NORTH CENTRAL REGION GRMP
EDSON / STONY PLAIN
SITE INSPECTION FORM

SITE NUMBER AND NAME:	HIGHWAY AND KM:	PREVIOUS INSPECTION:	CURRENT INSPECTION:
NC010 – Willow Bend Slide	33:04, km 25.005	May 31, 2023	May 22, 2025
LEGAL DESCRIPTION:	**NAD83 COORDINATES:**		**RISK ASSESSMENT:**
SE 28-57-03-W5	UTM11U 5981185N, 672306E		PF: 13 CF: 6 Total: 78
AVERAGE ANNUAL DAILY TRAFFIC (AADT):		**CONTRACTOR MAINTENANCE AREA (CMA):**	
2,190 (2024)		509	

SUMMARY OF INSTRUMENTATION:	INSPECTED BY:
One slope inclinometer and five standpipe piezometers functional. **LAST READING DATE:** May 8, 2025	Stantec: Leslie Cho, Sonja Pharand and Carrie Murray TEC: Kristen Tappenden

PRIMARY SITE ISSUE:

Landslide affecting sidehill section of the highway.

APPROXIMATE DIMENSIONS:

About 70 m long.

DATE OF ANY REMEDIAL ACTION:

Chip sealed in 2010. Patched in 2013. Crack sealing and spray patch in 2016. Two patches in 2017. West side slope improvements in 2019 including a clay wedge to eliminate the sharp drop off. Patched in Spring 2022. Milled and repaved in Fall 2022 after significant cracking and vertical differences up to 40 mm were observed during a September call-out inspection.

ITEM	CONDITIONS EXIST		DESCRIPTION AND LOCATION	NOTICEABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Cracks have reflected through the pavement patch placed Fall 2022.	X	
Slope Movement	X		Landslide scarp cracks were reflecting through previous pavement patch. Tilting fence posts at toe of west side slope. Backslope slump near intersection with TWP Rd 574.	X	
Erosion	X		Erosion at inlet and outlet of 900 mm diameter CSP culvert. Subsidence along the alignment of 900 mm diameter culvert about 15 m north of inlet.		X
Seepage		X			
Culvert Distress	X		900 mm diameter culvert inlet separated about 0.5 m in. Separation near outlet as well, water flowing under final CSP segment. Localized slump above culvert outlet.	X	

COMMENTS

- Pavement left as milled surface some time after the 2023 inspection. Site conditions were generally unchanged since the 2023 site inspection (Figure 1) except for cracks that have reflected through the milled surface (Photos 1 to 3). Pavement cracking pattern appear similar to previous inspections.
- The semi-circular pavement crack is approximately 0.5 m away from the shoulder line on the northbound lane (Photo 2). The crack is approximately 0-10 mm wide.
- The NBL shoulder appears to be relatively steep and may constitute a safety hazard to motorists.
- Water was observed to be ponding throughout the east ditch.

