CONCRETE CANVAS® DRAINAGE DITCH

Case Study

PROJECT DETAILS

Project Name	CDOT I-25 South Gap Side Embankment Drainage
Location	Larkspur, Colorado
Date of Installation	August 2022
Contractor | Owner	Kraemer North America | Colorado Department of Transportation
Salesperson	Ryan Anderson
Application/Solutions	Concrete Canvas® used to provide erosion control to flow drainage located on the side of a highway.

THE CHALLENGE

During periods of rainfall, rainwater runoff from the I-25 highway was causing heavy erosion of the slope. The site needed a system to drain runoff water from the highway to the bottom of the slope while preventing the slope from eroding. CDOT wanted a long-term solution to mitigate the issues that required minimal maintenance.

THE SOLUTION

Concrete Canvas® (CC) was used to provide erosion control to a ditch used to divert water runoff from the highway.

Two solutions were originally considered to convey the runoff and stop the slope erosion. Embankment Protector Type 3 (pipe) and Embankment Protector Type 5 (paved ditch). However, Type 3 would have required regular maintenance to prevent the pipe from clogging, and Type 5 would have required pre-cast concrete forms and poured concrete to create a solid foundation. Both of these solutions would have also resulted in lane closures on the highway, as the limited access would have made delivery of the materials difficult.

Concrete Canvas® was chosen as the alternative solution due to the speed at which it can be installed, and also because of its minimal need for maintenance. As the location has limited access, having the material in batched roll format eliminated the need to close any lanes on the highway during installation, minimizing disruption.

Completed Concrete Canvas® Installation

PRODUCTS USED

Concrete Canvas® GCCM
(Geosynthetic Cementitious Composite Mat)

– 650 ft² of CCX-M™ Bulk Rolls

THE INSTALLATION

Prior to the Concrete Canvas® installation, vegetation and protrusions were removed, and the channel was regraded to create a solid and uniform surface. Anchor trenches were also excavated at the crests of the drainage ditch. To slow the flow of water coming from the highway, 4" diameter plastic pipes were placed underneath and lined with the canvas every 12' to create check dams, and a small dissipation pond was installed at the end of the drainage ditch to control the final water velocity.

Pre-cut panels of CCX-M™ were brought on-site and laid by hand transversely across the ditch and the installed check dams. The material was then secured through perimetral anchor trenches using anchor pegs and later backfilled with excavated substrate. Each layer was overlapped by 4" in the directional flow of water. Stainless steel screws set at 4" spacings and 2" away from the overlapping edge were used to secure the CC material down. A sealant was used between layers, providing waterproof protection. After securing the Concrete Canvas® material, it was hydrated using a small, portable water tank and hose.

Concrete Canvas® Laid Transversely Across the Channel

Overlapped CC Layers Secured Using Stainless Steel Screws

Concrete Canvas® Secured with Anchor Trenches

Check Dams & Dissipation Pond Covered in Concrete Canvas®

THE RESULTS

A total of 650ft² of Concrete Canvas® was installed, creating a 90' long x 7' wide x 1' deep drainage ditch. The CC installation took less than two days with a six-person team, and the overall project was completed in less than four days. The owner and contractor were impressed with both the speed and ease with which CC was installed and were very satisfied with the final results of the project.

Concrete Canvas® has been successfully installed on several other similar projects/ applications along this same I-25 highway corridor.

Completed Concrete Canvas® Installation

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