

ITEM 750

ROCK FILTER DAMS

750.1 Description. This work shall consist of the installation of temporary erosion protection and sediment control rock filter dams utilized during construction operations and prior to final stabilization in accordance with these specifications and construction drawings, and as directed by the Engineer. Rock filter dams are temporary berms constructed of stone to intercept and slow storm water runoff to retain sediment on the construction site. Depending upon the type of rock filter dam specified in the construction plans as Type 1, 2, 3, 4, or 5, the aggregate fill may be unwrapped, wrapped in twisted hexagonal wire mesh, or confined in a gabion wire basket.

Applications of Rock Filter Dams:

- A. Type 1 dams may be used at toe of slopes, around inlets, in small ditches, and at dike or swale outlets. Type 1 dams are recommended for erosion and sediment control from a drainage area of 5 acres or less.
- B. Type 2 dams may be used in ditches and at dike or swale outlets.
- C. Type 3 dams may be used in stream flow.
- D. Type 4 sack gabions may be used in ditches and smaller channels to form an erosion and sediment control dam.
- E. Type 5: As shown in plans.

750.2 Materials. Geotextile fabric shall consist of a woven monofilament or spunbond nonwoven fibers consisting of long-chain synthetic polymers composed of at least 95 percent by weight of polyolefins. Geotextile fabric shall equal or exceed the following average roll values or as directed by the Engineer:

- A. Minimum average roll value.
 - (1) Elongation \geq 50 percent.
 - (2) Grab Strength – 200 pounds.
 - (3) Puncture Strength – 75 pounds.
 - (4) UV Stability (retained strength) – 50 percent after 500 hours of exposure.
- B. Maximum average roll value.
 - (1) Apparent Opening Size (AOS) – 0.6 mm/#30 US sieve.

Geotextile fabric shall be resistant to commonly encountered soil chemicals, mildew, rot, insects, and deterioration resulting from exposure to sunlight or

heat. Geotextile fabric shall provide an expected useable life comparable to the anticipated construction period.

Aggregate for the rock filter dams shall consist of crushed stone. Aggregate particles shall be composed of clean, hard, durable materials free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials or organic and injurious matter. Aggregate shall be cubic or rounded form, not elongated, flat, shapes. Spalls, fragments, and chips shall not exceed 5 percent by weight. Crushed concrete shall not be substituted for the crushed stone unless as approved by the Engineer.

Aggregate size shall depend upon the type of rock filter dam specified in the construction plans. Aggregate size based on type of rock filter dam is as follows:

- A. **Type 1:** 3 inches to 5 inches, open-graded.
- B. **Type 2:** 3 inches to 5 inches, open-graded.
- C. **Type 3:** 4 inches to 8 inches, open-graded.
- D. **Type 4:** 3 inches to 5 inches, open-graded.
- E. **Type 5:** As shown on the plans.

Mesh is required for reinforced type rock filter dams. Mesh shall be 20 gauge galvanized double twisted hexagonal wire mesh with 1-inch diameter hexagonal openings. Mesh wire shall be zinc coated prior to being double twisted. Reinforcing spiral binders, lacing wire, and stiffeners shall be made of wire having the same coating material and same wire size as the wire mesh. Gabion wire baskets shall equal or exceed the requirements of the wire mesh.

As an alternative to using rock filter dams, proprietary sediment control barriers such as “Erosion Eel”, manufactured by Friendly Environment, or any approved equal may be used. Supporting technical data shall be submitted and approved in writing by the engineer as defined in the General Conditions.

750.3 Construction Methods. No clearing and grubbing or rough cutting, other than as specifically directed by the Engineer to allow for soil testing, surveying and installation of erosion protection and sediment control measures, shall be permitted until sediment control and erosion protection systems are in-place.

