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“Blanketing Nature With Nature”

Effective: 2/15/09

RE: Certificate of Conformance: *Excel CS-3 All Natural*[™]

To Whom it May Concern:

This letter is to certify that Western Excelsior manufactures the Rolled Erosion Control Product (RECP) marketed as EXCEL CS-3 All Natural. Each blanket is subjected to Western Excelsior’s Quality Assurance Program and is manufactured to the specifications listed in document number WE_EXCEL_CS3AN_SPEC. Further, Western Excelsior utilizes industry standardized test procedures to develop performance references for Excel CS-3 All Natural. Document number WE_EXCEL_CS3AN_PERF presents the industry standardized testing and results. Installation instructions are provided in document numbers WE_EXCEL_CS3AN_SII and WE_EXCEL_CS3AN_CII for hill slope and channel installations, respectively. A copy of document number WE_EXCEL_CS3AN_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,

A handwritten signature in black ink, appearing to read "Chad M. Lipscomb".

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



Material Properties and Dimensions



Description

Western Excelsior manufactures a full line of Rolled Erosion Control Products (RECPs). The Coconut/Straw Excel CS-3 All Natural Extended Term Erosion Control Blanket consists of 30% coconut fibers and 70% certified noxious weed free agricultural straw manufactured into a continuous matrix. The coconut/straw matrix is confined by a biodegradable, jute/scrim net on top and bottom, mechanically (stitch) bound on two inch centers with a biodegradable, cotton thread. Excel CS-3 All Natural is intended for slope or channel erosion control applications requiring up to twenty-four months of functional longevity. Actual field longevity is dependent on soil and climatic conditions.

Specifications

Each roll of EXCEL CS-3 All Natural is manufactured under Western Excelsior's Quality Assurance Program to ensure a continuous distribution of fibers and consistent thickness. Verifiable values are provided in Table 1 and product characteristics are provided in Tables 2 and 3. Values provided in Tables 1, 2 and 3 represent expected values at the time of manufacture. Installation instructions and performance data are available from Western Excelsior's Technical Support Division.

Tested Property	Test Method	Value	Units
Tensile Strength	ASTM D6818	16.0 (MD), 11.0 (TD)	lb/in
Elongation	ASTM D6818	20.0 (MD), 20.0 (TD)	%
Mass per Unit Area	ASTM D6475	8.9	oz/yd ²
Thickness	ASTM D6525	8.5	mm
Light Penetration	ASTM D6567	10	% open
Water Absorption	ASTM D1117	325	%

Top Net	Biodegradable Jute/Scrim (Leno Weave)
Bottom Net	Biodegradable Jute/Scrim (Leno Weave)
Top Net Opening	0.50 in x 0.50 in (Nominal)
Bottom Net Opening	0.50 in x 0.50 in (Nominal)

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	62 lbs	N/A

Document # WE_EXCEL_CS3AN_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 2/09.



Product Evaluation Data and Test Results



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 CS-3 All Natural Extended Term Erosion Control Blanket (ECB) 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	2 in. per hour	14.41	Soil Loss Ratio
	4 in. per hour	17.38	
	6 in. per hour	20.95	
ECTC Test Method 3 - Shear Resistance	2.36 psf	0.5	Soil Loss (in.)
ECTC Test Method 4 - Germination	Top Soil, Fescue, 21 day Incubation	693	% Improvement

Table 2 - Texas Transportation Institute (TTI)

Rainfall Testing				Channelized Testing		
Class	Slope Gradient	Soil Type	Result	Class	90 Day Partially Vegetated Shear Stress Threshold	Result
A	< 3H : 1V	Clay	Approved	E	2.0 lb/ft ²	Approved
B	< 3H : 1V	Sand	Approved	F	4.0 lb/ft ²	N/A
C	> 3H : 1V	Clay	Approved	G	6.0 lb/ft ²	N/A
D	> 3H : 1V	Sand	Approved	H	8.0 lb/ft ²	N/A
				I	10.0 lb/ft ²	N/A
				J	12.0 lb/ft ²	N/A

