

2.5 SILT FENCE



Figure 2.10. Silt fence (Source: Iowa DOT)

Overview

Description: A temporary barrier of geotextile fabric (filter fabric) used to intercept runoff from small drainage areas of disturbed soil to allow the sediment to settle out of the runoff water. Silt fences are one of the most convenient control measures to use on all projects that involve soil disturbance.

Problem identification: Exposed soil areas are subject to water erosion and sediment movement during and after storm water events. Materials and methods are required to eliminate soil loss or movement of soil across construction sites from such events.

Design purpose: To trap sediment from sheet flows before it leaves the construction site. Silt fences are effective in trapping sediment from all activities that involve soil disturbance. The fences can be used on adjacent properties, adjacent bodies of water, large sloping areas, near streams and waterways, and near surface drainageways.

Associated practices: Used in conjunction with silt traps and basins, temporary seeding, and ditch checks to limit the amount of sediment that approaches the silt fence.

Installation: Tables 2.2 and 2.3 show the suggested spacing on slopes and in ditches that contribute runoff to a silt fence area.

Table 2.2. Silt fence spacing on slopes

Slope	Placement interval, ft
3:1 (33%)	40
4:1 (25%)	50
5:1 (20%)	60
10:1 (10%)	100
≤ 50:1 (2%)	150

Table 2.3. Silt fence spacing in ditches

Ditch grade, %	Approximate spacing, ft
1-2	150
2-4	75
4-6	40
>6	25

The maximum drainage area flow to a silt fence should not exceed 1/4 acre per 100 ft of fence. Most erosion will occur in the form of sheet erosion, with no concentrated water flow to the fence.

Silt fences should be placed as close as possible to the undisturbed soil.

All filter fabric shall comply with the specifications set forth by the Iowa Department of Transportation.

Steel posts must be used.

Note other control measures, filter strips, and inlet protection.

Maintenance/inspection: Inspect once a week and after each rainstorm; look for undercutting and failures in fabric. Clean and dispose of sediment as necessary; repair water damage and fabric failures at once.

Design Life: Until sediment accumulates to one-half the height of the fence.

Estimated cost: Silt fence: \$2.80 per linear ft.

Instructions for Figures 2.11 and 2.12

The following details describe various methods of silt fence construction that may be required for the control of siltation on a project. The contractor shall be responsible for accomplishing the required silt fence construction work on the project in such a manner as to effectively minimize and control the water pollution that might be caused by soil erosion from the project. These features are intended to be maintained in appropriate functional condition from the initial construction stages to completion of project.

In addition to the details shown in Figure 2.11 and Figure 2.12, other provisions for controlling erosion may be incorporated into the project work.

Steel line posts for the field fence (T-section), exclusive of an anchor plate, shall weigh not less than 1.3 lbs per ft.

All compaction of backfill shall be performed with a mechanical tamper or pneumatic tamper. All compacting equipment shall be operated according to the manufacturer's recommendations.

Installation Notes (numbers match those on Figures 2.11 and 2.12)

1. Secure top of geotextile fabric to steel post (see detail of attachment to post).
2. Fold engineering fabric across the bottom of the trench.
3. Make vertical cut in top fold area of fabric. Pull out and twist cord.
4. Loop cord around post to form a loop. Pull wire through fold area of fabric and secure around post.
5. Steel post to be embedded 28 in. below trench bottom.
6. Minimum trench size should be 12 in. deep by 4 in. wide; compact the backfill.

