Stantec

Memo

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

Reference: North Central Region, Edson/Stony Plain, Site NC081 – Highway 16A:08 Evansburg 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 three slope inclinometers (BH20-02, BH21-01 and BH21-02) and four standpipe piezometers (BH20-01A, BH20-01B, BH20-02A, and BH20-02B). Figure 1 attached provides a schematic of the site. The instruments were read by Andres Padros, Technician and Olawale Odusi, Geotechnical Technologist on May 16, 2024.

The slope inclinometers (SI) were measured using an RST MEMS digital inclinometer probe with 0.5 m increments and RST handheld PC. The standpipe piezometers (SP) were measured using a Heron Instruments water tape.

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

2.0 INSTRUMENTATION READINGS

2.1 GENERAL

The SI plots are provided in the attachments 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 are provided in Table NC081-1 and the attachments.

Standpipe piezometer results are summarized in Table NC081-2 and in the following sections with resulting plots attached.

2.2 ZONES OF MOVEMENT

No discernable zone of movement was observed in the newly installed SIs BH21-01 and BH21-02 which were installed in piles P27 and P47, respectively. However, small movements were observed at the pile tops. These movements may reflect deflection and loading of the pile wall.

2.3 MONITORING RESULTS

2.3.1 Slope Inclinometers

BH20-02 has a discrete movement zone from 2.2 m to 4.2 m. The current rate of movement is less than 1 mm/yr during the Spring 2024 reading cycle. The current cumulative movement is 72 mm.

Reference: **North Central Region, Edson/Stony Plain, Site NC081 – Highway 16A:08 Evansburg Slide, Spring 2024 Instrumentation Monitoring Report**

BH21-01 and BH21-02 have no discernable movement zones.

2.3.2 Piezometers

Compared with water levels from the previous reading cycle, the water level in BH20-01A dropped by approximately 0.3 m while that in BH20-01B rose by approximately 0.1 m. BH20-02A and BH20-02B both dropped by less than or equal to 0.1 m. The water levels at the site ranged from 2.1 m to 4.3 m below ground surface (bgs), with elevations ranging from 749.5 m to 751.8 m. For reference, the creek elevation is at approximately 750 m.

3.0 RECOMMENDATIONS

It is recommended that the next reading cycle take place in Fall 2024.

3.1 INSTRUMENTATION REPAIRS

No instruments require repair at this time.

Reference: **North Central Region, Edson/Stony Plain, Site NC081 – Highway 16A:08 Evansburg Slide, Spring 2024 Instrumentation Monitoring Report**

Table NC81-1: Spring 2024 Slope Inclinometer 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							
BH20-01	Sept. 23, 2020	5941007	630594	19 mm over 1.2 m to 3.8 m depth in 15º direction	39 mm/yr; September 2021	Non-Operational	Sept. 7, 2021	Found blocked at 3.0 m in October 2021		
BH20-02	Sept. 23, 2020	5940980	630613	72 mm over 2.2 m to 4.2 m depth in 346º direction	68 mm/yr; September 2022	Operational	Sep 19, 2023	< 1	< 1	<1
BH21-01 (P27)	Oct. 21, 2021	5941010	630595	No discernable movement zone.		Operational	Sep 19, 2023	No discernable movement zone.		
BH21-02 (P57)	Oct. 21, 2021	5941013	630618	No discernable movement zone.		Operational	Sep 19, 2023	No discernable movement zone.		

(1) Operational instruments updated on May 16, 2024, with approximate accuracy of ± 3 m

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Table NC81-2: Spring 2024 Standpipe Piezometer Readings Summary

Instrument Name	Date Initialized	Coordinates (1) (UTM 11U, NAD1983) (m)		Bottom Depth (mbgs), (Elevation)	Current Status	Maximum Water Level (m bgs)	Measured Water Level (Spring 2023) (m bgs), (Elevation)	Previous Water Level (Fall 2023) (Elevation), (m bgs)	Change in Water Level (m)
		Northing	Easting						
BH20-01A	Sept. 23, 2020	5941004	630594	5.0 (750.7 m)	Operational	2.8 (October 2021)	4.0 (751.8 m)	3.7 (752.0 m)	< -0.3
BH20-01B	Sept. 23, 2020	5941004	630594	10.0 (745.7 m)	Operational	3.9 (October 2020)	4.3 (751.5 m)	4.3 (751.4 m)	< 0.1
BH20-02A	Sept. 23, 2020	5940983	630616	6.9 (745.7 m)	Operational	2.7 (May 2022)	3.1 (749.5 m)	2.9 (749.6 m)	-0.1
BH20-02B	Sept. 23, 2020	5940983	630616	4.9 (747.7 m)	Operational	1.7 (May 2022)	2.1 (750.5 m)	2.0 (750.5 m)	< -0.1

(1) Updated on May 16, 2024, with approximate accuracy of ± 3 m

Reference: **North Central Region, Edson/Stony Plain, Site NC081 – Highway 16A:08 Evansburg Slide, Spring 2024 Instrumentation Monitoring Report**

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.

PROFESSIONAL ENGINEER ALBERTA
LESLIE CHO
June 18, 2024
ID# 139079

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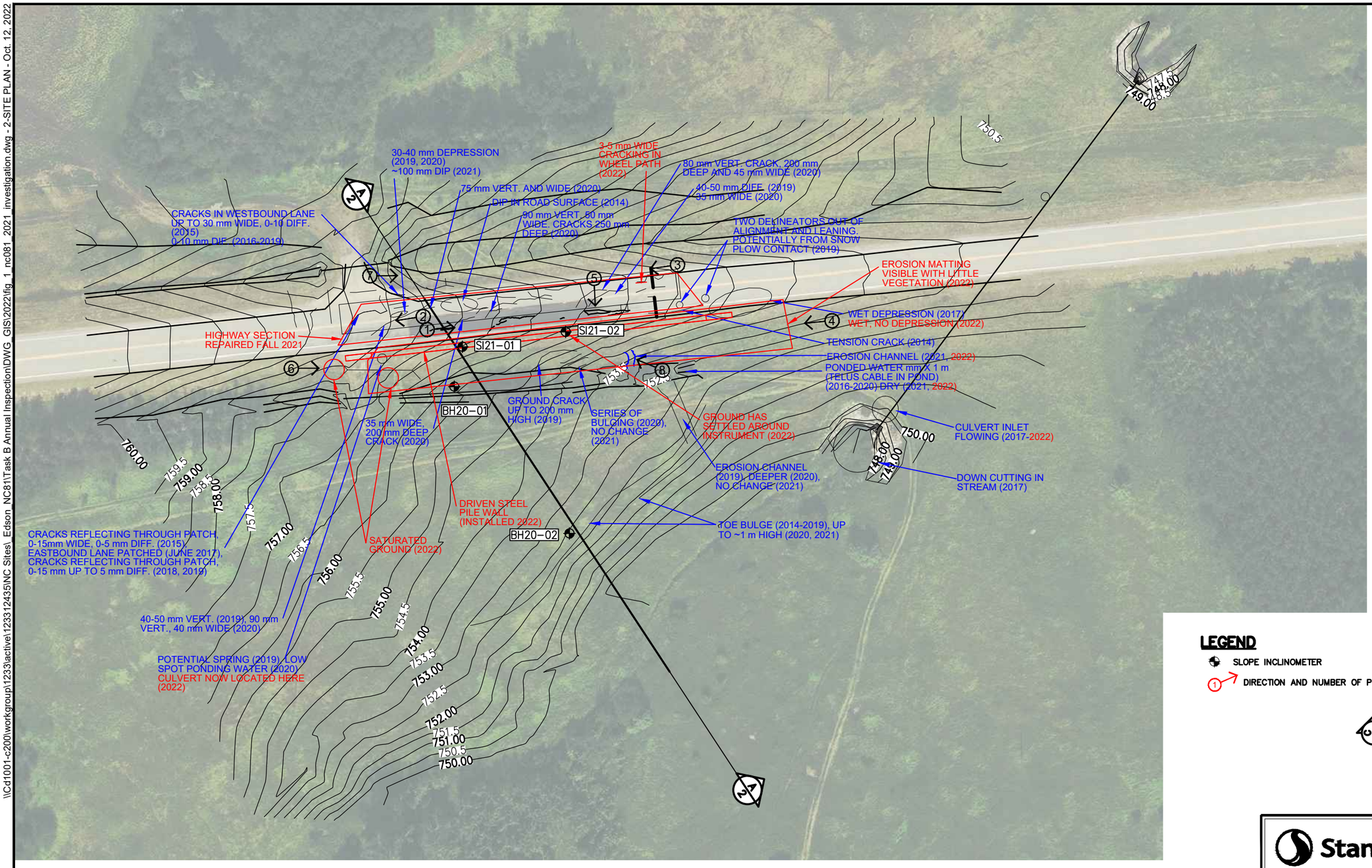
Attachment:
Figure 1 – Site Plan
BH20-02 Slope Inclinometer Plots
BH21-01 Slope Inclinometer Plots
BH21-02 Slope Inclinometer Plots
Standpipe Piezometer Level Depth vs Time Plot
Standpipe Piezometer Level Elevation vs Time Plot