Recommended Design Values

Table 3 - Unvegetated Design Values

Maximum Permissible Velocity*	Soil Loss
6.0 ft/s	0.5 inches
Maximum Permissible Shear Stress*	Soil Loss
1.6 lb/ft ²	0.5 inches
Resistance to Flow*	
HEC 15 Shear Relationship	Manning's n
0.4 lb/ft ² (Tau _{lower})	0.045
0.8 lb/ft ² (Tau _{mid})	0.036
1.6 lb/ft ² (Tau _{upper})	0.031
RUSLE Cover Factor*	Slope Gradient*
0.05	3 H : 1V

Table 4 - Vegetated Design Values

Maximum Permissible Velocity*
N/A
Maximum Permissible Shear Stress*
N/A

*Recommended Design Values provided herein are based on results of standardized industry 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.

Document # WE_EXCEL_CS3AN_PERF. This document has been developed to provide information regarding the bench scale and/or performance testing conducted on the Excel CS-3 All Natural ECB. For questions or installation recommendations, contact Western Excelsior Technical Services Division at 800-967-4009 or wexcotech@westernexcelsior.com. Updated 02/09.



Slope Installation
 Instructions EXCEL CS-3™
 All Natural

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.

Step 3 - Staple Selection

At a minimum, 6" long by 1" 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 slope to secure the upstream end of the blanket. The trench should run along the length of the installation, be 6" wide and 6" 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.

Document # WE_EXCEL_CS3AN_SII

*Approximately 200 Staples per 8.0' Roll
 Drawings Not to Scale 8.0' Wide Blanket
 Shown

