NORTH CENTRAL REGION GRMP
EDSON / STONY PLAIN
SITE INSPECTION FORM

SITE NUMBER AND NAME:	HIGHWAY AND KM:	PREVIOUS INSPECTION:	CURRENT INSPECTION:
NC013 – Cattlepass West	633:02, km 0.780	June 15, 2022	June 11, 2024
LEGAL DESCRIPTION:	**NAD83 COORDINATES:**		**RISK ASSESSMENT:**
NW 29-53-6-W5M	UTM11U 5942619N, 642207E		PF: 10 CF: 4 Total: 40
AVERAGE ANNUAL DAILY TRAFFIC (AADT):		**CONTRACTOR MAINTENANCE AREA (CMA):**	
460 (2023)		509	

SUMMARY OF INSTRUMENTATION:	INSPECTED BY:
One slope inclinometer and two vibrating wire piezometers functional **LAST READING DATE:** May 15, 2024	Stantec: Leslie Cho, Sonja Pharand AT: Kristen Tappenden, Tim Germyn
PRIMARY SITE ISSUE: Relatively high embankment over soft clay with high groundwater level leading to slope instability.	
APPROXIMATE DIMENSIONS: 150 m long, 70 m wide	
DATE OF ANY REMEDIAL ACTION: Wick drains and toe berm constructed in 2011. Pavement overlays in 2011 and 2013. Gravel placed on shoulder of eastbound lane in 2015. Select cracks were sealed between Spring 2022 and Spring 2024.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICEABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Pavement cracking along Highway 633	X	
Slope Movement	X		Increased pavement cracks, SI readings show signs of creep movement	X	
Erosion		X			X
Seepage	X		A spring was observed near the toe of the south embankment.	X	
Bridge/Culvert Distress		X			X

