

**SECTION 02115
WATER POLLUTION CONTROL (SOIL EROSION)**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Requirements and other Division 1 Specifications Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. The work under this section shall consist of any and all temporary and/or permanent measures to control water pollution and soil erosion as may be required, specified herein, shown on the Contract Drawings or directed by the Owner, during the construction of the work embraced under this contract and for such a length of time after the completion of the work embraced under this contract for such a length of time after the completion of work as determined by the Owner.
- B. This work applies to, but is not limited to, any construction work resulting in water pollution or soil erosion.
- C. The work shall consist temporary erosion control protection measures to control water pollution and soil erosion through the use of berms, dikes, dams, sediment basins, temporary seeding, netting, gravel, mulches, grasses, slope drains, ditches, channels, riprap fabric fences, filter socks, ditch checks, compost blankets, geo-fabric, hay bales, silt sacks and grading to control surface runoff and other erosion control devices or methods. The work shall include the construction and maintenance of temporary sediment basins to the dimensions and details and at the locations shown on the contract drawings and as directed by the Owner.
- E. Site Work Improvement construction shall not proceed until the erosion and sedimentation controls have been placed and have been approved by the Owner.

1.3 RELATED SECTIONS

- A. Section 02200 - General Earthwork For Athletic and Baseball Fields
- B. Construction Drawings

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Protect adjacent properties and water resources from erosion and sediment damage throughout life of contract.

PART 2 PRODUCTS

2.1 MATERIALS

The materials shall be satisfactory to the Owner and may consist of the following:

- A. Mulches may be hay, straw, wood cellulose, wood chips, stone, netting, burlap, plastic sheets or other suitable mulch material acceptable to the Owner. Mulches shall be reasonably clean and free of noxious weeds and deleterious materials. Asphalt sprays will not be allowed. The Contractor shall prevent straw, wood chips, etc. from entering any reservoirs or watercourses.

- B. Slope drains or ditches may be constructed of pipe, rubble, riprap, sod, burlap, jute and excelsior matting, plastic sheets, Portland cement concrete, bituminous concrete or other material satisfactory to the Owner.
- C. Permanent Grass shall conform to that as specified in Section 02931 Lawn.
- D. Temporary Grass Seed shall be perennial rye-grass (*Lolium perenne*) or an improved variety thereof, such as Manhattan, having a minimum purity of 98 percent and a minimum germination of 90 percent. The seeding may be altered by the Owner if requested by the Contractor to suit special areas or conditions.
- E. Fabrics shall consist of durable polypropylene, polyethylene or other material approved by the Owner or as shown on the Contract Drawings.
- F. Hay bales shall be made of hay with 40 pounds minimum weight and 120 pounds maximum weight. Wood stakes shall be a minimum of 1 inch by 1-inch nominal size by a minimum of 3 feet long.
- G. Silt Fence shall consist of 3-foot wide Geosynthetic fabric with prefabricated wood posts as manufactured by "Mirafi" or equal.
- H. "Filtrex" Filter Socks for Silt Fence Replacement and for Ditch Checks shall be constructed of a water permeable compost filled 3 or 5 mil continuous, tubular, HDPE 3/8" knitted mesh netting material to contain soil erosion and sediment by removing soil particles from water moving off site to adjacent waterways, wetlands or storm water drainage systems.
 - 1. Compost used for the Filter Socks and Ditch Checks shall be weed free and derived from a well-decomposed source of organic matter. The compost shall be produced using an aerobic composting process meeting CFR-503 regulations, including time and temperature data indicating effective weed seed, pathogen and insect larvae kill. The compost shall be free of any refuse, contaminants or other materials toxic to plant growth. Non-composted products will not be accepted. Test methods for the items below should follow USCC TMECC guidelines for laboratory procedures:
 - a. PH – 5.0 – 8.0 in accordance with TMCC 04.11-A, "Electrometric pH Determinations for Compost".
 - b. Particle size – 99% passing a 2" sieve and a minimum of 70% greater than the 3/8" sieve, in accordance with TMCC 02.02-B, "Sample Sieving for Aggregate Size Classification". (In the field, the product commonly requested is between 1/2" and 2" particle size.)
 - c. Moisture content of less than 60% in accordance with standardized test methods for moisture determination.
 - d. Material shall be relatively free (<1% by dry weight) of inert or foreign man made materials.
 - e. A sample shall be submitted to the engineer for approval prior to being used and must comply with all local, state and federal regulations.
Filtrex Filter Socks and Ditch Checks and installation may be purchased from the following companies:

Filtrex International, LLC
35481 Grafton Eastern
Grafton, OH 44044
440-926-8041
440-926-4021 (fax)
www.filtrex.com

- I. Filtrex Compost Blankets shall consist of a water permeable Compost Blanket to reduce soil erosion and sediment by preventing soil particles from water moving off site into adjacent waterways, wetlands or storm water drainage systems. Compost used for Filtrex Compost Blankets shall be as specified in Section H above.
- J. Silt Sacks shall be constructed of a woven polypropylene fabric and shown by a double needle machine using a high strength nylon thread. The Silt Sack seams shall have a certified average wide width strength per ASTM D-4884 standards of at least 165.0 lbs./in. Silt Sacks shall be as manufactured by "ACF Environmental", Richmond, VA or approved equal.
- K. Sediment basins shall be constructed of materials conforming to applicable items as shown on the contract drawings.

