

Section 01574

TRAPPING SEDIMENT IN CHANNELIZED FLOW

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Installation of reinforced filter fabric barriers, sandbag barriers, stone outlet sediment trap, excavated earth outlet sediment trap, embankment earth outlet sediment trap, sediment basin with pipe outlet and sediment basin with stone outlet for erosion and sediment control used during construction and prior to final development of site. Reinforced filter fabric barriers are used to retain sedimentation in channelized flow areas.

1.02 UNIT PRICES

- A. Measure and pay for reinforced filter fabric barrier by linear feet of completed and accepted filter fabric barrier between limits of beginning and ending steel fence posts.
- B. Measure and pay for sandbag barrier by linear feet of completed and accepted sandbag barrier between limits of beginning and ending of sandbags.
- C. Measure and pay for stone outlet sediment trap is on unit price basis for each completed and accepted stone outlet sediment traps.
- D. Measure and pay for excavated earth outlet sediment trap is on unit price basis for each completed and accepted excavated earth outlet sediment traps.
- E. Measure and pay for embankment earth outlet sediment trap is on unit price basis for each completed and accepted embankment earth outlet sediment traps.
- F. Measure and pay for sediment basin with pipe outlet or stone outlet by square yard of completed and accepted sediment basin.

1.03 SUBMITTALS

- A. Conform to requirements of Section 01330 - Submittal Procedures.
- B. Submit manufacturers catalog sheets and other product data on geotextile or filter fabric's outlet pipe, perforated riser and connectors.

1.04 REFERENCES

- A. ASTM D 698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)).

- B. ASTM D 4491 - Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- C. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- D. ASTM D 6382 - Standard Practice for Dynamic Mechanical Analysis and Thermogravimetry of Roofing and Waterproofing Membrane Material.
- E. Storm Water Quality Management Guidance Manual prepared by City of Tomball and/or Montgomery County.

PART 2 PRODUCTS

2.01 FILTER FABRIC

- A. Provide woven or non-woven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material.
- B. Geotextile fabric: minimum grab strength of 100 psi in any principal direction (ASTM D-4632); Mullen burst strength exceeding 200 psi (ASTM D-3786); equivalent opening size between 50 and 140 for soils with more than 15 percent by weight passing No. 200 sieve and between 20 and 50 for soils with less than 15 percent by weight passing No. 200 sieve; and maximum water flow rate of 40 gallons per minute per square feet (ASTM D4491).
- C. Filter fabric material shall contain ultraviolet inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees F to 120 degrees F.
- D. Representative Manufacturers: Mirafi, Inc., or equal.

2.02 FENCING

- A. Provide woven galvanized steel wire fence with minimum thickness of 14 gauge and a maximum mesh spacing of 6 inches.
- B. Woven wire shall be galvanized 2-inch by 4-inch welded wire fabric, 12-1/2 gauge.

2.03 SANDBAG MATERIAL

- A. Provide woven material made of polypropylene, polyethylene, or polyamide material.
- B. Minimum unit weight of four ounces per square yard.
- C. Minimum grab strength of 100 psi in any principal direction (ASTM D4632)

- D. Mullen burst strength exceeding 300 psi (ASTM D3786).
- E. Ultraviolet stability exceeding 70 percent.

2.04 SANDBAG

- A. Length: 18 to 24 inches. Width: 12 to 18-inches. Thickness: 6 to 8-inches. Weight: 50 to 125 pounds.

2.05 GEOTEXTILE FABRIC WRAP

- A. Provide woven or non-woven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material.
- B. Geotextile fabric: Minimum grab strength of 270 psi (ASTM D 6832) and equivalent opening size specified on Drawings.
- C. Filter fabric material shall contain ultraviolet inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 degrees F to 120 degrees F. Both geotextile and threads must be resistant to chemical attack, mildew and rot.
- D. Representative Manufacturers: Mirafi, Inc., or equal.

2.06 ROCK AND STONE

- A. Use open graded rock with most fines removed.
- B. Rock: Minimum of 3-inches in diameter and less than 2 cubic foot in volume unless otherwise specified. Use clean, hard rocks free from adherent coatings, salt, alkali, dirt, clay, loam, shale, soft or flaky materials, or organic and injurious matter.

2.07 PIPE

- A. Conform to requirements of Section 02642 - Corrugated Metal Pipe for outlet pipe and riser pipe.

PART 3 EXECUTION

3.01 PREPARATION AND INSTALLATION

- A. Provide erosion and sediment control systems at locations shown on Drawings. Construct in accordance with requirements shown on Drawings and of type indicated as specified in this Section.

