

MATERIAL PROPERTY DATA SHEET



EXCEL CS-3 All Natural™

Extended Term • Double Net • Coconut/Straw Matrix •
Biodegradable • Erosion Control Blanket

DESCRIPTION

Excel CS-3 All Natural (CS-3AN) Extended Term Erosion Control Blanket consists of 30% coconut fibers and 70% 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-3AN is intended for slope and channel erosion control applications requiring up to twenty-four months of functional longevity. The material is fully degradable. The net, thread, and the fiber matrix is biodegradable. Actual field longevity is dependent on soil and climatic conditions.



Each roll of Excel CS-3AN is made in the USA and manufactured under Western Green's Quality Assurance Program to ensure a continuous distribution of fibers and consistent thickness.

CS-3AN has replaced ECSC-2B, formerly provided by East Coast Erosion. CS-3AN meets or exceeds the ECSC-2B and can be used as a replacement with no limitations.

Material Content	
Matrix	Straw/Coconut Blend

Netting	Top & Bottom Net: Jute Scrim, Biodegradable, Leno Weave	Double Net
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Thread	Biodegradable Cotton or Rayon
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Standard Roll Sizes			
Width	8 ft (2.4 m)	16 ft (4.9 m)	

Length	112 ft (34.1 m)	563 ft (171.0 m)	
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Weight ± 10%	53 lb (24.1 kg)	530 lb (241.0 kg)	
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Area	100 sy (83.6 m ²)	1000 SY (836.0 m ²)	
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Material available in custom roll sizes

Approvals & Classification	
FHWA/ECTC Class	Type 3.B
TTI Approvals	Class 2 Type E
NTPEP Number	ECP-2020-01-010

Disclaimer: The information contained herein may represent product index data, performance ratings, bench scale testing or other material utility quantifications. Each representation may have unique utility and limitations. Every effort has been made to ensure accuracy, however, no warranty is claimed and no liability shall be assumed by Western Green or its affiliates regarding the completeness, accuracy or fitness of these values for any particular application or interpretation. While testing methods are provided for reference, values shown may be derived from interpolation or adjustment to be representative of intended use. For further information, please feel free to contact Western Green.

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Index Property	Test Method	Typical	
Thickness	ASTM D6525	0.30 in.	(8 mm)
Mass/Unit Area	ASTM D6566	8.5 oz/sy	(290 g/sm)
Tensile Strength – MD	ASTM D6818	210 lbs/ft	(3.1 kN/m)
Tensile Strength – TD	ASTM D6818	190 lbs/ft	(2.8 kN/m)
Elongation - MD	ASTM D6818	15%	
Elongation – TD	ASTM D6818	15%	
Density/Specific Gravity	D792	N/A	
Light Penetration	ASTM D6567	12%	
Biomass Improvement	ASTM D7322	500%	
Water Absorption	ASTM D1117	350%	

Design Parameters		
Property	Unvegetated	Vegetated ³
RUSLE C Factor ²	0.03	N/A
Slope Maximum Gradient ¹	2H:1V	N/A
Permissible Shear Stress ²	2.1 psf (100 Pa)	N/A
Permissible Velocity ²	8.0 fps (2.4 m/s)	N/A

Manning's n Roughness (HEC-15)		
τ_{lower}	τ_{mid}	τ_{upper}
0.045	0.036	0.031

¹ Maximum Gradient a recommendation for typical insillations.

² Hydraulic thresholds compliant with ASTM D6459/D6460 but generalized for typical applications.

³ Vegetated values dependent on established stand of vegetation

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Scan for additional and updated product information, or [click here](#).



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01/01/2023

RE: Certification of Conformance and Delivery for CS-3 All Natural

To Whom it May Concern:

This document has been drafted to provide certification as to the origin, properties and delivery of CS-3 All Natural, an Erosion Control Blanket (ECB). CS-3 All Natural is produced by Western Excelsior Corporation (WEC). The material is produced in the United States. Each roll is subjected to regular inspection and testing in accordance with the WEC Quality Assurance Program. Properties and specifications of the material are provided on document number WG_MPDS_CS-3AN, attached as reference. Installation documentation may be found at www.westernexcelsior.com.

Since most WEC products are sold to distributors and stocked, WEC is typically unable to certify material type or quantity delivered to the project/project site. However, space is provided below for distributor/contractor certification of materials delivered to the project/project site.

To the best of our knowledge, the information included is accurate.

A handwritten signature in black ink, appearing to read "Jill Pack", is written over a horizontal line.

