

SITE NUMBER AND NAME: S008 Fisher Creek Pile Wall		HIGHWAY & KM: 762:02, 2.125	PREVIOUS INSPECTION DATE: May 16, 2022	INSPECTION DATE: May 9, 2023
LEGAL DESCRIPTION: 09-10-21-04 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5627342 678866		RISK ASSESSMENT: PF: 11 CF: 6 TOTAL: 66	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 700 (north) & 1320 (south) (Reference No. 65170 & 60180)			CONTRACTOR MAINTENANCE AREA (CMA): 27	

SUMMARY OF SITE INSTRUMENTATION: 5 slope inclinometers installed into the concrete pile wall. LAST READING DATE: June 12, 2023	INSPECTED BY: Chris Grapel (KCB) Peter Roy (KCB) Alex Frotten (AT) Roger Skirrow (AT) Maury Siddons (AT)
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PRIMARY SITE ISSUE: Settlement of the embankment slope downslope of the existing pile wall by up to 0.85 m, and development of a dip in the pavement north of the existing pile wall.

APPROXIMATE DIMENSIONS: Pre 2017: 130 m long slide area in an earth slope approximately 12 m high (embankment slopes vary from 3H:1V to 4H:1V). Previous reports indicated a sliding plane 5 m below the highway. The landslide was repaired with a concrete pile wall. In 2020, settlement and new pavement cracking was observed north of the previous slide and the site extents have therefore been extended 20 m northwards.

DATE OF ANY REMEDIAL ACTION: January 2017 – a concrete pile wall installed on west side of highway. The pile wall consists of cast-in-place, 1.2 m diameter and 18 m long concrete piles anchored in bedrock. Some piles encountered water bearing sand and gravel that required concrete to be tremied into place. Fall 2017 – pavement was resurfaced and the installation of a HTC.B. Fall 2022 – pavement at the north end of the pile wall was resurfaced.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement cracking is 6 m long and up to 15 mm wide in the northbound lane, approximately 24 m north of the existing pile wall. Cracking showing through new overlay completed in 2022	X	
Slope Movement	X		Slope movement downslope of pile wall and sinkholes at individual pile locations.	X	
Erosion	X		Downstream slope is well vegetated with grass. Erosion is visible between the concrete piles where downstream slope has settled.	X	
Seepage		X	N/A – none observed		X
Culvert Distress		X	N/A – none observed		X

COMMENTS

A high-tension cable barrier (HTCB) is installed along the east (southbound) edge of the highway and extends across the whole length of the pile wall.

The height of the highway embankment is approximately 5 m to 6 m and well vegetated.

During the 2023 inspection, the east (upslope) ditch was well vegetated, dry, and in good condition.

There is negligible movement being recorded in the pile-wall slope inclinometers and no pavement cracking has been observed directly upslope of the pile wall. However, pavement cracking and settlement in the highway approximately 24 m north of the pile wall (15 m north of the HTCB) has been observed since 2020. The previous pavement cracking observed during the 2022 inspection was visible through the asphalt overlay completed in fall 2022.

The pavement cracking and settlement north of the pile wall could indicate the slide has begun to outflank the pile wall.

In 2018, fill on the west side of the highway began settling around the concrete piles, creating tension cracking downslope of the pile wall and some localized sinkholes above the pile wall.

During the 2023 inspection, cracking and settlement of the embankment downslope of the pile wall was visible and the ground surface had dropped by up to 850 mm, creating a ledge that could potentially pond water, leading to increased infiltration.

Surface water runoff has enlarged existing sinkholes at the pile locations and contributed to embankment settlement downslope of the pile wall.

Discussed Remedial Actions:

Short-Term

- The pavement cracks should be sealed to reduce surface water infiltration.
- The voids between the pile walls should be backfilled to reduce infiltration and potential erosion undermining the east (southbound) lane.
- The site should be regularly inspected as part of the Southern Region Section B inspections and instruments read as part of the Section C instrumentation monitoring.
- A borehole should be drilled through the pavement north of the pile wall and a slope inclinometer and piezometer(s) should be installed to monitor movement and groundwater conditions, respectively. A proposal for this work was submitted on December 15, 2022.

Long-Term

- The pile wall could be extended to the north, so the slide doesn't outflank the existing pile wall; or
- Stabilize the highway embankment by excavating and replacing embankment fill with geogrid reinforced granular fill.