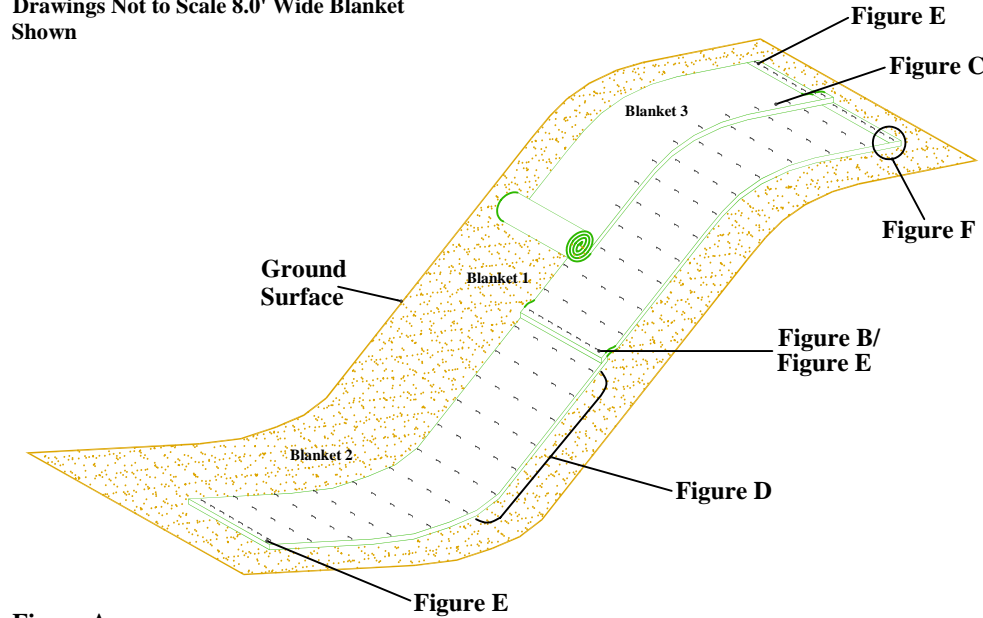


Figure A

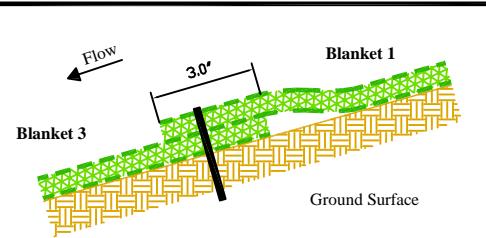


Figure B - Profile View

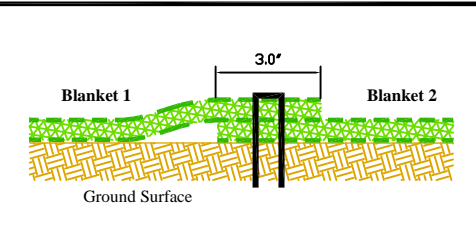
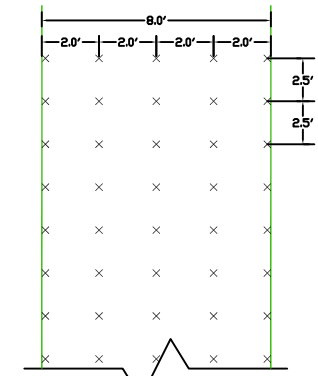


Figure C - Cross Section View

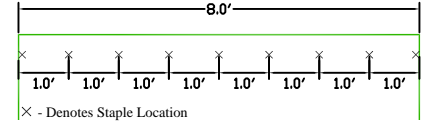
Product Application/Equivalency Specifications

Excel CS-3 All Natural is produced by Western Excelsior and consists of an extended term Rolled Erosion Control Product (RECP) comprised of a coconut/straw blend matrix mechanically (stitch) bound between two, biodegradable jute/scrim nets (top and bottom). The expected longevity of Excel CS-3 All Natural is approximately 24 months (actual longevity dependent on field and climatic conditions). Excel CS-3 All Natural is manufactured to include physical properties sufficient to provide the intended longevity and performance. Product specifications may be found on document WE_EXCEL_CS3AN_SPEC and performance information may be found on document WE_EXCEL_CS3AN_PERF. All documents are available from Western Excelsior Technical Support or www.westernexcelsior.com. Additional to above, equivalent products to Excel CS-3 All Natural must meet identical criteria as Excel CS-3 All Natural as follows:

1. Consist of a coconut/straw blend matrix mechanically (stitch) bound between two, biodegradable jute/scrim nets.
2. Sufficient tensile strength, thickness and coverage to maintain integrity during installation and ensure material performance.
3. Listing within AASHTO NTPEP database.



× - Denotes Staple Location
 Figure D - Plan View



× - Denotes Staple Location
 Figure E - Plan View

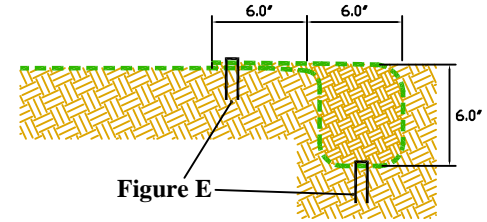


Figure F - Profile View

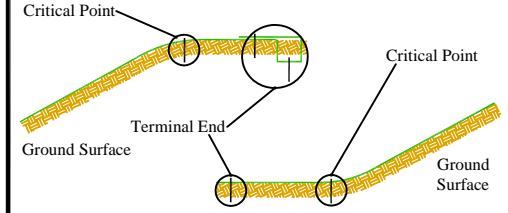


Figure G - Critical Point Securing



Channel Installation
 Instructions EXCEL CS-3™
 All Natural

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.

Step 3 - Staple Selection

At a minimum, 6" long by 1" 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" wide and 6" 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 from 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.

