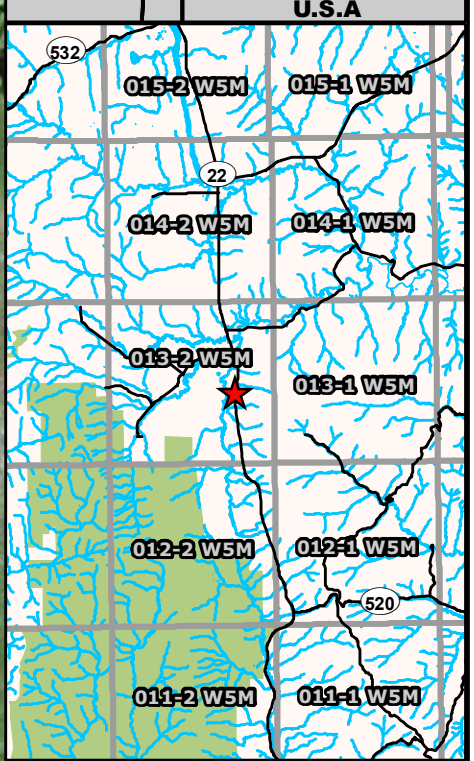
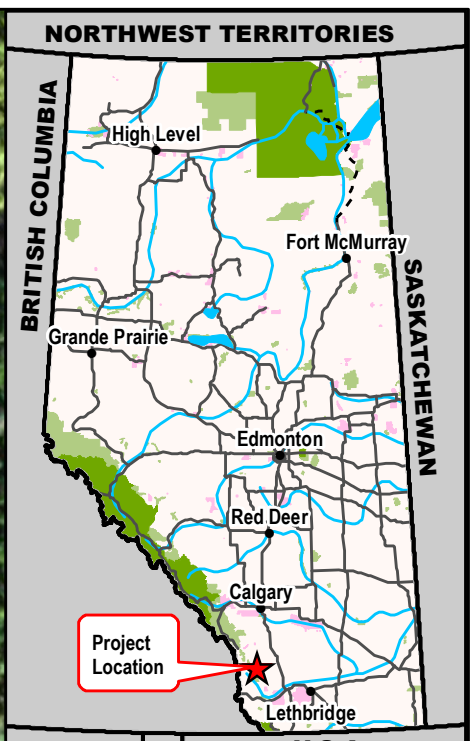


SITE NUMBER AND NAME: S052 Nelson Creek		HIGHWAY & KM: 22:08, 34.25	PREVIOUS INSPECTION DATE: June 1, 2017	INSPECTION DATE: July 7, 2020
LEGAL DESCRIPTION: 10-14-013-02 W5M	NAD 83 COORDINATES: UTM Northing Easting 11 5552067 702482		RISK ASSESMENT: PF: 5 CF: 2 TOTAL: 10	
AVERAGE ANNUAL DAILY TRAFFIC (AADT): 2,740 (north), 2,740 (south), (Ref. No. 77090)			CONTRACTOR MAINTENANCE AREA (CMA): 27	

SUMMARY OF SITE INSTRUMENTATION: None LAST READING DATE: N/A	INSPECTED BY: Chris Morgan (KCB) Margot Lederman (KCB) Kristen Tappenden (AT) Alex Frotten (AT)
PRIMARY SITE ISSUE: Pavement deformation caused by bearing capacity failure of embankment with deformation towards west. There may be a frost heave component to the pavement deformations.	
APPROXIMATE DIMENSIONS: Embankment is 3 to 4 m high with slopes of 3H:1V on the east side and 4H:1V on the west side.	
DATE OF ANY REMEDIAL ACTION: French drains were installed about 10 to 15 years ago on both sides of the embankment over a length of approximately 180 m. A new pavement patch was completed in 2017.	
A pavement overlay was underway at the time of the 2020 site visit and construction included regrading the ditch on the east side of the highway.	

