
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 NC011 – Highway 40:30 5.5 km North of Highway 16 (Near Hinton), 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 two slope inclinometers (SI2 and SI22-01). **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 14, 2024.

SI22-02 became buried under construction and was not readable.

The slope inclinometers (SI) were measured using an RST MEMS digital inclinometer probe with 0.5 m increments and RST handheld PC.

GPS coordinates of the instruments were confirmed using a Garmin eTrex 22x handheld GPS unit.

2.0 INTERPRETATION

2.1 GENERAL

The SI plots are provided in the attachments and summarized in the following sections. Plots in both directions along with movement rates, total cumulative movement, maximum movement rates, and incremental movements are provided in **Table NC011-1** and the attachments.

2.2 ZONES OF MOVEMENT

No new zones of movement were observed in SI2. However, SI22-01 has shown two potential movement zones at depths of 8 to 10 m and superficially at a depth of 0 to 2 m. While the deeper movement zone is very slight, the shallow movement zone is larger and is likely due to disturbance by ongoing construction. Directions of movement are referenced to the azimuth of the “A+” groove in each SI casing in **Table NC011-1**.

2.3 INSTRUMENTATION READINGS

2.3.1 Slope Inclinometers

SI22-01 was cut 2 m shorter due to construction for backslope flattening in April 2024. No discernible movement was observed in SI22-01. Some movement was observed in the upper 2 m of the casing and is likely due to frost effects and is likely not related to slope movement.

SI22-02 was buried due to backslope flattening during the current Spring 2024 reading cycle.

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As aforementioned, construction was still ongoing around SI22-01 and SI22-02 and is likely influencing the results. SI22-01 may require reinitializing upon construction completion.

SI2 was found again during the current reading cycle and showed little incremental movement (1 mm) since the last reading in May 2022. The current movement rate is 1 mm/yr.

3.0 RECOMMENDATIONS

3.1 FUTURE WORK

SI22-01 may require reinitialization upon completion of construction. SI22-02 should be monitored again once construction is complete and could also require reinitializing. It is recommended that the next reading cycle take place in Fall 2024.

3.2 INSTRUMENTATION REPAIRS

No instruments require repair at this time.

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Table NC011-1: 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							
SI1	Oct 3, 1999	-	-	1 m over 11.4 m to 13.2 m depth in 342° direction (Fall 2015)	2.8 between May 2000 and Sept 2000	Non-operational	Oct. 1, 2015	Removed from reading cycle since Spring 2015		
SI2	Oct 3, 1999	5914150	453047	20 mm over 4.5 m to 9.0 m depth in 17° direction	8.3 in October 2019	Operational	May 3, 2022	1	<1	<1
SI4	Oct 3, 1999	-	-	No zone of movement observed since 2016		Non-operational	July 03, 2021	No zone of movement observed since 2016. Destroyed during construction in 2021/2022.		
SI22-01	Sept 8, 2022	5914414	453224	N/A		Operational	Sept 20, 2023	No discernible movement		
SI22-02	May 10, 2023	5914359	453246	N/A		Non-Operational	Sep 20, 2023	N/A	N/A	N/A
Updated May 14, 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.

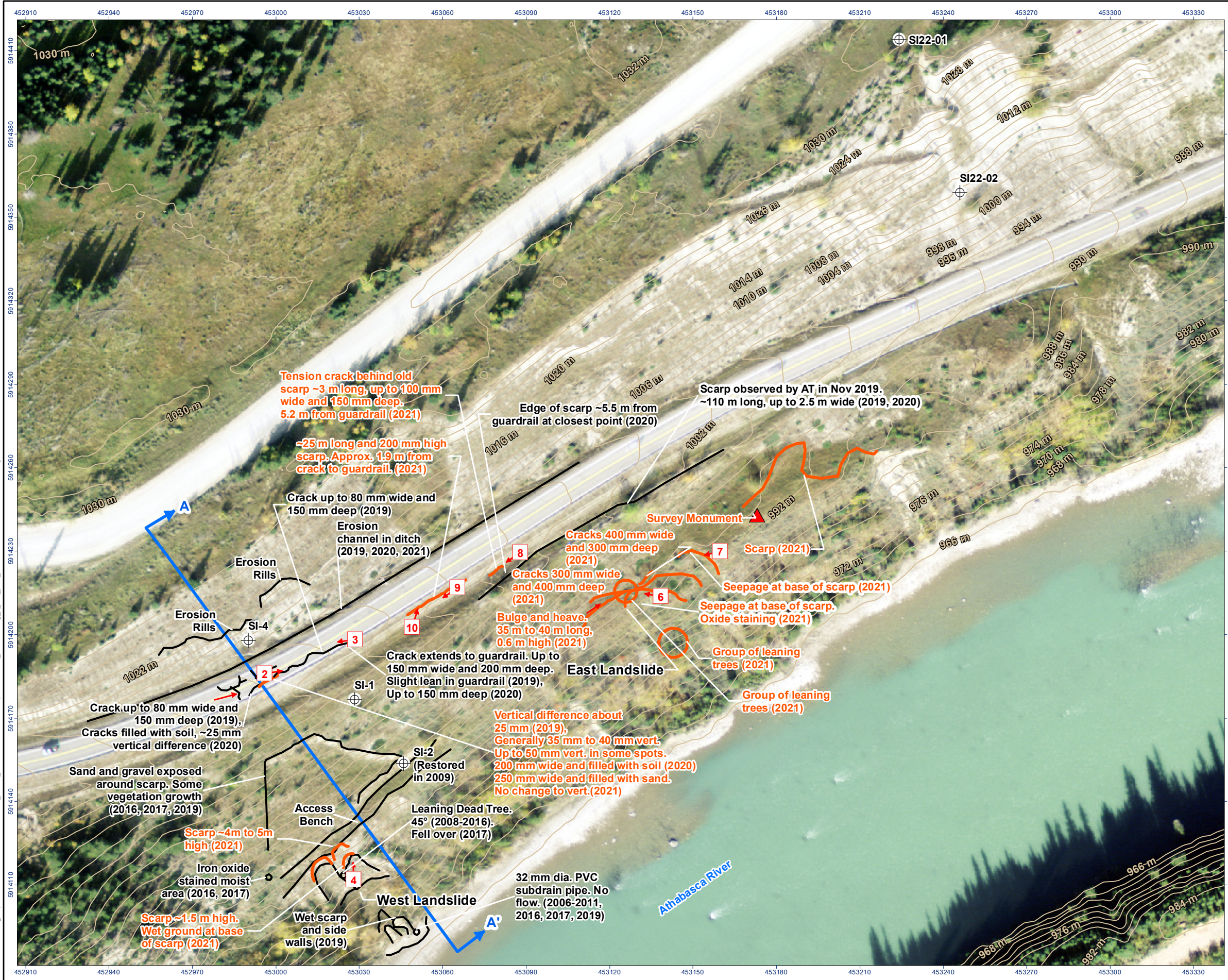
Stantec Consulting Ltd.