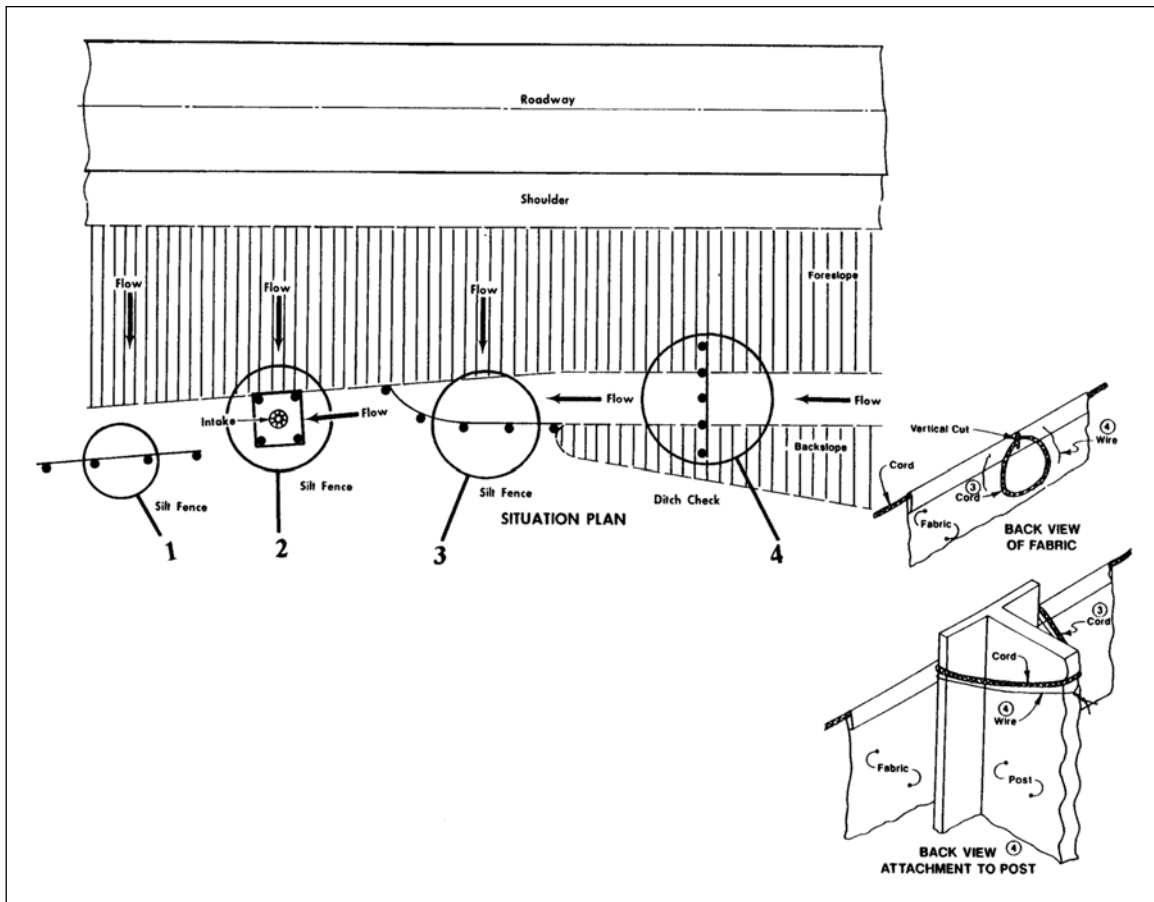


Figure 2.11. Silt fence situation plan (Source: Department of Civil, Construction, and Environmental Engineering, Iowa State University)

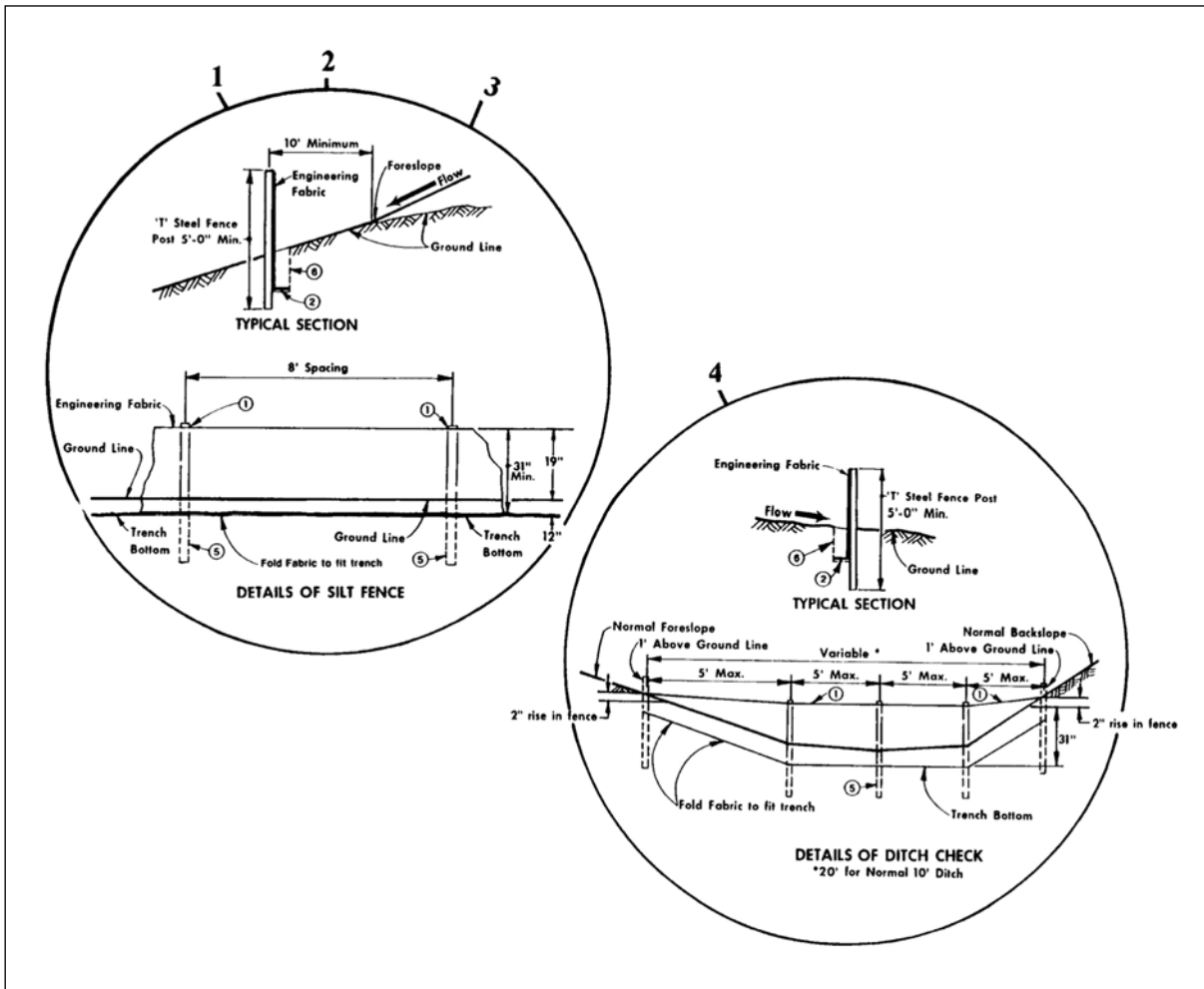


Figure 2.12. Enlargements of number elements in Figure 11 (Source: Department of Civil, Construction, and Environmental Engineering, Iowa State University)



Figure 2.13. Improper silt fence installation (Source: Minnesota DOT)



Figure 2.14. Proper silt fence installations (Source: Iowa DOT)