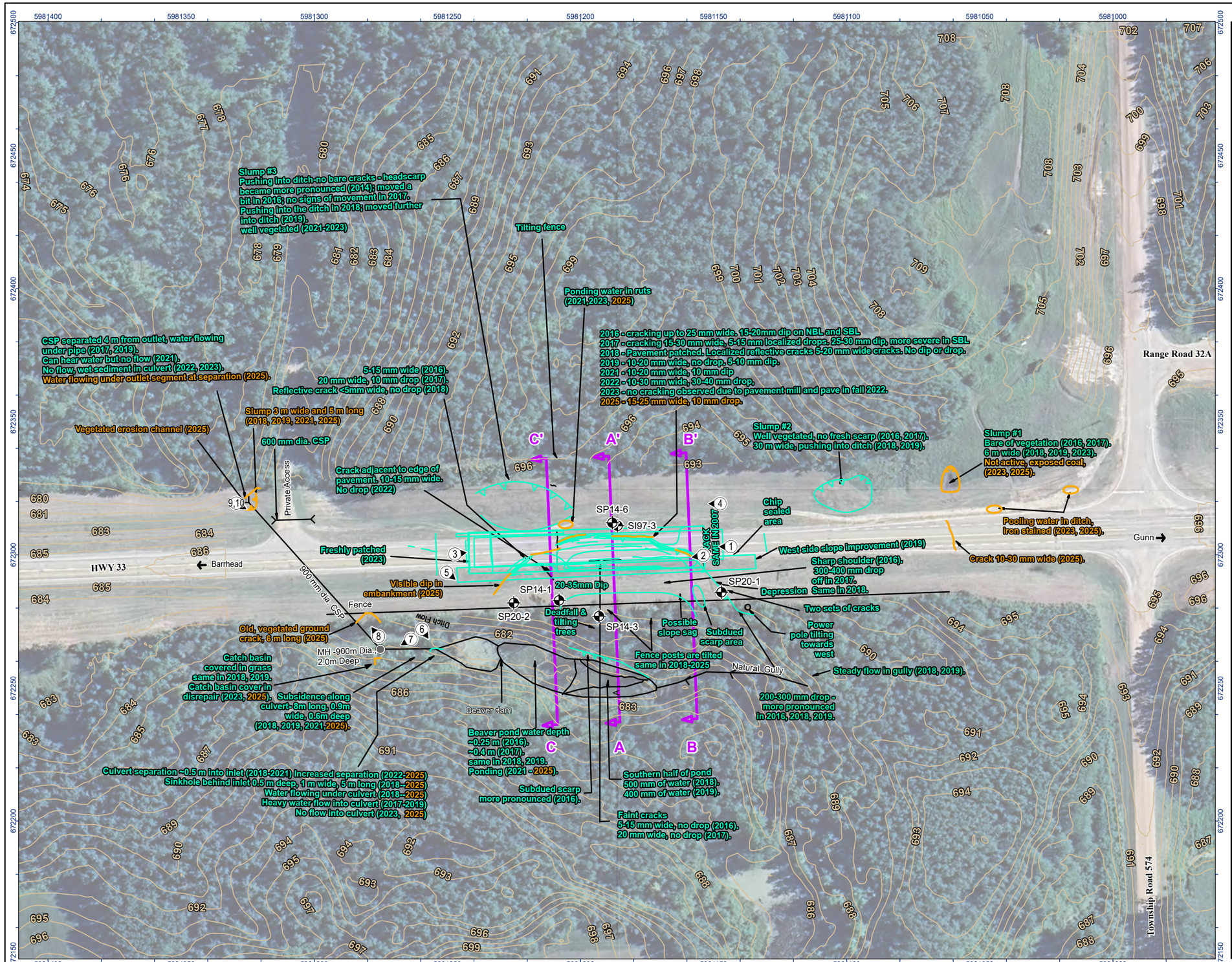
- Sedimentation was observed in the wheel tracks on the east side of the highway, south from backslope slump #3 (Photo 4).
- No changes to the backslope slumps #2 and #3 were observed due to thick vegetative cover.
- Slump #1 appeared to be in a similar condition to 2023, approximately 5.9 m wide and 7 m long, and was mostly bare of vegetation with exposed coal fragments at the surface.
- The west embankment appeared to be in good condition, with no fresh ground cracks observed (Photo 5).
- The beaver dam at the 900 mm diameter culvert inlet continues to dam water upstream of the culvert.
- Standing water was observed at the culvert inlet.
- A separation was observed about 0.5 m into the inlet of the 900 mm diameter culvert. Further erosion has occurred on the east side of the inlet, creating a gap between the ground surface and the culvert which is full of standing water (Photo 6).
- Subsidence of the ground along the 900 mm diameter culvert alignment between the inlet and the catch basin was observed, similar to 2023 (Photo 7).
- The catch basin cover north of the inlet of the 900 mm diameter culvert was observed to be in a state of disrepair, similar to 2023. The metal is extremely weak and falling apart due to heavy rusting. This may present a hazard to anyone/ wildlife walking in the area. The depth from the top of the catch basin to the bottom of the culvert was measured to be approximately 2.4 m.
- An old, vegetated ground crack was observed near the toe of the west embankment slope. The crack is near both the 900 mm diameter CSP alignment and the north extent of the slide zone (Photo 8).
- The local slump was observed above the 900 mm diameter culvert outlet (Photo 9), likely due to saturation of the embankment fill at the location of the separation (Photo 10).
- No flow was observed from the culvert outlet, however, water was observed to be flowing under the outlet from the next segment directly behind the outlet (Photo 10).
- SI97-3 does not show any movement suggesting the landslide scarp is located on the highway. Previous SI readings indicate the slip surface is about 7 m below the highway surface.
- Piezometric levels have increased 0.1 m to 0.5 m since the 2023 inspection.
- The Consequence Factor remains at 6 since the landslide could result in a full road closure. The Probability Factor remains at 13 since the hazard appears to be active with a high rate of movement considering the fast progression of cracks and vertical displacement after the Fall 2022 patch.

