

<b>SITE NUMBER AND NAME:</b> NC080 – Fickle Creek Slide	<b>HIGHWAY AND KM:</b> 47:06, km 39.608	<b>PREVIOUS INSPECTION:</b> May 26, 2020	<b>CURRENT INSPECTION:</b> July 15, 2021
<b>LEGAL DESCRIPTION:</b> SE-24-51-19-W5	<b>NAD83 COORDINATES:</b> UTM11U 5918635N, 522484E		<b>RISK ASSESSMENT:</b> PF: 5 CF: 6 Total: 30
<b>AVERAGE ANNUAL DAILY TRAFFIC (AADT):</b> 180 (2020)		<b>CONTRACTOR MAINTENANCE AREA (CMA):</b> 508	

<b>SUMMARY OF INSTRUMENTATION:</b> One slope inclinometer and two pneumatic piezometers functional	<b>INSPECTED BY:</b> Stantec: Leslie Cho and Carrie Murray AT: Bernard Ching, Rishi Adhikari, Kathleen Davis, Howard Hawley, and Dave Farr
<b>LAST READING DATE:</b> July 3, 2021	
<b>PRIMARY SITE ISSUE:</b> Embankment failure likely associated with precipitation and erosion around culvert.	
<b>APPROXIMATE DIMENSIONS:</b> 60 m wide x 30 m long	
<b>DATE OF ANY REMEDIAL ACTION:</b> Driven steel pile wall constructed in Fall 2013. Side slope regraded and tension cracks filled in Fall 2014. 1200 mm diameter culvert relined in winter 2014. Milled and paved in Sept. 2015.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICEABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Curvilinear crack reflecting through overlay on northbound lane (NBL).		X
Slope Movement	X		Cracks reflecting through pavement overlay. Hairline crack developing on the outside of the NBL guardrail. Dip in pavement towards southeast.		X
Erosion	X		Scour hole above 750 mm dia. culvert outlet. Creek bank erosion/slump at 1200 mm dia. culvert outlet. Erosion northeast of 1200 mm dia. culvert inlet. Erosion below 400 mm diameter down drain outlet.	X	
Seepage		X			
Bridge/Culvert Distress	X		Inlet of 750 mm dia. culvert lifted above ground. Water flowing under culvert and entering culvert at the next segment.		X

<b>COMMENTS</b>
<ul style="list-style-type: none"> <li>• The pavement cracking (Photos 1 and 2) appeared to be similar to the 2020 inspection and generally consisted of: <ul style="list-style-type: none"> <li>– Approximately 40 m long curvilinear crack along NBL.</li> <li>– 25 mm dip to the southeast in the south third of the curvilinear crack.</li> </ul> </li> <li>• Potential hairline cracks were observed on the outside of the guardrail of the NBL near the south limit of the overlay.</li> </ul>

- SI13-01 showed less than 1 mm of incremental movement corresponding to a movement rate of less than 1 mm/year since the Fall 2020 readings. This SI is installed downslope of the pile wall and may not be indicative of movement upslope of the wall.
- No change was observed to the scour hole above the 760 mm diameter culvert and remains about 1.2 m wide and deep (Photo 3).
- The erosion at the outlet of the 1200 mm dia. culvert appears to have worsened (Photo 4). The scarp has receded to about 4 m behind the edge of creek and is about 1.2 m deep.
- A 1.2 m deep scour hole exists at the 400 mm diameter down drain.
- A smaller erosion gully upslope from the erosion gully north of the 1200 mm dia. culvert inlet was observed (Photo 5). The smaller erosion gully was about 500 mm wide and 450 mm deep and extended to about 2 m short of the north tree line (Photo 6).

**RECOMMENDATIONS**

- All pavement cracks should be sealed to reduce surface water infiltration into the slide mass. Mill and fill or patching may also be completed to improve the rideability of the highway (i.e. smoothen dips and repair cracks)
- Since there are no functional instruments above the pile wall, two lines of survey control points can be installed to monitor movement of the embankment above the pile wall. Alternatively, replacement inclinometers can be considered to monitor pile wall performance.
- Riprap or gravel can be placed at the down drain to reduce scouring. If left unchecked, the erosional scour may remove additional material and trigger a slope failure on the west side of the highway.
- Riprap can be placed along the creek at the outlet of the 1200 mm dia. culvert to reduce toe erosion of the slump. This slump should be backfilled and reseeded.
- The scour hole above the 760 mm diameter culvert outlet should be backfilled and reseeded.
- The site should continue to be inspected every two years with the next visit in 2023.
- Instrumentation monitoring should continue annually in the spring.

