

AMMENDMENT A

Re-Test of HESCO Bastion

During the 2004 tests of flood fighting structures, seepage rates through the HESCO Bastion Concertainer™ barrier were higher than seepage rates through the other structures being tested. CHL was therefore requested by HESCO Bastion to retest the Concertainers™ in the laboratory for seepage rates to demonstrate the effectiveness of an alternate construction method. A Testing Evaluation Agreement was prepared between CHL and HESCO Bastion, with HESCO Bastion paying for all costs of the retesting. The alternate construction method consisted of wrapping plastic sheeting around the river-side wall of the structure.

A double line of putty roofing tape was placed on the floor around the outer edge of where the Concertainers™ would be erected. Plastic sheeting was placed over the putty and carefully folded at the corners to allow a single roll of sheeting to extend around the outer perimeter of the Concertainers™. At the corners, 12-in-wide duct tape was placed over the folds in the plastic. The Concertainers™ were then erected on top of the plastic, and the plastic sheeting was folded up over the outer face of the Concertainers™ and down inside the Concertainers™ prior to filling with sand. The plastic sheeting was cut where the wire mesh extended between the inner and outer walls of the Concertainers™ so the plastic could be folded inside the baskets. Plastic wire ties secured the plastic sheeting to the top of the Concertainers™. Expanding foam sealed the Concertainers™ to the wing walls and duct tape sealed the plastic sheeting to the wing walls.

Laboratory Testing – Results

The following three tables (Tables A1-A3) present the pertinent laboratory testing results. Construction of the Concertainer™ wall with plastic sheeting took slightly longer than construction without the sheeting. Other differences in construction were that the 2005 structure was assembled by an experienced HESCO Bastion team (the 2004 structure was built by laborers under the supervision of HESCO Bastion), and the 2005 structure was not covered during the large wave tests. No repairs were made to the 2005 structure during testing.

Table A-1. Effort Required to Construct, Repair, and Remove The Flood-Fighting Structures			
Structure	Construction (man-hrs)	Repairs (man-hrs)	Removal (man-hrs)
HESCO Bastion	20.8	1.8	13.4
HESCO Bastion retest	23.2	N/A	4.72

Seepage rates with the plastic sheeting were reduced by about 90 percent. Small holes in the plastic caused by the debris impact tests had no noticeable impact on seepage rates.

Table A-2. Seepage Rates During Static Head Tests				
Structure	1 ft Head (gpm / ft)	2 ft Head (gpm / ft)	95% Head (gpm / ft)	Average (gpm / ft)
HESCO Bastion	0.39	0.94	1.81	1.05
HESCO Bastion retest	0.04	0.09	0.14	0.09

gpm / ft = gallons per minute per linear foot of structure

Table A-3. Structure Damage During Laboratory Testing	
Structure	Observed Damage
HESCO Bastion	Minor Sand Settling and Washout, Some Bending of Wire During Debris Impact
HESCO Bastion Retest	Minor Sand Settling and Washout, Some Bending of Wire and Minor Tears in Plastic Sheeting During Debris Impact