Instruction for use
Construction Specification 61—Rock Riprap

1. Applicability
Construction Specification 61 is applicable to equipment-placed or hand-placed rock riprap, granular filter, and granular bedding. It is also applicable for riprap placed over geotextile fabrics installed in accordance with Construction Specification 95.

2. Material specifications
Material Specifications 521, 523, and 592 complement Construction Specification 61. Select rock type 1, 2, or 3 of Specification 523, section 2, as appropriate and specify in section 8.

Rock type 1—For exposure conditions that require sound and durable material because of aggressive environment and demanding requirements, or in locations where replacement or repair would be difficult if breakdown or other failure were to occur.

Rock type 2—A lesser degree of durability is required while meeting a good standard of performance. The hazard is not a major consideration, and accessibility for repair or replacement is practical. No design changes are necessary for use of this rock type.

Rock type 3—Does not meet our normal requirements for quality, but because of the lack of onsite availability or availability of better materials, it is advantageous to use. Design changes, such as greater rock thickness and/or flatter slopes, may be required to compensate for the lack of long-term durability. More frequent repair and replacement should be anticipated.

3. Included items
Items to be included in contract specifications and drawings follow:

a. Complete plans and cross-sections of the required riprap.

b. Type of placement (equipment or hand-placed).

c. Pay limits, where applicable.

d. Foundation preparation requirements, if any.

e. Gradation requirements for material.

f. Screening, selection, or other processing requirements to ensure obtaining rock of the required quality and grading. For example, if angular to subangular rock is preferred over subrounded to rounded rock, specify this requirement in section 8.

g. Sources of material if the sources are to be specified. When sources are designated in the contract, the adequacy of quantity and quality of usable material at each source must be determined in advance by:

   (1) Geologic investigations with adequate sampling and testing

   (2) Specific case history that establishes the quality by satisfactory performance under comparable conditions of use and exposure or acceptable prequalification by other agencies.

h. ASTM D 5240 should be specified to check for rock resistance to freeze-thaw damage on sites that have large volumes of riprap, at highly hazardous locations, or on sites that would be difficult to repair if rock breakdown occurs. Acceptance limits in the specification must be evaluated and strengthened, if needed, to ensure the use of the appropriate rock type and quality.

i. Method(s) of measurement and payment.

j. When geotextile filters are specified, Construction Specification 95 should be used.

4. Methods

Section 8, Measurement and payment

The methods listed below provide two basic options for measuring and paying for rock riprap using either weight (ton) or volume (cubic yard) methods. Advantages of each option are as follows:

Weight—Ton methods would be more appropriate for quarried rock imported to a site. Contractors generally pay their supplier for quarried rock by the ton. Payment by the ton provides for direct pricing without the need to convert from a ton basis to cubic yards. Variations in riprap characteristics, such as rock specific gravity, transportation and placement losses, denseness of placement, make it necessary for the contractor to add contingencies that include these variations.

Volume—Cubic yard methods would be more appropriate for riprap that is produced from onsite locations, for gathered field stone, quarried rock sold by the truck load, and other situations where a certified scale is not readily available. It would also be appropriate for small quantities of rock where quantity measurement is not complex or a major task. Cubic yard methods can also be an advantage where the riprap end section is uniform for long reaches on larger projects. The elimination of the need to keep track of delivery tickets may be a considerable timesavings.

Cubic yard methods can be expected to impose some contingency considerations from the contractor because of the necessity to convert from tons to cubic yards in quantity estimation.

Methods 1, 2, and 3—Provide various means of measurement and are intended for use where filter or bedding aggregate, if any, is to be paid for as a separate item.

Method 4—Intended for use where filter or bedding aggregate is a minor item and its volume is added to the volume of rock riprap so that payment for it is to be included in the payment for rock riprap.

Methods 5 and 6—Intended for use when no filter, bedding aggregate, or geotextile are specified or when compensation for filter, bedding aggregate, geotextile, or a combination of these is to be included in the payment for rock riprap.

When all methods but one are deleted for use in a contract specification, delete from the last paragraph ***All Methods The following provisions apply to all methods of measurement and payment.*** Left justify the remaining text.

5. Items of work and construction details

Starting at the top of page 61–3, prepare and outline job specific "Items of Work and Construction Details" (IWCD) in accordance with these instructions.