

SITE NUMBER AND NAME: S015 Crowsnest Rockfall		HIGHWAY & KM: 3:02, 3.431	PREVIOUS INSPECTION DATE: May 10, 2019	INSPECTION DATE: May 20, 2022
LEGAL DESCRIPTION 14-05-008-05 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5499651 669776		RISK ASSESSMENT: PF: 15 CF: 2 TOTAL: 30	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 4630 (west) & 4630 (east) (Reference No. 70000005)			CONTRACTOR MAINTENANCE AREA (CMA): 26	

SUMMARY OF SITE INSTRUMENTATION: There is no instrumentation at the S015 site. LAST READING DATE: N/A	INSPECTED BY: Chris Morgan (KCB) Laura Assaad (KCB) Roger Skirrow (AT) Alex Frotten (AT)
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PRIMARY SITE ISSUE: Rockfall hazard from debris falling down a ravine into the highway ditch and highway surface.

APPROXIMATE DIMENSIONS: Rock slope is approximately 75 m high, feeding into a ravine approximately 20 m wide.

DATE OF ANY REMEDIAL ACTION: 2016 – a large, reinforced gabion barrier wall was constructed to stop debris from falling onto highway. Used conveyor belts are placed on the upslope side of the barrier to reduce the possibility of barrier wall damage from rock falls. Unknown date – pavement crack sealing.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Longitudinal pavement cracking in the north (westbound) lane		X
Slope Movement		X	Rock falls from the ravine south of the highway and retrogression of erosion gully at top of slope.		X
Erosion	X		Erosion from surface water runoff under concrete barriers at edge of highway		X
Seepage		X	N/A – none observed		X
Culvert Distress		X	CSP culvert from behind the rockfall to the lake is in unknown condition. Rockfall and loose conveyor belt mats are blocking the culvert inlet.	X	

COMMENTS

Overall, there were no significant changes to the site observed during the 2022 inspection.

The are two culverts at the site to stop surface water runoff from undermining the northeast corner of gabion barrier. During the 2022 inspection, the culverts were blocked by fallen conveyor belts and rocks and standing water was observed northeast of the gabion barrier (WP 110) (Photo 2).

The reinforced gabion barrier prevents rockfall in the ravine from impacting the highway and appears to be performing well (Photo 1). The gabion barrier is in good condition, but multiple conveyor belts have been dislodged due to wind exposure or rockfall strikes (Photo 2 and 3).

During the 2022 inspection, rockfall debris was observed building up behind the barrier (Photo 4). The debris should be removed. Mesh on adjacent rock slopes was placed to create safe access for contractors to clean out behind the wall.

The brow of the ravine slope is retrogressing towards the west. During the 2022 site visit, multiple large blocks with the potential of rolling downslope were observed. Goat activity on the rock face also appears to be dislodging gravel and rocks from the ravine. There were multiple sawed-off stumps observed trapped in the mesh.

The mesh base cable has torn away from the mesh in places due to rockfall impacts (Photo 5). The cable has parted in one place, possibly due to a loose joint.

Longitudinal cracking of the pavement in the north (westbound) lane (Photo 6) has been regularly observed at the S015 site. The pavement cracking appears to be increasing in severity over time and has lengthened and widened since the 2019 inspection. The pavement has settled approximately 30 mm.

Maintenance/Repair/Monitoring Recommendations:

- The culverts should be cleared of any debris to allow proper drainage.
- The mesh base cable should be repaired and reattached to the mesh.
- The conveyor belts should be reattached to the gabion barrier to provide protection from rockfalls.
- The longitudinal pavement crack in the north (westbound) lane should be sealed to reduce potential infiltration.
- The site should continue to be inspected every two-years as part of the Southern Region GRMP Section B inspections.

