

SITE NUMBER AND NAME: C007 Kenilworth Lake	HIGHWAY & KM: 16:30, 23.89	PREVIOUS INSPECTION DATE: June 24, 2020	INSPECTION DATE: June 28, 2023
LEGAL DESCRIPTION: 11-27-050-04 W4M	NAD 83 COORDINATES: UTM Northing Easting 12 5910761 532907	RISK ASSESSMENT: PF: 2 CF: 2 TOTAL: 4	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 7,420 (west) & 7,560 (east) (Ref No. 137470 & 134470)		CONTRACT MAINTENANCE AREA (CMA): 512	

<p>SUMMARY OF SITE INSTRUMENTATION:</p> <p>Operational: Five slope inclinometers installed along the H-pile wall (two installed in 2015 and three installed in 2021).</p> <p>Inoperable: Two slope inclinometers and two standpipe piezometers installed in 2013.</p> <p>LAST READING DATE: May 8, 2023</p>		<p>INSPECTED BY: James Lyons (KCB) Guerin White (KCB) Rishi Adhikari (TEC) Pramaya Kannel (TEC) Wade Nichol (TEC)</p>
<p>PRIMARY SITE ISSUE: Slope failure of the south highway embankment slope and pavement cracking and settlement in the south (eastbound) lanes. Pavement cracking has continued after pile wall installation.</p>		
<p>APPROXIMATE DIMENSIONS: Approximately 100 m long. The highway embankment/natural slope is approximately 20 m high and sloped at approximately 6H:1V.</p>		
<p>DATE OF ANY REMEDIAL ACTION: 2001 – berm and shear key constructed at toe of failing slope, changing the effective slope angle to 6V:1H. 2015 – H-pile wall constructed at top of failing slope and asphalt overlay constructed on eastbound lanes. 2021 – H-pile wall extension east and west of the 2015 pile wall (extended approximately 62 m east and 15 m west).</p>		

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement cracking and settlement observed in the south (eastbound) shoulder and in the driving lane, extending into the passing lane.	X	
Slope Movement	X		The south highway embankment slope has been slowly moving but movements have appeared to have attenuated.		X
Erosion	X		Settlement of surface materials into voids between the flanges of the H-pile wall are creating sinkholes along the top of the H-pile wall.		X
Seepage		X	N/A – not observed during the 2023 inspection.		X
Culvert Distress		X	N/A – there are no culverts at this site.		X

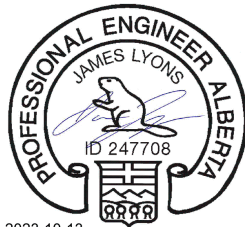
COMMENTS
Instrumentation data indicates that deflection of the pile wall is slowly attenuating (movement rates of approximately 2 mm/year or less in May 2023).
The guardrail along the south (eastbound) lane was extended approximately 65 m to the west between the 2018 and 2019 inspections.
The pavement cracks in the south (eastbound) shoulder and driving lane are approximately 25 mm to 50 mm wide. It appears that a recent (between 2021 and 2023) pavement patch was completed along the site and the cracking has made its way through the pavement patch (Photos 1 through 3).
Ground settlement and cracking (up to approximately 75 mm) (Photo 4) was observed just downslope (i.e., within 2 m to 3 m) of the guardrail in the upper portion of the highway embankment slope. The cracking and settlement were observed downslope of the east and wall pile wall extensions completed in 2021 and can most likely be attributed to the ground/fill settling after construction. A ground crack approximately 26 m long and 50 mm to 75 mm wide was observed during the fall 2020 instrument readings. However, this crack was not found during the 2023 Section B Inspection (may have been obscured by tall vegetation or closed itself between the fall 2020 readings and 2023 inspection).
The vegetation on the highway embankment slope was tall during the site inspection, potentially obscuring evidence of recent slope movement (e.g., slope deformation, settlement, cracking, etc.).
The sinkholes along the top of the 2015 H-pile wall have been filled repeatedly with sand and gravel. However, sinkholes have continued to form at the pile locations (both the 2015 pile wall and 2021 pile wall extensions) as the fill near the top of the piles continues to settle.
<u>Maintenance/Repair/Monitoring Recommendations:</u> <ul style="list-style-type: none"> The site should be regularly inspection by the Highway Maintenance Contractor (HMC) and sand and gravel should be added to the sinkholes above the H-pile wall as voids are observed. The site should continue to be inspected once per contract as part of the Central Region GRMP Section B inspections.

