



G E O L I N K <sup>TM</sup>



**CONTECH**<sup>®</sup>  
EARTH STABILIZATION  
SOLUTIONS INC.

ARTICULATED CONCRETE BLOCK for Erosion Control Applications

CULVERT/PIPE OUTLETS

SHORELINES

LOCAL SCOUR

SLOPE PROTECTION

CANALS & CHANNELS

STREAMBANK STABILIZATION

LANDFILL DRAINAGE

SPILLWAYS & WEIRS

RIVERS & STREAMS

DIKES & LEVEES

BOAT LAUNCH RAMPS

BRIDGE ABUTMENTS

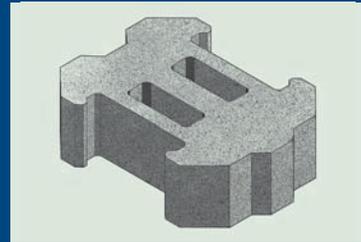
GOLF COURSES

ATV TRAILS

## OUR VIEW

CONTECH Earth Stabilization Solutions Inc. (ESS) is the nation's leading provider of complete solutions for earth stabilization projects of every description. From landscaping and retaining wall systems to erosion control and surface stabilization solutions, CONTECH ESS is unequaled in its breadth of products, level of expertise and willingness to support your construction efforts. CONTECH ESS is one of four operating divisions of CONTECH Construction Products Inc. The most extensive selection of bridge, drainage, earth stabilization, and stormwater solutions comes from CONTECH, the only true nationwide, single source provider.

We approach the environmental responsibilities that are integral to our business by focusing on efficient and clean design applications. We also aim to prevent pollution by applying products that combat erosion and promote natural vegetation that filters impurities from our waterways.



*Geolink™ is a perfect solution to the imperfect problem of soil erosion.*



## OTHER PRODUCTS BY CONTECH EARTH STABILIZATION SOLUTIONS INC.



*ArmorFlex® is an articulating concrete block revetment system.*



*A-Jacks® are high stability concrete armor units designed for riverine, scour, and streambank protection.*



**G E O L I N K**™



#### **ENVIRONMENTAL BENEFITS**

Geolink's superior methods of erosion control prevention promote a natural and aesthetically pleasing environment. The open block cell design supports and maintains vegetative growth, which provides a natural cleansing process that filters out contaminants and results in enhanced water quality. This superior design also inhibits the transport of soil during the erosion control process to help keep waterways free from silt and hazardous pollutants.

#### **DURABILITY**

Geolink units are designed to create positive unit-to-unit interlock that enables its installation to act as a system rather than a series of individual units. Acting as a system results in a greater factor of safety and superior performance.

#### **INSTALLATION**

High strength, hand-placed concrete units over a properly prepared foundation virtually eliminates the need for heavy equipment, making Geolink an ideal solution for hard-to-get-to sites. The use of smaller equipment during construction reduces disturbances on-site and in adjacent areas.

#### **RESEARCH & TESTING**

Rigorous testing at the University of Minnesota's St. Anthony Falls Laboratory has proven the solid performance of the Geolink system.

CONTECH ESS is committed to providing premium site solutions. Our experienced field personnel are available to assist you with your project from start to finish. Our in-house engineering staff can provide technical assistance from preliminary drawings and CADD details to final design.

### **COMPLETED & VEGETATED**



# the B E N E F I T S

## WATER QUALITY & SOIL EROSION

The most influential impact on water quality is soil erosion, which has resulted in new federal and local regulations mandating the control of silt runoff. Innovative measures are needed to meet these new regulations and control the erosion process.

When flow velocities and shear stresses exceed the limits of natural vegetation, protective measures need to be implemented. Historically, riprap and concrete paving have been used to control this process, however these solutions do not support vegetation, which is a natural filter. Also, riprap and concrete paving create greater runoff volumes, which increasingly contribute to flooding.