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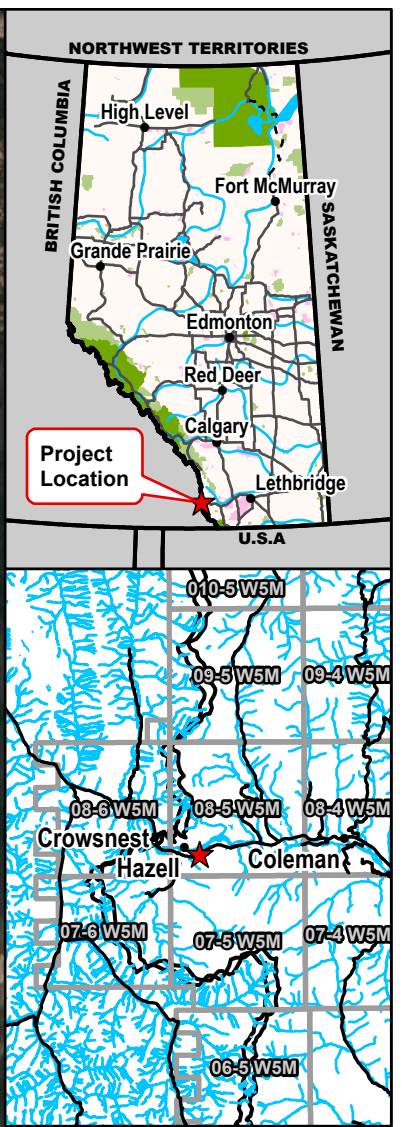
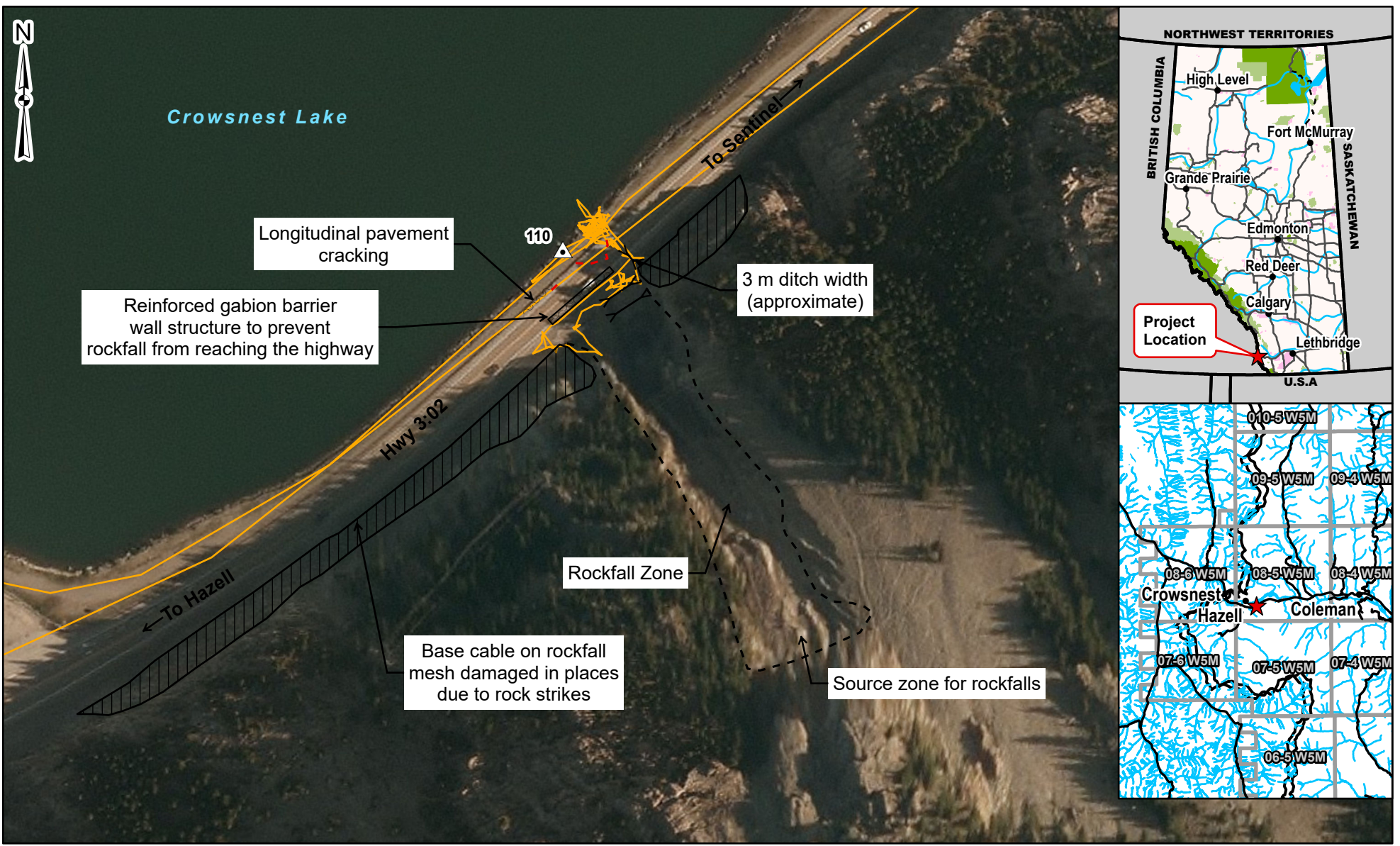
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<p>Chris Gräpel, M.Eng., P.Eng. Senior Civil Engineer, Associate</p>	
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- Legend**
- GPS Waypoint (May 20, 2022)
 - GPS Track (May 20, 2022)
 - Crack
 - Pavement Crack
 - Culvert
 - Rockfall Zone
 - Rockfall Mesh
 - Barrier Wall

NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM ZONE 11N
 3. IMAGE SOURCE: ESRI, MAXAR, EARTHSTAR GEOGRAPHICS AND THE GIS USER COMMUNITY.

CLIENT

0 100 Metres

PROJECT
SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE
Site Plan
S015 - Crowsnest Rockfall
Hwy 3:02, km 3.431

SCALE 1:2,000 PROJECT No. A05116A03 FIG No. 1

Inspection Photographs

Photo 1 Reinforced gabion barrier wall to prevent rockfall from the ravine reaching the highway. Photo was taken on May 20, 2022, facing southeast.



Photo 2 Rockfall material behind the gabion wall is blocking surface water drainage culverts. Standing water near the gabion wall is indicated by red arrow. Photo taken on May 20, 2022, facing northeast.



Photo 3 Rubber mats (indicated by red arrows) on south side of gabion wall have become detached and should be reinstalled to protect gabions from rockfall damage. Photo taken on May 20, 2022.



Photo 4 Debris accumulation behind the barrier needs cleaning out (indicated by red circle). Photo was taken on May 20, 2022, facing northeast.



Photo 5 The base cable of the slope mesh has broken in places due to rock falls inside the mesh (loose ends indicated by red arrows). Proper location of the base a cable is indicated by red dashed line. Photo taken on May 20, 2022, facing east.



Photo 6 Longitudinal pavement cracking in the north (westbound) lane (indicated by red circle). Photo taken on May 20, 2022, facing northeast.

