



Fairmont Creek Annual Dike Inspection

Introduction

Fairmont Creek experienced a debris flow event on Sunday July 15, 2012 which deposited 65,000 m³ of debris in the creek channel, debris fan and along rural subdivision roadway drainage ditches. The dike structure protected the NES191 Fairmont Ridge Strata development from significant damage and potential injury or death of residents. The condition of the dike/bank protection was unknown as it was covered in mud, large rocks, cobble, trees and other wood debris. The Regional District of East Kootenay applied for Disaster Financial Assistance – Recovery funding for the reconstruction of the dike infrastructure. Excavation of the debris revealed the dike rip rap material had been peeled away by the debris flow and a complete reconstruction of the dike/bank protection infrastructure was required. The work was substantially complete on April 19, 2013 with a formal inspection of the works on April 24, 2013. Kerr Wood Leidal is the consultant on the project, with Max Helmer Construction out of Invermere as the contractor. The creek channel was reconstructed with 9 grade controls over the length of the dike/bank protected section with 2 additional grade controls above the dike area. The creek had established a different channel after the event, but with the reconstruction of an engineered section of channel the creek was returned to the original channel once the dike/bank protection was completed. A plug was placed in the temporary channel to direct the flow back to the original channel.

The plug and grade controls are in excellent condition after approximately 6 weeks of water flow against and over them. The nearby Fairmont Hot Springs Resort (FHSR) has a large swimming pool approximately 800 m above the works. FHSR will flush the pool on a regular basis and create a surge of flow through the creek, the surge leaves a high water mark along the bank that could be considered representative of freshet flow conditions. Before and after event photos are provided in this inspection report and periodic monitoring of the site is conducted by the RDEK staff.

Inspector of Dikes Information

The following information has been extracted from the April 19, 2013 Inspector of Dikes (35050-20 Mailout, 35050-20/IOD Dike Files), Annual Dike Inspection Reporting and the 2013 Spring Freshet letter.

Watercourse	Fairmont Creek	Structure Type	Dike
Watercourse 2	Cold Spring Creek	Ancillary Works	Log Crib Wall
GPS Number	52	NAD 83 Map Number	82J031/032
Dike Name	Fairmont Hot Springs	Floodplain Maps	N/A

Regional District of East Kootenay

Region	Kootenay	UTM Northing	5 575 5
		UTM Easting	11U 581 742
		Geographic Feature	Riverine
		Type of Flooding	Spring Freshet
		Local Authority Under EPA	East Kootenay Regional District

Fairmont Creek Inspection

The inspection occurred over 2 days, April 24, 2013 at 9:00 am and May 29, 2013 from 10:00 am to 10:45 am and 2:45 pm to 3:30 pm, conducted by RDEK engineering technician Jim Maletta.

Weather Conditions:

- April 24, 2013 Clear and approximately 10⁰ C, the inspection also served as a substantial completion inspection for a Disaster Financial Assistance Recovery Project.
 - Grade controls functioning as designed
 - Plug unaffected by water flow
 - Fairmont Hot Springs Resort pool flush creates a surge in water flow in the creek and has placed a visible high water mark on the creek bank
 - Some minor bank erosion occurring above the dike/bank protection area
- May 29, 2013 morning, mostly clear and 12⁰ C, afternoon, partially overcast and 21⁰ C
 - Grade controls in good condition
 - Plug unaffected by water flow
 - Pool flush high water mark evident
 - Some minor bank erosion above dike/bank protection works
 - Calcification in creek channel beginning to re-establish in the recently repaired original channel
 - Creek channel above the dike and bank protection works to the campground road in good condition
 - Campground road culvert in good condition
 - Culverts below the works were inspected for obstructions and the culvert inlet under Fairmont Creek Road has some cobble and gravel deposition in front of it causing a partial restriction. MoTI has been informed of the issue



May 29, 2013 Dike/Site Conditions



Post Debris Flow Event July 19, 2012 Dike Site Conditions



Pre-Debris Flow Event May 11, 2012 Site Conditions

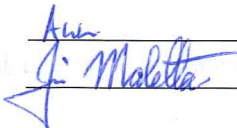
Summary

The RDEK has been in regular communication with the regional Deputy Inspector of Dikes regarding design, construction and project completion for the Fairmont Creek Disaster Financial Assistance – Recovery Project and the re-construction of the dike/bank protection works for dike name Fairmont Hotsprings Resort. A log crib wall exists beneath the past and current works. Prior to the July 15, 2012 debris flow event a log crib wall existed below the dike/bank protection works but has been replaced by the Fairmont Hotsprings Resort with a natural rock, creek bank rock wall.

The RDEK performs regular monitoring of the newly constructed dike/bank protection and has submitted an expression of interest application to Emergency Management BC for improvement to the creek channel below the dike/bank protection as a phased approach to debris flow mitigation. The mitigation measures have been recommended in the Clarke Geoscience/Golder And Associates Fairmont Creek Debris Flow Hazard and Risk Assessment.

Report completed by RDEK Engineering Technician, Jim Maletta, ASCT.

