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

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**Reference: North Central Region, Edson, Site NC076 - Highway 658:02 Blue Ridge Slide Spring 2024 Instrumentation Monitoring Report**

## 1.0 OBSERVATIONS

The Spring 2024 reading cycle consisted of reading two slope inclinometers (SI19-02 and SI19-03). SI19-01 was not read due to an obstruction at a depth of about 14.5 m. **Figure 1** attached provides a schematic of the site. The instruments were read by Andres Padros, Technician and Olawale Odusi, Geotechnical Technologist, on May 14, 2024.

The slope inclinometers (SI) were measured using an RST MEMS digital inclinometer probe with 0.5 m increments and handheld PC. Readings were taken based on cable markings in relation to the top of SI casing.

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

## 2.0 INSTRUMENTATION READINGS

### 2.1 GENERAL

The SI plots are attached and summarized in the following sections. Displacement-time plots in the resultant x-direction (i.e., slope movement direction) along with movement rates, total cumulative movement, maximum movement rates, and incremental movements since initializing each SI are provided in **Table NC076-1** and the attachments.

### 2.2 ZONES OF MOVEMENT

No new zones of movement were observed in any of the operational slope inclinometers. Directions of movement are referenced to the azimuth of the A+ groove in each SI casing in **Table NC076-1**.

### 2.3 MONITORING RESULTS

#### 2.3.1 Slope Inclinometers

The potential movement zone in SI19-01 previously had a movement rate of less than 1 mm/yr. The blockage that prevented the readings will be reassessed during the next monitoring cycle.

The potential movement zone in SI19-02 currently has a movement rate of less than 1 mm/yr with corresponding cumulative movement of less than 1 mm.

The movement zone in SI19-03 currently has a movement rate of 1 mm/yr and cumulative movement of 6 mm.

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## **3.0 RECOMMENDATIONS**

### **3.1 FUTURE WORK**

It is recommended that all instruments be read in the Spring 2024 reading cycle.

### **3.2 INSTRUMENTATION REPAIRS**

No repairs are required at this site.

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**Table NC076-1: Spring 2024 Slope Inclinometer Summary**

Instrument Name	Date Initialized <sup>(1)</sup>	Coordinates <sup>(2)</sup> (UTM 11U, NAD83) (m)		Total Cumulative Resultant Movement (mm) [Depth of Movement to Date (m)]	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							
SI19-01	Sept. 24, 2019	5999083	606059	N/A	2 (September 2020)	Non-Operational	May 5, 2022	N/A	N/A	N/A
SI19-02	Sept. 24, 2019	5999099	606053	<1 [11.2 to 13.2]	2 (May 2020)	Operational	May 5, 2022	<1	<1	< 1
SI19-03	Sept. 24, 2019	5999086	606045	6 [5.8 to 7.8]	8 (September 2020)	Operational	May 5, 2022	1	1	< 1

(1) Previous baseline/initialization date was July 2, 2019. New baseline date established to account for construction disturbance.  
(2) Updated May 14, 2024, with approximate accuracy of ± 3 m.

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## **CLOSING**

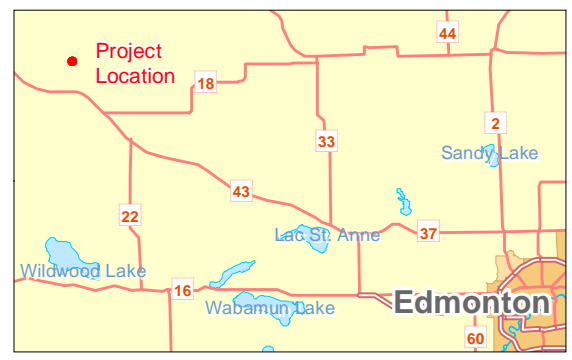
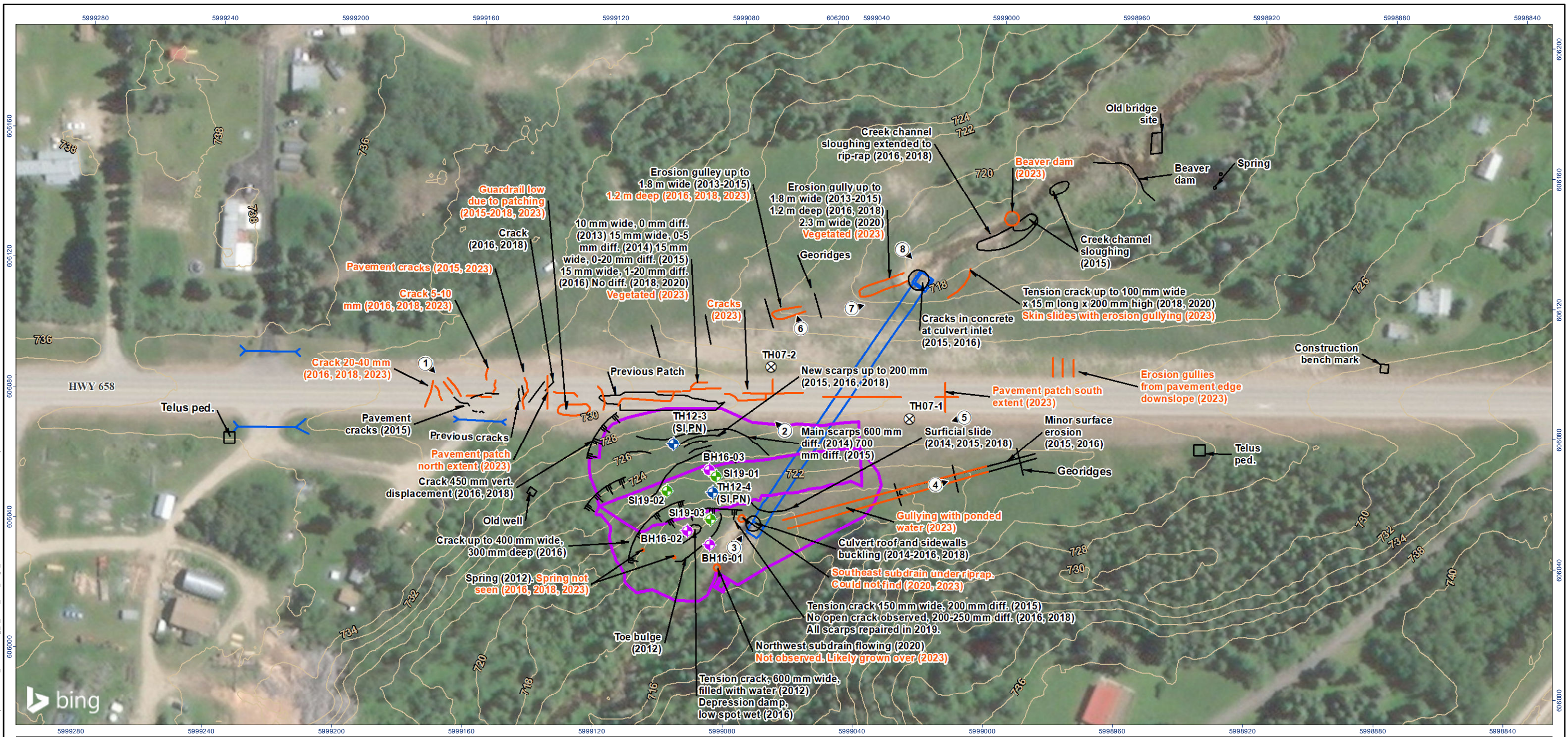
We trust this instrumentation report meets your requirements. If you have any questions, please do not hesitate to contact the undersigned.