RECOMMENDATIONS

- The local MCI should continue to monitor the highway condition for development of new cracks and progression of existing cracks.
- Crack sealing should be completed to reduce surface water infiltration into the landslide.
- Milling and paving may continue as a short-term solution until long-term repairs can be performed. For any planned milling, the highway should be overlaid such that the final elevation matches the existing elevation or lower (i.e., no net addition of loads).
- A small amount of fill could be placed to reduce the steepness of the NBL shoulder. Sharp shoulder signs may also be placed to warn motorists.
- The 900 mm diameter culvert should be inspected via CCTV to check for separation below the highway. Separated sections of the culvert should be excavated and replaced. Repair of the slump at the outlet can also be completed concurrently for efficiency.
- A pile wall design was prepared for tender by another consultant and was scheduled for implementation in 2022. However, it's understood that the construction schedule changed. It is recommended that the pile wall be constructed as soon as practicable.
- Site inspections should be completed every 2 years with the next inspection in 2027.
- Instrumentation should be monitored annually in the spring.

NORTH CENTRAL REGION GRMP
EDSON / STONY PLAIN
SITE INSPECTION FORM

PREPARED BY: Sonja Pharand, P.Eng.	**PREPARED BY:** Leslie Cho, M.Eng., P.Eng.	**PERMIT TO PRACTICE:**
PROFESSIONAL ENGINEER ALBERTA SONJA A. PHARAND ID 286545 2025-10-15		PERMIT TO PRACTICE STANTEC CONSULTING LTD. Signature ID# 74389 Date 16 - Oct - 2025 PERMIT NUMBER: P 0258 The Association of Professional Engineers and Geoscientists of Alberta



Stantec

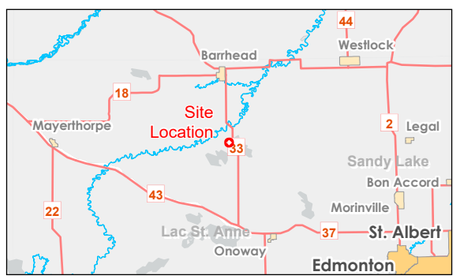
- Catch Basin
- Standpipe Piezometer / Slope Indicator
- Photos and Direction
- Ground Elevation Contours [3](m AMSL[4])
- Site Detail
- Previous Observation
- 2025 Observation
- Cross Section

N

0 25 50 metres
(At original document size of 11x17)
1:1,450

Notes

1. Coordinate System: NAD 1983 CSRS UTM Zone 11N
2. Imagery: Light Gray Base: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
   Google Satellite: © OpenStreetMap (and) contributors, CC-BY-SA
3. Contours obtained from Thurber (2021)
4. m AMSL - Metres Above Mean Sea Level



Project Location
HWY 33
Alberta

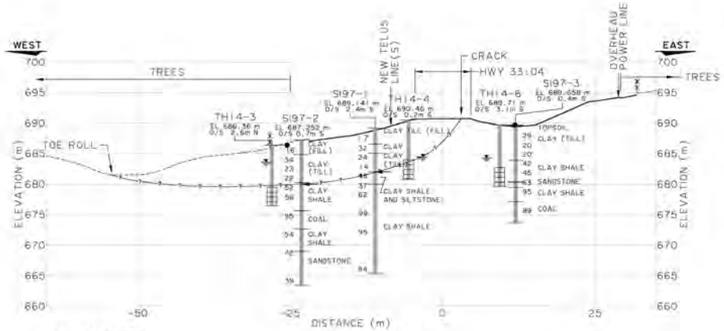
Prepared by MK on 2025-10-15
QR by SP on 2025-10-15
IR by LC on 2025-10-15

Client/Project 123315222
Alberta Transportation and Economic Corridors
Geohazard Monitoring Program
NC010-1: HWY 33:04 Willow Bend (KM 25)

