

BANK STABILIZATION ON MOORE'S CREEK

Construction Costs | Permitting | Environment Protection

Design Options

Rootwad revetments

Trees cut from the site provide an option for stabilizing the banks. The root balls provide a stabilizing media for live stakes and absorb energy from flow in the channel.

Living Riprap

Riprap is a traditional bank stabilizer. By inserting live stakes within the riprap, it can establish tree cover and vegetation and so becomes an enhancement to the bank.

Gabions

Gabion baskets provide a traditional hard armoring approach and a flat surface from which to rebuild banks.

Filtrexx Living Wall™

The Living Wall provides a geotextile with vegetation that can create a stable, steep bank that encourages shrub and tree establishment.

Dry Stack Wall

The dry stack wall provides a near vertical hard armor approach where space is at a premium.



The Challenge

The 5th Street Station development includes more than 60 acres. With a shopping center and local connector road, the negotiations with the County of Albemarle for allowing the development included environmental protection of the stream that surrounds much of the project. As part of the development proposal, the developer proffered stream bank stabilization and buffer repair work.

Areas along Moore's Creek and a tributary were in need of stabilization. The closed landfill had been compromised and continued to release trash into the stream. A sanitary trunk sewer had been exposed along the bank. Areas of sloughing banks threatened a recreation trail. This study is an analysis of the effectiveness of measures selected for stabilizing the various areas.



5th Street Station, Charlottesville, VA

Phase 1 and 2 Construction



Gabions and Filtrexx Living Wall™

Access issues aside, the construction of the Gabions and Living Wall went fairly quickly. The key to the success was establishing a suitable starting point. Working in the dry allowed the contractor to place stone to create a flat starting point for gabion construction. Much like a building, once the foundation is flat and stable, the construction can progress quickly.



Dry Stack Wall

This measure was only permissible as an emergency situation arising from the exposed sanitary trunk sewer in the eroding bank. Similar to the Living Wall construction, the key was establishing a suitable base. The contractor was not able to divert the creek, so, working under a few feet of water, it was difficult to see the starting point for the wall. Once the first layer was set, however, the construction was completed in about 2 months.

Cost Comparisons

It is perhaps stating the obvious to say that the costs are highly dependent on available materials. The project area adjacent to this work was 60 acres to be cleared and has provided both stone for riprap and trees for rootwad revetments. The costs in the table below are a combination of actual costs for this project and anticipated costs based on conversations with the contractor for this project.

Observed Cost Comparison

Measure	Observed Cost or Budget	Standardized Cost at 10' bank height
Gabions	\$ 13 / cf	\$ 390 / lf
Living Wall	\$ 26 / sf	\$ 260 / lf
Dry Stack Wall	\$ 36 / sf	\$ 360 / lf
Rootwad Revetments	\$300 each	\$120 / lf
Living Riprap	\$ 150 / sy	\$ 165 / lf

Summary of Findings and the Next Phases

The table below shows an assessment of the measures based on several criteria that every project will need to consider. Creating a table like this before committing to a specific measure will help educate interested parties and led to better decisions in your bank stabilization projects.

The next phases of the project include Rootwad Revetments and Living Riprap. These will be summarized and addressed in future updates to this document. The project is underway and phases 3 and 4 are anticipated to be completed in 2015.

Stabilization Measure	Material Cost	Labor Intensity	Level Of Green	Stability	Difficulty Permitting
Living Wall™	💰💰	😊😊😊	🌳🌳🌳	👍👍👍	⚠️
Gabions	💰💰💰	😊😊😊	🌱	👍👍	⚠️⚠️
Dry Stack Riprap	💰💰💰	😊	🌱	👍👍👍	⚠️⚠️⚠️
Rootwad Revetments	💰	😊	🌳🌳🌳	👍👍	👍
Living Riprap	💰💰	😊😊	🌳🌳	👍👍	👍