

**ADDENDUM NO. 1**

**MISTEGUAY CREEK INTERCOUNTY DRAIN  
GENESSE, SAGINAW, SHIAWASSEE COUNTIES, MICHIGAN**

**TO: ALL PROSPECTIVE BIDDERS ON THE SUBJECT PROJECT**

**RE: CHANGES TO BIDDING DOCUMENTS**

*Acknowledge Receipt of this Addendum on Page C-410-1  
of the Bidform (Proposal) where indicated.*

The following is a list of changes to the bidding documents:

1. Addendum No. 1 has been emailed or made available to you through the Spicer Group website on Wednesday, May 30<sup>th</sup>, 2019.
2. Enclosed please find minutes which reflect discussion at the Mandatory Pre-Bid Meeting held on May 21<sup>st</sup>, 2019. All items and changes from the Mandatory Pre-Bid Meeting shall be part of this contract.
3. Enclosed please find a copy of the attendance sheet from the Mandatory Pre-Bid Meeting held on May 21<sup>st</sup>, 2019.
4. Information for the articulated concrete block product to be used for the alternate bid item in Division III is included with this addendum.

Note all clarifications and changes contained within this Addendum and/or the Pre-Bid meeting minutes supersede any data that may be contained in the plans and specifications regarding the same matter.

An unsigned acknowledgement or lack of acknowledgement shall be cause to have the bid rejected. Acknowledgment of the Addendum No. 1 by the bidder shall indicate full understanding and acceptance of this addendum in its entirety.

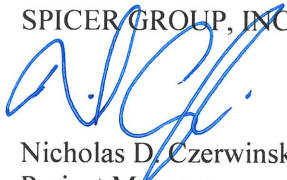
Please sign the Acknowledgment below and attach this Addendum No. 1 to the front of your bidding document. Acknowledge the same in the Bid Form (Proposal).

Included with the sealed bid should be:

- A. The Bid Form with Addendum No. 1 acknowledged
- B. A copy of this Addendum with the Acknowledgement Form completed

Prepared by:

SPICER GROUP, INC.



Nicholas D. Czerwinski, P.E.  
Project Manager

**ACKNOWLEDGMENT**

BIDDER: \_\_\_\_\_

BY: \_\_\_\_\_

DATE: \_\_\_\_\_

**Misteguay Creek Intercounty Drain  
Michigan Department of Agriculture & Rural Development  
Genesee, Saginaw, & Shiawassee Counties**

**Mandatory Pre-Bid Conference  
10:00 A.M., May 21<sup>st</sup>, 2019  
Spicer Group, Inc.**

**MEETING MINUTES**

- I. Introductions
  
- II. Sign-In Sheet
  - **See Attached sign in sheet**
  - This meeting will entail a general overview of the project, construction schedule, specific items on plans and specifications, and questions and answers.
  - This is a Mandatory Pre-Bid Meeting. Your signature on the sign-in sheet acknowledges your presence at this meeting.
  - An addendum will be issued as a result of this Pre-Bid Meeting.
  - Ask questions at any time.
  
- III. Project Overview
  - Project divided into 3 divisions: Division I, Division II, and Division III
    - Divisions will be awarded individually, and contractors may bid one, two or three divisions.
    - If a contractor is the low bidder on multiple divisions, they will be required to provide proof of having resources to complete all divisions on time. If a contractor cannot complete all divisions on time, the owner will make a decision as to which division is awarded and which will go to the next lowest responsible bidder.
  - Division I
    - Construction of flap gate structure on Munson Drain
    - Construction of flap gate structure on Peart Intercounty Drain
    - Construction of dike transitions at proposed structure locations
    - Installation of Riprap
    - Approximate locations shown in blue on Sheet 1
  - Division II
    - Earthwork required to construct dikes along 2.2 miles of drain as shown on plans
    - Construction of flap gate structure on Denslow Drain
    - Relocation of Cresswell Road near Denslow Drain outlet
    - Installation of Riprap and Soil Erosion and Sedimentation Control Measures
    - Approximate location shown in red on Sheet 1
    - Review details on Sheet 55 of 64

- Division III
    - Maintenance items on dam and plunge pool
    - Installation of erosion control measures
    - Construction of access ramp
    - Fence installation
    - Approximate location shown in green on Sheet 1
- IV. Project Coordination
- Coordinate work near pipelines with pipeline owners
  - Coordinate work with regards to field tiles with landowners
  - Survey staking to be coordinated with Spicer
    - Division II includes up to 3 sets of stakes per side of dike
  - Monthly progress meetings will be scheduled
- V. Project Schedule
- Bid Letting/Opening – June 25<sup>th</sup>, 2019 @ 10:00 A.M. at Albee Township Hall
    - Bids will be accepted at Albee Township Hall June 25<sup>th</sup>. **Township Hall will be open at 8:30 AM to drop of bids.**
    - If turning in bids prior to June 25<sup>th</sup>, they are to be submitted to Spicer Group in this office. Bids will not be accepted at Spicer after 5 pm on June 24, 2019.
  - Notice to Proceed – Estimated to be Fall 2019
  - Substantial Completion: October 1<sup>st</sup>, 2021
  - Final Completion: May 31<sup>st</sup>, 2022
  - Liquidated Damages - \$500.00 per day from substantial completion date.
- VI. Special Project Considerations
- Work will need to be scheduled around weather conditions and openings in dikes must be closed up as needed to prevent flooding of adjacent property.
    - Coordinate schedule with engineer if openings in dikes will be left overnight.
    - No opening in dikes shall be unattended for more than 36 hours.
  - Emergency response plan for adverse weather shall be prepared by contractor and submitted to engineer and approved prior to work beginning on any division of work.
  - Expansion and compaction of dike soils:
    - Volume tables on plan and profile sheet use an estimated expansion factor of 15%.
    - Minimum required compaction on proposed dike will be 80%.
    - If volumes of dirt are lower do to field conditions on expansion and compaction the height of the dike will be adjusted, but the footprint of the dike and slopes of the dike will remain as shown on plans.
  - Dewatering
    - Division I and II – Cofferdams and dewatering measures must be used prior to removing existing flap gates and pouring concrete for headwalls. Contractor’s dewatering plan must include a way to let storm water pass through during large storm events.
    - Division II - Type III Riprap detail for dry conditions may only be used when existing soils are properly dried and the working area is dewatered sufficiently to get 80% compaction.
    - Division III - The plunge pool must be dewatered and inspected by engineer prior to installation of riprap or concrete blocks.