Rock filter dams shall be installed at the locations shown on the construction plans and in accordance with the drawing attached to this specification or as directed by the Engineer. Rock filter dams shall be the types specified in the construction plans. Rock filter dams shall be constructed in accordance with an approved schedule that clearly describes the timing during the construction process that the various erosion control measures will be implemented. Rock filter dams shall be installed so as to prevent downstream deposition of sediment and debris from the construction site.

Rock filter dams shall be constructed to meet the following criteria:

A. Type 1:

- (1) Non-reinforced.
- (2) Height: 18-24 inches.
- (3) Top width: 2 feet minimum.
- (4) Upstream and downstream side slope of dam: 2:1 maximum.
- (5) Open graded aggregate 3-5 inches.

B. Type 2:

- (1) Reinforced with wire mesh.
- (2) Height: 18-36 inches.
- (3) Top width: 2 feet minimum.
- (4) Upstream and downstream side slope of dam: 2:1 maximum.
- (5) Open graded aggregate 3-5 inches.

C. Type 3:

- (1) Reinforced with wire mesh.
- (2) Height: 36-48 inches.
- (3) Top width: 2 feet minimum.
- (4) Upstream and downstream side slope of dam: 3:1 maximum.
- (5) Open graded aggregate 4-8 inches.

D. Type 4:

- (1) Reinforced in a gabion wire basket.
- (2) Height: 30 inches minimum.
- (3) Top width: 2 feet minimum.
- (4) Upstream and downstream side slopes of dam: none specified.
- (5) Open graded aggregate 3-5 inches.

E. Type 5:

- (1) As shown on construction plans.

The separation geotextile fabric and wire mesh shall be sized and placed in accordance with the rock filter dam detail and as specified by the type of rock filter dam shown in the construction plans. The separation geotextile fabric may be omitted only as approved by the Engineer. The separation geotextile fabric and wire mesh shall be securely staked with wooden or metal stakes to the bottom and side slopes of the ditch or channel prior to aggregate placement. Sack gabions for Type 4 rock filter dams shall be securely staked with wooden or metal stakes to the bottom and side slopes of the ditch or channel, as well.

Aggregate fill shall be placed to the width, length, height and slopes in accordance with this specification and the rock filter dam detail and as specified by the type of rock filter dam shown in the construction plans.

The height of the dam shall be measured vertically from the existing ground to the top of the filter dam. The length of the dam shall be measured across the top centerline of the dam from embankment to embankment and includes the additional length embedded into the embankment. Width of the dam shall be measured along the top face of the dam.

Wire mesh shall be folded upstream side over the aggregate fill and tightly secured to itself on the downstream side using wire ties. Hog rings may be substituted for wire ties.

Additional aggregate fill or gravel bags shall be placed and secured at the embedded section to prevent low flows from short circuiting the dam at the adjacent dirt embankment area. Gravel bags shall meet the specifications of Item 741 Gravel Bag Inlet Protection Barrier.

The Contractor shall be responsible for periodic reshaping, repairing, and maintaining of rock filter dams as directed by the Engineer.

The Contractor shall inspect the rock filter dam at least once every week or as directed by the Engineer. Damage caused to rock filter dams shall be repaired immediately. Rock filter dams shall be maintained by the Contractor until construction staging requires removal or upon final stabilization of the construction site. Upon removal of the rock filter dam, the area shall be stabilized with vegetation, or other.

The Contractor is responsible for removal and proper disposal of sediment and debris from the rock filter dam. Removed sediment and debris shall not be allowed to flush into the storm sewer system, waterways, jurisdictional wetlands, or onto adjacent properties. Sediment deposits shall be removed before they reach one-third of the height of the dam.

Uncontaminated sediment can be placed at the project spoil site or, if properly handled, spread out to supplement fill requirements. The Engineer will designate how the sediment deposits are to be handled. Uncontaminated sediment shall not be placed in waterways or jurisdictional wetlands, unless as approved by the Engineer. If sediment has been contaminated, then it shall be disposed of in accordance with the applicable federal, state, and local regulations. Offsite disposal shall be the responsibility of the Contractor.

