A SIMPLE SOLUTION

“Blanketing Nature With Nature”

Effective: 5/7/10

RE: Certificate of Conformance: *Excel PP5-Xtreme*™

To Whom it May Concern:

This letter is to certify that Western Excelsior manufactures the Rolled Erosion Control Product (RECP) marketed as EXCEL PP5-Xtreme. Each blanket is subjected to Western Excelsior’s Quality Assurance Program and is manufactured to the specifications listed in document number WE_EXCEL_PP5XT_SPEC. Further, Western Excelsior utilizes industry standardized test procedures to develop performance references for Excel PP5-Xtreme. Document number WE_EXCEL_PP5XT_PERF presents the industry standardized testing and results. Installation instructions are provided in document numbers WE_EXCEL_ PP5XT_SII and WE_EXCEL_PP5XT_CII for hill slope and channel installations, respectively. A copy of document number WE_EXCEL_PP5XT_SPEC is attached; all other documentation may be obtained by calling Western Excelsior Technical Services at 1-800-967-4009, at www.westernexcelsior.com or by email at wexcotech@westernexcelsior.com.

Regards,

Chad M. Lipscomb, PE, CPESC
Director, Technical Services
Western Excelsior Corporation

Material Properties and Dimensions

CS -3 Excel

Description

Western Excelsior manufactures a full line of Rolled Erosion Control Products (RECPs). PP5-Xtreme is a fully synthetic, UV stable Turf Reinforcement Mat (TRM) manufactured by weaving continuous, synthetic thread elements by way of a proprietary (patent pending) process to form a lofty, three-dimensional pattern. PP5-Xtreme is resistant to environmental and climatic conditions and provides high strength, durability and turf reinforcment performance.

Specifications

Each roll of PP5-Xtreme is manufactured under Western Excelsior's Quality Assurance Program to ensure a consistent distribution of strands and consistent thickness. PP5-Xtreme is constructed of UV stabilized, high strength synthic yarns to be incorporated into turf and/or the soil matrix. For typical applications, the expected design life of PP5-Xtreme is fifty years, however, may be less or indefinite.

Verified values are provided in Table 1 and product characteristics are provided in Table 2. Values provided in Tables 1 and 2 represent expected values at the time of manufacture. Installation instructions and performance data are available from Western Excelsior's Technical Support Division.

Table 1 - Verified Values			
Tested Property	Test Method	Value	Units
Tensile Strength	ASTM D6818	300 (MD), 250 (TD)	lb/in
Elongation	ASTM D6818	25 (MD), 25 (TD)	%
Mass per Unit Area	ASTM D6475	9.2	oz/yd^2
Thickness	ASTM D6525	7.6	mm
Light Penetration	ASTM D6567	30	% open
Resiliency	ASTM D6524	75	%
UV Stability	ASTM 4355 (3000 Hours)	80	%
Porosity	Computed	N/A	%

Table 2 - Netting	
Top Net	N/A
Bottom Net	N/A
Top Net Opening	N/A
Bottom Net Opening	N/A

Table 3 - Roll Dimensions		
Style	Narrow	Wide
Roll Width	8.0 ft	N/A
Roll Length	112.5 ft	N/A
Coverage	100 yd^2	N/A
Roll Weight	57.5 lbs	N/A

Document # WE_EXCEL_PP5XT_SPEC. This document has been developed to provide the characteristic properties of the product described. For questions, to request performance data or installation recommendations, contact Western Excelsior at 800-967-4009 or wexcotech@westernexcelsior.com. Updated 05/10.

Product Evaluation Data and Test Results

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Test Methods

A variety of test methods are utilized to determine performance and conformance values for Rolled Erosion Control Products (RECPs). Information within this document is presented to provide conformance values and recommended design values. Test results obtained for the Excel PP5-12 Turf Reinforcement Mat (TRM) and general design values are presented in Tables 1-4. For specific information detailing testing protocols, results and application of design values, refer to document number WE_EXCEL_PERF_GEN.

Test Results

Table 1 - Bench Scale Testing (NTPEP)

Test Method	Test Condition	Results	Units
ECTC Test Method 2 - Rainfall/Rainsplash Resistance	2 in. per hour	N/A	Soil Loss Ratio
	4 in. per hour	N/A	
	6 in. per hour	N/A	
ECTC Test Method 3 - Shear Resistance	N/A	0.5	Soil Loss (in.)
ECTC Test Method 4 - Germination	Top Soil, Fescue, 21 day Incubation	N/A	% Improvement

Table 2 - Texas Transportation Institute (TTI)

