



Case Study:

# Lemm Gully Slope Stabilization

Presto GEOWEB Vegetated Retaining Wall

Spring, TX



# Lemm Gully Slope Stabilization

Presto GEOWEB Vegetated Retaining Wall

Project Date:

Engineer/Architect:

Contractor:

November 2021

VOGT Engineering

Triple J Enterprises

Project Goals and Specs:

**Stabilize and reinforce the eroding banks around a bend of Lemm Gully near a sanitary line and apply erosion control measures to provide protection against a 100 year storm event.**

## Problem

This particular bend of Lemm Gully was not far from a lift station, and was quickly deteriorating around a main sanitary line. Montgomery County wanted minimal impact on the geometry of Lemm Gully, and excavation was limited due to the sanitary line, which cut through the center of the project. The owner preferred a vegetated option for reinforcement and erosion control on the banks.

## Site Conditions

Limited site access prevented any industrial grade equipment from entering the site. The soils were moisture sensitive, and if left exposed to the elements, were prone to washout during storm events throughout the construction phase.

## Identified Issues and Constraints

Due to the steep side slopes and impending erosion from the next major storm event, the owner needed a solution that would last. The project team wanted to present multiple MSE options to the owner, due to the project's unique constraints. A combination of the critical slope angle of the banks, the soft belly of the channel, and a sanitary line splitting the slopes forced the project team to consider multiple alternative options.

### ★ Solutions / Final Application / Results

The project team presented two final options to stabilize the slopes. The first option was a gravity wall consisting of aggregate-filled gabion baskets, tied back by reinforcing steel mesh into the embankment. The second option was a vegetated MSE wall consisting of GEOWEB, reinforced by uniaxial geogrid into the embankment. Both designs proved to be well suited for the application at hand, providing flexibility to build around the sanitary line, as well as the ability to construct the wall with small to medium sized equipment.

After reviewing both options for slope stabilization, the GEOWEB vegetated retaining wall was selected to maintain a permanent, green aesthetic and restore Lemm Gully back to its original state. The GEOWEB wall solution offers a terraced structure, so that vegetation can effectively grow within each of the cells, much like a series of isolated planter beds. Uniaxial geogrid was used to reinforce the system's face, providing adequate load distribution behind the GEOWEB. Strips of turf reinforcement mats were used to protect the soil within each of the exposed GEOWEB facing units until vegetation was established. The project site's challenging conditions proved to be no match for the flexibility and ease of construction that the GEOWEB vegetated retaining wall system provided.

GEOWEB's ability to confine material within each of the systems cells allowed the contractor to effectively compact the face units of the wall as he worked his way up, constructing the system from the bottom of the slope to the top. The soft belly of the channel was combatted by burying the first few lifts of GEOWEB to establish a firm footer for the wall. Once vegetation was established, the root system grew through the face cells to produce an interconnected, monolithic matrix of roots. In turn, this will mitigate long-term soil loss and provide additional surficial reinforcement for the banks. Upon final application, a concrete apron was poured upstream and downstream, vertically along the slopes to ensure high velocity events have no chance in undermining the system.



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## Lemm Gully Slope Stabilization – Presto GEOWEB Vegetated Retaining Wall

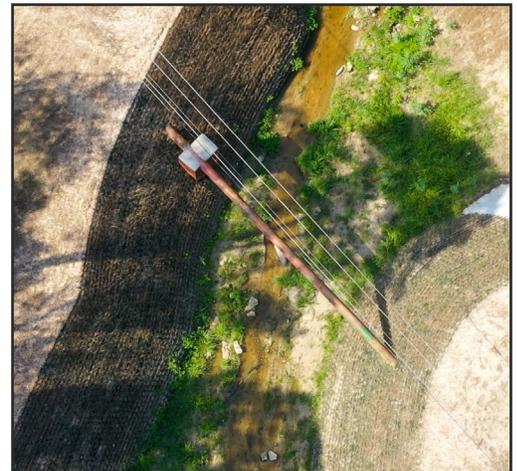
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### Optimization Highlights

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The GEOWEB vegetated retaining wall system was cut in the field, so that the system would hug tight to the sanitary line to mitigate any erosion around the obstruction. The contractor built an engineered frame out of lumber per the plans, to pre-stretch the GEOWEB before placing and filling it. This enabled the contractor to move quickly, filling the front cells with organic media for vegetation purposes, and the back cells with aggregate to improve drainage and stabilize the embankment. The GEOWEB vegetated retaining wall system significantly reduced the required quantity of aggregate and concrete, allowing the owner to build a long term erosion control solution for the once failing banks of Lemm Gully with minimal material costs.

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### Customer Testimonial:

**The GEOWEB installation was phenomenal. The way the product connected together was so easy with the ATRA Clips. Creating a jig/frame made for a smooth installation. The crew loved using it so much that they built another one on-site, so that they could fill one up while they were pre-stretching the next.**

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