- On Division II, Contractor must gain approval from Engineer in order to be simultaneously working on both sides of dike. Approval of engineer will be based on the contractor having sufficient equipment and workers onsite to be able to respond adequately to an upcoming storm and implement the approved emergency response plan.
- Cast-in-place concrete headwalls for Munson Drain, Peart Intercounty Drain, and Denslow Drain are to be constructed by a contractor or sub-contractor experienced and qualified in this type of work. References and previous work experience may be requested by engineer/owner prior to award of project
- Fuel Estimation Spreadsheet (used for Division II only) – Fill out this form and submit with bid. Bids without this form completed are considered incomplete. The intent of this form is to document the fuel costs for hauling riprap that were included in the bid. This document will be used to help evaluate any claims made against the project for increased fuel cost related to the hauling of riprap. In addition to this form, the contractor will also be required to submit a report from the riprap supplier documenting the volume of riprap supplied for the project on a monthly basis. Providing unbalanced numbers on this form will be considered the same as an unbalanced bid and will be cause for dismissal of bid.
- Riprap – Division II
  - Estimated riprap volume on Division II is 14,500 cubic yards. Includes all riprap in Division II that is included in the various riprap bid items.
  - Tickets from riprap supplier will be required to be turned in with monthly pay requests.
- Alternate Bids Item – Division III
  - Provide alternate bid to use IECS CC135 articulated concrete blocks or approved equal in lieu of heavy riprap at dam outlet. **See attached information on IECS CC135 articulated concrete blocks.**
  - Low bidder of this division will be determined based on final contract price once materials have been selected.
- Basis of Payment & Measurement
  - Basis of Payment and Measurement for each bid item is provided in the specifications and should be reviewed in detail by all bidders.
  - Bid Items are based on local standards and vary from MDOT standard specifications.
  - All work shown in plans is intended to be included in the bid items on the bid form. If there are questions on how work items are being paid for inquire with Spicer Group, and we will provide clarifications as needed.

#### VII. Payment

- Owner shall make progress payments on account of the Contract Price on the basis of Contractor's Applications for Payment on or about the 25th day of each month during performance of the Work.

#### VIII. Construction Staking and Inspection

- Staking – OWNER will provide through the ENGINEER all construction staking for the project.
- Spicer Group Inspection - A Spicer Inspector will be required to be on site for the installation of all underground utilities and road work. Periodic inspection will be provided for dike work.

#### IX. Permits

- All necessary permits are being obtained from the MDEQ by the owner.

- Contractor is responsible for obtaining any additional required permits from local agencies.
- Permit costs will be reimbursed to contractor based on actual invoiced amounts.

X. Traffic Control

- Contractor to provide traffic control as needed on project.
- Traffic control plan for shutdown of Cresswell Road is to be approved by Saginaw County Road Commission prior to work beginning on road relocation.
- Contractor to provide traffic control as needed where trucks will be entering/exiting the job site on/off of county roads for trucking operations.

XI. Bonds and Insurance

- Bid Bond – 5% of total bid amount
- Construction Performance Bond
- Construction Payment Bond
- Insurance Requirements (in specifications)

XII. Contractor Bids

- Bids are due June 25<sup>th</sup>, 10:00 A.M. @ Albee Township Hall. See notes above if submitting prior to day of bid.
- Project will be awarded to lowest responsible bidder in each division based on selected project scope including alternate bid items.
- An addendum will be issued as a result of this meeting.
- All questions following this meeting must be received by 5 PM on June 18<sup>th</sup>, to have an answer supplied in an addendum.
- Bid bond
- Signed addendum
- Acknowledge addendum on bid form
- Sign bid form
- Complete all required forms in the bid documents

XIII. Contact

Nicholas Czerwinski, P.E.  
 Spicer Group  
 Project Manger  
 (989) 529-0256  
 nickc@spicergroup.com

