

6.2.5 Bank Stabilization

PURPOSE & DESCRIPTION

The Filtrex® **Bank Stabilization** vegetated soft armoring system is designed to **stabilize banks, and prevent erosion of waterway and shoreline banks**. The bank stabilization system is composed of **GroSoxx®** - heavy duty tubular mesh netting matrix used to contain and stabilize GrowingMedia™ and vegetation. The bank stabilization technology provides structural protection, erosion control, vegetation growth, and vegetation reinforcement in one system. The bank stabilization weight and anchoring system can withstand storm runoff velocities and hydraulic shear stresses similar to traditional soft armoring devices (brush mattresses, coconut fiber logs, turf reinforcement mats), while the injected GrowingMedia and optional drip tape irrigational system ensure establishment and sustainability of both seeded and live stake plantings.

Bank stabilization will provide:

- structural stability and protection from toe-cutting and sloughing of waterway bank,
- structural stability and protection from mass wasting and sloughing of shoreline from wave action,
- control of erosion from overland runoff, wave action, and shear stress from concentrated flows,
- control of runoff velocity flowing to receiving water,
- dissipation of runoff energy flowing to receiving water,
- sustained vegetation health, and
- sediment, soluble pollutant, and pathogen removal efficiency of runoff flowing to receiving water.

APPLICATION

Bank stabilization is used where waterway and shoreline banks are eroding, have become unstable, or cannot sustain vegetation. Bank stabilization can be used to establish, sustain, and reinforce vegetation in areas of flow and intense hydraulic pressure that typically undermine vegetation growth, such as creeks and streams. Applications include:

- creek, stream, and riparian bank stabilization,
- pond and lake shoreline stabilization,
- sediment and storm water retention/detention pond bank slope stabilization, or
- riparian, stream bank, tidal creek, and salt marsh restoration, habitat and ecological restoration, and aesthetic revitalization.

INSTALLATION

1. Bank stabilization shall meet Filtrex Bank stabilization and Filtrex Certified GrowingMedia specifications.
2. Call Filtrex at 877-542-7699 or visit www.filtrex.com for a current list of installers and distributors of Filtrex products.
3. Bank stabilization will be placed at locations indicated on plans as directed by the Engineer.
4. Bank stabilization shall be placed in a manner that protects the entire bank or shoreline from erosion and destabilization.
5. Bank stabilization must be installed and stabilized before concentrated flow is allowed to contact bank or slope area.
6. Sediment control devices (such as Filtrex Sediment Control) shall be installed if construction requires land disturbance or earth moving.
7. Land surface shall be cleared of debris, including rocks, roots, large clods, and sticks prior to bank stabilization installation.
8. Waterway bank or shoreline shall be made smooth prior to installation of Bank stabilization.

