

ROLLMAX™ ROLLED EROSION CONTROL

INSTALLATION GUIDE





RollMax™ Installation Guidelines:

Tensar International Corporation (Tensar) is the world's leading provider of performance-guaranteed erosion control solutions. For more than 25 years, our North American Green® line of erosion and sediment control products has kept our customers on solid ground. The RollMax™ Systems' family of Rolled Erosion Control Products (RECPs) is solid evidence of Tensar's ongoing investment in innovation. Our short-term and long-term Erosion Control Blankets (ECBs) and Turf Reinforcement Mats (TRMs) keep you one step ahead of just about any erosion challenge.

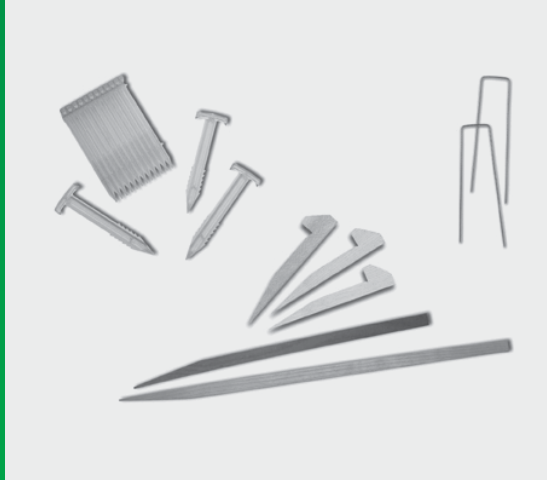
Tensar provides everything you need to know for quick, accurate erosion control installation tailored to your site. From start to finish, our RollMax Systems' product installation instructions are based on extensive research and field-proven techniques to ensure project success. The following pages offer instructions and guidelines for several scenarios you may encounter during the installation of RollMax Systems.

EXPERIENCE YOU CAN RELY ON

Tensar is the industry leader when it comes to providing comprehensive erosion and sediment control and turf reinforcement solutions as well as internal soil reinforcement solutions for site development challenges. We have developed integrated systems and products with the sole objective to ensure absolute customer satisfaction. Our products are backed by the most thorough quality assurance practices in the industry. And, we provide comprehensive design assistance for every Tensar system.

For additional installation assistance on RollMax Systems, please call **800-TENSAR-1**, visit **www.tensarcorp.com** or e-mail **info@tensarcorp.com** and we will be happy to put in touch with your erosion control specialist who can assist you.





Installation Made Easy

When under the pressure of severe conditions, even the best erosion control products can't function to their full potential without proper installation and anchoring. Tensar supplies a wide variety of fastener options for nearly every application and soil type.

For use in cohesive soils, wire staples are a cost-effective means to fasten RECPs. Available in 6 in., 8 in., 10 in. and 12 in. lengths, our U-shaped staples can reach to various depths to ensure adequate pull-out resistance. For installation using our handy Pin Pounder installation tool, 6 in. V-top staples or 6 in. circle top pins are available.

Our biodegradable BioStakes® are available in 4 in. and 6 in. lengths and provide an environmentally friendly alternative to metal staples. For an even more durable, deeper reaching yet all-natural anchoring option, our wood EcoStakes® are available in 6 in., 12 in., 18 in. and 24 in. lengths.

For severe applications needing the ultimate, long-lasting hold, try our 12 in. and 18 in. rebar staples, our 12 in. plastic ShoreMax® stakes, or our complete line of percussion earth anchors. The Tensar earth anchors reach deep into the soil strata to offer enhanced anchoring in the worst conditions. Our variety of earth anchors are designed for durability and holding power under extreme hydraulic stresses and adverse soil conditions.

STAPLE PATTERNS

Proper staple patterns must be used to achieve optimal results in RECP installation. Tensar recommends the following general stapling patterns as guidance for use with our RECPs as seen in (Figure 1). Site-specific staple pattern recommendations based on soil type and severity of application may be acquired through our Erosion Control Materials Design Software (ECMDS®), www.ecmnds.com.