XIV. Questions or Comments

- **As stated in Section 313700 of the specifications for PLAIN RIPRAP uniformly broken concrete meeting the specified size range for plain riprap is acceptable but must be examined by the engineer prior to installation. Concrete must be free of rebar, steel, and paint by-products in order to be acceptable. Broken Concrete is not acceptable for HEAVY RIPRAP.**
- **The articulated concrete block may be obtained by the contractor from any supplier that sells the specified product (IECS CC135). The supplier that assisted with the design and selection of the product was Jeff Skinner at CSI Geoturf, Cell: 248-640-6005.**
- **The flap gates may be obtained by the contractor from any supplier that sells the specified product. The supplier that assisted with the design and selection of the product was Jim Bakos at Kennedy Industries, Cell: 989-412-3978.**

XV. Optional Project Tour

- **If bidders wish to visit secured areas of the project at a later time, access shall be coordinated through Spicer Group.**

# Misteguay Creek Intercounty Drain

Mandatory Pre-Bid Meeting: 10:00 AM - May 21, 2019

Name	Company	Phone/Fax	Email
NICK CZERWINSKI	SPICER	P: (989) 529 - 0256 F: ( ) -	nickc@spicergroup.com
LUKE O'BRIEN	SPICER	P: (989) 280 - 2109 F: ( ) -	LUKEO@spicergroup.com
JUSTIN TOMASEK	Prairie Grain	P: (989) 357 - 2778 F: ( ) -	justin@prairiegrain.org
LARRY JOCHAN	L.J. Construction	P: (989) 761 0131 F: (989) 761 0132	LJconstructionmi@gmail.com
JASON NICOL	Nicol and Sons Inc	P: (989) 553 - 0040 F: (989) 658 - 8513	J-JNicol@hotmail.com
JW KALIN	Kalin Inc	P: (269) 925 - 2746 F: (269) 925 - 4920	JWKalina@Kalininc.com
JEFF RILEY	Champagne & Marx	P: (989) 755 - 8971 F: (989) 755 - 0033	jriley@champagnemarx.com
ANDREW STONER	TOEBE	P: (517) 245 - 5026 F: ( ) -	andrew.stoner@toebe-construction.com
ALAN SIMANSKEY	FISHER CONTRACTING	P: (989) 835 - 7771 F: ( ) -	ASIMANSKEY@THEFISHER.CO
JOE ROBISON	Fessler & Bowman	P: (810) 280 - 0331 F: ( ) -	jrobison@FesslerBowman.com
SAM LUEDTKE	RCL	P: (989) 687 - 7319 F: ( ) -	SAM@RCLCONSTRUCT.COM



# Misteguay Creek Intercounty Drain

Mandatory Pre-Bid Meeting: 10:00 AM - May 21, 2019

Name	Company	Phone/Fax	Email
ROSS PENNATA	ZITO CONSTRUCTION Co	P: (810) 695-9025 F: (810) 695-4996	MAILBOX@ZITCONSTRUCTION.COM
Manya Colpaert	Sag. Co. Pub Works	P: (981) 790-5222 F: ( ) -	
BRIAN ROHDE	ROHDE Bas. Ex.	P: (989) 753-0294 F: (989) 753-2028	brian@rohdebrothers.com
Zac Birnbaum	American	P: (984) 233-7141 F: ( ) -	Zac@americaneve.com
Jamie Plummer	Anlaan Corp	P: (231) 896-0695 F: ( ) -	jamiplummer@anlaan.com
SUZANNE BIRNBAUM	GREENTECHSYSTEMS	P: (669) 239-5510 F: ( ) -	greentechsystemsllc@gmail.com
AVERY STERLING	STERLING Exc.	P: (989) 343-0926 F: (989) 343-0952	AVERYSTERLING407GMAIL.COM.
Chad Herrema	CHOP	P: (616) 430-1278 F: ( ) -	cherrema@we-chop.com
Sue Hagan	GDC	P: (810) 732-1590 F: ( ) -	
Kurt Vincke	Vincke Exc	P: (989) 239-8139 F: (989) 845-2609	kurtvincke@yahoo.com
JIM BAKOS	Kennedy Ind (Fountain)	P: (248) 684-1200 F: (981) 412-3978	jbakos@Kennedyind.com

MART STANO

SHAWASSOR  
DRAIN COMM.



*SUBMITTAL PACKAGE  
FOR*

*MISTEGUAY CREEK INTERCOUNTY DRAIN  
SAGINAW, MICHIGAN*

*CC 135 CABLE CONCRETE®*

# International Erosion Control Systems, Inc.

3030 N. Rocky Point Drive, Suite 150

Tampa, Florida 33607

Ph: 1-855-768-1420 Fx: 1-855-768-1425

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## **CABLE CONCRETE® SPECIFICATIONS**

### **A. Description**

Cable Concrete® is an articulated concrete block revetment system, developed by International Erosion Control Systems Inc. to control various types of erosion due to water, wind, or vehicular traffic. This system shall be made up of 8'x 8' mattresses (if needed, irregular mat sizes may be designed), which are placed side by side and clamped together to provide one homogeneous erosion protection system. The mats are made up of concrete blocks interlocked by integrally woven polyester revetment cables, which are poured within each block. The mats will be manufactured without the geotextile attached during manufacturing. The size of the concrete blocks shall be 31.5" square at the base and 27.6" square at the top face (a truncated pyramid shape).

System	System Weight (lbs/sf)	Unit Thickness (in)
CC 135	130-140	12.0

### **B. Concrete**

The minimum required mix design shall be 4000 psi @ 28 days. Air entrainment of 4% to 7% shall be added to the concrete mix in States/Areas that experience freeze/thaw conditions. All ASTM standards will be met in the production of the concrete. The finished concrete product shall consist of a minimum density of 140lbs/cf, in an average of 3 units. No individual block shall consist of a minimum concrete density lower than 125lbs/cf.

