



SUBMITTAL PACKAGE FOR

CABLE CONCRETE

OPEN CELL



**INTERNATIONAL
EROSION CONTROL
SYSTEMS**



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CABLE CONCRETE SPECIFICATIONS
ORIGINAL BLOCK - OPEN CELL

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 shall be made up of 4' x 16' and 8' x 16' 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 interconnected by integrally woven stainless steel cables, which are poured within each block. The size of the concrete blocks shall be 15.5" square at the base and 11.5" square at the top face (a truncated pyramid shape). The blocks shall be poured with a round insert in the block pans, to provide open area within the block to release hydrostatic pressures and grow additional vegetation. The only variations between the two different mat systems are the block heights and weights.

Table 1

General:		<u>CC35 OC</u>	<u>CC55 OC</u>
	Weight (lbs/sf)	37	57
	Block Height	5.5"	8.5"
Cable:			
	Longitudinal:	5/32"	3/16"
	Transverse:	5/32"	5/32"
Rope:			
	Longitudinal :	28mm	28mm
	Transverse:	28mm	28mm

B. Concrete

The minimum required concrete strength should be 4000 PSI @ 28 days. Air entrainment of 4% to 7% shall also be added. All ASTM standards will be met in the production of the concrete. The finished concrete product shall consist of a minimum density of 140lbs/sf, in an average of 3 units. No individual block shall consist of a minimum concrete density lower than 135 lbs/sf.

C. Cables

The cables shall be made of stainless steel aircraft cable of type 302 or 304, depending on the specific use and conditions of the project. The cable shall be of type 1 x 19 construction. Cables shall be integral (poured into) to the concrete block, and shall traverse through each block in both longitudinal & lateral directions of the mat system. Polyester rope may be substituted for stainless steel cable in design, but UV degradation protection must be maintained. The rope mats must be covered with rock or topsoil and vegetated. This cover will provide UV degradation protection. A channel with no soil or vegetation cover will not be acceptable for polyester rope.

D. Geotextile

The geotextile used is to be specified by the governing project engineer. The standard geotextile material used on non-specific projects is an 8-oz, needle punched non-woven fabric. The geotextile must be placed prior to placement of concrete block mats. The geotextile shall be installed according to the geotextile manufacturer's recommendations.

It should be noted that when different geotextile weights are used additional costs would adjust the price per unit.

E. Clamps

Sufficient stainless steel wire rope clamps shall be used to secure loops of adjoining Cable Concrete mats.

The number of loop connections is based on project specifics, and may be shown in the shop drawings or in the typical detail sheets (or see the Guide for the Design and Placement of Cable Concrete Mats). Clamping in field must follow project layout details to be acceptable. Details available showing the proper method of clamping.

F. Anchoring

Cable Concrete mats are designed to take 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 offers additional safety to the erosion protection system. But, if a situation arises where velocities exceed maximum limits of a mat system, or if slopes of 1.5 to 1 or greater are encountered, then anchoring becomes an item to be specified by the governing project engineer. See detail sheets of rule-of-thumb procedures when considering anchoring.

G. Installation

The supplier shall have a technician experienced in the installation of the Cable Concrete System available at the start of an installation where the engineer or contractor have not had experience with the product to assist in any special techniques needed to assure a proper installation.

The mats shall be laid from the downstream end of project to the upstream end, so the geotextile joints are shingled to direct flow over the joint and to prevent undermining. 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 grout mixture. The outside edges of the mat shall be entrenched and buried at least one block into the ground. Compacted granular fill or grout may be used to fill the entrenched edges.

It is recommended that after the installation of the mat system, that the mat system be covered with black dirt and seeded with vegetation (grasses). The mat system will allow moisture to traverse back and forth from sub grade to vegetation. The mat system 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 will be by the square foot, the clamps, anchors, and geotextile are separate cost item. Upgrades or additional items to what is called for on a project shall be considered additional costs. Anchors are separate and are an additional cost to the system.

I. 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
ASTM C207	Specification for Hydrated Lime Types
ASTM C595	Specifications for Blended Hydraulic Cements
ASTM C618	Specifications for Fly Ash and Raw or Calcined Natural Pozzolans for use in Portland Cement Concrete.
ASTM D18.25.04	Specifications for Articulated Concrete Block Systems (In design)
ASTM D698	Laboratory Compaction Characteristics of Soil Using Standard Effort
ASTM D3786	Hydraulic Burst Strength of Knitted Goods and Non-woven Fabrics
ASTM D4355	Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water
ASTM D4491	Water Permeability of Geotextiles by Permittivity
ASTM D4533	Trapezoidal Tearing Strength of Geotextiles

ASTM D4632	Breaking Load and Elongation of Geotextiles (Grab Method)
ASTM D4751	Determining Apparent Opening Size of a Geotextile
ASTM D4833	Index Puncture Resistance of Geotextiles, Geomembranes and Related Products
ASTM D5101	Measuring the Soil-Geotextiles System Clogging Potential by the Gradient Ratio
ASTM D5567	Hydraulic Conductivity Ratio Testing of Soil/Geotextile Systems
AASHTO T88	Determining the Grain-size Distribution of Soil
AASHTO M288-96	Standard Specification for Geotextiles

CABLE CONCRETE BLOCK SPECIFICATIONS ORIGINAL BLOCK – OPEN CELL

CC 35 OC
37 LBS. / S.F

MAT	AREA	96 S.F.	
	WEIGHT	3,552 LBS.	
	BLOCKS/MAT	54	
BLOCKS	SPACING @ BASE	0.5 IN	
	SPACING @ TOP	4.5 IN.	
	WEIGHT	66 LBS	
	HEIGHT	5.5"	
CABLE		LENGTH	WIDTH
	DIAMETER	5/32 IN.	5/32 IN.
	CONSTRUCTION	1 X 19	1 X 19
	BREAKING STRENGTH	3300 LBS.	3300 LBS.
OPEN AREA		20.3%	

- ① - STAINLESS STEEL CABLE IS USED TO CONNECT THE CONCRETE BLOCKS WITHIN THE MAT. SEE PROJECT SPECIFICATIONS.
- ② - GEOTEXTILE MATERIAL MANUFACTURED ON THE BASE OF THE CONCRETE MAT SYSTEM.