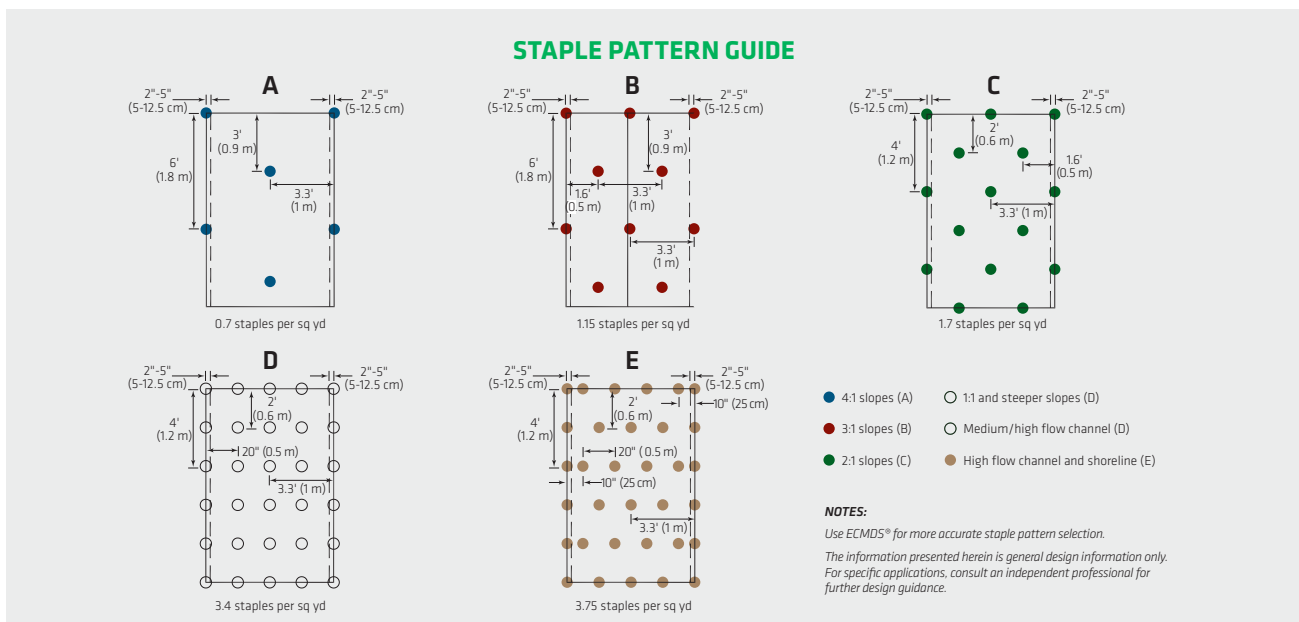