9. Soil bed may be compacted and graded prior to installation.
10. If toe-cutting is an issue at the waterway bed and slope interface, excavation should be performed at the interface below creek bed level to allow placement of Bank stabilization.
11. Excavation should be to a minimum of 1 ft (300mm) below scour line for streams with flow depths of 6 in (150mm) or greater.
12. Bank stabilization is wrapped in a geotextile (Filtrex LockDown Netting or FLW Geogrid Recommended) or in a geogrid for connective stability to the bank and for added durability to hydraulic conditions.
13. Bank stabilization will be fabricated on-site.
14. On-site fabrication of bank stabilization will ensure a continuous length sock system. Upon completing one section of sock filling (approximately 100-200 ft [30-60m]), the next section shall be 'sleeved' over the completed section by a minimum of 1 ft (300mm). A stake shall be placed in the overlap section, securing the two sections. For joints occurring at or below the waterline, each section will be closed and secured via the Geotextile or Geogrid wrap.
15. Bank stabilization shall be placed parallel to concentrated water flow and perpendicular to wave action, where Soxx are tightly stacked or abutted to prevent water seepage between and underneath the system.
16. For stacking applications, larger diameter bank stabilization GroSoxx will be placed on the bottom of the installation and sequentially smaller diameter GroSoxx placed on top as the construction moves upslope and away from the waterline.
17. Stabilization applications below the waterline will use pea gravel and small rock in the GroSoxx at the base of the bank stabilization system and GrowingMedia in the GroSoxx where vegetation will be established above the waterline.
18. In areas where waterline fluctuates below and above the GroSoxx, custom soil blends may be used, as directed by the Engineer. Custom soil blends may include GrowingMedia, topsoil, sand, pea gravel, or other small aggregate.
19. Once in place, Bank stabilization GroSoxx shall be lightly compacted to tighten seal between socks and encourage even water flow over the surface of the system.
20. Bank stabilization shall not be installed on banks or shorelines greater than 1:1, and 3:1 if mowing will be conducted to manage vegetation.
21. Above the waterline, stakes shall be installed through the middle of the GroSoxx on a minimum of 5 ft (1.5m) centers, using 2 in (50mm) by 2 in (50mm) by 3 ft (1m) wooden stakes.
22. Above the waterline, alternatively, L-shaped rebar may be installed through the middle of the GroSoxx on 5 ft (1.5m) centers, where the "L" shall be bent to form a hook over the top of the GroSoxx and pounded to fit snug.
23. Above the waterline, stakes shall also be placed at the ends of GroSoxx to hold it in place.
24. Minimum staking depth for sand and silt loam soils shall be 12 in (300mm), and 8 in (200mm) for clay soils.
25. Bank stabilization shall be seeded at the time of application, seed selection will be determined by the Engineer.
26. Seeded bank stabilization should not be installed prior to seasons where growing vegetation is difficult.
27. Seed shall be thoroughly mixed with the GrowingMedia prior to construction or injected into GrowingMedia at time of application.

28. Optional biotechnical engineering with live stakes, tubers, seedlings, or plugs should be conducted after staking is complete.
29. Live stakes should be from a live species and cuttings should be 1 to 3 ft (300-900mm) long.
30. Live stakes should be spaced 5-7 ft (1.5-2.1m) apart, and planted vertically with one end planted through the bank stabilization and at least 2 in (50mm) into native soil.
31. Seeded and/or live staked Bank stabilization shall be thoroughly watered after installation and allowed to settle for 1 week.
32. Drip tape may be installed within the GroSoxx during construction to provide irrigation for establishing vegetation.
33. If drip irrigation system is installed a reliable water source should be located and secured.
34. If drip irrigation system is installed and municipal water or a pump will be utilized, a pressure reducer may be required to manage flow and prevent drip tape from bursting.

INSPECTION & MAINTENANCE

Routine inspection should be conducted within 24 hrs of a runoff event for the first year after installation, until permanent vegetation has established, or as designated by the regulating authority. If product dislodgement occurs, or vegetation does not establish, bank stabilization/GroSoxx should be repaired, reseeded, and/or replanted. If bank or shoreline erosion occurs, the area should be repaired immediately. Vegetation practices should always be inspected for noxious or invasive weeds. If sediment accumulation is 25% of the height of the vegetation, sediment removal is recommended. Storm debris and trash should be removed immediately.

1. The Contractor shall maintain the bank stabilization in a functional condition at all times and it shall be routinely inspected.
2. Seeded bank stabilization shall be maintained until a minimum uniform 70% cover of the applied area has been vegetated, permanent vegetation has established, or as required by the jurisdictional agency.
3. Seeded bank stabilization may need to be irrigated in hot and dry weather and seasons, or arid and semi-arid climates to ensure vegetation establishment.
4. Where bank stabilization fails or becomes dislodged, the Contractor will ensure the product is in good contact with the soil and backfill media, repair, and use additional staking if necessary.
5. Where bank or shoreline erosion occurs, the Contractor will regrade the soil if necessary and repair or replace the bank stabilization.
6. Where vegetation does not establish the contractor will reseed, replant, replace live stakes, or provide an approved and functioning alternative.
7. If bank stabilization is only seeded at time of installation live stakes may be added to increase stability, aesthetics, wildlife habitat, and ecological succession.
8. No additional fertilizer or lime is required for vegetation establishment and maintenance.
9. No disposal is required for this product/practice.
10. Bank stabilization shall become part of the permanent landscape.
11. Regular mowing of grass vegetation on seeded bank stabilization to a minimum height of 4 in (100mm) and a maximum height of 10 in (250mm) will deter invasive weeds, allow sunlight to kill captured pathogens from stormwater, and provide maximum sediment removal efficiency and sediment storage capacity in the

vegetation.

