

Instruction for use**Construction Specification 65—Articulating Concrete Block Revetment System****1. Applicability**

Construction Specification 65 is applicable to articulating concrete block revetment systems used primarily for controlling erosion. The system includes the blocks and a geotextile. The system may also include a granular drainage layer and a geogrid.

Installation is specified to conform to ASTM D6884, Standard Practice for Installation of Articulating Concrete Block (ACB) Revetment Systems. D6884 includes options to be specified by the designer. Construction Specification 65 addresses these items and additional items which may be desired for some NRCS applications.

2. Construction Specifications

Construction Specification 21, Excavation, may be needed if there is a substantial amount of excavation required.

Construction Specification 23, Earthfill, may be needed if there is a substantial amount of earthfill required.

Construction Specification 31, Concrete for Major Structures, or Construction Specification 32, Structure Concrete, should accompany Construction Specification 65 whenever concrete or grout will be used to fill seams and other voids.

Compaction control and accurate shaping and fine grading of the subgrade is needed so that the components (i.e. geotextile, crushed stone or gravel where applicable, geogrid where applicable, and concrete blocks) remain in intimate contact with each other. Thus, a high degree of quality control is required. Include Construction Specification 94, Contractor Quality Control, with Construction Specification 65. Specify Method 2 for the contractor's quality control system and personnel.

3. Material specifications

Material Specification 521, Aggregates for Drainfill and Filters, and Material Specification 592, Geotextile, complement Construction Specification 65.

4. Included items

Include the following in contract specifications and drawings:

- a. Complete engineering detail drawings of the articulating concrete block revetment system installation showing location of the system, beginning and ending stations relative to the axis of the system, line and grade of the installed system, limits of excavation and earthfill, details of termination trenches, details of how changes in grade are treated (typically by concreting or grouting if there is a seam at the grade change), and any other details needed to completely and accurately describe the work. Ensure access and work limits are adequate to deliver and store materials and to convey the materials to the point of installation.
- b. In section 2, Materials, specify:
 - Freeze/thaw durability tests if the system will be subjected to moderate, severe, or very severe freezing and thawing as defined in ACI 318, Building Code Requirements for Structural Concrete.
 - The physical and performance properties necessary for the system to function as intended. Specify the block dimensions, percent open area, block weight when submerged in water, Manning's n -value of the blocks and any other physical properties the designer deems important to the function of the system. Specify critical shear stress at horizontal based on tested data, peak tested velocity, tested bed slope, and other performance properties the designer deems important to the system function.
 - The gradation of bedding or filter material if bedding or filter material is used.
 - The maximum opening size of geogrid (typically sized for filter compatibility with bedding or filter material) if geogrid is used.
 - If deemed important, the minimum tensile strength of geogrid.

- The class of geotextile (class I, II, III, or IV) and the type (woven or nonwoven). (See Design Note 24.)
 - The range of apparent opening size (AOS) for woven geotextiles. Any increase or change from those parameters shown in Material Specification 592 tables 1 and 2 that are desired and based on specific design data. The minimum permittivity and the maximum apparent opening size (AOS). The specifier may choose to not specify these values, in which case, the default values in MS 592 tables 1 and 2 will govern. (Note that in many cases, the default values in tables 1 and 2 are overly restrictive.)
 - Lapped or sewn geotextile panel joining. ASTM D6884 includes specific requirements for joining by lapping or sewing, but the specifier must specify whether laps or sewing will be required.
 - For sewn joining, specify the required seam strength per ASTM D4884.
 - Geotextile anchorage or pinning details if applicable.
 - Additional special installation requirements if there are any.
- c. In section 4, Subgrade preparation, specify the minimum density of the subgrade and, where applicable, the bedding or filter material. Specify the type and class of earthfill required to prepare the subgrade. Refer to Construction Specification 23, Earthfill, as applicable.
- d. In section 5, Installation, specify the maximum block protrusion if less than ½-inch protrusion is desired. Specify the soil or granular material required to fill the open areas in the ACB system.
- e. In section 5, specify if lacing or anchoring of mats is required.

Method 1 is intended whenever excavation, earthfill, concrete, grout, bedding material, geogrid, and geotextile, as applicable, are paid for by separate bid items.

Method 2 is intended whenever concrete, grout, bedding material, geogrid, and geotextile, as applicable, are to be paid for by the same bid item as the blocks, cables, and fittings but substantial earthfill or excavation is required with potential for variation in the quantity of these and paid for under separate bid items. Only specify this method when any quantity variation in concrete, grout, bedding material, geogrid, or geotextile would be proportional with variations in the blocks, cables, and fittings.

Method 3 is intended whenever concrete, grout, bedding material, geogrid, geotextile, and minor amounts of earthfill or excavation, as applicable, are to be paid for by the same bid item as the blocks, cables, and fittings. Only specify this method when the potential for variations in the amounts of earthfill and excavation are minor and any quantity variation in concrete, grout, bedding material, geogrid, or geotextile would be proportional with variations in the blocks, cables, and fittings.

6. Items of work and construction details

Starting at the top of page 65–4, prepare and outline section 7, job-specific “Items of Work and Construction Details,” in accordance with these instructions.

5. Methods

Section 6, Measurement and Payment