SOUTHERN REGION GRMP
SITE INSPECTION FORM

SITE NUMBER AND NAME: **S002 Priddis**	HIGHWAY & KM: 22:14, 12.595	PREVIOUS INSPECTION DATE: June 9, 2020	INSPECTION DATE: **May 9, 2023**
LEGAL DESCRIPTION: 01-34-022-04 W5M	NAD 83 COORDINATES: UTM 11 Northing 5642606 Easting 678005	RISK ASSESMENT: PF: 7 CF: 4 TOTAL: 28	
AVERAGE ANNUAL DAILY TRAFFIC: 2520 (east) & 2520 (west) (Ref. No. 62187)		CONTRACTOR MAINTENANCE AREA (CMA): 27	

SUMMARY OF SITE INSTRUMENTATION:	INSPECTED BY:
2 functioning slope inclinometers (SI) SI #9 and SI #11 and 3 active vibrating wire piezometers (VWPs). LAST READING DATE: June 2023	Chris Grapel (KCB) Peter Roy (KCB) Renato Macciotta (U of A) Roger Skirrow (AT) Alex Frotten (AT) Maury Siddons (AT)

PRIMARY SITE ISSUE: Pavement cracking at the northwest edge of the highway caused by continued slope movement downslope of a concrete pile wall (unknown date of construction and unknown design details).

APPROXIMATE DIMENSIONS: Landslide zone affecting highway is approximately 90 m long. Slope varies from 3H:1V on the upper half of the slope and 5H:1V on the lower half of the slope. Embankment slope approximately 15 m high.

DATE OF ANY REMEDIAL ACTION: A concrete pile wall was installed along the northwest shoulder of highway in 1992, to stabilize the highway against the ongoing landslide movement. Additionally, a row of gravel columns was installed on the upslope, southeast, side of the highway and two pumps placed in the gravel columns with a water-level-activated switch to turn the pumps on. The pumps are permanently installed but are turned off during winter months. As-built information for repairs is not available. Last pavement overlay was 7 years ago. Patching of the cracking has periodically been completed by the maintenance contractor.

ITEM	**CONDITION EXISTS**		**DESCRIPTION AND LOCATION**	**NOTICABLE CHANGE FROM LAST INSPECTION**	
	YES	NO		YES	NO
Pavement Distress	X		Cracking and settlement of the north shoulder of the road surface was observed, between the guard rail and existing pile wall location. Depth of settlement around piles appears to be about the same in 2020. The pavement cracking at the east end of the slide extends the full width of the highway.		X
Slope Movement	X		There is an active slope failure to the north of the highway in front of the pile wall. Dip in guard rail.	X	
Erosion	X		None noted. Vegetation cover was continuous over the slide area.		X
Seepage	X		Seepage at the toe of the slope, from buried culvert.		X
Culvert Distress	X		Buried culvert appears to be discharging water into small pond at the toe of the slope.		X

COMMENTS
Pavement cracks were patched a few years ago after the previous inspection in 2020, cracking has come though the patches. Cracking should be repaired by the maintenance contractor through patching. Cracking at the east extent of the slide across the highway surface appears unchanged since the previous inspection in 2020.
At the time of the site visit, the pumps in the gravel columns were operational with active discharge. The pumps are permanently installed in the wells and get turned on and off for winter. Ponded water was observed in the upslope ditch, adjacent to the discharge lines from the groundwater pumps.
No obvious increase in slope cracking was noted. Guard rail deflection appears unchanged from the 2020 site visit.
Seepage was noted at the tree line approximately in the centre of the slide upslope of a buried culvert. Seepage reports to a drainage channel, which contains standing water.
There is a culvert to the east of the slide zone which was active and flowing during the site visit. The culvert channel is overgrown and partly filed with sediment. A ditch plug diverts water into this culvert.
New instrumentation covers should be installed on the SIs adjacent to the roadway. The current covers have holes in them that allows sediment to migrate into the instruments, making reading difficult and impacting the ability to accurately read instruments.
The thickness of asphalt on the north shoulder is around 500 mm thick. AT pavement LIDAR could be used to monitor changes in the road surface over several years.
It is understood that Highway 22 at this location is to be twinned at some point in the future.
The nature of the reinforced pile wall should be investigated with the use of wet rotary diamond drilling techniques to identify how deep the piles are. Geophysical methods could be used to assess pile depths and check for the presence of rebar. At least three piles should be located and investigated. The assessment should include drilling boreholes downslope of the pile wall to install two slope inclinometers to allow assessment of the depth of movement downslope of the pile wall against the depth of the pile wall. The impact of turning off the groundwater pumps in the winter should be assessed by placing level loggers in the pump wells and reviewing the data in the spring when the pumps are turned back on.