#### **Concrete Curing**

The mats are to be air dried and curing compounds are not required. The onsite Company Rep will determine the appropriate time to strip the molds. The minimum time before the molds are to be stripped is 10 hours.

#### **Concrete Finish on The Bottom Side of Blocks**

After the molds are filled with concrete and vibrated, the bottom side of the blocks will be floated with a bow float and/or broom finish eliminating any sharp edges. Note: The concrete surface of the bottom of the blocks shall be smooth but sufficiently rough enough to prevent sliding of the blocks on the geotextile. This roughness is determined by the company representative of the manufacturing company.

### **C. Cables**

The cables shall be made of 40mm polyester revetment cable and shall be diamond braided polyester filament cord braided over a polyester core. Cables shall be integral (poured into) to the concrete block and shall traverse through each block in both longitudinal and lateral directions of the mat system. See enclosed material specifications.

### **D. Clamps**

Stainless steel clamps shall be used to secure loops of adjoining Cable Concrete® mats. The standard placement of clamps shall be placed on 4' centers interlocking adjoining mats together. See enclosed material specifications.

### **E. Visual Inspection**

After normal fabrication procedures are completed, a visual inspection of the mats will take place. All mats shall be sound and free of defects that would interfere with the proper placing of the mats or impair the strength or performance of the construction. Pin holes on the surface of the mats resulting from entrapped air in the wet cast procedure, surface cracks and any other incidental imperfections from the usual methods of manufacturing including surface chipping from handling the mats on the job site and in shipment and delivery, shall not be deemed grounds for rejection. Cracks exceeding 0.25 inches (.635 cm) in width and/or 1.0 inch (2.54 cm) in depth shall be deemed grounds for rejection. Chipping resulting in a weight loss exceeding 10% of the average weight of the blocks shall be deemed grounds for rejection. Blocks rejected prior to delivery from the point of manufacture shall be replaced at the manufacturer's expense. Blocks rejected at the job site shall be repaired with structural concrete/grout at the expense of the contractor.

### **F. Installation**

Installation equipment shall have a lifting capacity, capable of completely lifting the concrete mat and the lifting bar during unloading, stockpiling and installing etc. Prepared areas shall be graded to a smooth plane finish. Any roots, debris and stones must be removed, and the surface must be re-graded. Intimate contact with the subsurface is critical to the systems performance. The gaps between each mat shall not be greater than 2" (preferably 1"). Gaps greater than 2" must be infilled with concrete. The outside edges of the mat system shall be keyed in at least one block adding stability to the system and also to prevent undercutting.

### **G. Payment**

Payment shall be by the square foot.

### **H. TEST STANDARDS AND SPECIFICATIONS**

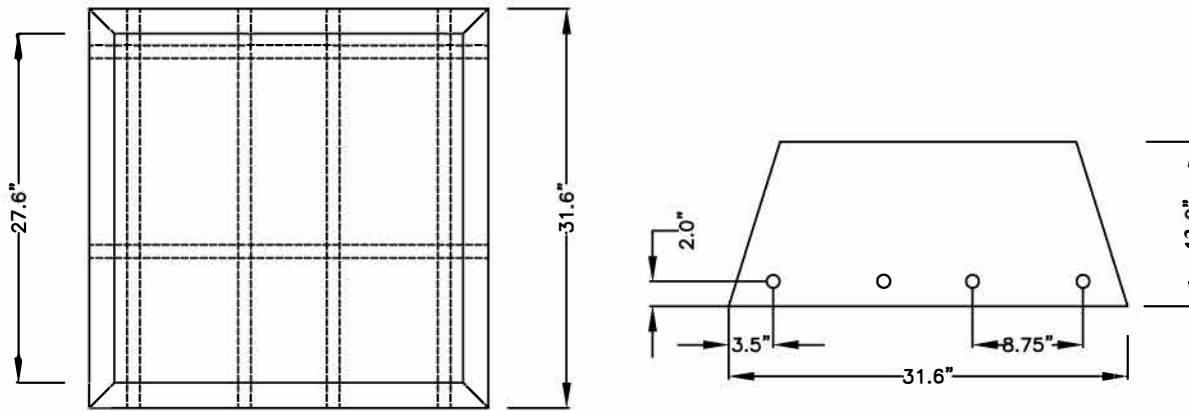
ASTM C31	Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Specifications for Concrete Aggregates
ASTM C39	Compressive Strength of Cylindrical Concrete Specimens
ASTM C42	Obtaining & Testing Drilled Cores and Sawed Beams of Concrete
ASTM C140	Sampling and Test Concrete Masonry Units
ASTM C150	Specification for Portland Cement