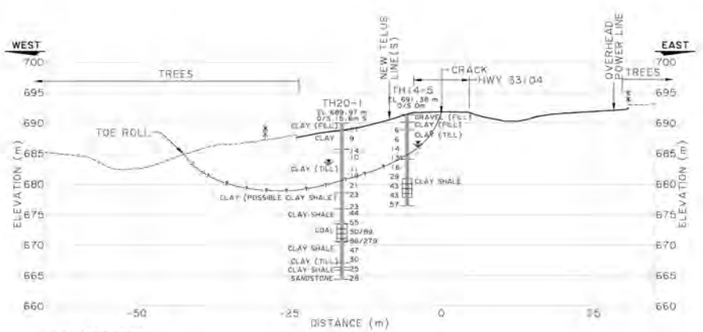
Figure No.
1

Title
Site Plan

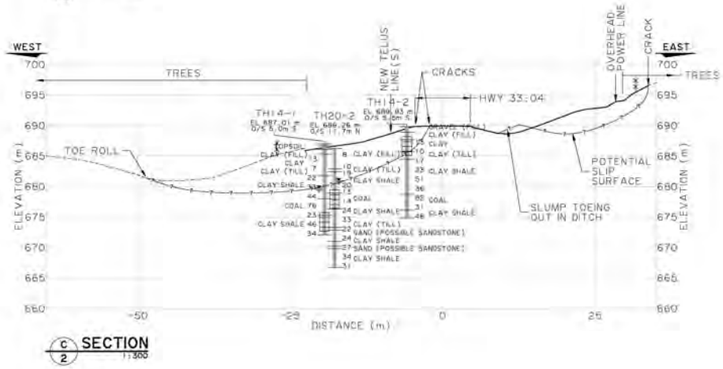
\\cd1001-c200\workgroup\12333\active\123315222\03_data\gis_cad\figures\annual_inspection\NC1012025 Figure: fig_1_site_plan_nc10 Revised: 2025-10-15 By: sjiwani



A 2 SECTION 1:300



B 2 SECTION 1:300



C 2 SECTION 1:300

LEGEND
- 5 SPT N VALUE
- WATER LEVEL IN PIEZOMETER (APRIL 27, 2020)
- STANDPIPE PIEZOMETER SCREENED INTERVAL
- DEPTH OF MOVEMENT IN SLOPE INCLINOMETER
- JUNE 2, 2020 SURVEYED PROFILE
- LIDAR PROFILE
- INFERRED SLIP SURFACE
- FENCE LINE (NOT TO SCALE)

NOTES
1. DATA CONCERNING THE VARIOUS STRATA HAVE BEEN OBTAINED AT THE TEST HOLE LOCATIONS ONLY. THE SOIL STRATIGRAPHY BETWEEN TEST HOLES HAS BEEN INFERRED FROM GEOLOGICAL EVIDENCE AND SO MAY VARY FROM THAT SHOWN.
2. NO SAMPLES WERE TAKEN FROM TH14-3, TH14-4, TH14-6.
3. IT IS THE RESPONSIBILITY OF OTHERS USING THE GEOTECHNICAL INTERPRETATION TO ENSURE IT IS ADEQUATE OR TO SUPPLEMENT IT WITH ADDITIONAL INFORMATION AT THEIR OWN COST.
4. THE CONTRACTOR SHALL CONFIRM THE LOCATIONS OF ALL UTILITY LINES WITHIN THE WORK AREA PRIOR TO CONSTRUCTION.
5. THE LOCATION OF NEW TELUS LINE(S) IS APPROXIMATE AND SHALL BE CONFIRMED BY CONTRACTOR.

0 7.5 15 22.5 30 metres
(At original document size of 11x17)
1:400

Notes
1. Coordinate System: NAD 1983 3TM 114
2. Data Sources: Geogratis, ©Department of Natural Resources Canada, All rights reserved.
3. Cross sections from Thurber Engineering Ltd. (2021). Plans of HWY No. 33:04 NC10: Willowbend Landslide Repair Contract No 21565 Tender Set.
4. Background: Light Gray Base: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
Google Satellite: © OpenStreetMap (and) contributors, CC-BY-SA

Stantec

Project Location
HWY 33
Alberta

Prepared by MK on 2025-10-15
QR by SP on 2025-10-15
IR by LC on 2025-10-15

Client/Project 123315222
Alberta Transportation and Economic Corridors
Geohazard Monitoring Program
NC010-1: HWY 33:04 Willow Bend (KM 25)

Figure No.
2

Title
Highway 33 Cross-Section

2025 Inspection Photos at NC010

Photo 1: South end of milled / patched highway area. Looking north.

