International Erosion Control Systems Inc.
22295 Hoskins Line, Rodney, ON N0L 2C0
Phone: 1-800-821-7462 Fax: 1-866-496-1990
www.iecs.com

Specifications

A. DESCRIPTION

Cable Concrete® is an articulated concrete block revetment system, developed by International Erosion Control Systems, to control various types of erosion due to water, wind, or vehicular traffic.
This system is made up of 2.44m x 4.88m long (8'x16') mats placed side by side and clamped together to provide one homogeneous erosion protection system. Smaller mats are available as required.
The mats consist of concrete blocks interlocked by integrally woven stainless steel cables, which are poured within each block. Geotextile fabric is attached to the base of each concrete mat. The blocks typically have 292.10mm (11.5") square top faces and 393.70mm (15.5") square bottoms. Variations between the mat systems are the block heights and weights.

SYSTEM	Minimum BLOCK WEIGHT		Minimum BLOCK HEIGHT		Open Area %
	kg/sm	***lbs/sf***	***mm***	***inches***	
CC 35	180.65-195.30	37-40	114.3-127.0	4 ½ -5	20
CC 45	229.47-253.88	47-52	139.7-152.4	5 ½ -6	20
CC 70	351.53-380.83	72-78	215.9-228.6	8 ½ -9	20

B. CONCRETE

The concrete shall meet the requirements of CSA A23.1/A23.2 for materials, testing, and methods of construction. The concrete mix shall be designed to meet CSA A23.1 Exposed Class C-2 requirements. The minimum required concrete strength shall be 25 MPA @ 28 days with a minimum of 5-8 % air entrainment throughout.

C. CABLES

The cables shall be made of type 302/304 stainless steel aircraft cable, 1x19 construction. Cables shall be integral (poured into) to the concrete block and shall traverse through each block in both longitudinal and lateral directions, providing a flexible interlocked system.

STAINLESS STEEL CABLE				
System	Lengthwise mm	inches	Widthwise mm	inches
CC35	4	5/32"	4	5/32"
CC45	4	5/32"	4	5/32"
CC70	4.8	3/16"	4.8	3/16"

D. GEOTEXTILE

The standard geotextile material used is a needle punched non-woven fabric which is attached to the underside of the mats. An overlap shall be incorporated on three sides. The overlap provides area for the adjoining mats to be placed upon and prevent undermining of the erosion control system.
It should be noted that when different geotextile weights are used and or when additional overlap area is added to the mat, additional cost adjustments shall be made.

E. CLAMPS

Sufficient malleable or stainless steel cable clamps may be used to connect adjoining Cable Concrete® mats. The standard placement of clamps shall be placed on 1.22m (4') centres connecting adjoining mats together. Clamps are recommended in applications exceeding 3.05m (10') per second.
When placing clamps under existing water, the manufacture will specify a clamp for the condition.

F. ANCHORING

Cable Concrete® mats are designed to take certain velocities in certain slope and bedding situations. This information is founded on engineered flume testing. The data shows maximum limits of the mat system, based on unanchored mats.
Anchoring Cable Concrete® mats offer additional safety to the erosion protection system. If a situation arises where velocities may exceed maximum limits of a system, or if slopes of 1.5:1 or greater are encountered, then anchoring becomes an item to be specified by the governing project engineer.

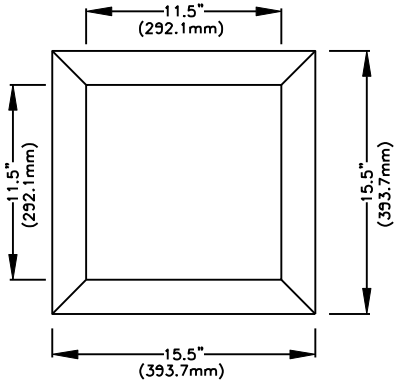
G. INSTALLATION

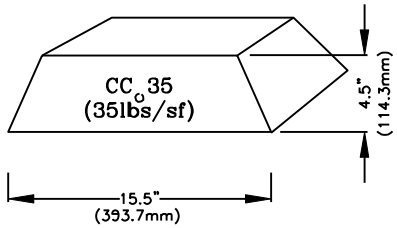
Installation equipment shall have a lifting capacity, capable of completely lifting the concrete mat and the lifting bar during unloading, stockpiling and installing etc.
Prepared areas shall be graded to a smooth plane finish. Any roots, debris and stones must be removed and regarded. Specified geotextile to be placed according to manufacturing. recommendations. There shall not be any dragging, tearing or damaging of the geotextile. The mats shall be laid on the geotextile in such a manner to produce a smooth plane surface.
Intimate contact with the subsurface is critical to the systems performance in the field.
The gap between each mat shall not be greater than 2", preferably 1" or it must be closed using a cement mixture.
It is recommended that after the installation of the mat system, that it be covered with desired backfill. If vegetation is required, the mat system shall be backfilled and seeded. This will allow moisture to traverse back and forth from sub grade to vegetation.
Vegetation will lend support and an even grade for maintenance vehicles (mowers) to traverse over it. Any surface application should not be placed prior to the inspection of the systems clamping and anchoring.