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2023-10-13

James Lyons, P.Eng.
Civil Engineer

Inspection Photographs

Photo 1 Asphalt cracking observed in the south (eastbound) travel lane and shoulder of Hwy 16:30, upslope of the H-pile wall and guardrail. Photo taken June 28, 2023, facing east.



Photo 2 Asphalt cracking and settlement observed in the south (eastbound) lane. Asphalt cracking appears to have extended through a recent asphalt patch between 2020 and 2023. Photo taken June 28, 2023, facing west.

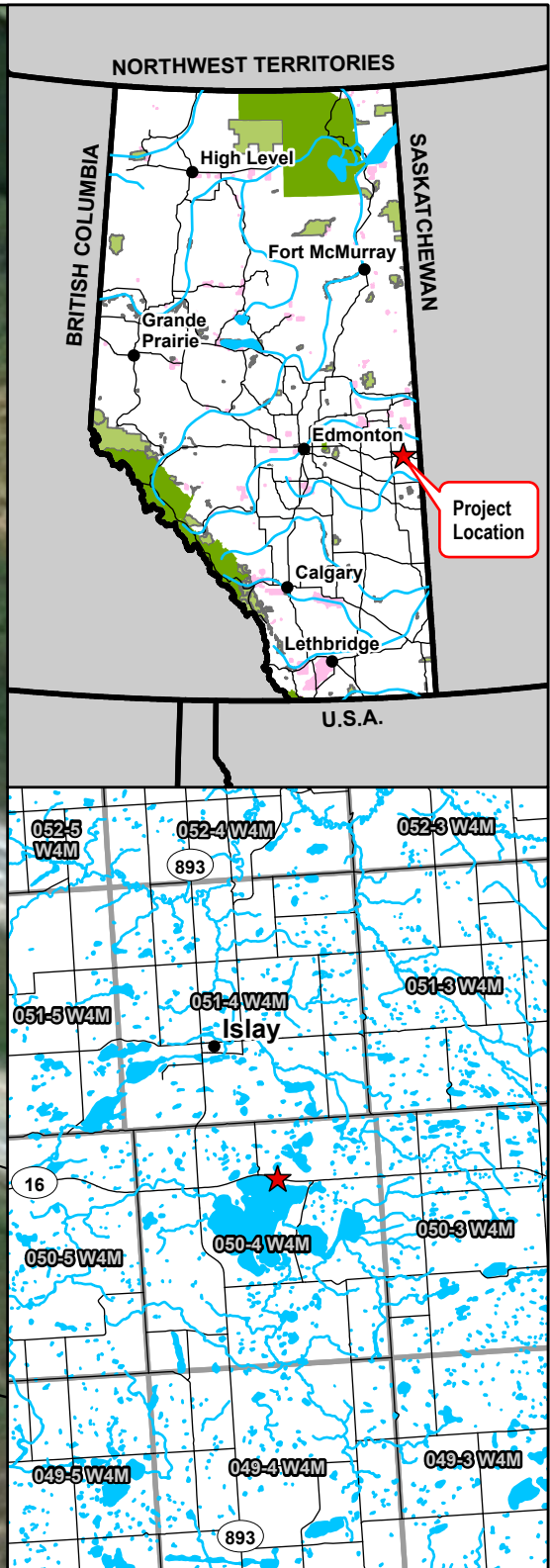
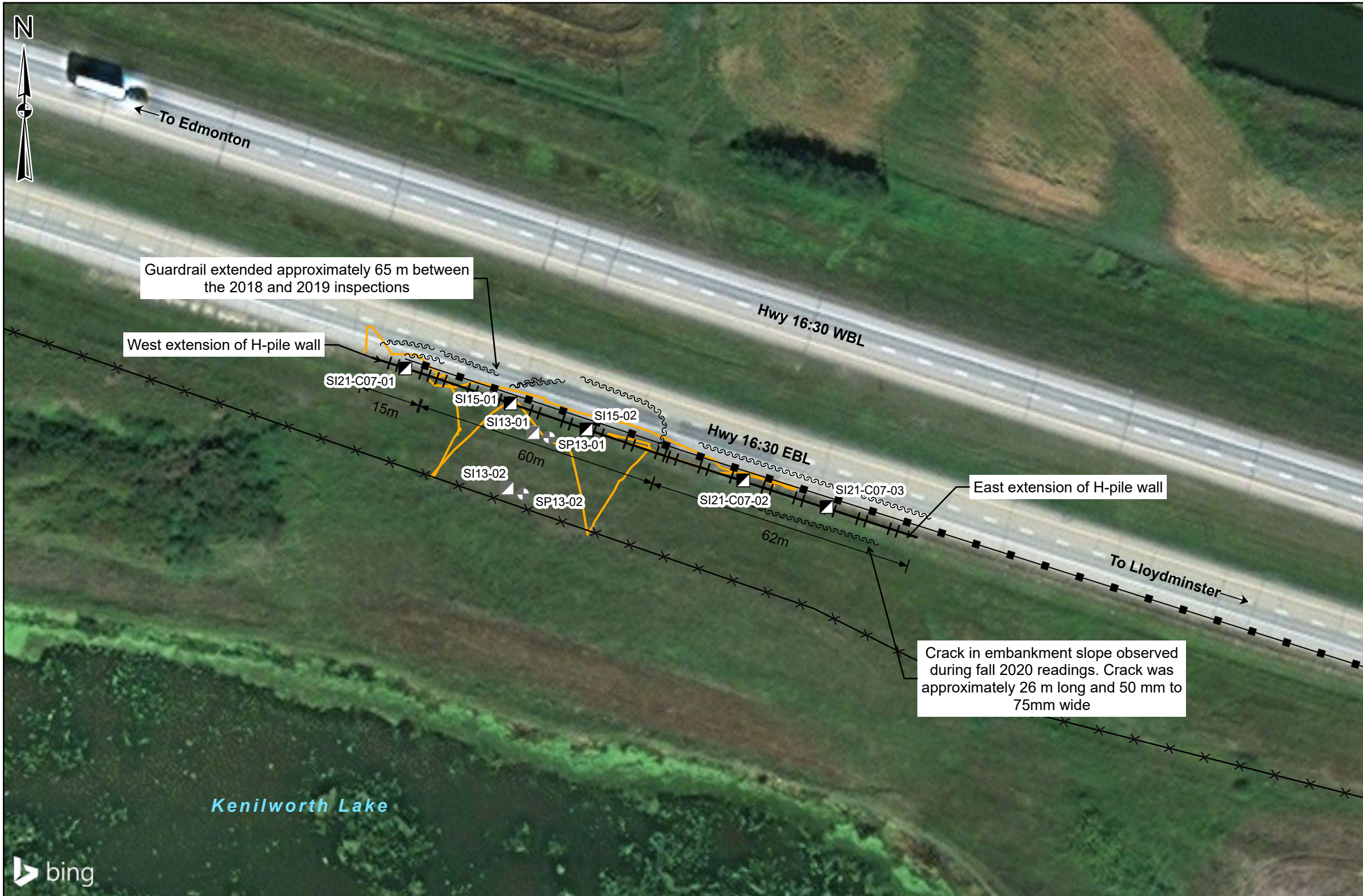


Photo 3 Asphalt cracking in the shoulder of the south (eastbound) lane, east of the pile wall installed in 2015 and upslope of the east H-pile wall extension completed in 2021. Photo taken June 28, 2023, facing east.



Photo 4 Ground settlement and cracking observed on the upper portion of the highway embankment slope downslope of the h-pile wall (crack indicated by red arrow). Photo taken June 28, 2023, facing north.





Legend

- | | | | |
|--|--|--|-------------|
| | Slope Inclinator (SI) | | Crack |
| | Slope Inclinator (SI) (Inoperable) | | H-Pile Wall |
| | Standpipe Piezometer (SP) (Inoperable) | | Guardrail |
| | GPS Tracks (June 28, 2023) | | Fence |

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 12N
3. IMAGE SOURCE: 2023 MICROSOFT CORPORATION,
2023 MAXAR CNES, DISTRIBUTION AIRBUS DS

CLIENT



PROJECT

CENTRAL REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE

Site Plan
C007 - Kenilworth Lake Slide
Hwy 16:30, km 23.890

SCALE
1:1,000

PROJECT No.
A05116A02

FIG No.
1