PART 3 EXECUTION

- A. Sedimentation Basins shall be constructed to the dimensions and details as shown on the contract drawings or as approved by the Engineer or Local Governing Authority in conformance with the Connecticut Guidelines for Soil Erosion and Sediment Control. Except as may be required to provide access to the work and to secure on-job materials required, the sedimentation basins shall be constructed prior to the start of any other work upstream from the basins in the runoff area controlled by the bowl.

The Contractor shall provide and maintain adequate access to the basin, and shall be responsible for the maintenance, cleaning, protection and repair of all sediment basins for the life of the contract.
- B. Prior to the commencement of any work, the Contractor shall submit to the Owner the proposed methods of water pollution and soil erosion control to be incorporated in the work.
- C. The Owner has the authority to control the surface area of earth materials exposed by construction operations and to direct the Contractor to immediately provide permanent or temporary pollution control measures to prevent contamination of adjacent streams, watercourses, lakes, ponds, or other areas of water impoundment. Every effort shall be made by the Contractor to immediately provide permanent or temporary pollution control measures to prevent contamination of adjacent streams, watercourses, lakes, ponds, or other areas of water impoundment. Every effort shall be made by the Contractor to prevent erosion on the site and abutting property.
- D. The Owner has the authority to direct the Contractor to divert surface water runoff away from exposed raw earth surfaces through the use of temporary berms, dikes, and diversion channels.
- E. The erosion control features shall be installed and maintained by the Contractor, and shall be checked daily and after each severe rain storm for damage, until such features are no longer needed. All sediment traps and sediment basins shall have the accumulated sediment and/or clean water removed before it significantly reduces their storage volume or function, prior to the next rain storm forecast for the region.

- F. All slopes of stockpile material and other disturbed areas shall be stabilized and protected by surrounding with silt fencing, mulching, seeding, or otherwise protected as the work progresses to comply with the intent of this specification. All damaged areas shall be repaired as soon as possible. The Owner shall limit the surface area of each material exposed if the Contractor fails to sufficiently protect the slopes to prevent pollution.
- G. The Contractor shall at all times have on hand the necessary materials and equipment to provide for early slope stabilization and corrective measurements to damaged slopes.
- H. Temporary channels, ditches and out-falls shall be protected prior to directing water into them to prevent erosion.
- I. The erosion control features installed by the Contractor shall be maintained by the Contractor and he shall remove such installations if ordered by the Owner.
- J. The Contractor shall operate all equipment and perform all construction operations so as to minimize pollution. The Contractor shall cease any of his operations which will increase pollution during rainstorms.
- K. Hay Bales shall be placed as shown on the plans or as directed by the Owner. They shall be held in place by two wooden stakes in each bale. Bales shall be maintained or replaced as ordered by the Owner until they are no longer necessary for the purpose intended or are ordered removed by the Owner.
- L. When filter fabric is used it shall be mounted on posts with or without fence backing as recommended by the fabric manufacturer. The bottom six inches of fabric shall be buried by either trenching, laying the six-inch section horizontally across the trench and burying or by laying the six inch section horizontally on the ground and burying by ramping the topsoil up to the control fence.
- M. The installations shall be maintained or replaced until they are no longer necessary for the purpose intended or are ordered removed by the Owner.
- N. The filter fabric fence systems will be completely removed from the project at the completion of the project, unless specifically authorized by the Owner to be left in place.
- O. Hay bale systems will be allowed to remain in toe of slope areas unless ordered removed by the Owner.
- P. Filter fabric shall be non-rotting, acid and alkali resistant and have sufficient strength and permeability for the purpose intended, including handling and backfilling operations. Fibers shall be low water absorbent. The fiber network must be dimensionally stable and resistant to delamination. The fabric shall be free of any chemical treatment or coating that will reduce its permeability. The fabric shall also be free of any flaws or defects, which will alter its physical properties. Torn or punctured fabrics shall not be used. For each specific use, only commercially available fabric which is certified in writing by the manufacturer for the purpose intended shall be used. The Contractor shall submit a two-foot square sample of each type of fabric to be used along with, technical data sheets, certified test reports, materials, certificates and certificates of compliance. The Engineer reserves the right to reject any fabric which he deems unsatisfactory for a specific use. The brand name shall be labeled on the fabric or the fabric container. Fabrics, which are susceptible to damage from sunlight or heat, shall be so identified by suitable warning information on the packaging material.

Fabric susceptible to sunlight damage shall not be used in any installations where exposure to light will exceed 30 days, unless specifically authorized in writing by the Owner.