Leslie Cho M.Eng., P.Eng.
Senior Associate, Geotechnical Engineer
Phone: 780-917-7403
leslie.cho@stantec.com

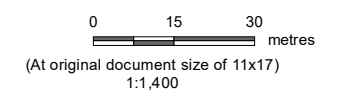
Xiteng Liu M.Sc., P.Eng., PMP
Senior Principal, Geotechnical Engineer
Phone: 780-917-7247
xiteng.liu@stantec.com

Attachment: Figure 1 – Site Plan
SI22-01 and SI22-02 Slope Inclinator Plots

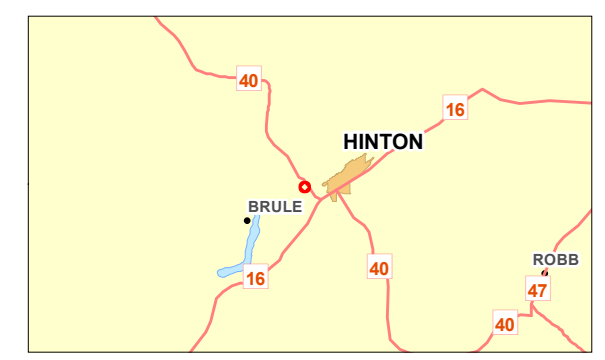
\\Cd1001-c200\workgroup\1233\active\123312435\NC Sites_Edison_NC11\Task B Annual Inspection\DWG_GIS\2023\fig_1_site_plan_nc11.mxd Revised: 2023-06-06 By: MKuhl



- Approximate Slope Inclinometer Location
- 2021 Observation
- Previous Observation / Site Detail
- Ground Elevation Contours (m AMSL, LiDAR Sept. 2014)
- Cross Section Location
- Photo Number and Direction



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 11N
 2. Imagery: Valtus, Imagery 2012



Project Location
Hinton, Alberta

Prepared by MK on 2023-06-06
Quality Review by LC on 2023-06-xx
Independent Review by CM on 2023-06-xx

