

SITE NUMBER AND NAME: C043 Soil-Nail Site		HIGHWAY & KM: 619:06, 12.206	PREVIOUS INSPECTION DATE: June 29, 2021	INSPECTION DATE: June 28, 2023
LEGAL DESCRIPTION: 03-29-48-05 W4M 14-20-48-05 W4M	NAD 83 COORDINATES: UTM Northing Easting 12 5890276 520018		RISK ASSESSMENT: PF: 3 CF: 1 TOTAL: 3	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 400 (west) & 440 (east) (Ref No. 134430 & 131430)			CONTRACT MAINTENANCE AREA (CMA): 512	

SUMMARY OF SITE INSTRUMENTATION: Operational: 2 vibrating wire piezometers and 2 slope inclinometers installed in 2017 and 2021, respectively. Inoperable: 1 slope inclinometer and 1 standpipe piezometer installed in June 2013. LAST READING DATE: May 8, 2023		INSPECTED BY: James Lyons (KCB) Guerin White (KCB) Wade Nichol (TEC) Rishi Adhikari (TEC) Pramaya Kannel (TEC)
PRIMARY SITE ISSUE: Embankment fill and foundation slide affecting eastbound lane and some of westbound lane.		
APPROXIMATE DIMENSIONS: Approximately 40 m long semi-circular crack, slope approximately 10 m high at approximately 3H:1V.		
DATE OF ANY REMEDIAL ACTION: Summer 2006 – soil nails launched into embankment; 2010 to present – regular asphalt patching. No asphalt patching in the last two years. 2021 – H-Pile wall installed in the north (eastbound) embankment slope approximately 2 m offset from the edge of asphalt.		

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement cracks and settlement observed in the north (westbound) lane.		X
Slope Movement	X		There is a shallow depression on the north (westbound) highway embankment slope.		X
Erosion		X	N/A – none observe during the 2023 inspection.		X
Seepage		X	N/A – none observe during the 2023 inspection.		X
Culvert Distress		X	N/A – there are no culverts at the C043 site.		X

COMMENTS

Soil nails (installed in two construction phases) slowed slide movements, but the slide continued to move as indicated by widening pavement cracks and pavement settling that required patches to be placed to level the highway. The asphalt cracks extend from the east and west extent of the most recent asphalt patch. Prior to soil nail installation, the site was patched 2 to 3 times annually by TEC's Highway Maintenance Contractor (HMC). Before 2021, the site was typically patched annually. It is estimated that up to 1.5 m to 2.0 m of asphalt has been placed at the C043 site. The continued need for patching resulted in TEC deciding to install a driven-steel-pile wall (completed in March 2021)

A H-pile wall was installed in the north (westbound) highway embankment slope in March 2021 (Photo 2). The H-pile wall was installed approximately 2 m north of the edge of asphalt. Two slope inclinometers (SIs) were installed in the pile wall to monitor pile wall deflection.

A pavement patch was completed in the north (westbound) lane between the 2021 and 2023 inspections (Photo 1 and 2). Pavement cracks were observed in the north (westbound) lane upslope of the 2021 H-pile wall. However, the degree of pavement cracking was less than previous inspections (i.e., thinner, and not along the entire length of the site) indicating the pile wall is taking load from the highway embankment and performing well.

The north (westbound) highway embankment slope is well vegetated. No evidence of slope movement was observed during the 2023 inspection. However, ground cracking may have been obscured by the tall vegetation.

The dip in the highway surface near the east extent of the site appears to similar to the previous inspection.

The south (eastbound) ditch is well vegetated with grass and appears dry (Photo 4).

The south (eastbound) backslope has failed and the fence line has deflected. The extent of the slide failure does not appear to have changed significantly since the 2021 inspection (Photo 4).

Maintenance/Repair/Monitoring Recommendations:

- The site should continue to be regularly inspected by TEC's Maintenance Contract Inspector (MCI).
- The site should continue to be inspected as part of the Central Region GRMP Section B Inspections. KCB recommends the frequency be decreased from every two-years to once per contract.
- TEC's Highway Maintenance Contractor (HMC) should complete pavement resurfacing (i.e., milling and repaving) work to patch and restore the pavement behind the pile wall. The north (westbound) shoulder be raised to reduce the drop from the asphalt to the embankment slope. KCB will supply the HMC with a detail for this work.
- The two SIs installed in the 2012 h-pile wall should be extended if the shoulder is raised. KCB will be required to be on site to raise the SIs so the reading depths will align with the previous readings.

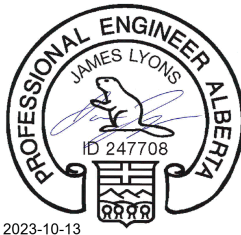
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James Lyons, P.Eng.
Civil Engineer

Inspection Photographs

- Photo 1** A pavement patch was completed in the north (westbound) lane between the 2021 and 2023 inspections, obscuring the pavement cracks previously observed. Photo taken June 28, 2023, facing west.



- Photo 2** Minor pavement cracking observed near the center of the north (westbound) lane (indicated by red arrow). Photo taken June 28, 2023, facing west.



