



GEOHAZARD RISK MANAGEMENT PROGRAM North Central Region – Edson / Stony Plain Area

2019 Inspection Report

Site Number	Site Name		Hwy	km
NC74	South of Entwistle Slide		22:30	44.2
Legal Land Description	SE 17 and SW 16-52-07-W5M			
UTM Coordinates (NAD 83)	Zone 11N	N5928504	E633710	
Operational Site Instrumentation	Slope Inclinometers		0	
	Pneumatic Piezometers		0	
	Vibrating Wire Piezometers		1	
	Standpipe Piezometers		0	
Date of Last Instrumentation Readings	May 7, 2019			

Risk Assessment	Date	PF	CF	Risk Ranking
Current Inspection	May 14, 2019 (Site Inspection) July 11, 2019 (Call-Out)	13 16	3 6	39 96
Previous Inspection	May 30, 2018	11	3	33
Report Attachments	□ Photographs (10 photos)	⊠ Site Plar	ns (1 page)	

	Stantec	Alberta Transportation
Inspected By	Leslie Cho, Junwen Yang, and Xiteng Liu	Kristen Tappenden, Paul Macaraeg, Tim Germyn, and Kathleen Davis
Date of Remediation	n/a	



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Recent Maintenance Primary Site Issue	Patched 3 times in 2011. Overlaid after 2012 inspection. Southbound lane (SBL) overlaid in 2013 and 2014. Patched in 2015. Patched end of June 2017. Gravel placed on SBL to repair drop at edge of pavement. West shoulder patched in 2018. SBL overlaid on June 21, 2019. SBL hand patched on June 29, 2019. Slope instability from weak foundation soils and high groundwater table.		
Observations	Description and Location	Change from Inspection	Previous
□ Pavement Distress	Cracks reflected through overlay.	□ Yes	⊠ No
□ Culvert Distress	Inlet is rusted and 0.5 m off ground.	□ Yes	⊠ No
☐ Bridge Distress		□ Yes	□ No
	Ongoing pavement cracking. Leaning fence posts on west side.	□ Yes	⊠ No
	Erosion around culvert inlet	□ Yes	⊠ No
☐ Seepage		☐ Yes	□ No
⊠ Other	Creek partially blocked downstream of culvert outlet	□ Yes	⊠ No

At the time of the site inspection, the last noted patch at the site occurred on the SBL of Highway 22. Since then, pavement cracking has reflected through the highway patches and appeared more severe than in 2018 as shown in Photos 1 to 3.

The leaning fence posts appeared unchanged from 2017 with angles up to 16°.

Discussion

Standing water was observed at the outlet of the culvert similar to the previous inspections dating back to 2013 as shown in Photo 4. The creek appeared to be partially blocked at the outlet. The culvert inlet in the east ditch was measured to be 500 mm above ground similar to the 2017 inspection. Additionally, the culvert inlet was rusted through and erosion was observed around the inlet as shown in Photo 5.

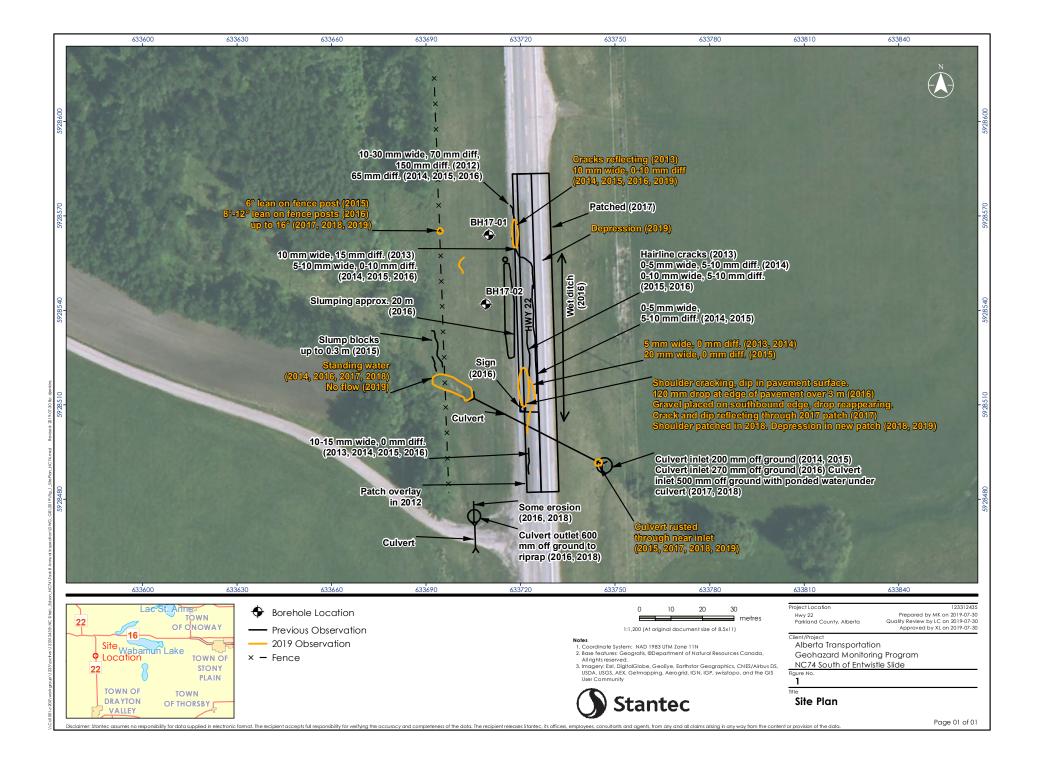
The overall west slope is shown in Photo 6.