12. Storm debris and trash deposited on bank stabilization should be removed immediately.
13. Sediment shall be removed if it reaches 25% of the height of the vegetation (mowed) to prevent diversion of storm runoff and reduction of vegetation health and cover.
14. If drip tape irrigation system is installed, once vegetation is fully established, connections to drip tape irrigation system may be removed, leaving the drip tape inside the GroSoxx. Cut ends of drip tape and discard in approved waste receptacle.

ADDITIONAL INFORMATION

For other references on this topic, including additional research reports and trade magazine and press coverage, visit the Filtrexx website at filtrexx.com

Filtrexx International, Technical Support
877-542-7699 | www.filtrexx.com | info@filtrexx.com
Call for complete list of international installers and distributors.

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Figure 5.1. Engineering Design Drawing for Filtrexx Bank Stabilization

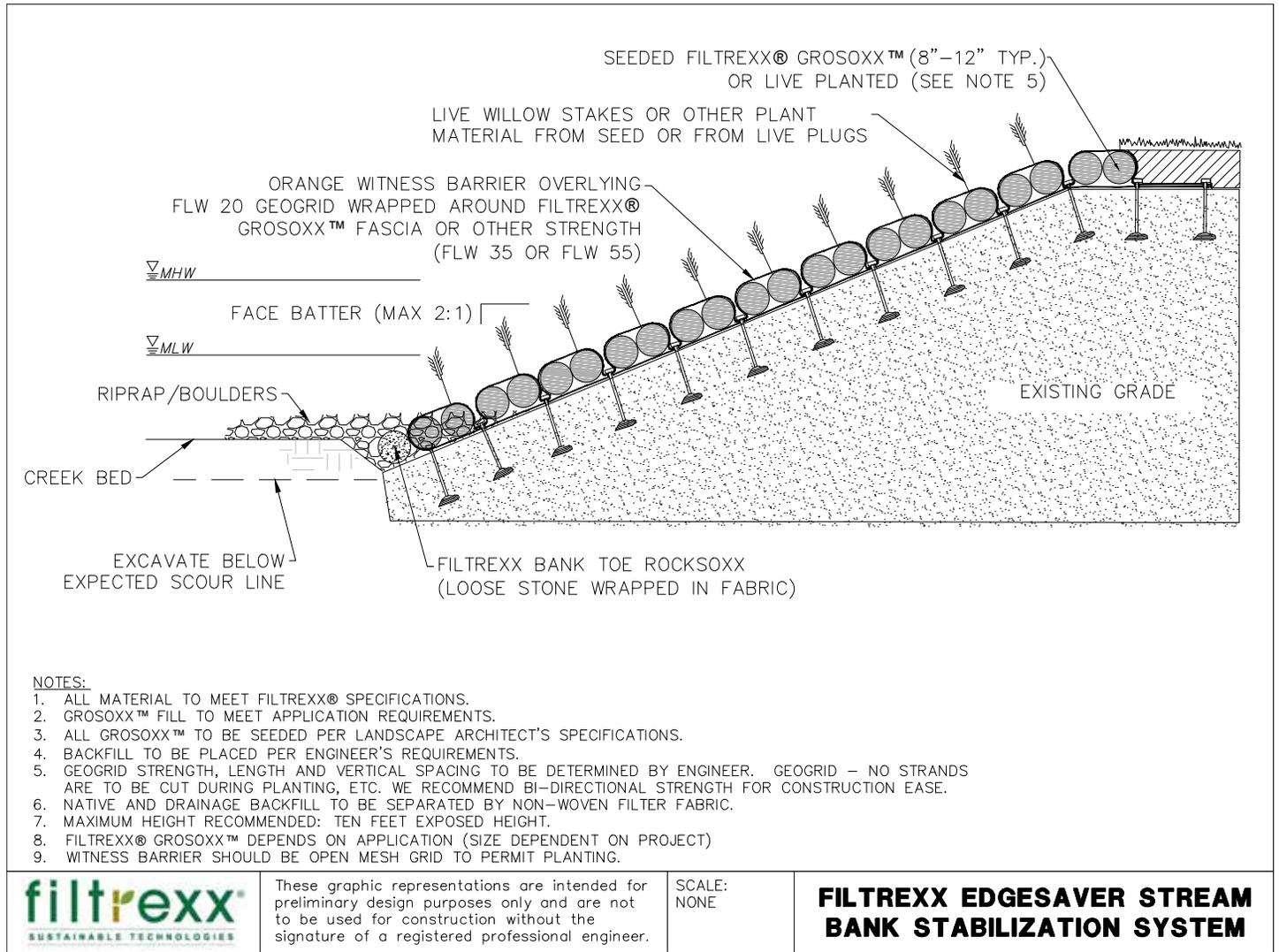


Figure 5.2. Engineering Design Drawings for Filtrexx Bank Stabilization - Reinforced with Riprap Toe

