

GEOHAZARD RISK MANAGEMENT PROGRAM

North Central Region – Edson / Stony Plain Area

2019 Inspection Report

Site Number	Site Name		Hwy	km
NC36	Lazy 'S' Slide		22:32	30.2
Legal Land Description	SW28-56-8-W5M			
UTM Coordinates (NAD 83)	Zone 11U	N5969791	E622172	
Operational Site Instrumentation	Slope Inclinometers			0
	Pneumatic Piezometers			0
	Vibrating Wire Piezometers			0
	Standpipe Piezometers			1
Date of Last Instrumentation Readings	May 8, 2018			

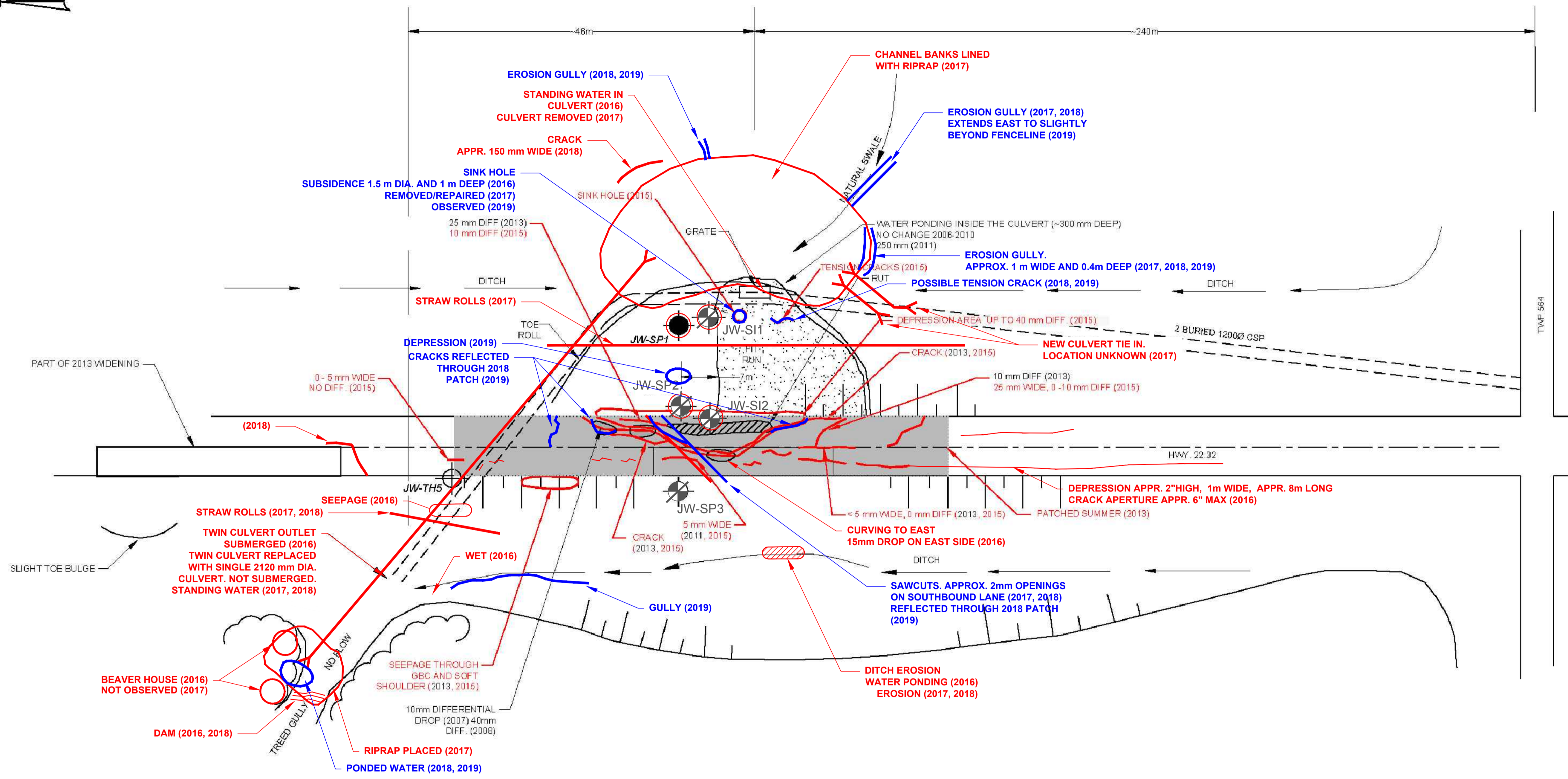
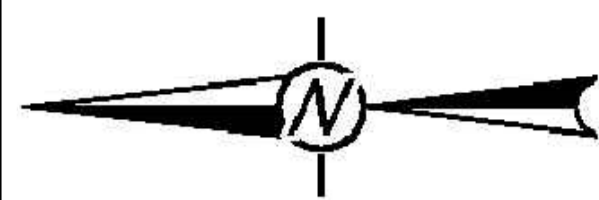
Risk Assessment	Date	PF	CF	Risk Ranking
Current Inspection	May 14, 2019	9	4	36
Previous Inspection	May 30, 2018	9	4	36
Report Attachments	<input checked="" type="checkbox"/> Photographs (9 photos)		<input checked="" type="checkbox"/> Site Plans (1 page)	