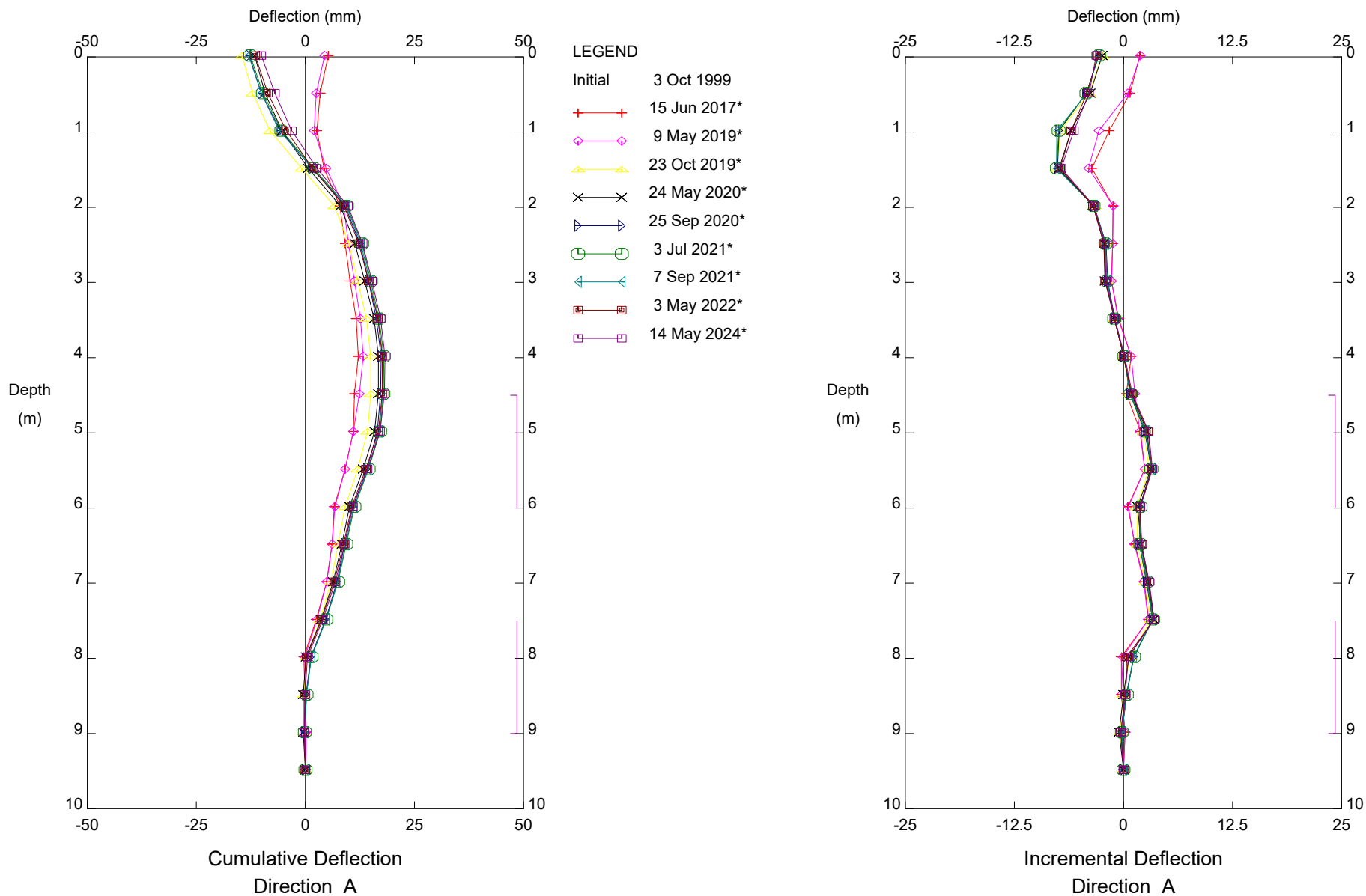
Client/Project
Alberta Transportation
Geohazard Monitoring Program
NC11 5.5 km North of Hwy 16 (Near Hinton)