Class	Test Condition	Result
A	< 3H : 1V Clay Slope Testing	N/A
B	< 3H : 1V Sand Slope Testing	N/A
C	> 3H : 1V Clay Slope Testing	N/A
D	> 3H : 1V Sand Slope Testing	N/A
E	2.0 lb/ft^2 Partially Vegetated Channel Testing	N/A
F	4.0 lb/ft^2 Partially Vegetated Channel Testing	N/A
G	6.0 lb/ft^2 Partially Vegetated Channel Testing	N/A
H	8.0 lb/ft^2 Partially Vegetated Channel Testing	N/A
I	10.0 lb/ft^2 Partially Vegetated Channel Testing	N/A
J	12.0 lb/ft^2 Partially Vegetated Channel Testing	N/A

Document # WE_EXCEL_PP5XT_PERF. This document has been developed to provide information regarding the bench scale and/or performance testing conducted on the Excel PP5-Xtreme TRM. For questions or installation recommendations, contact Western Excelsior Technical Services Division at 800-967-4009 or wexcotech@westernexcelsior.com. Updated 05/10.

Recommended Design Values

Table 3 - Unvegetated Design Values

Maximum Permissible Velocity*	Soil Loss
N/A ft/s	0.5 inches
Maximum Permissible Shear Stress*	Soil Loss
N/A lb/ft^2	0.5 inches
Resistance to Flow*	
HEC 15 Shear Relationship	Manning's n
N/A lb/ft^2 (Tau $_{lower}$)	N/A
N/A lb/ft^2 (Tau $_{mid}$)	N/A
N/A lb/ft^2 (Tau $_{upper}$)	N/A
RUSLE Cover Factor*	Slope Gradient*
N/A	1 H : 1V

Table 4 - Vegetated Design Values

Maximum Permissible Shear Stress (lb/ft^2)	12.0
Maximum Permissible Velocity (ft/s)	15.0
C_{FVeg}/C_{FTRM} (Test Conditions)	0.26

*Recommended Design Values are based on results of standardized industry full-scalle testing and may not be applicable for all field conditions. Values provided herein are intended for use with the state of the practice design procedures. For most accurate computation of field performance, consult Excel Erosion Design (EED) at www. westernexcelsior.com.

Slope Installation
Instructions PP5-Xtreme™

Step 1 - Site Preparation

Prepare site to design profile and grade. Remove debris, rocks, clods, etc.. Ground surface should be smooth prior to installation to ensure blanket remains in contact with slope.

Step 2 - Seeding

Seeding of site should be conducted to design requirements or to follow local or state seeding requirements as necessary.

Stap 3 - Staple Selection

At a minimum, 6 in. long by 1 in. crown, 11 gauge staples are to be used to secure the blanket to the ground surface. Installation in rocky, sandy or other loose soil may require longer staples.

Step 4 - Excavate Anchor Trench and Secure Blanket

Excavate a trench along the top of the channel side slopes and the upstream terminal end of the channel to secure the edges of the blanket. The trench should run along the length and width of the installation, be 6 in. wide and 6 in. deep. Staple blanket along bottom of trench, fill with compacted soil, overlap blanket towards toe of slope and secure with row of staples (shown in Figures A, E and F).

Step 5 - Secure Body of Blanket

Roll blanket down slope from anchor trench. Staple body of blanket following the pattern shown in Figure D. Leave end of blanket unstapled to allow for overlap shown in Figure B. Place downstream blanket underneath upstream blanket to form shingle pattern. Staple seam as shown in Figure E. Secure downstream blanket with stapling pattern shown in Figure D. Stapling pattern shown in Figure D reflects minimum staples to be used. More staples may be required to ensure blanket is sufficiently secured to resist mowers and foot traffic and to ensure blanket is in contact with soil surface over the entire area of blanket. Further, critical points require additional staples. Critical points are identified in Figure G.

Step 6 - Continue Along Slope - Complete Installation

Overlap adjacent blankets as shown in Figure C and repeat Step 5. Secure toe of slope using stapling pattern shown in Figure E. Secure edges of installation by stapling at 1.0' intervals along the terminal edge, as shown in Figure E.