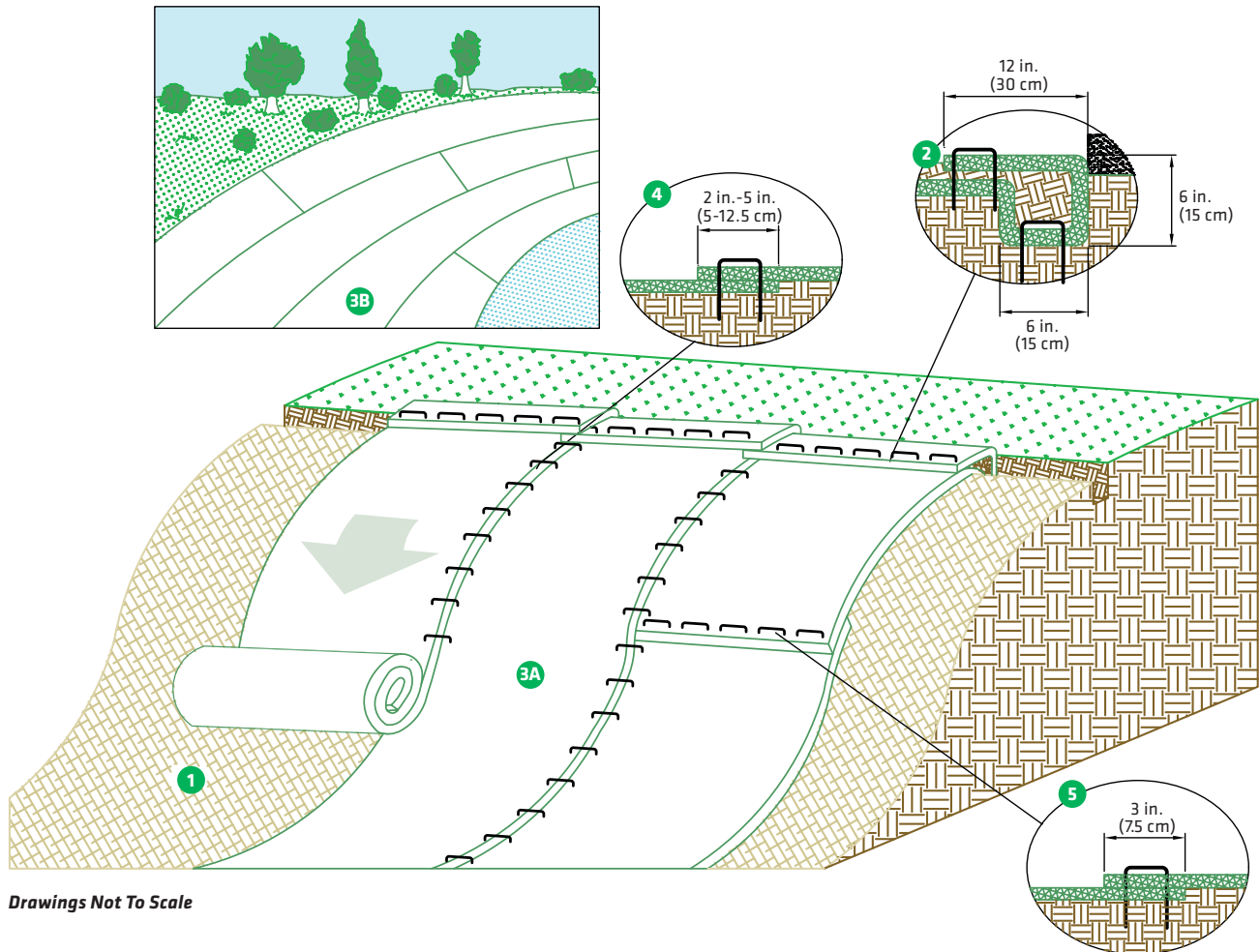