Jill Pack, CPESC
Product Manager

Standard Material Delivery Certification

Material Provided by
(Distributor/Contractor): _____

Material Provided to
(Contractor/Project): _____

Project Name / Project Number: _____

Rolls / Square Yards Provided: _____

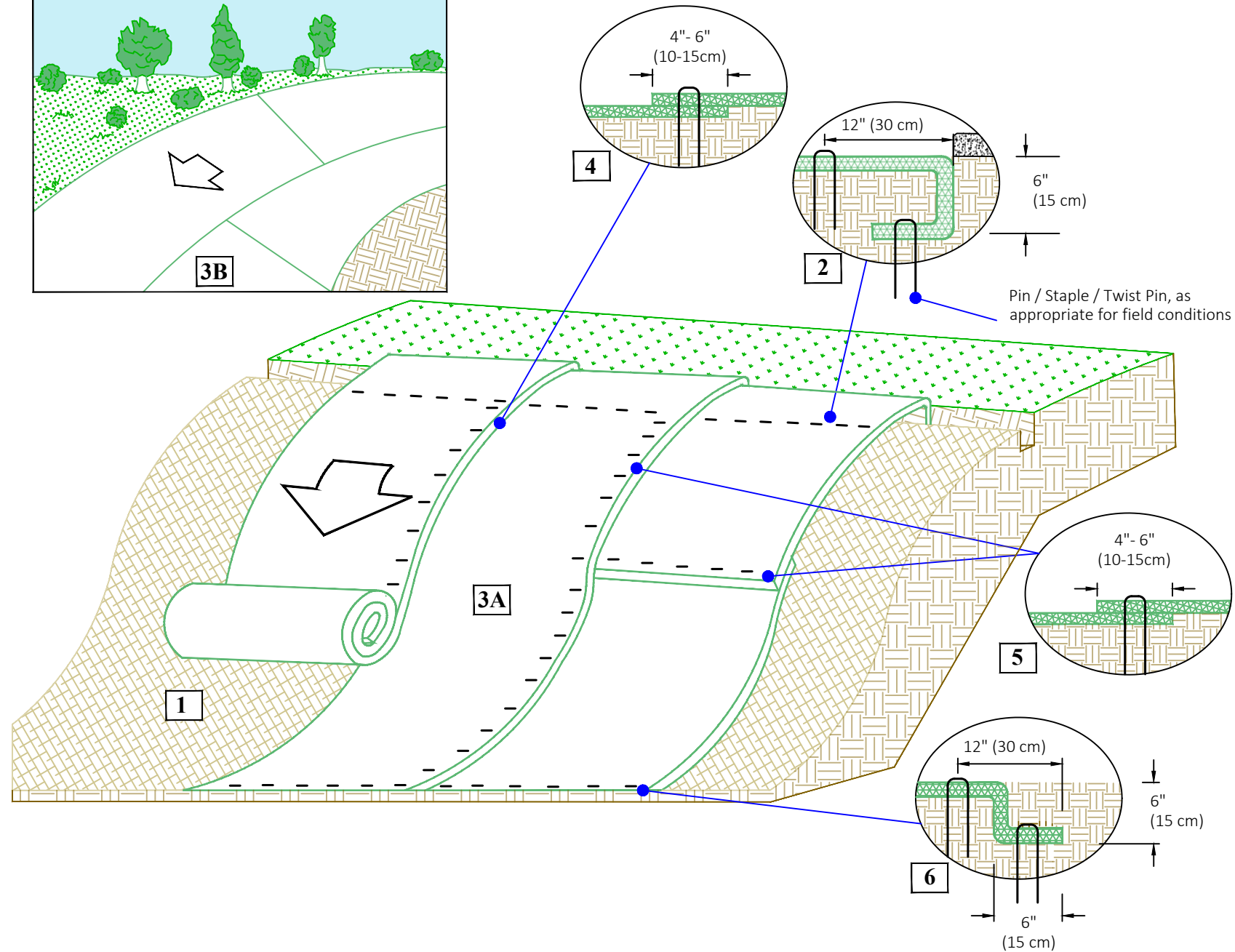
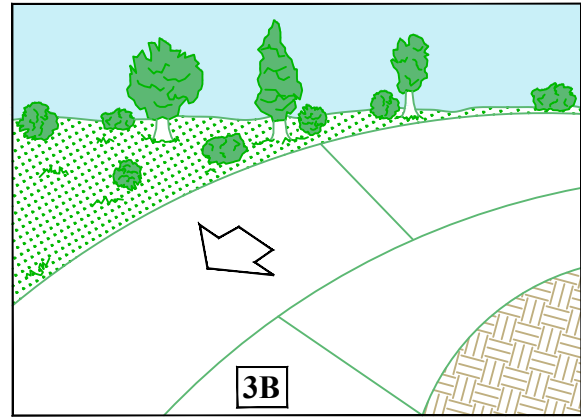
Specification #: _____

