



Reduce Your Carbon Footprint

GREEN ENGINEERED SOLUTIONS FOR SLOPES, WALLS & STREAMS





Detalok System Introduction

Detalok is a versatile civil engineering system designed for erosion control and earth wall applications.

Detalok utilizes modular geosynthetic bags and interlocking units to create a 3D structure strong enough to hold back the earth forces. In addition Detalok is capable of accepting various forms of planting to create an aesthetically pleasing and eco-friendly vegetated system.

Detalok System is:

- Eco Friendly
- Accepts Various Types of Vegetation
- Easy to Install
- Easy to Transport
- A Permanent Vegetated Solution

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Deltalok Applications

Deltalok is an engineered system designed specifically to work with geosynthetic soil reinforcement materials. The geosynthetics reinforce the soil to give the structural integrity needed for stability and erosion control. Deltalok creates a reinforced facing option that protects the surface from erosion and provides a natural bed for vegetation to take root and beautify the structure.

Applications for Deltalok have included:

- Vegetated Reinforced Soil Slopes
- Vegetated Reinforced Soil Walls
- Stream / Waterway Improvements
- Solutions to Infrastructure Projects

Deltalok System Benefits

- Vegetated & permanent engineered solution.
- Low Environment Impact (low carbon footprint)
- Noise Reduction
- Reduced Heat Island Effect
- Anti-Graffiti
- Friendly to Fish & Wildlife
- Quick & Easy Installation
- Flexibility Allows Deltalok to Install Where Others Cannot



Vegetated Reinforced Soil Slopes



Vegetated Reinforced Soil Walls



Stream bank Protection



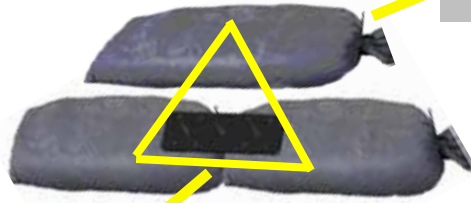
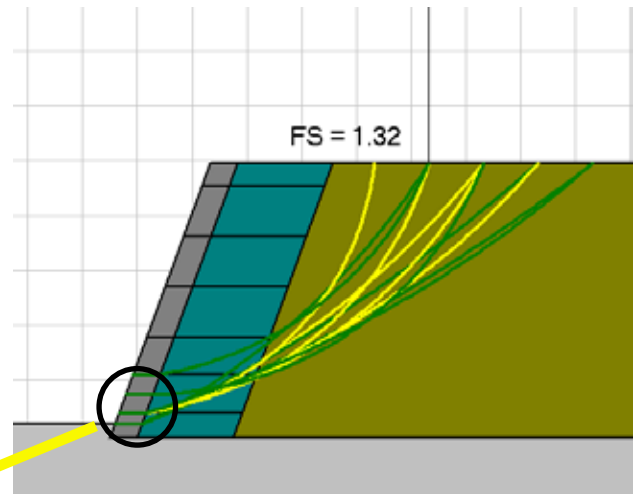
Infrastructure Solutions



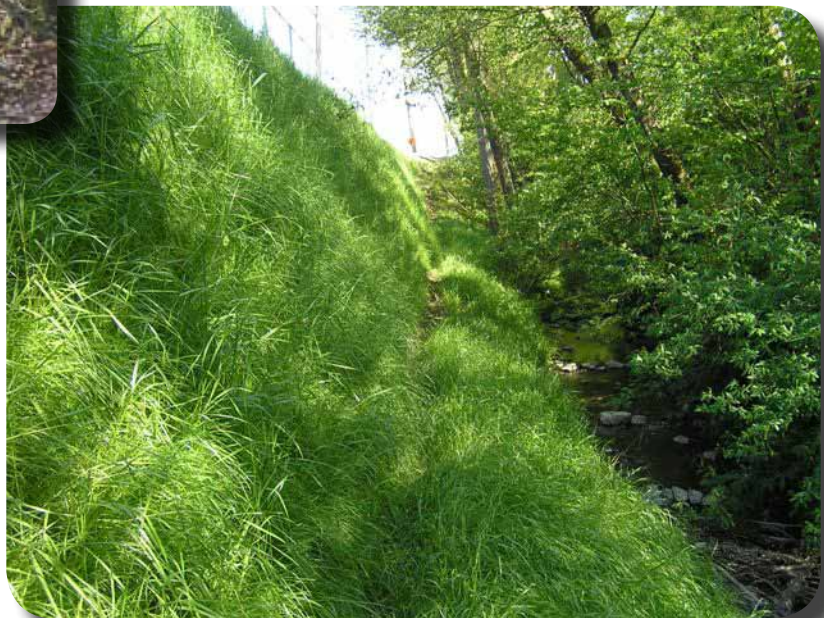
Vegetated Slopes

Deltalok brings structural stability to over-steepened soil slopes through:

- Structural interlocking at the facing connection
- Interlock with structural reinforcing
- Instant protection against surface erosion
- Vegetated facing for a bioengineering solution



Deltalok Interlocking plate for unit to unit and units to Geogrid connection.



