SOUTHERN REGION GRMP
SITE INSPECTION FORM

SITE NUMBER AND NAME: **S031-2 Mystery Culvert**	HIGHWAY & KM: 762:02, 17.660	PREVIOUS INSPECTION DATE: May 28, 2024	INSPECTION DATE: **May 26, 2025**
LEGAL DESCRIPTION: 07-19-22-04-W5M	NAD 83 COORDINATES: UTM 11 Northing 5639613 Easting 672917	RISK ASSESSMENT: PF: 8 CF: 4 TOTAL: 32	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 1090 (north) & 1380 (south) (Reference No. 65170 & 60180)		CONTRACTOR MAINTENANCE AREA (CMA): 521	

SUMMARY OF SITE INSTRUMENTATION:	INSPECTED BY:
February 11, 2025 – Operable – one slope inclinometer (SI) and two vibrating wire piezometers (VWPs). LAST READING DATE: March 04, 2025 – SI was initialized as part of the 2025 spring readings.	Chris Gräpel (KCB) Jorge Rodriguez (KCB) Karen Masterson (KCB) Alex Frotten (TEC) Rishi Adhikari (TEC)

PRIMARY SITE ISSUE: Slope instability in the west highway embankment impacting the west (southbound) lane.

APPROXIMATE DIMENSIONS: The slide is approximately 40 m wide. Settlement is approximately 2 m of the west (southbound) lane. The height of the highway embankment is approximately 4 m to 5 m.

DATE OF ANY REMEDIAL ACTION: Regular pavement patches have been completed at the site, with the most recent one being completed in the summer or fall of 2022. February 2025 – A site investigation was performed at the site, which included one borehole and the installation of one SI and two VWPs. Previous repairs might have included a toe berm that was noticed during the 2025 inspection, which appears to extend past the fence along the west side of the highway. There are no known details from the berm at the time this report was written.

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement distress (cracking and settlement) has been observed in the west (southbound) lane.	X	
Slope Movement	X		Slope instability in the west (southbound) highway embankment slope (cracking at crest and slight bulge in slope surface).		X
Erosion		X	N/A – none observed during the 2025 inspection.		X
Seepage		X	N/A – none observed during the 2025 inspection. A wetland is located along the west side of the highway embankment.		X
Culvert Distress	X		The CSP culverts appear rusted and deformed.		X

COMMENTS

General:

- S031-1 is no longer inspected as it was repaired in 2017 (including excavating and replacing the

embankment material, building a toe berm, and improving drainage).

- A proposal for a drilling investigation (including instrument installation) was initially submitted to TEC on December 15, 2022. Updating proposals were submitted on July 16, 2024 and January 9, 2025 to include design and tendering services. TEC approved the latest proposal in January 2025.
- In February 2025, a drilling investigation was performed by Mobile Augers and Research Ltd. (MARL) and monitored by KCB. One SI and two VWPs were installed to monitor movement and groundwater, respectively. The investigation was performed to support design work. The instruments will be incorporated into the fall 2025 Southern Region GRMP Section C readings. The geotechnical investigation report was issued to TEC on July 3, 2025.
- In general, there were no significant changes between the 2024 and 2025 inspections.

S031-2:

- The slope instability is along an approximate 40 m length of the highway and is impacting the west (southbound) lane (Photos 1 and 2)
- Regular pavement patching has been competed at the site with the latest pavement patch completed between the 2022 and 2023 inspections (Photos 1 and 2). There is longitudinal pavement cracking (up to approximately 10 mm wide) along the west shoulder and settlement (up to approximately 20 mm) in the west (southbound) lane. Pavement cracking appears most severe at the north and south extents of the pavement patch (Photo 2).
- The west (southbound) highway embankment slope is relatively well vegetated (Photos 3 and 4). There is evidence of a previous repair at the site, which could have included a toe berm extending past the fence along the west side of the highway (Photos 3 and 4).
- TEC's Maintenance Contract Inspector (MCI) informed KCB during a previous inspection that the pavement had settled approximately 200 mm vertically and required patching in June 2020. During the 2020 inspection, mid-slope tension cracking was noted along the west (southbound) embankment between the north and south culverts. There is a slight bulge in the slope but no discernible change has been observed since 2021.
- The east (northbound) ditch appears poorly drained. Wet areas were observed along the ditch during the 2025 inspection (Photo 5).
- There are two corrugated-steel-pipe (CSP) culverts at the site that are underlying the highway (oriented east-west). The culverts were installed to convey flows from the east ditch to the west ditch. The south culvert was replaced as part of the 2017 repair work at the S031-1 site, and the north culvert is outside the site limits. Both culverts are deformed and bent beneath the highway embankment due to potential settlement. An asphalt apron was installed at the outlet of the north culvert.