Signature: _____

Date: _____

Title: _____

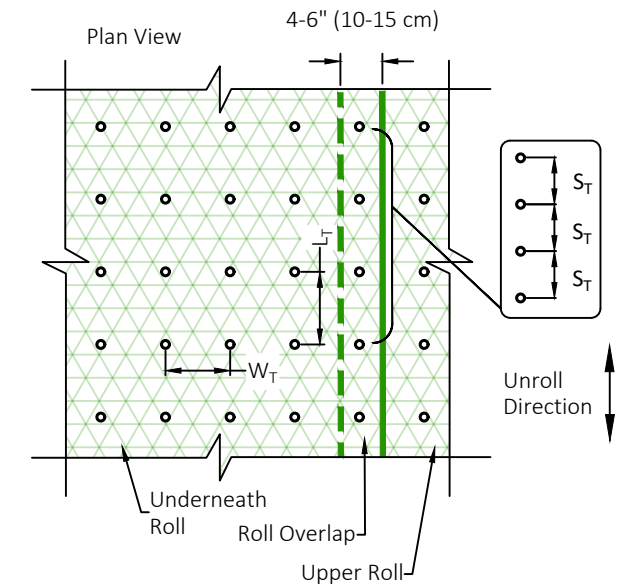




Instructions

1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed. Ground surface must be free of debris, rocks, clay clods and raked smooth sufficient to allow intimate contact of the RECP with the soil over the entirety of the installation.
2. Begin at the top of the slope by anchoring the RECPs in a 6" (15 cm) deep X 6" (15 cm) wide trench. Anchor the RECPs with a row of staples/stakes/pins spaced at S_T apart in the bottom of the trench. Backfill and compact the trench after stapling and fold the roll over downslope. Secure RECPs over compacted soil with a row of staples/stakes/pins spaced at S_T apart across the width of the RECPs.
3. Roll the RECPs (A) down or (B) horizontally across the slope. When laying RECPs horizontal, a maximum of two roll widths or 16 feet, whichever is less, may be applied up the slope. If two roll widths or 16 ft is insufficient to cover the slope, material shall be placed vertically. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes/pins in appropriate locations as shown in the staple pattern guide. RollMax RECPs and ECBs should utilize Staple Pattern C, TRMs and VMax materials should utilize Staple Pattern D.
4. The edges of parallel RECPs must be stapled with approximately 4" - 6" (10 - 15 cm) overlap.
5. Consecutive RECPs spliced down the slope must overlapped with the upstream mat atop the downstream mat (shingle style). The overlap should be 4" - 6" (10 - 15 cm).
6. At the terminal end, secure each mat across the width with a row of staples/stakes/pins spaced at S_T . If exposed to flow, foot traffic, wind uplift or other disruption, trench the terminal end in as shown in detail.
7. Fasteners should provide a minimum of twenty pounds of pullout resistance. Six-inch (10 cm) X one-inch (2.5 cm) eleven gauge staples are typically adequate. In loose soils, longer staples may be necessary, twist pins can provide the greatest pullout resistance. In hard or rocky soils, straight pins, such as HP-8 or HP-12, may be used where staples or twist pins are refused, provided the minimum pullout requirements are met. Bio-degradable fasteners shall not be used with TRM or HPTRM materials.