Document # WE_EXCEL_CS3AN_CII

*Approximately 360 Staples per 8.0' Roll
 Drawings Not to Scale 8.0' Wide Blanket
 Shown

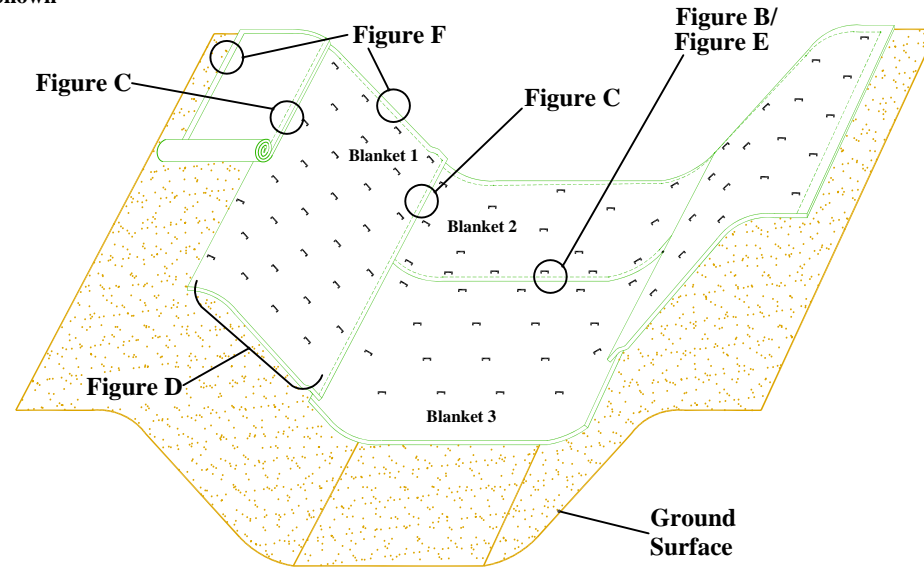


Figure A

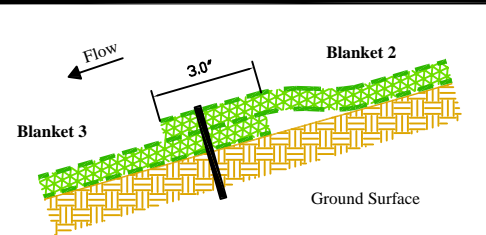


Figure B - Profile View

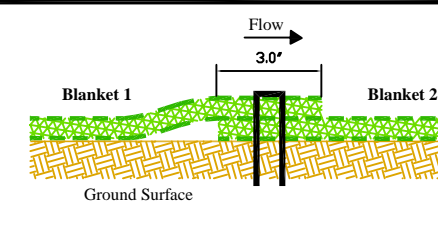
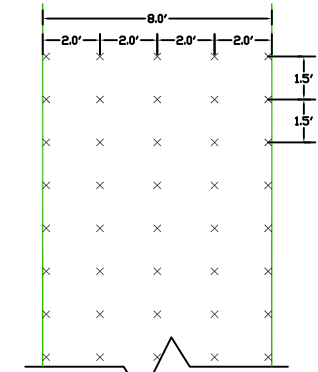


Figure C - Cross Section View

Product Application/Equivalency Specifications

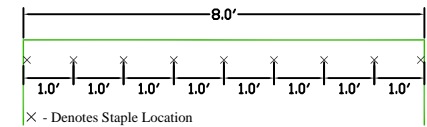
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1. Consist of a coconut/straw blend matrix mechanically (stitch) bound between two, biodegradable jute/scrim nets.
2. Sufficient tensile strength, thickness and coverage to maintain integrity during installation and ensure material performance.
3. Listing within AASHTO NTPEP database.