PERMIT TO PRACTICE
STANTEC CONSULTING LTD.
Signature
Date 2024-06-18
PERMIT NUMBER: P 0258
The Association of Professional Engineers and Geoscientists of Alberta



LEGEND

- SLOPE INCLINOMETER
- (1) DIRECTION AND NUMBER OF PHOTO
- CROSS SECTION LOCATION

NOTES :

1. FEATURE LOCATIONS ARE APPROXIMATE.
2. PREVIOUS OBSERVATIONS SHOWN IN BLUE
3. *2022 OBSERVATIONS SHOWN IN RED*

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ALBERTA TRANSPORTATION
GEOHAZARD MONITORING PROGRAM
NC81 EVANSBURG SLIDE
SITE PLAN

DRAWN KE	CHECK XL	APPROVE LC
DATE 04 OCT 2022	SCALE AS SHOWN	PROJECT # 123315222

FIGURE - 1 -

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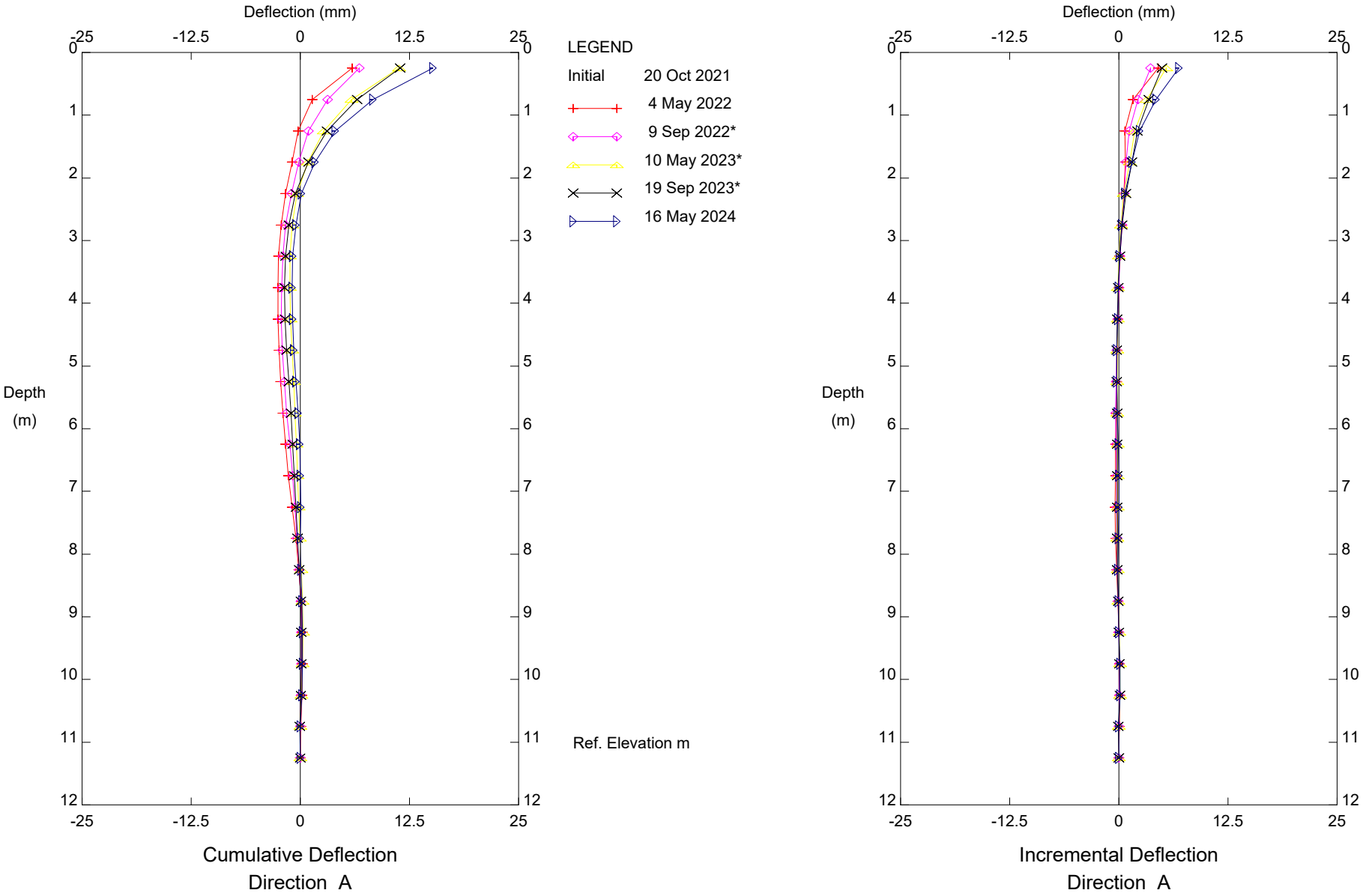

