ARMORTEC HARD ARMOR SOLUTIONS.

A LEGACY OF SUCCESS

Doing the seemingly impossible is an everyday job. With erosion control systems for any need in any application, Contech Engineered Solutions delivers a range of effective, efficient solutions. Our engineered systems provide performance-tested solutions for a wide variety of applications including channel lining, shoreline protection, dam crests and spillways, energy dissipation, pipeline and cable protection, bridge and abutment protection, boat ramps, low water crossings, outfall protection, wave attack protection and more.

BUILDING CONFIDENCE EVERY STEP OF THE WAY

ARMORTEC SOLUTIONS VS. TRADITIONAL RIP-RAP

<table>
<thead>
<tr>
<th>RESEARCH &amp; DEVELOPMENT</th>
<th>ASTM TESTING PROTOCOL COMPLIANT FULL-SCALE TESTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESIGN</td>
<td>CONSISTENT &amp; CONSERVATIVE INDUSTRY DESIGN GUIDELINES</td>
</tr>
<tr>
<td>QUALITY CONTROL</td>
<td>MANUFACTURED UNDER CONTROLLED CONDITIONS IN COMPLIANCE WITH ASTM ESTABLISHED STANDARDS</td>
</tr>
<tr>
<td>CONSTRUCTION</td>
<td>CONFIDENT &amp; SELF-EVIDENT PLACEMENT QUALITY</td>
</tr>
</tbody>
</table>

INCREASE YOUR CONFIDENCE WITH ARMORTEC
ARMORFLEX® ARTICULATING CONCRETE BLOCKS

OPEN CELL BLOCK DESIGN ALLOWS FOR REVEGETATION

CLOSED CELL BLOCK DESIGN ALLOWS FOR HEAVY LOADING

BOTH BLOCKS READILY ADAPT TO COMPLEX SITE GEOMETRIES

BLOCK OPTIONS

Open-Cell Block
Closed-Cell Block
Tapered Open-Cell Block
Block and a Half®

ARMORFLEX UNIT SPECIFICATION

<table>
<thead>
<tr>
<th>Block Class</th>
<th>Nominal Thickness (in)</th>
<th>Length (in)</th>
<th>Width (in)</th>
<th>Gross Area (sf)</th>
<th>Minimum Weight (lbs)</th>
<th>Open Area %</th>
<th>Tc° slope* (psf)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEN</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30-S</td>
<td>4.75</td>
<td>13.0</td>
<td>11.6</td>
<td>0.98</td>
<td>33</td>
<td>20</td>
<td>5.2</td>
</tr>
<tr>
<td>50-S</td>
<td>6.00</td>
<td>13.0</td>
<td>11.6</td>
<td>0.98</td>
<td>42</td>
<td>20</td>
<td>6.1</td>
</tr>
<tr>
<td>40</td>
<td>4.75</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>59</td>
<td>20</td>
<td>11.2</td>
</tr>
<tr>
<td>50</td>
<td>6.00</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>76</td>
<td>20</td>
<td>13.6</td>
</tr>
<tr>
<td>70</td>
<td>8.50</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>107</td>
<td>20</td>
<td>17.7</td>
</tr>
<tr>
<td>40-L</td>
<td>4.75</td>
<td>17.4</td>
<td>23.6</td>
<td>2.58</td>
<td>97</td>
<td>20</td>
<td>14.6</td>
</tr>
<tr>
<td>50-L</td>
<td>6.00</td>
<td>17.4</td>
<td>23.6</td>
<td>2.58</td>
<td>116</td>
<td>20</td>
<td>22.1</td>
</tr>
<tr>
<td>70-L</td>
<td>8.50</td>
<td>17.4</td>
<td>23.6</td>
<td>2.58</td>
<td>164</td>
<td>20</td>
<td>29.5</td>
</tr>
<tr>
<td>CLOSED</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-S</td>
<td>4.75</td>
<td>13.0</td>
<td>11.6</td>
<td>0.98</td>
<td>39</td>
<td>10</td>
<td>6.2</td>
</tr>
<tr>
<td>55-S</td>
<td>6.00</td>
<td>13.0</td>
<td>11.6</td>
<td>0.98</td>
<td>50</td>
<td>10</td>
<td>7.3</td>
</tr>
<tr>
<td>45</td>
<td>4.75</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>71</td>
<td>10</td>
<td>13.5</td>
</tr>
<tr>
<td>55</td>
<td>6.00</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>91</td>
<td>10</td>
<td>16.3</td>
</tr>
<tr>
<td>85</td>
<td>8.50</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>126</td>
<td>10</td>
<td>21.1</td>
</tr>
<tr>
<td>45-L</td>
<td>4.75</td>
<td>17.4</td>
<td>23.6</td>
<td>2.58</td>
<td>109</td>
<td>10</td>
<td>21.9</td>
</tr>
<tr>
<td>55-L</td>
<td>6.00</td>
<td>17.4</td>
<td>23.6</td>
<td>2.58</td>
<td>138</td>
<td>10</td>
<td>26.3</td>
</tr>
<tr>
<td>85-L</td>
<td>8.50</td>
<td>17.4</td>
<td>23.6</td>
<td>2.58</td>
<td>195</td>
<td>10</td>
<td>35.1</td>
</tr>
<tr>
<td>HIGH VELOCITY APPLICATIONS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-T</td>
<td>4.75</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>58</td>
<td>20</td>
<td>25.0</td>
</tr>
<tr>
<td>50-T</td>
<td>6.00</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>75</td>
<td>20</td>
<td>30.5</td>
</tr>
<tr>
<td>70-T</td>
<td>8.50</td>
<td>17.4</td>
<td>15.5</td>
<td>1.77</td>
<td>109</td>
<td>20</td>
<td>38.5</td>
</tr>
</tbody>
</table>