× - Denotes Staple Location

Figure D - Plan View



× - Denotes Staple Location

Figure E - Plan View

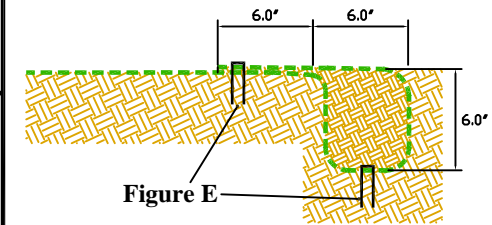


Figure E

Figure F - Profile View

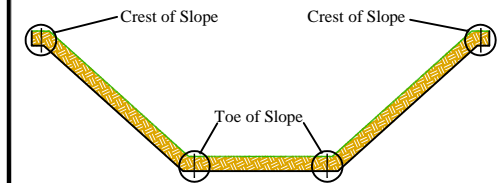


Figure G - Critical Points



Instalación en Pendiente

Instrucciones EXCEL CS-3™ All Natural

Paso 1 - Preparación del Lugar

Prepare el lugar según el perfil del diseño y de la pendiente. Remueva el escombros, piedras, y terrones, etc. La superficie de la tierra debe estar lisa antes de la instalación para asegurar que el cojín permanezca en contacto con la pendiente.

Paso 2 - Semilla

El sembrado de la semilla en el lugar se debe hacer de acuerdo a los requisitos del diseño o a los requisitos locales y estatales, según sea necesario.

Paso 3 - Selección de Grapas

Lo mínimo que se debe usar son grapas de calibre 11, de 6" de largo y 1" de corona para sujetar el cojín a la superficie de la tierra. La instalación en tierra rocosa, arenosa o suelta puede requerir grapas más largas.

Paso 4 - Excave Zanja para Anclaje y Sujete el Cojín

Excave una zanja a lo largo de la parte superior de las pendientes de los lados del canal y la orilla de arriba del canal para sujetar las orillas del cojín. La zanja debe correr a lo largo y ancho de la instalación, tener 6" de ancho y 6" de profundidad. Engrape el cojín a lo largo del fondo de la zanja; llénela con tierra compactada, empalme el cojín hacia la parte inferior de la pendiente y sujételo con una hilera de grapas (Vea las Figuras A, E y F).

Paso 5 - Sujete el Cuerpo del Cojín

Desenrole el cojín hacia abajo desde la zanja de anclaje. Engrape el cuerpo del cojín siguiendo el patrón que se muestra en la Figura D. Deje la punta del cojín sin engrapar para que lo pueda empalmar como se muestra en la Figura B. Coloque el cojín que baja por debajo del de arriba para formar un patrón como de tejas. Engrape las uniones como se muestra en la figura E. Sujete el cojín de bajada con el patrón de engrapado que se muestra en la Figura D. El patrón de engrapado de la Figura D refleja el mínimo de grapas que se debe usar. Se pueden requerir más grapas para asegurar que el cojín quede sujetado suficientemente para resistir podadoras y tráfico a pie y para asegurar que el cojín permanezca en contacto con la superficie de la tierra en toda el área. Además, los puntos críticos requieren grapas adicionales. Los puntos críticos están identificados en la Figura G.

Paso 6 - Continúe a lo largo de la Pendiente - Termine la Instalación

Empalme los cojines adyacentes como se muestra en la Figura C y repita el Paso 5. Sujete la parte inferior de la pendiente usando el patrón de grapas que se muestra en la Figura E. Sujete las orillas de la instalación engrapando a intervalos de 1.0' a lo largo de la orilla.

Document # WE_EXCEL_CS3AN_SII

* Se Requieren Aproximadamente 200 Grapas por Rollo de 8' - El Dibujo No Está a Escala Se. Muestra el Cojín de 8' de Ancho

