

CASE STUDY

Slope Stabilization and Turf Establishment Success

SITUATION

In February of 2013, Tenaris SA, a global manufacturer and supplier of steel pipes and related services, announced plans to construct a 1.2 million square foot seamless pipe manufacturing facility in Bay City, Texas. Construction of the manufacturing plant, pipe storage yards, parking and area access roads would create approximately 350 acres of impervious surface area. Having previously been a decades old turf farm, the property was very flat with virtually no topographic distinctions. To facilitate conveyance of stormwater from the property, over 60,000 linear feet of channels with varying depths and widths were to be constructed. More than 80 acres of surface detention was included in the design.

CHALLENGE

The main challenges in constructing the earthen drainage channels would be to establish vegetation that could resist erosion in the flow lines and to stabilize the slopes to prevent damage from channelized flow, as well as sheet flow from adjacent impervious areas. The original civil engineering design plan to address these issues was to install temporary erosion control blankets on the slopes and channel bottoms.

Temporary erosion control blankets (ECB) are not typically recommended for erosion control in the flow line of channels because they cannot withstand the velocity and shear stress present in many channels. Additionally, the installation method for such blankets requires very smooth fine grading, which is time consuming and labor intensive.

How could Construction EcoServices help solve these challenges?

SOLUTION

Construction EcoServices chose to pursue a quicker, more effective and more cost-effective hydraulically applied solution to achieve channel stabilization and turf establishment. But, in order to “value-engineer” (VE) the ECB out of the project, the hydraulically applied solution had to be proven first. This was done via Profile’s modeling software, PS3.

Using the project geometry, the provided flow data and Profile’s PS3 software, the Tenaris channels were analyzed using Manning’s equation to ensure compatibility with a less than 2 lb/ft shear stress threshold. The analysis showed that, though velocities increased up to over 3.5 ft/sec, shear stresses remained below 1 lb/ft² allowing the analysis team to comfortably conclude that a Flexterra HP and Terra-Shield combination will be a good fit for erosion protection at the site. The addition of Terra-Shield to Flexterra HP would provide even greater erosion control effectiveness, as well as added wet bond strength, increased shear resistance, and higher moisture retention to the matrix.

The decision was made to recommend the combination of Flexterra HP and Terra-Shield™ be applied to the flow lines of the channels, and ProMatrix EFM be applied to the channel slopes. The Construction EcoServices / Profile recommendation was approved by the Civil Engineer of record, and the temporary Erosion Control Blanket was eliminated from the project in favor of the hydraulically applied solution.

RESULTS

Application of the recommended “recipe” was completed over a 5-month period with the following results:

- **Project cost savings exceeded \$250,000 compared to the original design.**
- **115 acres of drainage channels and slopes were successfully stabilized over a 5-month period.**



Contact Construction EcoServices for More Information

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