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TECHNOTES
Silt Fence Design

Sediment Barrier (Silt Fence) – 3 Elements of Design

Introduction "Silt fences" are one of many Best Management Practices (BMPs) that are used to trap sediment and keep it on the construction site. Unfortunately, silt fences frequently demonstrate their ineffectiveness more often than not. This issue of TechNote discusses three "design" considerations that must be considered to have silt fences work effectively and suggests how the design can be improved.

The correct design

The *Manual for Erosion and Sediment Control in Georgia* contains information related to material characteristics and some installation requirements. Beyond that, your design and instructions must clearly tell the contractor how to overcome several installation problems that are found on many construction sites. Typical design problems include 1) layout techniques to encourage surface (sheet) flow, 2) bypassing obstacles such as trees and large rocks, 3) preventing end-around drainage.

1. **Design for effective surface (sheet) flow**

   One of the most important sentences in the *Manual* states: **"**The silt fence is to be used for sheet flow conditions." To create and maintain sheet flow, the silt fence must be installed "on the contour". Any other layout (off-contour) creates a low spot in the silt fence where water and sediment concentrate before spilling over the top or causing the bottom to become unseated.

   Without instructions, the contractor usually installs the fence in a straight line between points A and B as in the plan view of Fig. 1. The elevation view of this same figure shows that water will concentrate at the lowest point "C" in the fence line. The water and sediment overtop the fence at this point and cause further erosion downslope. This is undesirable.

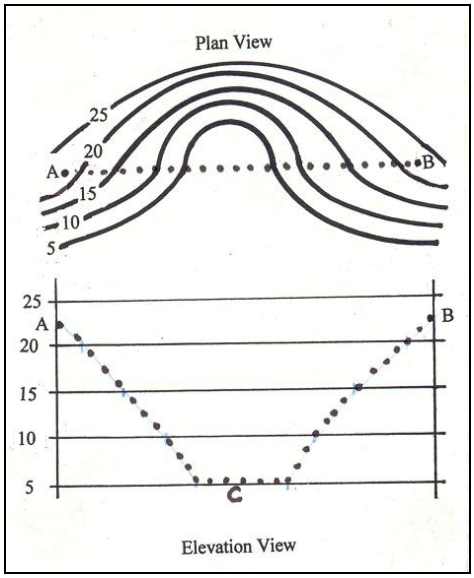

Figure 1
Straight line installation on rolling terrain

Instead, the contractor can maintain the same line, by installing shorter lengths of fence, as in Figure 2a, with the ends turned upslope. A better solution is to follow a path that keeps the fence on the contour, as in Figure 2b.

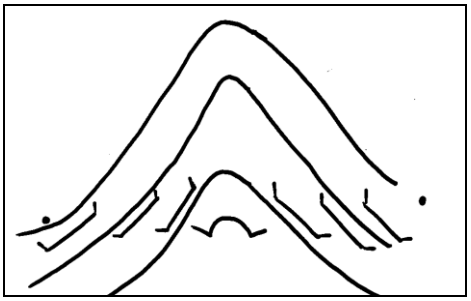

Figure 2a Short lengths of fence (good)

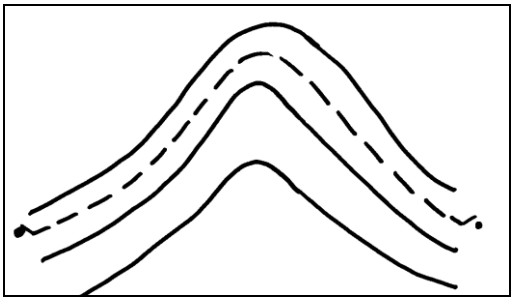

Figure 2b Contour installation (better)

2. Bypassing obstacles

Large rocks, structures or valuable trees must be bypassed. A dip in the fence on the downslope side will create a low spot, where water will again collect and spill over and cause erosion at the foot of the silt fence, as shown in Fig. 1. Either of two approaches can be successfully used. Stop the fence, offset a length, and then resume the original course as in Fig. 3a. Or as an alternative, circumvent the obstacle on the upslope side, Fig. 3b.

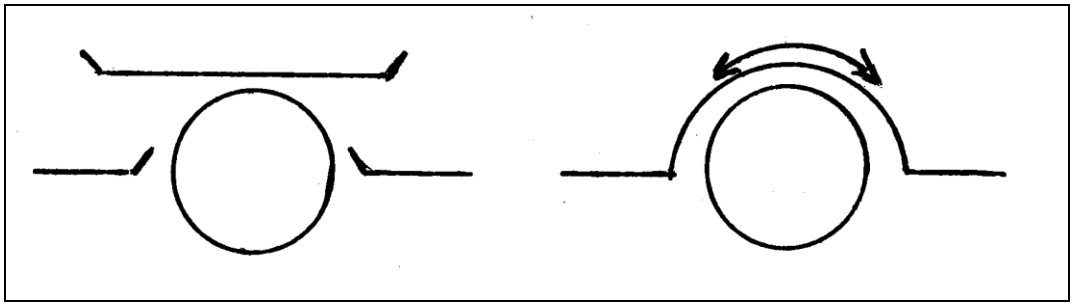

Figure 3a Offset length of fence

Figure 3b Upslope circumvent fence

3. End-around drainage

Even silt fences installed correctly can lead to a situation where sediment builds up behind it and then spills out around the ends, as in Fig. 4a. To correct this problem, redirect the last five feet of material upslope at a 45-degree angle, as in Fig. 4b.

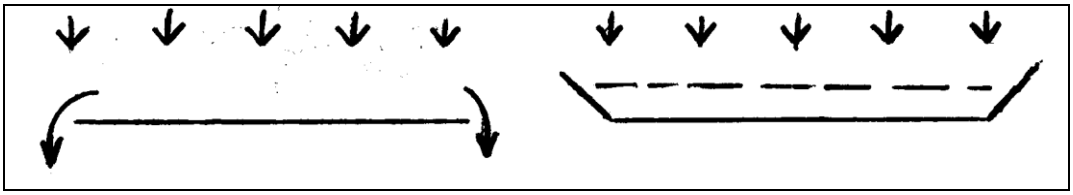

Figure 4a Sediment bypasses fence

Figure 4b Sediment is trapped behind fence