FIGURE 1

Slope Installation

The following slope guide outlines our general recommendations for installing Tensor's RollMax™ temporary and/or permanent RECPs on sloping applications. Consult the staple pattern guide (Figure 1) for fastener spacing recommendations based on the slope severity.



Drawings Not To Scale

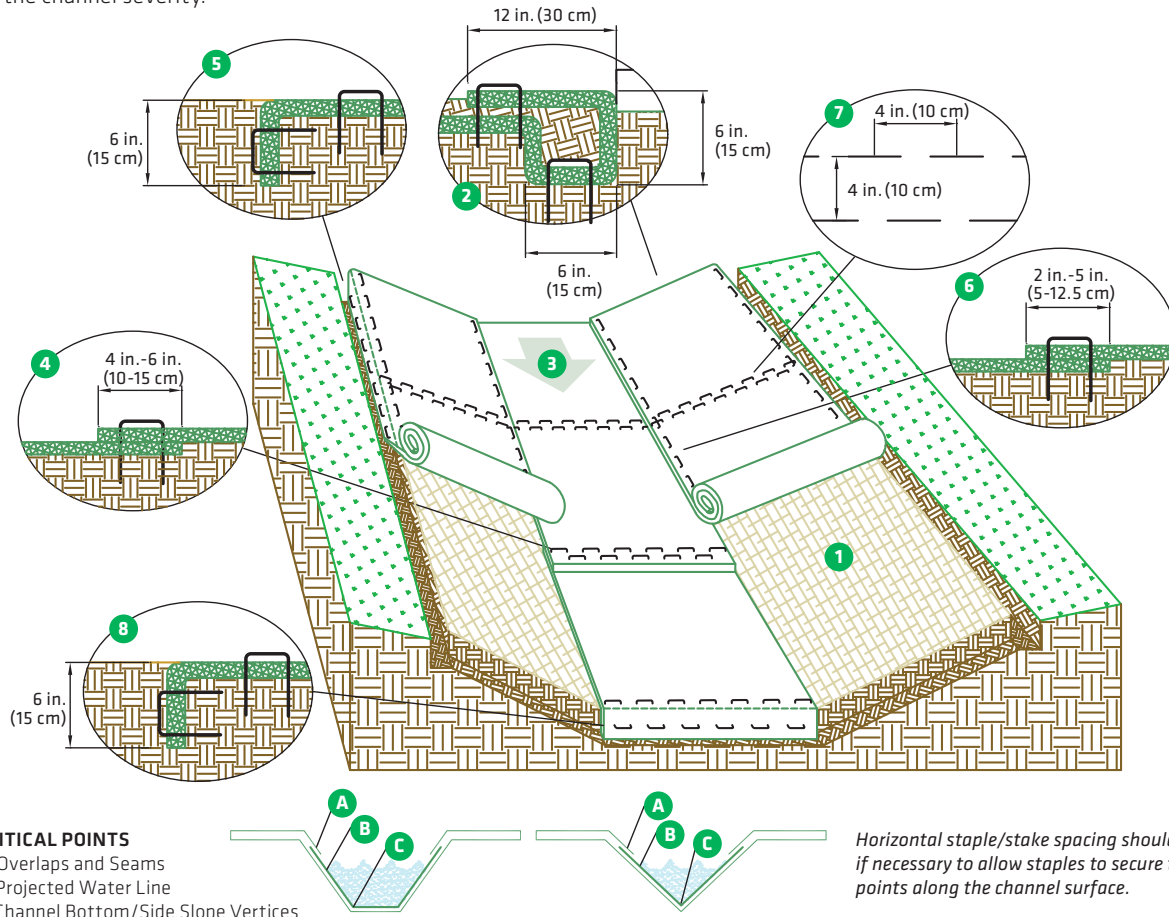
SLOPE INSTALLATION STEPS

1. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed. See page 7 for special requirements when soil filling a woven TRM.
2. Begin at the top of the slope by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12 in. (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 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
3. Roll the RECPs (3A) down or (3B) horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
4. The edges of parallel RECPs must be stapled with approximately 2 in.-5 in. (5-12.5 cm) overlap depending on the RECP type.
5. Consecutive RECPs spliced down the slope must be end-over-end (shingle style) with an approximate 3 in. (7.5 cm) overlap. Staple through overlapped area, approximately 12 in. (30 cm) apart across entire RECPs width.*

***NOTE:** In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.

Channel Installation

The following channel guide outlines our general recommendations for installing Tensor's RollMax™ temporary and/or permanent RECPs in concentrated flow applications. Consult the staple pattern guide (Figure 1) for fastener spacing recommendations based on the channel severity.



