SPECIFICATIONS
FOR

CHANNEL LOCK II®

Class 450
FLEXIBLE REVETMENT SYSTEM

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FOR
EROSION CONTROL

PART 1 - GENERAL

1.1 SCOPE OF WORK:

This item consists of furnishing and installing an interlocking flexible revetment system (cellular concrete blocks) in accordance with the lines, grades, design and dimensions shown on the plan and drawings and specified herein.

1.2 REFERENCES:

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designations only.

American Society for Testing and Materials (ASTM) Publications.

ASTM C 33-97	Concrete Aggregates
ASTM C 140-91	Sampling and Testing Concrete Masonry Units
ASTM D-7277	Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open Channel Flow
ASTM D-7276	Standard Guide for Analysis and Interpretation of Test Data for Articulating Concrete Block (ACB) Revetment Systems in Open Channel Flow.

US Federal Highway Administration (FHWA) and US Bureau of Reclamation (USBR)

FHWA RD-89-199	Hydraulic Stability of Articulated Concrete Block Revetment Systems During Overtopping Flow

1.3 DELIVERY, STORAGE AND HANDLING OF MATERIALS:

Materials delivered to the site shall be inspected for damage, unloaded and stored with the minimum of handling. Contractor may designate a storage site at the project for materials to be delivered and stored prior to placement if needed. Storage site to be approved by the Contracting Officer. Materials shall not be stored directly on the ground and shall be kept free of dirt and debris. Materials shall be so handled as to ensure delivery to the site in sound undamaged condition. Synthetic geotextiles that are not to be installed immediately shall be protected from the direct sunlight and in accordance with the applicable portions of the SECTION entitled GEOTEXTILES.

1.4 MEASUREMENT:

Unit of measurement for the cellular concrete blocks shall be by the square feet of surface area satisfactorily covered with the cellular concrete blocks.

1.5 PAYMENT:

Unit of payment for acceptable cellular concrete blocks placed will be made at the contract unit price per square foot for “cellular concrete blocks”, which price shall include costs of furnishing, hauling and placing the cellular concrete blocks.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA:

The interlocking flexible revetment system shall be as described herein known as Channel Lock II, or an approved equal design by the engineer. Hydraulic test data and block performance according to FHWA-RD-89-199 will be required to be submitted for approval by the Contracting Officer. The 4.5" concrete blocks shall be a minimum of 38 lbs. PSF (per square foot), shall withstand water velocity of 26.1 FPS and have a critical shear stress value of 31.8 lbs. PSF (at 0 Horizontal). The ACB System shall have been tested on a 2H:1V slope, direction of flow, according to ASTM D-7277 and shall have the following minimum properties:.

Surface Void Ratio	20%
Drainage Correction Factor	22.0%
Critical Velocity – FPS	26.1 ft/sec
Critical Shear Stress – Lbs/Ft^2	31.8 Lbs.
Weight per Block, Minimum	60 Lbs
Curvature Radius	3 feet
Block Thickness:	4.50"

2.2 CELLULAR CONCRETE BLOCKS:

The cellular concrete blocks shall be octagonal shaped with interlocking components four directional within a 15" module. Each component shall resist horizontal movement when interlocked into adjacent blocks. (Interlock is hereby defined as the inability to pull apart or separate when one component is placed in conjunction with another component). The assembled blocks shall be the open-cell type to allow for re-vegetation.

2.21 Concrete Materials:

The compressive strength of the concrete shall be a minimum of 4000 PSI at 28 days. The core compressive strength shall not be less than the minimum and test cores shall be tested at the engineer's option. Test procedures shall be in accordance with ASTM C 140-91. Cores failing to meet the minimum compressive strength requirements shall be cause for rejection of the represented lot by the engineer.

2.22 Aggregate:

The aggregate shall meet the requirements of ASTM C 33-97, except for grading. Aggregate grading shall be reasonably consistent and shall be well-graded from the maximum size which can be conveniently handled with available equipment

2.3 FILTER FABRIC:

The filter fabric used for cellular concrete blocks shall be in accordance with the SECTION entitled GEOTEXTILES.

PART 3 - EXECUTION

3.1 FOUNDATION PREPARATION:

Areas on which filter fabric and cellular concrete blocks are to be placed shall be constructed to the lines and grades shown. The subgrade for the cellular concrete blocks shall be free of voids, pits and depressions. Voids, pits and depressions shall be brought to grade by backfilling in accordance with the applicable portions of the SECTION entitled STRIPPING, EXCAVATION, FILLING and BACKFILLING. Obstructions, such as roots and projecting stones larger than 1 inch remaining on the surface, shall be removed and the soft or low density pockets of material removed shall be filled with selected material and compacted to a minimum of 90% proctor density.

3.12 Perimeter:

Excavation and preparation for anchor trenches, side trenches, toe trenches and aprons shall be done in accordance to the lines, grades and dimensions shown on the plans.

2.41 Inspection:

Immediately prior to placing the filter fabric and cellular concrete blocks, the prepared area shall be inspected by the Contractor and approved before the fabric or blocks are placed thereon.

3.2 INSTALLATION OF CELLULAR CONCRETE BLOCKS:

3.21 Filter Fabric:

Placement of filter fabric shall be installed in accordance with the SECTION entitled GEOTEXTILES and as stated herein.

3.22 Placement of Cellular Concrete Blocks:

Cellular Concrete Blocks shall be installed in accordance with ASTM D-6884. Block installer must have a minimum of five (5) years experience installing ACB Systems and have installed at least 1Million square feet within the past five (5) years for the block system being submitted for approval. In addition Cellular concrete blocks shall be placed within the limits shown. The blocks shall be interlocked in a manner which discourages any vertical displacement or horizontal movement. The cellular concrete blocks shall be placed on the filter fabric in such a manner as to produce a level surface. No more than 200 linear feet of filter fabric shall be laid before covered with concrete blocks. Fabric installed more than two (2) days not covered by blocks shall be lifted and the surface of the slope inspected for slope defects. The Contracting Officer will require uncovered fabric to be lifted after heavy rainfall to inspect for slope damage. The manufacturer, Contractor and Client shall discuss subgrade preparation, geotextile and cellular block placement at the pre-construction meeting to ensure that all parties are aware of the issues regarding installation. The manufacturer of the cellular concrete blocks shall be present during the first week of block placement to assist the Contractor. The Contractor shall furnish a certificate from the manufacturer or an authorized representative thereof stating that the blocks were installed correctly. Final acceptance and approval of the installation will be made by the Contracting Officer.

3.23 Quality Control:

Equipment shall not be allowed on the installed concrete blocks until topsoil is placed over the revetment system to refrain from breaking or damaging any blocks.

3.3 FINISHING:

3.41 The voids of the cellular concrete blocks for the limits shown shall be filled with topsoil, seed and fertilizer in accordance with the SECTION entitled TURF. At no time shall more than 200 lineal feet of blocks be exposed unturfed. Prior to turf placement, the blocks surface shall be inspected for damage. Individual blocks which are cracked and reduce the individual block weight to 1/3 shall be replaced prior to the placement of turf.

3.4 CONTRACTOR QUALITY CONTROL:

The Contractor shall inspect for compliance with contract requirements and record the inspection of operations including but not limited to the following as applicable:

(1) Preparation of surface to receive cellular concrete blocks or mattresses
(2) Individual concrete blocks and filter fabric soundness and free of defects
(3) Assembly of cellular concrete blocks and filter fabric on the prepared subgrade