- Q. "Filtrexx" Filter Socks will be placed at locations indicated on the contract plans as directed by the engineer. Socks should be installed parallel to the base of the slope or other affected area. In extreme conditions (i.e., 2:1 slopes), a second sock shall be constructed at the top of the slope.

If the Filter sock is to be left as a permanent filter or part of the natural landscape, it may be seeded at time of installation for establishment of permanent vegetation. The Engineer will specify seed requirements.

Filter Socks are not to be used in direct flow situations or in runoff channels.

The Contractor shall maintain the Filter Sock in a functional condition at all times and it shall be routinely inspected.

Where the Sock requires repair, it will be routinely repaired.

The contractor shall remove sediments collected at the base of the Sock when they reach 1/3 of the exposed height of the Sock, or as directed by the Engineer.

The Filter Sock will be dispersed on site when no longer required, as directed by the Engineer.

- R. "Filtrexx" Ditch Checks will be used as a form of drainage channel protection and sediment removal on construction sites, which require protection against sediment-laden water.

Filtrexx Ditch Checks will be placed at locations indicated on plans as directed by the Engineer.

Filtrexx Ditch Checks will ensure that the Ditch Checks exceed the normal drainage area by 4 feet on the upslope of both banks. The Ditch Checks will be anchored to the soil using stakes where required.

Standard sizes of Ditch Checks for normal protection should be 12" diameter. In sever flow situations, the Engineer may recommend larger Ditch Checks of 18" or 24". Ditch Checks shall be constructed of a continuous, tubular, 3/8" knitted mesh material and filled with a compost product that passes the criteria listed in H above.

If the Ditch Checks become clogged with debris and sediment, they shall be maintained so as to assure a proper drainage and water flow into the drainage channel.

For areas where Ditch Checks are to be left as a permanent part of the landscape, Ditch Checks may be seeded during time of manufacture to create a 'living' Ditch Check. For seeding options, the Engineer shall specify seed type and seeding rate.

The contractor shall maintain Filtrexx Ditch Checks in a functional condition at all times and it shall be routinely inspected.

Where the Ditch Check requires repair, it will be routinely repaired.

The contractor shall remove the sediments collected at the base of the Ditch Check when they reach 1/3 of the exposed height of the Ditch Check, or as directed by the Engineer.

The Filtrexx Ditch Check will be dispersed on site when no longer required, as determined by the Engineer. The netting material will be disposed of in normal trash containers ore removed by the Contractor.

For projects requiring Ditch Checks to be left in place, no removal of compost or netting is required.

- S. "Filtrex" Compost Blankets will be placed at locations indicated on the contract plans as directed by the engineer. Unless otherwise specified, Filtrex Compost Blankets should be installed at a minimum depth of 2". Depth requirements are indicated on the contract drawings.

Filtrex Compost Blankets may be seeded at time of installation for establishment of permanent vegetation. The Engineer will specify seed requirements.

Filtrex Compost Blankets are not to be used in direct flow situations or in runoff channels.

If required, combining Filtrex Compost Blankets with Filtrex Filter Socks or Filter Berms may offer additional protection from slopes that have heavy run-off water. In these situations, Filtrex Filter Socks, Filter Berms and Compost Blankets may be used in combination.

The Contractor shall maintain the Filtrex Compost Blanket in a functional condition at all times and it shall be routinely inspected.

Where the Compost Blanket fails, it will be routinely repaired.

The Filtrex Compost Blanket will be seeded on site, at rates and seed types as determined by the Engineer. Once vegetation is established, final seeding is not required.

- T. Silt Sacks shall be installed in existing or proposed catch basins. Remove the grate and place the sack in the opening. Hold out approximately 6 inches of the sack outside the frame. Replace the grate to hold the sack in place.

The Silt Sack is considered full and should be emptied when the restraint cord is no longer visible. To remove the Silt Sack, take two pieces of 1" diameter rebar and place through the lifting loops on each side of the sack to facilitate the lifting of the Silt Sack.

To empty the Silt Sack, place it where the contents will be collected. Place rebar through the lifting straps (connected to the bottom of the sack) and lift. This will turn the Silt Sack inside out and empty the contents. Clean out with a shovel and rinse. Return the Silt Sack to its original shape and place back in the basin.

- U. Temporary Seeding shall be applied by any agronomically acceptable procedure. The rate of application shall be no less than 220 pounds per acre. Fertilizer conforming to M.13.03 of the State of Connecticut Department of Transportation, Standard Specifications for Roads, Bridges and Incidental Construction, Form 814A, shall be applied at a rate of 320 pounds per acre during seeding.
- V. Temporary erosion control systems installed by Contractor shall be maintained as directed by Owner to control siltation during life of contract. Contractor must respond to maintenance or additional work ordered by Owner within 24 hours.
- X. Permanent Seeding shall be applied in accordance with Section 02931 Lawn.
- Y. Removal and Disposal of all erosion and sediment controls, temporary structures, haybales, filter fabric, silt fences, stakes, etc. as areas are accepted and stabilized and as approved by Owner and governing agencies.

END OF SECTION 02115