CRITICAL POINTS

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

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

Drawings Not To Scale

CHANNEL INSTALLATION STEPS

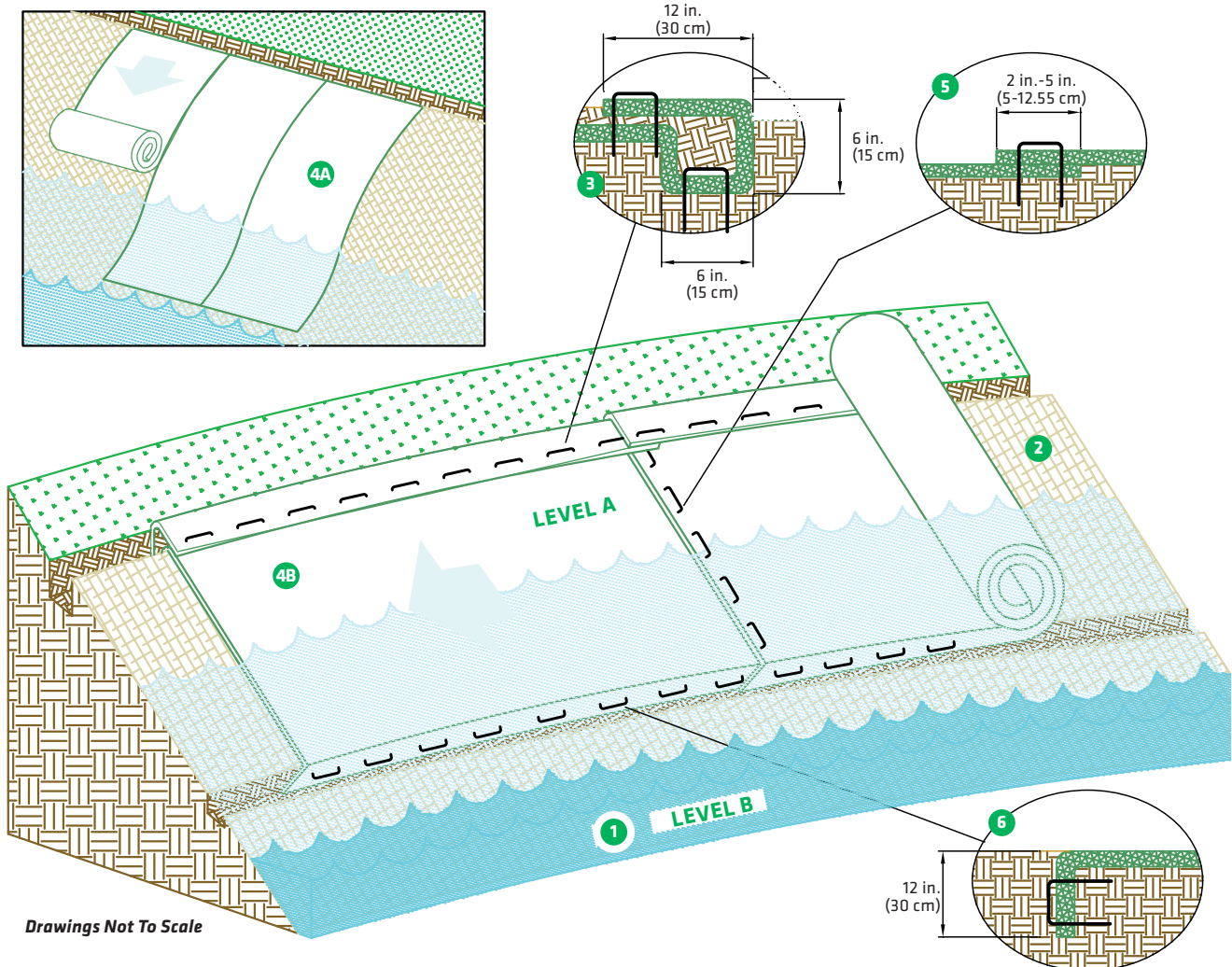
1. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed. See page 7 for special requirements when soil filling a woven TRM.
2. Begin at the top of the channel by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope 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 approximately 12 in. (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 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (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 in appropriate locations as shown in the staple pattern guide.

4. Full-length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.
5. Adjacent RECPs must be overlapped approximately 2 in.-5 in. (5-12.5 cm) (depending on RECP type) and stapled.*
6. In high flow channel applications a staple check slot is recommended at 30 to 40 ft (9-12 m) intervals. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center over entire width of the channel.
7. The terminal end of the RECPs must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.

***NOTE:** In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.

Shoreline Installation

The following guide outlines our general recommendations for installing Tensor's RollMax™ temporary and/or permanent RECPs along shoreline and stream bank applications. Consult the staple pattern guide (Figure 1) for fastener spacing recommendations based on the bank severity.



Drawings Not To Scale

SHORELINE/STREAMBANK INSTALLATION STEPS

1. For easier installation, lower water level from Level A to Level B before installation.
2. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed. See page 7 for special requirements when soil filling a woven TRM.
3. Begin at the top of the shoreline by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12 in. (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 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
4. 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. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.

5. The edges of all horizontal and vertical seams must be stapled with approximately 2 in.-5 in. (5-12.5 cm) overlap. In streambank applications, seam overlaps should be shingled in the predominant flow direction.
6. The edges of the RECPs at or below normal water level must be anchored by placing the RECPs in a 12 in. (30 cm) deep x 6 in. (15 cm) wide anchor trench. Anchor the RECPs with a row of staples/stakes spaced approximately 12 in. (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 may be recommended. Bottom anchor trench can be eliminated when using ShoreMax mat over RECP along the bottom edge.

NOTE: In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.

Special Installation Instructions

INSTALLING RECP WITH EARTH ANCHORS

Consult the following edge details when using earth anchors in conjunction with our RollMax™ RECPs:

- ▶ For the leading edge of a slope or channel, secure the RECP in a 6 in. (15 cm) x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECP extended beyond the upslope portion of the trench. Anchor the RECP with a row of staples and anchors approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to backfilled soil and fold remaining 12 in. (30 cm) of RECP over seeded soil. Secure the RECP with a row of staples and anchors approximately 12 in. (30 cm) across the width of the RECP (Figures 2 and 3).

