



Banff Legacy Trail Flood Repairs



Engineer recognizes using ArmorFlex® would provide cyclists with a safe, grassy slope compared to hard rock.

LOCATION:

Banff, Alberta

PRODUCT:

ArmorFlex®

PROJECT PARTNERS:

Owner

Parks Canada

Consultant

Parks Canada

Contractor

Guenther's Landscaping Ltd.

Completion Date

September 2014

THE NILEX ADVANTAGE:

CO₂ Saved

208 tonnes

Banff Legacy Trail is a 22.3 km long, three meter wide paved pathway that runs parallel to the Trans-Canada Highway and spans from Banff Park East Gate to the Bow Valley Parkway. Legacy Trail also connects Banff to Canmore, Alberta as part of an extended trail referred to as the Rocky Mountain Legacy Trail. In June 2013, southern Alberta experienced heavy rainfalls

which resulted in a one-kilometer section of the Banff Legacy Trail pathway being washed out by Cascade Creek — a spillway channel for Lake Minnewanka.

Challenge

As part of the project to rebuild the Banff Legacy Trail pathway, Parks Canada wanted to re-establish the creek's banks and build the three meter wide pathway to withstand a 100-year storm event while providing a safer route for cyclists.

The original design consisted of large, one-meter thick, rock armor to be placed on 2:1 side slopes at an average length of 4.5 meters. This would create three challenges. First, the design had the trail elevated one meter higher than before which would result in the toe of the slope reaching two meters further into the channel. The rock armor would further constrict the channel leading to an increased depth and velocity during a high flow event. Second, the riprap required would be costly and difficult to obtain due to the ongoing flood rehabilitation efforts throughout southern Alberta. Lastly, in the unfortunate event a cyclist was to fall off the trail they would be at an extremely high risk of injury when crashing into large rock armor.



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Solution

Nilex proposed ArmorFlex, an articulating concrete block revetment system, as a stable economical alternative to rock armor. The ArmorFlex system was able to conform to the 2:1 side slope identified in the original design and, due to its lower profile, provided the creek far less constriction, permitting water to flow at a lower velocity and shallower depth in the event of a flood. In comparison to the rock alternative, the open cell ArmorFlex blocks also allowed for vegetation establishment making it safer for cyclists while providing habitat for local species. As per the original design, a software analysis provided by Nilex supported that ArmorFlex would provide stability for a potential 30 m³/sec flow rate expected to occur in the event of another 100-year flood event.



Installation

Using an excavator, the contractor continually excavated the side slopes of the channel while simultaneously placing ArmorFlex mats using a spreader bar. The installation of approximately 30 meters of ArmorFlex mats was completed each day. In total, 325 ArmorFlex mats were installed requiring only 24 truckloads to site.

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In comparison, the riprap design would have required over 200 truckloads increasing the environmental impact and construction time.

Upon completion, approximately two inches of topsoil was placed over the entire area of AmorFlex and hyrdomulch was then applied to establish vegetation.



Results

Using Nilex's Innovation Calculator, it was determined that the ArmorFlex solution provided a CO₂ savings of 208 tonnes by eliminating the need for mining, processing, hauling and placing Class 2 riprap. The client also received substantial savings on material and transportation costs alone. The ease with which the ArmorFlex mats are placed allowed the contractor to complete the project ahead of schedule and with the ability to vegetate, the ArmorFlex solution will provide enhanced aesthetics and a safer terrain for cyclists while allowing a natural habitat for wildlife. In the end, Nilex was able to provide Parks Canada with a safer, economical and easier to install alternative to riprap.

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