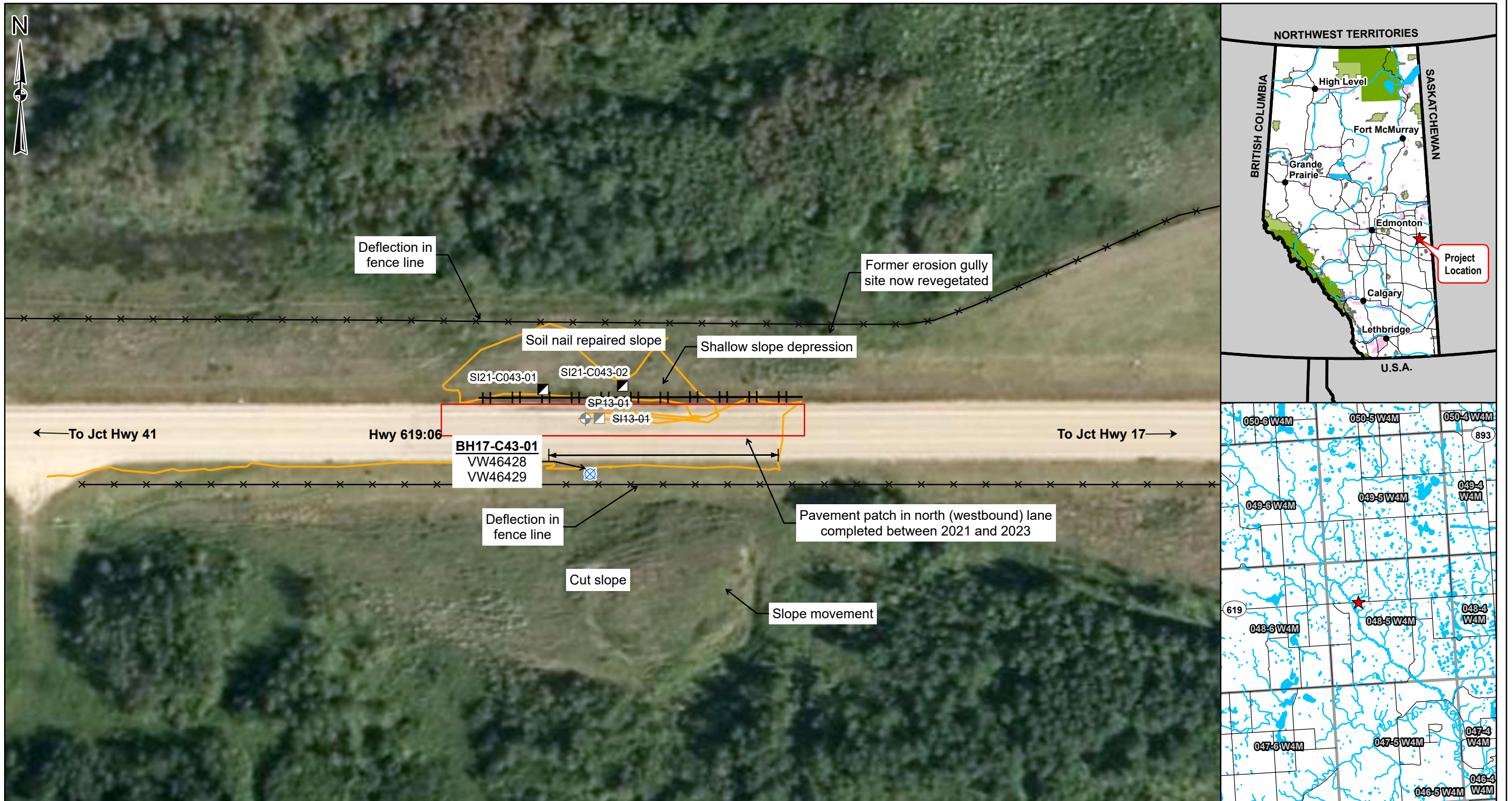
Photo 3 The north (westbound) highway embankment slope is well vegetated. A slope inclinometer installed in the 2021 h-pile wall is indicated by the red arrow. Photo taken June 28, 2023, facing east.



Photo 4 The slide on the cutslope on the south side of Hwy 619:06 appears similar to during the 2021 inspection. Photo taken June 28, 2023, facing southeast.



File: Z:\AEDM\A05116A02\ABT Central Region GRMP\400 Drawings\GIS\02_Profiles\2023\Section B\ABT_Central_SectionB_230724\ABT_Central_SectionB_230724.aprx Date: Time: Creator: : atamson



Legend

- ▣ Slope Inclinator (SI)
- ▣ Slope Inclinator (SI) (Inoperable)
- ⊕ Standpipe Piezometer (SP) (Inoperable)
- ⊗ Vibrating Wire Piezometer (VW)
- GPS Track (June 28, 2023)
- ⊕ H-Pile Wall
- Fence
- ▭ Pavement Patch

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 12N
3. IMAGE SOURCE: ESRI, MAXAR, EARTHSTAR
GEOGRAPHICS AND THE GIS USER COMMUNITY
4. STRIKETHROUGH INDICATES INSTRUMENT IS
INOPERABLE.

CLIENT

Alberta

Klohn Crippen Berger

PROJECT

CENTRAL REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE

Site Plan
C043 - Soil Nail Site
Hwy 619:06, km 12.206

SCALE 1:750

PROJECT No. A05116A02

FIG No. 1

0 25
Metres