2013 DIKE INSPECTION CHECK LIST

Dike Name (From database)	FAIRMONT HOTSPRINGS RESORT	GPS No. (database)	52
Water Courses	FAIRMONT CREEK	Dike Section	
Water Course 2	LOW SPRING CREEK	Inspected	AW
Date Inspected	APRIL 24 / MAY 29, 2013	Signed	

Please also refer to "Flood Protection Works Inspection Guide" from March 2000 for a detailed guide to dike inspection and reporting, available at:
http://www.env.gov.bc.ca/wsd/public_safety/flood/pdfs_word/fld_prot_insp_gd.pdf

	YES	NO	N/A
1. Is there any obstruction, deterioration or damage to dike access? (access routes, ramps, and gates)		X	

Location(s): ACCESS OFF OF FAIRMONT DRIVE

Summary of Issues:
NONE

Maintenance Recommendations:
NONE

When will Recommendations be Completed: NONE

Supplemental Photos & Descriptions Attached – Section 1

	YES	NO	N/A
2. Is there any deterioration or damage to the following?			

- Dike Crest and slopes (ruts, loss of surfacing material, obstructions, slumping, cracking)

	YES	NO	N/A
		X	

Location(s): NORTH SIDE OF FAIRMONT CREEK IN MARBLE CANYON SECTION, ADJACENT OR FRONTING STRATA NES 191 FAIRMONT RIDGE

Summary of Issues:
NONE
NEW CONSTRUCTION COMPLETED APRIL 19, 2013

Maintenance Recommendations:
PERIODIC MONITORING OF WORKS

When will Recommendations be Completed: YES

2013 DIKE INSPECTION CHECK LIST

3. Were any of the following serious problems observed? (if yes, please attach a photo or a sketch)

YES	NO	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<ul style="list-style-type: none"> • Seepage (and/or evidence of piping) 	
Location(s): <i>SAME AS PREVIOUS</i>	
Summary of Issues:	
Maintenance Recommendations:	
When will Recommendations be Completed:	

<ul style="list-style-type: none"> • Erosion 	
Location(s):	
Summary of Issues:	
Maintenance Recommendations:	
When will Recommendations be Completed:	

<ul style="list-style-type: none"> • Slumping, cracking, sink holes 	
Location(s):	
Summary of Issues:	
Maintenance Recommendations:	
When will Recommendations be Completed:	

2013 DIKE INSPECTION CHECK LIST

3. Were any of the following serious problems observed? (if yes, please attach a photo or a sketch)

YES	NO	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- Seepage (and/or evidence of piping)

Location(s): SAME AS PREVIOUS

Summary of Issues:

Maintenance Recommendations:

When will Recommendations be Completed:

- Erosion

Location(s):

Summary of Issues:

Maintenance Recommendations:

When will Recommendations be Completed:

- Slumping, cracking, sink holes

Location(s):

Summary of Issues:

Maintenance Recommendations:

When will Recommendations be Completed:

2013 DIKE INSPECTION CHECK LIST

	YES	NO	N/A
<ul style="list-style-type: none"> • Significant flood levels (within free board) within the last 12 months 		✓	
<p>Location(s):</p> <p>Summary of Issues:</p> <p>Maintenance Recommendations:</p> <p>When will Recommendations be Completed:</p>			

Supplemental Photos & Descriptions Attached – Section 3

4. Vegetation Management

<ul style="list-style-type: none"> • Hampers or prevents access? 		✓	
<p>Location(s):</p> <p>Summary of Issues:</p> <p>Maintenance Recommendations:</p> <p>When will Recommendations be Completed:</p>			
<ul style="list-style-type: none"> • Reduces visibility to each toe? 		✓	
<p>Location(s):</p> <p>Summary of Issues:</p> <p>Maintenance Recommendations:</p> <p>When will Recommendations be Completed:</p>			

2013 DIKE INSPECTION CHECK LIST

	YES	NO	N/A
<ul style="list-style-type: none"> • Trees in or near dike (within 2m from toe) with potential for uprooting? 		✓	
Location(s): Summary of Issues: Maintenance Recommendations: When will Recommendations be Completed:			
<ul style="list-style-type: none"> • Multi-year vegetation management plan in place? 		✓	
If not, please discuss how one will be put into place:			

Supplemental Photos & Descriptions Attached – Section 4

Notes on using this Check List:

1. This check list can be used as an outline for your comprehensive report.
2. Use the dike names and GPS Numbers on the provincial database (on web page or as shown on green sheet enclosed with mail out).
3. When referring to specific locations use:
 1. Chainages from the O&M manual drawings,
 2. Major landmarks (roads, bridges, etc.),
 3. And if possible, GPS coordinates.
 4. **Please do not use local property names.**

PLEASE SEE ATTACHED REPORT.

East Kootenay Regional District

Water Course Fairmont Creek
Water Course 2 Cold Spring Creek
GPS Number 52
Dike Name Fairmont Hotsprings Resort
Region Kootenay
Owner/Administrator East Kootenay Regional District
Address 19 - 24th Ave S
City Cranbrook
Province BC
Postal Code V1C 3H8
Contact Person Mr. Jim Maletta
Telephone 250-489-2791
Fax 250-489-1287

Structure Type Dike
Ancillary Works Log crib wall
Structure Length 85 m
NAD 83 Map Number 82J031/032
Floodplain Maps N/A
UTM Northing 5 575 570

UTM Easting 11U 581 742

Service Area

Land Use

Number of Buildings

Infrastructure Protected

Geographic Feature Riverine

Type of Flooding Spring Freshet

Local Authority under EPA East Kootenay Regional District

Regulated under DMA Yes

Notes