July 15, 2024

Alberta Transportation and Economic Corridors
Main Floor, Provincial Building
9621 – 96th Avenue
Peace River, Alberta
T8S 1T4

Robert Senior
Construction Technologist

Dear Mr. Senior:

CON0022166 Peace Region (Grande Prairie District – South) GRMP Instrumentation Monitoring Site GP006; H40:36, km 21.779 Sheep Creek Embankment (Three Teardrops Slide)
Section C – 2024 Spring Readings

1 GENERAL

Four slope inclinometers (SIs) (SI-2, SI19-1, SI19-2, and SI19-3), one pneumatic piezometer (PN) (PN-4), ten vibrating wire piezometers (VWPs) (VW19-1A/1B through 5A/5B), and four standpipe piezometers (SPs) (SP19-6 through SP19-10) were read at the GP006 site in the Peace Region (Grande Prairie District – South) (GP South Region) on May 22, 2024, by Tim Hillman, E.I.T. of Klohn Crippen Berger Ltd. (KCB). These instruments were read as part of the GP South Region Geohazard Risk Management Program (GRMP). The site is located on Hwy 40:36, km 21.779, on the Sheep Creek Embankment. The approximate site coordinates are 5990716 N, 366584 E (UTM Zone 11, NAD 83). A site plan is presented on Figure 1.

The geohazard at the GP006 site, which was formerly known as the Three Teardrop slide, consists of a landslide in the embankment fill of Hwy 40:36 which was repaired in 2020 with a binwall. The binwall consists of 60 bins with two subdrains, an asphalt ditch constructed between the guardrail and binwall that conveys surface water runoff to a riprap-lined channel at the north end of the binwall, a mid-slope bench constructed below the highway and binwall, horizontal subdrains drilled from the toe of the slope below the highway and binwall, and a drainage gallery in the upslope/west highway ditch. Prior to binwall construction, regular crack sealing and pavement patching were performed. The original Three Teardrop slide was also excavated (date unknown).

In 1998 and 2019, geotechnical site investigations, which included installing instruments, were conducted at the GP006 site by the previous consultants. The encountered stratigraphy has not been provided to KCB.

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1.1 Instrumentation

KCB has been reading the instruments at this site since the spring of 2021. Instrumentation installation details are tabulated in Table 1.1. Instrument locations are shown on Figure 1. Any instruments not included in Table 1.1 or shown on Figure 1 are assumed to be inoperable and are not presented or discussed herein.

In 1998 and 2019, 7 SIs and 18 piezometers were installed at the site by the previous consultants to monitor movement and groundwater conditions, respectively. Some of these instruments are now inoperable (e.g., destroyed, sheared, or lost), as detailed in Table 1.1 (see table notes).

Between June 2021 and May 2023, SI-4 has only been read three times because the SI probe wheels come out of both the A and B-direction casing grooves. Readings cannot be reliably obtained from this instrument, even after multiple reading attempts, and KCB recommends replacing the instrument.

The instruments are protected by above-ground casing protectors, except SI-2, SI19-2, and SI19-3.

The operable SIs were read using the same metric RST Digital MEMS Inclinometer System that has been used to read the SIs since KCB took over the readings in June 2021. The operable VWPs, PNs, and SPs were read using a Geokon GK-404 vibrating wire readout, RST C109 pneumatic piezometer readout box, and Heron Water Level Meter, respectively.

Table 1.1 Instrumentation Installation Details[1]

Instrument ID	Instrument Type	Date Installed	UTM Coordinates (m)		Ground Surface Elevation[2] (m)	Stick Up (m)	Depth (mbgs[3])	Condition
			Northing	Easting				
~~SI-1~~	~~SI~~	~~Mar. 1998~~	~~Unknown~~	~~Unknown~~	~~Unknown~~	~~Unknown~~	~~Unknown~~	~~Inoperable[4]~~
SI-2	SI	Mar. 1998	5990696	366588	922.7[2]	0.7	14.6	Operable
~~SI-3~~	~~SI~~	~~Mar. 1998~~	~~5990784~~	~~366650~~	~~914.9~~	~~Unknown~~	~~Unknown~~	~~Inoperable[5]~~
~~SI-4~~	~~SI~~	~~Mar. 1998~~	~~5990803~~	~~366640~~	~~914.1~~	~~1.1~~	~~9.7~~	~~Inoperable[6]~~
SI19-1	SI	Oct. 30, 2019	5990610	366529	924.8	0.8	25.0	Operable
SI19-2	SI	Oct. 30, 2019	5990726	366610	921.2[2]	0.9	24.8	Operable
SI19-3	SI	Oct. 30, 2019	5990814	366670	913.3	0.7	23.1	Operable
~~PN-1~~	~~PN~~	~~Mar. 1998~~	~~Unknown~~	~~Unknown~~	~~Unknown~~	~~N/A~~	~~Unknown~~	~~Inoperable~~
~~PN-2~~	~~PN~~	~~Mar. 1998~~	~~5990696~~	~~366588~~	922.7[2]	~~N/A~~	~~9.1~~	~~Inoperable~~
~~PN-3~~	~~PN~~	~~Mar. 1998~~	~~5990784~~	~~366650~~	~~914.9~~	~~N/A~~	~~14.9~~	~~Inoperable~~
PN-4	PN	Mar. 1998	5990803	366640	914.1	N/A	10.0	Operable
VW19-1A	VWP	Oct. 30, 2019	5990610	366529	924.8	N/A	5.3	Operable
VW19-1B	VWP	Oct. 30, 2019	5990610	366529	924.8	N/A	14.9	Operable
VW19-2A	VWP	Oct. 30, 2019	5990726	366610	921.2[2]	N/A	5.7[2]	Operable
VW19-2B	VWP	Oct. 30, 2019	5990726	366610	921.2[2]	N/A	23.8[2]	Operable
VW19-3A	VWP	Oct. 30, 2019	5990814	366670	913.3	N/A	8.4	Operable
VW19-3B	VWP	Oct. 30, 2019	5990814	366670	913.3	N/A	18.3	Operable
VW19-4A	VWP	Nov. 03, 2019	5990690	366562	920.9	N/A	7.0	Operable
VW19-4B	VWP	Nov. 03, 2019	5990690	366562	920.9	N/A	12.3	Operable
VW19-5A	VWP	Nov. 03, 2019	5990759	366609	917.8	N/A	7.0	Operable
VW19-5B	VWP	Nov. 03, 2019	5990759	366609	917.8	N/A	13.1	Operable
SP19-6	SP	Oct. 31, 2019	5990687	366510	936.4	0.8	19.2	Operable
SP19-7	SP	Nov. 02, 2019	5990844	366644	919.5	0.7	14.4	Operable
SP19-8	SP	Oct. 20, 2019	5990945	366762	905.3	0.7	10.1	Operable

Instrument ID	Instrument Type	Date Installed	UTM Coordinates (m)		Ground Surface Elevation[2] (m)	Stick Up (m)	Depth (mbgs[3])	Condition
			Northing	Easting				
SP19-10	SP	Oct. 20, 2019	5990465	366412	929.6	0.8	13.1	Operable

Notes:
[1] Instrument installation details were taken from reports and data files prepared or provided by the previous consultant(s) or TEC. Instrument coordinates and stick ups (where applicable) were confirmed by KCB using a handheld GPS (accuracy of ± 5 m) and tape measure, respectively.
[2] Ground surface elevations were measured prior to construction and should be surveyed. Ground surface elevation for SI-2, SI19-2, and VW19-2A/B increased by 2.5 m based on casing extensions.
[3] Meters below ground surface (mbgs). Bottom reading depth for SIs, and tip or screen depth for piezometers.
[4] SI-1 has sheared at an approximate depth of 10.0 m below ground surface.
[5] SI-3 is blocked at an approximate depth of 1.0 m below ground surface.
[6] The SI probe wheels come out of both the A and B-direction casing grooves in SI-4 when the instrument is being read, and the data when a reading is obtained has had high checksums. This instrument was previously damaged between 2013 and 2019 and may have been damaged again during binwall construction in late 2020.