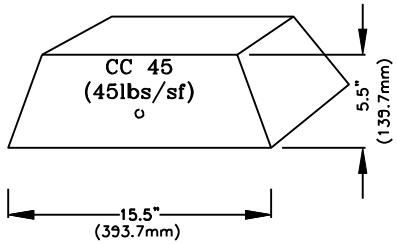
H. PAYMENT

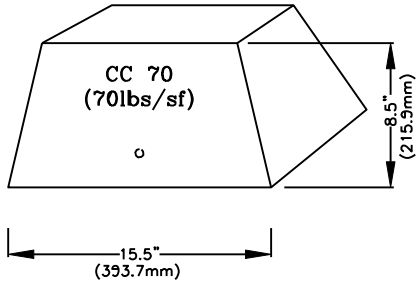
Payment shall be by the square meter and shall include Cable Concrete® mats and manufacturer's recommended geotextile.
Stainless Steel cable clamps, anchors, lifting bar rental and delivery are separate cost items.
Upgrades or additional items shall be considered additional costs

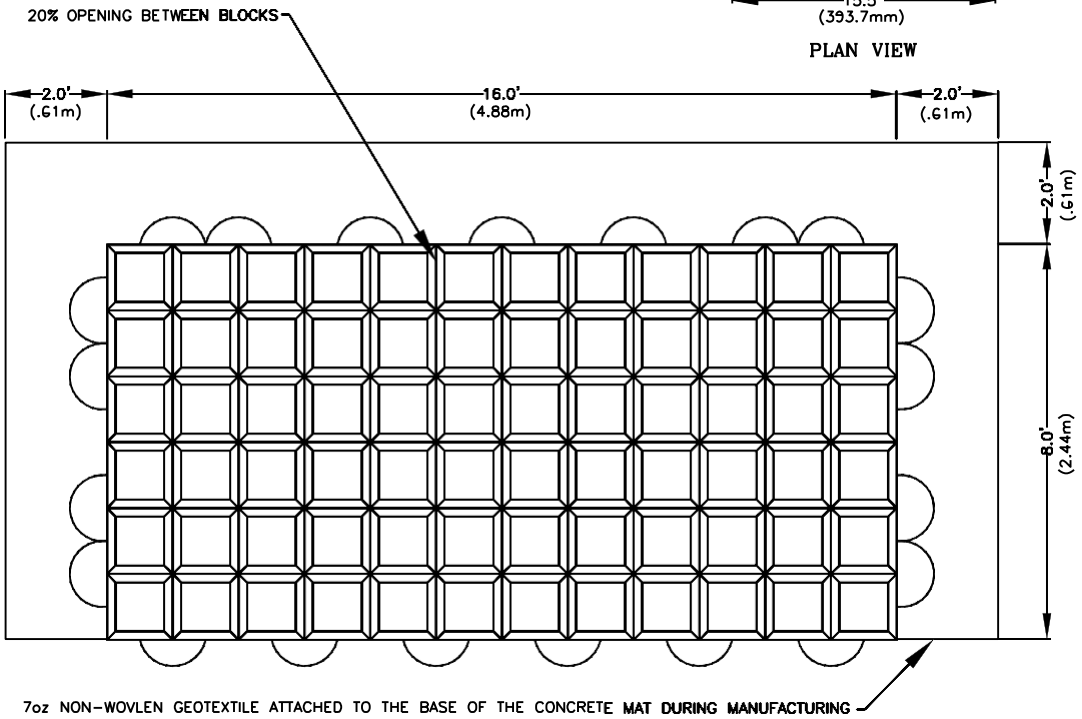
TYPICAL UNIT DEPTHS











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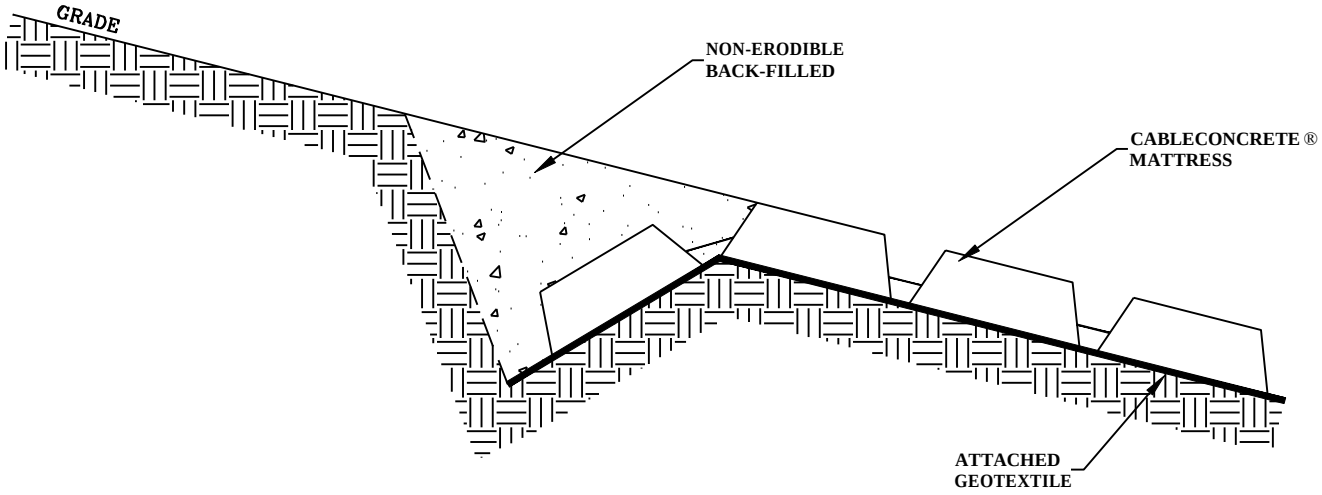
- **Typical Unit Depth** -

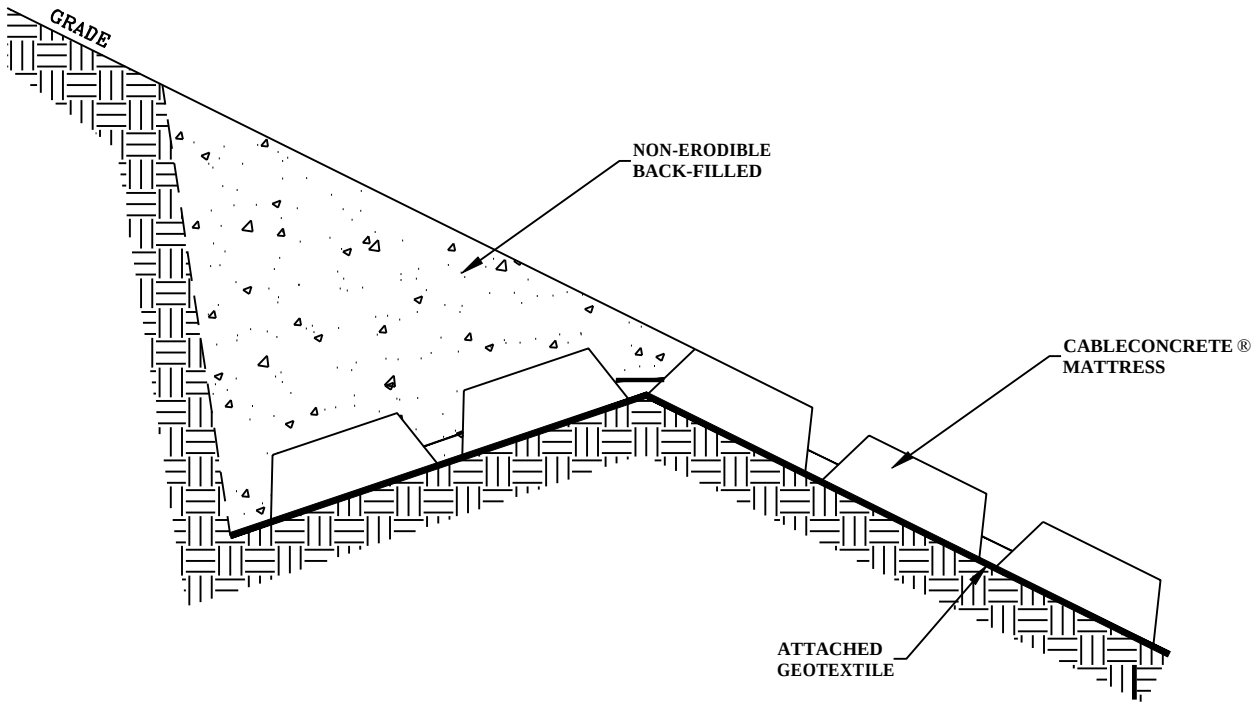
DRAWN BY:	CHECKED BY:	
D. J	L.A	
SCALE: N.T.S	DATE: 10/21/13	SHEET 1 OF 1

KEY IN DETAIL

TOPOFSLOPE
OPTION1



TOPOFSLOPE
OPTION2



DrawingN.T.S.