12331 5222

Figure No.
1

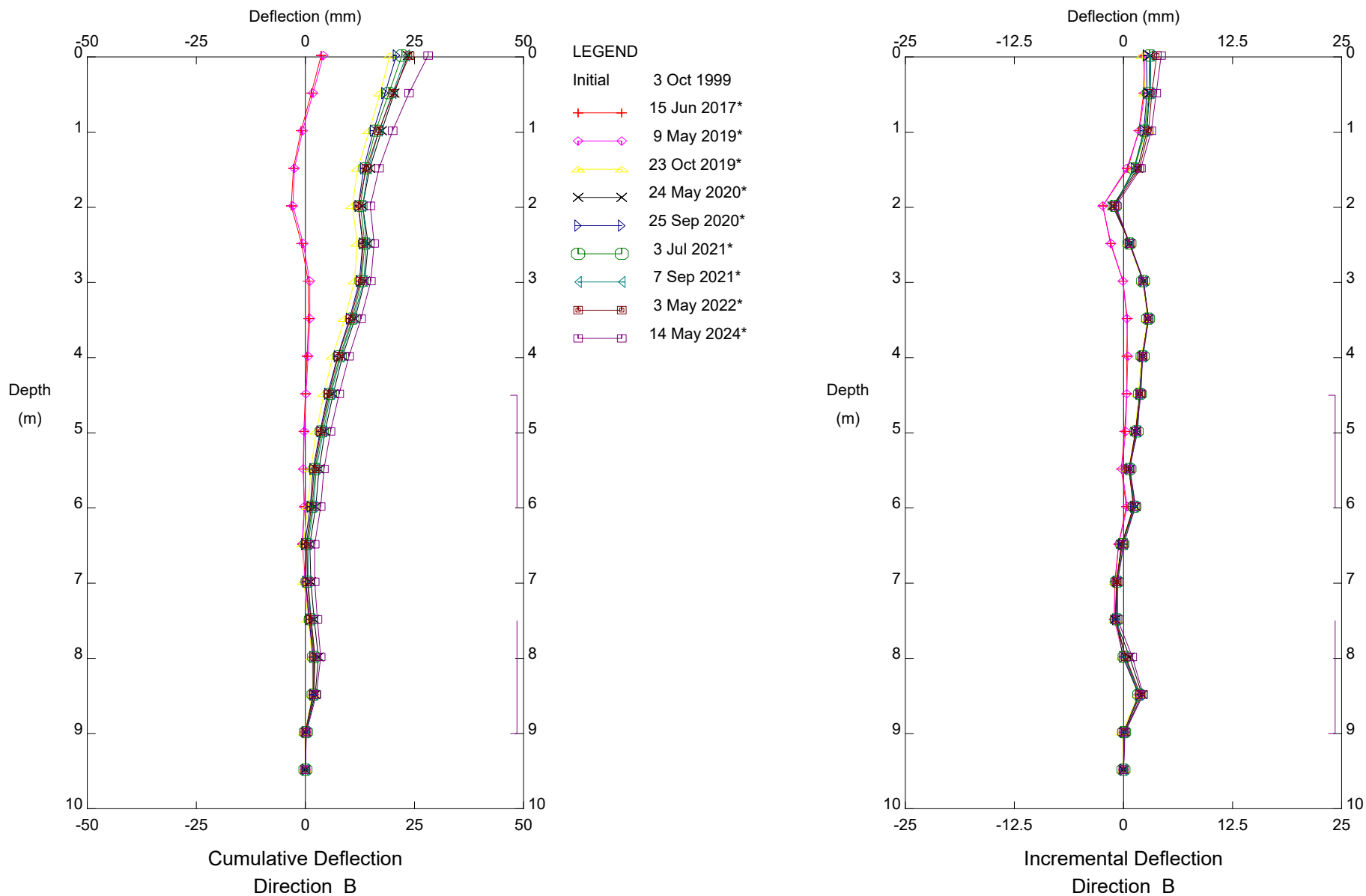
Title
Site Plan

Stantec Consulting Ltd - Edmonton



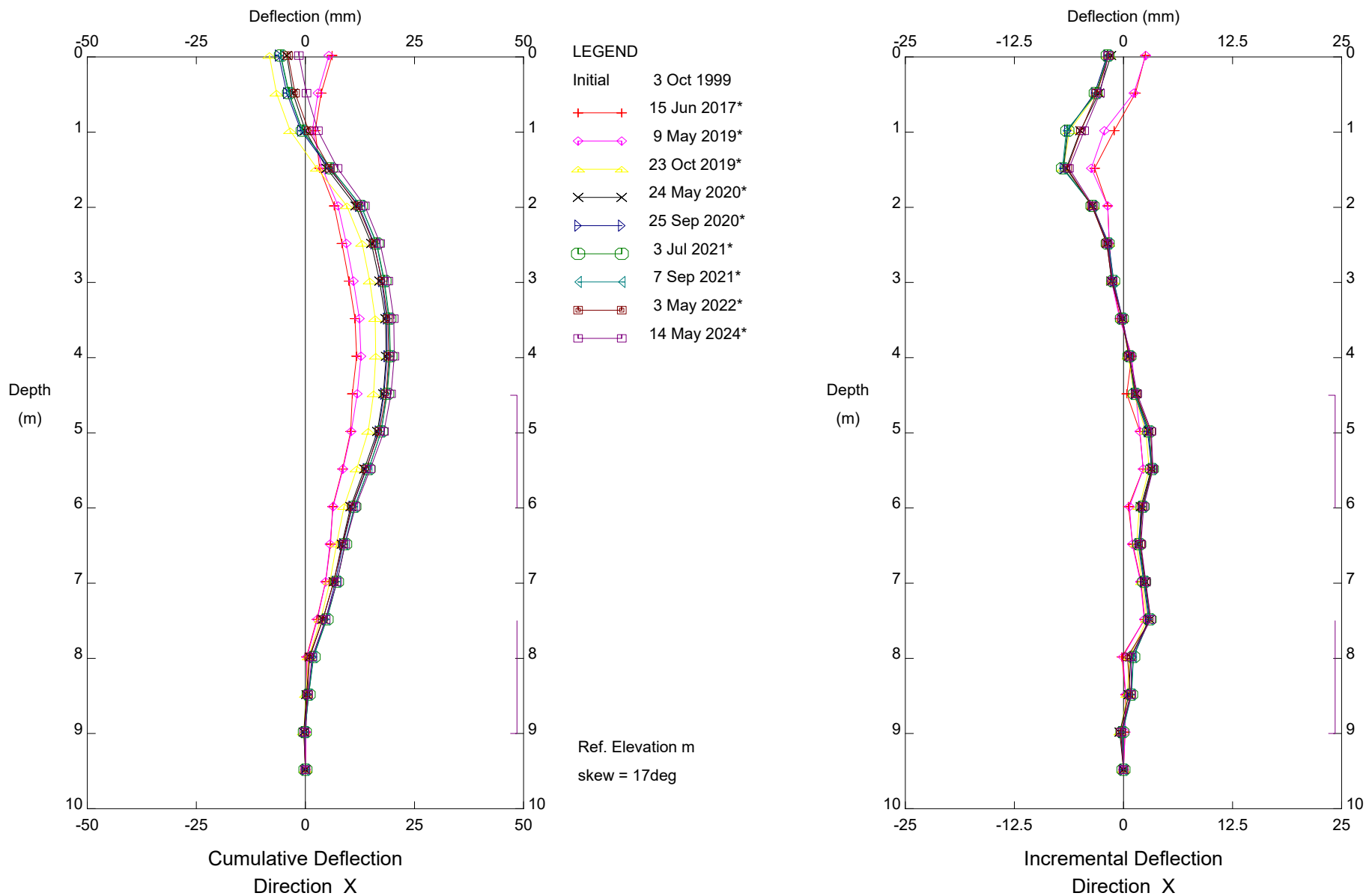
Hwy 40:30, North of Hinton (NC11), Inclinator SI2
 Alberta Transportation

Sets marked * include zero shift and/or rotation corrections.



