**Greenville County Technical Specification for:**

# SC-03 SILT FENCE

## 1.0 Silt Fence

## 1.1 Description

Silt Fence is used as a temporary sediment control measure around sites where there will be soil disturbance due to construction activities. Silt Fence consist of filter fabric stretched across posts. The lower edge of the fence is vertically trenched into the ground and covered by compacted backfill. Silt Fence is classified as either without reinforcement or with reinforcement.

## 1.2 Design Requirements

### 1.2.1 General Design Requirements

- Design Silt Fence with an 80% design removal efficiency goal of the total suspended solids (TSS) in the inflow.
- Do not use Silt Fence for concentrated flows greater than 0.5 cfs. Do not place Silt Fence across channels.
- Do not use Silt Fence as Porous Baffles in Sediment Basins or Sediment Traps.
- The Design Aids located in Appendix M may be used to properly design Silt Fence.

Ensure the Silt Fence designs adhere to the following requirements:

- Minimum 80% design removal efficiency goal for TSS
- Maximum Sheet Flow or Overland Slope Length: 100-feet
- Maximum Slope Gradient (perpendicular] to the Silt Fence line): 2H:1V
- Minimum Installed Fence Fabric Height: 18-inches
- Maximum Installed Fence Fabric Height: 24-inches
- Minimum Post Bury Depth: 18-inches
- Maximum Non-reinforced Post and Reinforced Fence Post Spacing: 6-feet

### 1.2.2 Specific Design Requirements

Use standard non-reinforced Silt Fence when the contributing slope is less than or equal to 3% and the design life of the silt fence is less than 6 months.

Use reinforced silt fence when the contributing slope is greater than 3% and the design life of the silt fence is greater than 6 months.

The allowable Silt Fence land slope to allowable flow length ratio is shown in Table 1.

**Table 1: Silt Fence Land Slope to Flow Length Ratio**

| Land Slope | Maximum Sheet Flow Slope Distance to Fence |
|---|---|
| 3% - 5% | 100-ft. |
| 5% - 10% | 75-ft. |
| 10% - 20% | 50-ft. |
| 20% - 50% | 25-ft. |

## 1.3 Materials

Provide material for Silt Fence complying with the requirements of this Specification, on the Plans details, or as approved by the Engineer.

### 1.3.1 Non-reinforced Silt Fence

The non-reinforced Silt Fence system is composed of geotextile filter fabric and steel posts.

#### 1.3.1.1 Steel Posts

Furnish steel posts meeting the following minimum physical requirements:

- Minimum length of five (4) feet.
- Composed of high strength steel with minimum yield strength of 50,000 psi.
- Standard "T" section with a nominal face width of 1.38 inches and nominal "T" length of 1.48 inches.
- Weighs 1.25 pounds per foot (± 8%).
- Painted with a water based baked enamel paint.

#### 1.3.1.2 Geotextile Filter Fabric

Provide a geotextile filter fabric meeting the requirements of Table2.

Ensure the filter fabric is composed of fibers consisting of long chain synthetic polymers composed of at least 85% by weight of polyolefins, polyesters, or polyamides. Ensure that the fibers are formed into a network so that the filaments or yarns retain dimensional stability relative to each other. Do not treat or coat the filter fabric with materials which might adversely alter its physical properties after installation. Do not use fabric with defects or flaws that significantly affect its physical and/or filtering properties.

Provide a filter fabric with a minimum roll width of 36 inches.

Protect the filter fabric with a suitable wrapping for protection against moisture and extended ultraviolet exposure before placement.

**Table 2: Minimum Geotextile Filter Fabric Performance and Physical Requirements**

| Physical Property* | Test Method | Required Value |
|---|---|---|
| Filtering Efficiency Performance* | ASTM D 5141 or Equivalent | 80% Total Suspended Solids (TSS) |
| Tensile Strength | ASTM D 4632 | 90 lbs |
| Ultraviolet Stability (retained strength after 500 hrs of ultraviolet exposure) | ASTM D 4355 | 70% |

*Unless otherwise indicated, numerical values represent the MARV.

### 1.3.2 Reinforced Silt Fence

The reinforced Silt Fence system is composed of steel or other approved posts, geotextile filter fabric, and of 6-inch by 6-inch 14-gage wire mesh. Use steel posts and geotextile materials specified in Section 1.3.1.

## 1.3 Construction Requirements

### 1.3.1 General Installation

- Construct Silt Fence in accordance with the Plans or as approved by the Engineer. Install Silt Fence before major land disturbing activities begin.
- Install Silt Fence across the slope along a line of uniform elevation (perpendicular to the direction of flow).