International Erosion Control Systems Inc.
22295 Hoskins Line, Rodney,
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PH:800-821-7462
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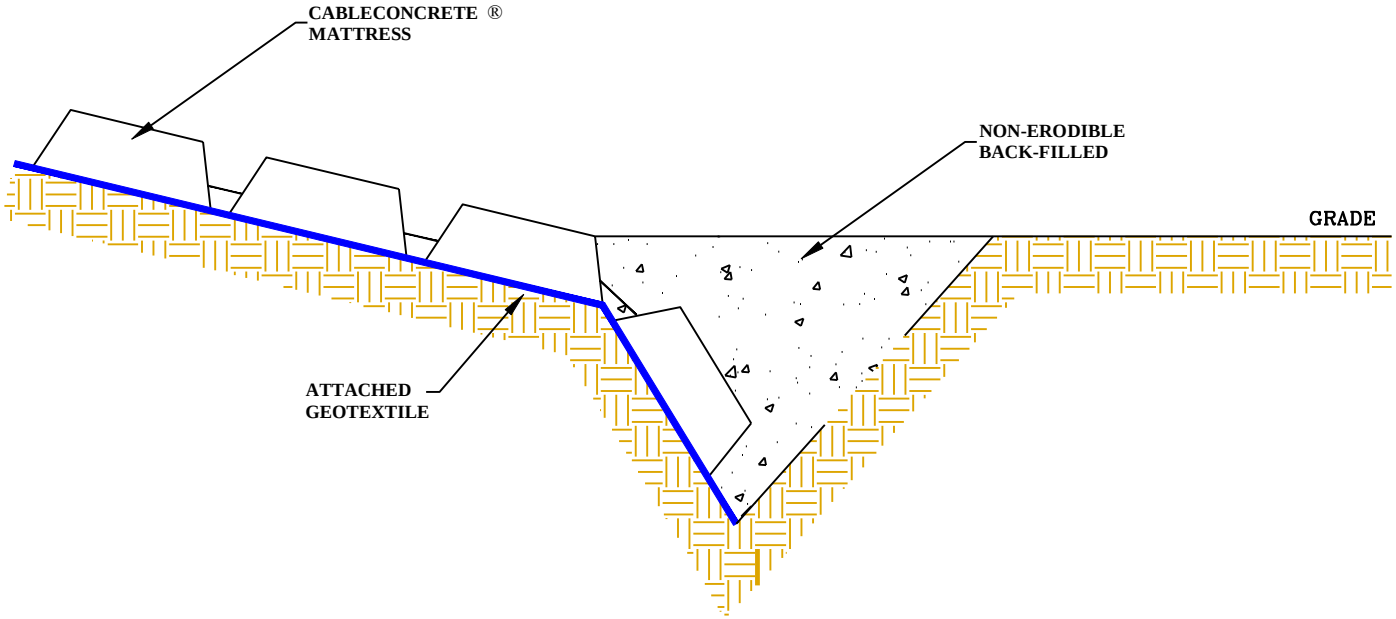
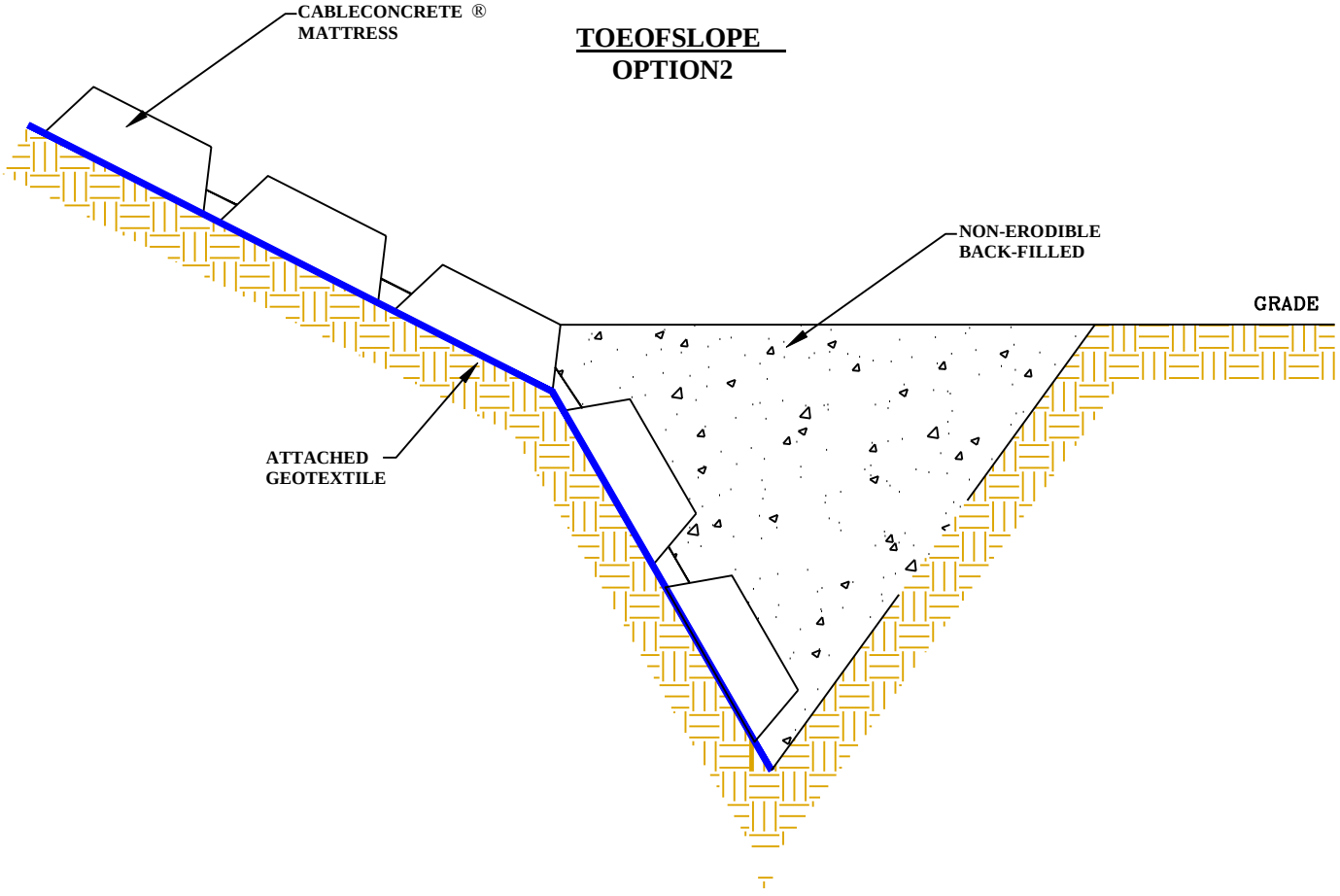
Tracking		DrawnBy:	McCoyDraftingandDesign,LLC.
Customer:		CheckedBy:	CharlieChase
Project:		Date:	December9,2010