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress		X	None visible. Overlay completed in mid 2020.	X	
Slope Movement		X	Prior to overlay, slope movement was most pronounced on the west slope, and the head scarp extended across the centreline into northbound lane. No cracking or slope movement was visible due to the overlay in progress.		X
Erosion		X	Topsoil stripping and slope regrading was ongoing at the time of the site visit. The slopes are not vegetated.		X
Seepage	X		Visible seepage and saturated ground midway down the east and west embankment side slopes. Potentially more visible because all vegetation has been stripped. No visible discharge from the French drains.	X	
Culvert Distress		X	Condition of existing 36" CSP culvert unknown.		X

COMMENTS
Site was repaved in mid 2020 and slope regrading / ditch cleanout was ongoing at the time of the site visit.
Exposed soil at the base of the ditch is silty, sandy, very wet, and soft. The failure mechanism at this site could be a bearing capacity failure, exacerbated by frost heaving. A toe roll had previously been observed in the west ditch but appeared to have been regraded during the embankment topsoil stripping.
French drains appear to be designed to dewater to embankment but there is no record of construction. Photos from the previous site visit in 2017 show the French drains to be directly beneath the pavement surface and they do not extend to the embankment toe. In 2020, the drains were measured to extend approximately 4 m down the slope (from the pavement edge), with each drain approximately 2.1 m wide. Seepage and saturated ground was noted along the lower half of the east and west embankment slopes. Seepage was more evident on the west side and more extensive in the southern portion of the site. Seepage areas were estimated to cover approximately 40% of the west slope and 20% of the east slope.
Prior to 2017, the ditch had been deepened to a depth of 2.5 to 3 m with steepening of the east embankment slope and construction of a narrow bottom width for the ditch (2 m). The ditch drains towards the north until a grade change at the base of the ditch prevents water from reaching the culvert. At the time of the 2020 site visit, the ditch grade was unchanged and standing water was present in the ditch.
Pavement overlay work included topsoil stripping, and the embankment side slopes had been track-packed parallel to the highway. Near-surface desiccation cracking was noted along the freshly exposed earth fill side slopes.
A file review should be conducted to obtain available background information (e.g. 1987 borehole data, construction and maintenance records, highway grade line drawings). Depending on the availability of background data, a geotechnical investigation should be conducted with instrumentation to assess groundwater level, depth of movement, and depth of frost penetration (piezometers, inclinometers, and ground temperature cables). Depending on the findings of the geotechnical investigation and instrumentation monitoring, the method of repair may include an H-pile wall, one or more drains, a gravel shear key and toe berm, a geosynthetic reinforced slope, and, if frost heaving is an issue, replacement of frost susceptible fill with non-frost susceptible fill or place insulation.



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Legend

- GPS Waypoint (July 7, 2020)
- GPS Track (July 7, 2020)
- Crack
- Toe Roll
- Culvert

NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM Zone 11N
 3. IMAGE SOURCE: Bing Maps 2020, Microsoft Corporation

CLIENT

PROJECT
 SOUTHERN REGION GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE
 Site Plan
 S052 - Nelson Creek
 Hwy 22:08, km 34.25

SCALE 1:2,000 PROJECT No. A05115A03 FIG No. 1

Time: 10:42:38 AM
 Date: August 10, 2020
 File: Z:\AEDM\A05115A03\ABT Southern Region GRMP\A00 Drawings\2020\2. Section BIM\XDS\052_200807.mxd



Photo 1 Highway overlay paving work and embankment regrading in progress. Photo taken facing south on July 7, 2020.



Photo 2 West slope has been stripped and regraded as part of ongoing highway overlay project. Photo taken facing south along the west side on July 7, 2020.



Photo 3 Seepage and saturated ground on the west slope. Photo taken facing north along the west side on July 7, 2020.



Photo 4 Seepage and saturated ground on the east slope. Standing water in the ditch due to poor grading of the ditch. Photo taken facing north on July 7, 2020.