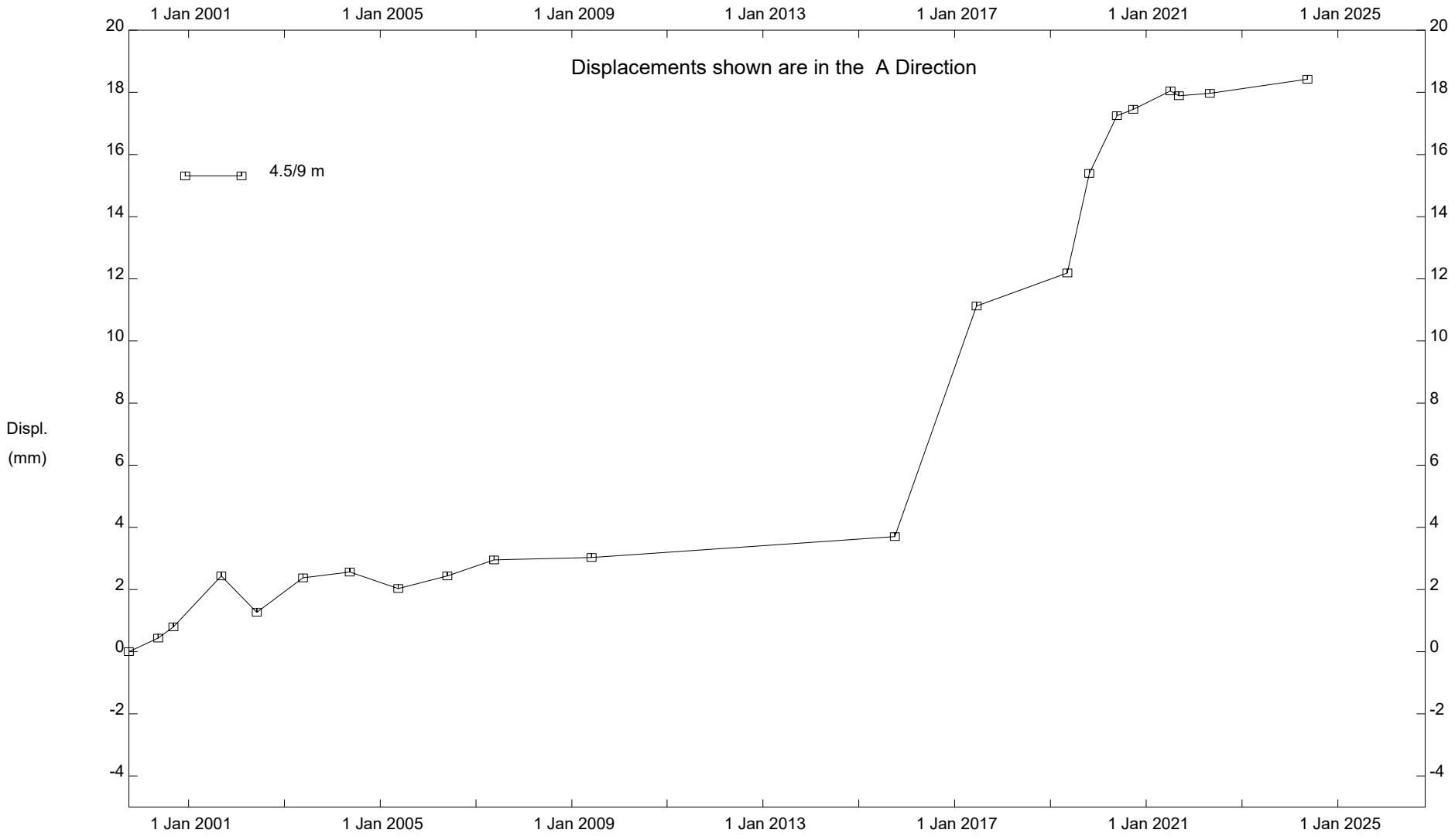
Hwy 40:30, North of Hinton (NC11), Inclinometer SI2
 Alberta Transportation

Sets marked * include zero shift and/or rotation corrections.