NC81 - 16A Evansburg, Inclinometer SI 21-01,P27

Transportation & Economic Corridors

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

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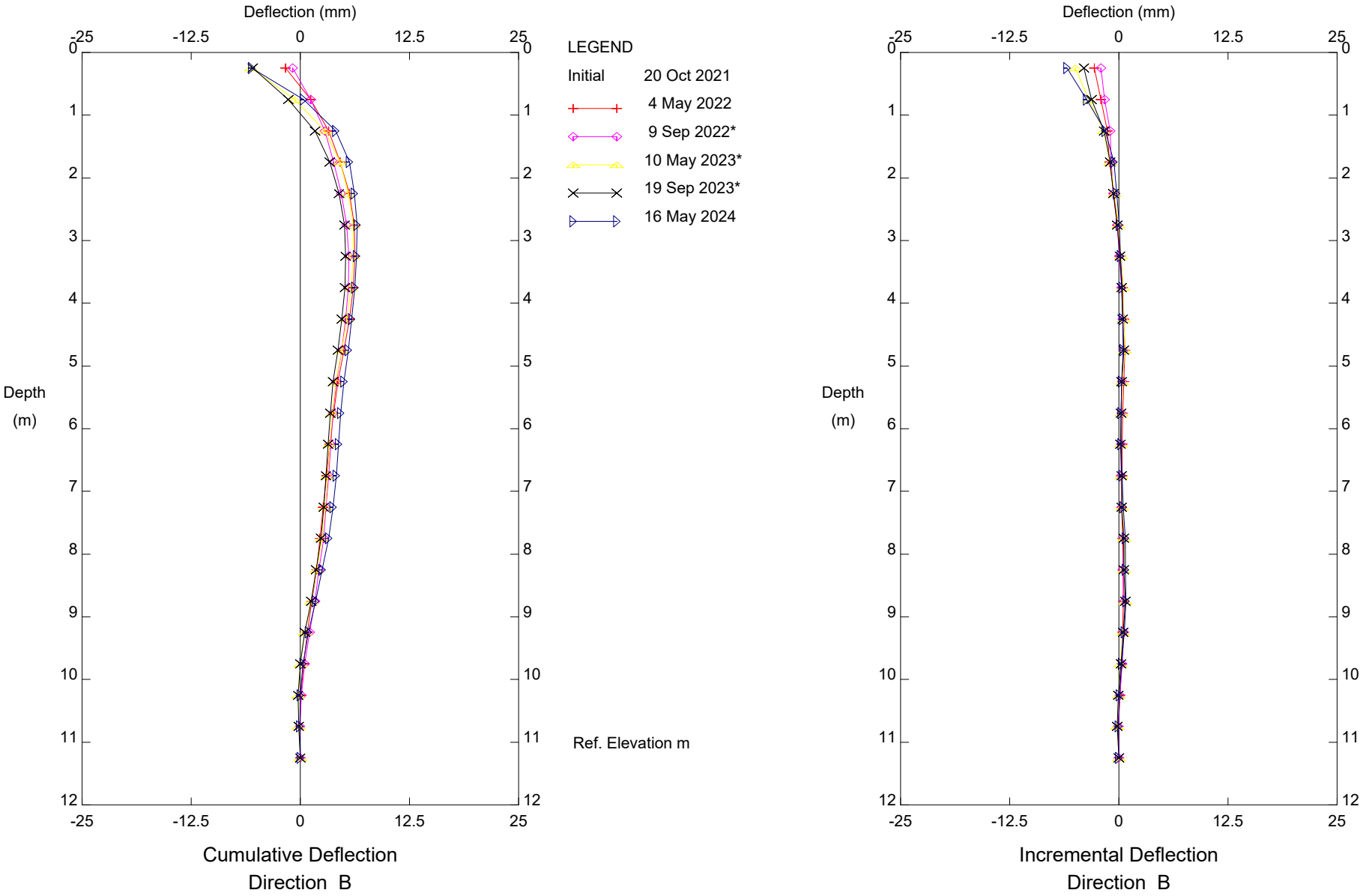

NC81 - 16A Evansburg, Inclinometer SI 21-01,P27

Transportation & Economic Corridors

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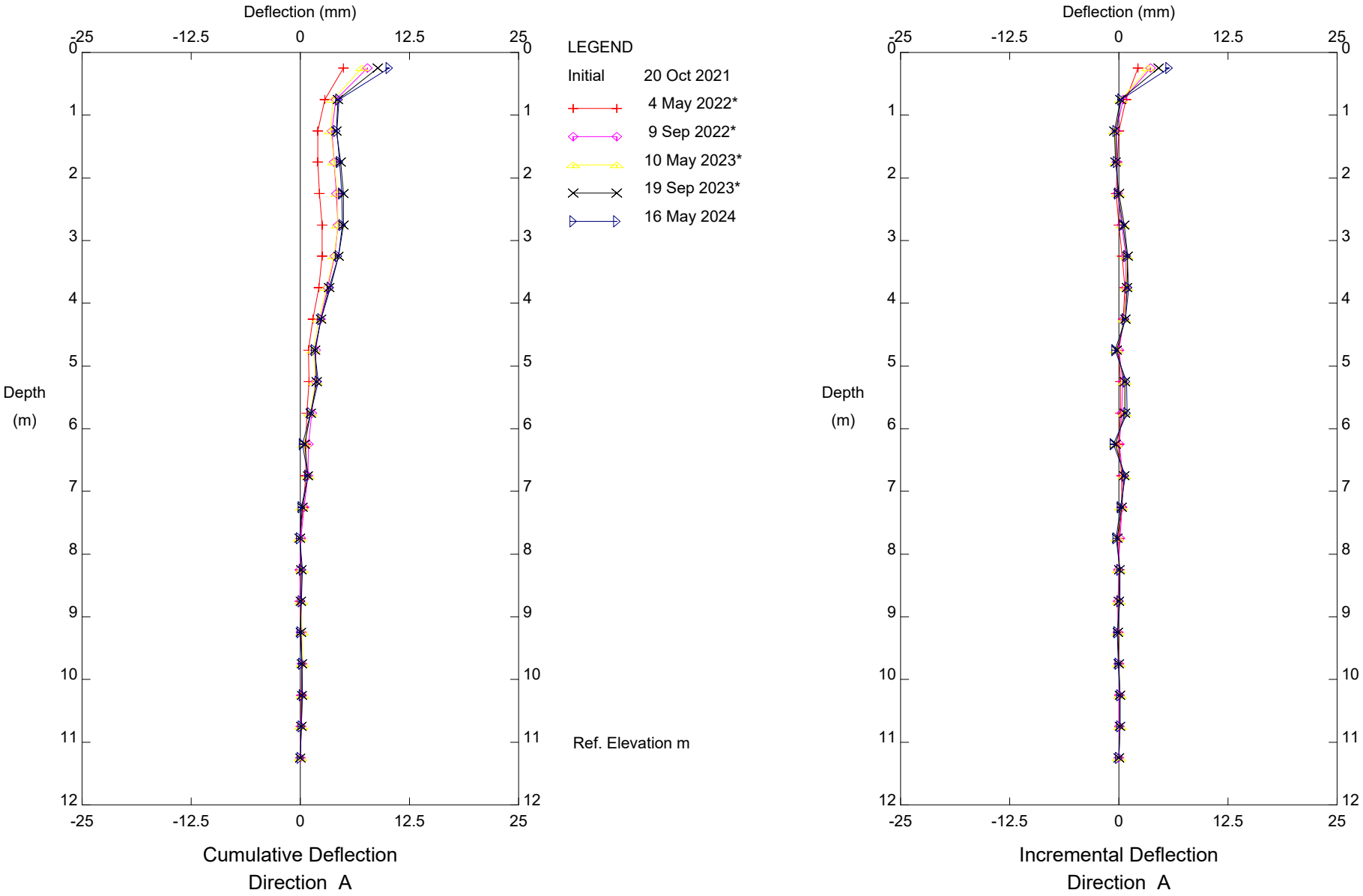

