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Fairmont Creek 2016 Annual Dike Inspection Report

Background

Fairmont Creek experienced a significant debris flow event on July 15, 2012 which deposited approximately 65,000 m^3 of debris in the creek channel, over the debris fan and along subdivision roadways and drainage ditches. Disaster Financial Assistance funds were used to reconstruct the previously existing section of dike and protected bank just below Marble Canyon. This work was completed by April 2013. In addition to reconstructing the creek channel and protecting the bank, a series of nine grade controls were constructed along this section. The engineering consultant for this work was Kerr Wood Leidal and the contractor was Max Helmer Construction.

After the 2012 debris flow, Emergency Management BC (EMBC) funds were obtained to have a debris flow hazard and risk assessment completed on Fairmont Creek. Clarke Geoscience was retained for the assessment. It was completed in January 2013 and included a series of recommendations that could be implemented to help mitigate debris flow risk.

On June 20, 2013, Fairmont Creek experienced another debris flow event caused by a significant rain event on saturated soils. The magnitude of this event was approximately 6,000 m^3 and the material was mostly contained in the channel and the golf course pond. The golf course pond, a few sites along the creek channel and material impacting the time share condominiums were cleaned out and repaired through EMBC Emergency Response funding. The newly constructed bank protection was not damaged in the event but six of the nine grade controls were significantly damaged or completely destroyed.

The RDEK commissioned an overview inspection of Fairmont Creek following the 2013 event. The inspection and report was funded through EMBC, and was completed by Clarke Geoscience. The inspection was attended by Dwain Boyer, Deputy Inspector of Dikes for the Kootenay Region and Jim Maletta, RDEK Engineering Technician. The inspection occurred on July 29, 2013 and confirmed the findings of the January 2013 Debris Flow Hazard and Risk Assessment, which states that unlimited material available for mobilization exists in the Fairmont Creek watershed and can mobilize given the right conditions.

In 2014, the RDEK was awarded funding through the Building Canada Fund Flood Protection Program for Phase 1 of the Fairmont Creek Debris Flow Mitigation Project. Engineering for this work was completed in Fall of 2014 and construction was completed in early May 2015. The project included widening the creek through the golf course to the pond in order to increase storage capacity. The banks were sloped appropriately and armoured and berms were constructed on both sides of the creek to further contain material in the event of a debris flow. The engineering consultant for this work was Urban Systems and the contractor was Max Helmer Construction.

In 2016, the RDEK was awarded additional funding through the EMBC Flood Protection Program in order to complete Phases 2 and 3 of the Fairmont Creek Debris Flow Mitigation Project. Phase 3 consists of the installation of a weather station at the ski hill and was completed in November. The weather station will be used to develop an early warning system for the community. Phase 2 will involve the construction of a large debris retention structure (berm with a culvert and trash rack) upstream of the Fairmont Hot Springs Resort. Construction is planned for Summer and Fall of 2017. The engineering consultant for this work is Northwest Hydraulic Consultants and the contractor has not yet been selected.

Provincial Flood Protection Works Database Information

The Provincial Flood Protection Works Database Information available online is outdated. The information sheet is included with this report and should be updated as shown.

April 20, 2016 Fairmont Creek Dike Inspection

The inspection was completed on April 20, 2016 and was conducted by Kara Zandbergen, RDEK Engineering Technician. All sections of the dike were found to be in good condition.

The photos below show the works beginning at the debris pond at the downstream extent of the system and continuing upstream. All photos were taken on April 20, 2016.

Photo 1: Downstream extent of the dike and bank protection works at the entrance to the debris pond.

Photo 2: Looking upstream from the pedestrian bridge on the previous photo.

Photo 3: Photo of the widened section of the channel looking upstream.

Photo 4: Cart Path Bridge at the upstream end of the golf course section of the channel.

Photo 5: Right bank berm. Picture taken from the cart path bridge.

Photo 6: Left bank berm and widened channel. Picture taken from the cart path bridge.

Photo 7: Tie in of Phase 1 to the DFA repairs upstream of the cart path bridge.

Photo 8: Upstream extent of the DFA works and bank protection.

Upstream Conditions

The section of Fairmont Creek immediately above the bank protection works is experiencing minor bank erosion that could be caused by water surges from flushing the Fairmont Hot Springs Resort (FHSR) large swimming pool into Fairmont Creek. The volume of water released is significant over a short period of time and could be weakening the bank structure that could result in added material generated in a debris flow.

Downstream Conditions

The Ministry of Transportation and Infrastructure (MoTI) has increased the culvert capacity at two locations along Fairmont Creek:

1. At the creek crossing of Columbia River Road
2. At the creek crossing of Fairmont Creek Road

Both locations have had larger and twinned culverts installed. All culverts were in proper working order at the time of inspection.

Maintenance

There were no maintenance activities completed or required on the Fairmont Dike in 2016. At this time, there are no maintenance activities planned for 2017, however if conditions change, the RDEK will adjust accordingly.