
To:	Amy Driessen	From:	Leslie Cho and Xiteng Liu
	Transportation and Economic Corridors		Stantec Consulting Ltd.
File:	123315222	Date:	June 18, 2024

Reference: North Central Region, Edson/Stony Plain, Site NC031 – Highway 22:32 Deer Lodge Slide, Spring 2024 Instrumentation Monitoring Report

1.0 OBSERVATIONS

1.1 FIELD PROGRAM AND INSTRUMENTATION STATUS

The Spring 2024 reading cycle consisted of instrument readings of one standpipe piezometer (SP1) and two vibrating wire piezometers (VW14-01 and VW14-02). **Figure 1** attached provides a schematic of the site. The instrument readings were taken by Andres Padros, Technician and Olawale Odusi, Geotechnical Technologist on May 15, 2024.

The standpipe piezometer (SP) was measured using a Heron Instruments water tape. The vibrating wire piezometers (VW) were read with an RST VW2106 readout box.

GPS coordinates of all instruments were obtained using a Garmin eTrex 22x handheld GPS unit.

2.0 INSTRUMENTATION READINGS

2.1 GENERAL

All slope inclinometers are non-operational. Total cumulative movement and maximum movement rates since initializing each SI are provided in **Table NC031-1**.

Piezometer information is summarized in **Table NC031-2**.

2.2 MONITORING RESULTS

2.3.1 Piezometers

Compared with the water level obtained during the Spring 2023 reading cycle, the water level in VW14-01 showed no change. VW14-02 had a slight drop in water elevation by about 0.1 m. The current water level is at 2.8 m and 1.8 m below ground surface (bgs) in VW14-01 and VW14-02, respectively.

The water level in standpipe SP1 decreased by 0.3 m compared to the previous reading taken in Spring 2023. The current water level is at 0.5 m bgs. In Spring 2023, 0.2 m bgs was the highest reading that had been recorded so far, and the general rise of water level in SP1 may be associated with the slope movement previously recorded in SI-1R.

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3.0 RECOMMENDATIONS

Replacement slope inclinometers should be considered for this site.

3.1 INSTRUMENTATION REPAIRS

No instruments require repair at this time.

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Table NC031-1: Spring 2024 Slope Inclinometer Reading Summary

Instrument Name	Date Initialized	Coordinates ⁽¹⁾ (UTM 11U, NAD1983) (m)		Total Cumulative Resultant Movement and Depth of Movement to Date (mm)	Maximum Rate of Movement (mm/yr)	Current Status	Date of Previous Reading	Incremental Movement Since Previous Reading (mm)	Current Rate of Movement (mm/yr)	Change in Rate of Movement Since Previous Reading (mm/yr)
		Northing	Easting							
S1-1R	Sept. 1, 2006	5968411	622194	82 over 4.8 m to 5.8m depth in 356° direction	29 in Oct. 2007	Non-Operational	May 4, 2022	Found sheared off Fall 2022 at about 5 m depth		
S1-2R	Sept. 1, 2006	-	-	60.1 over 3.2 m to 5.2m depth in 354° direction	19.7 in Oct. 2007	Non-Operational	Sept 22, 2016	Damaged in Fall 2017		

(1) Updated May 15, 2022, with approximate accuracy of ± 3 m.

Table NC031-2: Spring 2024 Piezometer Reading Summary

Instrument Name	Date Initialized	Coordinates ⁽¹⁾ (UTM 11U, NAD1983) (m)		Bottom/Tip Depth (m)	Current Status	Maximum Water Level [Elevation] (m bgs)	Measured Water Level (Spring 2024) (m bgs) (Elevation)	Previous Water Level, (Spring 2023) (m bgs) (Elevation)	Change in Water Level (m)
		Northing	Easting						
VW14-01	2014	5968400	622161	3.1	Operational	2.4 [730.7 m] (Sept. 2019)	2.8 (730.2 m)	2.8 (730.2 m)	No change
VW14-02	2014	5968421	622162	2.0	Operational	0.2 [733.8 m] (June 2017)	1.8 (732.2)	1.7 (732.3)	-0.1
SP1	Sept. 1, 2006	5968414	622194	4.2	Operational	0.2 [736.3 m] (May 2023)	0.5 (736.0)	0.2 (736.3)	-0.3

(1) Updated May 15, 2024, with approximate accuracy of ± 3 m.

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4.0 CLOSING

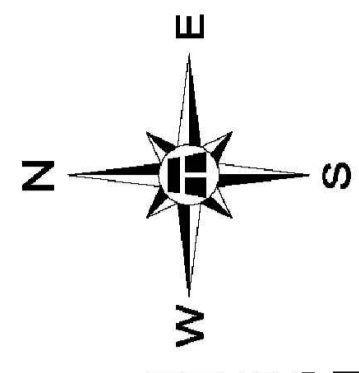
We trust this instrumentation report meets your requirements. If you have any questions, please do not hesitate to contact the undersigned.

Stantec Consulting Ltd.