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Vegetated reinforced soil slopes provide good benefits to highway and commercial construction where there is not enough room for a natural slope. Deltalok provides speed and efficiency of installation comparable to other modular systems.

The modular construction provides a consistent and contained high quality growing medium in non-biodegradable bags to 100% of the slope face. The superior vegetated outcome is due to eco-zones located between each row and each bag where rainwater accumulates and vegetation germinates. The slope shown is in northern Minnesota, an area usually difficult to get good vegetation on soil slopes. However after a year, the Deltalok was growing strong and continues to build a strong bed.

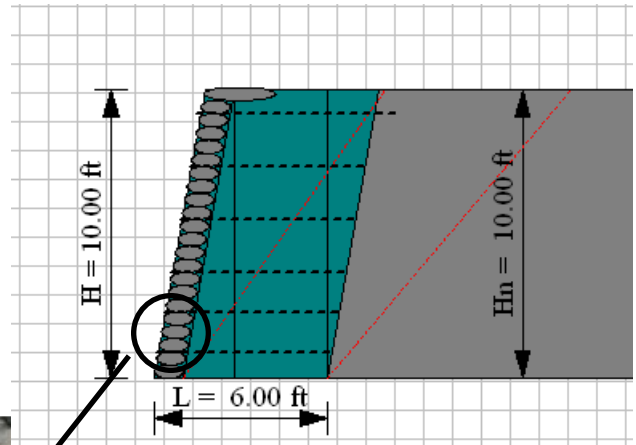
In areas of limited space or access the Deltalok system can accommodate reinforcement using a 'Tie-Back' method of design which does not require geogrid reinforcement. This solution also minimizes excavation requirements.



Vegetated Walls

Deltalok provides efficiency when designing and constructing vegetated walls. This pre-assembled geotextile system provides the engineered structural strength for highway surcharge loadings.

- Designed per Highway (AASHTO) & Commercial (NCMA) Guidelines.
- Built like a Modular Block Wall
- LEED Points up to 13 Credits
- Reduced Green House Gas Emissions (GHGE)
- Graffiti Resistant



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Developers looking for an esthetically pleasing and environmentally friendly solution for this beach front development chose Deltalok. The Deltalok solution provided additional benefits such as:

- Cost Effectiveness
- Sound Absorption
- Graffiti Resistant
- Enhanced Beauty of the Ocean Front Environment



Water Applications

Deltalok restores and protects streambanks and shorelines.

- Easy to Build over Soft Ground or Wet Environments
- Deltalok Mimics the Existing Contour
- Permanent and Instant Solution to Erosion Protection
- Promotes Vegetation for Fish and Wildlife
- Accepted by Environmental Consultants



Over 1400 feet of shoreline was lost from erosion. Deltalok was used to form a permanent erosion resistant shoreline.



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Rain gardens, ponds, drainage channels, rivers and waterfronts require flat slopes to remain stable with the moving water. Deltalok provides permanent protection to the soil slopes to build steeper angles. This permanent solution minimizes future losses of private and public land.





GREEN Infrastructure Projects

Deltalok's GREEN infrastructures include culvert head walls, trails, road repair, ditch lining, dikes, noise walls & garden walls. The system's ability to mimic existing contour, adapt to seismic activity and differential settlement as well as perform on soft or low bearing soil positions Deltalok in it's own category. This soft flexible system can adapt to most situations.



Drainage ditches along roads and property lines can erode, which results in steeper banks and loss of property. As this continues, undermining of highways and structures may occur. Deltalok provides an easy and cost effective solution to control erosion.



Restoration completed in December, not yet vegetated

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Culverts require head walls and erosion protection between the soils and the pipe. Deltalok provides the filter to minimize piping erosion, provides a bank that does not erode with moving water, and provides for steeper slopes that would otherwise require concrete head walls.