**Stantec Consulting Ltd.**

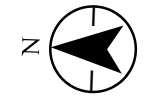
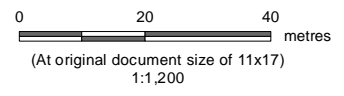
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Attachment: Figure 1 – Site Plan  
S119-02 Slope Inclinometer Plots  
S119-03 Slope Inclinometer Plots



- Photo Number and Direction
- Testhole (Others, 2007)
- Slope Inclinerometer Location (Thurber, 2012)
- Monitoring Well (Stantec, 2016)
- Slope Inclinerometer Location (Stantec, 2019)
- Previous Observation
- 2023 Observation
- Culvert
- Embankment Footprint (approx.)
- Ground Elevation Contours (m AMSL, LiDAR July 2006)



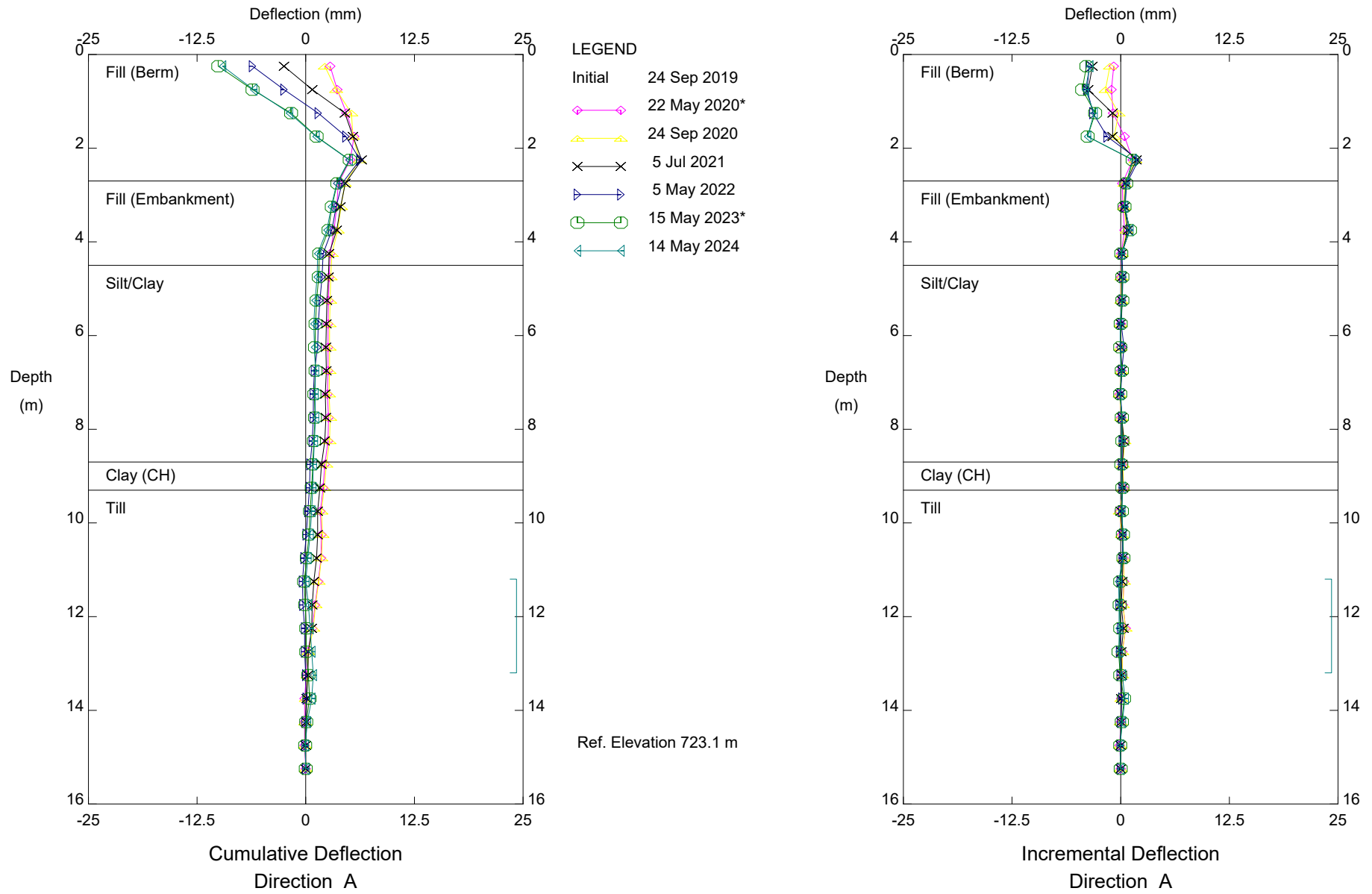
Project Location: Blue Ridge, Alberta  
 Prepared by MK on 2023-07-20  
 Quality Review by LC on 2023-08-23  
 Independent Review by XL on 2023-08-25

