

SITE NUMBER AND NAME: C048-1 and -3 Slides		HIGHWAY & KM: 575:04, 14.5	PREVIOUS INSPECTION DATE: June 23, 2021	INSPECTION DATE: June 26, 2023
LEGAL DESCRIPTION:	NAD 83 COORDINATES:		RISK ASSESSMENT:	
C048-1 03-28-29-22 W4M	UTM	Northing	Easting	
C048-3 14-21-29-22 W4M	12	5707777	358483	C048-1: PF: 3 CF: 5 TOTAL: 9
	12	5707780	358250	C048-3: PF: 6 CF: 5 TOTAL: 30
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 920 (west) and 860 (east) (Ref No. 106230 & 105240)			CONTRACT MAINTENANCE AREA (CMA): 517	

SUMMARY OF SITE INSTRUMENTATION:	INSPECTED BY:
Operable: Three slope inclinometers (SIs) were installed at C048-1 in 2021.	Chris Gräpel (KCB)
Inoperable: One slope inclinometer (SI) installed at C048-1 in 2011.	James Lyons (KCB)
	Tony Penney (TEC)
	Rishi Adhikari (TEC)
	Pramaya Kannel (TEC)
LAST READING DATE: September 20, 2023	
PRIMARY SITE ISSUE: C048-1 and -3: two shallow slides in the highway embankment fill. Both slides are located on the south side (eastbound lane) of Hwy 575 near the east and west abutments, respectively.	
APPROXIMATE DIMENSIONS: C048-1 and -3 are approximately 20 m and 100 m wide, respectively.	
DATE OF ANY REMEDIAL ACTION: C048-1: July 2010 – soil nails launched (52 nails, 4 rows); July 2014 – H-pile wall installed (65 HP310 X 93 piles, 0.75 m spacing, 48 m long, 12 m deep); “retaining wall” constructed behind the H-pile wall, by excavating to a depth of 2 m, placing filter cloth, installing 2x10 pressure-treated-wood lagging between the piles, and then backfilling with gravel; C048-1 existing pile wall extended in winter 2021 with addition of a downslope second pile wall; C048-3 repaired in 2020 with excavate and replace using geogrid reinforced gravel;	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		C048-1: there is pavement cracking and settlement upslope of the H-pile walls in the south (eastbound) lane.	X	
Slope Movement	X		C048-1: the slide appears to have outflanked the original H-pile wall and movements appear to continue as the 2021 H-pile extent and new lower H-pile wall take up load.	X	
Erosion		X	N/A – none observed during the 2023 inspection.		X
Seepage		X	N/A – none observed during the 2023 inspection.		X
Culvert Distress		X	N/A – there are no culverts at the C048 site.	N/A	

COMMENTS

C048-1:

- In early-2021, the existing pile wall was extended to the east and west, as the slide had begun to outflank the existing pile wall (east and west extent of original pile wall indicated by Waypoint 347 and 348, respectively). Wooden planks were installed between the piles and space between the highway and pile wall was backfilled with granular material (Photo 2 and 3). During the 2021 construction, a second H-pile wall (referred to as the lower pile wall) was installed downslope of the existing pile wall.
- Three SIs were installed, one in the west upper pile wall extension and two SIs in the new (lower) pile wall.
- The pavement cracking and settlement upslope (north) of the pile walls appear to have increased in severity since the 2021 inspection (Photo 1). The pavement cracking is between approximately 25 mm to 50 mm.
- The above-ground portions of the 2021 H-piles at the upper pile wall were cut off at ground surface between the 2021 and 2023 inspections. The upper pile wall appears to have deflected since the 2021 inspection (Photo 3).
- Voids were observed between the timber lagging and H-piles. Voids were observed at approximately 11 locations in the upper pile wall (one location indicated by Waypoint 349).
- A portion of the coir roll installed downslope of the lower H-pile wall is damaged (Waypoint 350).

C048-3:

- The site was repaired in 2020 using geogrid-reinforced granular fill. The repaired slope was not tied in well to match the existing highway embankment, particularly near the toe of the embankment (repaired slope "sticks out" from existing slope and was not graded properly during the repair work).
- The silt fencing at the toe of the slope has collapsed due to fill placed against the silt fence.
- Beaver damming of the creek at the toe of the south (eastbound) highway embankment was observed during the 2023 inspection (Photo 4).
- The vegetation cover has improved significantly since the 2021 inspection (Photo 5 and 6).

During the 2023 site inspection TEC told KCB that as part of a highway improvement project in summer/fall 2023, Hwy 575 would be resurfaced (i.e., milled and paved) and guardrails would be installed along the length of the site. This project will include excavating the thick pavement from the C048-1 site and modifying the vertical alignment of the highway to result in a slightly reduced loading behind the pile wall.

Maintenance/Repair/Monitoring Recommendations:

C048-1 and -3:

- The sites should continue to be inspected regularly by TEC's Maintenance Contract Inspector (MCI).
- The sites should be inspected every two-years as part of the Central Region GRMP Section B Inspections.

C048-1:

- The voids between the timber lagging and H-piles in the upper pile wall should be backfilled with sand and gravel.

C048-3:

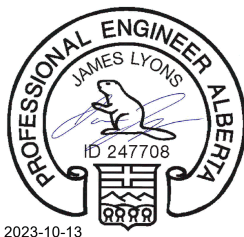
- The beaver dam at the toe of the slope at C048-3 should be removed, as the ponded water could saturate and soften the toe of the highway embankment, potentially resulting in increased rates of movement which could impact the highway surface.
- The silt fencing at the downslope extent of the repair should be removed.

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James Lyons, P.Eng.
Civil Engineer

Inspection Photographs

Photo 1 Pavement cracking along the edge of the south (eastbound) lane. The pavement cracks are between approximately 25 mm and 50 mm wide. Photo taken June 26, 2023, facing east.



Photo 2 Timber lagging and west h-pile wall extension installation completed in early-2021. Photo taken June 26, 2023, facing east.



Photo 3 **The upper pile wall has deflected since the 2021 inspection. Photo take June 26, 2023, facing east.**



Photo 4 **Beaver dam located at the toe of the south highway embankment slope downslope of the C048-3 site. Photo taken June 26, 2023, facing west.**



Photo 5 **The vegetation coverage at the C048-3 slide repair (completed fall of 2020) has improved since the 2021 inspection. Photo taken June 26, 2023, facing west northwest.**



Photo 6 **The vegetation coverage at the C048-3 slide repair (completed fall of 2020) has improved since the 2021 inspection. Photo taken June 26, 2023, facing east.**



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

- | | |
|--------------------------------|----------------|
| △ GPS Waypoint (June 26, 2023) | × Fence |
| ■ Slope Inclinometer (SI) | ++ H-Pile Wall |
| ⊕ Standpipe Piezometer (SP) | ■ Guardrail |
| → Flow Direction | Top of Slope |
| ~~~~ Crack | Toe Roll |
| ● Power Pole | Scarp |

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
C048 - West of Drumheller Slide
Hwy 575:04, km 14.50

SCALE 1:2,000 PROJECT No. A05116A02 FIG No. 1