

**ALBERTA TRANSPORTATION
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – GRANDE PRAIRIE DISTRICT
2020 INSPECTION**



Site Number	Location	Name	Hwy	km
GP38B	NW of Grande Cache	1.6 km N of Kakwa River Bridge	40:38	25.5
Legal Description		UTM Co-ordinates (NAD 83)		
SE8-63-4-W6		11U N 6,032,885	E 398,710	

	Date	PF	CF	Total
Previous Inspection:	May 28, 2019	3	2	6
Current Inspection:	May 26, 2020	3	2	6
Road AADT:	1,370		Year:	2019
Inspected By:	Don Proudfoot, Nicole Wilder (Thurber) Ed Szmata, Rishi Adhikari (AT)			
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

Primary Site Issue:	The original issue was a landslide in an 8 m high sidehill highway embankment fill. There is now a bit of settlement under the asphalt patch and minimal surficial erosion along where the slide was repaired.	
Dimensions:	The original slide was about 20 m long by ~10 m wide	
Date of any remediation:		
Maintenance:	In June 2016, an overlay was placed. The northbound lane was patched after construction of landslide remedial measures in 2018.	
Observations:	Description	Worse?
<input checked="" type="checkbox"/> Pavement Distress	The pavement patch has settled a bit since the end of construction. Appeared to be in similar condition in 2020.	<input type="checkbox"/>
<input type="checkbox"/> Slope Movement		<input type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Minimal surficial erosion was observed where the slide was repaired from surface flow runoff creating rills. Grass growth in this area is somewhat sparse but is growing.	<input checked="" type="checkbox"/>
<input type="checkbox"/> Seepage		<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>

Instrumentation: October 08, 2020 - Standpipes SP17-1 = 2.4 m BGS; SP17-2 = Destroyed.

Assessment:

A 3 m diameter SPCSP culvert exists adjacent to the northeast side of where the slide scarp was located. This culvert did not have any identifiable distress; however, a small slump was observed in the south channel bank downstream of the culvert riprap plunge pool.

Remedial measures for GP38B, which comprised of a remedial design of the landslide using a sheet pile wall shear key and removal and replacement the of the slide mass with compacted granular fill, were carried out in 2017/2018. The pavement was re-established over the gravel fill and additional riprap was also placed downstream of the culvert at that time.

A geotechnical investigation consisting of 2 test holes with standpipes piezometers was performed in the winter of 2017.

A dip previously existed in the northbound driving lane/shoulder, and along the perimeter of the dip some cracking had been observed. The east highway fill embankment, which was inclined at ~21°, was also

bulged partway down the slope. This had developed into a slide scarp within the northbound lane and it toed out near the culvert outlet.

It is anticipated that the original slide was caused by wet subgrade materials (possibly from groundwater seepage or a naturally high water table) and creek erosion at the toe of the slope, downstream of the rip rap. The slide movement was likely aggravated by the high frequency of heavy truck traffic traversing the area. The embankment fill slope of about 21° (~2.6H:1V), was considered too steep for the clay subgrade materials it was composed of.