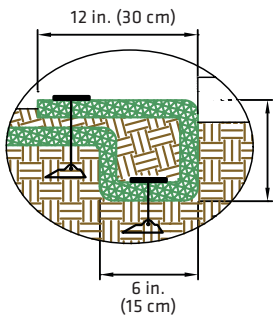


FIGURE 2

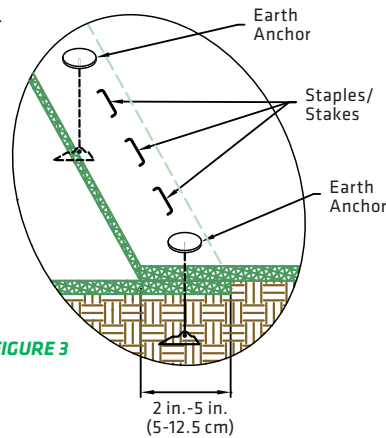


FIGURE 3

- ▶ Full-length edge of RECPs in critical areas should be anchored with a row of staples and anchors approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling (Figure 4).

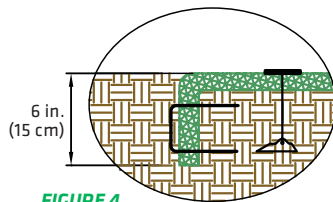


FIGURE 4

Drawings Not To Scale

DISCLAIMER: The information presented herein is general design information only. For specific applications, consult an independent professional for further design guidance.

- ▶ Adjacent RECPs must be overlapped 3 in.-5 in. (5-12.5 cm) overlap. Consecutive blankets should be placed end-over-end (shingle style). Secure with a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center and anchors to secure (Figure 5).

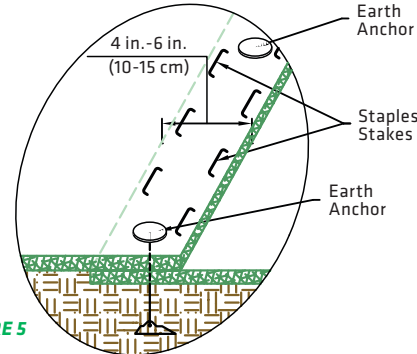


FIGURE 5

- ▶ Consult the Slope Gradient Detail for recommendations on anchor quantities based on slope or bank steepness (Figure 6).

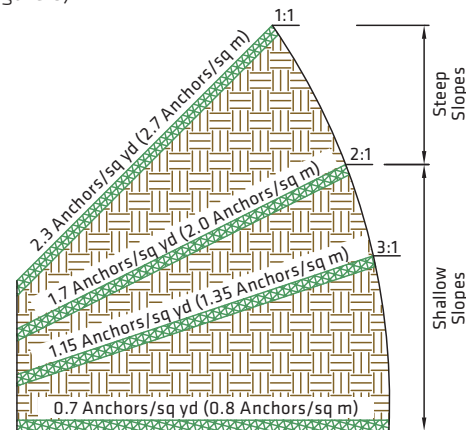


FIGURE 6 Slope Gradient Detail

SOIL FILLING

Consult the following installation instructions when soil filling a woven TRM.

- ▶ Installed TRM shall be seeded and soil-filled.
- ▶ After seeding, spread a layer of fine soil into the mat. Using the flat side of a rake, broom or other tool, completely fill the voids. Smooth soil-fill in order to just expose the top of the TRM matrix. Do not place excessive soil above the mat.
- ▶ In the case of equipment use, no tracked equipment or sharp turns shall be allowed on the mat. Avoid any traffic over the mat if loose or wet soil conditions exist.
- ▶ Additional seed, hydraulic mulching or the use of a temporary erosion control blanket can be applied over the soil-filled mat for additional protection.
- ▶ Consult with a manufacturer's technical representative for installation assistance if unique conditions apply.



Tensar International Corporation
2500 Northwinds Parkway, Suite 500
Alpharetta, Georgia 30009
800-TENSAR-1
tensarcorp.com

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