

<b>SITE NUMBER AND NAME:</b> <b>C048-1 and -3 West of Drumheller Slides</b>	<b>HIGHWAY &amp; KM:</b> 575:04, 14.5	<b>PREVIOUS INSPECTION DATE:</b> June 26, 2023	<b>INSPECTION DATE:</b> <b>June 10, 2025</b>
<b>LEGAL DESCRIPTION:</b>  C048-1 03-28-29-22 W4M C048-3 14-21-29-22 W4M	<b>NAD 83 COORDINATES:</b> UTM Northing Easting 12 5707777 358483 12 5707780 358250	<b>RISK ASSESSMENT:</b>  C048-1: PF: 1 CF: 3 TOTAL: 3 C048-3: PF: 1 CF: 3 TOTAL: 3	
<b>HIGHWAY CLASSIFICATION NUMBER:</b> 3		<b>CONTRACT MAINTENANCE AREA (CMA):</b> 517	
<b>AVERAGE ANNUAL DAILY TRAFFIC (AADT):</b> 920 (west) and 860 (east) (Ref No. 106230 & 105240)			

<b>SUMMARY OF SITE INSTRUMENTATION:</b>  Operable: Three slope inclinometers (SIs) were installed at C048-1 in 2021.  Inoperable: One slope inclinometer (SI) installed at C048-3 in 2011.  LAST READING DATE: May 20, 2025	<b>INSPECTED BY:</b> Chris Gräpel (KCB) James Lyons (KCB) Tony Penney (TEC) Chris Newman (TEC) Imram Mehmood (TEC)
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<b>PRIMARY SITE ISSUE:</b> 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.
<b>APPROXIMATE DIMENSIONS:</b> C048-1 and -3 are approximately 100 m and 20 m wide, respectively.
<b>DATE OF ANY REMEDIAL ACTION:</b> 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; Summer 2023, the highway was resurfaced (new pavement and highway subgrade) and a new guardrail was installed along the length of the site as part of a highway improvement project. The work also included excavating the thick pavement from the C048-1 site and modifying the vertical alignment (removing some of the highway subgrade) of the highway to reduce the loading behind the pile wall.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		C048-1: there was minor pavement settlement upslope of the H-pile walls in the south (eastbound) lane after 2023 construction.		X
Slope Movement	X		C048-1: the slide appeared to have outflanked the original H-pile wall and movements appeared to be ongoing as the 2021 H-pile extension and new lower H-pile wall took up additional load.		X
Erosion		X	N/A – none observed during the 2025 inspection.		X
Seepage		X	N/A – none observed during the 2025 inspection.		X
Culvert Distress		X	N/A – none observed during the 2025 inspection.		X

## 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 to the east and west of original pile wall. Timber lagging was installed between the piles and space between the highway and pile wall was backfilled with granular material (Photos 3 and 4). During the 2021 construction, a second H-pile wall (referred to as the lower pile wall) was installed downslope of the existing pile wall. This work was performed as part of Contract No. CON0021394 which also included installing pile walls at the Central Region C007, C043, and C065 sites. Three SIs were installed during 2021 H-pile construction, one in the west upper pile wall extension and two SIs in the new (lower) pile wall.
- In summer 2023, the highway was resurfaced (new pavement and highway subgrade) and a new guardrail was installed along the length of the site as part of a highway improvement project. This project included excavation of the thick pavement from the C048-1 site and modification of the vertical alignment (removing some of the highway subgrade) of the highway to reduce the loading behind the pile wall.
- The highway surface and new guardrail appeared to be in good condition (Photo 2).
- During previous inspections, longitudinal pavement cracking and settlement (i.e., dip) in the south (eastbound) lane was observed near the east extent of the upper H-pile wall. During the 2025 inspection, pavement distress was not observed, and the highway surface was in good condition. It appeared that with the combination of the 2021 pile wall extension, 2021 lower pile wall installation, and 2023 highway improvements, the rate of movement at the site has decreased.
- There was an erosion gully at the east extent of the site, extending from the south (eastbound) ditch to the creek downslope of the site (Photo 1). The rate of erosion appeared to be slow since the erosion gully base and side slopes were vegetated with grass. No plume was observed at the downstream limit of the erosion gully.
- 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. Since construction, the upper portion of the pile wall (above ground surface) appeared to have been deflecting (Photo 3).
- Voids have been observed between the timber lagging and H-piles, particularly along the west length of the H-pile wall. Voids were observed between approximately 10 to 15 locations in the upper pile wall (Photo 3 and 4).
- A portion of the coir roll installed downslope of the lower H-pile wall was damaged.

### 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.
- The vegetation cover has improved since construction and the repair appears to be performing well (Photo 6).
- Beaver damming of the creek at the toe of the south (eastbound) highway embankment has been observed since the 2021 inspection (Photo 7).

### 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 once per contract 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.

This report is an instrument of service of Klohn Crippen Berger Ltd. (KCB). The report has been prepared for the exclusive use of Alberta Transportation and Economic Corridors (Client) for the specific application to the Central Region Geohazard Risk Management Program (Contract No. CON0022160) and it may not be relied upon by any other party without KCB's written consent.