COMMENTS

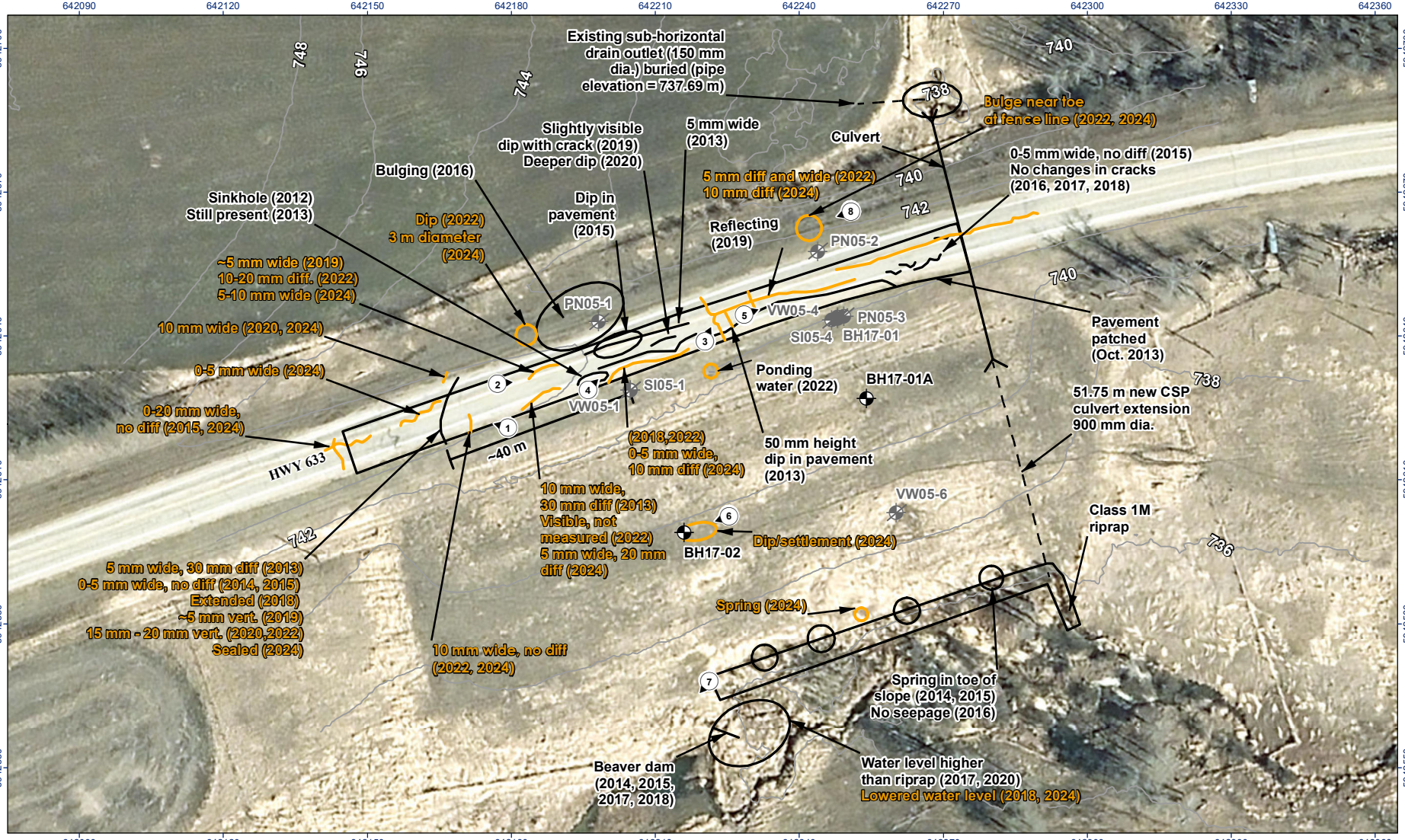
- The circular crack west of SI05-1 has been sealed since the previous inspection in 2022 (Photo 1).
- The crack to the northwest of SI05-1 has maintained its vertical difference of about 20 mm. The crack to the east of SI05-1 was observed to have a vertical difference of about 10 mm and has lengthened since the 2022 inspection (Photo 2).
- Additional pavement cracks with no vertical difference are present (Photos 3, 4 and 5).
- An approximately 3 m diameter ground depression was observed around BH17-02 (Photo 6).
- The bulge in the slope near the toe north of BH17-01 does not visually appear to have grown since the previous inspection in 2022.
- The slope on the north side of Highway 633 appears to be bulging near the toe north of BH17-01 (Photo 8).
- A spring was observed during the 2024 inspection, near the middle of the length of riprap placed at the toe of the southern embankment. This spring was not observed during previous site inspections.
- The water level in the pond to the south of the toe berm appeared slightly lower than the level observed during the 2022 inspection (Photo 7).
- The SI reading shows signs of creep movement. SI17-02 is showing a current rate of movement less than 1 mm /year. All other SIs on the site have been damaged and could not be read.

- The overall porewater pressures at site remain high and have continued to increase since 2017. VW17-01 and VW17-02 are currently at its highest recorded porewater pressure since initiation in 2017. Artesian conditions were observed prior to remediation in 2011 in VW05-6; however, VW05-6 was found damaged in Spring 2024.
- Due to the continued creep measured in the SI, and the loss of instruments due to shearing, the Probability Factor for the site remains at 10. The Consequence Factor has also been kept at 4 as partial closure of the road or significant detours would be the result of a slide occurrence.

RECOMMENDATIONS

- Pavement cracks should be sealed to reduce surface water infiltration into the embankment. Additional pavement patches are not recommended since it is considered an additional driving force on the embankment. Mill and fill could be completed to address the vertical displacement until remediation is completed. Any fill placed, either soil or asphalt, should result in no net addition of loads.
- The culverts and drains at the site should be inspected regularly to reduce the risk of pore pressures building up in the berm and slope, and to confirm functionality.
- Since the site is preloaded, a grade reduction to improve slope performance may be considered. The high-level cost for grade reduction is $400,000 to $700,000 excluding engineering costs. Alternatively, lightweight fill may be considered to reduce the overall driving force on the embankment, with a high-level cost of $1.5 to $2.3 Million excluding engineering costs.
- Site inspections should continue every 2 years.
- Instrumentation readings should continue to be read semi-annually.

