

EXPECTED IMPLEMENTATION JANUARY 2021

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530 REVETMENT SYSTEMS (REV 8-4-20) (FA 8-5-20) (1-21)

SUBARTICLE 530-2.1.1 is deleted and the following substituted:

530-2.1 Riprap:

530-2.1.1 General: Meet the following requirements:

Type D-2 Geotextile Fabric*Section 985

*Use products listed on the Department's APL.

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SUBARTICLE 530-2.1.2 is deleted and the following substituted:

530-2.1.2 Prepackaged Sand-Cement Bags: Provide prepackaged sand-cement bags that meet the following requirements:

1. Evenly proportioned sand and cement in the ratio of five cubic feet of sand to 94 pounds of cement. Material proportioned by mass shall use a sand density of 85 pounds per cubic foot.

2. Sealed package of 80 pounds of sand-cement in a bag.

3. Bag made of scrim-reinforced paper capable of holding the sand-cement without leakage.

4. Sand meets requirements of Section 902-3.3

5. Type I/II cement meets requirements of Section 921.

Prepackaged Sand-Cement Bags shall be one of the products listed on the Department's Approved Product List. Manufacturers seeking evaluation of their product shall submit an application in accordance with Section 6. Include with the submittal a product data sheet, safety data sheet, product label, and a self-certified statement the product meets the requirements of this Section.

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SUBARTICLE 530-2.1.3.3 is deleted and the following substituted:

530-2.1.3.3 Physical Requirements of Broken Stone and

Broken Concrete: Use broken stone and broken concrete meeting the following physical requirements:

Absorption (FM 1-T85)	Maximum 5%
Los Angeles Abrasion (ASTM C535)	Maximum loss 45%*
Soundness (Sodium Sulphate) (AASHTO T104)	Maximum loss 12%** (after five cycles)
Flat and elongated pieces	Materials with least dimension less than one third of greatest dimension not exceeding 10% by weight.

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Dirt and Fines	Materials less than 1/2 inch in maximum dimension accumulated from interledge layers, blasting or handling operations not exceeding 5% by weight.
Drop Test***(EM 1110-2-2302)	No new cracks developed, or no existing crack widened additional 0.1 inch, or final largest dimension greater than or equal to 90% original largest dimension of dropped piece.
<p>* Ensure that granite does not have a loss greater than 55% and that broken concrete does not have a loss greater than 45%.</p> <p>** The Engineer may accept rubble exceeding the soundness loss limitation if performance history shows that the material will be acceptable for the intended use. The Engineer will waive the soundness specification for rubble riprap (broken stone and broken concrete) when project documents indicate it will be placed in or adjacent to water or soil with a sulfate content less than 150 parts per million and a pH greater than 5.0.</p> <p>*** The Engineer will waive the Drop Test unless required to ensure structural integrity. Provide all equipment, labor and testing at no expense to the Department. EM refers to the US Army Corps of Engineer's Specification Engineering Method.</p>	

SUBARTICLE 530-2.1.3.4 is deleted and the following substituted:

530-2.1.3.4 Source Approval and Project Control: The Engineer will approve construction aggregate sources in accordance with 6-2.3.

1. The Engineer may perform Independent Verification tests on all materials placed on the project.
2. The Engineer will check the gradation of the riprap by visual inspection at the project site. Resolve any difference of opinion with the Engineer in accordance with the method provided in FM 5-538. Provide all equipment, labor, and the sorting site at no expense to the Department.
3. The Engineer may test components in a blend of rubble processed from different geologic formations, members, groups, units, layers or seams. The Engineer may select components based on like color, surface texture, porosity, or hardness. The Engineer will reject any blend if a component that makes up at least five percent by volume of the blend does not meet these specifications.

SUBARTICLE 530-2.3.4 is deleted and the following substituted:

530-2.3.4 Gabion Rock: Use rock meeting the requirements of ASTM D6711 to fill gabions. The rock must be reasonably free from thin, flat or elongated pieces. Rock size must be at least 1.25 times greater than the aperture size of the wire mesh or fabric. Each range of sizes may allow for a variation of 5% oversize rock by weight, 5% undersize rock by weight, or both.

Physical Property Requirements	Acceptable Range
Los Angeles Abrasion and ASTM C535	Maximum loss 40%
Bulk Specific Gravity	Minimum 2.20
Absorption, ASTM C127 and ASTM C128	Maximum 3%

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SUBARTICLE 530-3.2 is deleted and the following substituted:

530-3.2 Sand-Cement Bags:

530-3.2.1 Placing: Place the bags with their ends all in the same direction. Lay the bags with broken joints, in a regular pattern. Ram or pack the bags against each other so as to form a close and molded contact. Remove and replace bags ripped or torn in placing with sound, unbroken bags. Then, thoroughly saturate all bags with water.

530-3.2.2 Grouting: Immediately after watering, fill all openings between bags with dry grout composed of one-part Portland cement and five parts sand.

530-3.2.3 Toe Walls: Use sand-cement bags for the toe walls if required. Fill the entire trench excavated for the toe walls with sand-cement bags.

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SUBARTICLE 530-4.1 is deleted and the following substituted:

530-4 Method of Measurement.

530-4.1 Sand-Cement Bags: The quantity to be paid for will be the volume, in cubic yards, calculated from the minimum dimensions shown in the Plans or Standard Plans, satisfactorily placed and accepted.

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SUBARTICLE 530-5.7 is deleted and the following substituted:

530-5.7 Payment Items. Payment will be made under:

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| Item No. 530- 1- | Riprap Sand-Cement Bags - per cubic yard. |
| Item No. 530- 3- | Riprap Rubble - per ton. |
| Item No. 530- 4- | Articulating Concrete Block Revetment System - per square yard. |
| Item No. 530- 5- | Gabion |
| Item No. 530- 74- | Bedding Stone - per ton. |

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