TOE IN DETAIL

TOEOFSLOPE
OPTION1



TOEOFSLOPE
OPTION2



Design N.T.S.

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Tracking		DrawnBy:	McCoyDraftingandDesign,LLC.
Customer:		CheckedBy:	CharlieChase
Project:		Date:	December9,2010

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Installation Cost Estimate

When estimating the placement of Cable Concrete® in typical applications, here are some guidelines to follow:

On gentle slopes of 3:1 or less, trackhoe with operator and two labourers to place-
11-13 (1.22m x 4.88m) mats, approximately 60 SM/hr or
8-10 (2.44m x 4.88m) mats, approximately 115 SM/hr.

On slopes of 2:1 to 1.5:1, trackhoe with operator and three labourers to place (the 3rd labourer to unhook the mats from the lifting bar at the top of the slope).
10-12 (1.22m x 4.88m) mats, approximately 50 SM/hr or
7-9 (2.33m x 4.88m) mats, approximately 90 SM/hr.

Allow one labourer to clamp and anchor the placed Cable Concrete® mats. Approximately 1 man/10 min. to drive, set and clamp each anchor, 1 man/3min. per clamp to connect adjoining mats together.

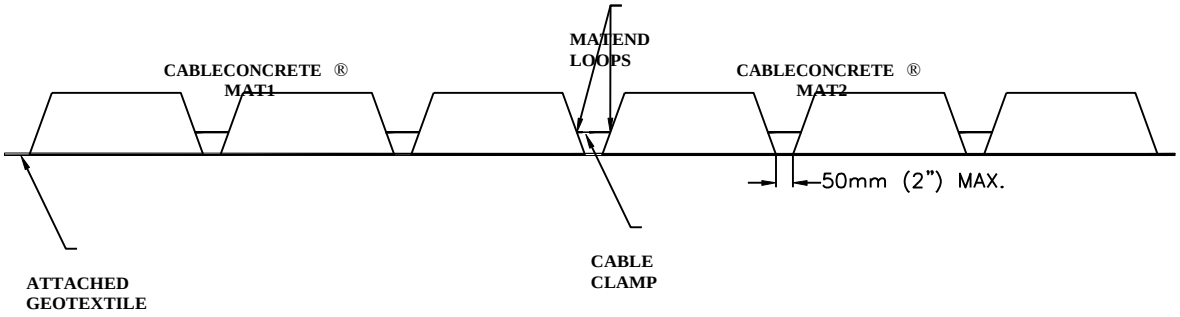
The above estimations are based on placing Cable Concrete® mats on a prepared base.
Use your local machine and labour rates.

Installation equipment shall have a lifting capacity, capable of completely lifting the concrete mats and the lifting bar during unloading, stockpiling, installing etc. Prepared areas shall be graded to a smooth plane finish. Any roots, debris and stones must be removed and re-graded. There shall not be any dragging, tearing or damaging of the geotextile. The mats shall be laid in such a manner to produce a smooth plane surface. Intimate contact with the subsurface is critical to the systems performance in the field. The gaps between each mat shall not be greater than 2", preferably 1", or the gap must be closed using a cement mixture.

It is recommended that after the installation, the mat system be covered with desired backfill. If vegetation is required, the mat system shall be backfilled and seeded. This will allow moisture to traverse back and forth from sub grade to vegetation. Vegetation will lend support and an even grade for maintenance vehicles (mowers) to traverse over it. Any surface application should not be placed prior to the inspection of the systems clamping and anchoring.

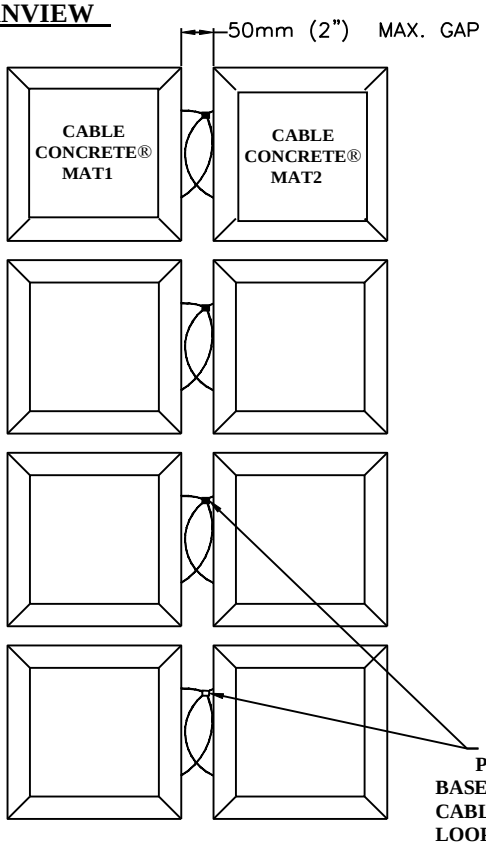
These are recommended guidelines only.

PROFILEVIEW



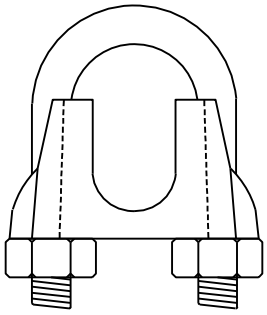
WHENPLACINGTHEMATS,THEGAPBETWEENTHEMATSSHOULDNOTBEANYLARGERTHANA50mm(2") MAXIMUM.IFTHEMATSAREPLACEDWITHALARGERSPACETHAN50mm(2"),ITISRECOMMENDEDTOGROUT THESEAMBETWEENTHEMATS.

PLANVIEW



POSITIONCABLECLAMPASSNUGTOTHE BASEOFTHECONCRETEBLOCKBYSLIDING CABLECLAMPDOWNTOTHEADJACENT LOOPS,THENTIGHTENCLAMPSECURELY.

CABLECLAMP



NOTE:
CABLE CLAMPS ARE MADE OF A U-BOLT, ACOVERSADDLE,ANDTWONUTS.