On July 11, 2019, a call-out inspection was conducted by Stantec and AT due to active movement of the SBL. Photos showing the site observations are provided in Photos 7 to 10 for comparison and continuity during the next inspection. Additional information can be found in the Call-Out Report dated August 1, 2019.



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Assessment	Prior to the call-out inspection, the Spring 2019 instrumentation readings showed a movement rate of 41 mm/yr and 49 mm/yr in S117-01 and S117-02, respectively. An attempt to collect instrumentation readings was made during the call-out inspection. However, the SIs were found to be sheared off at 3.5 m and 4.5 m bgs in S117-01 and S117-02, respectively. In addition, VW17-02 was found to be damaged at that time. VW17-01 showed piezometric levels to be approximately 1.5 m. The cause of movement is likely due to a combination of relatively shallow groundwater table and weak high plastic clay as foundation soils. The extra surcharge loads from pavement overlay accelerates the movement.
Recommendations	Currently, AT has closed the SBL and implemented alternating traffic lights for two-way traffic over the northbound lane (NBL). This should continue until the highway is repaired. Stantec has submitted a tender package for landslide remediation (pile wall), culvert replacement, and reconstruction of both the NBL and SBL. Long term recommendations are, therefore, not required at this time. The pavement surface should be regularly inspected to monitor cracking across the NBL. Site inspections should continue to be completed annually. The instruments should be monitored semi-annually.







<u>Photo 1:</u> Cracks reflecting through Highway 22 patch along west shoulder. Looking south.



<u>**Photo 2:**</u> Semi-circular pavement crack along southbound lane. Looking southeast.





Photo 3: Pavement cracking along southbound lane. Looking south. Photo taken May 14, 2019.



<u>Photo 4:</u> Standing water at the culver outlet on the west ditch. Creek partially blocked. Looking northwest. Photo taken May 14, 2019.





<u>Photo 5:</u> Standing water at the culver outlet on the west ditch. Looking northwest. Photo taken May 14, 2019.



Photo 6: Scour hole around culvert inlet. Culvert rusted through. Looking northwest. Photo taken May 14, 2019.



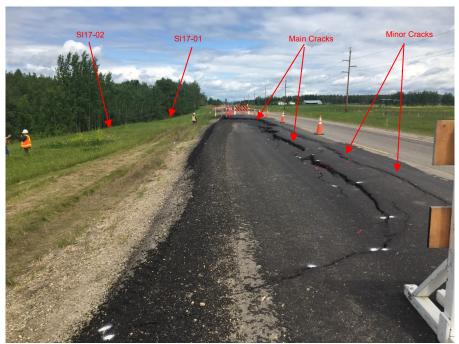


Photo 7: Pavement cracking from Call-Out Inspection. Looking north. Photo taken July 11, 2019.



Photo 8: Overall site and pavement cracks, looking south. Grade drop was evident. Photo taken July 11, 2019.





Photo 9: Looking toward north at pavement cracks. Grade drop was obvious. Photo taken July 11, 2019.



Photo 10: Looking south at the mid-slope. Note potential mid-slope crack. The foot track was created during locating the potential mid-slope crack. Photo taken July 11, 2019.