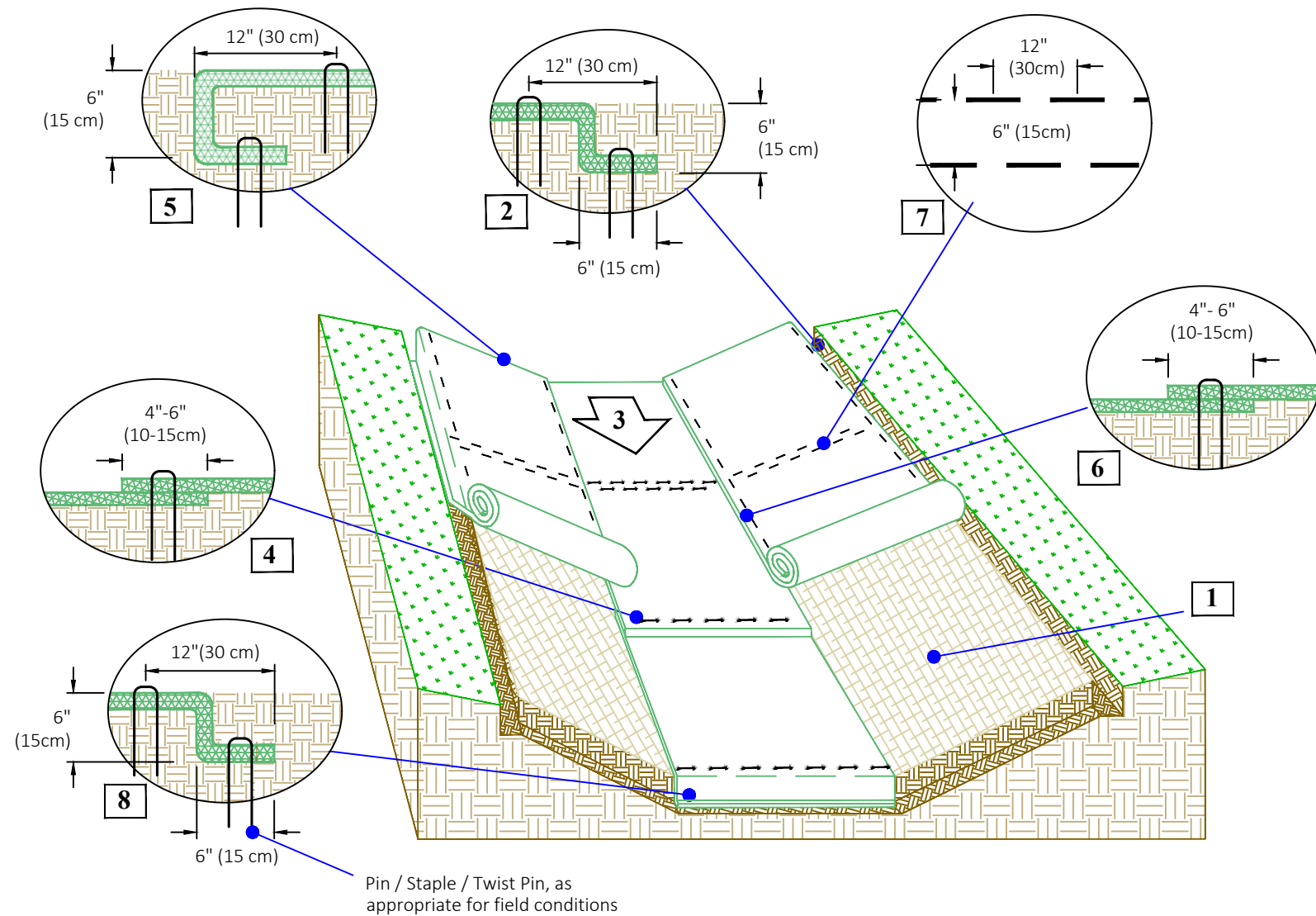
Staple Pattern Guide



- Pin / Staple / Twist Pin, as appropriate for field conditions

Dimension	Staple Pattern	
	C	D
W_T	30" (75 cm)	22" (55 cm)
L_T	30" (75 cm)	22" (55 cm)
S_T	18" (45 cm)	18" (45 cm)
Nominal Frequency	1.7 / SY	3.0 / SY
Application	ECB (Degradable)	TRM (Permanent)
Required Fastener	Min. 20# pullout	Min. 20# pullout

*Note: Staple Pattern A and B used prior to 8/2019 have been discontinued.



CRITICAL POINTS
 A. Overlaps and Seams
 B. Projected Water Line
 C. Channel Bottom/Side Slope Vertices

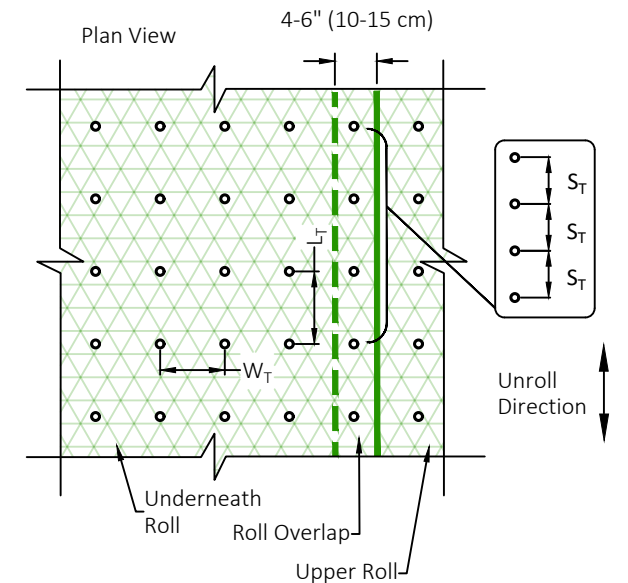


NOTES:
 *Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.