**PREPARED BY:** Leslie Cho, M.Eng., P.Eng.**REVIEWED BY:** Carrie Murray, M.Eng., P.Eng.

2021 Site Inspection Photos at NC080



**Photo 1:** Arched crack near SI13-02. Looking southwest.



**Photo 2:** Pavement dip near south end of overlay. Looking southwest.



2021 Site Inspection Photos at NC080



**Photo 3:** Scour hole above 760 mm diameter culvert. Looking west.



**Photo 4:** Slump/erosion at outlet of 1200 mm diameter culvert. Looking east.



2021 Site Inspection Photos at NC080

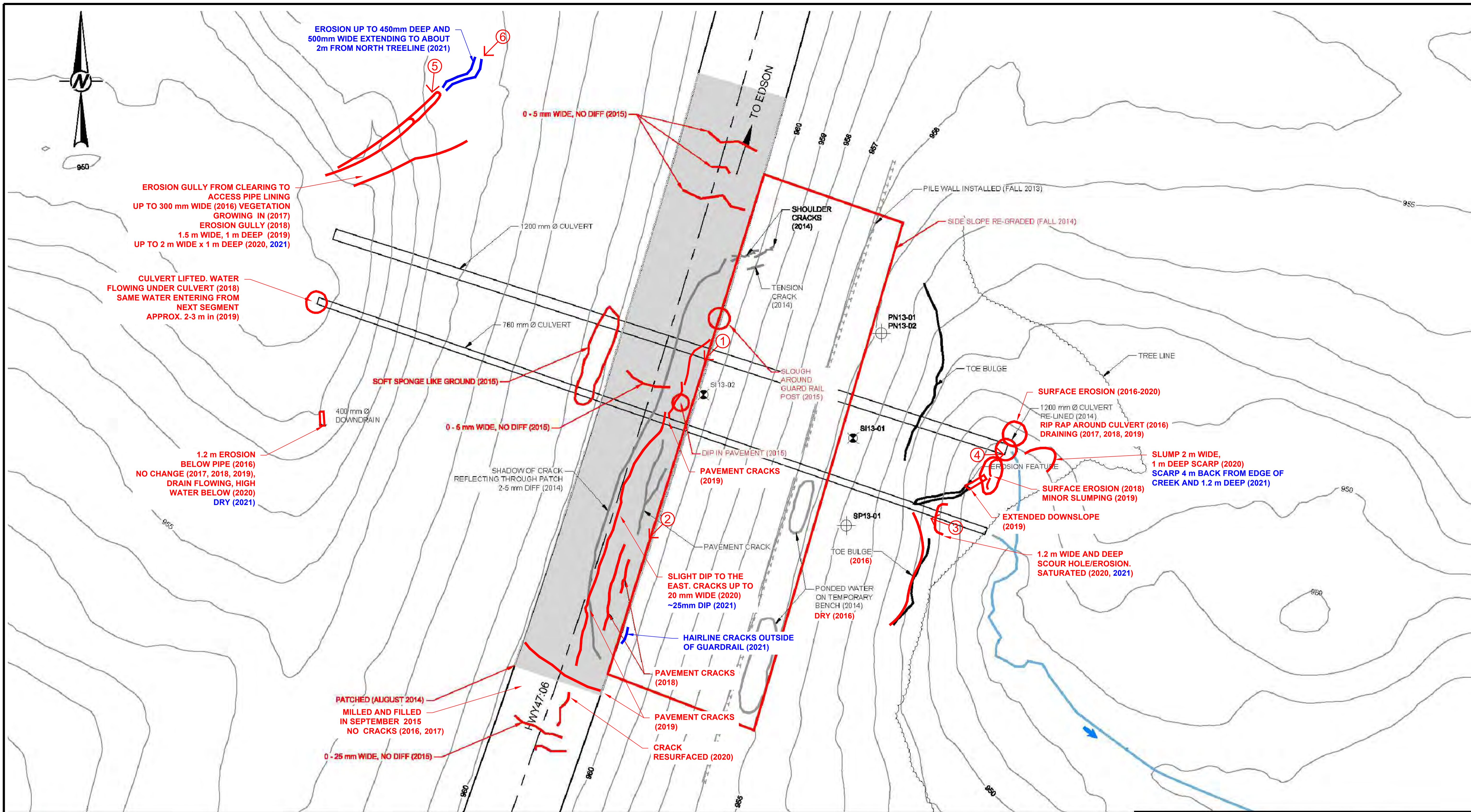


**Photo 5:** Erosion gully north of 1200 mm diameter culvert inlet. Looking southwest.



**Photo 6:** New erosion gully leading to old gully shown in Photo 5. Looking southwest.






- LEGEND**
- FLOW ARROW
  - CONTOUR (5 m INTERVAL)
  - WATER COURSE
  - ⊕ PIEZOMETER LOCATIONS
  - ⊗ SLOPE INCLINOMETER LOCATIONS
  - ⊚ DRIVEN STEEL PILE
  - PHOTO NUMBER AND DIRECTION

- NOTES**
1. FEATURE LOCATIONS ARE APPROXIMATE.
  2. PREVIOUS OBSERVATIONS SHOWN IN BLACK.
  3. 2015-2020 OBSERVATIONS SHOWN IN RED
  4. 2021 OBSERVATIONS SHOWN IN BLUE

**REFERENCE**  
LIDAR CONTOURS OBTAINED FROM CLIENT.





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ALBERTA TRANSPORTATION  
GEOHAZARD MONITORING PROGRAM  
NC80 FICKLE CREEK SLIDE  
SITE PLAN

DRAWN WW / MK	CHECK CM	APPROVE LC	
DATE 03 SEPT. 2021	SCALE AS SHOWN	PROJECT # 123315222	

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**FIGURE - 1**