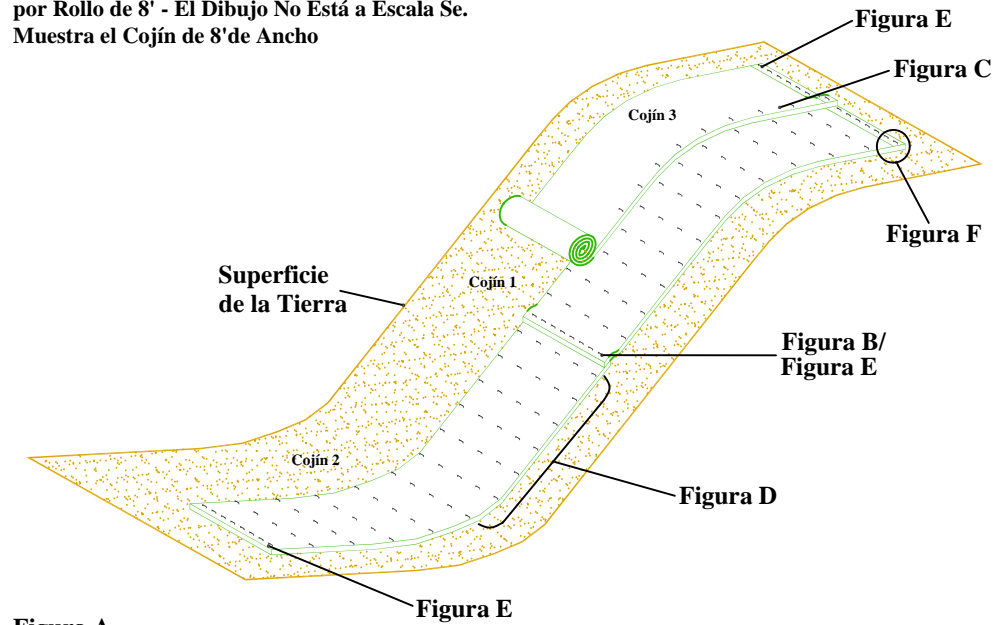


Figura A

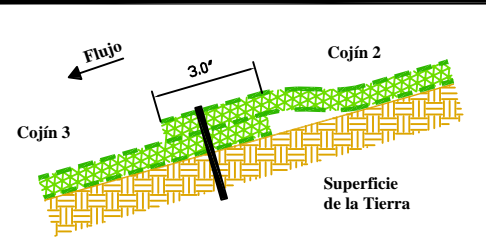


Figura B - Vista de Perfil

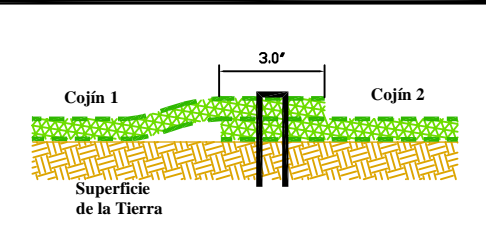
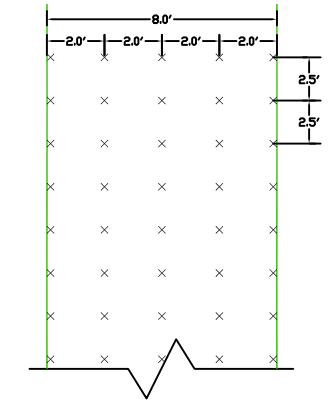


Figura C - Corte de Vista Transversal

Product Application/Equivalency Specifications

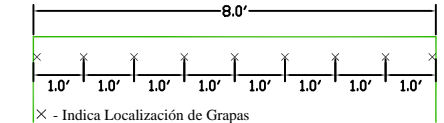
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3. Listing within AASHTO NTPEP database.



× - Indica Localización de Grapas

Figura D - Vista del Plano



× - Indica Localización de Grapas

Figura E - Vista del Plano

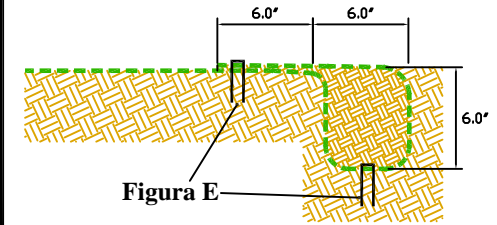


Figura F - Vista de Perfil

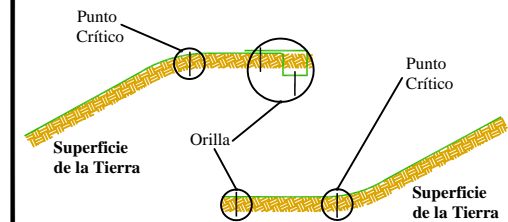


Figura G - Sujeción de Puntos Críticos



Instalación en Canal

Instrucciones EXCEL CS-3™
All Natural

Paso 1 - Preparación del Lugar

Prepare el lugar según el perfil del diseño y de la pendiente. Remueva el escombros, piedras, y terrones, etc. La superficie de la tierra debe estar lisa antes de la instalación para asegurar que el cojín permanezca en contacto con la pendiente.