Instructions

1. Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed. Ground surface must be free of debris, rocks, clay clods and raked smooth sufficient to allow intimate contact of the RECP with the soil over the entirety of the installation.
2. Begin at the top of the channel by anchoring the RECPs in a 6" (15 cm) deep X 6" (15 cm) wide trench with approximately 12" (30 cm) of RECPs extended beyond the up-slope portion of the trench. Use ShoreMax mat at the channel/culvert outlet as supplemental scour protection as needed. Anchor the RECPs with a row of staples/stakes/pins approximately 12" (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12" (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes/pins spaced approximately 12" (30 cm) apart across the width of the RECPs.
3. Roll center RECPs in direction of water flow in bottom of channel. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes/pins in appropriate locations as shown in the staple pattern guide.
4. Place consecutive RECPs end-over-end (Shingle style) with a 4" - 6" (10 - 15 cm) overlap. Use a double row of staples staggered 4" apart and 4" on center to secure RECPs.
5. Full length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes/pins spaced at S_T apart in a 6" (15 cm) deep X 6" (15 cm) wide trench. Backfill and compact the trench after stapling.
6. Adjacent RECPs must be overlapped approximately 4" - 6" (10 - 15 cm) and secured with staples/stakes/pins at S_T .
7. In high flow channel applications a staple check slot is recommended at 30 to 40 foot (9 -12m) intervals. Use a double row of staples staggered 6" (15 cm) apart and 12" (30 cm) on center over entire width of the channel.
8. The terminal end of the RECPs must be anchored with a row of staples/stakes/pins spaced at S_T apart in a 6" (15 cm) deep X 6" (15 cm) wide trench. Backfill and compact the trench after stapling.
9. Fasteners should provide a minimum of twenty pounds of pullout resistance. Six-inch (10 cm) X one-inch (2.5 cm) eleven gauge staples are typically adequate. In loose soils, longer staples may be necessary, twist pins can provide the greatest pullout resistance. In hard or rocky soils, straight pins, such as HP-8 or HP-12, may be used where staples or twist pins are refused, provided the minimum pullout requirements are met. Bio-degradable fasteners shall not be used with VMax (TRM) or TMax (HPTRM) materials.

Staple Pattern Guide



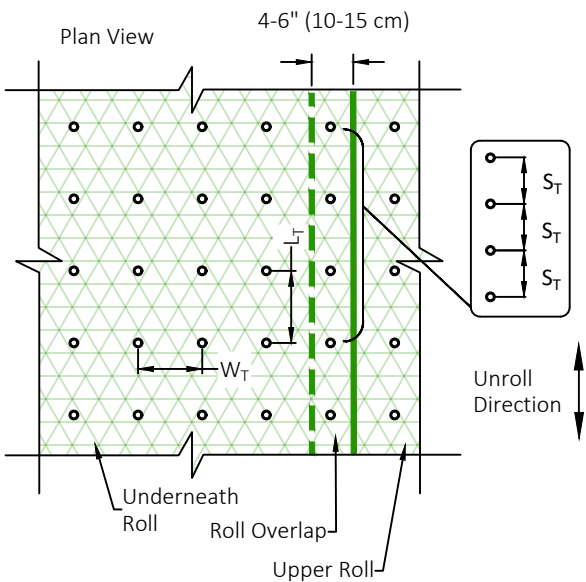
- Pin / Staple / Twist Pin, as appropriate for field conditions

	Staple Pattern
Dimension	E
W_T	20" (50 cm)
L_T	20" (50 cm)
S_T	18" (45 cm)
Nominal Frequency	3.8 / SY
Required Fastener	Min. 20# Pullout