NC81 - 16A Evansburg, Inclinometer SI 21-02,P57

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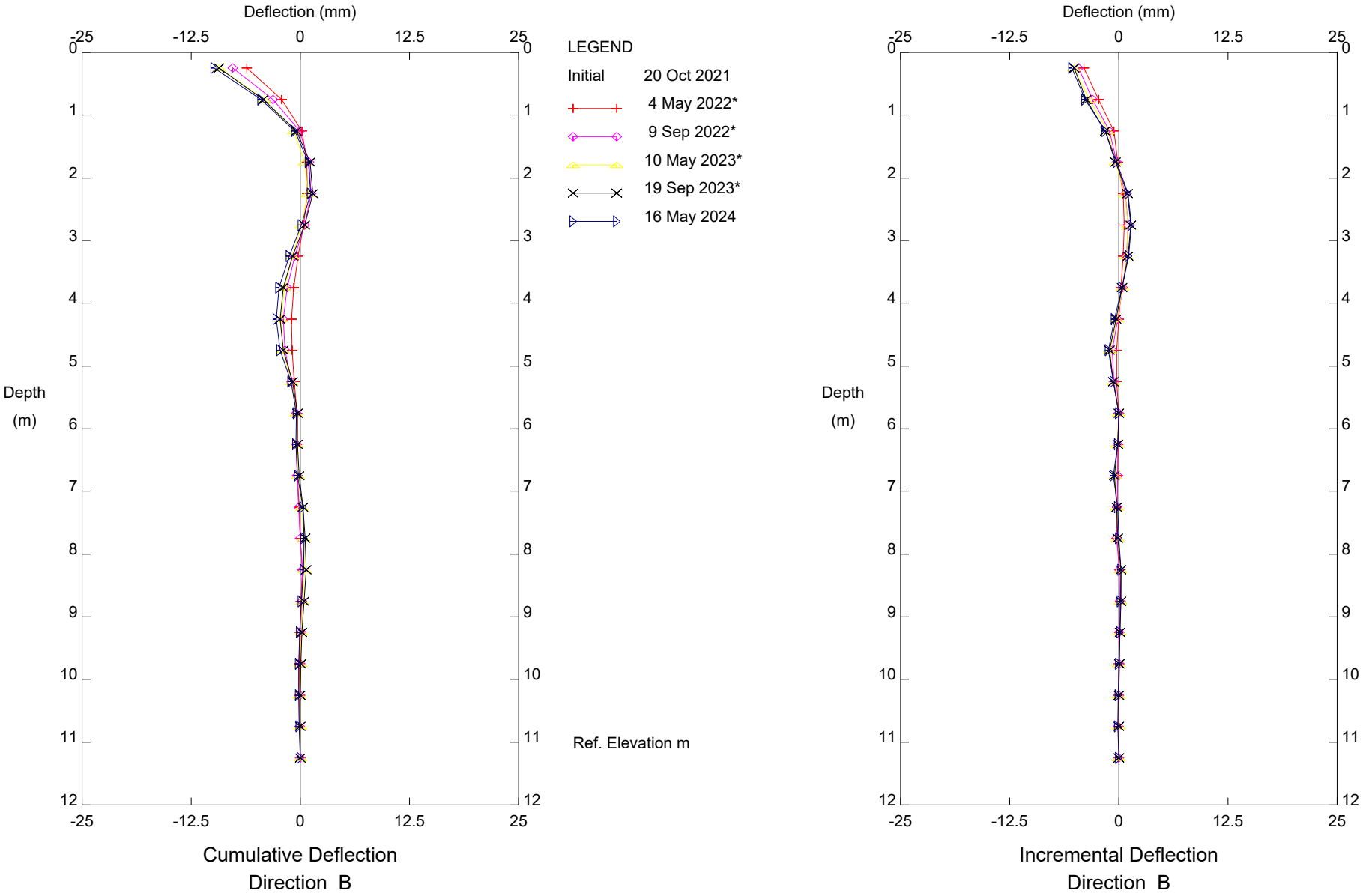

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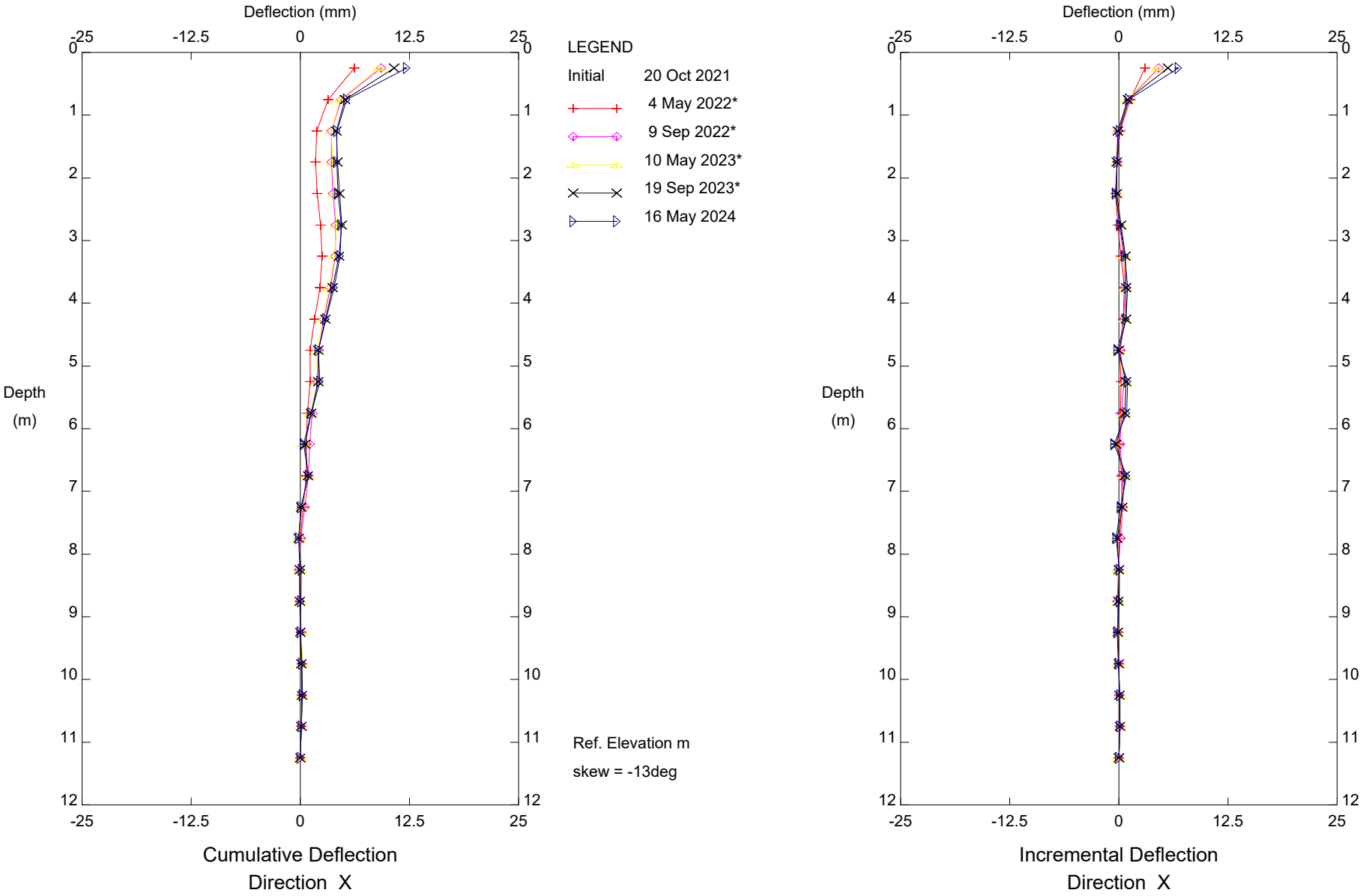

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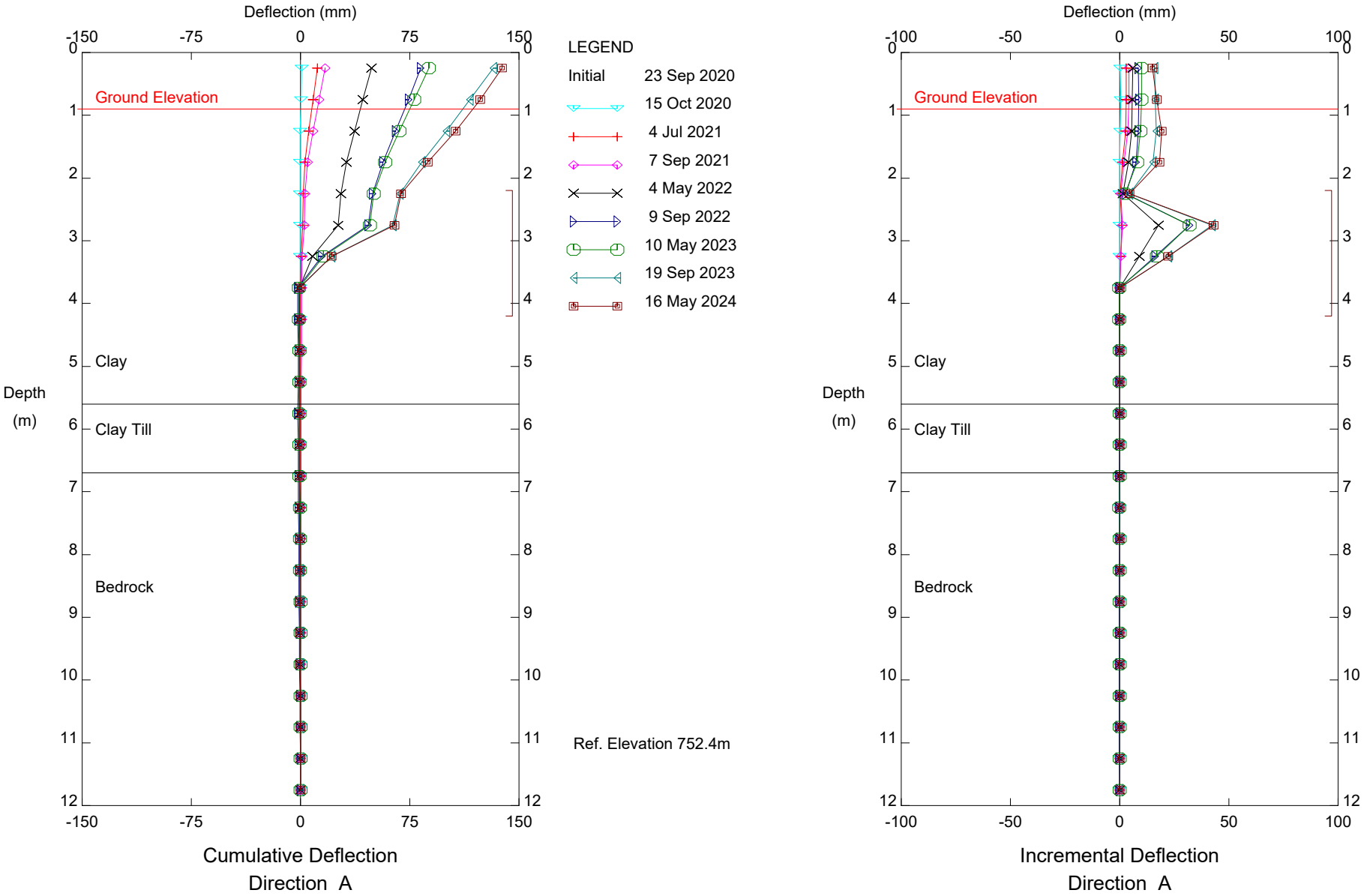

NC81 - 16A Evansburg, Inclinometer BH20-02

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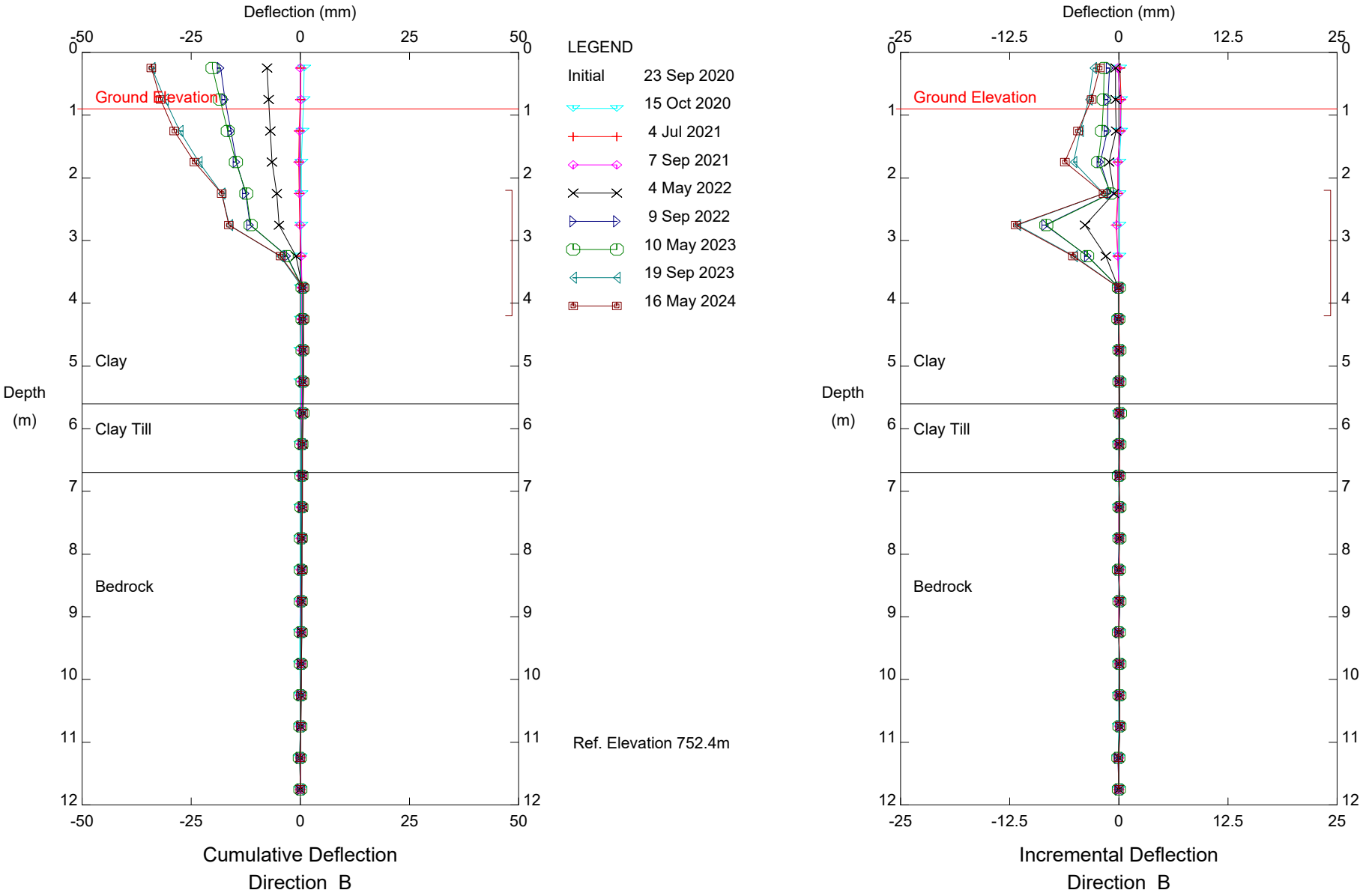

NC81 - 16A Evansburg, Inclinometer BH20-02

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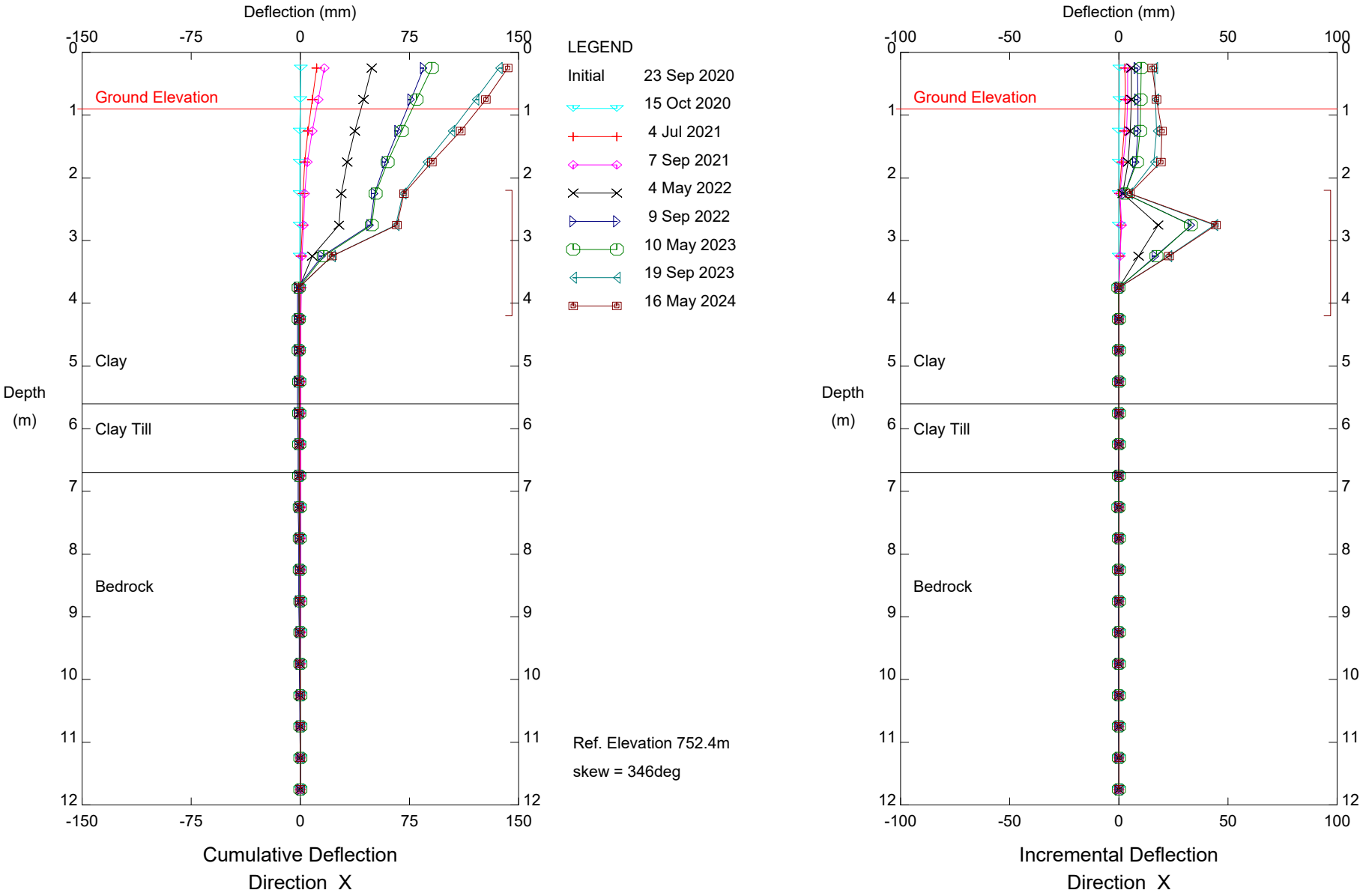

NC81 - 16A Evansburg, Inclinometer BH20-02

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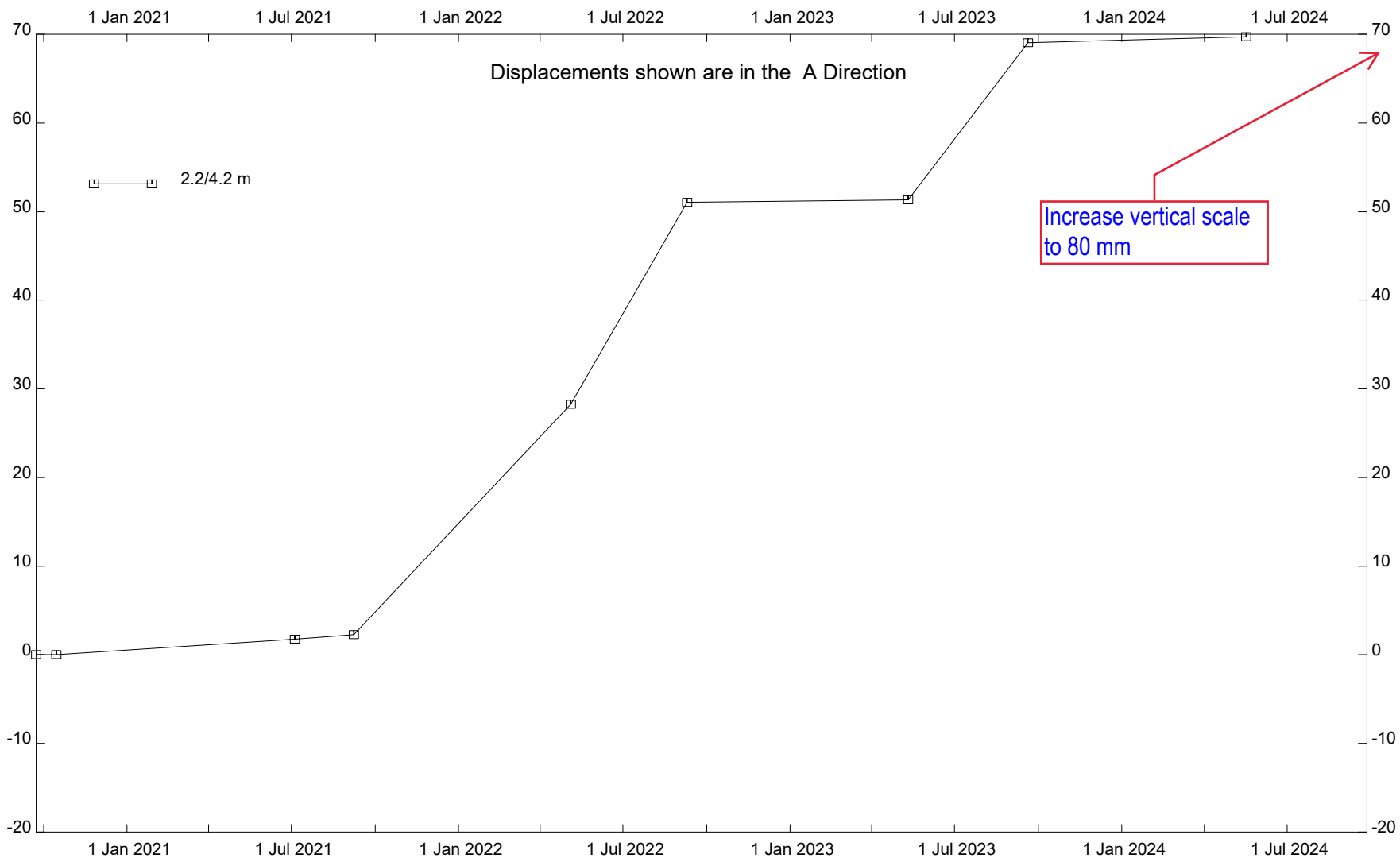

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Transportation & Economic Corridors

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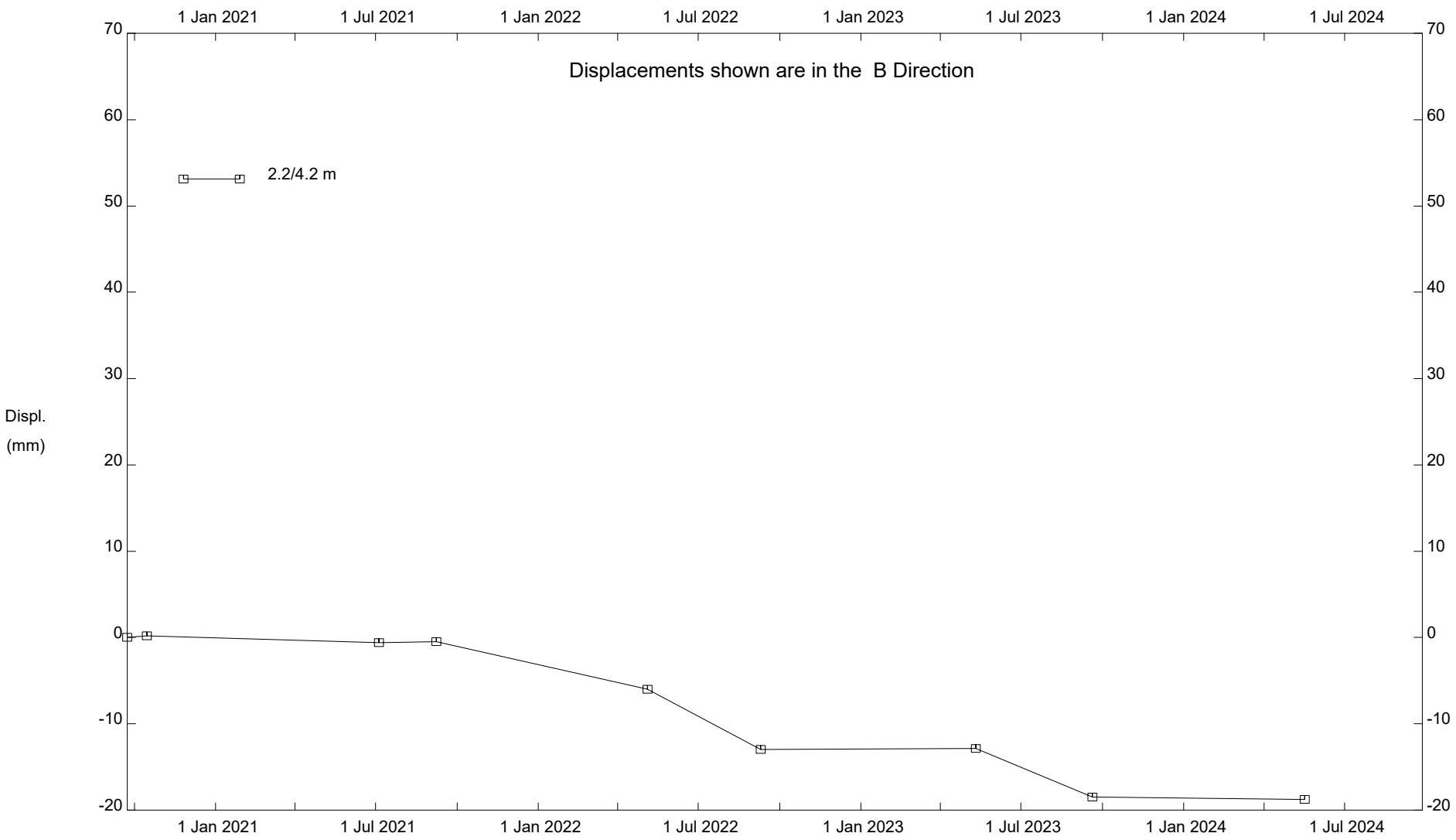

NC81 - 16A Evansburg, Inclinometer BH20-02

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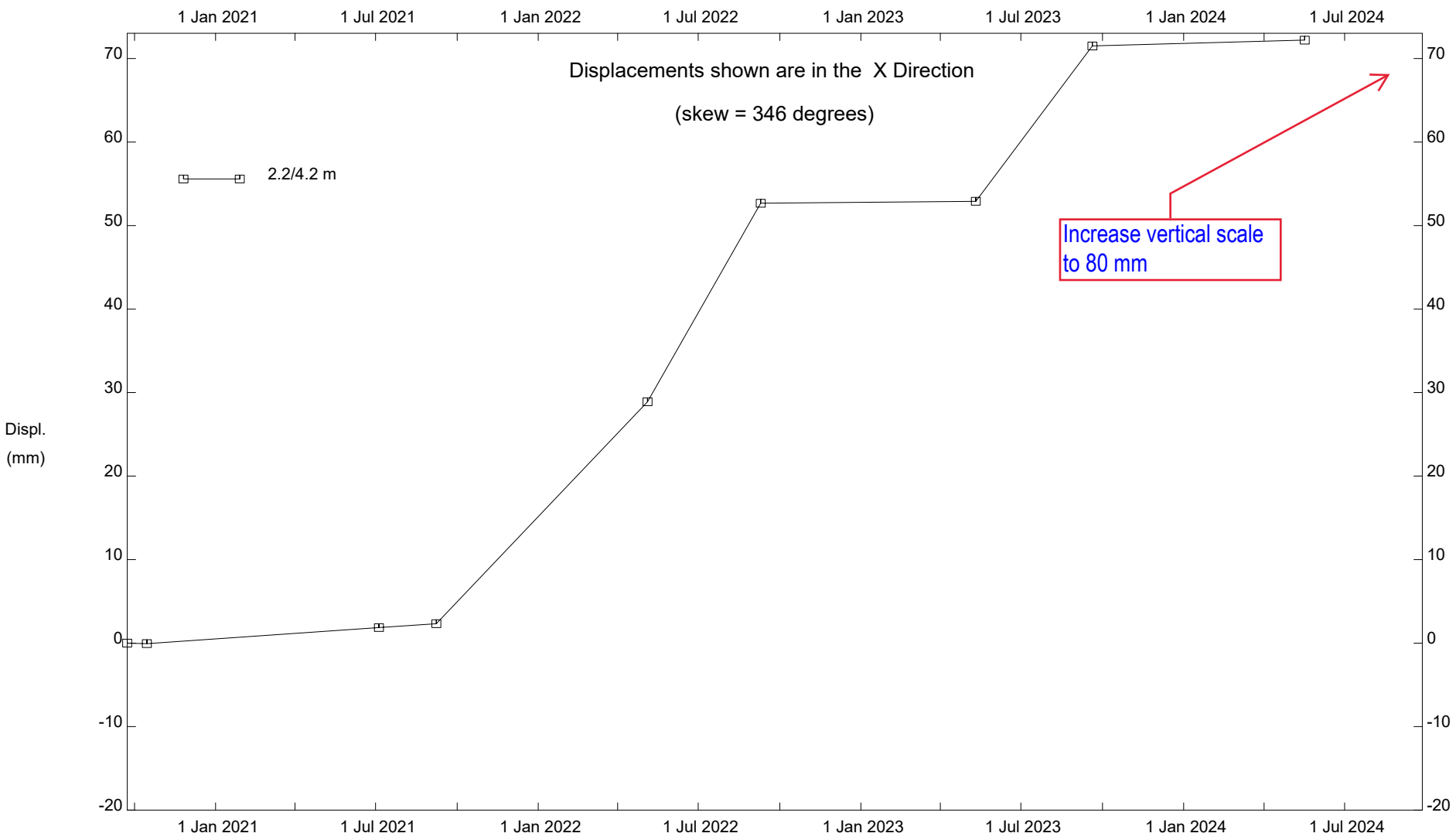