ARMORFLEX® ARTICULATING CONCRETE BLOCKS

APPLICATIONS

• Channel Lining
• Shoreline Protection
• Scour Protection
• Slope Protection
• Outfall Protection
• Pipeline & Cable Protection
• Weirs
• Spillways
• Dam Overtopping
• Emergency Overflows
• Grade Transitions
• Intracoastal Waterways
• Bays
• Lakes
• Reservoirs
• Low Water Crossings
• Boat Ramps
• Down Chutes

Dam Overtopping
ARMORFLEX® DESIGN CONSIDERATIONS

SIZING

ArmorFlex® ACB vs Traditional Riprap*

* Assume 4H:1V sideslopes, 2% bed slope, 15ft. bed width, 3ft. flow depth, FS = 1.5

REFERENCES AND STANDARDS

- ASTM D 7276 – Standard Guide for Analysis and Interpretation of Test Data for ACB Revetment Systems in Open Channel Flow
- ASTM D 6684 – Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems
- ASTM D 6884 – Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems
ARMORFLEX® INSTALLATION

THE ARMORTEC® HARD ARMOR ADVANTAGE

PROCESS

**EASE OF INSTALLATION**

**Step 1:** ArmorFlex arrives on-site as a system of factory-assembled mats. ArmorFlex is placed on a site specific geotextile which has been placed on a prepared subgrade using conventional construction equipment.

**Step 2:** Mats are supplied on flat bed trailers. Mats can be handled with a spreader bar which can be rented from Contech.

**Step 3:** ArmorFlex Mats are placed according to the site plans with appropriately sized equipment. Above normal waterline mats may be topsoiled and seeded to give a vegetated effect.

**Step 4:** Proper toe trench requires a minimum of two rows of block buried below predicted soil depth. Tapered series block or mats subject to wave attack are required to have a bedding layer of crushed stone or gravel.

* See ArmorFlex Installation Guide for additional information.

**APPLICATIONS**

- Industrial Yards
- Durable Driving Surface
- Temporary Road
- Lay Down Yard
- Heaving and Expanding Subgrades

**ARMORROAD UNIT SPECIFICATION**

<table>
<thead>
<tr>
<th>Block</th>
<th>L</th>
<th>W</th>
<th>H</th>
<th>Minimum Weight (lbs / sf)</th>
<th>SF per Truck Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mat</td>
<td>18.00</td>
<td>15.60</td>
<td>6.00</td>
<td>60</td>
<td>750</td>
</tr>
</tbody>
</table>
A-JACKS® CONCRETE ARMORING UNITS (CAU)

APPLICATIONS

- Bridge/Pier Scour
- Energy Dissipation
- Streambank/Toe Stabilization
- Shoreline
- Drop Structure
- Weirs
- Coastal Breakwater (Jetty)
- Habitat Creation

A-Jacks® provided bridge pier foundation scour protection to withstand Hurricane Sandy.

INSTALLATION

- Hand-placed and Bundled Unit Methods
- Field Technicians Available for Pre-con and Installation
- Construction Versatility
**A-JACKS® DESIGN CONSIDERATIONS**

### DESIGN

- A-Jacks® are recommended in FHWA HEC 23 with further guidance in Design Guideline 19.