Client/Project: Transportation and Economic Corridors  
 Geohazard Monitoring Program  
 NC76 Blue Ridge Slide  
 123315222

Figure No.: 1

Title: Site Plan

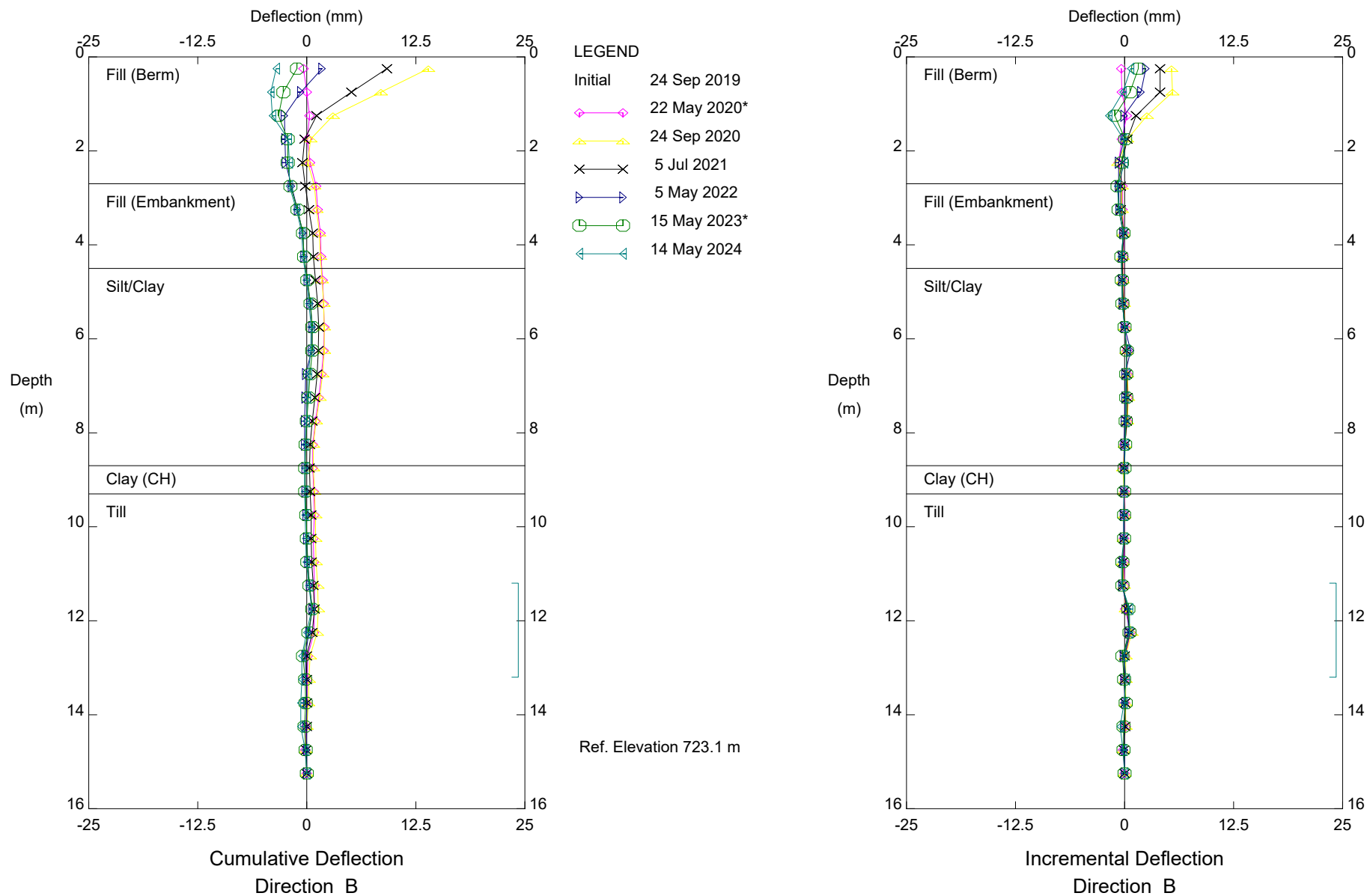
Notes  
 1. Coordinate System: NAD 1983 UTM Zone 11N  
 2. Data Sources: Geogratis, ©Department of Natural Resources Canada, All rights reserved.  
 3. Background: © 2023 Microsoft Corporation © 2023 Maxar ©CNES (2023) Distribution Airbus DS