- B. No clearing, grubbing, or rough cutting permitted until erosion and sediment control systems are in place, other than as specifically directed by City Engineer to allow soil testing and surveying.
- C. Maintain existing erosion and sediment control systems located within Project site until acceptance of Project or until directed by City Engineer to remove and discard existing system.
- D. Regularly inspect and repair or replace damaged components of reinforced filter fabric barrier as specified in this Section. Unless otherwise directed, maintain erosion and sediment control systems until project area stabilization is accepted by City. Remove erosion and sediment control systems promptly when directed by City Engineer. Discard removed materials off site.
- E. Remove and dispose of sediment deposits at designated spoil site for Project. If a project spoil site is not designated on Drawings, dispose of sediment off site at a location not in or adjacent to a stream or flood plain. Assume responsibility for off site disposal. Spread sediment evenly throughout site, compacted and stabilized. Do not allow sediment to flush into a stream or drainage way. If sediment has been contaminated, dispose in accordance with existing federal, state, and local rules and regulations.
- F. Unless otherwise indicated, compact embankments, excavations, and trenches by mechanically blading, tamping, and rolling soil in maximum of 8-inch layers. Compaction density shall be at a minimum of 90 percent Standard Proctor ASTM D698-78 density. Make at least one test per 500 cubic yards of embankment.
- G. Prohibit equipment and vehicles from maneuvering on areas outside of dedicated rights-of-way and easements for construction. Damage caused by construction traffic to erosion and sediment control systems shall be repaired immediately.
- H. Conduct construction operations under this Contract in conformance with erosion control practices described in Section 01572 - Source Controls for Erosion and Sedimentation.

3.02 CONSTRUCTION METHODS

- A. Provide barriers, sediment traps and sediment basins in accordance with Drawing details. Install erosion and sedimentation systems in manner so that surface runoff shall percolate through system in sheet flow fashion and allow retention and accumulation of sediment.
- B. Inspect erosion and sedimentation control systems after each rainfall, daily during periods of prolonged rainfall, and at minimum once each week. Repair or replace damaged sections immediately.

3.03 REINFORCED FILTER FABRIC BARRIER CONSTRUCTION METHODS

- A. Attach woven wire support to 2-inch by 2-inch wooden posts or steel posts (min. of 1.25 lbs. per linear foot and Brinell Hardness greater than 140 spaced maximum 6 feet apart and

embedded minimum of 12-inches. Maximum spacing of 8 feet is allowed when posts are made of hot rolled steel, at least 4 feet long with Tee or Y-bar sections with surface painted or galvanized. Provide safety caps on top of metal posts. Install stakes at slight angle toward source of anticipated runoff.

- B. Trench in toe of filter fabric barrier with spade or mechanical trencher so that downward face of trench is flat and perpendicular to direction of flow as shown on Drawings. Trench shall be minimum of 6-inch by 6-inch. Lay filter fabric along edges of trench. Backfill and compact trench.
- C. Use galvanized 2-inch by 4-inch welded wire fabric for woven wire. Securely fasten filter fabric material to woven wire with tie wires.
- D. Reinforced filter fabric barrier shall have a height of 18-inches.
- E. Provide filter fabric in continuous rolls and cut to length of fence to minimize use of joints. When joints are necessary, splice fabric together only at support post with minimum 6-inch overlap and seal securely.
- F. When used in swales, ditches or diversions, elevation of barrier at top of filter fabric at flow line location in channel shall be lower than bottom elevation of filter fabric at ends of barrier or top of bank, whichever is less, in order to keep storm water discharge in channel from overtopping bank.
- G. Remove sediment deposits when silt reaches depth one-third height of barrier or 6-inches, whichever is less.

3.04 SEDIMENT TRAP CONSTRUCTION METHODS

- A. Use fill material for embankment free of roots, woody vegetation, oversized stones or rocks, or organic or other objectionable matter. Clear, grub and strip area under embankment of vegetation and root material.
- B. Limit of excavation and outlet length and height shall be as specified on Drawings. Use side slopes of 2:1 or flatter.
- C. Maintain minimum of 6-inches between top of core material and top of stone outlet, minimum of 4 inches between bottom of core material and existing ground and minimum of 1 foot between top of stone outlet and top of embankment.
- D. Embed rock minimum of 4-inches into existing ground for stone outlet.
- E. For stone outlet, core shall be minimum of 1 foot in height and in width and wrapped in triple layer of geotextile fabric.

- F. Repair or replace damaged trap components. Redress and replace stone as needed to replenish depleted stone. Remove sediment deposit and restore traps to original dimensions when sediment has accumulated to one-half design depth of the trap or one foot, whichever is less.

3.04 SEDIMENT BASIN CONSTRUCTION METHODS

- A. Do not start installation of sediment basins until permits from governmental agencies, where required, have been obtained.
- B. Use fill material for embankment for pipe outlet free of roots, woody vegetation, oversized stones or rocks, or organic or other objectionable matter. Clear, grub and strip area under embankment of vegetation and root material.
- C. Install stone outlet or outlet pipe and riser as shown on Drawings.
- D. Maintain basin dimensions necessary to obtain required basin volume as shown on Drawings. Repair and replace damaged components of basin.
- E. Remove sediment deposits when design basin volume is reduced by one-third or sediment level is one foot below principal spillway crest, whichever is less.

END OF SECTION