### STANDARD DETAILS

**A-Jacks Placement Profile**

**A-Jacks Toe Stabilization Detail**

**A-Jacks Energy Dissipation Detail**

<table>
<thead>
<tr>
<th>A-JACKS UNIT SPECIFICATION</th>
<th>A-Jacks</th>
<th>Coverage (SF)</th>
<th>Weight (lbs)</th>
<th>Standing Height (H) (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AJ-24</td>
<td>1.0</td>
<td>78</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>AJ-48</td>
<td>4.0</td>
<td>629</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td>AJ-72</td>
<td>9.0</td>
<td>2,120</td>
<td>4.5</td>
<td></td>
</tr>
<tr>
<td>AJ-96</td>
<td>16.0</td>
<td>5,022</td>
<td>6.0</td>
<td></td>
</tr>
<tr>
<td>AJ-120</td>
<td>25.0</td>
<td>9,699</td>
<td>7.5</td>
<td></td>
</tr>
</tbody>
</table>
ADDITIONAL HAND-PLACED ACB SOLUTIONS

ARMORFLEX®

- Dam Overtopping
- Auxiliary Spillways
- Emergency Overflow
- Grade Transitions
- Retention Basins
- Shoreline Protection
- Drainage Ditch Lining
- Outfall Protection
- Bridge Abutment Protection

ARMORLOC®

- Auxiliary Spillways
- Emergency Overflow
- Grade Transitions
- Retention Basins
- Shoreline Protection
- Drainage Ditch Lining
- Outfall Protection
- Bridge Abutment Protection
- Walking Paths
- Auxiliary Parking
- Slope Paving

ARMORWEDGE®

- Dam Overtopping
- High Velocity Channels
- Primary and Secondary Spillways
- Down Chutes
CONSIDERATIONS FOR ENGINEER OF RECORD

Site Design
Soil Borings
Hydraulic Analysis
Scour Analysis
Scour Countermeasures
Permitting
Inspections

SOLUTION DEVELOPMENT & DESIGN SUPPORT

Limit Assessment
Hydraulic Analysis
HEC RAS Review
Factor of Safety Analysis
Block Selection
Engineer’s Estimate
Proposal Drawings
Contract Drawings
Specifications
Approval Assistance
Staging and Layout
Fabrication Drawings

INSTALLATION SUPPORT

Preconstruction Meeting
Logistics Coordination
Onsite Installation Assistance

HEC RAS REVIEW

DRAWINGS & TECHNICAL SUPPORT

STAGING & LAYOUT
Contech® Engineered Solutions provides innovative, cost-effective site solutions to engineers, contractors and developers on projects across North America. Our portfolio includes bridges, drainage, erosion control, retaining wall, sanitary sewer and stormwater management products.

ADDITIONAL SPECIALTY PRODUCTS

TURF REINFORCEMENT MATS
BIN WALL
LIGHT GAGE METRIC SHEETING

For more information, call one of Contech's Regional Offices located in the following cities:

Corporate Office - Ohio (Cincinnati)  513-645-7000
California (Roseville)  800-548-4667
Colorado (Denver)  720-587-2700
Florida (Orlando)  321-348-3520
Maine (Scarborough)  207-885-9830
Maryland (Baltimore)  410-740-8490
Oregon (Portland)  503-258-3180
Texas (Dallas)  972-590-2000

NOTHING IN THIS CATALOG SHOULD BE CONSTRUED AS A WARRANTY. APPLICATIONS SUGGESTED HEREIN ARE DESCRIBED ONLY TO HELP READERS MAKE THEIR OWN EVALUATIONS AND DECISIONS, AND ARE NEITHER GUARANTEES NOR WARRANTIES OF SUITABILITY FOR ANY APPLICATION. CONTECH MAKES NO WARRANTY WHATSOEVER, EXPRESS OR IMPLIED, RELATED TO THE APPLICATIONS, MATERIALS, COATINGS, OR PRODUCTS DISCUSSED HEREIN. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND ALL IMPLIED WARRANTIES OF FITNESS FOR ANY PARTICULAR PURPOSE ARE DISCLAIMED BY CONTECH. SEE CONTECH’S CONDITIONS OF SALE (AVAILABLE AT WWW.CONTECHES.COM/COS) FOR MORE INFORMATION.

© 2020 Contech Engineered Solutions LLC , a QUIKRETE Company
All rights reserved. Printed in USA.