American Excelsior Company®

Curlex® SiltTRAP™ Stops Runaway Sediment from Reaching Streets

Case Study – Curlex® Sediment Control Solutions

Introduction

A housing development encountered significant rainfall shortly after initial site preparation had begun. Most areas were not yet protected with erosion and sediment control Best Management Practices (BMPs) (see Figure 1).

Figure 1: Unvegetated area within a housing development in which erosion and sediment control/revegetation BMPs had not yet been installed.

Project Scope

Construction delays meant that completion of the development was pushed out to the following year. Even so, National Pollutant Discharge Elimination System (NPDES) guidelines mandate implementing measures to minimize the discharge of sediment-laden water from the site onto streets and into nearby storm sewers. A unique type of sediment control BMP was needed to meet these requirements. The BMP chosen would have to prevent sediment loss even though few erosion control BMPs were installed to prevent erosion.

The Plan

Both Curlex® and straw-based buffer strips were installed as sediment control BMPs along the development's street edges and curbsides.

Curlex® SiltTRAP™ buffer strips are made with engineered curled and barbed Great Lakes aspen excelsior (Curlex) fibers that expand when exposed to moisture. These natural mechanical properties allow the fibers to interlock with one another and to the soil surface, giving Curlex SiltTRAP's fiber matrix a high Manning's *n* value. By expanding when wetted and contracting when dried, the Curlex matrix "digs" into the soil, allowing it to absorb rainfall energy and slow sheet flow during hydraulic events while creating a "greenhouse effect" for the seed bed. Curlex SiltTRAP contains QuickGRASS® fibers (green pigment), allowing it to present a clean, finished look until vegetation is established.

Straw-based buffer strips are often installed on flatter areas, but they contain agricultural byproduct fibers that are hollow, straight, and flat. These fibers give the buffer strip a low Manning's *n* (hydraulic roughness) value and bridge over irregularities in the subgrade, leaving it and the seed bed vulnerable to erosive forces. Straw fibers' hollow nature causes them to float during hydraulic events, thereby exposing areas on which the buffer strips were installed to protect. In addition to limited performance capabilities, straw fibers' color does not provide the clean, aesthetically pleasing look that is highly desirable.

Executing the Plan

- Curlex SiltTRAP (see Figure 2) and straw buffer strips were installed to help contain sediment and prevent it from entering the newly paved streets and nearby storm sewers.

Figure 2: Curlex SiltTRAP installed on a street within the development.

Results

- When the area encountered a 1.5” rain event in early September, the Curlex SiltTRAP contained the flow of sediment because of its high Manning’s *n* value (see Figures 3 and 4).

Figure 3: Curlex SiltTRAP installation where sediment was retained within the SiltTRAP and prevented from entering the street.

Figure 4: Curlex SiltTRAP installation that stopped flows of sediment.

Results (Continued)

- Because straw fibers are hollow, straight, and flat, the straw buffer strips provided insufficient protection/sediment control during the rain event (see Figures 5 and 6).

Figure 5: Failed straw buffer strip allowed sediment into the street approximately 14 days after installation.

Figure 6: Failed straw buffer strip installation that was overrun by sediment-laden flows.

Next Steps

- Failed straw BMPs were replaced with Curlex SiltTRAP and its proven performance (see Figure 7). Curlex SiltTRAP installations at the site that prevented sediment from being transported into streets and storm sewers remain in place and continue to work well.

Figure 7: Recently installed Curlex SiltTRAP.