

Project Info

-  September 2014
-  CC8™ Bulk Rolls
-  500m²
-  Transverse layers
-  Alsec Valley Contracting, Summit Waterproofing
-  Takhini River area, Whitehorse, Yukon
-  CC installed to provide surface & storm water containment and eliminate water path erosion.



Completed channel

In September 2014, Concrete Canvas® (CC8™ - GCCM) was specified as a channel lining solution in a trial application on Gully Road, intersecting the Takhini River road in Whitehorse, Yukon, the smallest territory in Canada, located in the north-west of the country.

Gully Road carries surface water runoff and precipitation from natural benches on the top (farms), down to an area at river level. Gully Road was constructed through a natural drainage and water is carried by roadway channels and a small natural drainage system to the North West. The natural soils of the area consist of sand and are free from any rocky or angular material, making them prone to erosion. The slopes in the area have previously been re-graded and the channel re-profiled in attempts to mitigate water path erosion. This compromises both the stability of the back slope and the roadway.

As water path erosion begins to undercut the slope, sloughing occurs, creating a temporary damming effect. This damming effect changes water direction and causes erosion to the roadway surface, making it unstable and potentially dangerous. During changeable weather conditions, which cause freezing at night and thawing during daylight hours, there is also potential for frozen slurry to create a damming effect.

The main objectives of the trial were to contain surface and storm water, reduce or eliminate sloughing of the back slope, reduce maintenance, eliminate water path erosion and sloughing of the road surface, and to find and utilise a high-performance, long-term solution.

*Geosynthetic Cementitious Composite Mat



Condition of slope prior to installation



Sand-based substrate in the area was prone to erosion



CC8 was cut to length and laid transversely



CC edges were captured in a large anchor trench which was later backfilled



Hydration



Completed channel trial installation



Completed installation

The client had previously tried rip-rap, gabions, shotcrete and vegetative methods to control erosion and sloughing on the site, but these had all led to failure. The chosen solution for this trial had to accommodate road maintenance, and would have to facilitate the engineering of a significant anchor trench in order to ensure catchment surface and runoff water.

The flexibility of CC combined with its ability to accommodate high flow velocities made it uniquely able to meet the conditions required for this project. Other flexible channel lining materials were unable to withstand the flow velocity of this channel and would be susceptible to damage in this environment. CC was chosen due to its ability to contain and direct the surface and storm-water successfully, as well as being easier and more economical to install.

An area was selected to install and observe the overall suitability and performance of the CC during melt conditions. In preparation for the installation, vegetation was removed from the substrate and the slope re-graded to 1:1. The channel was then re-profiled. The CC was deployed using a transverse layup with a 100mm overlap in the direction of flow. Overlapped lengths of the CC were jointed with 22mm screws at intervals of 300mm. The outside edges of the material were captured in an anchor trench and fixed using spikes.

The project was completed by a team of three in just 8 hours. Since installation, the client has observed no migration or damage to the CC and no undermining or erosion of the substrate below. Water is travelling within the confines of the lined portion of the channel as designed.

The CC material for this project was provided by Concrete Canvas Ltd's sales and distribution partners in Canada, Nuna Innovations Inc. (where the material is referred to as Concrete Cloth). Nuna helped the client achieve all of their project goals. In addition to successful water and erosion management, CC has also provided significant cost savings and will greatly reduce the required annual maintenance, providing further opportunity to reduce expense.