SOUTHERN REGION GRMP
SITE INSPECTION FORM

SITE NUMBER AND NAME: **S020 Highwood House Rock Cut**	HIGHWAY & KM: 541:02, 0.817	PREVIOUS INSPECTION DATE: May 6, 2019	INSPECTION DATE: **July 7, 2020**
LEGAL DESCRIPTION: 04-33-016-05 W5M	NAD 83 COORDINATES: UTM 11 Northing 5584038 Easting 667795	RISK ASSESMENT: PF: 14 CF: 3 TOTAL: 42	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 280 (west), 290 (east), (Ref. No. 59130)		CONTRACTOR MAINTENANCE AREA (CMA): 27	

SUMMARY OF SITE INSTRUMENTATION: None LAST READING DATE: N/A	INSPECTED BY: Chris Morgan (KCB) Margot Lederman (KCB) Renato Macciotta (KCB) Kristen Tappenden (AT) Alex Frotten (AT)

PRIMARY SITE ISSUE: Rockfall from the rock cutting, large rock block potentially unstable (west end), and soil debris flows due to surface water runoff erosion (gullying) from the brow of the slope.

APPROXIMATE DIMENSIONS: Approximately 150 m length and over 20 m high.

DATE OF ANY REMEDIAL ACTION: Ditches cleaned periodically. Rock debris in the ditch indicates that it has not been cleaned recently.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Rock strike marks on pavement indicates rockfall of 0.1 - 0.3 m diameter (estimate), track marks from heavy equipment on pavement from rockfall removal.		X
Slope Movement	X		Rockfall, rock debris in ditch. Many blocks up to 0.5 m x 0.5 m x 0.5 m.		X
Erosion	X		Weathering coal and shale sub-vertical beds interlayers with less weathered mudstone and sandstone, runoff erosion from brow (gullying).		X
Seepage		X			X
Culvert Distress		X			X

COMMENTS

Rockfall materials are accumulating in the ditch and should be regularly removed from the ditch to maintain storage capacity for future rockfalls. Some rocks noted to have fallen onto and across the highway. The ditch needs cleaning out. No significant changes to the site when compared to 2019.

Loose blocks and boulders up to 0.5 m x 0.5 m x 0.5 m present along the top of the rock slope. Some blocks of rock are within the soil at the brow of slope and are being eroded out and will eventually fall. One large boulder at the brow of western end of the slope, and one smaller boulder midslope are both perched at the crest of the exposed bedrock.

There appeared to be a minor increase in extent of soil erosion at brow of hill, and surface runoff down the slope is leading to erosion and washout of material, which is being deposited in fans at the base of the slope.
Pine trees are present above the rock slope and adjacent to the slope. The trees appear to be Limber Pine or Whitebark Pine.
Recommended Mitigation Measures: <u>Short-Term</u> • Clean rockfall ditch; and • Carry out drone survey including photogrammetric survey and 3D surface model of slope to assess failure modes and volumes. A proposal to complete a photogrammetry survey and rock slope assessment was submitted to AT by KCB in 2019. <u>Long-Term</u> • Regular ditch cleaning; • Rock face scaling, including check scaling of loose blocks (for safety), clearance of trees and loose debris from the brow of the slope, and removal of the large potentially unstable rock blocks on the upper portion of the rock slope (possibly requiring drilling and blasting); • Place rock slope mesh in critical areas to protect road users, leaving gaps for sheep passage; and • Increase the ditch depth/width and evaluate the addition of HTCB or possible barrier wall at the toe of the rock slope (between rock slope and highway).

Legend

- GPS Track (July 7, 2020)
- Top of Slope
- Flow Direction

0 — 100 Metres

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM Zone 11N
3. IMAGE SOURCE: Bing Maps 2020, Microsoft Corporation. Source date September 2013

CLIENT: Alberta

Klohn Crippen Berger

PROJECT: SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
S020 - Highwood House Rockfall Hazard
Hwy 541:02, km 0.817

SCALE	PROJECT No.	FIG No.
1:1,250	A05115A03	1

Time: 17:04:55 PM
Date: August 06, 2020
File: Z:\AIEDM\A05115A03 ABT Southern Region GRMP\400 Drawings\020\02_Section B\MXD\S020_200806.mxd

Photo 1 **Rock slope has a maximum height of approximately 20 m, with continuous joints in an adverse orientation. Photo was taken facing northeast on July 7, 2020.**

Photo 2 **Loose blocks and boulders up to 0.5 m x 0.5 m x 0.5 m present along the length of the rock slope. Note large boulder at crest of slope. Photo was taken facing west on July 7, 2020.**

Photo 3 **Active rockfall - debris fans and large rocks in ditch. The ditch should be regularly cleaned of debris. Photo taken facing northwest on July 7, 2020.**

Photo 4 **Erosion of soil at brow of slope, leading to rockfalls and debris fans in the ditch.**