PREPARED BY: Sonja Pharand, P.Eng.	**REVIEWED BY:** Xiteng Liu, M.Sc., P.Eng., PMP	**PERMIT TO PRACTICE**
PROFESSIONAL ENGINEER ALBERTA SONJA A. PHARAND ID 256545 Oct. 15 2024		**PERMIT TO PRACTICE** **STANTEC CONSULTING LTD.** Signature Date 2024-10-15 **PERMIT NUMBER: P 0258** The Association of Professional Engineers and Geoscientists of Alberta



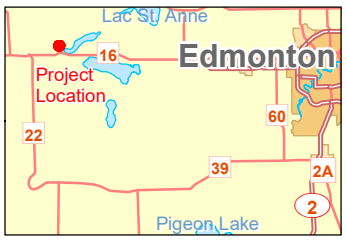


Photo Number and Direction

Borehole Location

Non-Operational Instrument

Previous Observation

2024 Observation

Ground Elevation Contours (m AMSL, LiDAR Nov. 2014)

N

0 10 20 metres

(At original document size of 8.5x11)

1:1,200

Notes

1. Coordinate System: NAD 1983 UTM Zone 11N

2. Data Sources: Geogratis, ©Department of Natural Resources Canada, All rights reserved.

3. Background: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Stantec

Project Location
Hwy 633
Parkland County, Alberta

Prepared by SP on 2024-08-13
Quality Review by LC on 2024-08-14
Independent Review by XL on 2024-08-14

Client/Project
123315222
Alberta Transportation
Geohazard Monitoring Program
NC13 Cattle Pass West

Figure No.
1

Title
Site Plan

2024 Site Inspection Photos at NC013

Photo 1: Sealed circular crack approximately 40 m west of SI05-1 and smaller circular crack in EBL. Looking northwest.

Photo 2: Semi-circular pavement cracks about 10 m east of Photo 1. Looking northeast.

2024 Site Inspection Photos at NC013

Photo 3: Pavement cracking approximately 15 m east from SI05-1. Looking north.

Photo 4: Crack on shoulder north of SI05-1. Looking northeast.

2024 Site Inspection Photos at NC013

Photo 5: Semi-circular crack along C/L and EBL lane north of BH17-01. Transverse cracking. Looking east.

Photo 6: Settlement around BH17-02 on the south embankment. Looking west.

2024 Site Inspection Photos at NC013

Photo 7: Ponding water at toe of slope. Looking southwest.

Photo 8: Slumping in north ditch, north from BH17-01. Looking southwest.

