

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)	13	3	39
	July 11, 2019 (Call-Out)	16	6	96
Previous Inspection	May 30, 2018	11	3	33
Report Attachments	<input checked="" type="checkbox"/> Photographs (10 photos)		<input checked="" type="checkbox"/> Site Plans (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	

Recent Maintenance	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.	
Primary Site Issue	Slope instability from weak foundation soils and high groundwater table.	
Observations	Description and Location	Change from Previous Inspection
<input checked="" type="checkbox"/> Pavement Distress	Cracks reflected through overlay.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/> Culvert Distress	Inlet is rusted and 0.5 m off ground.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> Bridge Distress		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Slope Movement	Ongoing pavement cracking. Leaning fence posts on west side.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/> Erosion	Erosion around culvert inlet	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<input type="checkbox"/> Seepage		<input type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Other	Creek partially blocked downstream of culvert outlet	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Discussion	<p>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.</p> <p>The leaning fence posts appeared unchanged from 2017 with angles up to 16°.</p> <p>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.</p> <p>The overall west slope is shown in Photo 6.</p> <p>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.</p>
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Assessment	<p>Prior to the call-out inspection, the Spring 2019 instrumentation readings showed a movement rate of 41 mm/yr and 49 mm/yr in SI17-01 and SI17-02, respectively.</p> <p>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 SI17-01 and SI17-02, respectively. In addition, VW17-02 was found to be damaged at that time. VW17-01 showed piezometric levels to be approximately 1.5 m.</p> <p>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.</p>
Recommendations	<p>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.</p> <p>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.</p> <p>The pavement surface should be regularly inspected to monitor cracking across the NBL.</p> <p>Site inspections should continue to be completed annually. The instruments should be monitored semi-annually.</p>

Reference: 2019 Annual Inspection Photographs at NC74 – South of Entwistle Slide
File Number: 123312435



Photo 1: Cracks reflecting through Highway 22 patch along west shoulder. Looking south.



Photo 2: Semi-circular pavement crack along southbound lane. Looking southeast.

Reference: 2019 Annual Inspection Photographs at NC74 – South of Entwistle Slide
File Number: 123312435



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



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

Reference: 2019 Annual Inspection Photographs at NC74 – South of Entwistle Slide
File Number: 123312435



Photo 5: Standing water at the culvert 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.

Reference: 2019 Annual Inspection Photographs at NC74 – South of Entwistle Slide
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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.

Reference: 2019 Annual Inspection Photographs at NC74 – South of Entwistle Slide
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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.