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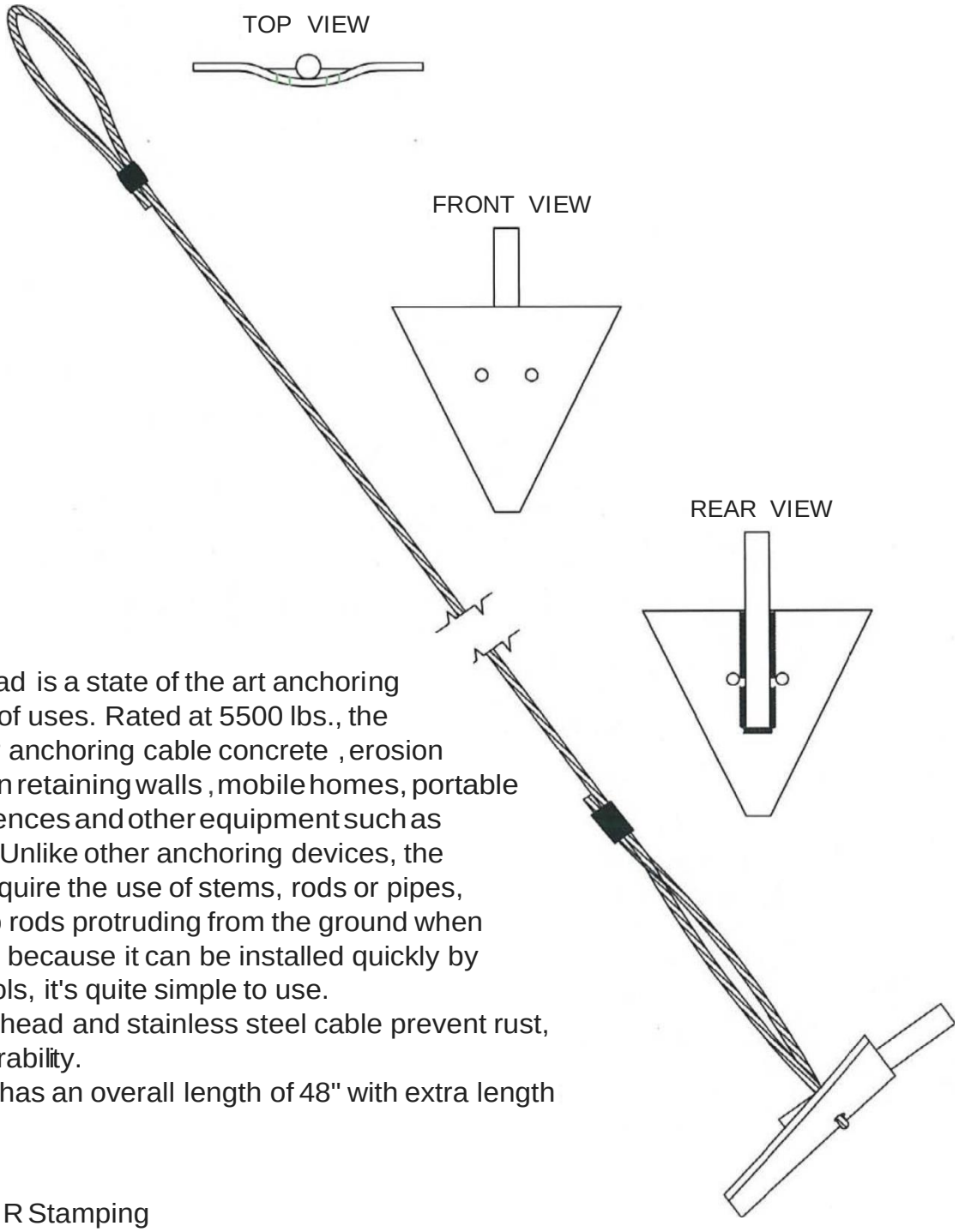
CABLE CLAMP DETAIL		
DRAWN BY: D. JOHNSTON	CHECKED BY: L. ARVAI	
SCALE: N.T.S	DATE: 03/18/13	SHEET 1/1

