

**SECTION 31 40 00
SOIL STABILIZATION (EROSION CONTROL)**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies erosion control measures to be provided for during construction.

1.2 RELATED WORK

- A. Demolition and Site Clearing: Section 02 41 10, DEMOLITION AND SITE CLEARING.
- B. Safety Requirements: GENERAL CONDITIONS and all OSHA requirements for the work being performed.
- C. Environmental Protection: Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS.
- D. Waste Management: Section 01 74 19, CONSTRUCTION WASTE MANAGEMENT
- E. Planting and seeding: Section 32 90 00, Planting
- F. Subgrade Preparation: Section 31 20 00 Earth Moving

1.3 SUBMITTALS

- A. A schedule of soil erosion control activities.
- B. Manufacturers' Literature and Data shall be submitted, as one package, for sediment barriers (i.e. silt fence), erosion control fabric, filter bag, and other miscellaneous items.

1.4 REFERENCES

- A. Pennsylvania General Permit PAG-02 for Coverage Under General NPDES Permit for Stormwater Discharges Associated with Construction Activities.
- B. Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual.

1.5 PROJECT REQUIREMENTS

- A. All applicable state and local statutes, relating to the prevention and abatement of pollution, shall be complied with during the performance of the contract.
- B. All applicable permits and requirements thereof shall be complied with. All site preparation and erosion control measures shall be as required by the Erosion and Sediment Control Plan. A copy of the Erosion and Sediment Control Plan is attached to these specifications.
- C. Construction operations shall be conducted in such manner as to provide permanent and temporary erosion controls and to prevent damaging siltation of watercourses, streams or lakes.
- D. A schedule of soil erosion activities shall be submitted prior to any earth-change activity. This schedule shall be updated as necessary.
- E. During any filling and grading operation where siltation is likely to be a problem, the Contractor's operation shall be scheduled and performed such that required permanent soil stabilization can follow immediately thereafter if the project conditions permit; otherwise,

temporary approved erosion and siltation control measure will be required between successive construction stages.

- F. The Contractor shall control dust from his operation, in a manner approved by Pennsylvania Department of Environmental Protection Erosion and Sediment Pollution Control Program Manual.

PART 2 - PRODUCTS

2.1 EROSION CONTROL

- A. Silt Fence: Assembled from filter fabric stapled to square 2"x2" hardwood posts or equivalent steel (U or T weighing not less than 1.33 pounds per linear foot) as detailed on the Contract Drawings and in compliance with the Erosion and Sediment Control Plan.
1. Silt fence fabric shall have the minimum properties:

Grab Tensile:	120 pounds; ASTM D 1682
Elongation at Failure:	20 percent max; ASTM D 1682
Mullen Burst Strength:	200 psi; ASTM D 3786
Trapezoidal Tear Strength:	50 pounds
Puncture Strength:	40 pounds; ASTM D 751 (modified)
Slurry Flow Rate:	0.3 gal/min/sf; ASTM 5141
Equivalent Opening Size:	30 U.S. Sieve Number CW-02215
Ultraviolet Radiation Stability:	80 percent; ASTM G-26
 2. Silt fence mesh support: Metallic coated steel, 14.5 gage wire mesh, arranged in a maximum grid of 6-inches by 6-inches.
 3. Fasteners: No. 9 staples, 1.5-inch long, or tie wires, 17 gage steel, of appropriate length, acceptably metallic coated.
 4. Ground anchors: 1-inch by 2-inch by 18-inch wooden stakes.
 5. Guy wires: No. 13.5 gage galvanized, according to ASTM A, Class II.
- B. Compost Filter Sock: Consist of a biodegradable or photodegradable mesh tube filled with a coarse compost filter media.
1. Compost sock fabric shall have the minimum properties:

Material Type:	5 mil HDPE
Material Characteristics:	Photodegradable
Mesh Opening:	3/8"
Tensile Strength:	26 psi
Ultraviolet Stability % Original Strength:	23 percent at 1,000 hr: ASTM G-155
Minimum Functional Longevity:	9 months
 2. Compost shall meet the standards contained in the PennDOT Publication 408 or have the following minimum properties:

Organic Matter Content:	80% - 100% (dry weight basis)
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Organic Portion:	Fibrous and elongated
pH:	35 to 55 percent
Particle Size:	98 percent pass through 1" screen
Soluble Salt Concentration:	5.0 dS/m maximum

- C. Filter Bag Inlet Protection: Inlet filter assembly capable of trapping silt and sediment from surface storm water runoff. Inlet filter system shall be comprised of a corrosion resistant steel frame and replaceable geotextile filter bag. Filter bag shall be rated for 200 gpm/sqft with a removal efficiency of 82% when filtering a USDA Sandy Loam sediment load. Basis of design product, subject to compliance with requirements, FleXstorm Catch-It manufactured by Inlet & Pipe Protection, Inc or approved equivalent.
- D. Erosion Control Fabric: Provide rolled erosion control product conforming to PennDOT Standard Specifications for organic mulch material, Section 806, material 806.2(a)2.
- E. Sediment Filter Bag: Sediment filter bag conforming to PennDOT Standard Specifications for Pump Water Filter Bag, Section 855.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor shall implement erosion control measures as shown on the plans and as job conditions dictate. Intent is to minimize erosion and pollutants at the source, capture sediment at regular intervals and prevent sediment intrusion into storm sewer pipes, structures, and waterways.