Hwy 40:30, North of Hinton (NC11), Inclinometer SI2
Alberta Transportation

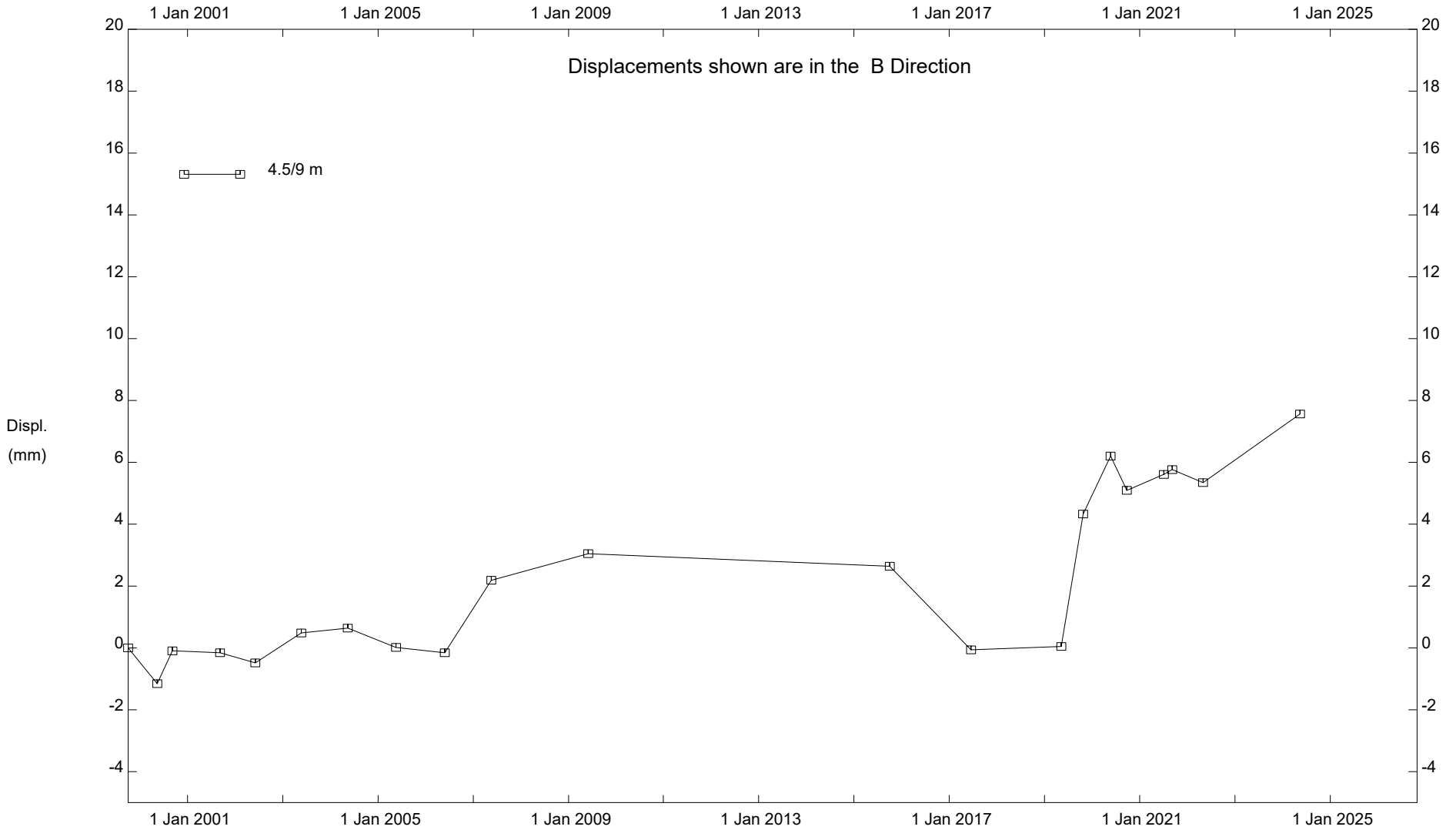
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Hwy 40:30, North of Hinton (NC11), Inclinator SI2