<b>ASTM C207</b>	<b>Specification for Hydrated Lime Types</b>
<b>ASTM C595</b>	<b>Specifications for Blended Hydraulic Cements</b>
<b>ASTM C618</b>	<b>Specifications for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.</b>
<b>ASTM D698</b>	<b>Laboratory Compaction Characteristics of Soil Using Standard Effort</b>
<b>ASTM D3786</b>	<b>Hydraulic Burst Strength of Knitted Goods and Nonwoven Fabrics</b>
<b>ASTM D4355</b>	<b>Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water</b>
<b>ASTM D4491</b>	<b>Water Permeability of Geotextiles by Permittivity</b>
<b>ASTM D4533</b>	<b>Trapezoidal Tearing Strength of Geotextiles</b>
<b>ASTM D4632</b>	<b>Breaking Load and Elongation of Geotextiles (Grab Method)</b>
<b>ASTM D4751</b>	<b>Determining Apparent Opening Size of a Geotextile</b>
<b>ASTM D4833</b>	<b>Index Puncture Resistance of Geotextiles, Geomembranes and Related Products</b>
<b>ASTM D5101</b>	<b>Measuring the Soil-Geotextile System Clogging Potential by the Gradient Ratio</b>
<b>ASTM D5567</b>	<b>Hydraulic Conductivity Ratio Testing of Soil/Geotextile Systems</b>
<b>ASTM D6684-18</b>	<b>Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems</b>
<b>ASTM D6684-03</b>	<b>Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems</b>
<b>ASTM D72277-08</b>	<b>Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open Channel Flow</b>
<b>ASTM D7276-16</b>	<b>Standard Guide for Analysis and Interpretation of Test Data for Articulating Concrete Block (ACB) Revetment Systems in Open Channel Flow</b>
<b>AASHTO T88</b>	<b>Determining the Grain-size Distribution of Soil</b>
<b>AASHTO M288-96</b>	<b>Standard Specification for Geotextiles</b>
<b>FHWA-RD-89-199</b>	<b>Standard Testing for Hydraulic Stability of Concrete Revetment System During November 1989 Overtopping Flow</b>
<b>FHWA-RD-88-181</b>	<b>Minimizing Embankment Damage During Overtopping Flow (Replace by FHWA-RD-89-199 in November 1989)</b>

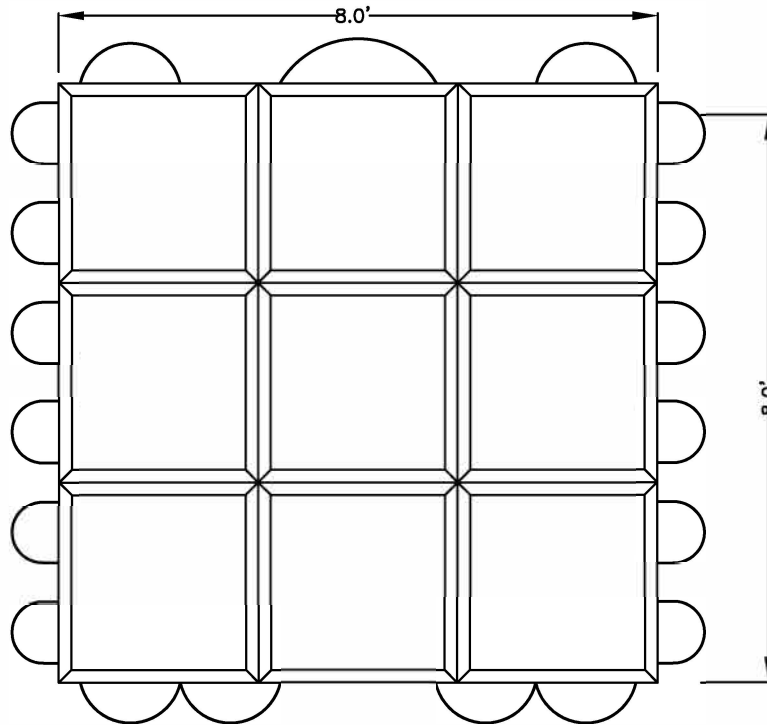


*CC 135 CABLE CONCRETE®*

*MATTRESS SPECIFICATON  
AND DRAWING*



PLAN VIEW



**International Erosion Control Systems**

3030 N. Rocky Point Drive  
 Suite 150, Tampa FL. 33607  
 Phone: 855-768-1420  
 Fax: 855-768-1425

Tracking #	
Customer:	
Project:	

Drawn By:	McCoy Drafting and Design, LLC.
Checked By:	Charlie Chase
Date:	March 1, 2016

**CC-135 CLOSED CELL SHOP DRAWINGS**

Drawing N.T.S.

## CC 135 Mattress Parameters

<b>MAT</b>	<b>AREA</b>	<b>( 8' X 8' ) S/F</b>
	<b>WEIGHT</b>	<b>8,320 lbs. per mat min.</b>
	<b>BLOCKS / MAT</b>	<b>9 blocks per mat</b>
<b>BLOCKS</b>	<b>SPACING @ BASE</b>	<b>0.5"</b>
	<b>SPACING @ TOP</b>	<b>4.5"</b>
	<b>WEIGHT</b>	<b>940 lbs. per block min.</b>
	<b>HEIGHT</b>	<b>12.0"</b>
<b>CABLE</b>	<b>TYPE</b>	<b>Polyester Revetment</b>
	<b>DIAMETER</b>	<b>40mm</b>
	<b>CONSTRUCTION</b>	<b>Diamond Braided</b>
	<b>BREAKING STRENGTH</b>	<b>15,000 lbs.</b>





*CC 135 CABLE CONCRETE®*

*FLEXIBILITY*

## ***FLEXIBILITY***

**Cable Concrete® blocks are interconnected with cable internally woven within the concrete block, allowing downward flexibility of upwards of 90% movement. The unique tapered block design allows for horizontal as well as vertical flexibility.**





*CC 135 CABLE CONCRETE®*

*POLYESTER CABLE DATA*



# ROCKFORD MANUFACTURING COMPANY

TWINES

BRAIDED CORDS

YARNS

## 100% Polyester Cord Engineering Specifications Sheet – 40 MM Revetment January 8, 2016

### Product Description

Diamond braided polyester filament cord braided over a polyester core

### Diameter

1/2" or 0.50" +/- 3%

### Tensile Strength

15000 lbs. to break average.