Instructions

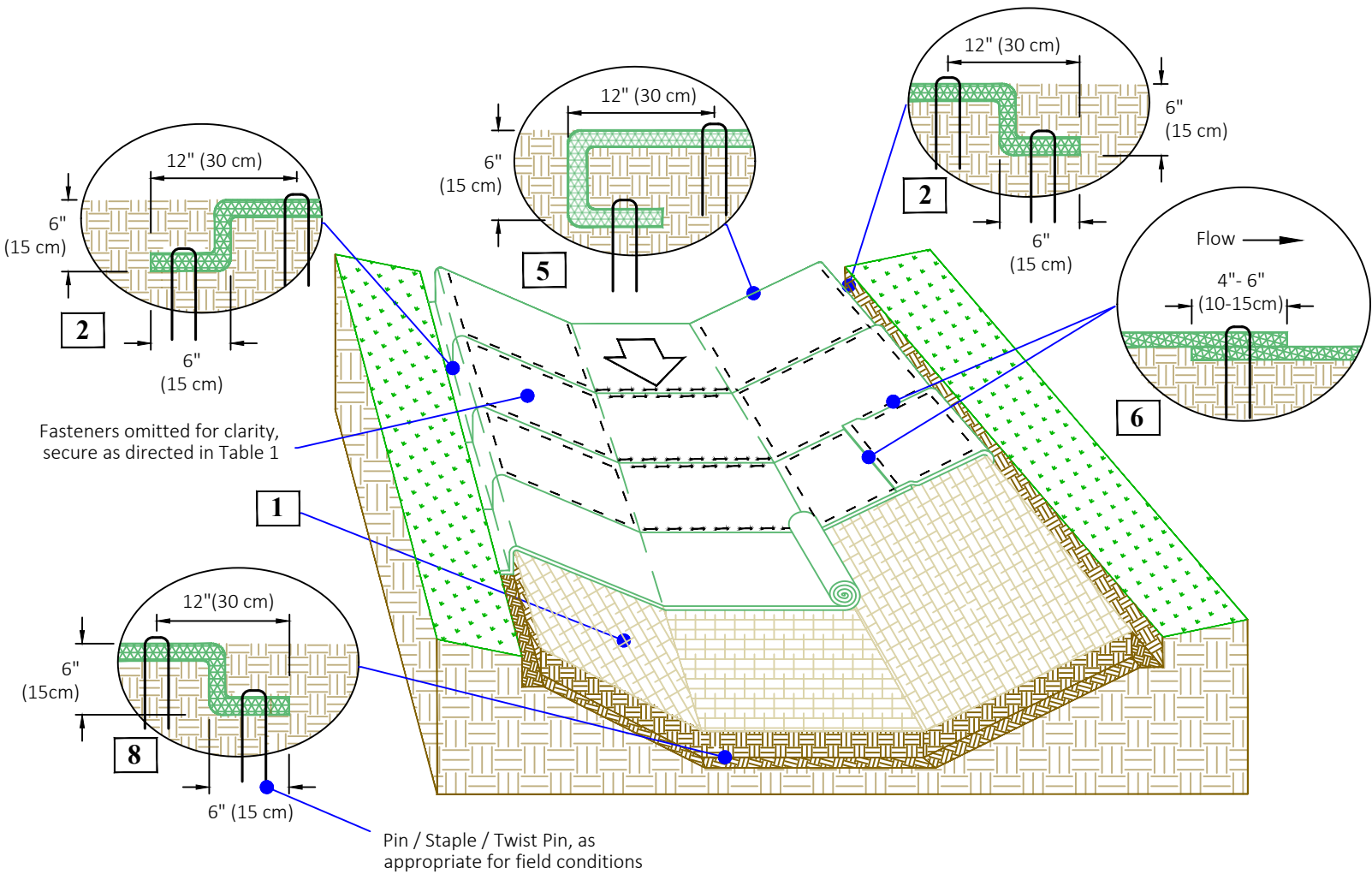
1. Prepare soil (fig. 1) before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed. Ground surface must be free of debris, rocks, clay clods and raked smooth sufficient to allow intimate contact of the RECP with the soil over the entirety of the installation. Apply seed and amendments to the compacted soil.
2. Dig anchor trench, 6" (15 cm) deep X 6" (15 cm) wide, at the upstream most edge of installation across the channel. Begin at the top of the channel by unrolling the RECP across the channel, perpendicular to the direction of flow, cut to fit. Carefully flip the RECP panel upstream, leaving it upside down. Place the upside down leading edge in the trench. Anchor the RECP panel with a row of fasteners spaced at S_T apart in the bottom of the trench. Backfill and compact the trench after fastening. With the RECP secured in the backfilled trench, flip the RECP panel over, right side up, over the backfill. The end result should mimic fig. 2. Secure RECP just downstream of trench with a row of fasteners located approximately 12" (30 cm) downstream from the trench, spaced at S_T .
3. Roll subsequent RECP panels across the channel, fitting the downstream panel under the upstream panel. RECPs shall be unrolled with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing twist pins in appropriate locations as shown in the pin pattern guide.
4. Place consecutive RECPs end-over-end (Shingle style) with a 4"- 6" (10 - 15 cm) overlap, see fig.6. Secure overlaps as shown.
5. Adjacent RECPs must be overlapped approximately 4"- 6" (10 - 15 cm) and secured with fasteners at S_T .
6. The terminal end of the RECPs must be anchored with a row of fasteners spaced at S_T apart in a 6" (15 cm) deep X 6" (15 cm) wide trench (minimum). Backfill and compact the trench after stapling.
7. Fasteners should provide a minimum of twenty pounds of pullout resistance. Six-inch (10 cm) X one-inch (2.5 cm) eleven gauge staples are typically adequate. In loose soils, longer staples may be necessary, twist pins can provide the greatest pullout resistance. In hard or rocky soils, straight pins, such as HP-8 or HP-12, may be used where staples or twist pins are refused, provided the minimum pullout requirements are met. Bio-degradable fasteners shall not be used with VMax (TRM) or TMax (HPTRM) materials.