	Stantec	Alberta Transportation
Inspected By	Leslie Cho, Junwen Yang, and Xiteng Liu	Kristen Tappenden, Kathleen Davis, Tim Germyn, and Paul Macaraeg
Date of Remediation	2016 – twin culverts replaced with 2120 mm diameter culvert at outlet. Rip rap lined	


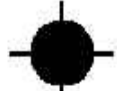

	drainage channel constructed to replace previous twin culvert.		
Recent Maintenance	Asphalt patch in 2010, 2013, and Fall 2018		
Primary Site Issue	High groundwater table, slope instability		
Observations	Description and Location	Change from Previous Inspection	
<input checked="" type="checkbox"/> Pavement Distress	- Pavement cracks reflecting through 2018 patch.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<input checked="" type="checkbox"/> Culvert Distress	- Standing water at culvert outlet.	<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	- Pavement cracks reflecting through 2018. - More pronounced ground cracks south of JW-SI1 - New depression east of JW-SP2.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<input checked="" type="checkbox"/> Erosion	- Erosion along northeast and south edge of riprap drainage channel - New erosion gully in west ditch leading to creek	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Seepage		<input type="checkbox"/> Yes	<input type="checkbox"/> No
<input type="checkbox"/> Other		<input type="checkbox"/> Yes	<input type="checkbox"/> No

Discussion	<p>Highway 22 was recently patched in late Fall 2018. Previously observed pavement cracks have already resurfaced as shown in Photos 1 to 3.</p> <p>The previous culverts at the site were removed and reconstructed in 2016 through AT's bridge department. It was noted during the Spring 2017 readings that instruments were destroyed consisting of SP2, SP3, and S11. S11 was also noted to be infilled with soil. As part of the reconstruction, a saw cut was used to remove a portion of the roadway. The southern saw cut location can be seen in Photo 2. The new culverts now drain into and out of a riprap lined channel as shown in Photo 4.</p> <p>The previous twin culvert outlet was replaced by a 2120 mm diameter SPCSP culvert and lined with riprap as shown in Figure 5. Straw rolls were placed upslope from the culvert outlet. Similar to previous inspections, a treed gully was observed downstream from the culvert outlet.</p> <p>Significant erosion was observed along the natural swale to the south and along the northeast and southern edge of the drainage channel. The erosion channel at the southeast side of the riprap channel has now extended to beyond the fence line as shown in Photo 6.</p> <p>The seepage on the west shoulder of the road noted in 2015 was not observed at the time of this inspection.</p> <p>The tension crack appeared to be more pronounced south of JW-S11 as shown in Photo 7.</p> <p>A depression in the ground immediately downslope from JW-SP2 was observed as shown in Photo 8.</p> <p>A new erosion gully in the west ditch leading into the treed gully area was observed as shown in Photo 9.</p>
Assessment	<p>All instruments at the site are no longer operational as of the Spring 2019 instrumentation readings.</p> <p>Based on previous instrumentation readings, slope movements are ongoing. This is further evidenced by pavement cracks resurfacing through the recent 2018 patch and the observation of more pronounced tension cracks.</p> <p>Prior to being non-operational, piezometer JW-SP1 was showing ground water levels as high as 0.5 m below ground surface. The near surface groundwater levels may be contributing to the ongoing slope movements. If remedial measures are not taken, the slide mass will likely continue to move and lead to further deformation to the pavement surface.</p>

Recommendations	<p>It is recommended that short term remediation measures should be taken. This may include sealing pavement cracks to reduce surface water infiltration into the slope and pavement structure. Clearing of the treed gully downstream from the culvert may also help to promote drainage.</p> <p>It is recommended that replacement instruments be installed to monitor pore pressure and slope movements.</p> <p>Remediation strategies at this site may include constructing a berm on the east side of the highway or installation of a pile wall. Due to the high groundwater levels on both sides of the slope, drainage measures should be considered on both sides of the road.</p> <p>Annual inspections should be continued at this site.</p>
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LEGEND

