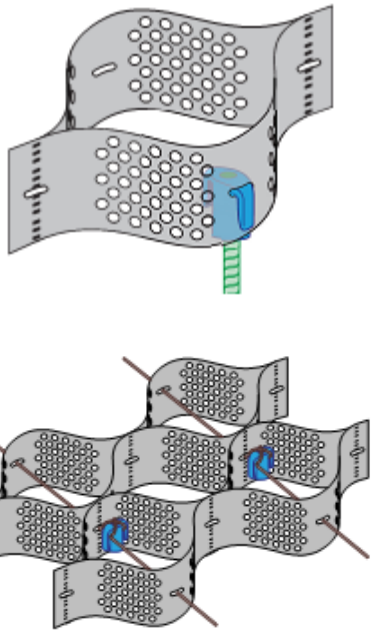
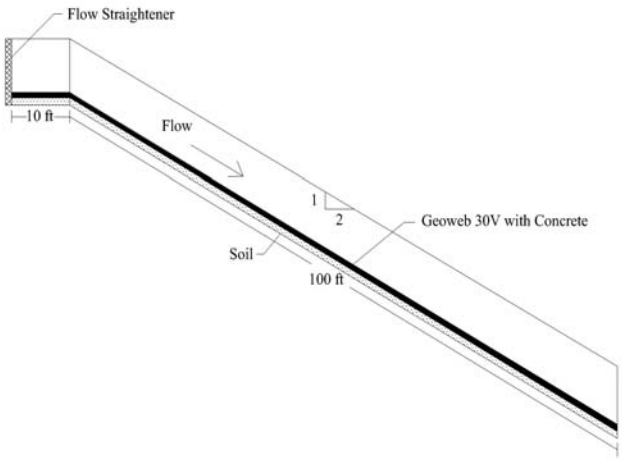
Colorado State University
Engineering Research Center
1320 Campus Delivery
Fort Collins, CO 80523

Geoweb® Cellular Confinement System
Presto Products Geosystems®
Performance Testing — Concrete Fill

Geoweb® Cellular Confinement Systems are used for applications such as load support, earth retention, porous pavement, and slope and channel erosion protection. The product can also be utilized in the efficient formation of concrete structures such as levees, stream bank revetment, or slope protection, allowing for rapid installation without the use of stakes or the need for curing. A testing program was carried out at the Colorado State University Hydraulics Laboratory to quantify and describe performance of concrete-filled, 3-in polyethylene GW30V Geoweb® under severe hydraulic conditions.





Hydraulic Conditions Tested

Approximately 100 ft of Geoweb® 30V was installed on a 2:1 H:V slope in a 4-ft wide flume with a flow straightener and 10 ft approach section according to standard procedures for Articulated Concrete Blocks (ASTM D7277). The confinement system was placed on top of erodible soil material consistent with materials specified in ASTM D7277 and filled with concrete. Testing consisted of a continuous 4-hr flow over the revetment system at steady flow conditions. A performance threshold was defined as the point at which deformation, soil loss, or loss of intimate contact with the embankment sub-grade occurred. Tested discharges corresponded to quantifiable overtopping flow depths.

Test ID	Test Date (mm/dd/yy)	Embankment Slope (H:V)	Overtopping Depth (ft)	Measured Discharge (cfs)	Test Duration (hrs)
one-foot	08/13/08	2:1	1.0	11.0	4.0
two-foot	08/13/08	2:1	2.0	30.0	4.0
three-foot	08/14/08	2:1	3.0	60.0	4.0
four-foot	08/14/08	2:1	4.0	90.0	4.0
Maximum	08/18/08	2:1	4.8	114.5	1.0

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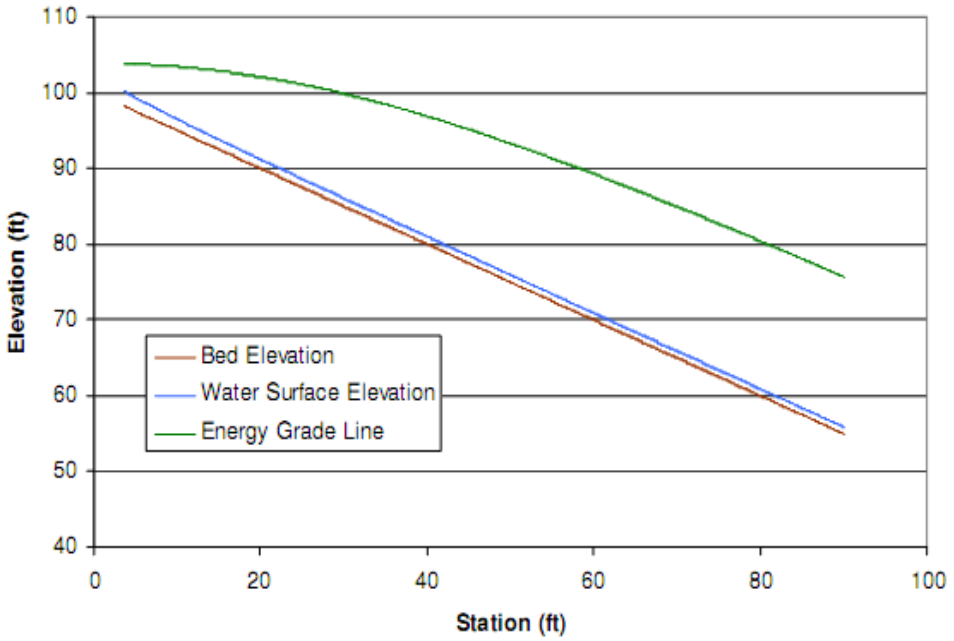

Test Results

At the conclusion of the test matrix, it was determined that the established performance threshold had not been exceeded for the highest flows capable of being delivered to the flume. It was found that 3-in Geoweb® 30V installed with concrete was capable of withstanding sustained flow velocities of 35.7 ft/s and shear stresses of 20.9 psf. Stability at severe hydraulic conditions indicates that 3-in Geoweb® 30V with concrete would perform well in most engineering applications where shear stresses are generally much lower than observed in the physical model. Furthermore, soil loss during testing was found to be negligible, emphasizing the efficiency of the system in erosion control and bank stabilization.

Maximum Hydraulic Conditions

The following data represent hydraulic conditions during 114.5 cfs testing: