
To:	Amy Driessen Alberta Transportation	From:	Leslie Cho and Xiteng Liu Stantec Consulting Ltd.
File:	123315222	Date:	June 2, 2022

Reference: North Central Region, Edson, Site NC076 - Highway 658:02 Blue Ridge Slide Spring 2022 Instrumentation Monitoring Report

1.0 OBSERVATIONS

The Spring 2022 reading cycle consisted of reading three slope inclinometers (SI19-01, SI19-02, SI19-03). **Figure 1** attached provides a schematic of the site. The instruments were read by Mahendran Senthooan, M.Eng., EIT and Akintola Fakinlede, M.Sc., Engineering Technologist on May 5, 2022.

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 10 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** currently has a movement rate of less than 1 mm/yr. The cumulative movement since initialization in December 2019 is nearly 2 mm.

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

The movement zone in **SI19-03** currently has a movement rate of less than 1 mm/yr and cumulative movement of 4 mm.

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3.0 RECOMMENDATIONS

3.1 FUTURE WORK

It is recommended that all instruments be read in the Spring 2023 reading cycle.

3.2 INSTRUMENTATION REPAIRS

No repairs are required at this site.

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Table NC076-1: Spring 2022 Slope Inclinometer Summary

Instrument Name	Date Initialized ⁽¹⁾	Coordinates ⁽²⁾ (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	2 [9.2 to 11.2]	2 (September 2020)	Operational	July 5, 2021	No Change	<1	-2
SI19-02	Sept. 24, 2019	5999099	606053	<1 [11.2 to 13.2]	2 (May 2020)	Operational	July 5, 2021	<1	-1	<1
SI19-03	Sept. 24, 2019	5999086	606045	4 [5.8 to 7.8]	8 (September 2020)	Operational	July 5, 2021	<1	<1	-1

(1) Previous baseline/initialization date was July 2, 2019. New baseline date established to account for construction disturbance.
(2) Updated May 5, 2022, with approximate accuracy of ± 3 m.

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CLOSING

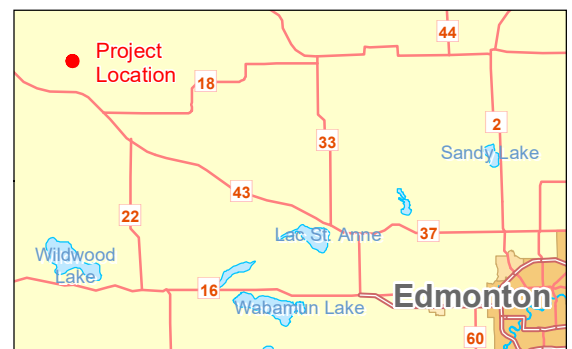
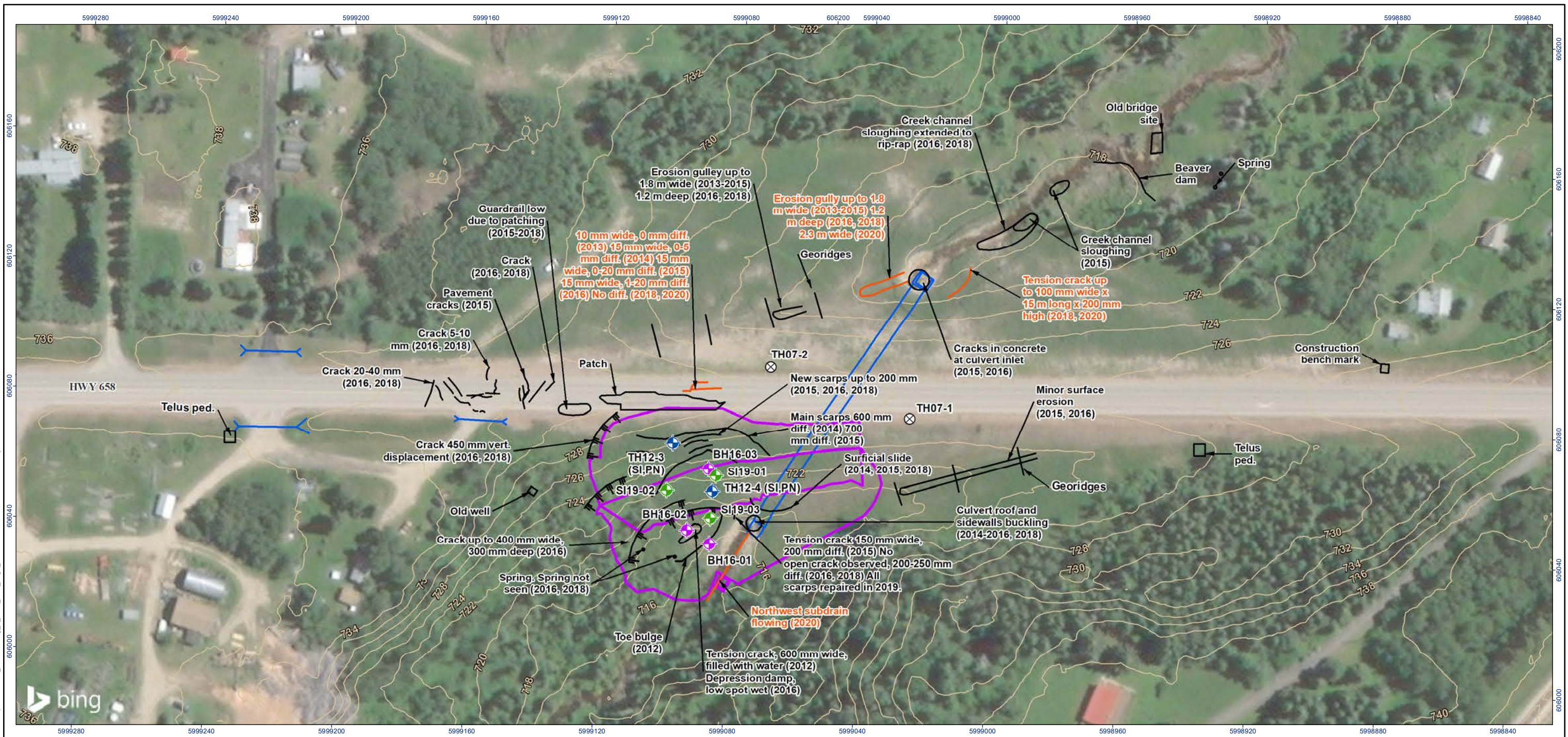
We trust this instrumentation report meets your requirements. If you have any questions, please do not hesitate to contact the undersigned.

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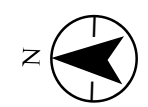
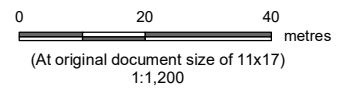
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Attachment: Figure 1 – Site Plan
S119-01 Slope Inclinometer Plots
S119-02 Slope Inclinometer Plots
S119-03 Slope Inclinometer Plots



- ⊗ Testhole (Others, 2007)
- ⊕ Slope Inclinometer Location (Thurber, 2012)
- ⊕ Monitoring Well (Stantec, 2016)
- ⊕ Slope Inclinometer Location (Stantec, 2019)
- Previous Observation
- 2020 Observation
- Culvert
- Embankment Footprint (approx.)
- Ground Elevation Contours (m AMSL, LiDAR July 2006)



Project Location: Blue Ridge, Alberta
 Prepared by MK on 2020-06-11
 Quality Review by LC on 2020-06-19
 Independent Review by XL on 2020-06-19

Client/Project: Alberta Transportation Geohazard Monitoring Program
 NC76 Blue Ridge Slide
 123315222

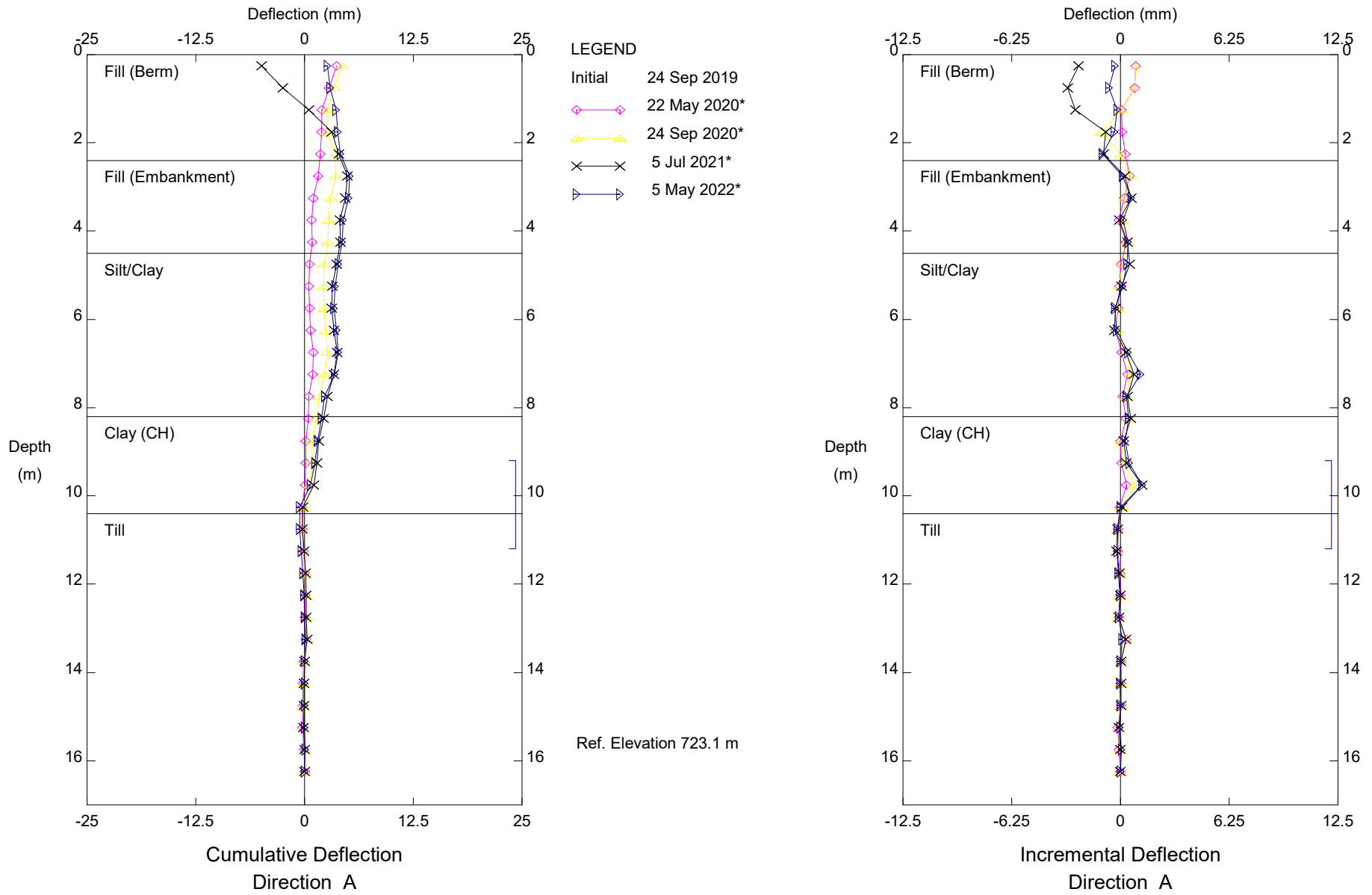
Figure No. 1

Title: **Figure 1: 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: © 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS

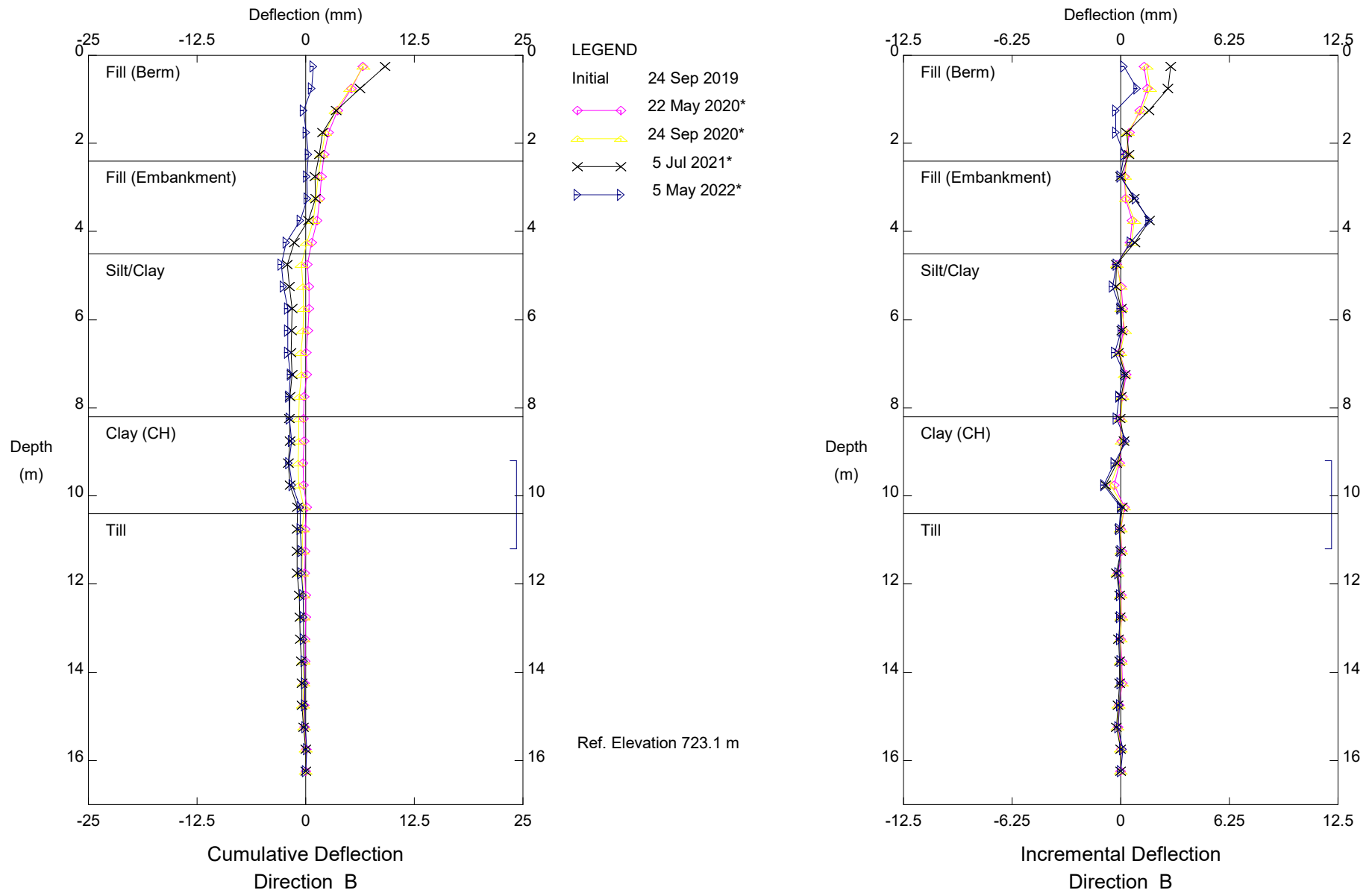
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HWY 658:02 Blue Ridge Slide (NC076), Inclinometer SI19-01
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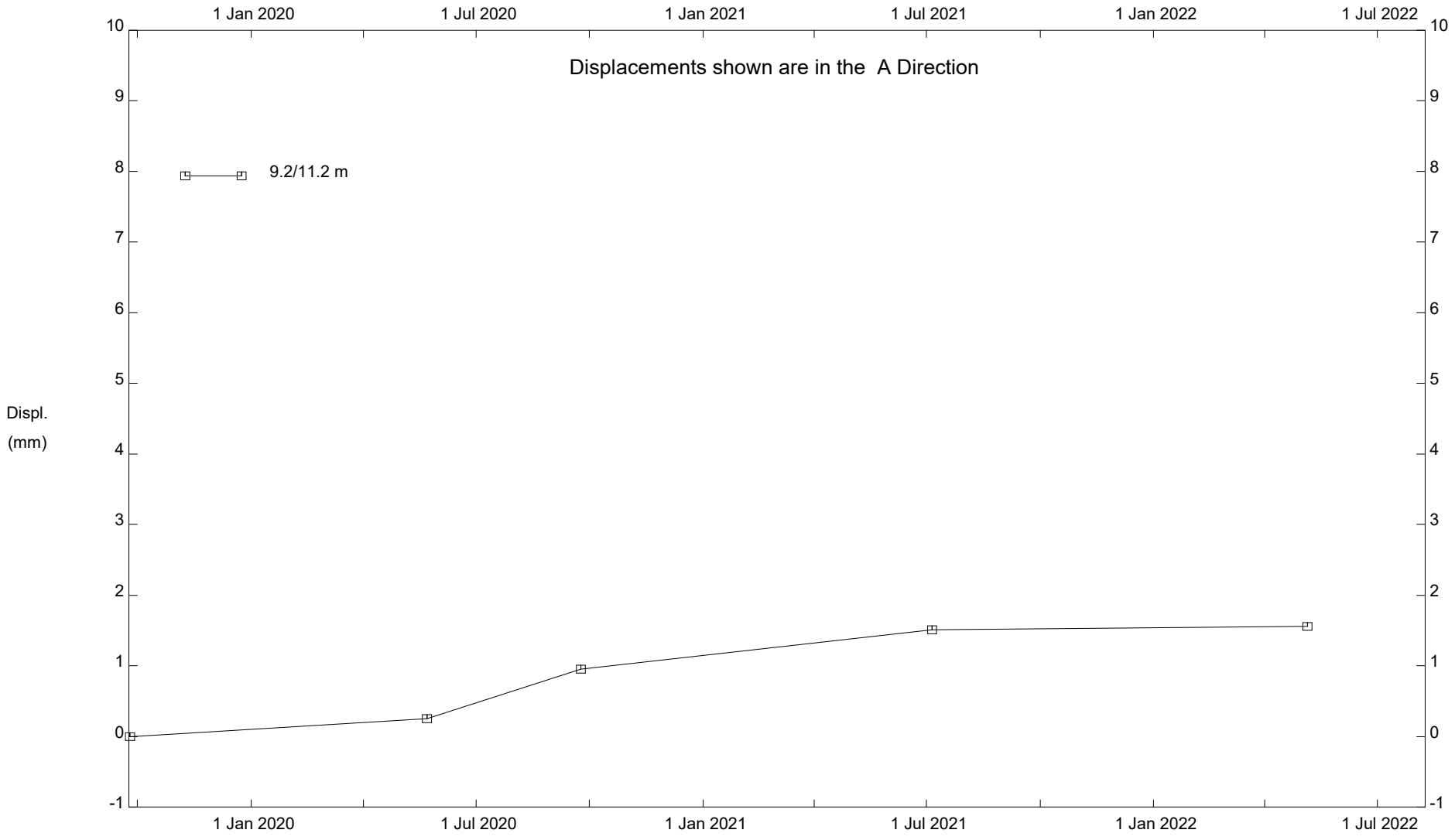
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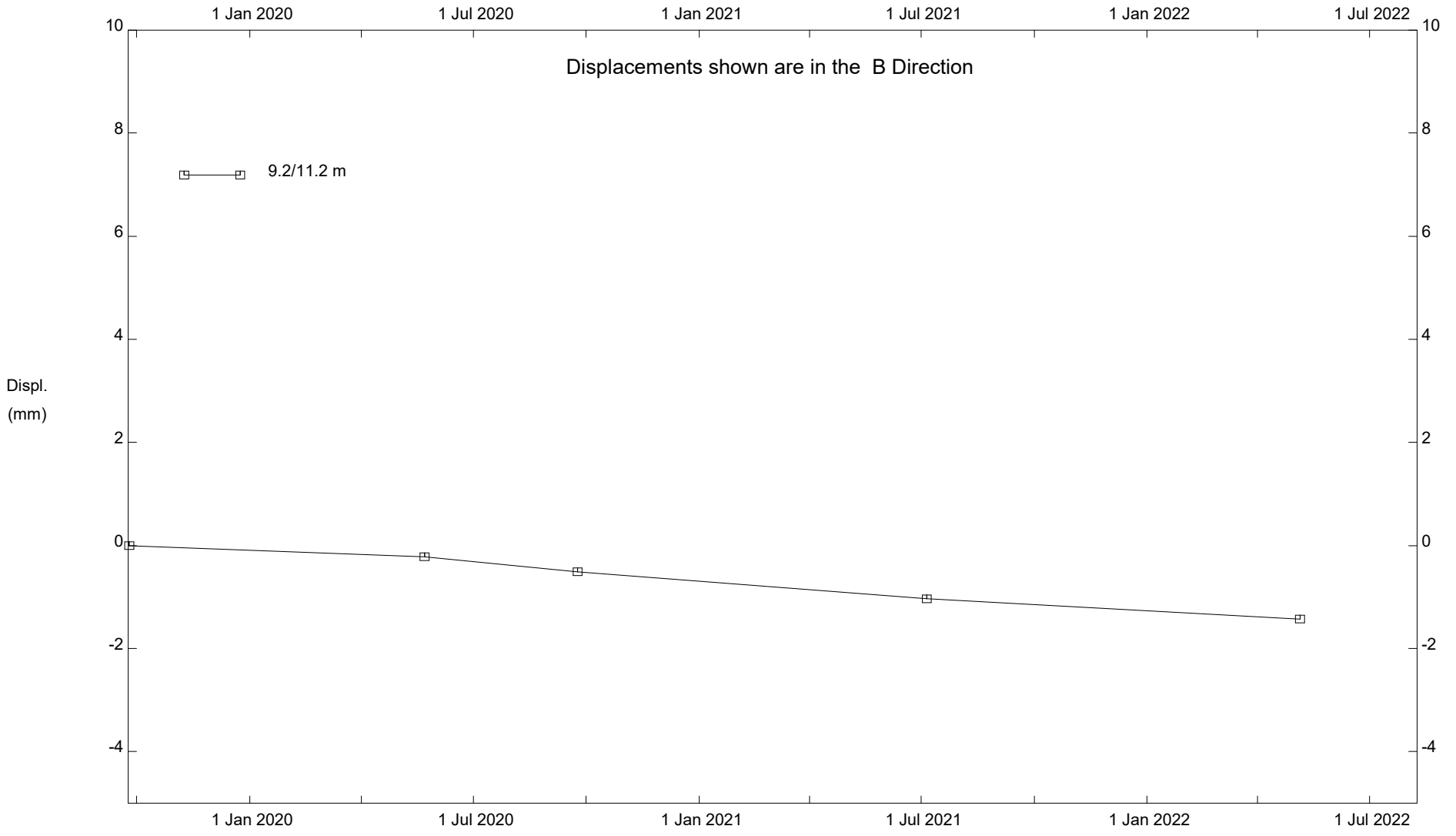
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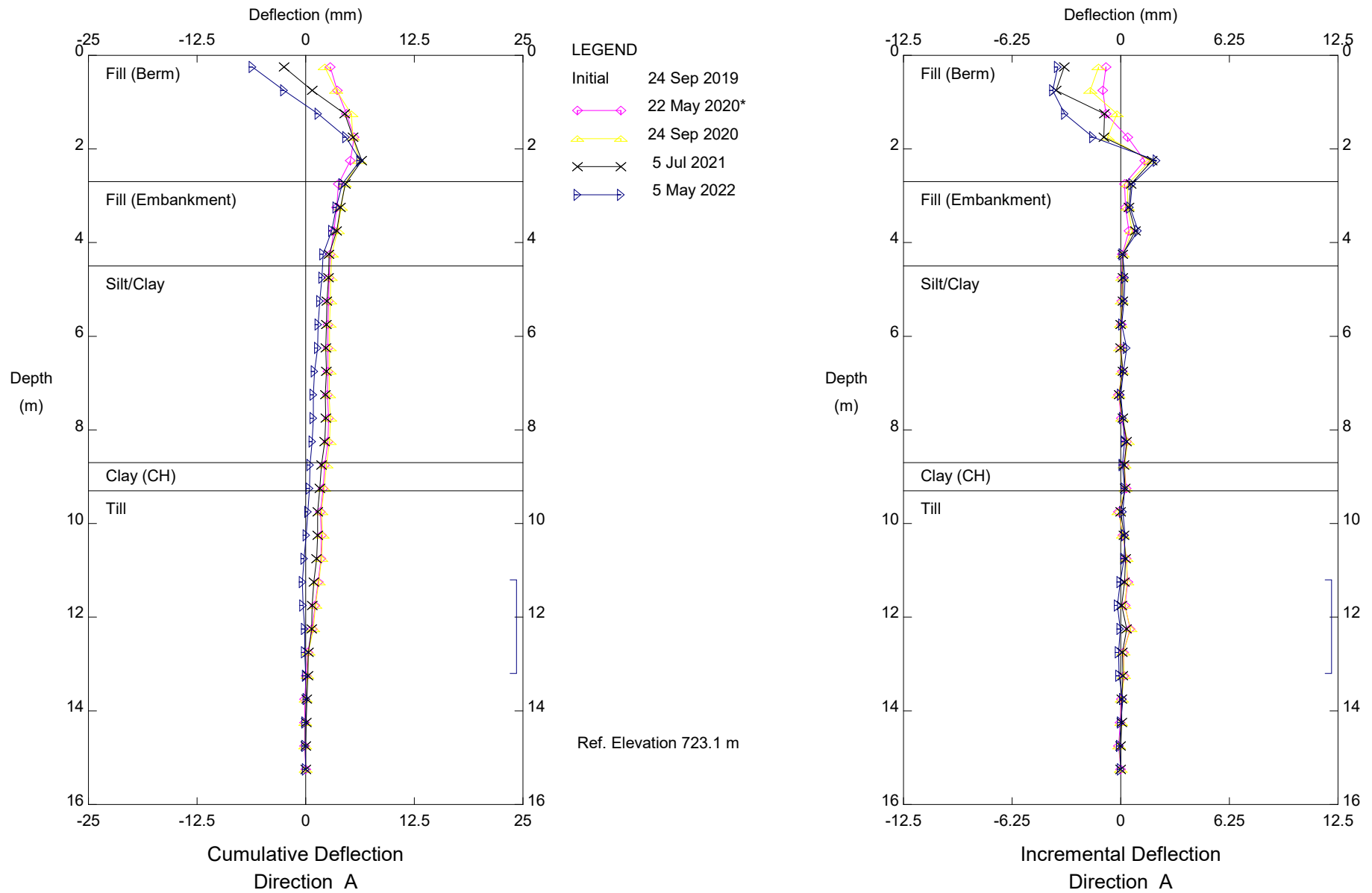
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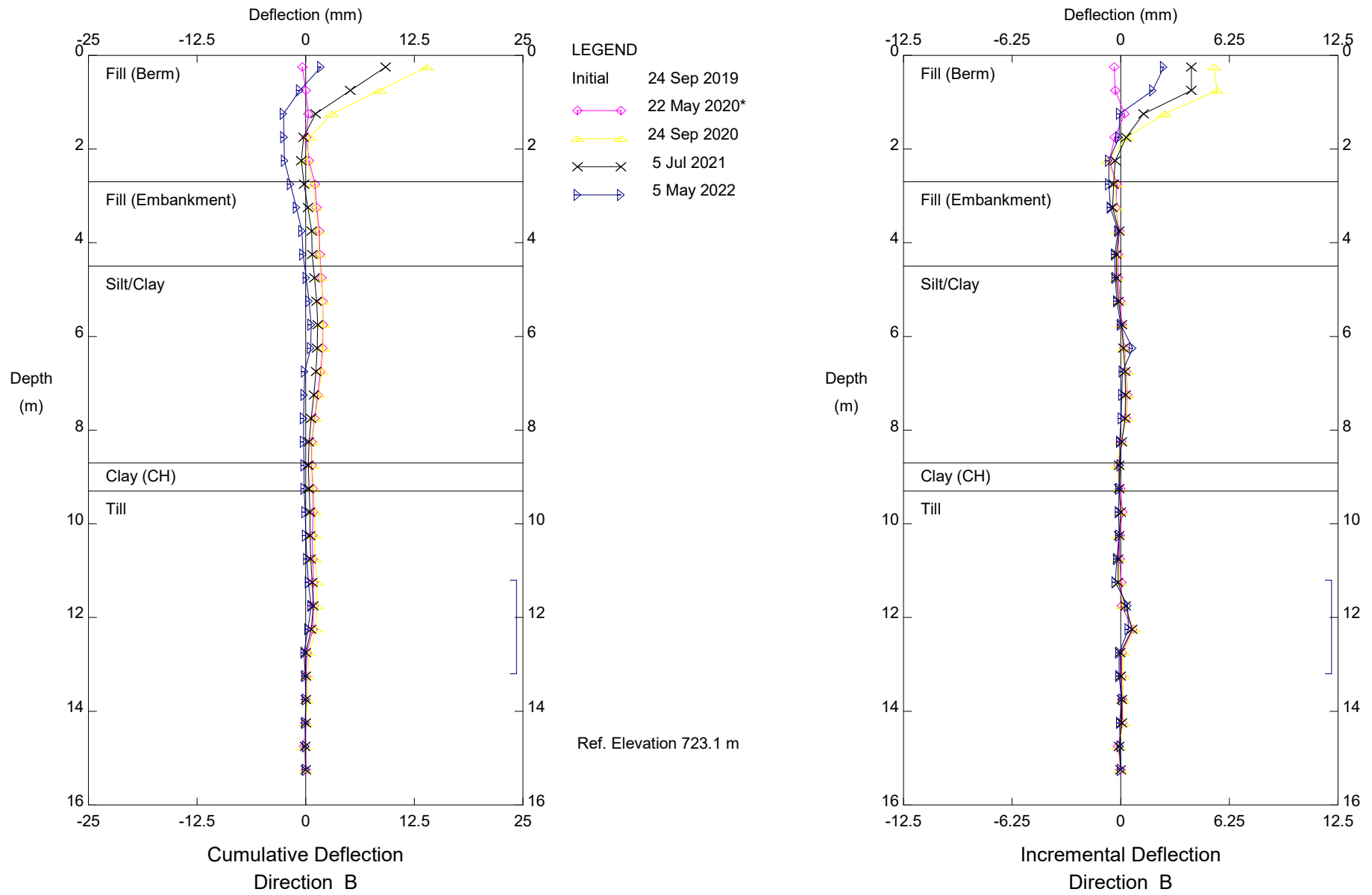
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HWY 658:02 Blue Ridge Slide (NC076), Inclinometer SI19-02

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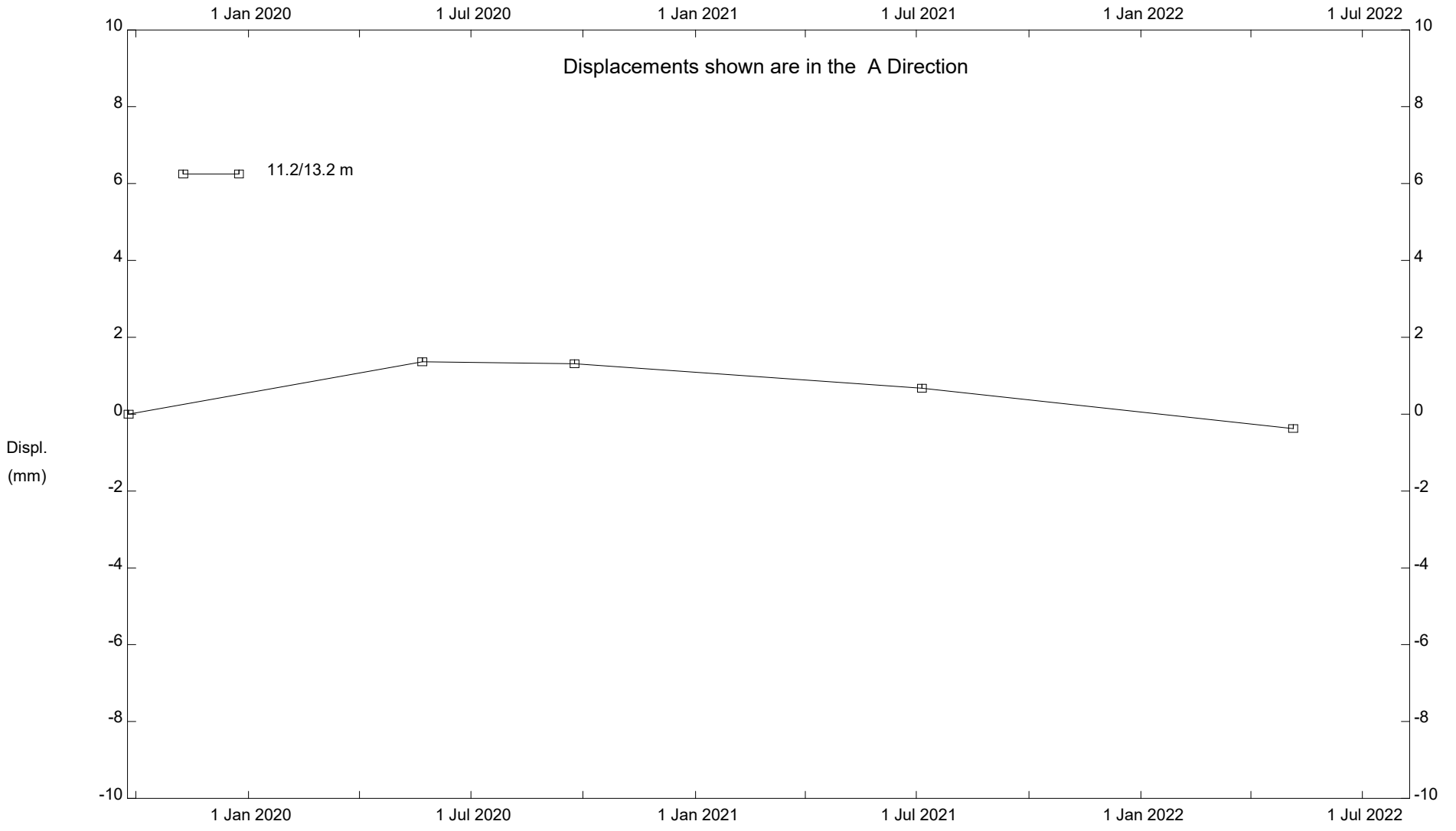
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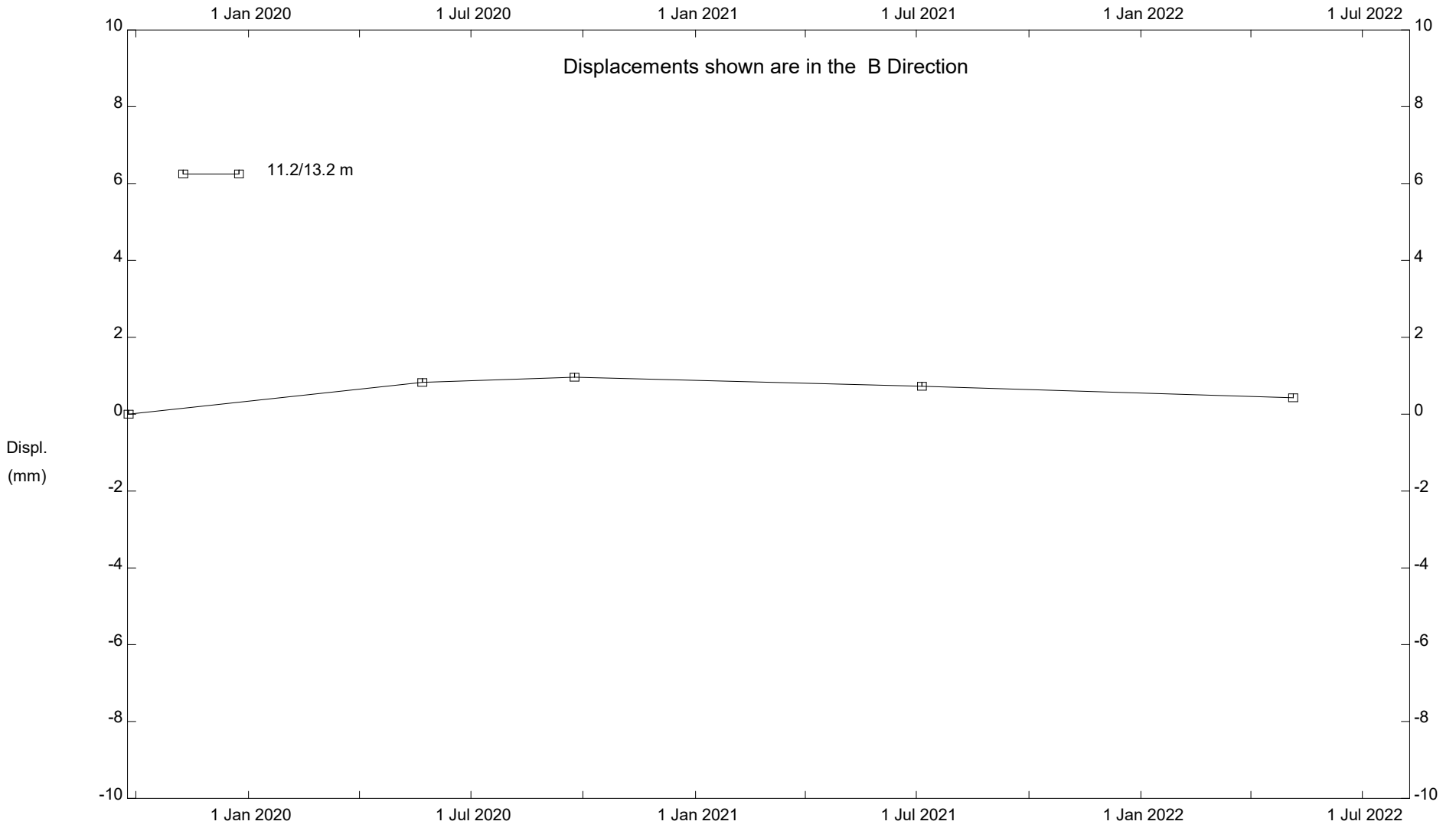
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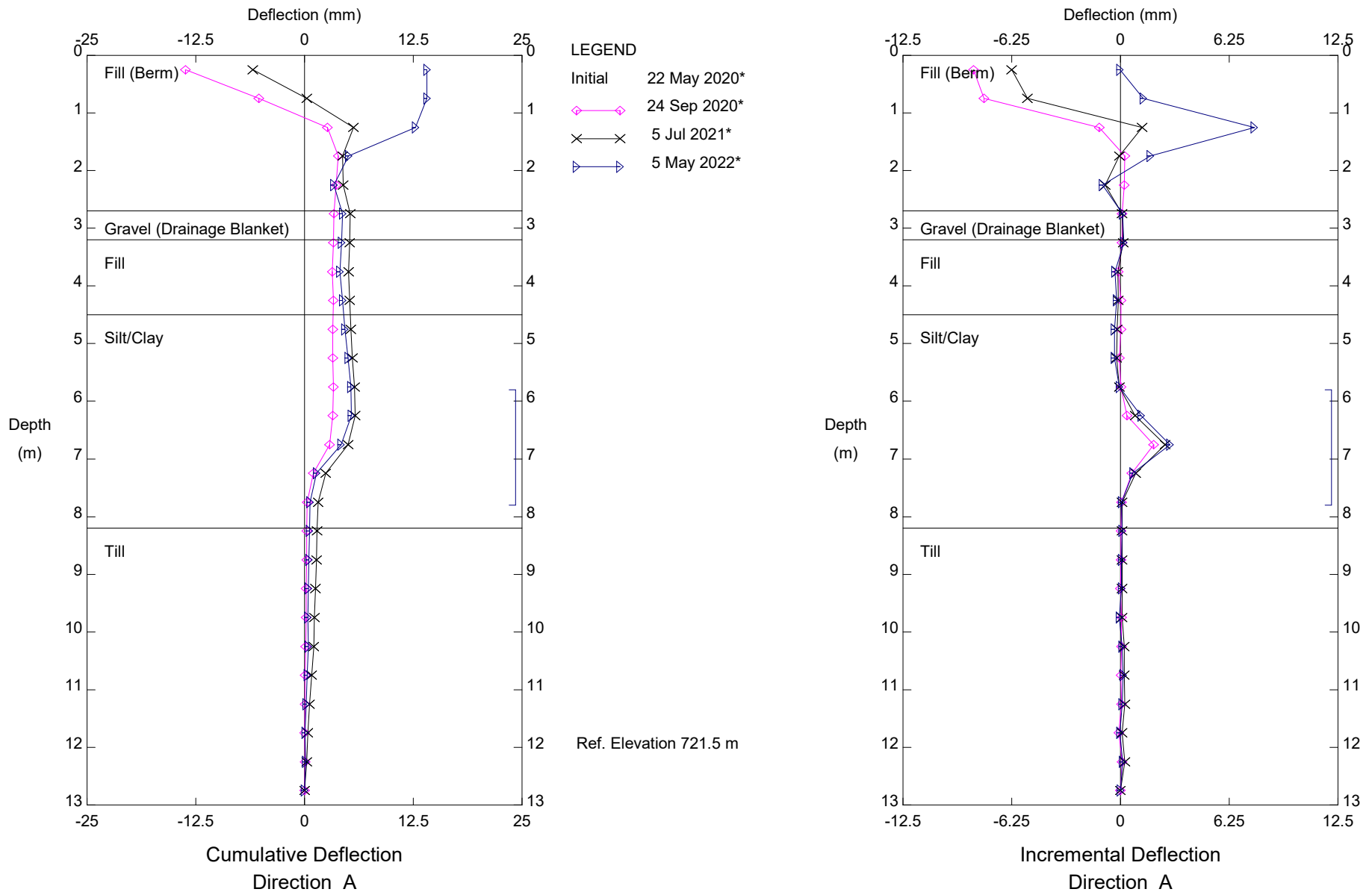
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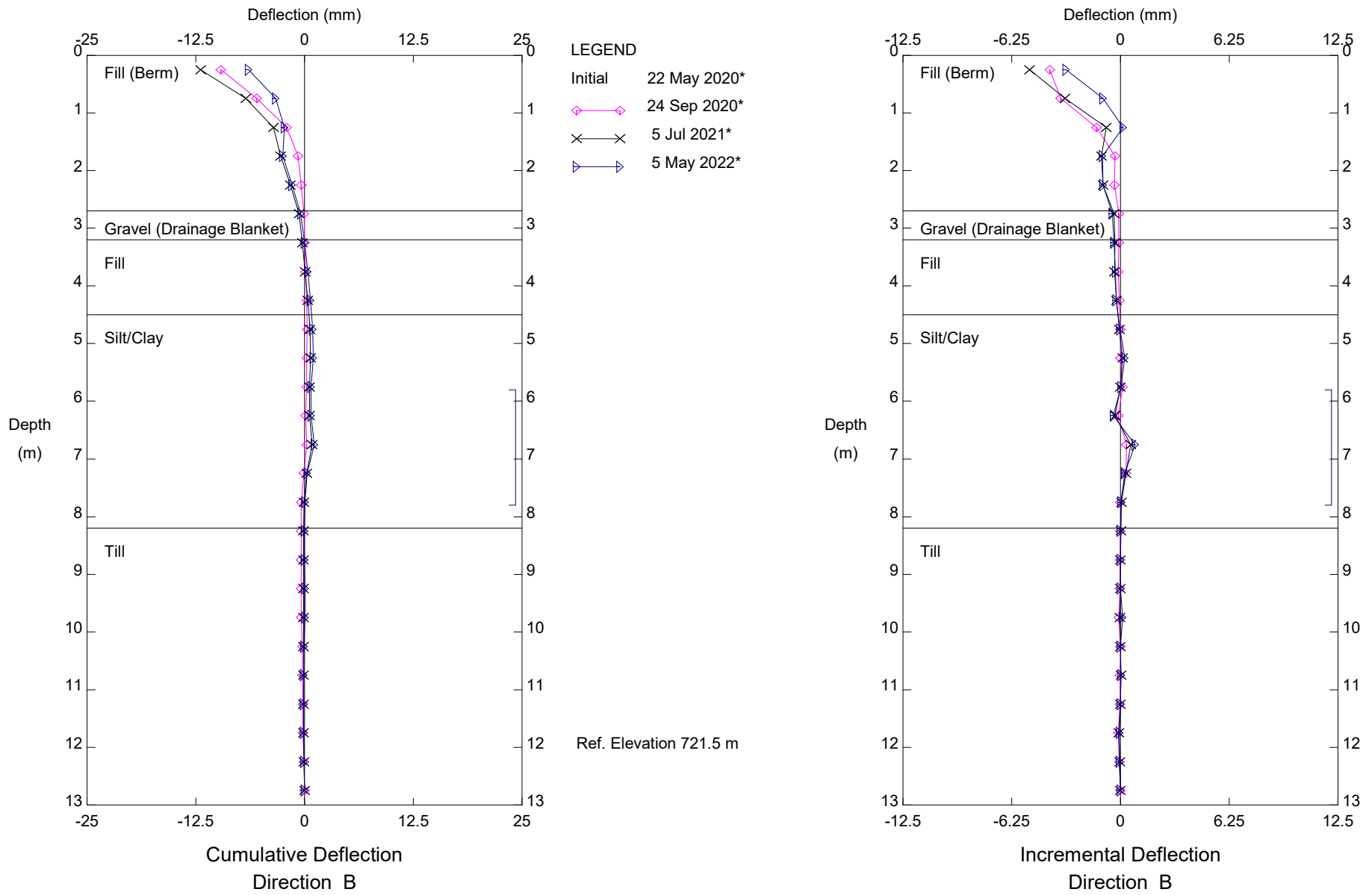
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HWY 658:02 Blue Ridge Slide (NC076), Inclinometer SI19-03

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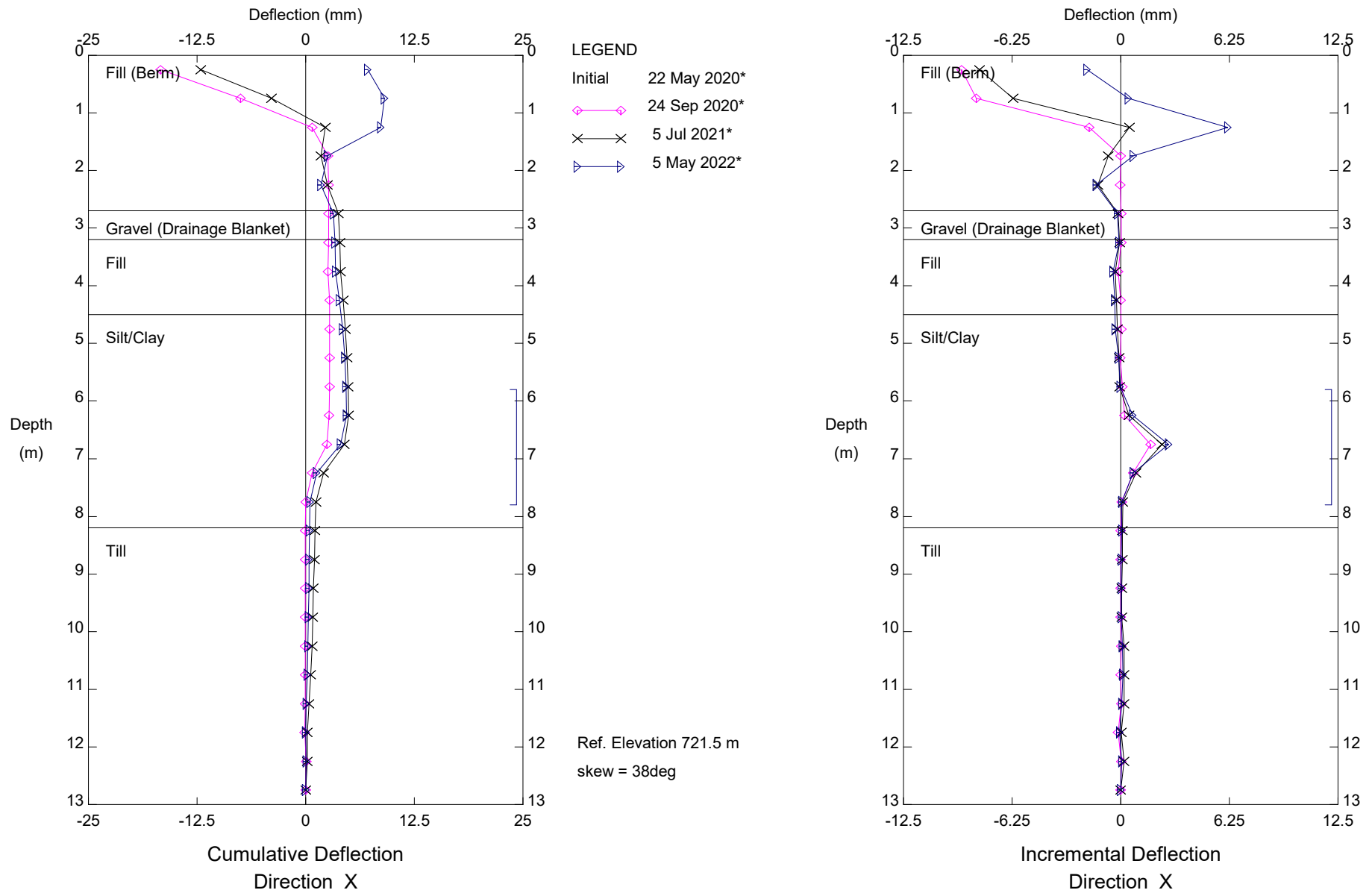
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HWY 658:02 Blue Ridge Slide (NC076), Inclinometer SI19-03

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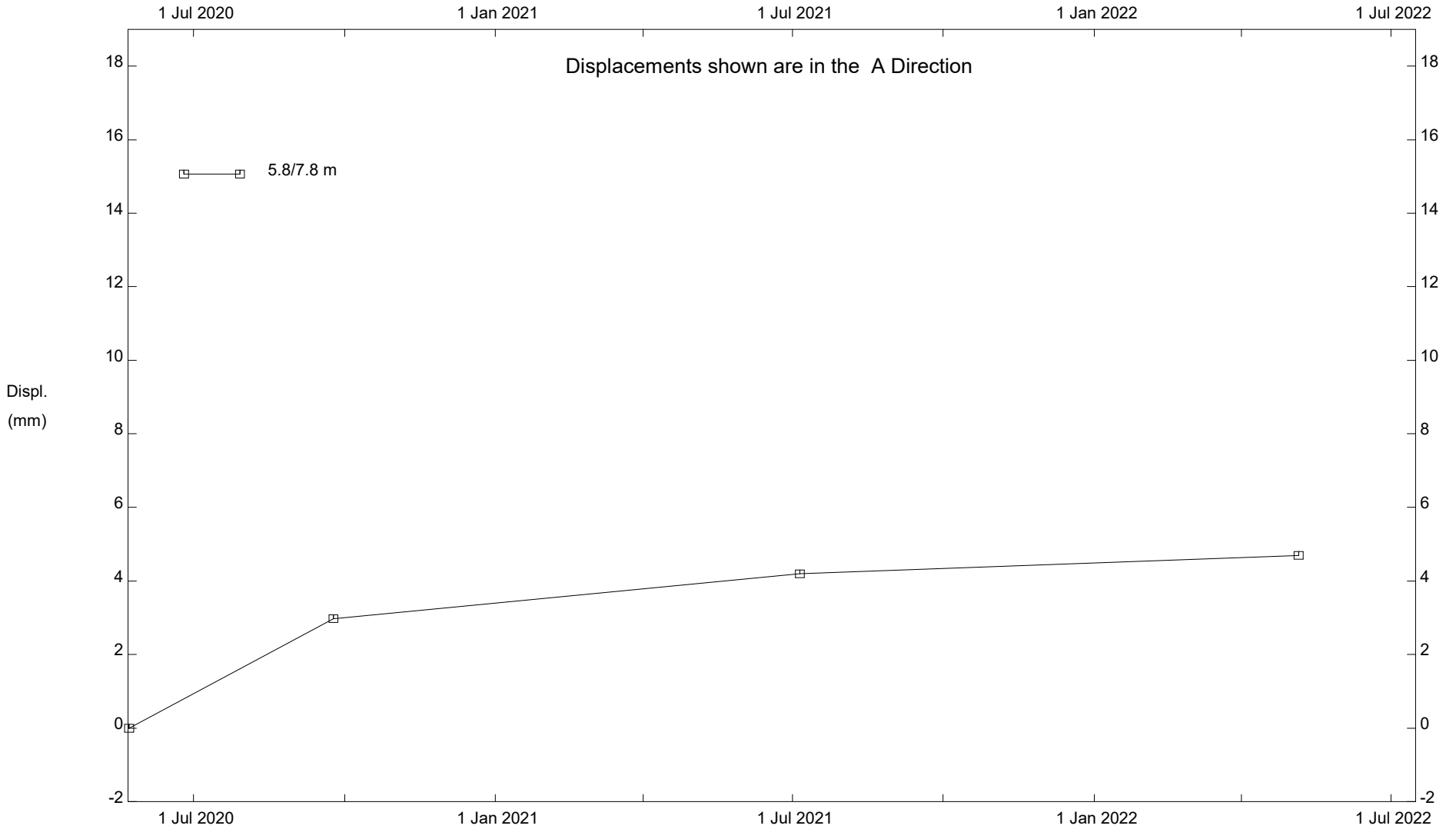