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Attachment: Figure 1 – Site Plan
Piezometer data - Depth vs Time Plot



SW 1/4 21-56-8 W5M

SATURATED GROUND AT INLET (2021)
PONDED CREEK. NO FLOW (2023)

POSTED 80 km/h SIGNS AT APPROACH TO SITE (2023)

CRACK (2019) APPEARS WIDER (2020, 2023) NO CHANGE (2021)

EXISTING CRACKS ON PAVEMENT (2016, 2017) SLIGHT DIP DEVELOPING AND APPEARS WIDER (2020) SAME ~5mm TO 10mm DIP (2021, 2023)

EXISTING 1200 mm DIA. CSP CULVERT

GRAVEL SURFACE BUILT FLUSH WITH PAVEMENT SURFACE (SEE SHOULDER DETAIL ON SHEET 3)

ACCESS ROAD
 PATCHED (2019)
 PATCHED (2015)

LIMITS OF TOE BERM

HWY 22

WIDEN SHOULDER 2.5m

15m TRANSITION ZONE

15m TRANSITION ZONE

APPROXIMATE LOCATION OF BURIED COPPER PHONE LINE

ESTIMATED SAG LOCATION. NOT NEW (2021)

NEW GATE

NEW GATE

FENCE SOUTH OF CP9 TO REMAIN IN PLACE

REMOVED & DISPOSED OF EXISTING FENCE AND REPLACED WITH NEW FENCE (TYPE B) ALONG RIGHT-OF-WAY (CP12 TO CP13)

HAND LAID RIPRAP

NEW FENCE (TYPE B) ALONG RIGHT-OF-WAY

WATER PONDING AT CULVERT (2016) PONDED BUT FLOWING (2019) FLOWING WELL (2020) DRY (2021) PONDING. INVERT GRADED BACKWARDS. NO FLOW (2023)

UNNAMED TRIBUTARY TO PADDLE RIVER

NEW FENCE (TYPE B) INSTALLED ALONG RIGHT-OF-WAY

EXISTING BARBED WIRE FENCE WITHIN RIGHT-OF-WAY REMOVED (CP9 TO CP13)

FENCE WEST OF CP46 TO REMAIN IN PLACE

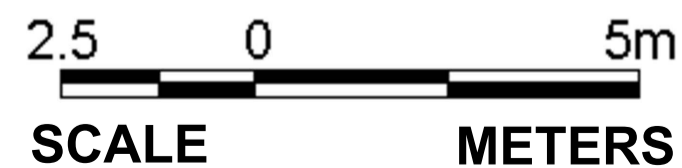
SE 1/4 20-56-8 W5M

LOT 1 BLOCK

NOTES:

- EXISTING BARBED WIRE FENCE REMOVED AND DISPOSED OFF SITE.
 - NEW 4-STRAND CLASS B BARBED WIRE FENCE INSTALLED ALONG PROPERTY LINE.
- * CONTROL POINT ADJUSTED AT TIME OF LAYOUT.

INSTRUMENT NO.	EASTING (m)	NORTHING (m)	ELEVATION (m)
SI01-1	622196.051	5968415.117	736.325
SI01-1R	622195.987	5968413.846	736.514
SP1	622195.987	5968413.846	736.514
SI01-2	622183.351	5968412.101	734.319
SI-2R	622183.360	5968412.034	734.412
VW14-1 TIP	622166.586	5968410.779	-
VW14-1 CASING	622161.356 (APPROX.)	5968397.620 (APPROX.)	-
VW14-2 TIP	622170.402	5968415.079	-
VW14-2 CASING	622163.808 (APPROX.)	5968431.793 (APPROX.)	-



CONTROL POINT	EASTING (m)	NORTHING (m)	ELEVATION (m)
CP1*	622197.842	5968445.499	736.370
CP2*	622200.084	5968359.093	737.360
CP3*	622195.134	5968443.221	736.340
CP4*	622197.658	5968359.225	737.300
CP5	622187.030	5968444.997	734.400
CP6	622185.091	5968368.076	734.400
CP7	622170.902	5968445.871	733.812
CP8	622170.016	5968380.318	734.000
CP9	622184.152	5968352.271	735.666
CP10*	622161.251	5968352.202	736.760
CP11*	622154.395	5968379.736	734.780
CP12*	622152.026	5968469.401	735.150
CP13	622181.142	5968469.288	735.598
CP44*	622200.405	5968344.096	737.730
CP45*	622197.402	5968460.492	736.290
CP46*	622160.831	5968379.865	734.500

LEGEND

- SLOPE INCLINOMETER LOCATION (SI)
- APPROXIMATE STANDPIPE PIEZOMETER LOCATION (SP)
- VIBRATING WIRE PIEZOMETER TIP LOCATION (VW)
- TREE LINE (APPROX.)
- EXISTING GROUND SURFACE CONTOUR - SURVEYED ON OCTOBER 13, 2015 (CONTOUR INTERVAL = 0.5m)
- CRACK ON HIGHWAY
- PROPERTY LINE
- APPROXIMATE BURIED COPPER PHONE LINE
- APPROXIMATE FENCE LINE (EXISTING)
- FENCE LINE (TYPE B) (NEW)
- CONTROL POINT
- VIBRATING WIRE PIEZOMETER LEADS STEEL PROTECTOR (APPROX.)
- 1** PHOTO NUMBER AND DIRECTION

NOTES

- PREVIOUS OBSERVATIONS SHOWN IN BLACK
- 2023 OBSERVATIONS SHOWN IN RED

REFERENCE

THURBER ENGINEERING LTD, JOB No.15-16-322, PLAN No. RD19252-C
 DATE NOVEMBER 25, 2015.

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Stantec

TRANSPORTATION AND ECONOMIC CORRIDORS
 GEOHAZARD MONITORING PROGRAM
 NC31 HWY 22-32
 SITE PLAN

DRAWN WW/MK/KE	CHECK XL	APPROVE LC
DATE 18 JULY 2023	SCALE AS SHOWN	PROJECT # 123312435

FIGURE - 1