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- (v) This report is electronically signed and sealed and its electronic form is considered the original. A printed version of the original can be relied upon as a true copy when supplied by the author or when printed from its original electronic file.

James Lyons, P.Eng.  
Civil Engineer



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**Legend**

- |  |                  |  |             |  |                |  |       |
|--|------------------|--|-------------|--|----------------|--|-------|
|  | Slope Inclinator |  | Fence       |  | Top of Slope   |  | Scarp |
|  | Crack            |  | H-Pile Wall |  | Flow Direction |  |       |
|  | Power Pole       |  | Guardrail   |  | Toe Roll       |  |       |

NOTES:  
1. HORIZONTAL DATUM: NAD83  
2. GRID ZONE: UTM Zone 12N  
3. IMAGE SOURCE: WORLD IMAGERY, ESRI ARCGIS  
ONLINE SOURCE DATE SEPTEMBER 2024  
4. INSTRUMENT LOCATIONS ARE APPROXIMATE (NOT SURVEYED).  
5. STRIKETHROUGH INDICATES THE INSTRUMENT IS INOPERABLE.

CLIENT

PROJECT  
CENTRAL REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE  
Site Plan  
C048-1 and -3 Slides  
Hwy 575:04, km 14.5

SCALE 1:2,000	PROJECT No. A05116A02	FIG No. 1
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## Inspection Photographs

**Photo 1** Aerial photo of the C048-3 site. Upper H-pile wall extension and timber lagging just downslope of the highway was installed in 2021. Lower H-pile wall (approximate location indicated by red dashed line) was installed downslope of the upper H-pile wall in 2021. Erosion gully between south ditch and creek downslope of the site indicated by red arrow. Photo taken June 10, 2025 facing northeast.





**Photo 2** New highway surface and guardrail was installed during summer 2023 construction when the highway surface was lowered and upper portion of the subgrade was replaced. Photo taken June 10, 2025 facing east.

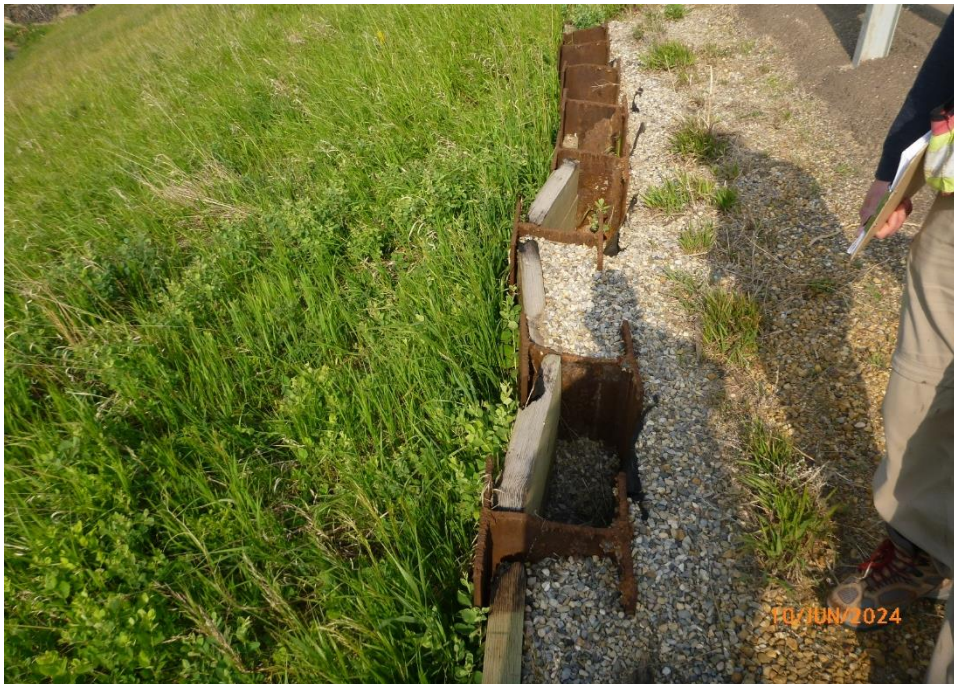


**Photo 3** The upper H-pile wall has continued to deflect since the 2023 inspection. Photo taken June 10, 2025 facing east.





**Photo 4** Voids have formed between H-piles and timber lagging. Photo taken June 10, 2025 facing west.



**Photo 5** H-pile wall extension, timber lagging, and lower H-pile wall installed in 2021. Downslope of the H-pile walls is well vegetated and in good condition. Photo taken June 10, 2025 facing west.





**Photo 6**      The repair completed at C048-3 in fall of 2020 appears to be performing well and the slope is well vegetated. Photo taken June 10, 2025 facing northwest.



**Photo 7**      Beaver dam located at the toe of the south highway embankment slope downslope of the C048-3 site. Photo taken June 10, 2025 facing southwest.