Paso 2 - Semilla

El sembrado de la semilla en el lugar se debe hacer de acuerdo a los requisitos del diseño o a los requisitos locales y estatales, según sea necesario.

Paso 3 - Selección de Grapas

Lo mínimo que se debe usar son grapas de calibre 11, de 6" de largo y 1" de corona para sujetar el cojín a la superficie de la tierra. La instalación en tierra rocosa, arenosa o suelta puede requerir grapas más largas.

Paso 4 - Excave Zanja para Anclaje y Sujete el Cojín

Excave una zanja a lo largo de la parte superior de las pendientes de los lados del canal y la orilla de arriba del canal para sujetar las orillas del cojín. La zanja debe correr a lo largo y ancho de la instalación, tener 6" de ancho y 6" de profundidad. Engrape el cojín a lo largo del fondo de la zanja; llénela con tierra compactada, empalme el cojín hacia la parte inferior de la pendiente y sujételo con una hilera de grapas (Vea las Figuras A, E y F).

Paso 5 - Sujete el Cuerpo del Cojín

Desenrolle el cojín hacia abajo desde la zanja de anclaje. Engrape el cuerpo del cojín siguiendo el patrón que se muestra en la Figura D. Deje la punta del cojín sin engrapar para que lo pueda empalmar como se muestra en la Figura B. Coloque el cojín que baja por debajo del de arriba para formar un patrón como de tejas. Engrape las uniones como se muestra en la figura E. Sujete el cojín de bajada con el patrón de engrapado que se muestra en la Figura D. El patrón de engrapado de la Figura D refleja el mínimo de grapas que se debe usar. Se pueden requerir más grapas para asegurar que el cojín quede sujetado suficientemente para resistir podadoras y tráfico a pie y para asegurar que el cojín permanezca en contacto con la superficie de la tierra en toda el área. Además, los puntos críticos requieren grapas adicionales. Los puntos críticos están identificados en la Figura G.

Paso 6 - Continúe a lo largo de la Pendiente - Termine la Instalación

Empalme los cojines adyacentes como se muestra en la Figura C y repita el Paso 5. Sujete la parte inferior de la pendiente usando el patrón de grapas que se muestra en la Figura E. Sujete las orillas de la instalación engrapando a intervalos de 1.0' a lo largo de la orilla.

Document # WE_EXCEL_CS3AN_CII

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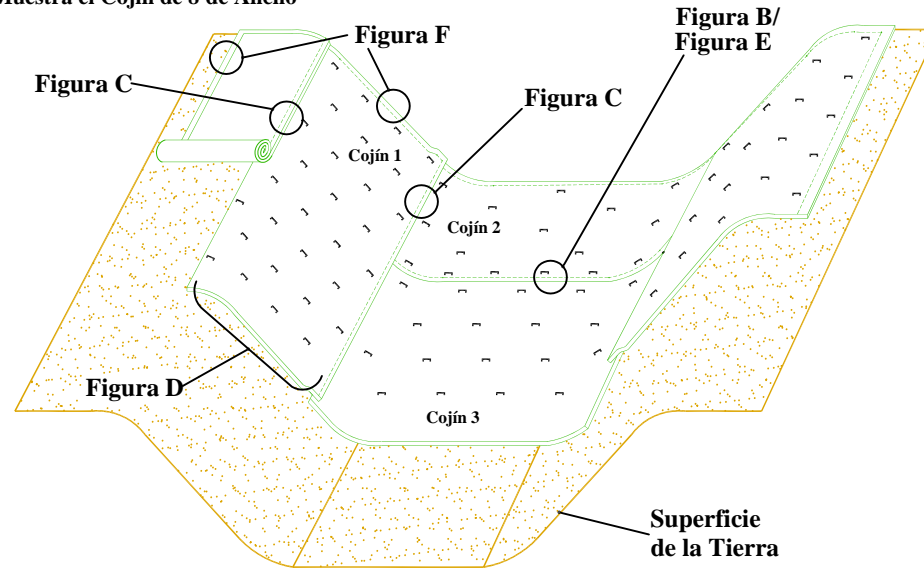


