Flood Fighting Structures Demonstration And Evaluation Program (FFSD)

Tri-Service Infrastructure Systems Conference
August 3, 2005
The conferees therefore direct the Corps of Engineers to act immediately to devise real world testing procedures for Rapid Deployment Flood Wall (RDFW) and other promising alternative flood fighting technologies.”

2004 Energy and Water Development Bill
Product Selections

Congressional Directive
Rapid Deployment Flood Wall (RDFW)
Product Selections
Standard for Comparison
Sandbags
Product Selections

1. Develop Evaluation / Selection Criteria
2. Issue Solicitation for Technical Proposals
   - 9 Proposals Received
   - Categories - Product Type
     Impermeable Liner (with or without frame)
     Granular Filled Container
     Water Filled Bladder
3. Evaluate Proposals and Make Selections Based on Technical Merit
Product Selections
Competitive Technical Proposals
Hesco Bastion
Evaluation Parameters

1. Product Requirements
   - Footprint and ROW requirements
   - Durability
   - Ease of Construction and Removal
     - Time / Manpower / Equipment
   - Adaptability to Varying Terrain
   - Seepage
   - Fill Requirements
   - Cost
   - Repair and Reusability
   - Ability to Raise During Flood

2. Tests
   - Static Loading
   - Overtopping
   - Wave Impact
   - Debris Impact

3. Performance on Various Surfaces
   - Freshly Graded
   - Grass / Weeds
   - Finished Concrete
Laboratory Testing

Construction Footprint
Laboratory Testing

Sandbag Structure

RDFW

US Army Corps of Engineers

ERDC Coastal and Hydraulics Laboratory Geotechnical and Structures Laboratory
Laboratory Testing
Debris Impact

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ERDC
Coastal and Hydraulics Laboratory
Geotechnical and Structures Laboratory
<table>
<thead>
<tr>
<th>Structure</th>
<th>Construction Effort (man hours)</th>
<th>Removal Effort (man hours)</th>
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<tbody>
<tr>
<td>Portadam</td>
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<td>Hesco</td>
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<td>Sandbags</td>
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<td>RDFW</td>
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</table>
Laboratory Results

Seepage

Gpm/ft

- Sandbags
- Hesco-Bastion
- RDFW
- Portadam

Static 1 ft  |  Static 2 ft  |  Static 95%

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Laboratory Results - Damage

**Sandbag Structure**
Repeatedly damaged by waves
Failed during overtopping

**Hesco-Bastion**
Minor sand settling and washout
Wire bent during debris impact tests
Laboratory Results - Damage

RDFW

Minor sand settling
Significant washout along edges and toe
Toe damaged during large waves or overtopping
10% of structure broken

Portadam

Liner torn during debris impact test
Field Testing
Site Selection

Vicksburg Harbor Study Area
Field Testing
As Constructed
Hesco Bastion – As Delivered
Hesco Bastion Structure

Construction

Testing

Removal

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Sandbag Structure

Construction

Testing

Removal
RDFW
Post Testing Modifications

- Color Coded for Accurate Installation
- Rounded Corners
- Suction Trailer Available to Expedite Removal
## Field Testing
### Construction and Removal

<table>
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<tr>
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<tr>
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<td>5.1</td>
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<td>12.6</td>
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</table>

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Field Testing - Damage

Portadam
None - 100% reusable

Hesco Bastion
Bent some panels and coils
Over 95% reusable

Sandbags
Bags began to deteriorate
All sandbags disposed

RDFW
Broke some unit pieces
95% of pieces reusable
Portadam Summary

Strengths

Ease of Construction / Removal
(time, manpower, equipment)
Low seepage rates
No fill required
High degree of reusability
Least ROW required

Weaknesses

Punctured during debris impact test
Can’t be raised in typical application
Hesco Bastion Summary

Strengths
Ease of Construction / Removal
(time & manpower)
Low cost
High degree of reusability
Can be raised

Weaknesses
Significant ROW required due to granular fill
Highest seepage rates
Sandbag Summary

Strengths
Low Cost (volunteer / prison labor)
Conforms well to varying terrain
Low seepage rates
Can be raised

Weaknesses
Very labor intensive
Not reusable
RDFW Summary

Strengths

Ease of Construction (time & manpower)
Low seepage rates
High degree of reusability
Can be raised
Most height flexibility (8 inch units)

Weaknesses

Significant ROW required due to granular fill
High cost
Difficult to remove
Remaining Work

1. Place testing data and results on publicly accessible web page.

2. Conduct pilot tests at 3 locations around the country.
   - Philadelphia / Baltimore Districts
   - Omaha District
   - Sacramento District

3. Use purchased products in actual flood events.
Use During Actual Flood
Iron County, Utah

Installation
May 2005

Removal
July 2005

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Geotechnical and Structures Laboratory
Flood Fighting Structures
Demonstration And Evaluation Program
(FFSD)

Questions ?
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