Maintenance/Repair/Monitoring Recommendations:

Short-term:

- The site should be regularly inspected by the Maintenance Contract Inspector (MCI).
- The site should be inspected annually as part of the Southern Region GRMP Section B inspections.
- The instruments should be read twice per year (spring and fall) as part of the Southern Region GRMP Section C readings. The 2025 instruments should be incorporated into the Section C readings in fall of 2025.

Long-term:

- KCB is currently performing design work for the site. Potential repair candidates being assessed for the site include:
  - a driven steel H-pile wall;
  - excavate and replace the embankment fill with geogrid reinforced granular fill, including a

shear key near the toe of the highway embankment; and,

- reduce embankment loading using lightweight fill (e.g., cematrix or polystyrene) in the upper portion of the embankment.

PROFESSIONAL ENGINEER ALBERTA
JORGE RODRIGUEZ NAVARRO
ID 222669
2025 Oct. 10
LICENSED TO PRACTICE

Jorge Rodriguez, Ph.D., M.Sc., P.Eng.
Geotechnical Engineer

PERMIT TO PRACTICE
KLOHN CRIPPEN BERGER LTD.
RM SIGNATURE: _____
RM APEGA ID #: 187607
DATE: 10 Oct. 2025
PERMIT NUMBER: P009196
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Legend

- Scarp
- Tension Crack
- Fence
- Culvert

0 50 Metres

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 11N
3. IMAGE SOURCE: MAXAR 2024

CLIENT: Alberta

Klohn Crippen Berger

PROJECT: SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
S031-2 - Mystery Culvert
Hwy 762.02, km 97.660

SCALE	PROJECT No.	FIG No.
1:1,500	A05116A03	1

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Inspection Photographs

Photo 1 **Aerial photo of the S031-2 site, highlighting the area of pavement distress (indicated by red rectangle) and culvert outlets (indicated by red arrows). Photo taken May 26, 2025, facing southeast.**

Photo 2 **Pavement patch, cracking, and settlement in the west (southbound) lane. Settlement up to approximately 20 mm was overserved. Photo taken May 26, 2025, facing south.**

Photo 3 **The west (southbound) highway embankment below the area of pavement distress (cracking and settlement). Photo taken May 26, 2025, facing north.**

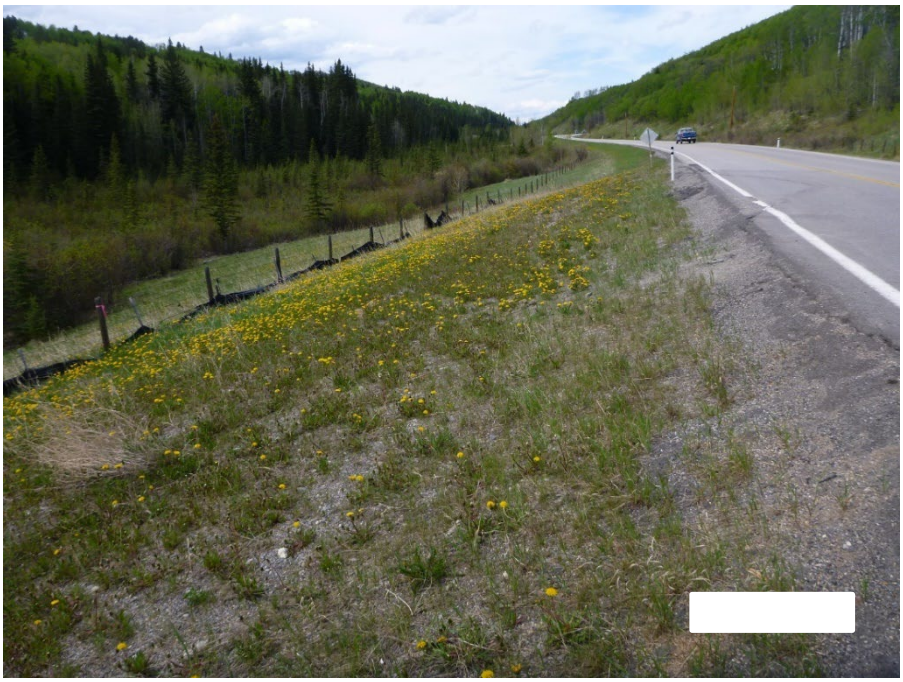

Photo 4 **The west (southbound) highway embankment slope is well vegetated. Photo taken May 26, 2025, facing south.**

Photo 5 **The eastbound ditch is well-vegetated, and no erosion was observed around the culvert inlet. Photo taken May 26, 2025, facing north.**