*** Drawings Not to Scale**

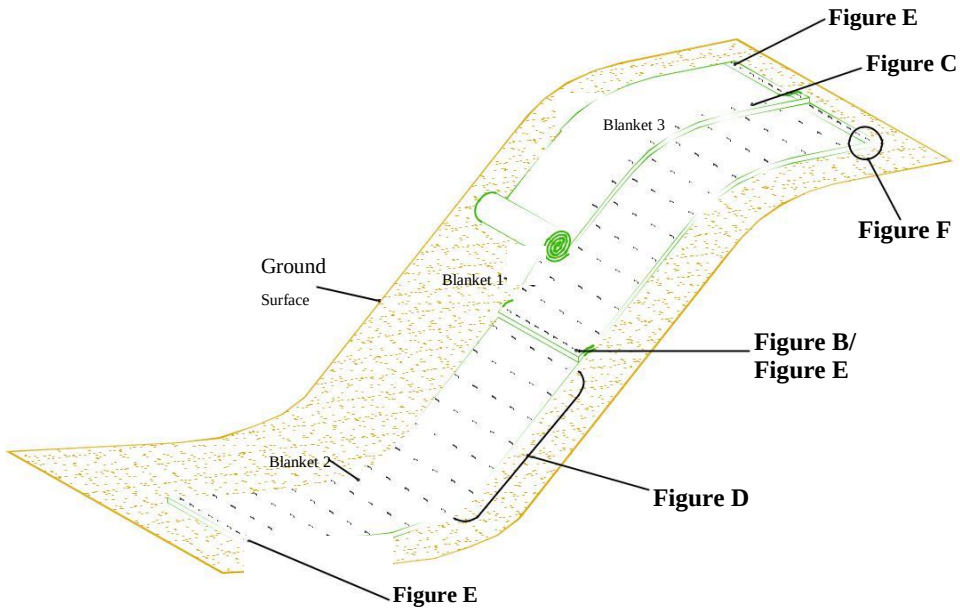


Figure A

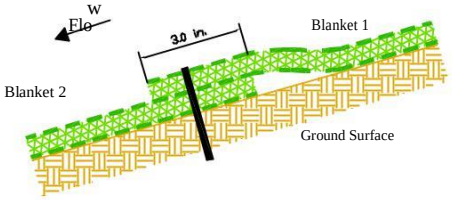


Figure B - Profile View

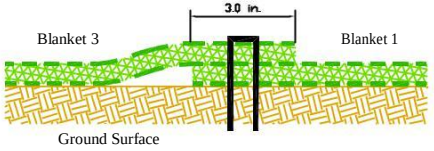


Figure C - Cross Section View

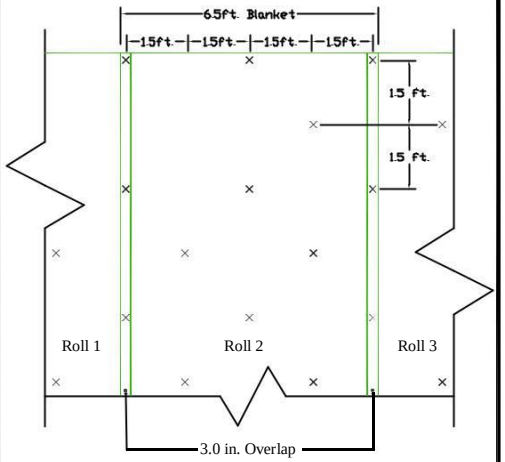


Figure D - Plan View × - Denotes Staple Location

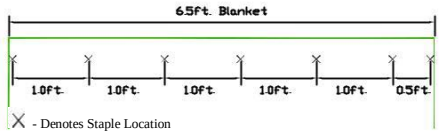


Figure E - Plan View

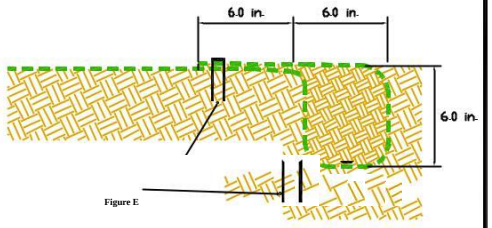


Figure F - Profile View

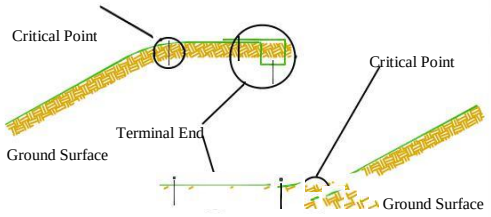


Figure G - Critical Point Securing

Product Application/Equivalency Specifications

PP5-Xtreme is produced by Western Excelsior and consists of a permanent Rolled Erosion Control Product (RECP) comprised of UV stable synthetic yarns continuously woven into a three-dimensional profile. PP5-Xtreme is designed and manufactured to provide immediate erosion control and permanent turf reinforcement and is comprised of physical properties sufficient to provide the intended longevity and performance. Additionally, PP5-Xtreme is constructed to yield a high tensile strength, high durability material. Product specifications may be found on document WE_EXCEL_PPXT_SPEC and performance information may be found on document WE_EXCEL_PPXT_PERF. All documents are available from Western Excelsior Technical Support or www.westernexcelsior.com. Additional to above, equivalent products to PP5-Xtreme must meet identical criteria as PP5-Xtreme as follows:

1. Consist of synthetic fiber matrix confined between two UV stable, heavy duty sythetic nets.
2. Sufficient tensile strength, thickness and coverage to maintain integrity during installation and ensure material performance. Provide permanent turf reinforcement with longevity greater than three years, immune from moisture damage or chemical conditions within the soil.
3. Listing within AASHTO NTPEP database.
4. Meet ECTC specification for category 5C product.