### Construction

Percentage of total rope by weight:

Cover	28.4 %
Core	71.6 %
Coating	0 %

### Cover

Diamond braid construction, 32-carrier, 5-ply 1000 denier polyester filament per carrier.

### Core

100% Polyester filament.

### Coating

None.

### Yield

10.12 ft/lb.



*CC 135 CABLE CONCRETE®*

*STAINLESS STEEL CLAMP  
DATA SHEET*

# Wire Rope Clips / Stainless

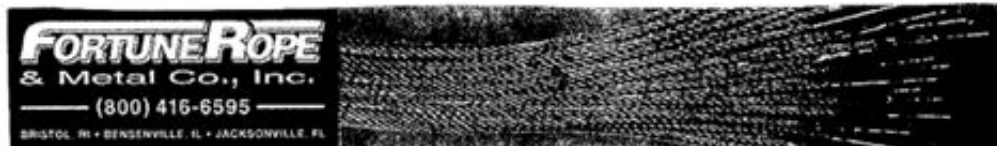
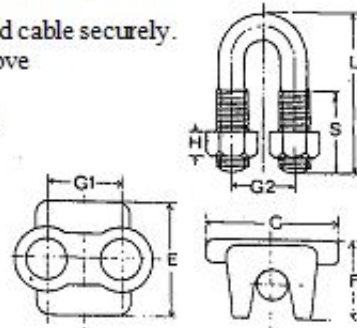
(Available in Type 302 or 316)

## Specifications

To Fit Cable Dia. In.	Cable Dia. MM	C	E	F	G-1 & G-2	H	L	S	Nut Size MM	Weight Per 100 Pcs
1/16-5/64-3/32	2	.55	.55	.44	.28	.094	.71	.39	3	2.2
1/8-5/32	4	.75	.71	.55	.39	.125	.95	.51	4	3.3
3/16-7/32	6	1.1	.87	.71	.55	.197	1.30	.59	6	7.7
1/4-9/32	8	1.38	1.10	.83	.71	.250	1.56	.79	8	17.6
5/16-3/8	10	1.78	1.38	.95	.87	.315	1.97	1.10	10	30.8

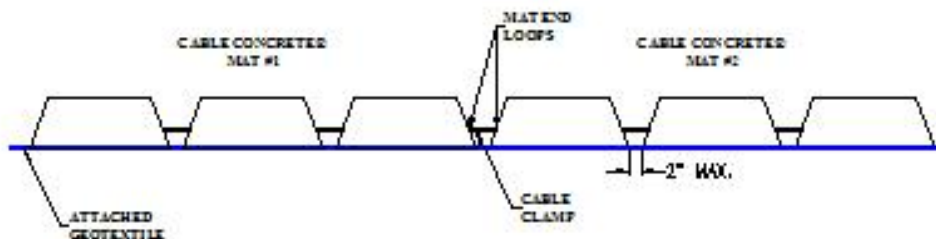
Rugged Stainless Steel Saddles with grooved deep recess to hold cable securely. Stainless Steel U Bolt and Nuts. Use Clips as recommended above (under Malleable Clips) to give maximum strength.

NOTE: THE NUTS ON THESE CLIPS ARE METRIC SIZES.



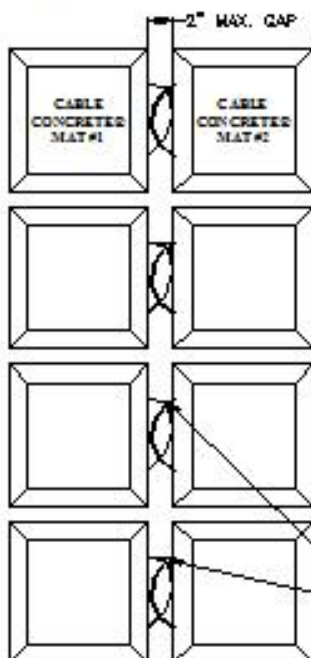
## CABLE CLAMP DETAIL

### PROFILE VIEW

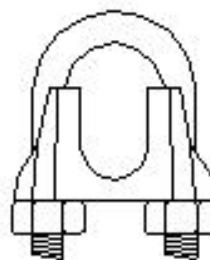


WHEN PLACING THE MATS, THE GAP BETWEEN THE MATS SHOULD NOT BE ANY LARGER THAN A 2" MAXIMUM. IF THE MATS ARE PLACED WITH A LARGER SPACE THAN 2", IT IS RECOMMENDED TO GROUT THE SEAM BETWEEN THE MATS.

### PLAN VIEW



### CABLE CLAMP



NOTE:  
CABLE CLAMPS ARE MADE OF A U-BOLT,  
A COVER SADDLE, AND TWO NUTS.

POSITION CABLE CLAMP AS SNUG TO THE  
BASE OF THE CONCRETE BLOCK BY SLIDING  
CABLE CLAMP DOWN TO THE ADJACENT  
LOOPS, THEN TIGHTEN CLAMP SECURELY.

