

Tenflow Geocomposite for a two slope landfill closure drainage design

PROJECT NAME: Harrisburg Authority Cells B2 & B3

LOCATION/YEAR: Harrisburg, PA / 2005

PRODUCT: Tenflow 770-2

INSTALLER: Hallaton, Inc.

APPLICATION: Landfill Surface Water Drainage

ENGINEER: Brinjac Engineering, Inc.



In the spring of 2003, Brinjac Engineering, Inc. began preparing the plans and contract documents to construct a partial closure on the side slopes of Cells B-2 and B-3 at the Harrisburg Authority's Ash Disposal facility. The original closure

design was performed in the 1990's. While updating the contract documentation, the site grading and drainage design was reviewed. It was determined that if the geocomposite drainage layer could handle all the infiltration water through the cover soil, the terrace drains and down chutes could be eliminated which would also simplify construction.

Pennsylvania requires that benches 15 feet wide be constructed every 25 feet. This limits the amount and velocity of surface runoff to minimize erosion on the slope.

When designing a landfill closure system there are two main factors that an engineer must consider in handling the water the closure system will receive from precipitation: erosion control from surface runoff and the surface water drainage above the barrier layer due to

infiltration through the top soil. The original design of the closure system for the Harrisburg Authority cells B-2 and B-3 ash residue disposal area partial closure incorporated a geocomposite drainage layer over a 40 mil LLDPE membrane with a drainage layer being outleted at each terrace. In order to simplify construction, the closure system was redesigned to allow the drainage layer to convey all the collected liquid from the top of the slope, through the terraces, to the toe of the slope where it was collected in a pipe. To do this, a two slope design methodology was applied to ensure the water head was maintained within the thickness of the geocomposite drainage layer.

It was determined that the design concept of installing a geocomposite to convey all liquid infiltrated through the cover soil from the top of the slope to the toe of the slope was feasible without the use of terrace drains and down chutes. It was estimated that this design change saved approximately \$6,000 per square acre while also speeding up and simplifying construction and minimizing future maintenance cost. The closure system was constructed using TENAX Tenflow high performance drainage geocomposite to achieve the necessary flow requirements and was completed the summer of 2005.

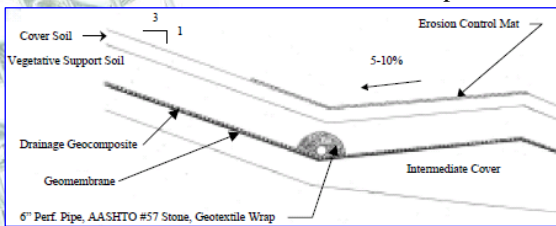


Figure 1: PA Typical Terrace Detail (not to scale)

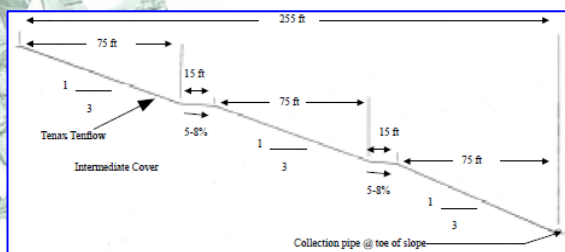


Figure 2: Intermediate cover soil grading for side slopes & terraces with Tenflow solution (not to scale)