Channel Installation
Instructions PP5-Xtreme™

*** Drawings Not to Scale**

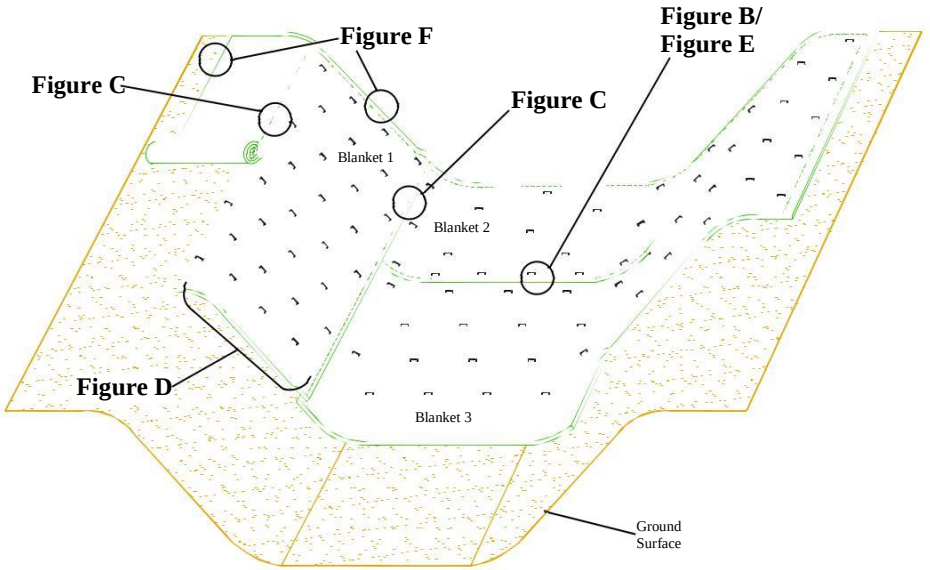


Figure A

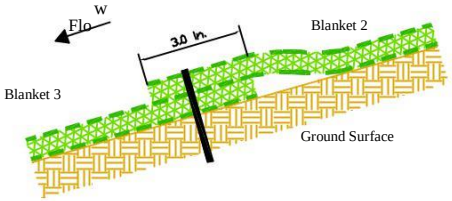
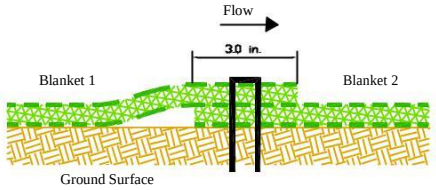


Figure B - Profile View



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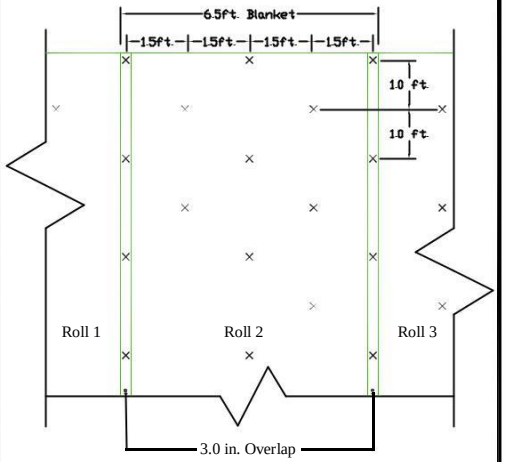

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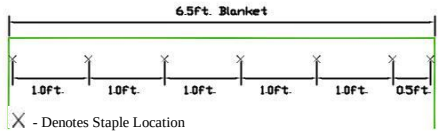
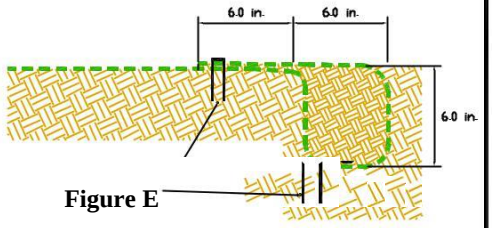


Figure E - Plan View



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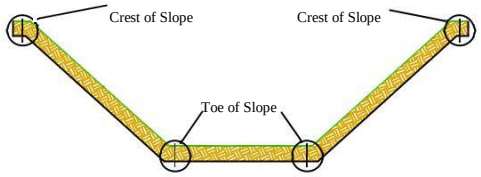

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