Over the past several years, a variety of innovative products have been developed that offer significant advantages over traditional methods of controlling erosion. Geolink, the alternative to rip rap, provides the benefits of conventional methods and offers the additional benefits of:

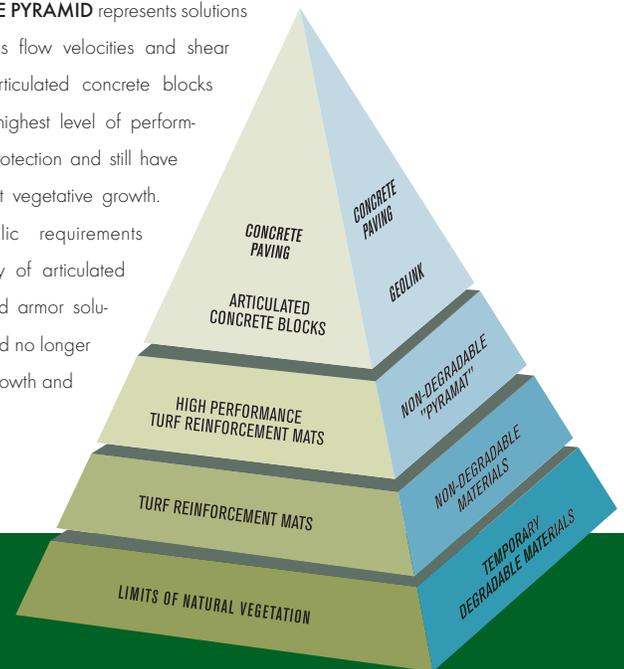
- Supporting vegetation
- Flexible, conforms to ground contours
- Facilitating groundwater recharge
- Reducing runoff velocities and volumes
- Enhancing water quality
- Easy to install



## B E F O R E & A F T E R



This **PERFORMANCE PYRAMID** represents solutions to erosion control as flow velocities and shear stresses increase. Articulated concrete blocks (Geolink) offer the highest level of performance and erosion protection and still have the ability to support vegetative growth. Once the hydraulic requirements exceed the capacity of articulated concrete blocks, hard armor solutions are required, and no longer support vegetative growth and water quality.

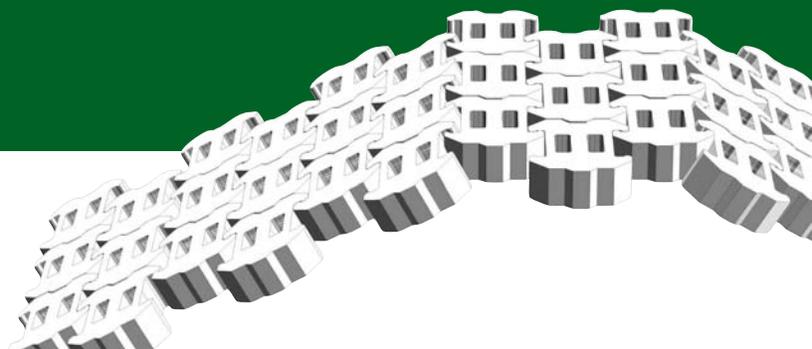


## PERFORMANCE PYRAMID

**CONCRETE PAVING** does not support vegetation.

**ARTICULATED CONCRETE BLOCKS** support vegetative growth.

**TIER ONE** limits natural vegetation.



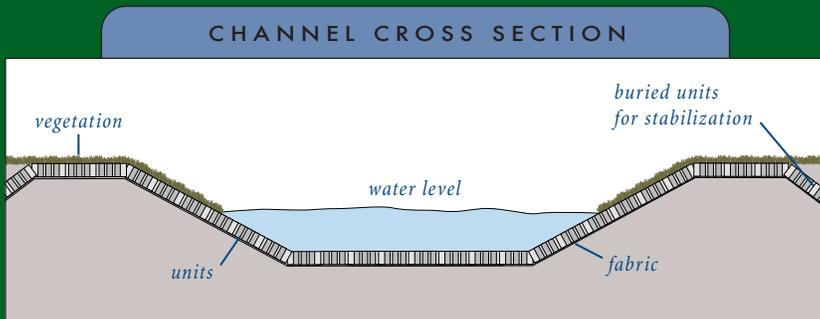
## OUR DESIGN PHILOSOPHY

A well-balanced, properly designed revetment system is mandatory to ensure your project will serve its intended purpose. The primary design considerations for typical applications are the hydraulic capabilities of the product as compared to the hydraulic requirements of the project. Also, drainage, separation, foundation and anchorage issues need to be considered and addressed during the design process.