NC81 - 16A Evansburg, Inclinometer BH20-02

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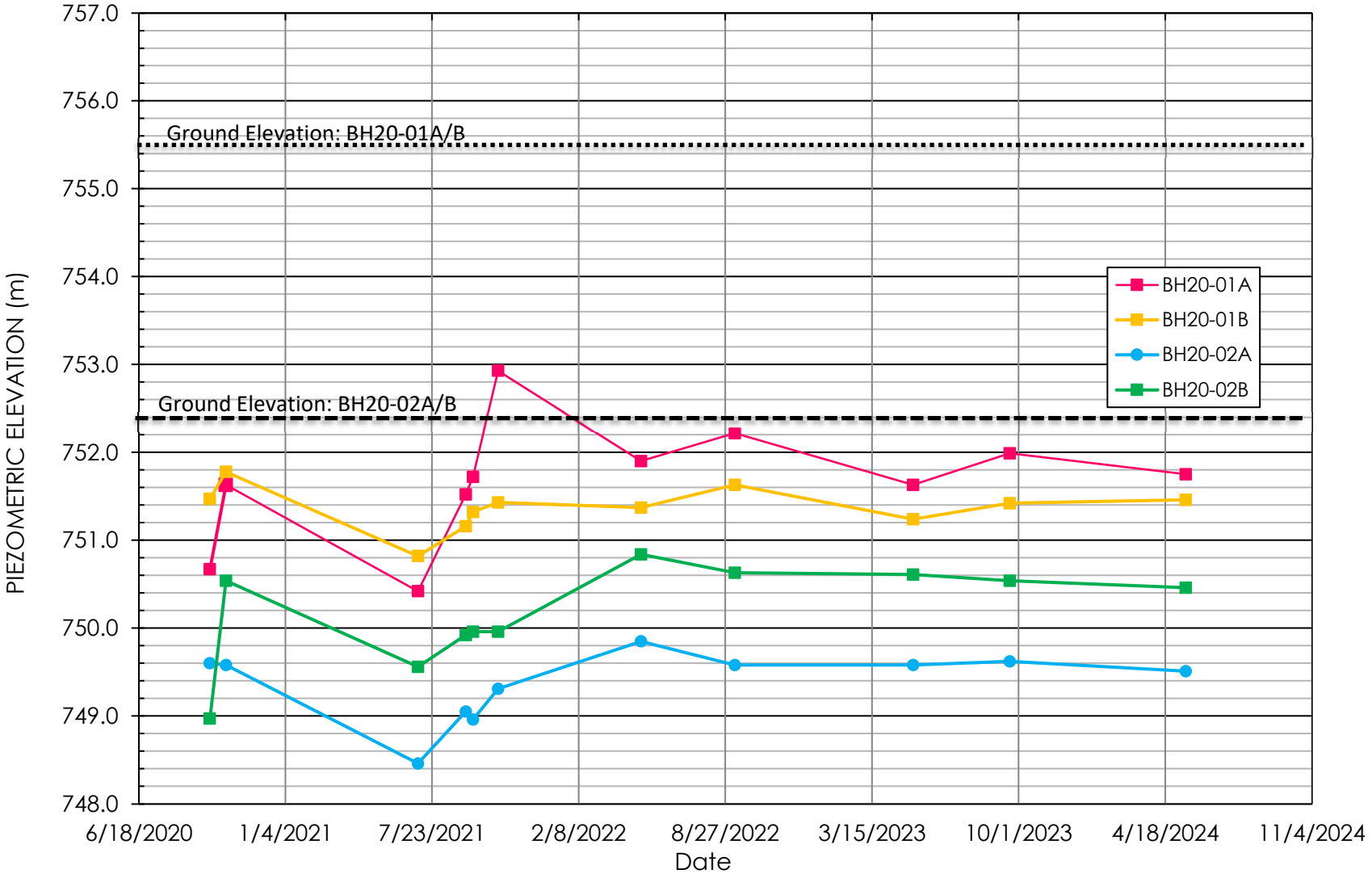
PIEZOMETER DATA



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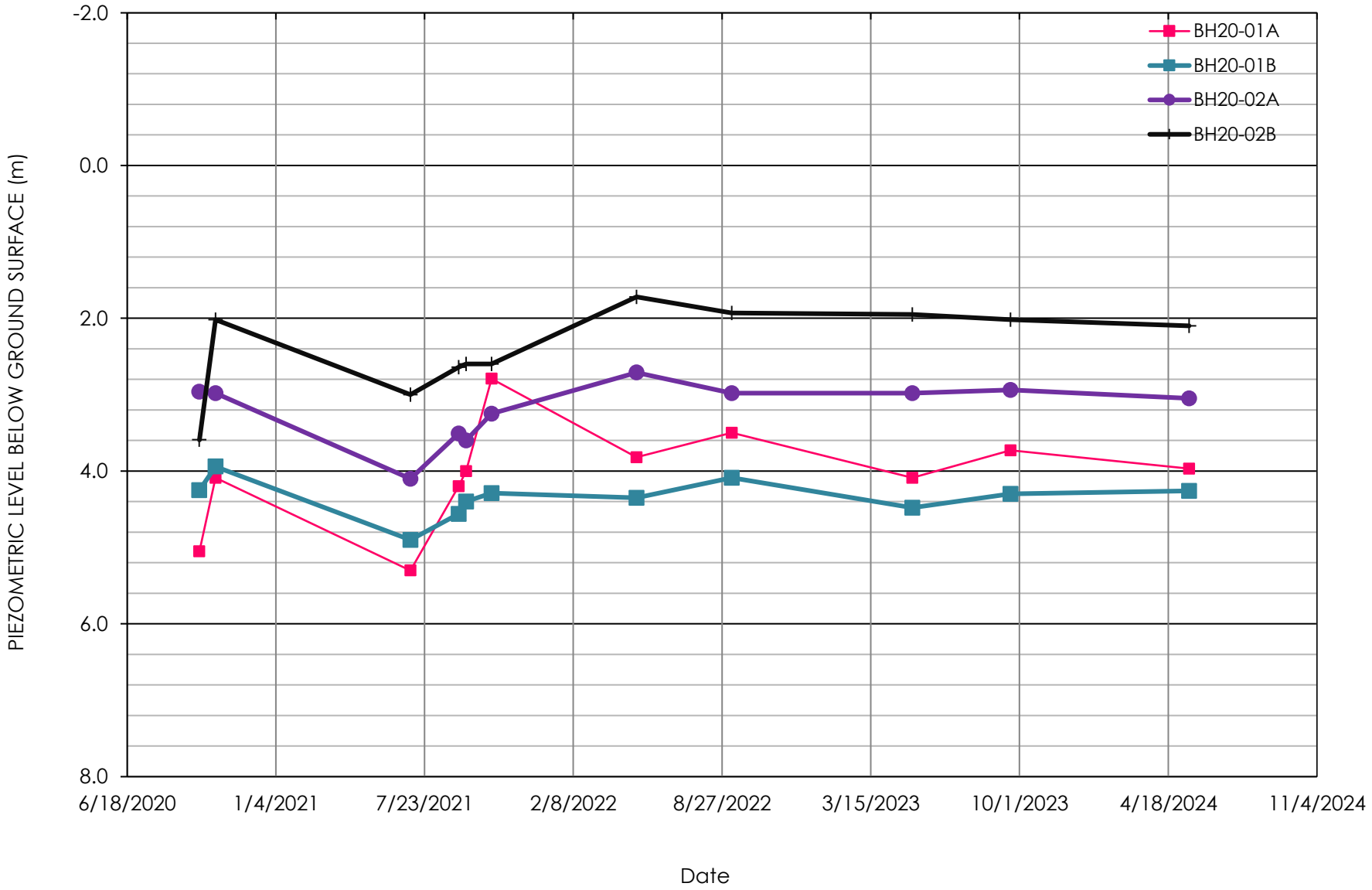
PIEZOMETER DATA



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