ALBERTA TRANSPORTATION
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – SWAN HILLS
2019 INSPECTION

THURBER ENGINEERING LTD.

Site Number	Location	Name	Hwy	km
SH030-1	West of High Prairie	East of Gunns Creek	2A:54	17.56 – 17.82
Legal Description		**UTM Co-ordinates**		
NE&SE32-73-19-W5M		11U E 508,043	N 6,135,622	

	Date	PF	CF	Total
Previous Inspection:	18-Jun-2018	5 11	3 3	15 (culvert) 33 (west)
Current Inspection:	11-Jun-2019	5 11	3 3	15 (culvert) 33 (west)
Road AADT:	800		**Year:**	2019
Inspected By:	Roger Skirrow, TRANS Ed Szmata, TRANS Rodney Johnston, TRANS		Ken Froese, Thurber Niels Rasmussen, Thurber	
Report Attachments:	☑ Photographs ☑ Plans		☐ Maintenance Items	

Primary Site Issue:	Longitudinal cracking and slumping of EBL lane and shoulder.	
Dimensions:	Section 1: 48 m and 15 m long shallow slides on either side of a 900 mm culvert; Section 2: 110 m long section with cracking and minor settlement about 60 m further west of initial areas (about 135 m west of culvert)	
Date of Remediation:	Section 1: 2017 – 137 m of SBL at culvert sites rebuilt with gravel fill and paved.	
Maintenance:	Section 1: Fall 2017 – Patching on EBL of west site. Section 2: 2018 – Minor patching.	
Observations (West Site):	**Description**	**Worsened?**
☑ Pavement Distress	Longitudinal cracking over 110 m and minor subsidence of south half of EBL and shoulder.	☑
☑ Slope Movement	Minor settlement of highway surface and potential toe bulging noted on embankment slope.	☐
☐ Erosion		☐
☑ Seepage	Ponded water observed in south ditch.	☐
☑ Bridge/Culvert Distress	900 mm culvert (km 17.612) at east end of area in good condition.	☐
☐ Other		☐
Instrumentation:		
None		

Assessment:

There had not been a history of landslide activity at this location until June 2016; however, there was higher-than-average rainfall in the weeks preceding signs of instability. It is likely that the embankment or foundation soils became saturated reducing the strength of the material allowing failure. At the time of June 2016 call-out inspection, the slide west of the culvert in Section 1 had been temporarily filled with 50 mm gravel. It was recommended that a gravel wedge with shear key be constructed using the Contractor currently working on the SH26 slide repair located about 0.6 km further west. Although a toe berm would have been as effective and less expensive, there was not time to acquire additional right-of-way. It is understood that this repair was completed in late fall of 2016 with final paving completed in the spring of 2017. At the time of the 2017 assessment, the new pavement in the EBL did not shows signs of cracking and the embankment slope appeared stable. It was noted that there appears to be a slight dip across both lanes over top of the 900 mm culvert which was unchanged at the time of the 2018 inspection and slightly less noticeable in 2019.

During the 2017 inspection, it was noted that there was additional longitudinal cracking along Section 2 about 60 m further west of the newly-paved area. Cracks were typically 10 mm to 20 mm in width and differential heights across the cracks were up to 25 mm. A possible toe bulge was identified over a portion of this area. It is likely that the mechanism of failure is similar to the area at the culvert; however, there may be some local strength variability in the embankment or foundation soils that delayed movement. It should be noted that the fields in the vicinity of this area are flat-lying and the drainage is poor due to low grades along the ditches. An additional round of localized patching was undertaken in Fall 2017; however, some of the cracks had reflected through. Some of the cracks not covered by the patch have gotten slightly wider since 2017 and continued to deteriorate through 2018 and 2019. As of 2019, some potholes and pop-outs have formed, the cracks have increased in length, width, and frequency, and there some differential movement is appearing.

In 2019, the site was drilled during engineering design (see Thurber Project 22188). The test holes drilled through the highway (locations shown on the drawings) encountered between 1.5 m (TH19-1) and 2.8 m (TH19-2) of gravel and clay fill overlying stiff, high plastic native clay to the depth of investigation (10.4 m below ground surface). The tender has been developed for remediation of this site and includes a 90 m long excavation of the south lane, including a shear key, to be backfilled with granular material which will flatten the sideslope to 4.25H:1V and incorporate some minor ditch grading at the toe.

Recommendations:

Short-term road maintenance may be required to maintain the driving surface until the project has been tendered and repaired. The GeoHazard assessment should continue annually as scheduled.