Staple Pattern Guide



• Pin / Staple / Twist Pin, as appropriate for field conditions

	Staple Pattern
Dimension	E
W_T	20" (50 cm)
L_T	20" (50 cm)
S_T	18" (45 cm)
Nominal Frequency	3.8 / SY
Required Fastener	Min. 20# Pullout



CRITICAL POINTS

- A. Overlaps and Seams
- B. Projected Water Line
- C. Channel Bottom/Side Slope Vertices



NOTES:

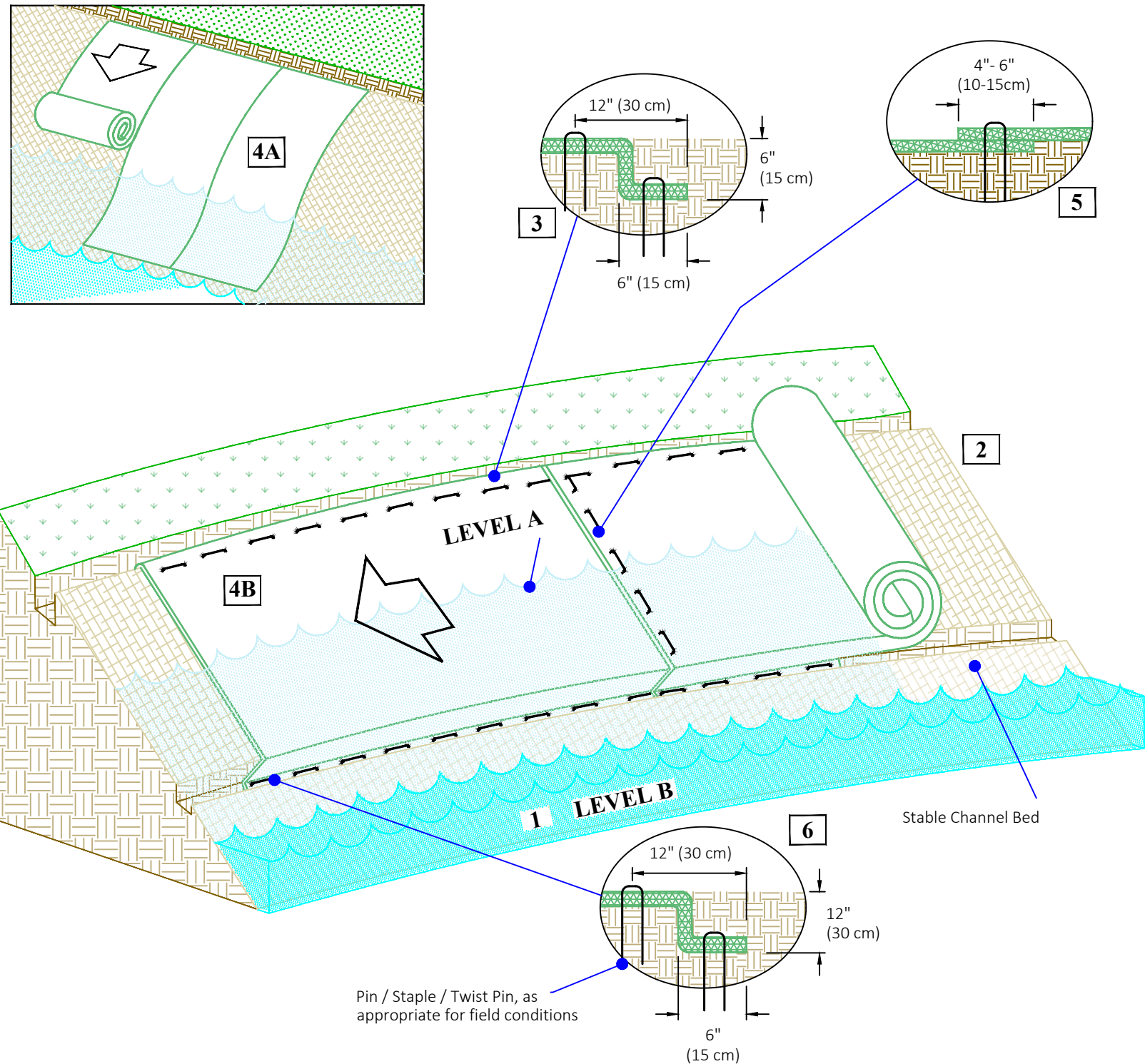
*Horizontal staple spacing should be altered if necessary to allow staples to secure the critical points along the channel surface.