HWY 658:02 Blue Ridge Slide (NC76), Inclinometer SI19-02

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

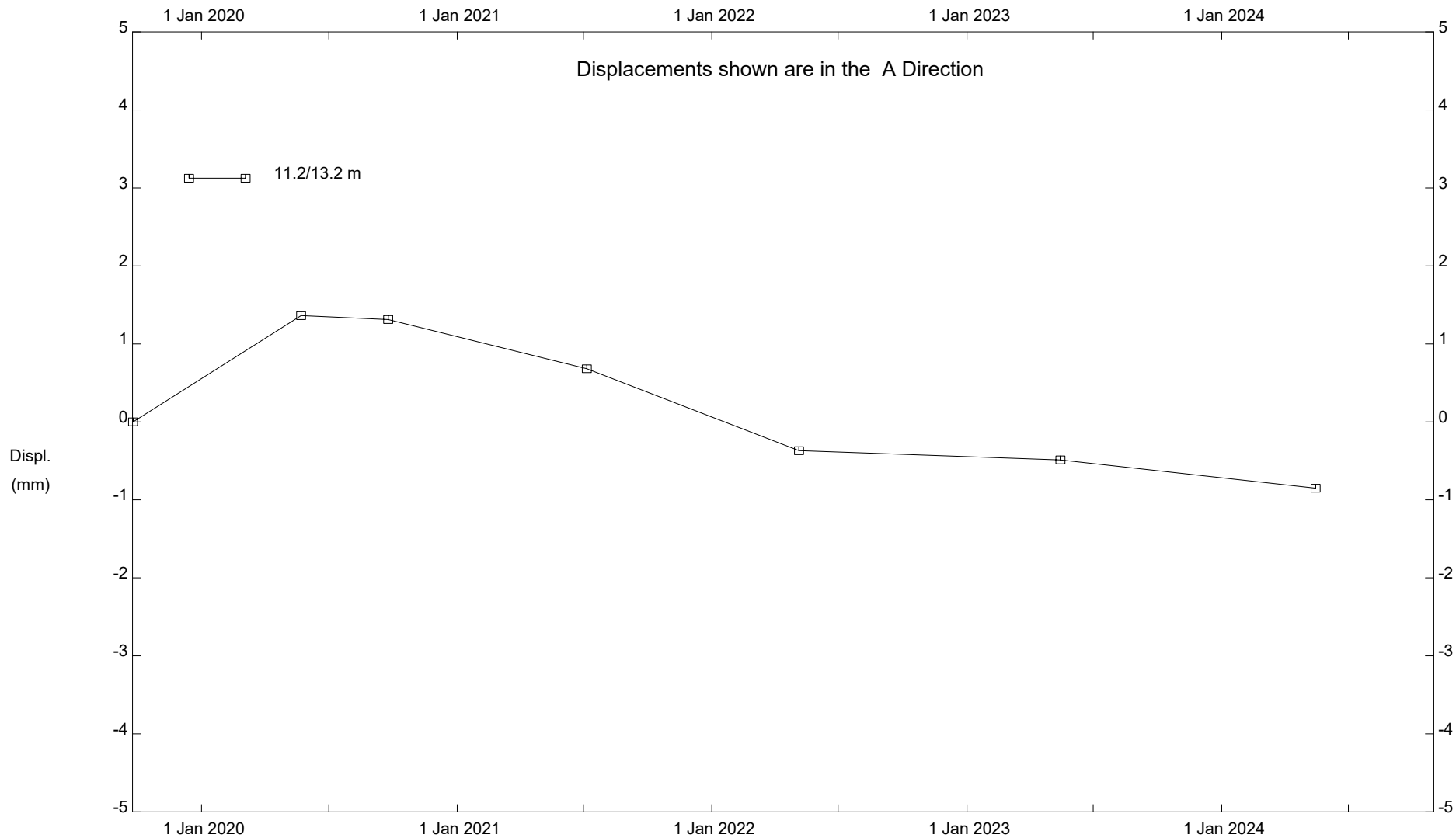


HWY 658:02 Blue Ridge Slide (NC76), Inclinometer SI19-02

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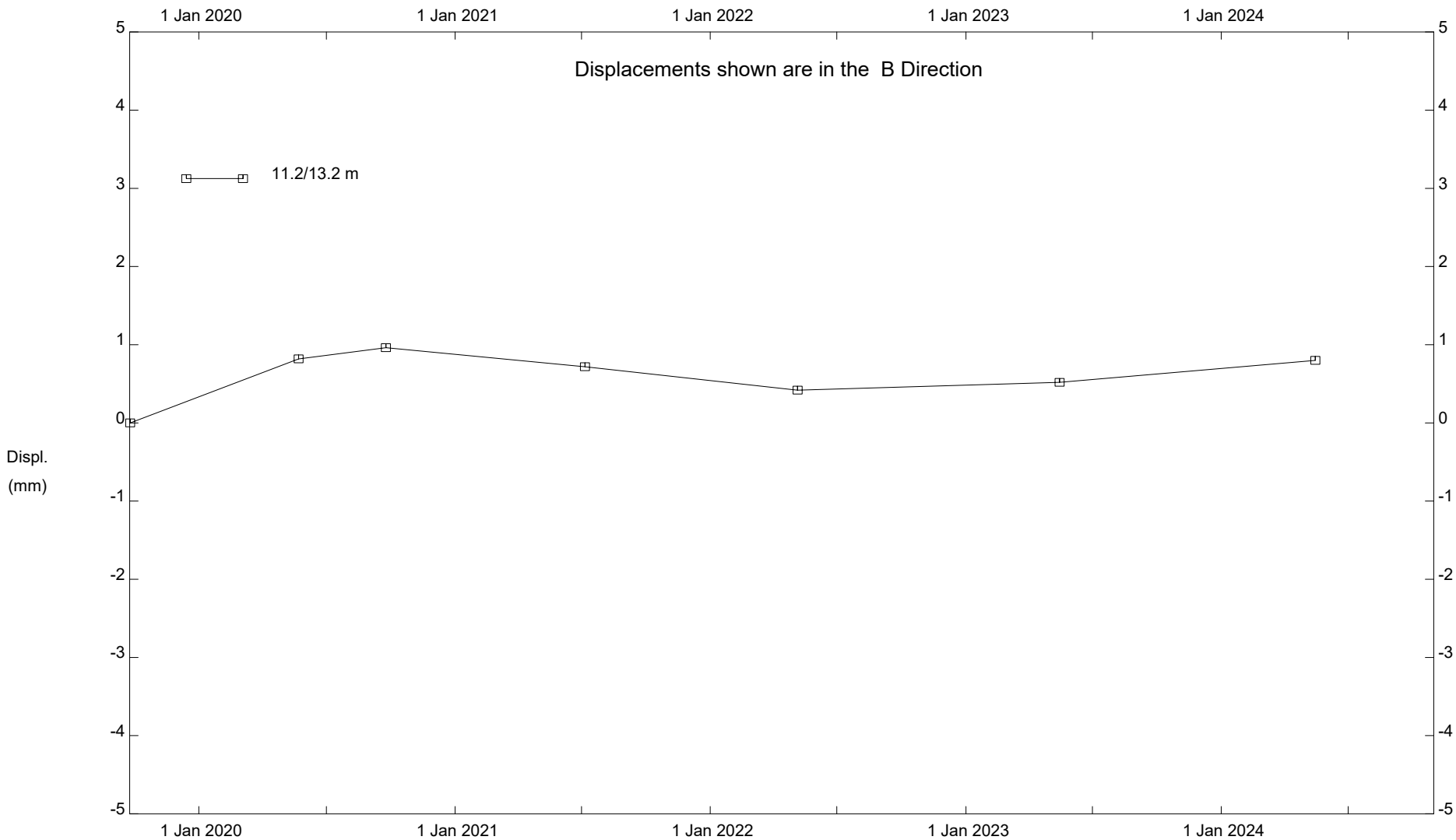