Photo 2: South end of landslide pavement cracking. Looking north.

2025 Inspection Photos at NC010

Photo 3: North end of milled / patched highway area. Looking south.

Photo 4: Flowing water and sedimentation in wheel tracks on east side of highway, south from backslope slump #3. Looking north.

2025 Inspection Photos at NC010

Photo 5: West embankment slope, looking southwest.

Photo 6: Separation at 900 mm diameter culvert inlet. Looking southwest.

2025 Inspection Photos at NC010

Photo 7: Subsidence along culvert alignment. Looking northwest.

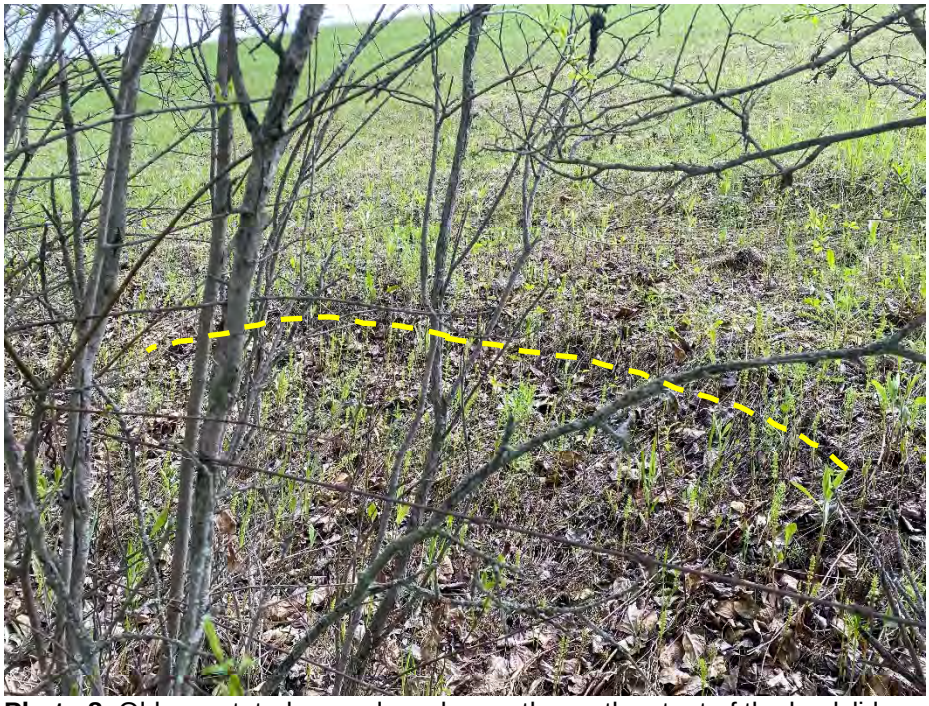


Photo 8: Old, vegetated ground crack near the north extent of the landslide zone. Looking northeast.

2025 Inspection Photos at NC010

Photo 9: Culvert outlet and settlement above culvert. Looking southeast.

Photo 10: Separation at first joint from culvert outlet. Looking southeast.