Hydro-seeded structure



DELTALOK Vegetation

Engineered vegetated walls and slopes have been desired for ages. The challenge has always been the stability of soils placed steeper than the natural angle of repose. Deltalok prevents the erosion of superficial soils, and avoids the cost and inconsistency of wrap slopes. Deltalok's creates and maintains a successful vegetated near vertical surface.

Deltalok's patented system addresses these challenges and more. The pre-assembled modular bag system is constructed with small vertical heights making it easy to build without any bulging or sagging of the face. There exist mini 'eco-pockets' between each row and each bag where rain water can accumulate and seeds can germinate. The system allows the root system to penetrate through both front and back layer of geotextile as well as grow into the backfill. In addition, vegetation options such as pre-seeding for near/in water applications, hydro seeding, live planting, live stacking as well as brush layering can be utilized with Deltalok.



Placed as modular bags, vegetation can grow through the geosynthetic fabric to reinforce the soil within and beyond the face. Native vegetation and woody plants can penetrate several feet of embedment and backfill.



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Hydro-seeding



Live plantings



Brush Layering



Live Staking



Deltalok Installation Guide

Made in the USA



1

FILLING & CLOSING DELTALOK BAGS

Fill the Deltalok bags with a clean granular soil and material mix. Properties should include approximately 70% - 80% coarse sand and 20% - 30% organic soils. Clay and silt are not recommended for filling the bag. Fill the bags consistently, close bag with a UV resistant zip tie. Sewing, stapling, hog-rings, etc. are also acceptable.

PREPARATION

Dig a shallow trench 15 inches wide for the length of your desired Deltalok structure and 3 inches deep. The purpose of the trench is to embed the base of the structure to protect from it being undermined by erosion. Tall structures or water applications will require deeper embedment. Ten percent of the design height is a good rule of thumb. With water applications, a minimum of one foot deep or below the scour line is a good rule of thumb.

2



3

PLACE DELTALOK BAGS & INTERLOCKING PLATE AT BASE

Place the Deltalok interlocking plate on the ground below the first row of bags. Place the interlocking plate face up, so that you are reading the "This Side Up" label. Space the interlocking plate so that it will lie directly below the middle of each bag, approximately 30 inches to 33 inches apart. Place the first row of bags spacing them with 1 inches to 2 inches between the ends of the bags. Compaction will fill the bag into the open space. Do not overlap the bags.

Place the bag with the seam towards the back - fill.



PLACING ADDITIONAL ROWS

Place a Deltalok interlocking plate over the space between the two base Deltalok bags. Place another row of bags in a running bond layout over the previous row so that the interlocking plates lie below the middle of each Deltalok bag. After placement, walk on top of the bags to lock them onto the interlocking plate. The bag may flatten forward with compaction, so a backward setback should be considered. We recommend using a simple right angle triangle jig with a small level attached to check that the slopes angle consistent with design drawings or specification.

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FILLING & COMPACTING THE STRUCTURE

Fill and compact the backfill soils every two layers of bags. Compaction should be done on no more than 8 to 10 inch thick lifts of fill. Vibratory compaction equipment is preferred. *[A clean gravel fill zone behind the bags is not recommended to help keep alignment or for filtration as required by concrete units].* Vegetation will penetrate the Deltalok bag and grow into the backfill zone, further stabilizing the structure.

Where required

GEOGRID PLACEMENT

For structure heights where soil reinforcement is needed, place the geogrid reinforcement from the front of the face of the bags toward the back of the fill area. Place the interlocking plate over the geogrid at the joints between the lower Deltalok bags. Pull the geogrid snug, removing folds and wrinkles. Place the next layer of bags into place over the interlocking plate and geogrid. Then walk on top of the row. Place the fill soil from the front of the structure toward the back, this technique keeps the geogrid flat and tightly connected to the face.

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TOP ROW

Place the top row of Deltalok bags at a 90-degree angle to the structure alignment. The deeper embedment will anchor the top of the structure and provide for a more stable structure. Embed the rear portion of the bag so that 50% of the bag will be covered with backfill soil. This may require less fill in the top row of bags.

PLANTING

Once wall construction is complete it is time to vegetate the wall. You may choose seed mixes of grasses or wild flowers suitable for the local climate and exposure. If live planting the wall, make a small cut in the bag, remove soil as needed to place the live planting material. If combining seeding and live planting, apply seed first, and then add live plant materials.

Vegetation choices are the owner's preference and should be discussed with local experts.

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Hydo-seeding



Live Planting



Live Staking



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***Deltalok, The Green Solution
For
Slopes, Walls, and Streams***