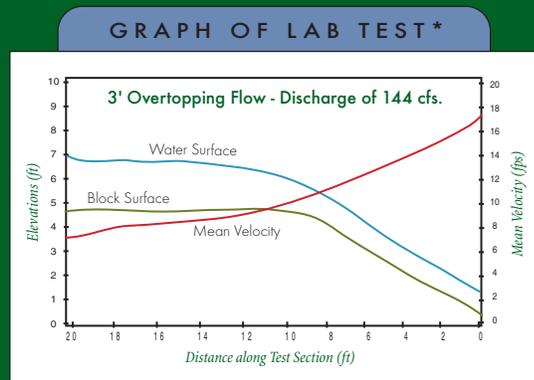
### RESEARCH & DESIGN

Full scale laboratory testing has been conducted on Geolink to determine its limiting shear stress and maximum velocity. These results can be compared to the actual shear stress and velocity requirements with an appropriate factor of safety for each specific site. The Geolink units are to be placed on a properly designed foundation. Depending on the site logistics and the soil type involved, global stability should be evaluated. The foundation must be stable and designed to prevent excessive and differential settlement.

A drainage media may need to be incorporated into the design depending on the porosity of the foundation soils in order to prevent uplift of the Geolink units. An engineering fabric is always required at the base of the units to prevent the loss of foundation soils during hydraulic events. If an open graded rock is used for drainage, an engineering fabric should be used between the subgrade and the drainage system to prevent clogging. The engineering fabric needs to be designed to prevent the loss of soil fines under various hydraulic conditions and dissipate excessive pore pressure. The revetment system should be entrenched at the edges and toe of the system to prevent scour.



University of Minnesota, hydraulic analysis performed in 1998.



### Geolink Unit Specifications

product number	height	width	length	gross coverage per ft <sup>2</sup>	weight	weight per sq ft	open area %
PL 41216	4"	12"	16"	1.12	36-42	32-37	20
PL 61216	6"	12"	16"	1.12	54-62	48-56	20

### DESIGN PLATFORM



- Geolink units with vegetation
- Soil filled units
- Engineering fabric layer
- Drainage media (optional)
- Prepared subgrade foundation

\*Published design values were derived from Geolink tested with a drainage media in place.

# the PROCESS

## INSTALLATION OF GEOLINK

The installation procedure for Geolink is simple, however, proper techniques must be followed to ensure the system's long-term performance. Prepare the site for installation by creating a smooth soil base, free of debris and rock. This will ensure contact between the base of the Geolink unit and the foundation. An approved geotextile fabric should be placed directly on the prepared foundation free of wrinkles. In some cases, "U" shaped staples may be required to hold the fabric in place.

The centerline of the system should be established and marked to ensure proper alignment of the Geolink units. Begin placing units parallel along the marked centerline. There is little flexibility of units side

to side, therefore, making them unable to be laid on a radius. If the soil grade is greater than 4:1, it is best to begin placing units at the toe of the slope.

Each edge of the system must be entrenched as detailed on the plans, to prevent the migration of water and keep the system from sliding. Depending on the geometric layout of the site, additional anchors may be required. Finally, if vegetation is desired, the system should be soil filled.