2 INTERPRETATION

2.1 General

For the operable SIs, the cumulative displacement, incremental displacement, and displacement-time data was plotted in the A-direction (i.e., the direction of the A0-grooves) and, where applicable, the X-direction (i.e., the direction of maximum movement obtained at a skew angle from the A0-grooves). SI-2, SI19-1, and SI19-3 have skew angles of 10°, 340°, and 35°, respectively, measured clockwise from the direction of the A0-grooves.

For the operable PNs and VWPs, the recorded porewater pressures were converted to an equivalent water/piezometric elevation and plotted relative to ground surface elevation and the tip elevation for each instrument.

For the operable SPs, the water level data was plotted relative to ground surface elevation and the screen elevation for each instrument.

The SI and piezometer plots are included in Appendix I, and a summary of the SI and piezometer data is provided in Table 2.1 through Table 2.4, respectively. SI-2, and SI19-1 through SI19-3 were re-initialized to the June 2021 readings to remove large post-construction deflections which were impacting data interpretation.

Table 2.1 Slope Inclinometer Reading Summary

Instrument ID	Date				Ground Surface Elevation (m)	Depth of Movement (mbgs[1])	Direction of Movement, Skew Angle[2]	Movement (mm)				Rate of Movement (mm/year)		
	Initialized (Re-initialized)	Previous Maximum Cumulative Movement Recorded	Previous Reading	Most Recent Reading				Maximum Cumulative			Incremental Since Previous Maximum Cumulative	Previous Maximum	Most Recent Reading	Change from Previous Reading
								Before Re-Initialization	After Re-Initialization	Total				
SI-2	Mar. 30, 1998 (Sep. 11, 2008)[3] (Jun. 29, 2021)[4]	Jun. 07, 2023	Jun. 07, 2023	May 22, 2024	922.7[6]	1.1 – 4.6	X-Direction, 10°	N/A	12.6	12.6	-2.2	46.8	-2.2	-4.2
		Jun. 07, 2023				5.1 – 9.1		(19.8)[3] (129.4)[4]	4.8	152.1	0.8	409.5	0.8	-0.8
SI19-1	Oct. 31, 2019 (Jun. 29, 2021)[4]	Sep. 28, 2022	Jun. 07, 2023	May 22, 2024	924.8	2.0 – 24.5	X-Direction, 340°	-11.4	-7.8	-19.2	-2.4	-168.2	-4.2	-6.5
SI19-2[7]	Nov. 03, 2019 (Jun. 29, 2021)[4]	Jun. 07, 2023	Jun. 07, 2023	May 22, 2024	921.2[6]	0.3 – 9.3	A-Direction	-203.2	21.7	-181.5	5.6	-276.6	5.8	-1.1
						3.3 – 3.8		--	4.1	4.1	2.0	3.1	2.2	1.2
SI19-3	Oct. 31, 2019 (Jun. 29, 2021)[4]	Jun. 07, 2023	Jun. 07, 2023	May 22, 2024	913.3	0.1 – 4.1	X-Direction, 35°	497.5	85.2	582.7	9.9	149.0	10.3	-10.8

Notes:
[1] Meters below ground surface (mbgs)
[2] Skew angle of X-direction measured clockwise from the A-direction. The azimuths of the A0-grooves in the SIs were measured by KCB with a magnetic compass in spring 2022.
[3] SI-2 and SI-4 were re-initialized in 2008 and 2019, respectively, by the previous consultants.
[4] SI-2, and SI19-1 through SI19-3 were re-initialized to the June 2021 readings to remove large post-construction deflections which were impacting data interpretation.
[5] The SI probe wheels come out of both the A and B-direction casing grooves in SI-4 when the instrument is read.
[6] Ground surface elevation for SI-2 and SI19-2 increased by 2.5 m based on casing extensions.
[7] As discussed in Section 2.1, data for SI19-2 is noisy and difficult to interpret.

