

HVCC–PERT STORMWATER INFILTRATION TRENCH PROJECT



PROBLEM CONDITIONS

Stormwater run-off from the high ground to the south of the HVCC site and from Paper Mill Road cascades onto the club's property.

From there, stormwater travels down the valley slope to Terwood Run which joins the Pennypack Creek at Bethayres.



During and after heavy rain events, this storm water run-off adds a significant amount of flow to Terwood Run and the Pennypack Creek

The stormwater also transports lawn and road chemicals directly into Terwood Run and eventually into the Pennypack Creek

HVCC–PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT OBJECTIVES

To intercept the stormwater on the side of the valley before it reaches Terwood Run and put it into the ground

To recharge the underground water table and filter harmful chemicals out of the stormwater run-off

To demonstrate the effectiveness of side hill stormwater interception / infiltration and identify the cost of this type of BMP project

To provide documentation and an on the ground example of a side hill infiltration trench system as an educational tool for others who might want to employ similar stormwater control measures.

HVCC-PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT CONSTRUCTION

Fifteen 20' lengths of 42" diameter perforated pipe were delivered to the project site from Paper Mill Road (*neat delivery truck*)

The last five lengths of pipe broke loose and rolled all the way to the bottom of the valley



It was amazing to see how well something of that size and weight rolls down a 15% grade, and how fast as well.

Scott Anderson, our course superintendant, didn't think it was funny, because he and his people had to spend two hours moving them back to where they belonged.

HVCC-PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT CONSTRUCTION

The entire trench site was rough graded to strip off the topsoil for later use and to provide a relatively level working platform. (note pipes have been returned to their intended location)

The 300' long x 8' wide x 6' deep trench excavation was completed in two working days and 12" of crushed stone was installed in the bottom of the excavation below the line of the pipe.

The material excavated from the trench was stock piled on the downhill side of the trench for future use in constructing a 2' high berm to keep run-off from bypassing the trench area.

We maintained a constant depth of 6' to avoid the expense of more complex excavation protection measurers



HVCC-PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT CONSTRUCTION

Immediately behind the excavation and the first layer of stone came the installation 20' long sections of 42" diameter perforated pipe and the chemical sealing of the joints.

We installed three 24" vertical inlet pipes, one near the mid-point of the horizontal run and one near each end of the 42" pipe, to provide direct inflow to the pipe during heavy stormwater conditions

The pipe installation took approximately two days to complete and was finished within hours of the final excavation work

HVCC-PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT CONSTRUCTION

As soon as the pipe sections were aligned and the joints sealed, the sides and top of the trench were back filled with 4" crushed stone to stabilize the pipe assembly and provide storage capacity for the infiltrated stormwater.

Next came the installation of a 12' wide layer of geotextile fabric intended to reduce the migration of sediment into the crushed stone and pipe below.



We considered installing geotextile fabric at the bottom and sides of the trench as well, but we had a concern that the fabric could become clogged with sediment and impede the infiltration of water from the trench to the surrounding soil. We decided to install the material on the top only.

HVCC-PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT CONSTRUCTION

Once the geotextile material was in place, a 12” layer of topsoil was placed over the trench to permit the re-vegetation of the disturbed area.

The entire project site was re-graded to better direct stormwater flow from Paper Mill Road to the trench area and to create the 2’ high berm on the down hill side of the trench. One of the 24” inlets can be seen in the lower photograph.

The entire earthwork and pipe installation part of the construction, which was done by an outside contractor, took about a week to complete. Following that, HVCC undertook the final grading and replanting of the site and the repair of several storm water features along Paper Mill Road. The total construction cost was \$52,000.

HVCC-PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT PERFORMANCE

Stormwater flows from Paper Mill Road into the trench area at several planned locations along the street and some minor grading adjustments put the water where we want it to go not where it wants to go.

The stormwater collects above the trench and the downhill berm keeps it from bypassing the area. The three inlet grates are set at approximately 6" above the finished grade to allow direct flow into the pipe during heavy rain events.

A graded swale was also provided at the lower end of the detention area to allow water to escape in the event of extraordinary rain fall and flow to an area away from the golf course and Terwood Run.

Through several firsthand observations, we've noted that as much as 12" of water will collect behind the berm and that within three hours it will totally infiltrate into the trench. We're still fine tuning the operation of the system.

HVCC-PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT SITE RESTORATION

While we've only been through one growing cycle, we've been able to establish a good cover of plant materials across the entire project site. The goal is to make the area appear exactly as it did before the trench was constructed.

The routing of the trench was planned to minimize the removal of trees and only three had to be taken down. We have now replaced those with new trees and an example can be seen in the lower photo.



As part of the project scope, we will install educational signs along Paper Mill Road to document the problem conditions, the project objectives, the project design & construction and the results. It is hoped that others will learn from the HVCC- PERT Infiltration Trench Project and will employ similar stormwater management measures where they're appropriate.

HVCC-PERT STORMWATER INFILTRATION TRENCH PROJECT



PROJECT BUDGET (GGI Grant + Match)

Salaries	\$ 500.00
Travel	\$ 0.00
Equipment & Supplies	\$ 1,000.00
Administration	\$ 0.00
Contractual (consultants)	\$14,354.00
Construction	\$34,231.00
Other	\$ 0.00
Total Grant Funds	\$50,085.00
Matching Funds	\$21,465.00
Total Project Budget	\$71,550.00
Projected Final Cost	\$71,550.00
Variance	\$ 0.00