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PROFESSIONAL ENGINEER PETER J. ROY ALBERTA

13 Oct. 2023
ID 141695

Peter Roy, P.Eng.
Civil Engineer

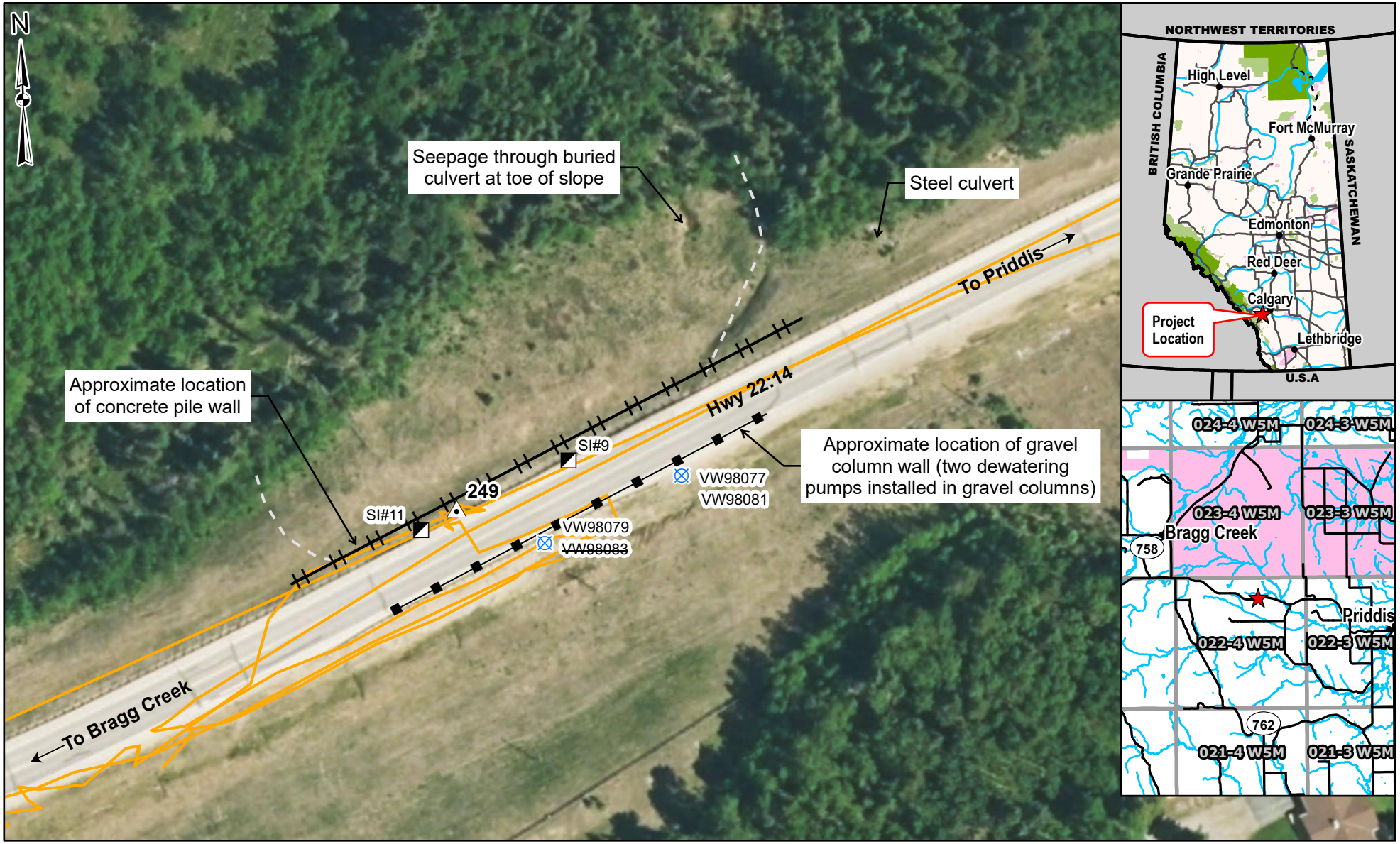
PERMIT TO PRACTICE
KLOHN CRIPPEN BERGER LTD.

RM SIGNATURE: _____

RM APEGA ID #: 187607

DATE: 13 Oct. 2023

PERMIT NUMBER: P009196
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)



Legend

- Slope Inclinometer (SI)
- Vibrating Wire Piezometer (VW)
- GPS Waypoint (May 8, 2023)
- GPS Track (May 8, 2023)
- Gravel Column
- Pile Wall

0 50 Metres

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

CLIENT: Alberta

Klohn Crippen Berger

PROJECT: SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
S002 - Priddis
Hwy 22:14, km 12.95

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

File: Z:\AC\GY\Alberta\A05116A03 ABT Southern Region GRMP\400 Drawings\2023\01_ProFile\Section B\ABT_Southern_SectionB_230713\ABT_Southern_SectionB_230717.aprx Date: Time: Creator: : aharrison

Photo 1 **Pavement distress at the location of the pile wall. Photo taken facing west on May 9, 2023.**

Photo 2 **Cracking at the east extent of the slide on the highway. Photo taken facing west on May 9, 2023.**

Photo 3 **South ditch with pumps shown. Photo taken facing east on May 9, 2023.**

Photo 4 **Cracking and hole in pavement at pile wall location. Photo taken facing east May 9, 2023.**

Photo 5 **Embankment slope north of the highway. Photo taken facing east on May 9, 2023.**

Photo 6 **Ponded water at the toe of the slope. Photo taken facing south on May 9, 2023.**