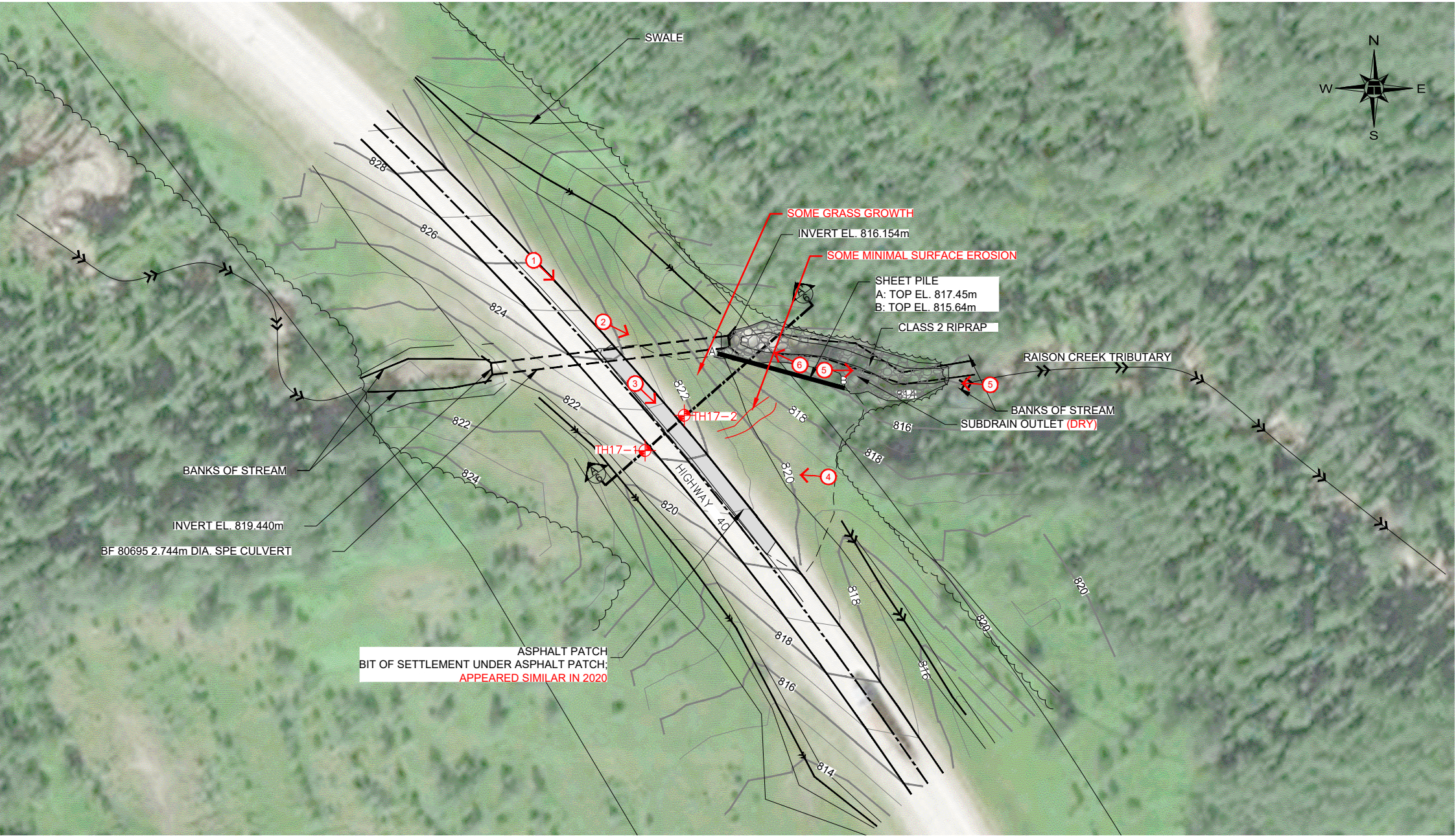
The remedial measures appear to be working well. Some settlement of the backfill that was placed below the highway for the repair was expected.

Recommendations:

Maintenance:

Further patching may be required if the patch continues to settle. Surficial erosion should be monitored so that it does not become a major issue.

This site could be removed from the annual inspection list.



SITE PLAN
SCALE 1:1250

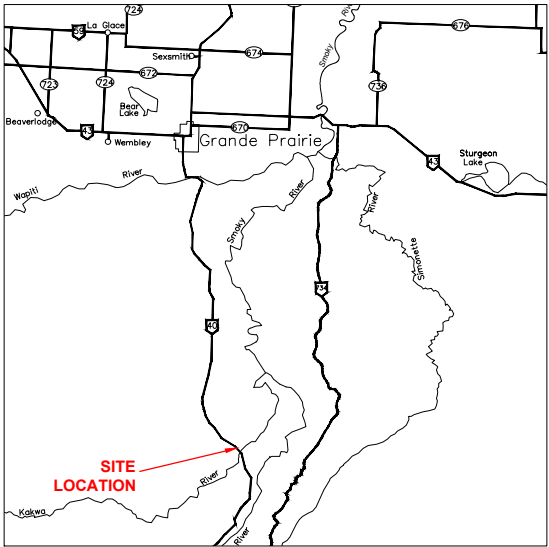




Photo 1.
Looking south at
culvert outlet and
where slide has
been replaced with
fill and new ACP
patch.



Photo 2.
Looking south
where slide mass
has been replaced.



Photo 3.
Looking south at
most recent ACP
patch where slide
was repaired.



Photo 4.
Looking north at
side slope of slide
repair.



Photo 5.
Looking west at the
3 m diameter
SPCSP outlet,
plunge pool, and
east highway
embankment.



Photo 6.
Looking west at the
3 m diameter
SPCSP outlet,
riprap and top of
sheet pile wall.



Photo 7.
Looking east at
where the subdrain
pipe has
disconnected.