HWY 658:02 Blue Ridge Slide (NC76), Inclinometer SI19-02

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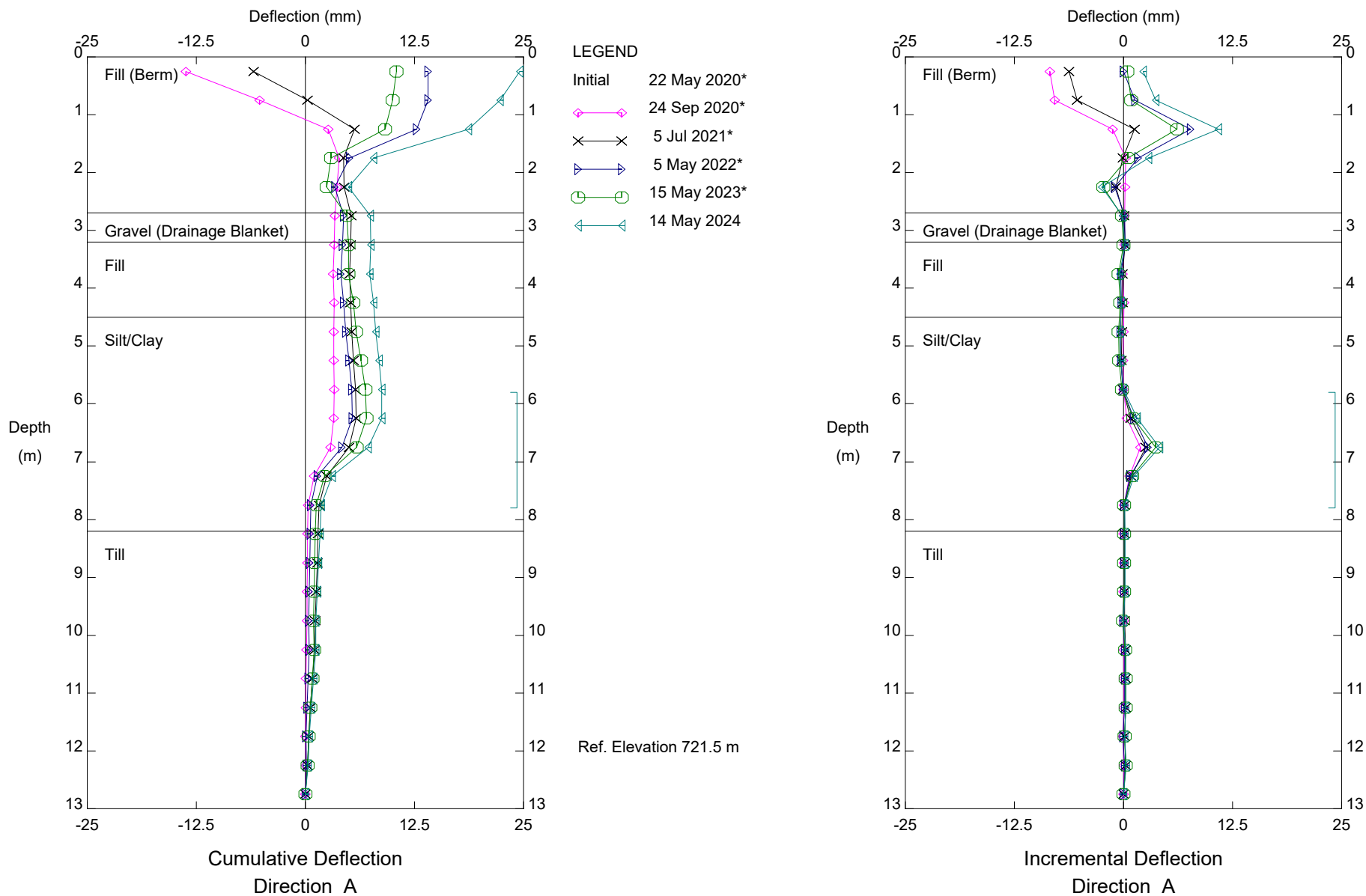