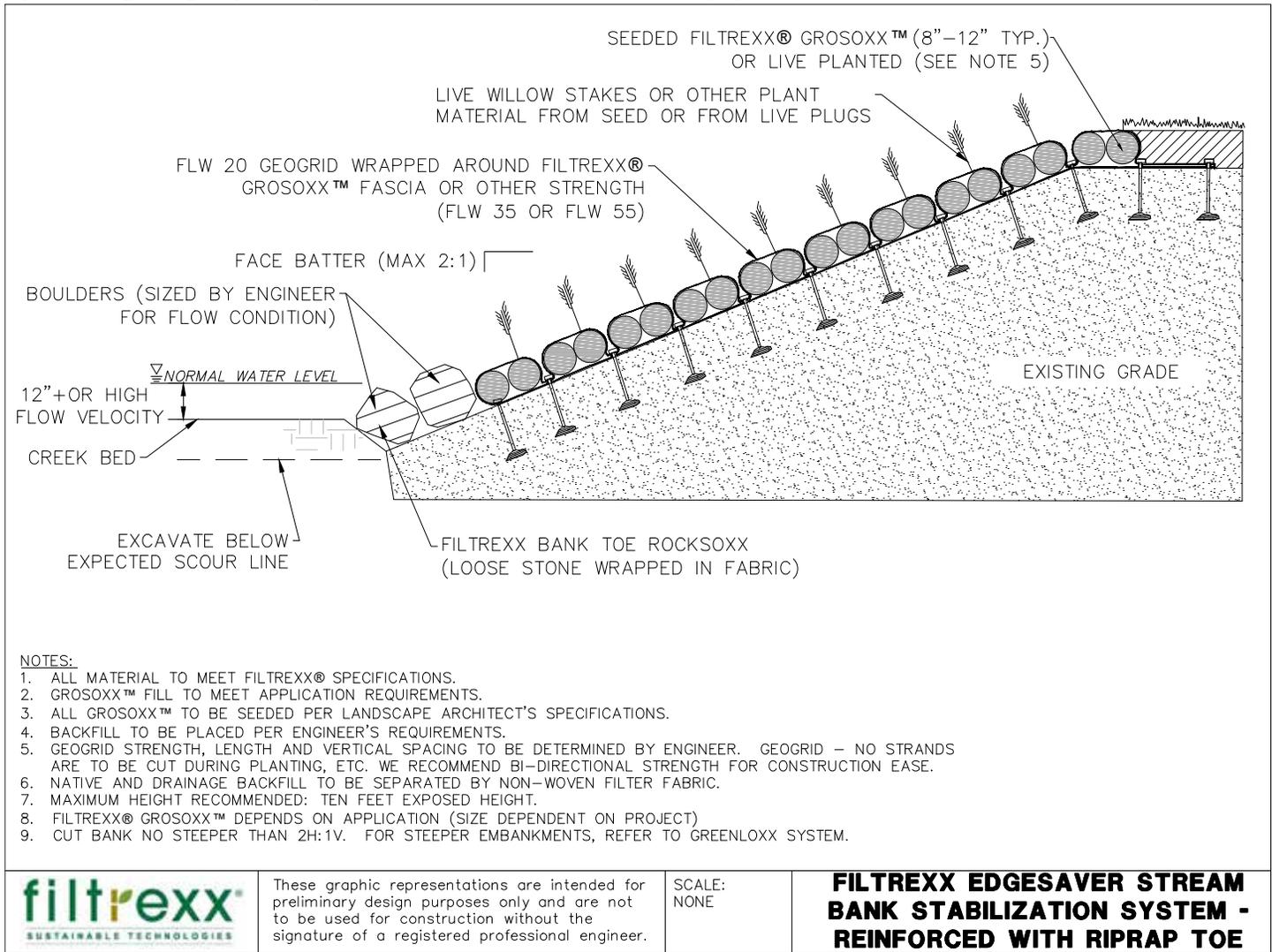


Figure 5.3. Staking Details for Filtrex® Bank Stabilization