2025 Inspection Photos at NC010

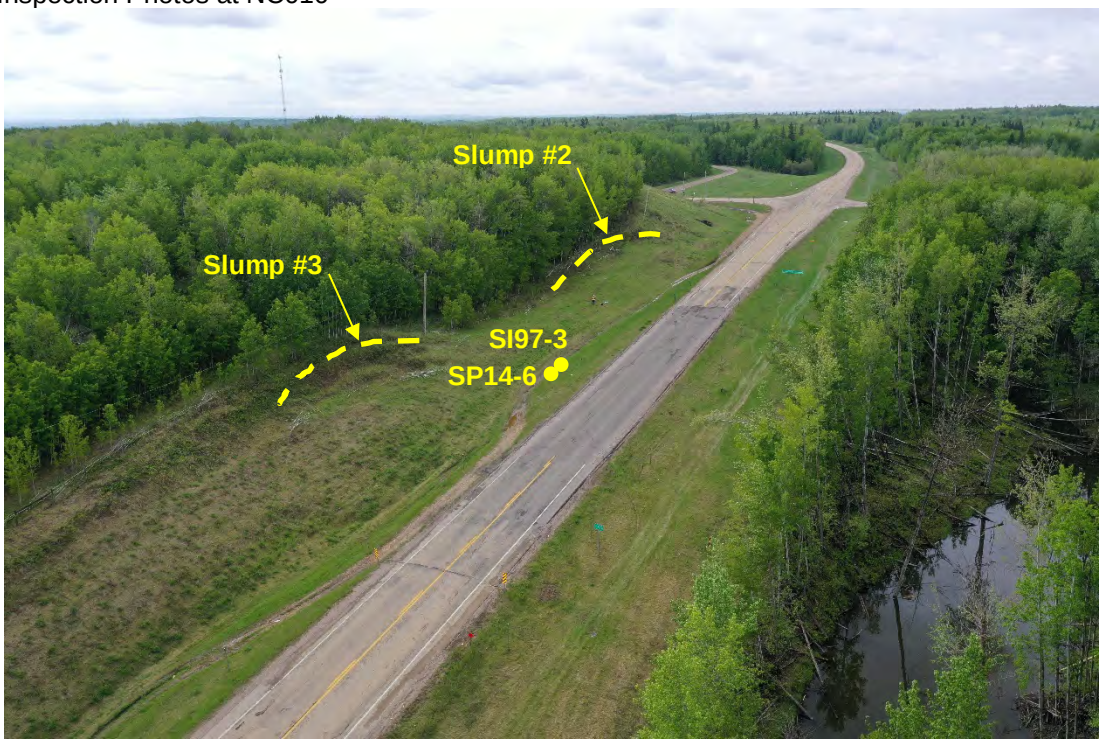


Photo 11: Aerial view of the site, taken by drone. Facing southeast.

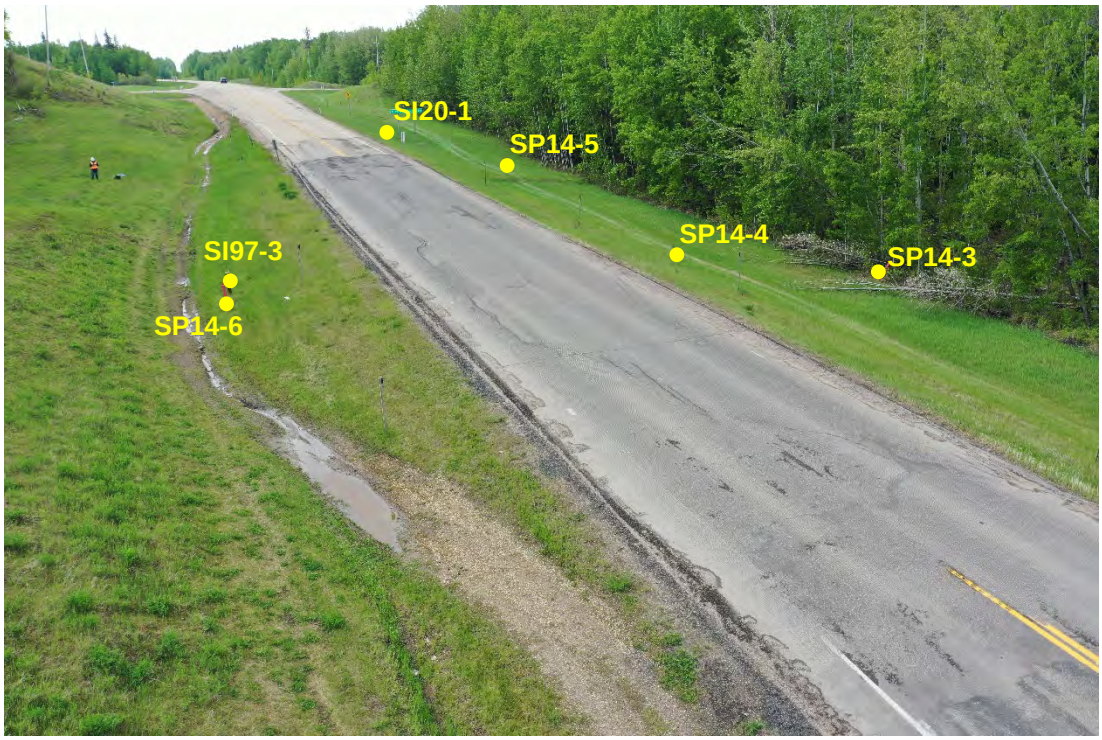


Photo 12: Aerial view of pavement cracking, taken by drone. Facing southwest.