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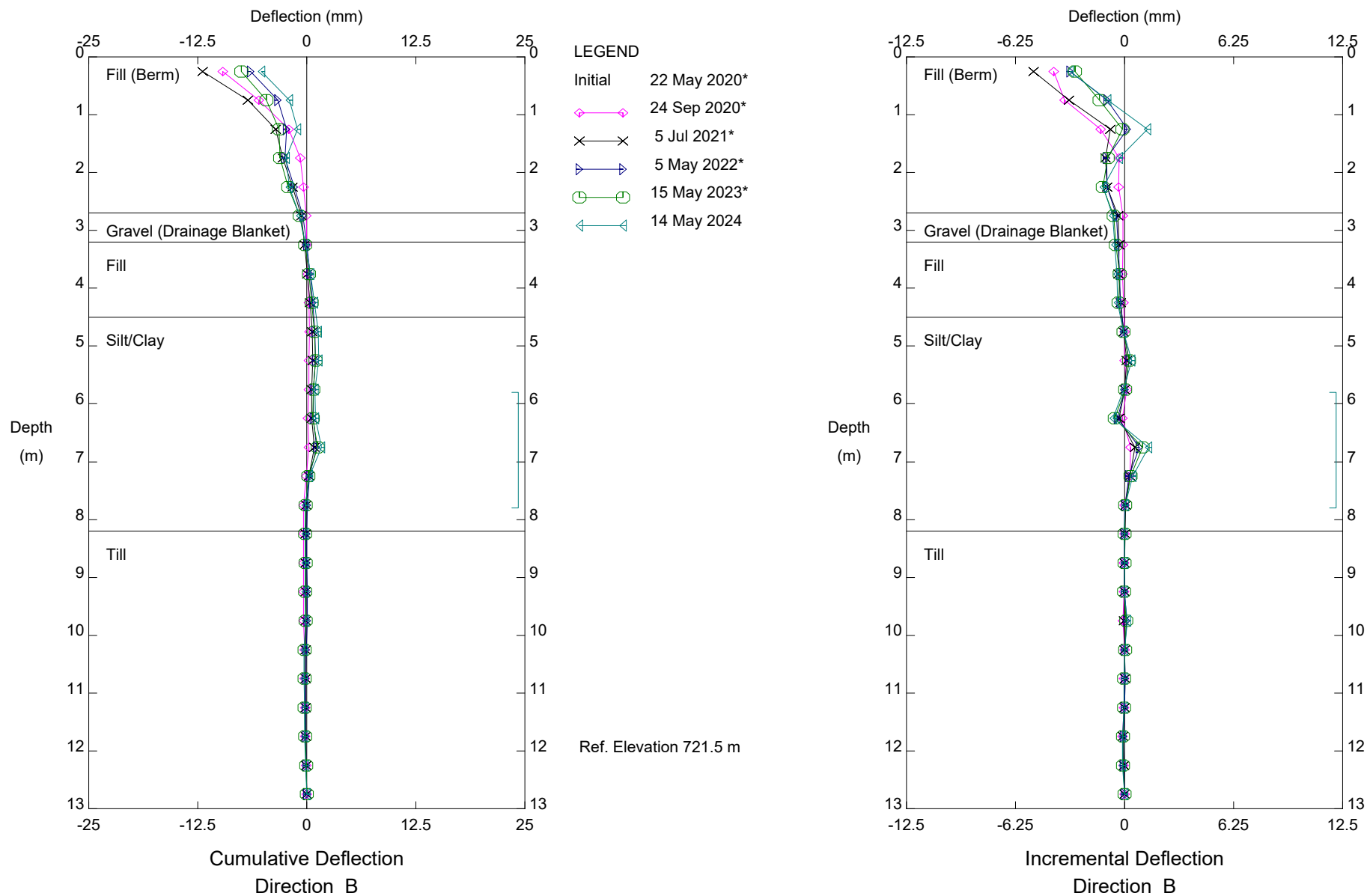
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HWY 658:02 Blue Ridge Slide (NC76), Inclinometer SI19-03

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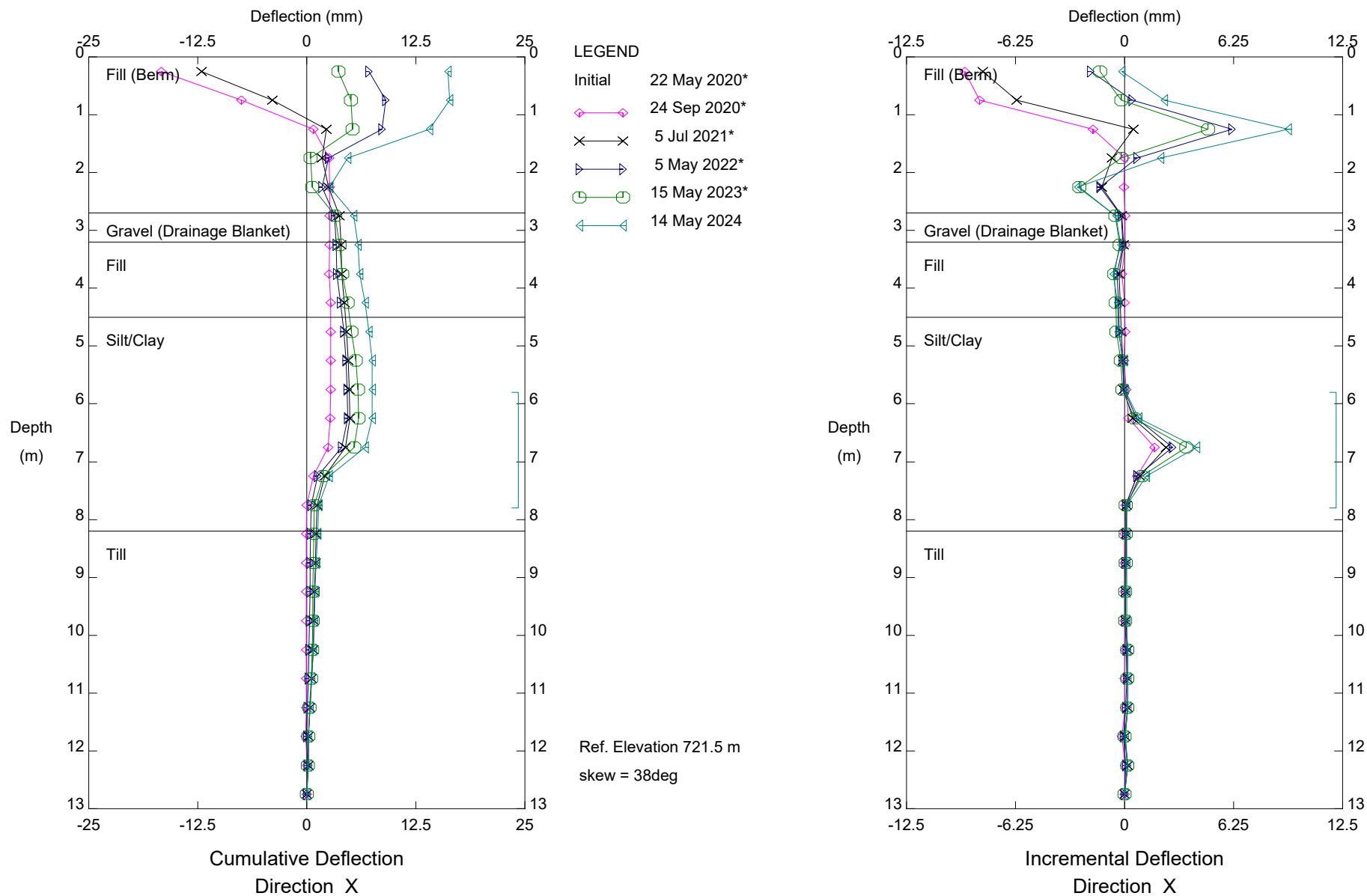
Sets marked \* include zero shift and/or rotation corrections.