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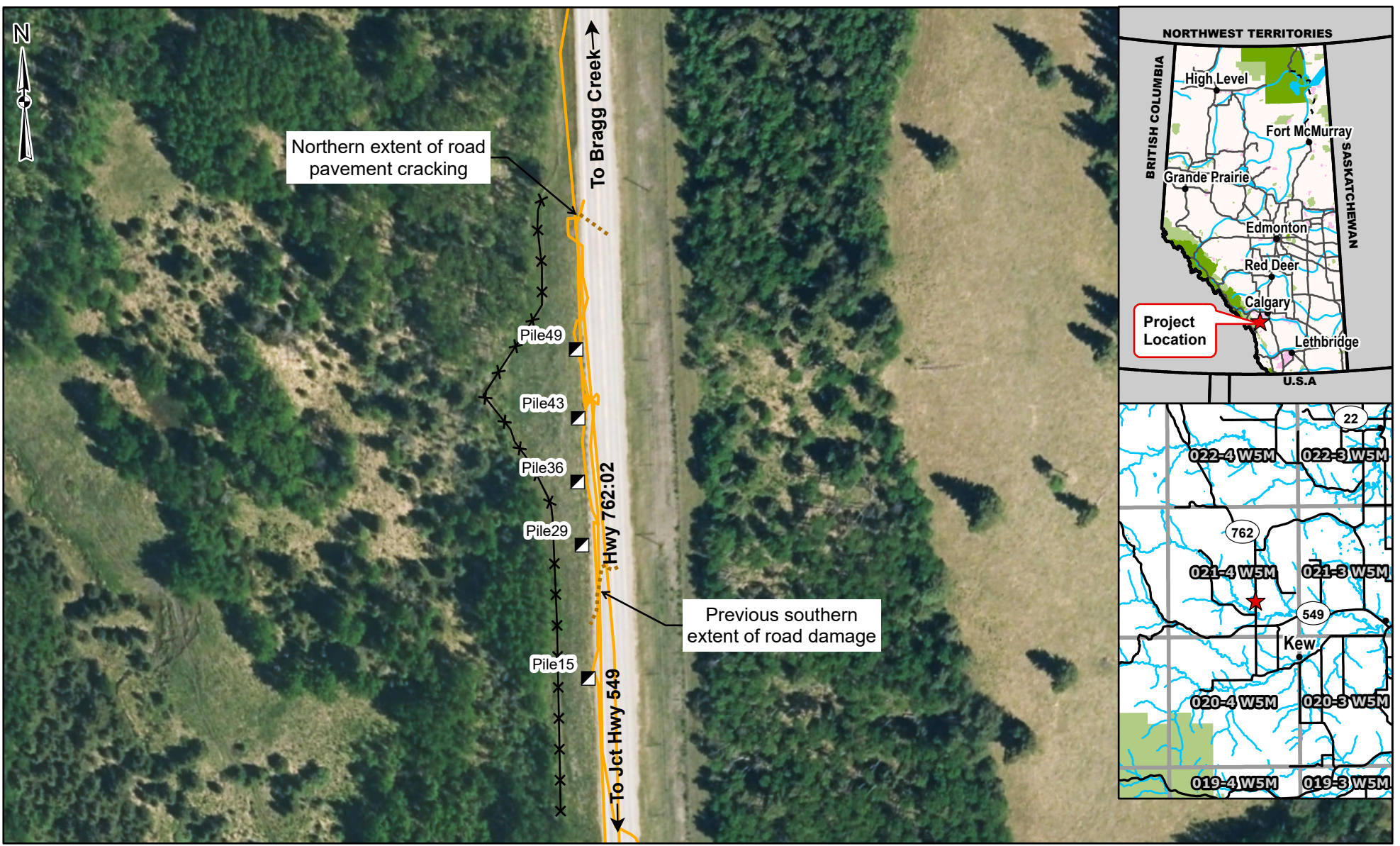
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Peter Roy, P.Eng.
Civil Engineer

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Legend

- Slope Inclinator (SI)
- ✕ Fence
- Cracking
- GPS Track (May 9, 2023)

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

CLIENT




PROJECT SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan S008 - Fisher Creek Pile Wall Hwy 762.02, km 2.125		
SCALE 1:1,500	PROJECT No. A05116A03	FIG No. 1



Photo 1 Pavement cracking north of the pile wall. Cracking through patch installed in 2022. Photo taken facing southeast on May 9, 2023.



Photo 2 South end of pile wall. No slope movement noted. Photo taken facing north on May 9, 2023.



Photo 3 Settlement downslope of pile wall, exposed concrete pile. Photo taken facing north on May 9, 2023.



Photo 4 Settlement downslope of pile wall. Photo taken facing south on May 9, 2023.

