Section 01573

MANAGING OVERLAND FLOW

PART 1 G E N E R A L

1.01 SECTION INCLUDES

A. Installation of erosion and sediment control filter fabric fences, triangular filter fabric fences, straw bale fences and brush berms used during construction and prior to final development of site. Purpose of control fences is to contain pollutants from overland flow. Control fences are not for use in channelized flow areas.

1.02 UNIT PRICES

A. Measure and pay for filter fabric fence by linear foot of completed and accepted filter fabric fence between limits of beginning and ending of wooden stakes.

B. Measure and pay for triangular filter fabric fence by linear feet of completed and accepted triangular filter fabric fence between limits of beginning and ending of wooden stakes.

C. Measure and pay for straw bale barrier by linear feet of completed and accepted straw bale barrier.

D. Measure and pay for brush berm by linear feet of completed and accepted brush berm.

1.03 SUBMITTALS

A. Manufacturers catalog sheets and other product data on geotextile fabric.

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 4355 - Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus).

C. ASTM D 4491- Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

D. ASTM D 4632 - Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

E. ASTM D 4833 - Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

F. Storm Water Quality Management Guidance Manual prepared by City of Tomball and Montgomery County.

PART 2 P R O D U C T S

2.01 FILTER FABRIC

A. Provide woven or nonwoven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material.

B. Geotextile fabric shall have a grab strength of 100 psi in any principal direction (ASTM D4632), puncture strength exceeding 115 psi (ASTM D4833) and 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 soil 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 expected usable life comparable to anticipated construction period. Ultraviolet stability shall exceed 70% after 500 hours of exposure (ASTM D4355).

D. Representative Manufacturers: Mirafi, Inc., or equal.

PART 3 E X E C U T I O N

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 site work 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 erosion and sediment control systems 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 sediment deposits at designated spoil site for Project. If a project spoil site is not designated on Drawings, dispose of sediment off site at location not in or adjacent to stream or floodplain. Assume responsibility for off-site disposal. Spread sediment evenly throughout site, compacted and stabilized. Prevent sediment from flushing into a stream or drainage way. If sediment has been contaminated, dispose of 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. Immediately repair damage caused by construction traffic to erosion and sediment control.

H. Conduct all construction operations under this Contract in conformance with erosion control practices described in Section 01572- Source Controls for Erosion and Sedimentation.

3.02 GENERAL CONSTRUCTION METHODS

A. Provide erosion and sedimentation control systems in accordance with Drawings. Install erosion and sedimentation control systems in manner 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. Remove sediment deposits when silt reaches depth one-third height of fence or 6 inches, whichever is less.

3.03 FILTER FABRIC FENCE CONSTRUCTION METHODS

A. Attach filter fabric to 1-inch by 2-inch wooden stakes spaced a maximum of 3 feet apart and embedded minimum of 8 inches. If filter fabric is factory preassembled with support netting, then maximum spacing allowable is 8 feet. Install wooden stakes at slight angle toward source of anticipated runoff.

B. Trench in toe of filter fabric fence with spade or mechanical trencher so that downward face of trench is flat and perpendicular to direction of flow. V-trench configuration as shown on Drawings may also be used. Lay filter fabric along edges of trench. Backfill and compact trench.

C. Filter fabric fence shall have a minimum height of 18 inches and a maximum height of 36 inches above natural ground.

D. 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 6inch overlap and seal securely.

3.04 TRIANGULAR FILTER FABRIC FENCE CONSTRUCTION METHODS

A. Attach filter fabric to fence structure fashioned from 6 gauge, 6-inch by 6-inch wire mesh, 18 inches on each side as shown on attached drawing. Fabric cover and skirt should be continuous wrapping of fabric. Skirt should form continuous extension of fabric on upstream side of fence.

B. Secure triangular fabric filter fence in place using one of the following methods:

1. Toe-in skirt 6 inches with mechanically compacted material;

2. Weight down skirt with continuous layer of 3-inch to 5-inch graded rock; or

3. Trench-in entire structure 4 inches.

C. If provided, anchor triangular fabric filter fence structure and skirt securely in place using 6-inch wire staples on 2-foot centers on both edges and on skirt, or staked using 18-inch by 3/8-inch diameter re-bar with tee ends.

D. Lap over fabric filter material by 6 inches to cover segment joints. Fasten joints with galvanized shoat rings.

3.05 STRAW BALE FENCE CONSTRUCTION METHODS

A. Bound bales with either wire, nylon or polypropylene rope tied across hay bales. Do not use jute or cotton bindings.

B. Place bales in row with ends tightly abutting adjacent bales. Place bales with bindings parallel to ground surface.

C. Embed bale in soil a minimum of 4 inches.

D. Securely anchor bales in place by 3/8-inch rebar stakes driven through bales a minimum of 18-inches into ground. Angle first stake in each bale toward previously laid bale to force bales together.

E. Fill gaps between bales with straw to prevent water from escaping between bales. Wedge carefully in order not to separate bales.

F. Replace with new straw bale fence every two months.

3.06 BRUSH BERM CONSTRUCTION METHODS

A. Construct brush berm along contour lines by hand placing method. Do not use machine placement of brush berm.

B. Use woody brush and branches having diameter less than 2-inches with 6-inches overlap. Avoid incorporation of annual weeds and soil into brush berm.

C. Use minimum height of 18-inches measured from top of existing ground at upslope toe to top of berm. Top width shall be 24 inches minimum and side slopes shall be 2:1 or flatter.

D. Embed brush berm into soil a minimum of 4-inches and anchor using either wire, nylon or polypropylene rope across berm with a minimum tension of 50 pounds. Tie rope securely to 18-inch x 3/8-inch diameter rebar stakes driven into ground on 4-foot centers on both sides of berm.

END OF SECTION