Figura A

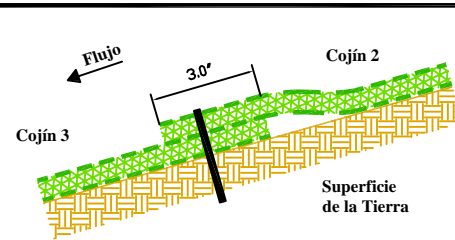


Figura B - Vista de Perfil

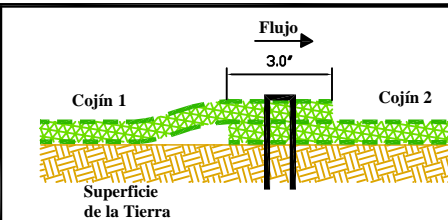
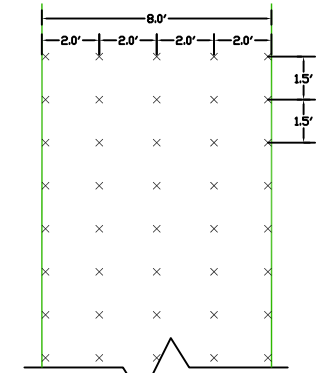


Figura C - Corte de Vista Transversal

Product Application/Equivalency Specifications

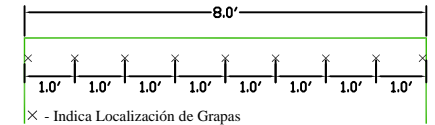
Excel CS-3 All Natural is produced by Western Excelsior and consists of an extended term Rolled Erosion Control Product (RECP) comprised of a coconut/straw blend matrix mechanically (stitch) bound between two, biodegradable jute/scrim nets (top and bottom). The expected longevity of Excel CS-3 All Natural is approximately 24 months (actual longevity dependent on field and climatic conditions). Excel CS-3 All Natural is manufactured to include physical properties sufficient to provide the intended longevity and performance. Product specifications may be found on document WE_EXCEL_CS3AN_SPEC and performance information may be found on document WE_EXCEL_CS3AN_PERF. All documents are available from Western Excelsior Technical Support or www.westernexcelsior.com. Additional to above, equivalent products to Excel CS-3 All Natural must meet identical criteria as Excel CS-3 All Natural as follows:

1. Consist of a coconut/straw blend matrix mechanically (stitch) bound between two, biodegradable jute/scrim nets.
2. Sufficient tensile strength, thickness and coverage to maintain integrity during installation and ensure material performance.
3. Listing within AASHTO NTPEP database.



× - Indica Localización de Grapas

Figura D - Vista del Plano



× - Indica Localización de Grapas

Figura E - Vista del Plano

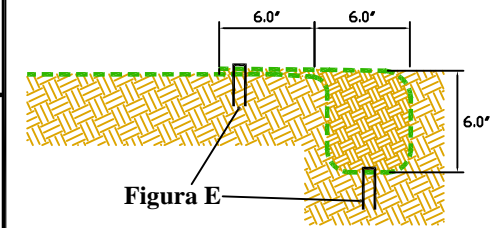


Figura F - Vista de Perfil

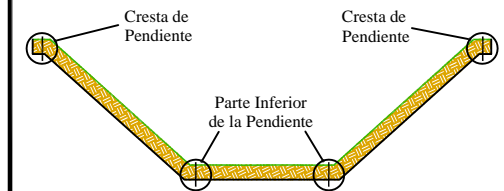


Figura G - Puntos Críticos