HWY 658:02 Blue Ridge Slide (NC76), Inclinometer SI19-03

Alberta Transportation

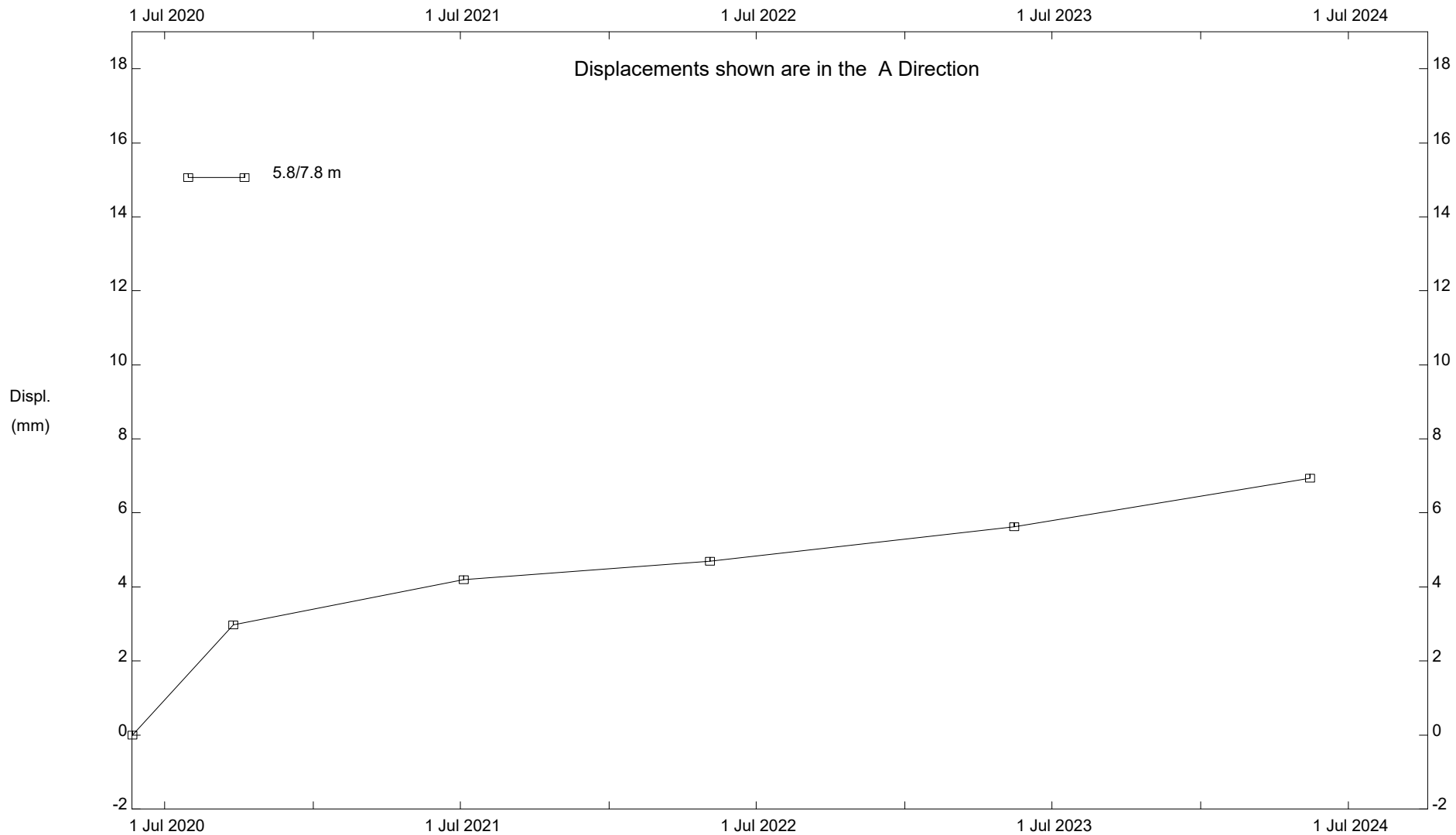
Sets marked \* include zero shift and/or rotation corrections.