Project: Standard Channel Layout, Unroll Cross Flow - RECP

Shown: Isometric View of Channel, Fastener Placement, Trenching and Overlap, Some Fasteners and Vegetation
Omitted for Clarity, NTS

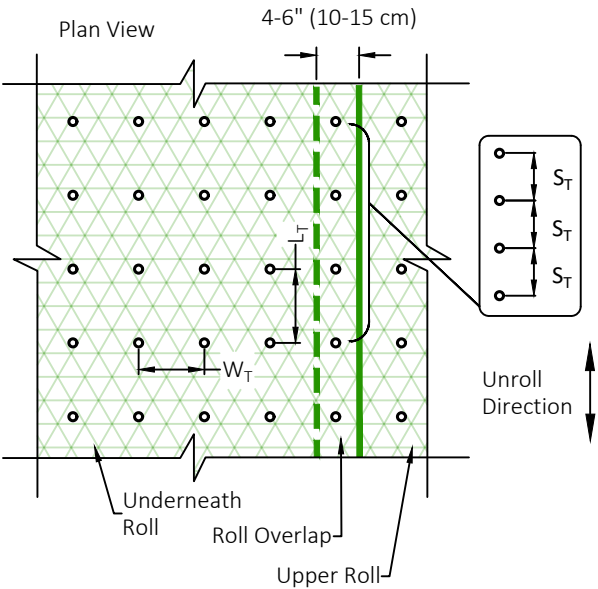
Date: 4/4/2023
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www.nagreen.com



Instructions

- For easier installation, lower water level from Level A to Level B before installation.
- Prepare soil before installing rolled erosion control products (RECPs), including any necessary application of lime, fertilizer, and seed. Ground surface must be free of debris, rocks, clay clods and raked smooth sufficient to allow intimate contact of the RECP with the soil over the entirety of the installation.
- Begin at the top of the shoreline by anchoring the RECPs in a 6" (15 cm) deep X 6" (15 cm) wide trench. Anchor the RECPs with a row of staples/stakes/pins spaced at S_T apart in the bottom of the trench. Backfill and compact the trench after stapling.
- Roll RECPs either (A) down the shoreline for long banks (top to bottom) or (B) horizontally across the shoreline slope. RECPs will unroll with appropriate side against the soil surface. VMax TRMs should always be installed parallel to flow. All RECPs must be securely fastened to soil surface by placing staples/stakes/pins in appropriate locations as shown in the staple pattern guide.
- The edges of all horizontal and vertical seams must be stapled with approximately 4" - 6" (10 - 15 cm) overlap. Note: *In streambank applications, seam overlaps should be shingled in the predominant flow direction.
- The edges of the RECPs at or below normal water level must be anchored by placing the RECP's in a 12" (30 cm) deep X 6" (15 cm) wide anchor trench. Anchor the RECPs with a row of staples/stakes/pins spaced approximately 12" (30 cm) apart in the trench. Backfill and compact the trench after stapling (stone or soil may be used as backfill). For installation at or below normal water level, use of ShoreMax mat on top of the RECP or geotextile underneath is likely required for sections below the normal water line.
- Fasteners should provide a minimum of twenty pounds of pullout resistance. Six-inch (10 cm) X one-inch (2.5 cm) eleven gauge staples are typically adequate. In loose soils, longer staples may be necessary, twist pins can provide the greatest pullout resistance. In hard or rocky soils, straight pins, such as HP-8 or HP-12, may be used where staples or twist pins are refused, provided the minimum pullout requirements are met. Bio-degradable fasteners shall not be used with VMax (TRM) or TMax (HPTRM) materials.

Staple Pattern Guide



• Pin / Staple / Twist Pin, as appropriate for field conditions

	Staple Pattern
Dimension	E
W_T	20" (50 cm)
L_T	20" (50 cm)
S_T	18" (45 cm)
Nominal Frequency	3.8 / SY
Required Fastener	Min. 20# Pullout



Project: Standard Channel Bank Layout - RECP

Shown: Isometric View of Channel, Fastener Placement, Trenching and Overlap, Some Fasteners and Vegetation
Omitted for Clarity, NTS

Date: 4/4/2023
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