

SITE NUMBER AND NAME: S043 Pine Ridge		HIGHWAY & KM: 6:04, 10.000	PREVIOUS INSPECTION DATE: May 2, 2018	INSPECTION DATE: May 10, 2019
LEGAL DESCRIPTION: 02-09-003-29 W4M	NAD 83 COORDINATES: UTM Northing Easting 12 5452673 292619		RISK ASSESMENT: PF: 9 CF: 4 TOTAL: 36	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 353 (north), 328 (south), (Ref No. 60060410)			CONTRACTOR MAINTENANCE AREA (CMA): 26	

SUMMARY OF SITE INSTRUMENTATION: None	INSPECTED BY: Chris Gräpel (KCB) Chris Morgan (KCB) Alex Frotten (AT) Roger Skirrow (AT) Nicolas Ropchan (AT)
LAST READING DATE: N/A	
PRIMARY SITE ISSUE: Embankment sliding and/or settlement causing cracks in pavement extending across the southbound lane.	
APPROXIMATE DIMENSIONS: Approximately 30 m to 35 m wide, extending 3 m into the southbound lane. Embankment fill and natural slope at approximately 1.5H:1V. Fill is approximately 8 m high with natural slope approximately 20 m high below the fill.	
DATE OF ANY REMEDIAL ACTION: No recent remedial measures have been undertaken. An overlay appears to have been placed approximately 20 years ago, according to AT.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		Cracking of the pavement extends to the middle of the southbound lane and near centreline.	X	
Slope Movement	X		Slope below the highway is exhibiting signs of movement.		X
Erosion		X			X
Seepage		X			X
Culvert Distress		X			X

COMMENTS
Ongoing slope movement. Pavement cracking has enlarged slightly in width and extent. Areas of sealed cracks appear to be opening slightly. There is cracking at the west edge of the pavement on the south side of the slope, and cracks seem to be opening and joining together.
Cracks up to 50 to 75 mm wide at southern extent of the failure area, with up to 50 mm of settlement. The cracking extends to the middle of the southbound lane but has not changed significantly since 2018.
There appears to be persistent ponding of water in the upslope ditch opposite the slide zone, with probable infiltration into the slide mass. The ditch was dry at the time of the inspection.
There is an existing draw feature to the northeast and southwest of the site, that was likely filled in as part of the highway construction works.

<p>The guard rail above the failure zone on the highway has dropped and a dip is apparent.</p>
<p>Up to 1 to 1.2 m thickness of asphalt was observed at various points along the highway shoulder on the crest of the downslope embankment. However, this could be overspill from the last overlay.</p>
<p>Vegetation was observed at the fill-natural soil contact at the toe of the embankment downslope of the highway. The density of vegetation could indicate seepage at the fill-foundation contact.</p>
<p>A noticeable deflection (approximately 1-2 m) of the barbed wire fence running parallel to the highway was noted in 2018. The fence is located approximately 5 m below the highway.</p>
<p>The embankment failure appears to be due to groundwater seepage and seepage from the adjacent drainage ditch leading to instability downslope. Ponded water in the drainage ditch is infiltrating into the adjacent highway embankment. It may also be possible that organic material present beneath the embankment was left in-situ during the embankment construction, or that sub-drainage was not included to drain springs, as was a common highway construction practice in the past.</p>
<p>Short-Term:</p> <ul style="list-style-type: none"> - The drainage ditch should be regraded to allow water to pass through this area without ponding, to see whether slope movements cease. If not, the ditch should be lined with a geomembrane to limit infiltration into the embankment fill. Additional stabilization measures such as a pile wall may be required if current rates of movement accelerate significantly. - If drainage improvements don't reduce slide activity, the highway should be relocated 1.5 lanes northeast with buried highway drainage.

Photo 1 Cracks at south end of failed area extending to middle of southbound lane. Photo was taken facing southeast on May 10, 2019.



Photo 2 Dip in guard rail (red circle) due to slope movement. Photo was taken facing northwest on May 10, 2019.



Photo 3 **Drainage ditch on upslope side of site. Damp areas observed in the poorly graded ditch. Photo was taken facing east on May 10, 2019.**



Photo 4 **Embankment slope south of highway. Photo was taken facing northwest on May 10, 2019.**





Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- Crack
- Fence
- Flow Direction



NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM Zone 12N
 3. IMAGE SOURCE: World Imagery, ArcGIS Online.
 Source date January 2015

CLIENT

PROJECT SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM		
TITLE Site Plan S043 - Pine Ridge Hwy 6:04, km 10.000		
SCALE 1:1,000	PROJECT No. A05115A03	FIG No. 1

Time: 12:12:40 PM
 Date: June 14, 2019
 File: Z:\A\EDM\A05115A03\ABT Southern Region GRMP\400 Drawings\2019\2 Section BIM\XDS\043_190614.mxd