Drawing N.T.S.



**International Erosion  
Control Systems, Inc.**  
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Tracking #	
Customer:	
Project	

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Date:	December 6, 2010



*CABLE CONCRETE®*  
*BROCHURE*





PIPELINE



SLOPE

# CABLE CONCRETE®

Articulated Concrete Block System

INTERNATIONAL EROSION CONTROL SYSTEMS INC.  
855.768.1420 | [www.iecsusa.com](http://www.iecsusa.com)

DAM OVERTOPPING PROTECTION



BOAT RAMP



BRIDGE SCOUR

# Effective Erosion Control

AFTER



BEFORE  
DIVERSION CHANNEL



# Strong, Reliable & Cost-Effective

**Effective Erosion Control** - As an innovator in the field we have developed a highly effective product to protect against erosion with our Cable Concrete®. With our comprehensive approach to erosion control, we look at not only emergency erosion problems but long term solutions to erosion problems.

## Customers choose us as a leader in Cable Concrete® manufacturing because...

- Our patented technology controls emergency and long-term erosion.
- Our concrete mats can be used for multiple applications.
- Our technology is cost effective and weather resistant.
- We are a leader in our industry.
- We deliver our materials in a timely manner and strive always for customer satisfaction.

## How does it work?

For our Cable Concrete® mat to provide maximum protection, the mat in combination with a needle punched polyester geotextile fabric must pair up.

The geotextile allows moisture in the subsoil to drain, which prevents a buildup of hydraulic pressure beneath the concrete mat.

Subgrade material is kept intact through the weight of the Cable Concrete® and the separating ability of the geotextile layer. This durable and reliable shield protects the subgrade material from intense water velocity and persistent wave action.

In order to provide maximum effectiveness in erosion control the Cable Concrete® must keep uniform pressure on the geotextile and subgrade material at all times. Due to its integrated design Cable Concrete® will easily conform to any surface changes caused by freeze-thaw cycles.

**For the Best in Quality Erosion Control,  
Contact International Erosion Control Systems, Inc.  
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**CABLE  
CONCRETE®**  
Articulated Concrete Block System

# Easy Installation

Cable Concrete® is exceptionally easy to install above or below water level. Since onsite assembly is not required, labor costs are kept to a minimum.

## ✓ SITE PREPARATION

This system can be installed over existing subgrade material with minimal grade preparation.

## ✓ DEPENDABLE STABILITY

If required our Cable Concrete® with its integrated cable allows easy interlocking of multiple mats to form a single strong unit which will cover any impacted area. We recommend clamping for maximum stability.

## ✓ VERSATILITY

Designed to be used wherever erosion occurs, our Cable Concrete® system can be easily adapted and cut to fit smaller areas to conform to irregular shapes or allow for drainage pipes.

## ✓ ANCHORING

Some installations may require anchoring to reinforce stability, to meet those needs, the integrated cable in Cable Concrete® is easily accessible.

## ✓ VEHICLE TRAFFIC

Cable Concrete® was built to take vehicle traffic. Thanks to the integrated cable, weight is distributed throughout the system. This feature means that low water crossings and riverbeds are easily constructed.










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## VEGETATION REGROWTH

The Cable Concrete® system makes allowances for the regrowth of vegetation. For the best results, soil can be back-filled to just below the top of the blocks and reseeded.

# Why Use Cable Concrete®

-  **Quality:** The quality concrete and cable materials that go into creating this erosion control system are what make it such a highly functional, versatile and sustainable product.
-  **Cost effective:** Whether you have a severe or minor erosion problem, our technology offers an affordable solution.
-  **Quality Product:** We use top-notch materials with our Cable Concrete® mats, and it shows in the effectiveness and durability of our product.
-  **Easily Maintained:** Whether vegetated or rock-filled, our cable mats are easy to maintain.
-  **Weather Proof:** Our materials are highly resistant to ice damage and freeze-thaw cycles.
-  **Safety:** Safe for humans to walk or drive on, safe for animals in their natural habitats and safe for the environment. The gaps can be filled with vegetation or stone, which makes it that much more transplantable into the land, thus reducing accidents and hazards.
-  **Removable and Reusable:** Our mats can be removed and reused on future sites.