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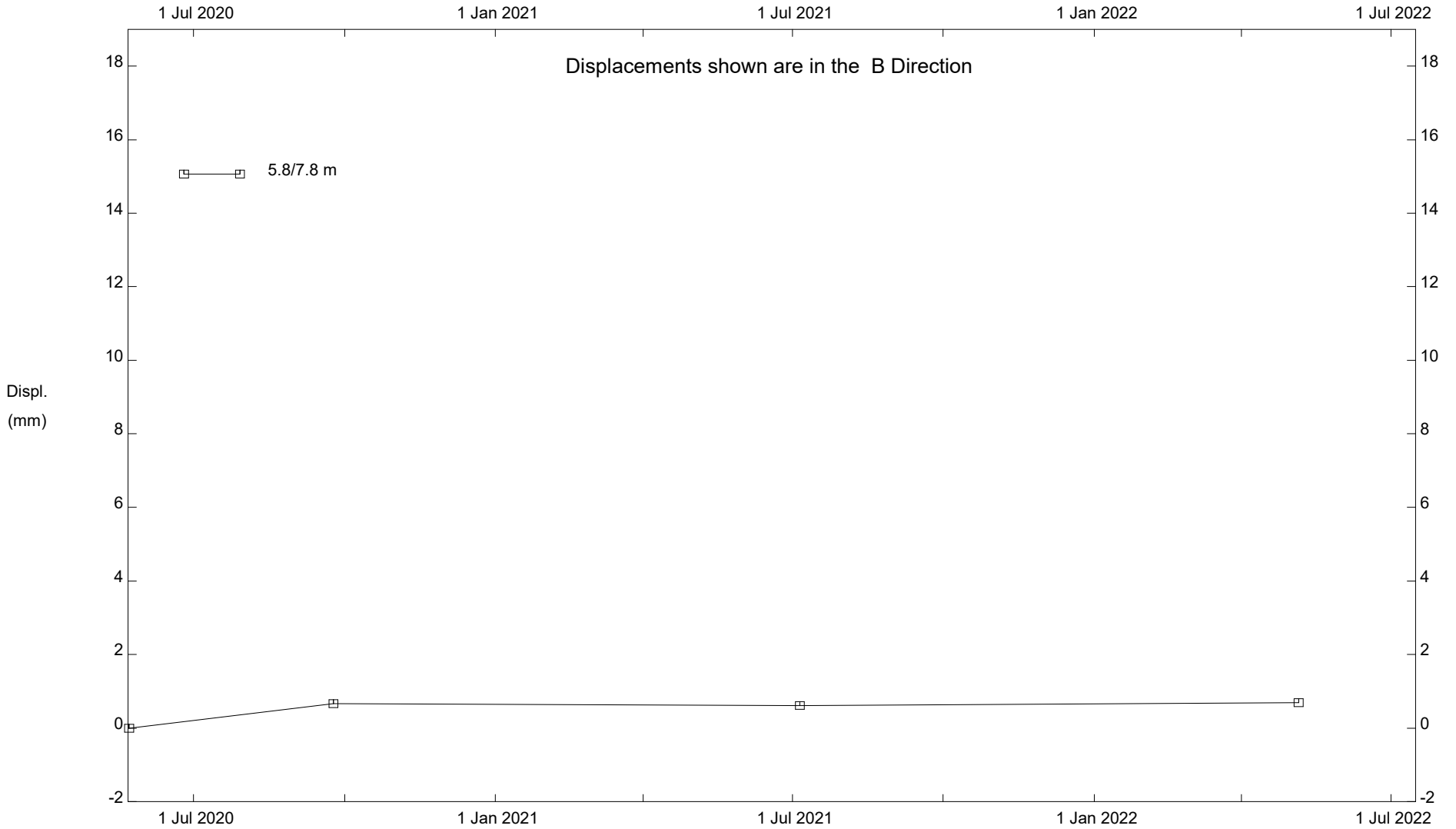
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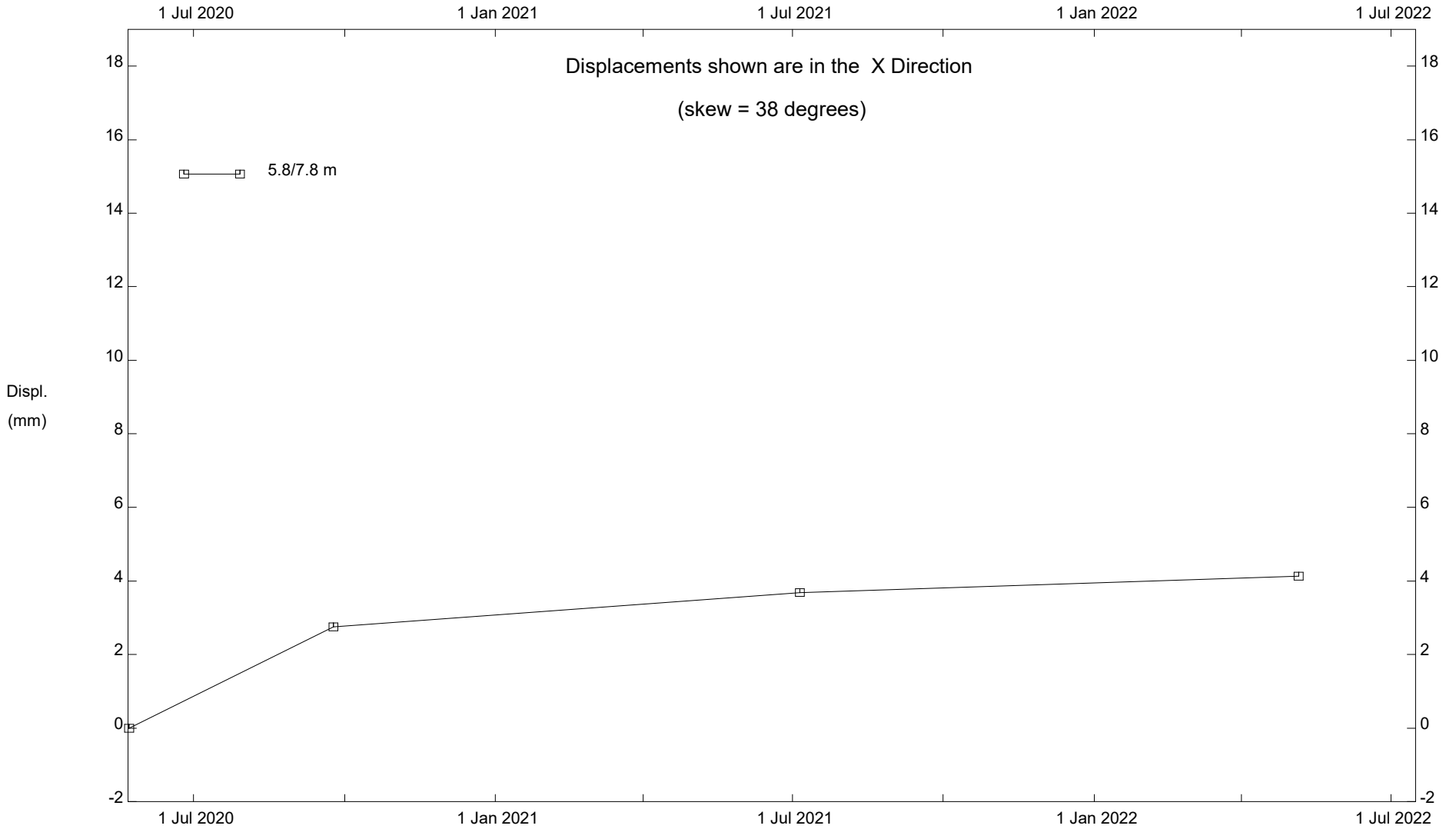
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