

SITE NUMBER AND NAME: S003 Cochrane		HIGHWAY & KM: 22:16, 9.875	PREVIOUS INSPECTION DATE: June 8, 2020	INSPECTION DATE: May 27, 2024
LEGAL DESCRIPTION: 06-34-025-04 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5672104 676003		RISK ASSESMENT: PF: 1 CF: 4 TOTAL: 4	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 28340 (north), 22460 (south) (Ref. No. 70000075)			CONTRACTOR MAINTENANCE AREA (CMA): 28	

SUMMARY OF SITE INSTRUMENTATION: 3 functional piezometers and 5 functional slope inclinometers LAST READING DATE: May 8, 2024	INSPECTED BY: Peter Roy (KCB) Chris Grapel (KCB) Renato Macciotta (U of A) Kristen Tappenden (TEC) Alex Frotten (TEC)
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PRIMARY SITE ISSUE: Slope instability affecting northbound lane, approximately 3 m into northbound lane. Landslide appears to be related to seepage and deeper instability located downslope.

APPROXIMATE DIMENSIONS: Embankment slope (within highway boundary) is approximately 10 m high and sloped at 3H:1V. Natural slope below embankment is quite high (over 30 m) and there is a zone of landsliding at the outside bend of the Bow River. Embankment slide area is approximately 50 m by 50 m in area of highway with 4 m to 9 m slide depth.

Sliding below the highway embankment appears to be shallow but has the potential to undermine and exacerbate the sliding at the highway embankment. The valley slope below the main slide area has a slope angle of 70%.

DATE OF ANY REMEDIAL ACTION: in 2023 a H-pile wall was installed downslope of the highway which consisted of 133 piles spaced at 0.7 m centre to centre. Four inclinometers were installed in the H-pile wall. The ditch through the site was reestablished and armoured with riprap.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Increased settlement and cracking on northbound lane and shoulder.	X	
Slope Movement	X		Cracking and settlement on shoulder of highway. Slides observed downslope in wooded area.	X	
Erosion	X		Downslope of highway boundary.	X	
Seepage	X		Downslope of toe roll.		X
Culvert Distress		X	None present.		X

COMMENTS

Pile wall construction and ditch reinstatement completed in November 2023. Slope movement downslope of the pile wall was measured during construction using survey hubs. Most of the movement during construction was approximately at the midpoint of the pile wall and due to construction activities.

Cracking on highway has been patched since completion of the pile wall construction. Patching should continue to be completed as the slope movement attenuates.

Fence across slide zone is deflected, undermined, and tipped over by slope movement.

Shallow failures downstream correspond with runoff areas. Slope movement on the steeper section of the slope (outside of highway boundary) are visible, including tension cracking, erosion scars, and leaning trees. Some sections of the slide are moving faster than others.

The slope inclinometers should continue to be read in the spring and fall annually to measure pile wall movement as it takes up load and begins to stabilize the slope.

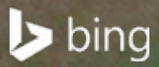
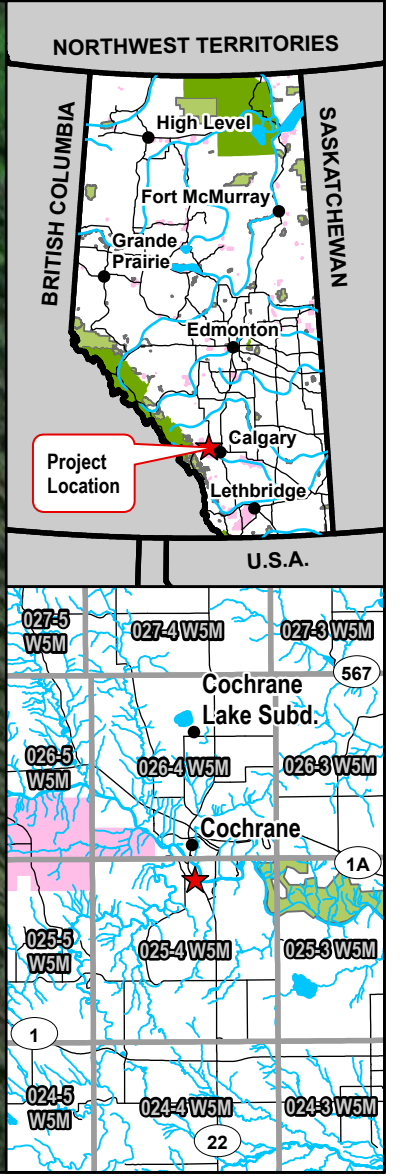
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Peter Roy, P.Eng.
Civil Engineer



- Legend**
- Slope Inclinerometer (SI)
 - ⊗ Vibrating Wire Piezometer (VW)
 - ➡ Flow Direction
 - ⊥ Scarp

NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM ZONE 11N
 3. IMAGE SOURCE: MAXAR 2024

CLIENT

PROJECT SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan S003 - Cochrane Hwy 22:16, km 9.875		
SCALE 1:1,200	PROJECT No. A05116A03	FIG No. 1

Photo 1 South end of the project area with the ditch reinstated with riprap. Photo was taken facing southeast on May 27, 2024.



Photo 2 North end of the project area with the ditch reinstated with riprap. Pile wall installed downslope of ditch. Photo was taken facing northwest on May 27, 2024.



Photo 3 Some voids forming in the pile flanges due to backfill settlement. Photo was taken facing northwest on May 27, 2024.



Photo 4 Pile wall alignment. Some voids forming in the pile flanges due to backfill settlement. Photo taken facing north on May 27, 2024.



Photo 5 Downslope of the pile wall. Fence knocked over from slope movement. Photo taken facing north on May 27, 2024.