# Our Concrete Mats Can be Used for Multiple Applications

- **SHORELINE PROTECTION:** Cable Concrete® stabilization increases the shoreline and bank resistance to erosive forces and repairing bank failures to protect valuable development.
- **RIVERBANK PROTECTION:** When erosion caused by high velocity and high water levels erode our riverbanks we offer bank stabilization solutions to protect ecosystems as well as developments.
- **LANDFILL DRAINAGE SYSTEMS:** Using our Cable Concrete® mats contractors can create a permanent channel to direct storm water into settlement basins and other waste areas.
- **LEEVE AND DAM OVERFLOW PROTECTION:** When severe storms strike it endangers the levees and dams on which we depend. Using our patented technology, our Cable Concrete® mats provide protection from erosive forces of flowing water.
- **BOAT RAMPS:** Our mats create a safe, effective and durable structure to service boaters and canoers within a multitude of geographic areas.
- **ACCESS ROADS:** The linked concrete portions within the mat themselves provide erosion resistance during floods and other rainy periods. The sheer size of the mat itself creates stability over a wide swath of land, protecting areas of weakness from long-term erosion that may see the access road's size and stability threatened over time.
- **PIPELINE PROTECTION:** Cable Concrete® is an economical solution for protecting exposed and threatened pipeline disturbances; decreasing the potential for corrosion and physical damage. Inadequate erosion control methods, especially on pipelines constructed in steep, hilly regions creates the potential to introduce large amounts of sediment and silt into streams or wetlands at the base of the slopes.
- **SPILLWAYS:** Cable Concrete® can be easily clamped together to provide one homogeneous erosion protection system, it has become an ideal standard for spillways. With the Cable Concrete® anchored in place with high tensile strength earth anchors, an encompassing model for the spillway can be formed, without risk of erosion or failure that can be attributed to poorly constructed spillways
- **TEMPORARY AND EMERGENCY EROSION CONTROL:** When emergencies strike, rely on our patented technology to stop dangerous erosion and strengthen existing structures and passageways.
- **REEF AND BIOLOGICAL STRUCTURES:** With coquina rock or other materials embedded into the top surface of the units, the mattresses will create an environment conducive to coral reef growth, while reducing damages caused by erosion and coastal storms to shorefront structures.





**OUR MATS - Closed Cell - Cable Concrete® is formed to cover an 8 ft. x 16 ft. - 128 sq. ft. area, our mats are available in 20 to 175lbs/sq. ft. weights as well as Open Cell in 35 and 55 lbs/sq. ft. IECS also offers custom sizing according to the project specifications. This allows you to economically meet the requirements of your particular project.**



**BEFORE**



**AFTER BERM**

## Open Cell Mats

These mats are created with an insert within the pans providing more open area for release of hydrostatic pressures. The open area also allows for additional vegetation. The ability to properly regrow vegetation atop Cable Concrete® makes it perfect for restoring the natural beauty of an area after the system has been put in place. The vegetation that's planted will eventually grow to create even more stability through the roots.

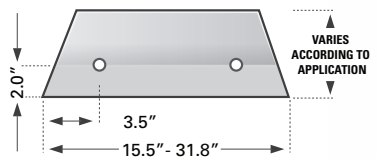
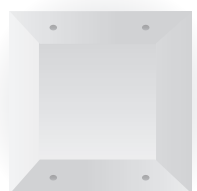
## Superior Flexibility

The integrated design of our Cable Concrete® system assures consistent uniform pressure on the geotextile layer and the subgrade material, providing maximum erosion control effectiveness at all times. It easily conforms and adapts to any surface, regardless of freeze/thaw and other ecological processes.

## Engineering and Testing

**IECS has engineering and testing data showing the industry leading standards in performance and stability of our Cable Concrete®, involving the following:**

- Minimizing Embankment Damage during Overtopping Flow, Federal Highway Administration Report No. FHWA-RD-88-181- November, 1988
- Hydraulic Stability of Articulated Concrete Block Revetment System During Overtopping Flow, Federal Highway Administration Report No. FHWA-RD-89-1988 – November 1989
- Wave Impact Testing and Measurement in accordance with Coastal Engineering Manual, US Army Corps of Engineers Manual EM 1110-110 (as amended up to August, 2008)
- Block wave impact testing was also compared to analytical results generated by Anamos Stability of Block Revetment program developed by Delft Hydraulics (The Netherlands)
- Conforms to HEC-23 & NCMA TEK -11 design guidelines for Articulated Concrete Block



### CABLE CONCRETE® SPECIFICATIONS

CABLE CONCRETE SYSTEM	UNIT HEIGHT (IN)	UNIT WEIGHT (LBS)	UNIT WEIGHT (LBS/SQ.FT.)
CC 20	2.5	38.9	22-25
CC 35	4.5	66.7	37-40
CC 45	5.5	85.3	47-51
CC 50	6.0	96.0	53-57
CC 70	8.5	129.8	73-78
CC 90	8.5	661.3	90-95
CC 135	12.0	940.0	130-140
CC 180	16.0	1252.0	175-185
CC 35 Open	5.5	67.6	37-40
CC 55 Open	8.5	103.1	57-60

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## Memberships & Associations

We are a member of both the Association of State Dam Safety Officials and the International Erosion Control Association.

# Nationwide Services

We recognize that made in America is important; IECS produces our Cable Concrete® mats Nationwide supporting local economy by using local labor forces and suppliers.

- For jobs that require a large quantity of Cable Concrete® mats, we mobilize and produce your mats on site.
- Your tax dollars are reinvested in the local economy.
- We believe in preserving local employment opportunities.
- For three decades International Erosion Control Systems has been an industry leader, provided patented technology and innovative hard armor erosion control solutions to customers
- Cable Concrete® can accommodate quick release overflows that may result in heavy damage to lesser-prepared spillways, which can shift, erode or fail under catastrophic pressure.
- IECS is actually changing the way we deal with erosion by providing a stable, effective and virtually invisible way of dealing with shifting lands and damaging runoff.
- Cable Concrete® mats prevent erosion from occurring because it doesn't allow shifting soil to amass. The blocks are stabilizers and effectively trap soil that might have the potential to erode.
- Our mats conform well to the terrain because the blocks are pyramidal in shape, so they articulate between 20 and 60 degrees, depending on the slope.

**INTERNATIONAL EROSION CONTROL SYSTEMS INC. 3030 N. Rocky Point Drive Suite 150, Tampa FL 33607**  
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