-  SLOPE INCLINOMETER INSTALLED BY JACQUES WHITFORD (2006)
-  STANDPIPE PIEZOMETER INSTALLED BY JACQUES WHITFORD (2006)
-  NON-OPERATIONAL INSTRUMENT


NOTES

1. FEATURE LOCATIONS ARE APPROXIMATE
2. PREVIOUS OBSERVATIONS SHOWN IN BLACK
3. 2015-18 OBSERVATIONS SHOWN IN RED
4. 2019 OBSERVATIONS SHOWN IN BLUE

REFERENCE

THURBER PROJECT No. 15-16-258
AUGUST 2011 ORIGINAL SCALE 1:2000





STANTEC CONSULTING
400-10220 103 AVENUE NW
EDMONTON, ALBERTA, CANADA
T5J 05A

ALBERTA TRANSPORTATION
GEOHAZARD MONITORING PROGRAM
NC36 LAZY "S" SLIDE
SITE PLAN

DRAWN WW / MK	CHECK XL	APPROVE LC	
DATE 17 JUL 2019	SCALE AS SHOWN	PROJECT # 123312435	

FIGURE - 1

Reference: 2019 Annual Inspection Photographs at NC36 – Lazy ‘S’ Slide
File Number: 123312435



Photo 1: Old pavement crack reflected through 2018 patch. on northbound lane. Looking north.



Photo 2: Dip in northbound lane repaired during 2018 patch. Saw cut visible. Looking west.

Reference: 2019 Annual Inspection Photographs at NC36 – Lazy ‘S’ Slide
File Number: 123312435



Photo 3: Crack reflecting through 2018 patch. Looking southwest.



Photo 4: Culvert draining into riprap lined channel. Looking south.

Reference: 2019 Annual Inspection Photographs at NC36 – Lazy 'S' Slide
File Number: 123312435



Photo 5: New 2120 mm diameter culvert outlet with riprap lining west of highway. Looking east.



Photo 6: Erosion channel leading from rip rap to fence line. Looking east.

Reference: 2019 Annual Inspection Photographs at NC36 – Lazy ‘S’ Slide
File Number: 123312435



Photo 7: Ground crack more pronounced south of JW-S11.

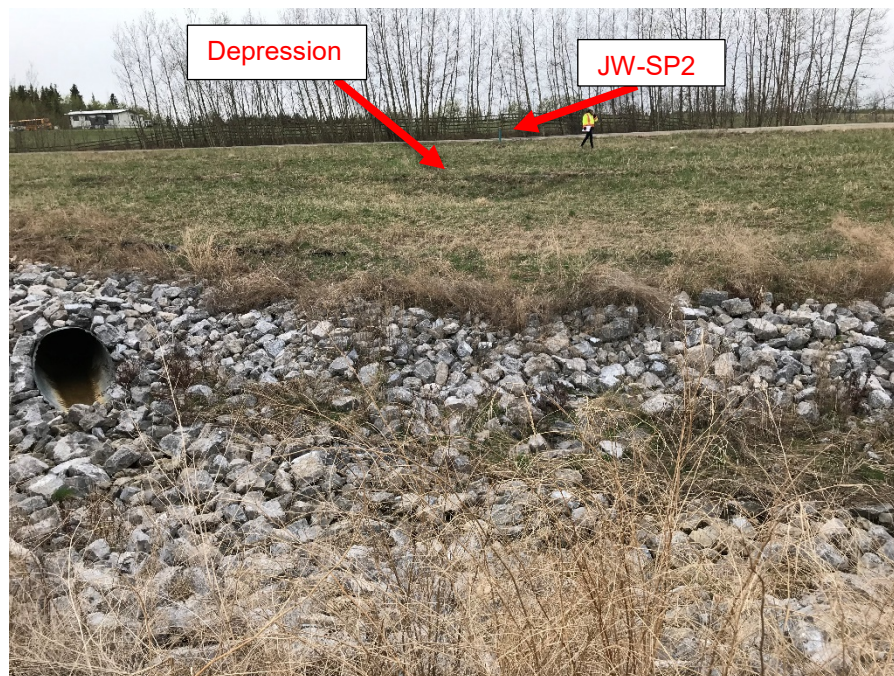


Photo 8: Depression in ground east of JW-SP2. Looking west.

Reference: 2019 Annual Inspection Photographs at NC36 – Lazy ‘S’ Slide
File Number: 123312435



Photo 9: Erosion gully with flowing water in west ditch. Looking north.