HWY 658:02 Blue Ridge Slide (NC76), Inclinometer SI19-03

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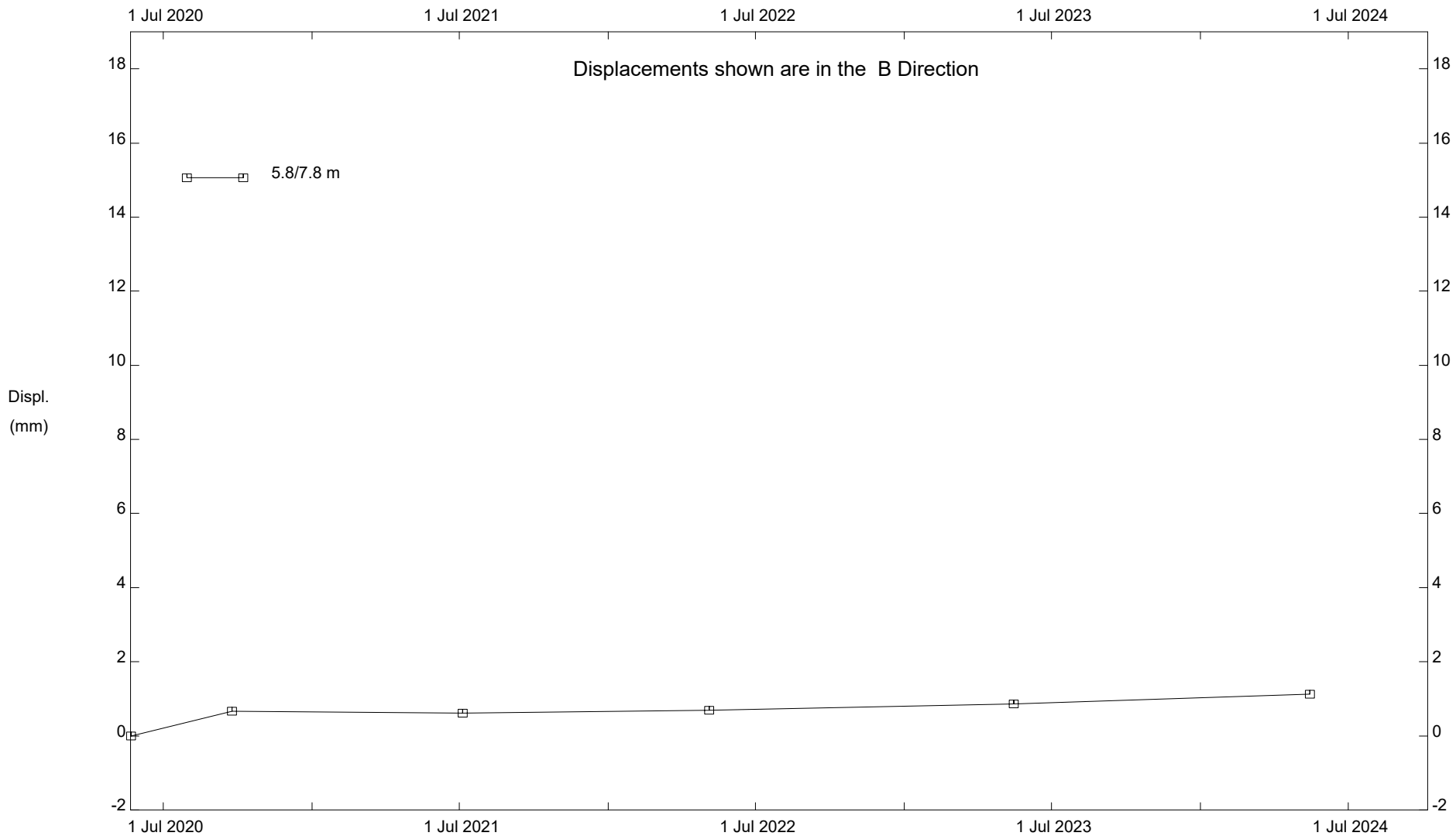
Sets marked \* include zero shift and/or rotation corrections.



HWY 658:02 Blue Ridge Slide (NC76), Inclinator SI19-03

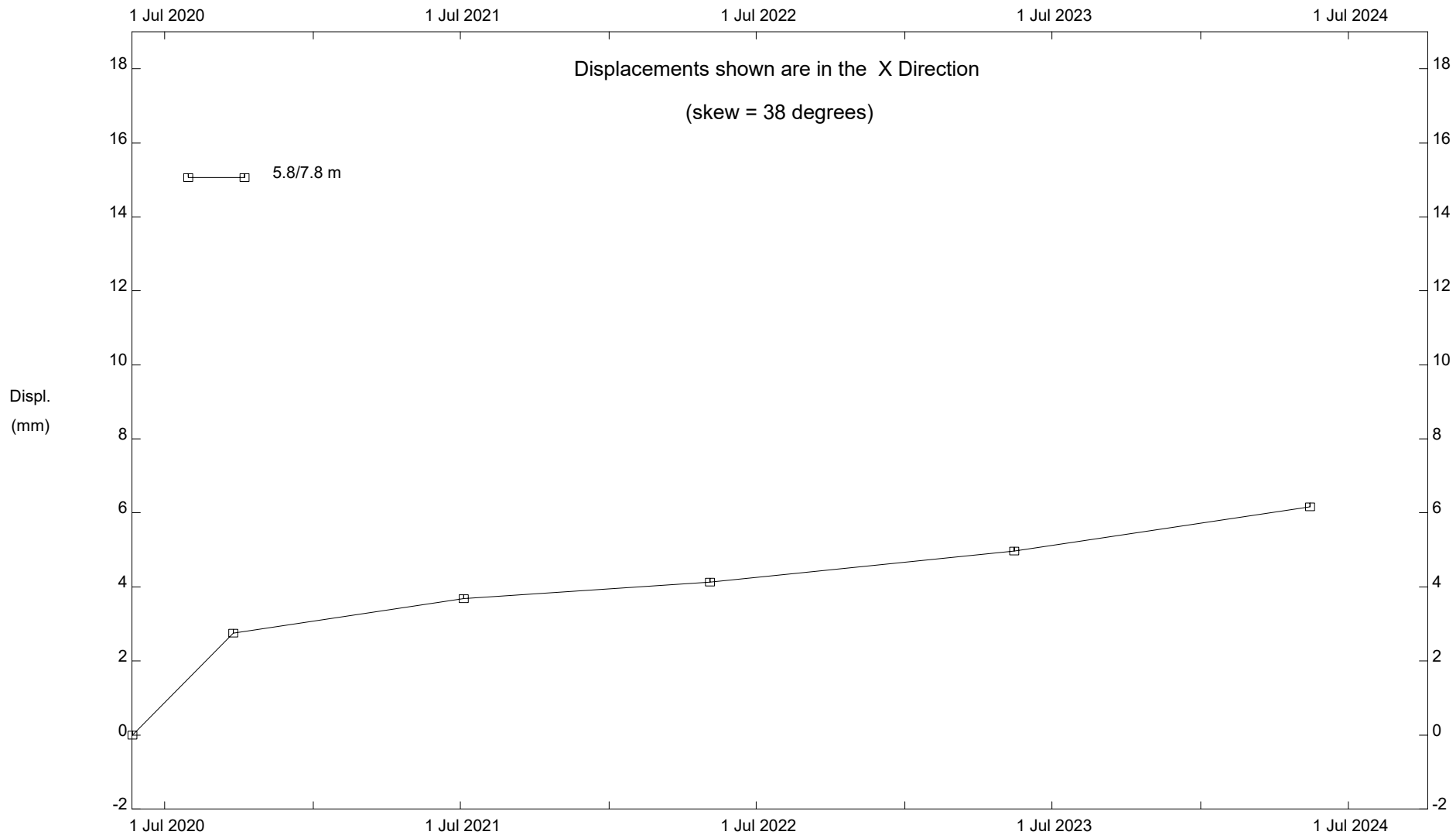
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