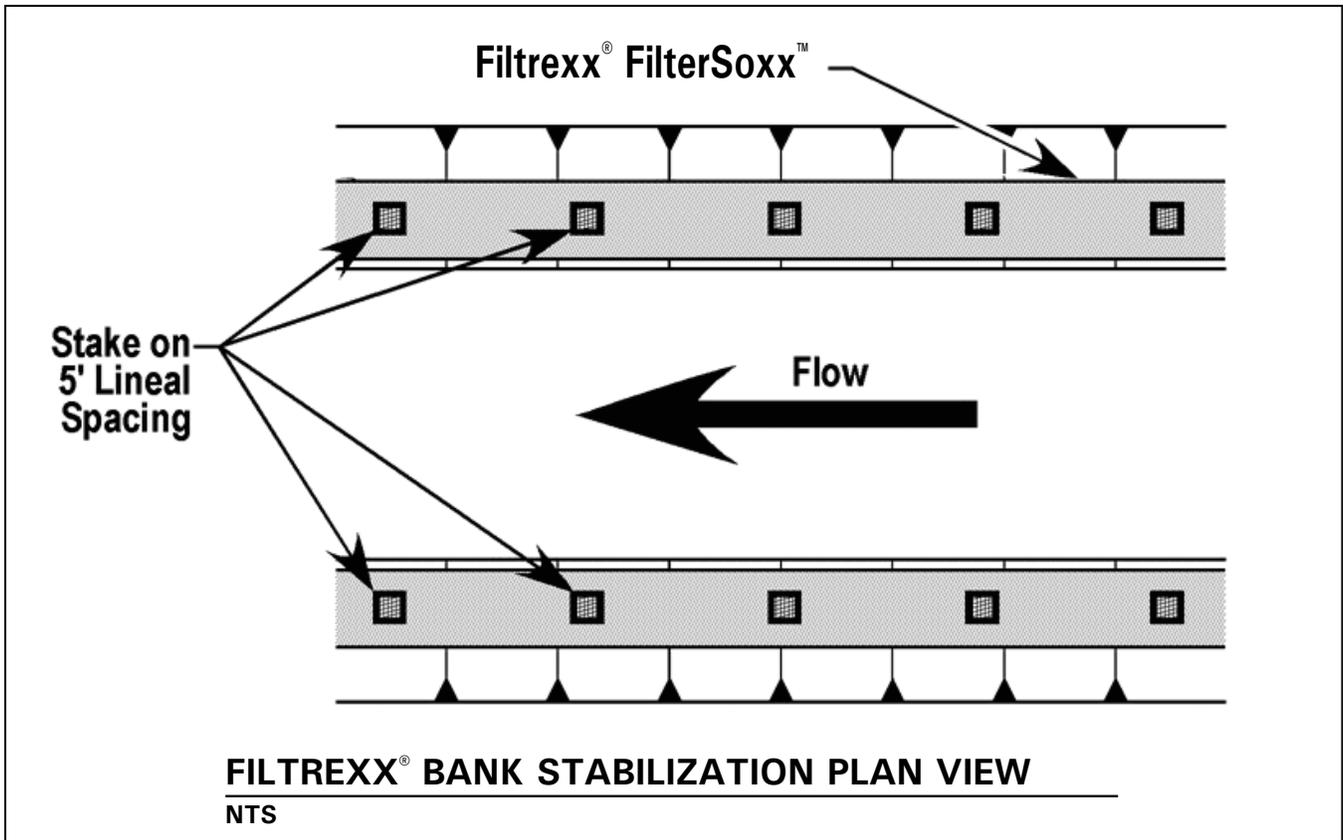


Figure 5.4. Staking Details for Filtrex Bank Stabilization