- Install Silt Fence a minimum 10-feet from the toe of steep slopes to provide sediment storage and access for maintenance and cleanout.
- Do not place Silt Fence across channels.

### 1.3.2 Non-reinforced Silt Fence Installation

1. Excavate a trench approximately four (4) inches wide and eight (8) inches deep and place twelve (12) inches of geotextile fabric into the eight (8) inch deep trench, extending four (4) inches towards the upslope side of the trench.
2. Backfill the trench with soil or gravel and compact.
3. Bury twelve (12) inches of fabric into the ground when pneumatically installing silt fence with a slicing method.
4. Purchase geotextile fabric in continuous rolls and cut to the length of the barrier to avoid joints. When joints are necessary, wrap the fabric together at a support post with both ends fastened to the post, with a six (6) inch minimum overlap.
5. On the downslope side of the trench, install steel posts to a minimum depth of 18-inches. Install posts protrude one (1) to two (2) inches minimum above the fabric, with no more than three (3) feet of the post protruding above the ground.
6. Space posts on a maximum of six (6)-foot centers.
7. Attach fabric to the steel posts using heavy-duty plastic or wire ties that are evenly spaced and placed in a manner to prevent sagging or tearing of the fabric. In all cases, affix ties in no less than four (4) places spaced a maximum of 6-inches apart.
8. Install the fabric to a minimum height of 18 inches and maximum of 24 inches above the ground. When necessary, the height of the fence above ground may be greater than 24 inches.

In areas where conditions warrant, larger posts or reduced post spacing may be required to provide an adequate fence to handle the stress from sediment loading.

Where applicable or as directed by the Engineer, install silt fence checks every 100 feet at a maximum and at low points.

### 1.3.3 Reinforced Silt Fence Installation

1. Excavate a trench approximately four (4) inches wide and eight (8) inches deep and place twelve (12) inches of geotextile fabric into the eight (8) inch deep trench, extending four (4) inches towards the upslope side of the trench.

2. Extend the **6-inch by 6-inch 14-gage wire mesh** into the trench to a minimum depth of eight (8) inches.

3. Backfill the trench with soil or gravel and compact.

4. Purchase geotextile fabric and wire mesh in continuous rolls and cut to the length of the barrier to avoid joints. When joints are necessary, wrap the fabric together at a support post with both ends fastened to the post, with a six (6) inch minimum overlap.

5. On the downslope side of the trench, install steel posts to a minimum depth of 18-inches. Install posts protrude one (1) to two (2) inches minimum above the fabric, with no more than three (3) feet of the post protruding above the ground.

6. Space posts on a maximum of six (6)-foot centers.

7. Attach fabric and wire mesh to the steel posts using heavy-duty plastic or wire ties that are evenly spaced and placed in a manner to prevent sagging or tearing of the fabric and wire mesh. In all cases, affix ties in no less than four (4) places spaced a maximum of 6-inches apart.

8. Install the filter fabric and wire mesh fabric to a minimum height of 18 inches and maximum of 24 inches above the ground. When necessary, the height of the fence above ground may be greater than 24 inches.

### 1.3.4 Inspection and Maintenance

Inspect Silt Fence every seven (7) days and inspections are recommended within 24-hours after each rainfall event that produces ½-inches or more of precipitation until final stabilization is achieved. Immediately correct any deficiencies. Check for sediment buildup and fence integrity. Check where runoff has eroded a channel beneath the Silt Fence, or where the Silt Fence has sagged or collapsed by fence overtopping.

Remove fabric and replace whenever it has deteriorated to such extent that it reduces the effectiveness of the silt fence system. In addition, review daily the location of Silt Fence in area where construction activities have changed the natural contour and drainage runoff to ensure that the Silt Fence is properly located for effectiveness. Install additional Silt Fence as directed by the Engineer where deficiencies exist.

Maintain Silt Fence until its capacity has been reached or erosion activity in the area has been stabilized. Remove sediment accumulated along the fence when it reaches approximately one-third (1/3) the height of the Silt Fence e, especially if heavy rains are expected. Remove trapped sediment or stabilize on site.

If Silt Fence is located in an area where removing the sediment is not possible, install a second Silt Fence, if necessary, at the direction of the Engineer.

Remove Silt Fence within 30 days after final stabilization is achieved or after temporary Best Management Practices (BMPs) are no longer needed. Permanently stabilize disturbed areas resulting from Silt Fence removal.

### 1.3.5 Acceptance

The Engineer will approve all Silt Fence installations.