Alberta Transportation

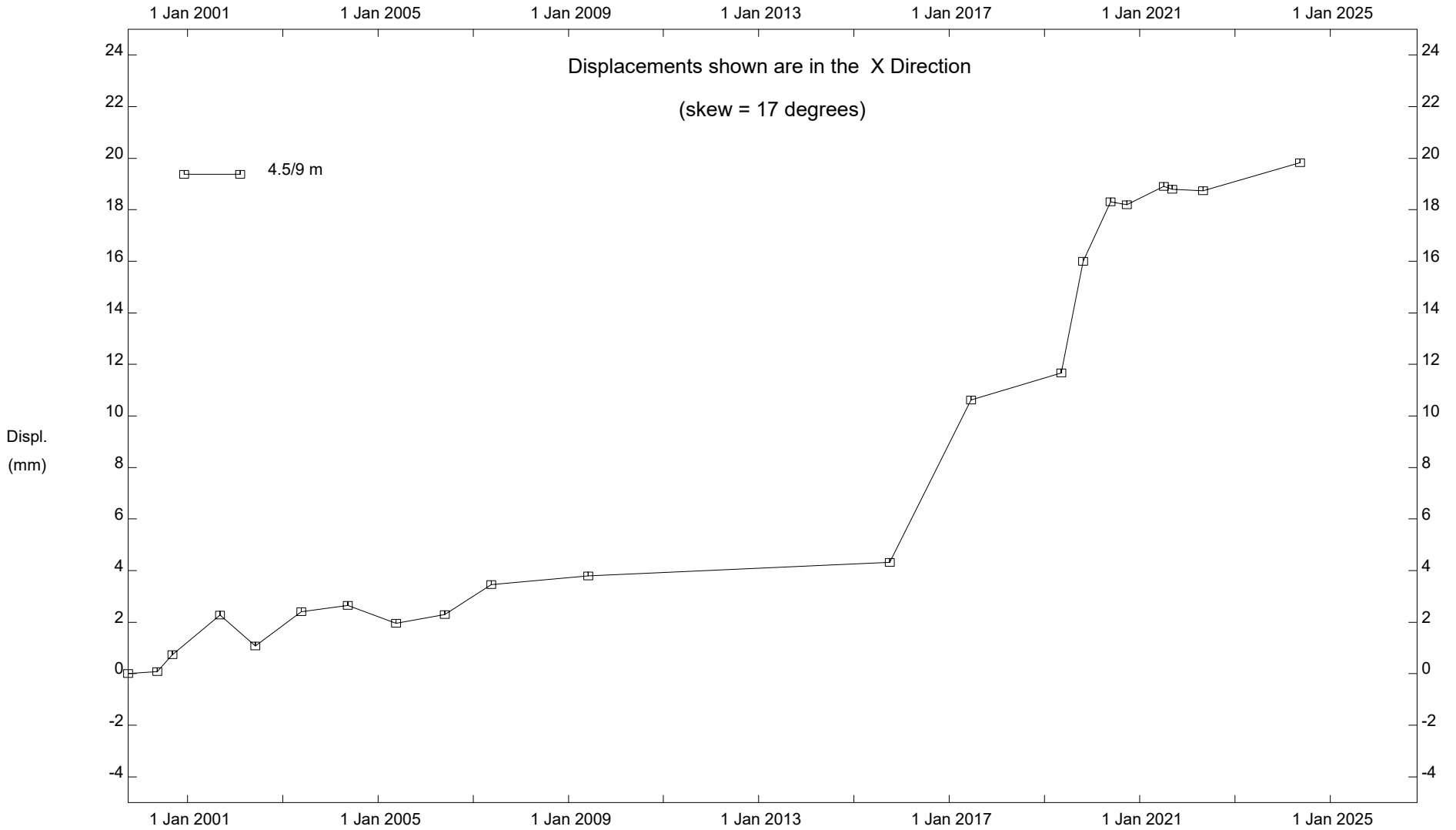
Stantec Consulting Ltd - Edmonton



Hwy 40:30, North of Hinton (NC11), Inclinator SI2

Alberta Transportation

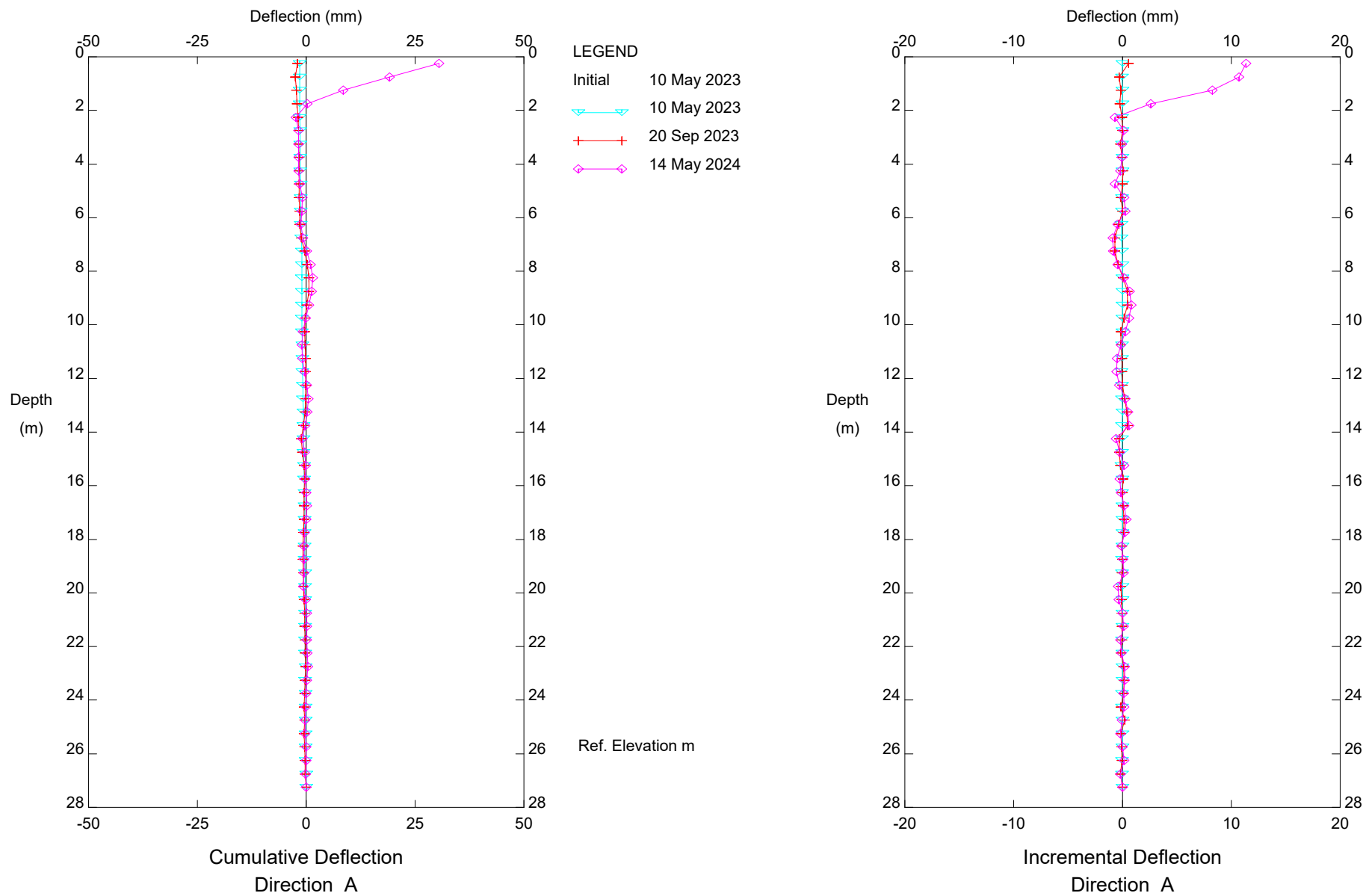
Stantec Consulting Ltd - Edmonton



