Rapid Go (Expiry Date: Feb 2015)

<i>PROVEN PRODUCTS</i>	<i>TRIAL PRODUCTS</i>	<i>POTENTIAL PRODUCTS</i>
Type C:		
ErosionControlBlankets.com: C32		Eastcoast, ECX-2 (Expiry Date: Sept 2012)
North American Green: C125 SC150	Eastcoast ECSC-2 (Expiry Date: Sept 2012)	AEC Curlex II (Expiry Date: Sept 2012)
Belton Industries: DeKowe 700 coir		AEC Curlex III (Expiry Date: Sept 2012)
Propex: Landlok C2 , Landlok CS2	AEC Premier Straw/Coconut (Expiry Date: Sept 2013)	
ErosionControlBlankets.com: SC32		AEC Premier Coconut (Expiry Date: Nov 2012)
Eastcoast ECC-2		Curlex High Velocity Blanket (Expiry Date: June 2012)
		Excel R-2 (Expiry Date: Feb 2015)
		Excel R-2 All Natural (Expiry Date: Feb 2015)

PERMANENT RECPS - TURF REINFORCEMENT MATS (TRM)

TRMs are long-term, non-degradable rolled erosion control products composed of UV stabilized, non-degradable, synthetic fibres, filaments, nettings and/or mesh processed into 3-dimensional reinforcement matrices designed for permanent and critical hydraulic applications where design discharges exert velocities and shear stresses that exceed the limits of mature, natural vegetation. Turf reinforcement mats provide sufficient thickness, strength and void space to permit soil filling and/or retention and the development of vegetation within the matrix. Some TRM included in this category, may contain organic materials and may be termed as Composite Turf Reinforcement Mats (C-TRM).

Material	Performance Properties for TRM	
	Permissible Shear Stress ^{3, 4, 5} (N/m ²)	Minimum Tensile Strength (kN/m)
Turf Reinforcement Mats ^{1,2}		
TRM Type A	288	1.82
TRM Type B	384	2.19
TRM Type C	480	2.55

¹ For TRMs containing degradable components, all property values must be obtained on the non-degradable portion of the matting alone.

² Minimum thickness of TRM is 6.35 mm.

³ Shear stress that fully vegetated TRM can sustain without physical damage or excess erosion [>12.7 mm soil loss] during a 30-minute flow event in large-scale testing.

⁴ Acceptable large-scale testing protocol may include ASTM D6460 or other independent testing deemed acceptable by the engineer.

⁵ Field conditions with high loading and/or high survivability requirements may warrant the use of a TRM with a tensile strength of 44 kN/m or greater.

<u>PROVEN PRODUCTS</u>	<u>TRIAL PRODUCTS</u>	<u>POTENTIAL PRODUCTS</u>
TRM Type A:		
		PC42 TRM (Expiry Date: Sept 2014)
Maccaferri MacMat N10 REPORT	Propex: Landlok 450 (Expires: Nov 2012)	PS42 TRM (Expiry Date: Sept 2014)
		Eastcoast ECSC-3 , ECC-3 , ECP-2 (Expiry Date: Sept 2012)

		Curlex Enforcer (Expiry Date: Sept 2012)
		Excel PP5-8 (Expiry Date: Feb 2015)
		Excel PP5-10 (Expiry Date: Feb 2015)
		Excel PP5-Xtreme (Expiry Date: Feb 2015)
TRM Type B:		
Greenfix America CFG2000		
North American Green: SC250 , P300	AEC Recyclex TRM (Expiry Date: Dec 2012)	
		Eastcoast ECP2 10oz. Polypropylene (Expiry Date: Sept 2012)
TRM Type C:		
North American Green: C350		East Coast T-RECS (Expiry date: May 2014)
Tenax Multimat 100 :		Propex: Landlok 1051 (Expires: Nov 2012)
North American Green: P550		
ErosionControlBlanket.com P42		
Landlok Pyramat TRM		Eastcoast ECP-2 Polypropylene (Expiry Date: June 2013)
Propex: Landlok 300		Eastcoast ECP-3 Polypropylene (Expiry date: June 2013)

SEDIMENT CONTROL

Sedimentation is the deposition of soil particles previously held in suspension by flowing water. Sedimentation is promoted before surface sediment laden water flow leaves a construction site.

<u>PROVEN PRODUCTS</u>	<u>TRIAL PRODUCTS</u>	<u>POTENTIAL PRODUCTS</u>

POLYACRYLAMIDE (PAM)

PROPRIETARY

<u>PROVEN PRODUCTS</u>	<u>TRIAL PRODUCTS</u>	<u>POTENTIAL PRODUCTS</u>
Water Lynx CFPB, Soil Lynx CFE & CFGP		PR5 Water Treatment Tank System (Expiry Date: April 2012)
		Earth Guard (Expiry Date: Sept 2014)

MISCELLANEOUS EROSION AND SEDIMENT CONTROL

PROPRIETARY

<u>PROVEN PRODUCTS</u>	<u>TRIAL PRODUCTS</u>	<u>POTENTIAL PRODUCTS</u>
ScourStop		ShoreMax (Expiry Date: April 2013)
		AEC E-Staple (Expiry Date: September 2011)
	Propex ArmorMax (Expiry Date: February 2012)	
		EcoMedia (Expiry Date: Sept 2013)
	ScourShield (Expiry Date: Nov 2012)	Armorflex (Expiry Date: Jan 2014)
A-Jacks		

HYDRAULIC EROSION CONTROL PRODUCT (HECP)

A HECP is a manufactured, temporary, degradable, pre-packaged fibrous material that is mixed with water and hydraulically applied as a slurry designed to reduce soil erosion and assist in the establishment and growth of vegetation. The HECP will achieve maximum performance after a sufficient curing period, which will vary based upon site specific conditions. The HECP forms a protective layer which controls erosion and allows for enhanced seed germination and accelerated plant growth.

<i>PROVEN PRODUCTS</i>	<i>TRIAL PRODUCTS</i>	<i>POTENTIAL PRODUCTS</i>
Flexterra FGM		Excel Fibremulch II (Expiry Date: Sept 2012)
		Verdyol HydroGold (Expiry Date: Sept 2012)
	Cocoflex ET – FGM (Expiry Date: Nov 2012)	Verdyol Biotic Earth BFM (Expiry Date: Sept 2012)
		Verdyol Biotic Earth Black HGM (Expiry Date: Sept 2012)
		Verdyol Biotic Earth HGM (Expiry Date: Sept 2012)
		North American Green HydraCX2 (Expiry Date: Feb 2013)
		Bindex Blend WT (Expiry Date: May 2014)
		Bindex Wood (Expiry Date: May 2014)
		Bindex Wood WT (Expiry Date: May 2014)
		Bindex BFM (Expiry Date: May 2014)
		Bindex Blend (Expiry Date: May 2014)