2024 Site Inspection Photos at NC013

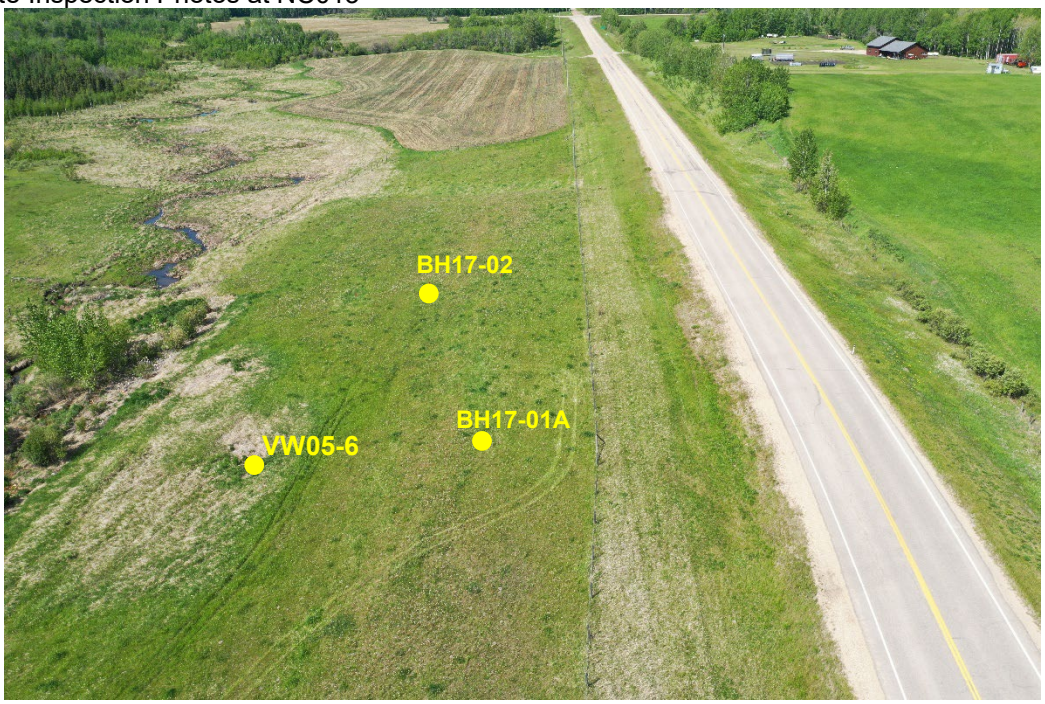


Photo 9: Site overview photo, taken by drone. Looking southwest.

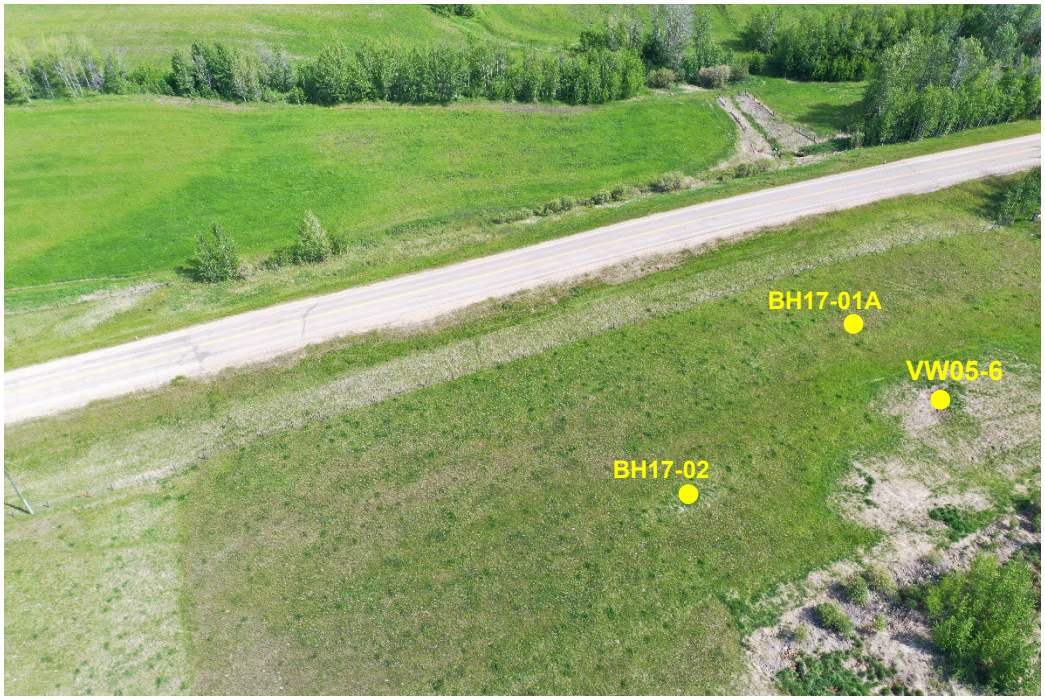


Photo 10: Site overview photo, taken by drone. Looking north.