Hwy 40:30, North of Hinton (NC11), Inclinator SI2

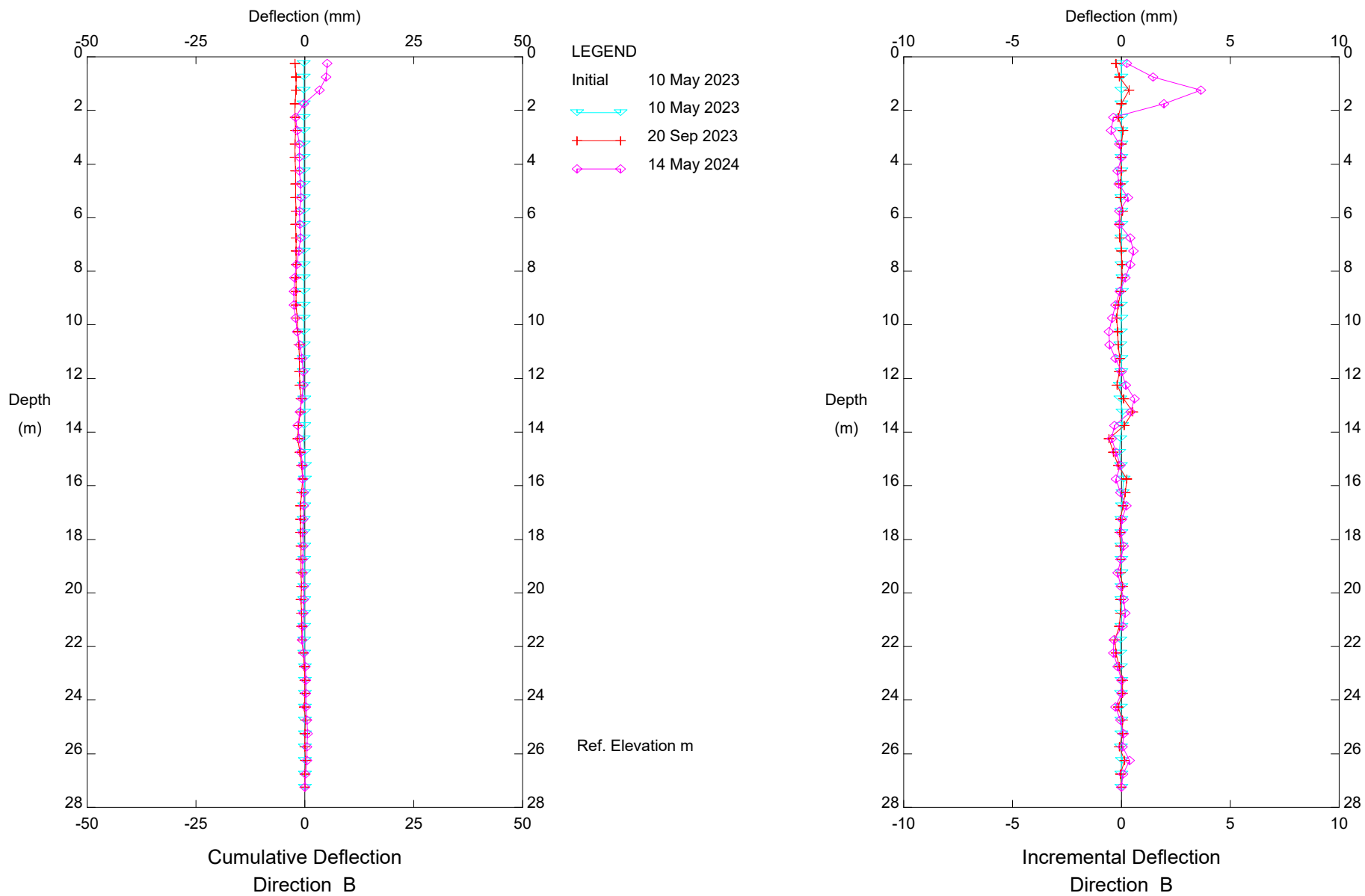
Alberta Transportation

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NC11,,,, Inclinator SI5,,,

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