*Note: Additional steps may be required depending on project specifications.*

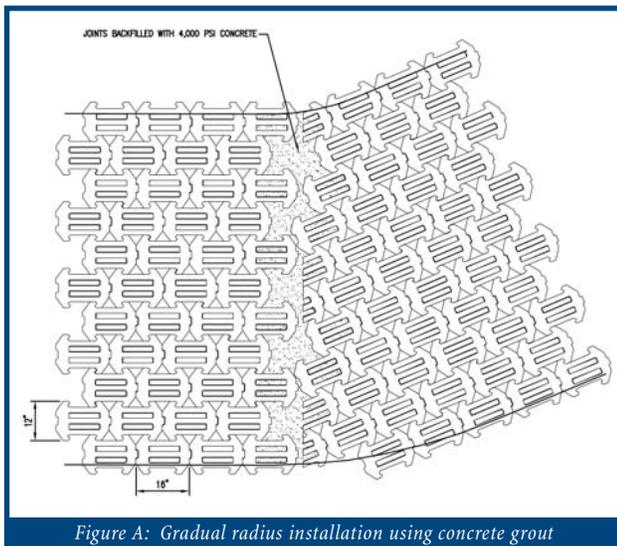


Figure A: Gradual radius installation using concrete grout

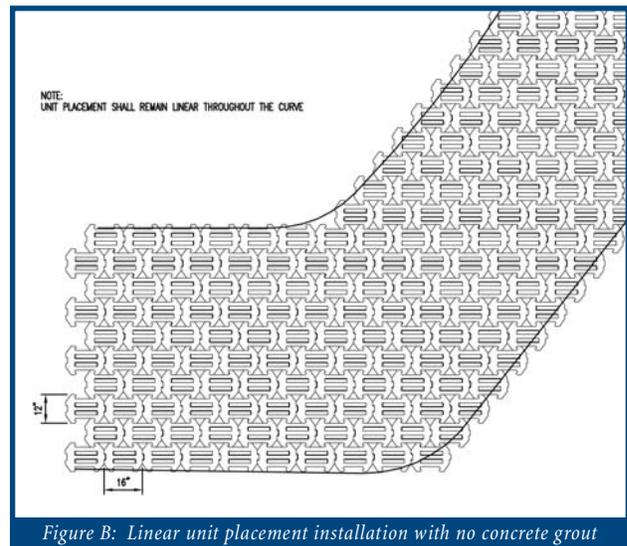
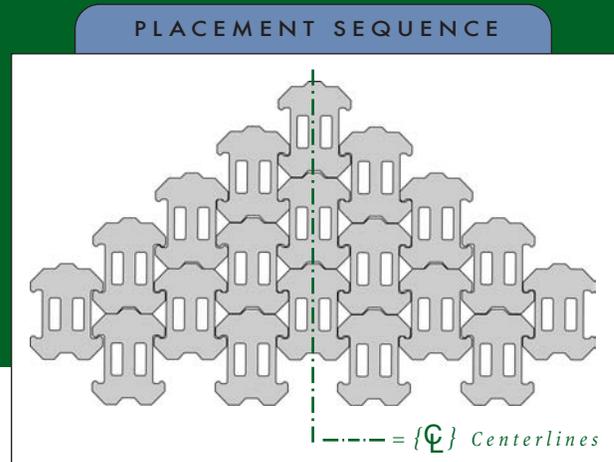


Figure B: Linear unit placement installation with no concrete grout



## INSTALLATION TECHNIQUES

Use a string line to establish the centerline of the channel. Place the units along the centerline, however, it is not recommended to place more than twelve units longitudinally before moving outward. To accommodate horizontal curves, there are two different installation techniques (see page 6). Figure A shows how to make a horizontal curve using concrete grout. From time to time, units may need to be field cut in order to provide a proper fit along the miter. The areas directly adjacent to the miter must be field grouted to tie the two sections together. Figure B shows a similar curve with no concrete grout. In this installation technique, unit placement shall remain linear throughout the curve.

## INSTALLATION PROCESS

### BASE PREPARATION

Prepare a smooth foundation to the proper geometric of the site.



### GEOTEXTILE INSTALLATION

Place the geotextile fabric on a prepared base surface.



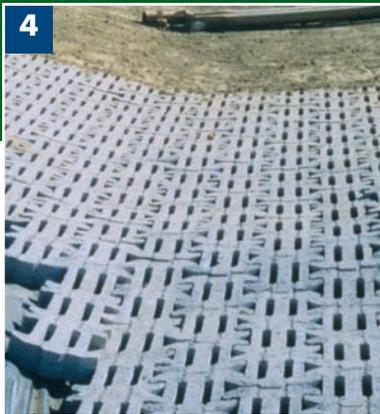
### GEOLINK UNIT PLACEMENT

Start at the centerline and work outward by interlocking the units together.



### ADDITIONAL UNITS PLACED

Continue unit placement by working towards the edge of the site. Covering units with soil will promote vegetative growth.



### NOTES FOR INSTALLATION

Keep units parallel to centerline. Units cannot negotiate horizontal curves by manipulating unit-to-unit contact.



### VEGETATIVE GROWTH FACTOR

Geolink is designed with a 20% open area. This allows vegetation to establish and act as a natural filter.



## CONTECH EARTH STABILIZATION SOLUTIONS INC. (ESS)

CONTECH ESS is committed to providing the construction industry with the best quality products and services for innovative site solutions. In order for us to keep the leading edge, our goals center on continued product improvements and new product development. Quality control programs and procedures are strictly enforced. As a result, site problems are drastically reduced. For more information, please visit [www.contechess.com](http://www.contechess.com) or call (800) 338-1122.



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