After final stabilization and at the direction of the Engineer, the Contractor, when required, shall be responsible for removing all erosion protection and sediment control systems that are not permanent, from the project.

Pursuant to Section 404 of the Clean Water Act, a permit may be required for placement of fill, rock filter dams, into Waters of the United States, Waters of

the State, and their associated jurisdictional wetlands. The Contractor shall not proceed with the construction of the rock filter dams in Waters of the United States, Waters of the State, and their associated jurisdictional wetlands until the permits are obtained.

750.4 Quality Assurance. The Contractor is responsible for the control of the quality of materials incorporated into the construction and quality of completed construction. The County will engage materials engineering services to provide quality assurance testing and inspection to assist the County Engineer in determining the acceptability of materials and completed construction. Quality assurance services provided by the County do not relieve the Contractor of his responsibility for quality control. The Materials Engineer shall not have control of the means, methods, techniques, sequences or procedures of construction selected by the Contractor.

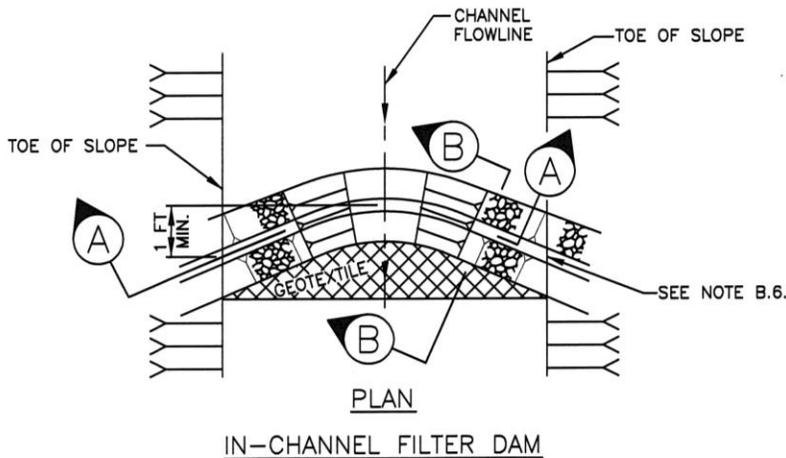
750.5 Measurement and Payment. When paid for separately as a pay item, measurement and payment for rock filter dams, Types 1,2,3,4, or 5 shall be by the **linear foot**, as shown on the plans, complete and in-place. Measurement shall be along the centerline of the top of the dam from embankment to embankment and includes the additional length which is embedded into the embankment.

Payment for rock filter dams shall include and be full compensation for all labor, equipment, materials, supervision and for all incidental expenses for the construction of these items, complete in-place, where 60% of the total unit cost shall be for furnishing and installation with embankment and excavation, and protection of trees. Thus, 40% of the total unit cost shall be for the removal of erosion protection and sediment control systems: rock filter dams, after final stabilization, at the end of the project. Geotextile fabric, reinforcement, aggregate fill, and gravel bags shall be considered incidental expenses to this item. Disposal of sediment and debris are considered incidental expenses to this item.

Note: This specification requires two drawings.

FILTER DAM NOTES:

- A. TYPES OF FILTER DAMS
1. TYPE 1 (NON-REINFORCED)
 - a. HEIGHT - 18-24 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
 - b. TOP WIDTH - 2 FEET (MINIMUM)
 - c. SLOPES - 2:1 (MAXIMUM).
 2. TYPE 2 (REINFORCED).
 - a. HEIGHT - 18-36 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
 - b. TOP WIDTH - 2 FEET (MINIMUM).
 - c. SLOPES - 2:1 (MAXIMUM).
 3. TYPE 3 (REINFORCED)
 - a. HEIGHT - 36-48 INCHES. MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
 - b. TOP WIDTH - 2 FEET (MINIMUM).
 - c. SLOPES - 3:1 (MAXIMUM).
 4. TYPE 4 (GABION)
 - a. HEIGHT - 30 INCHES (MINIMUM). MEASURE VERTICALLY FROM EXISTING GROUND TO TOP OF FILTER DAM.
 - b. TOP WIDTH - 2 FEET (MINIMUM).
 5. TYPE 5. AS SHOWN ON THE PLANS.
- B. CONSTRUCT FILTER DAMS ACCORDING TO THE FOLLOWING CRITERIA UNLESS SHOWN OTHERWISE ON THE PLANS.
1. TYPE 2 AND 3 FILTER DAMS: SECURE WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1 INCH DIAMETER HEXAGONAL OPENINGS.
 2. GRANULAR FILL:
 - a. PLACE ON MESH TO HEIGHT AND SLOPES SHOWN ON PLANS OR AS SPECIFIED BY THE ENGINEER.
 - b. 3-5 INCHES FOR ROCK FILTER DAM TYPES 1,2, AND 4 AND 4-8 INCHES FOR ROCK FILTER DAM TYPE 3.
 3. WIRE MESH: FOLD AT UPSTREAM SIDE OVER GRANULAR FILL AND TIGHTLY SECURE TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS.
 4. IN STREAMS: SECURE OR STAKE MESH TO STREAM BED PRIOR TO AGGREGATE PLACEMENT.
 5. EMBED ONE FOOT MINIMUM INTO SLOPE AND AT SLOPE RAISE ONE FOOT HIGHER THAN CENTER OF DEPRESSED AREA.

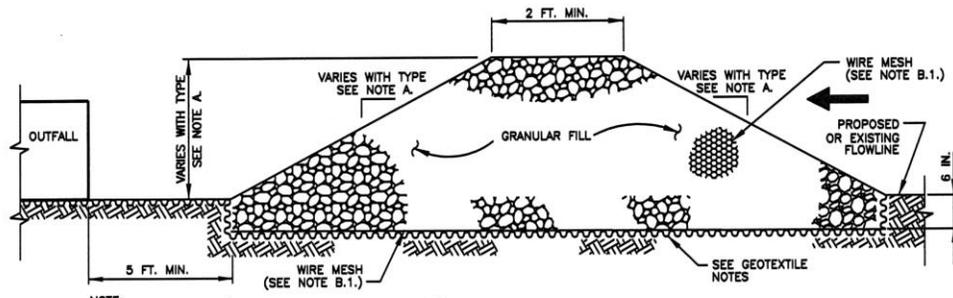


GEOTEXTILE NOTES:

MIN. AOS	SIEVE NO.	120 MIN
MAX. AOS	SIEVE NO.	50 MAX
WEIGHT	OZ/SY	4 OZ. MIN

DATE: 03-12-12
SCALE: NTS

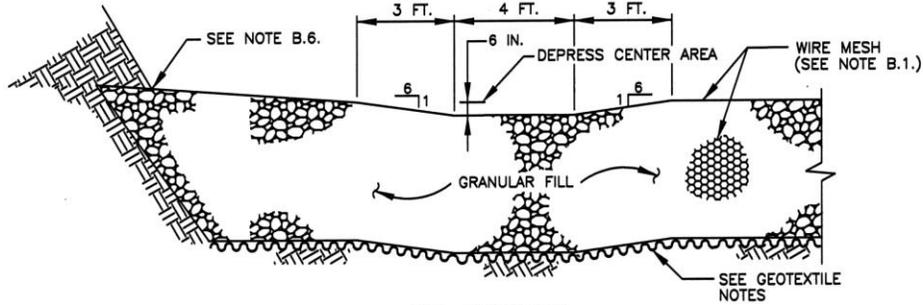
SHEET NUMBER
1 OF 2



NOTE:
ONLY APPLIES FOR
DETENTION BASIN
OUTFALL PIPE
PROTECTION.

(A) SECTION

FILTER DAM



(B) SECTION

DATE: 03-12-12

SCALE: NTS

SHEET NUMBER

2 OF 2

END OF ITEM 750