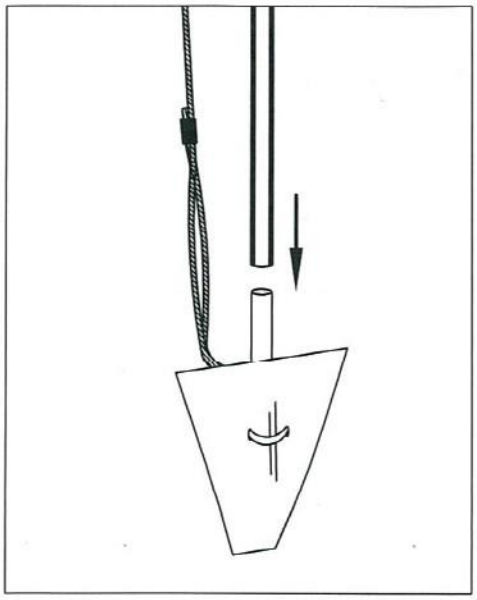
ARROWHEAD
EARTH ANCHORS



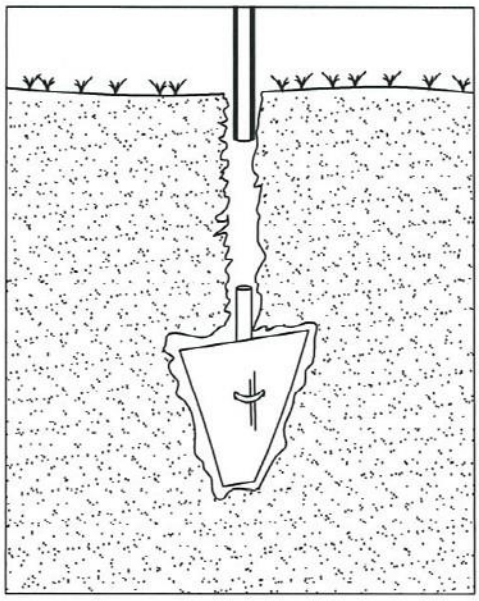
The Chasco Arrowhead is a state of the art anchoring system with a variety of uses. Rated at 5500 lbs., the Arrowhead is ideal for anchoring cable concrete , erosion mats , concrete gabion retaining walls , mobile homes, portable classrooms, sheds , fences and other equipment such as oil tanks and towers. Unlike other anchoring devices, the Arrowhead doesn't require the use of stems, rods or pipes, therefore there are no rods protruding from the ground when the anchor is set. And because it can be installed quickly by means of common tools, it's quite simple to use.
The galvanized Arrowhead and stainless steel cable prevent rust, giving it increased durability.
The standard anchor has an overall length of 48" with extra length supplied as required.

Manufactured by B & R Stamping
Oakville , Ontario
905-847-5294

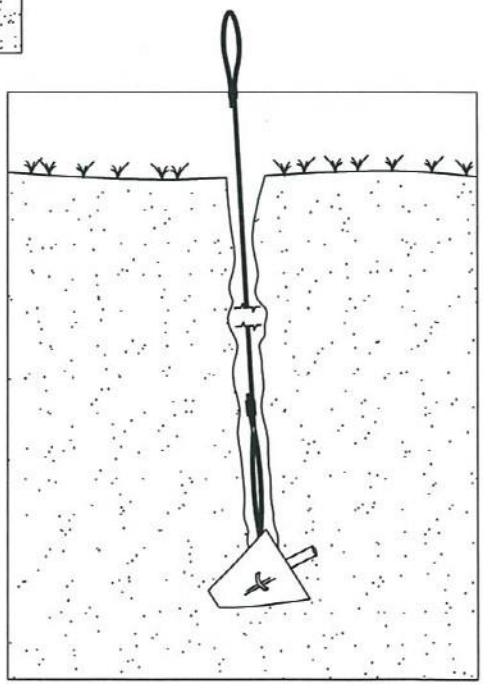
NOT TO SCALE



CABLE IS ATTACHED AND CRIMPED.
DRIVE ROD IS HALF INCH BLACK
IRON PIPE - 4 FEET LONG



DRIVE ANCHOR MINIMUM OF 1 METER INTO UNDISTURBED SOILS CAPABLE OF HOLDING SPECIFIED ANCHOR STRENGTH



ANCHOR MUST BE PULLED UP INTO PLANED / LOCKED POSITION

NOT TO SCALE

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ANALYSIS SHEET

Date:	
Project Name:	
Project Location:	
Engineer:	

OPEN CHANNEL OR FLOW APPLICATION **Imperial** **Metric**

Maximum Expected Flow, ***(cfs)***		
Maximum Expected Velocity, (fps)		
Channel Bed Slope ***(%)***		
Channel Side Slope ***(Ratio)***		
Type of Flow *–normal, overtopping, sub critical, hydraulic jump, impinging, bridge/culvert, undulating Transcritical*		
Bed Width, ***(ft.) bottom***		
Alignment-*straight, moderate, severe, extreme*		
Radius at the Crest (ft.)		
Channel/Chute Length, (ft.)		
Channel Depth, (ft.)		
Top Width of Channel (ft.)		
Outlet Source (ie: river, manhole)		
Soil Type and Related Conditions		

SHORELINE APPLICATION

Bank Slope		
Water Depth of Protection, (ft.)		
Wave Height, (ft.)		
Wave Lengths, (ft.)		
Soil Type and Related Conditions		