3.3 EROSION CONTROL

- A. Erosion Control: Contractor shall provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties.
- B. Surrounding roads shall be kept clean of dirt and debris at all times. Contractor shall utilize a mechanical means of sweeping road on a daily basis or as necessary to keep public roads free of soil, tracking or debris.
- C. Silt fence:
 - 1. Installation:
 - a. Install material along the contour of the ground, as specified in the contract documents.
 - b. Both ends of each fence section shall be extended at least 8 feet upslope across undisturbed ground at 45 degrees to main fence alignment.
 - c. Insert 12 inches of fabric to a minimum depth of 6 inches. Backfill and compact the fill material in the trench.
 - d. Wherever reinforced silt fence is installed, the reinforcement mesh should be fastened to the stakes prior to the fabric.
 - e. Drive support stakes at least 18" below existing ground surface at 8-foot (max) intervals.

- f. Wherever reinforced silt fence is installed, install guy wires attached to the support stakes of reinforced silt fence.
 2. Maintenance: At the Contractor's expense, repair or replace non-functioning silt fence that allows water to flow under the fence, is torn, or is otherwise damaged. Sediment shall be removed when accumulations reach half the aboveground height of the fence.
 3. Removal: Remove the silt fence upon final stabilization of the project area. Remove sediment and stabilize the area disturbed by removal operations.
- D. Compost Filter Sock:
1. Installation:
 - a. Install material along the contour of the ground, as specified in the contract documents.
 - b. Both ends of each sock section shall be extended at least 8 feet upslope across undisturbed ground at 45 degrees to main sock alignment.
 - c. Drive wood stakes through center of filter sock at least 12" below existing ground surface
 2. Maintenance: At the Contractor's expense, repair or replace non-functioning compost filter sock that allows water to flow under the sock, is torn, or is otherwise damaged. Sediment shall be removed when accumulations reach half the aboveground height of the sock. Biodegradable filter socks shall be replaced after 6 months; photodegradable socks after 1 year.
 3. Removal: Remove the filter sock upon final stabilization of the project area. Remove sediment and stabilize the area disturbed by removal operations.
- E. Stabilized Construction Entrance:
1. Install a stabilized construction entrance at all locations where construction traffic leaving the site presents the potential for sediment track-out.
 2. Remove accumulated sediment and install new stone, as required to prevent track-out.
 3. If excessive amounts of sediment are being deposited on roadway, extend length of rock construction entrance by 50 foot increments until condition is alleviated or install wash rack.
 4. Washing the roadway or sweeping the deposits into roadway ditches, culverts, or other drainage courses is not acceptable.
- F. Erosion Control Fabric:
1. Installation: Install erosion control fabric according to the manufacturer's published installation recommendations and per PennDOT Section 806, subject to the following requirements:
 - a. Slope surface shall be free of rocks, clods, sticks, vegetation, or other obstructions that will prevent direct contact between the rolled erosion control product and the soil surface.
 - b. Install anchor trench at top of slope. Seed and fertilize trench after backfill and compaction.
 - c. Unroll the fabric in direction of water flow, down the slope.

- d. Seed and soil amendments shall be applied according to the rates in the plan drawings prior to installing the blanket.
 2. Maintenance: Blankets shall be inspected weekly and after each runoff event until perennial vegetation is established to a minimum uniform 70% coverage throughout the blanketed area. Damaged or displaced blankets shall be restored or replaced within 4 calendar days.
- G. Filter bag inlet protection:
1. Installation: Install per manufacturer recommendation.
 2. Maintenance: Inspect filter bags on a weekly basis and following each ½" or more rain event. Bag should be emptied if the sediment bag is more than half filled with sediment and debris, when flow capacity has been reduced so as to cause flooding or bypassing of the inlet, or as directed by the Contracting Officer/Contracting Officer's Representative CO/COR. Dispose of the sediment or debris in an approved manner. Replace the bag if the filter is torn or punctured to ½" diameter or greater on the lower half of the bag.
- H. Compost Sock Washout:
1. Installation: Install impervious plastic lining at the location of the washout. Compost socks shall be staked as recommended by the manufacturer around the perimeter of the geo-membrane so as to form a ring with the ends of the sock. Care should be taken to ensure continuous contact of the sock with the impervious lining at all locations.
- I. Sediment Trap:
1. Installation:
 - a. Sediment trap shall have a minimum storage volume of 2,000 cubic feet for each acre of contributing drainage area.
 - b. Maximum embankment side slopes are 2H:1V.
 - c. The earthen embankment shall be seeded with temporary or permanent vegetation immediately after installation.
 - d. Sediment trap shall be removed and the area stabilized when the upslope drainage area has been stabilized.
 2. Maintenance: Sediment trap shall be inspected at least weekly and after each runoff event. Sediment shall be removed when it has reached the clean out elevation, as indicated on the design plans. Dispose of materials removed from the trap in the manner described in the Erosion and Sediment Plan.
- J. Sediment Filter Bag:
1. Locate bag in a well vegetated level area (less than 5% grade). Bag shall be placed on 3" thick bed of coarse aggregate.
 2. Replace the bag when 50% of the sediment capacity has been filled and/or when there is a failure.

3. Remove and properly dispose of the pumped water filter bags. Restore area in accordance with specifications.

3.2 CLEAN-UP

- A. On completion of work of this section and after removal of all debris, leave site in clean condition satisfactory to CO/COR. Clean-up shall include off the Cemetery Property disposal of all items and materials not required to remain property of the Government as well as all debris and rubbish resulting from demolition operations.

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