

Construction Specification 65—Articulating Concrete Block Revetment System

1. Scope

The work consists of furnishing and installing an articulating concrete block (ACB) revetment system in accordance with the drawings and as specified herein.

2. Material

Articulating Concrete Blocks (ACBs)—ACBs including blocks, cables, and fittings must conform to ASTM D6684, Standard Specification for Materials and Manufacture of Articulating Concrete Block (ACB) Revetment Systems.

When specified in section 7, ACBs must be tested for freeze/thaw durability according to ASTM C666/C666M, Test Method for Resistance of Concrete to Rapid Freezing and Thawing or ASTM C1262, Test Method for Evaluating the Freeze-Thaw Durability of Dry-Cast Segmental Retaining Wall Units and Related Concrete Units, as applicable. Freeze-thaw durability must be based on tests, conducted not more than 24 months prior to delivery of units made with the same materials, mix proportioning, manufacturing process, and curing method as the blocks installed under this specification. Representative specimens must comply with either of the following: (1) the weight loss of each of five test specimens at the conclusion of 100 cycles must not exceed 1 percent of its initial weight or (2) the weight loss of each of four of the five test specimens at the conclusion of 150 cycles must not exceed 1.5 percent of its initial weight.

ACBs must be tested according to ASTM D7277, Standard Test Method for Performance Testing of Articulating Concrete Block (ACB) Revetment Systems for Hydraulic Stability in Open Channel Flow and meet the physical and performance properties specified in section 7. Conduct the performance test using the same size and shape of block as the blocks installed under this specification with the density of the tested blocks being equal to or less than that installed under this specification.

Bedding or filter material—Bedding or filter material must meet the gradation stated on the drawings or in section 7 and conform to Material Specification 521, Aggregates for Drainfill and Filters.

Concrete or grout—Concrete or grout for filling voids must conform to Construction Specification 31, Concrete for Major Structures or Construction Specification 32, Structure Concrete as specified.

Geogrid—Biaxial geogrid must meet the requirements in section 7. Geogrid must be supplied separate from and not affixed to the blocks or mattresses.

Geotextile—Geotextile must meet the requirements in section 7 and Material Specification 592, Geotextile. Geotextile must be supplied separate from and not affixed to the blocks or mattresses.

3. Submittals

At least 14 days prior to delivery of materials, provide material submittals to the engineer that verify that all materials to be incorporated into the work conform to this specification.

At least 2 days prior to manufacturing the ACBs, submit a schedule showing anticipated production start and stop times for the manufacture of ACBs that will be incorporated into the work specified herein. Provide the manufacturing location and manufacturing facility contact information. Include the same information for the concrete production facility if different from the ACB manufacturing facility.

At least 7 days prior to the start of any installation of the ACB revetment system, submit to the engineer shop drawings for the layout and details including layout sequence and details of joining and anchoring blocks or mats.

Prior to delivery, submit ACB concrete compressive strength test results to verify the strength at the time of delivery will meet or exceed the strength required by ASTM D6684.

4. Subgrade preparation

Subgrade preparation includes excavation, earthfill, installation of bedding or filter material, and geotextile installation. Prepare the subgrade in accordance with ASTM D6884, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems.

Compact the subgrade to the density specified on the drawings or in section 7. Earthfill necessary to prepare the subgrade must be of the type and class specified on the drawings or in section 7. Complete the subgrade to within plus or minus a half inch of the grade shown on the drawings.

Compact bedding or filter material to the density specified on the drawings or in section 7. Grade the surface to within plus or minus a quarter inch of the grade shown on the drawings.

Do not place ACBs, bedding, or geotextiles until the subgrade preparation is completed and inspected by the engineer.

5. Installation

Install the system according to ASTM D6884.

Cover geotextile with filter material or other specified product the same day it is placed.

Unless specified in section 7, individual blocks must not protrude more than a half inch above the plane of the finished system.

If assembled and placed as large mats, a spreader bar must be used to evenly distribute the load between lifting points. The spreader bar must provide full width support at each end of the mat.

If lacing and anchoring the mats is required by the manufacturer or specified in section 7 of this specification, lace or anchor mats prior to filling or grouting.

Fill the open area of the ACB system with soil or granular material specified on the drawings or in section 7 before the occurrence of any rainfall runoff or other event that may damage or contaminate the subgrade. The open area must be filled within 3 days after the revetment has been installed. If the subgrade (including the earth, geotextile, filter or bedding) is damaged or contaminated, remove and replace the damaged or contaminated portion. Remove or replace the damaged or contaminated portion a minimum of one foot laterally beyond the damaged or contaminated area to ensure complete removal and replacement of all damaged or contaminated subgrade.

6. Measurement and payment

For items of work for which specific unit prices are established in the contract, the area of coverage is measured and computed to the nearest square yard based on slope distances.

Method 1—Payment for the ACBs is made at the contract unit price for the blocks, cables, and fittings. Such payment is considered full compensation for all labor, material, equipment, and all other items necessary and incidental to completion of the work.

Method 2—Payment for the ACB revetment system is made at the contract unit price for the blocks, cables, and fittings and includes, as applicable, payment for concrete, grout, bedding material, geogrid, and geotextile. Such payment is considered full compensation for all labor, material, equipment, and all other items necessary and incidental to the completion of the work.

Method 3—Payment for the ACB revetment system is made at the contract unit price for the blocks, cables, and fittings and includes, as applicable, payment for excavation, earthfill, concrete, grout, bedding material, geogrid, and geotextile. Such payment is considered full compensation for all labor, material, equipment, and all other items necessary and incidental to the completion of the work.

All methods—The following provisions apply to all methods of measurement and payment. Unless otherwise specified in section 7, no deduction in coverage area is made for any void or embedded item (e.g. a pipe passing

through the revetment system). Compensation for any item of work described in the contract but not listed in the bid schedule is included in the payment for the item of work to which it is made subsidiary. Each item and the items to which they are made subsidiary are identified in section 7 of this specification.

7. Items of work and construction details