Table 2.2 Pneumatic Piezometer Reading Summary

Instrument ID	Serial No.	Date			Ground Surface Elevation (m)	Tip Depth (mbgs[1])	Water Level		
		Installed	Previous Reading	Most Recent Reading			Previous Reading (mbgs[1])	Most Recent Reading (mbgs[1])	Change from Previous Reading (m)
PN-4	7668	Mar. 1998	Jun. 07, 2023	May 22, 2024	914.1	10.0	1.9	0.2 (above ground surface elevation)	1.7

Notes:
[1] Meters below ground surface (mbgs).

Table 2.3 Vibrating Wire Piezometer Reading Summary

Instrument ID	Serial No.	Date			Ground Surface Elevation (m)	Tip Depth (mbgs[1])	Water Level		
		Installed	Previous Reading	Most Recent Reading			Previous Reading (mbgs[1])	Most Recent Reading (mbgs[1])	Change from Previous Reading (m)
VW19-1A	61688	Oct. 30, 2019	Jun. 07, 2023	May 22, 2024	924.8	5.3	N/A – instrument is dry		
VW19-1B	61695	Oct. 30, 2019	Jun. 07, 2023	May 22, 2024	924.8	14.9	10.1	10.0	0.1
VW19-2A	61691	Oct. 30, 2019	Jun. 07, 2023	May 22, 2024	921.2[2]	5.7	5.5	5.4	0.1
VW19-2B	61693	Oct. 30, 2019	Jun. 07, 2023	May 22, 2024	921.2[2]	23.8	16.3	15.7	0.6
VW19-3A	61692	Oct. 30, 2019	Jun. 07, 2023	May 22, 2024	913.3	8.4	N/A – instrument is dry		
VW19-3B	61694	Oct. 30, 2019	Jun. 07, 2023	May 22, 2024	913.3	18.3	9.0	9.1	-0.1
VW19-4A	61687	Nov. 03, 2019	Jun. 07, 2023	May 22, 2024	920.9	7.0	6.0	6.1	-0.1
VW19-4B	61689	Nov. 03, 2019	Jun. 07, 2023	May 22, 2024	920.9	12.3	N/A – instrument is dry		
VW19-5A	61686	Nov. 03, 2019	Jun. 07, 2023	May 22, 2024	917.8	7.0	4.6	4.2	0.4
VW19-5B	61690	Nov. 03, 2019	Jun. 07, 2023	May 22, 2024	917.8	13.1	4.9	4.6	0.3

Notes:
[1] Meters below ground surface (mbgs).
[2] Ground surface elevation for VW19-2A/B increased by 2.5 m based on casing extension for SI19-2.

Table 2.4 Standpipe Piezometer Reading Summary

Instrument ID	Date			Ground Surface Elevation (m)	Screen Depth (mbgs[1])	Water Level		
	Installed	Previous Reading	Most Recent Reading			Previous Reading (mbgs[1])	Most Recent Reading (mbgs[1])	Change from Previous Reading (m)
SP19-6	Oct. 31, 2019	Jun. 07, 2023	May 22, 2024	936.4	19.2	10.5	9.9	0.6
SP19-7	Nov. 02, 2019	Jun. 07, 2023	May 22, 2024	919.5	14.4	5.5	5.5	0.0
SP19-8	Oct. 20, 2019	Jun. 07, 2023	May 22, 2024	905.3	10.1	8.3	8.7	-0.4
SP19-10	Oct. 20, 2019	Jun. 07, 2023	May 22, 2024	929.6	13.1	2.8	2.2	0.6

Notes:
[1] Meters below ground surface (mbgs).

In 2021, KCB reviewed the instrumentation data provided by the previous consultant and removed corrections applied to the historical SI data based on our experience. The instrumentation data obtained by KCB is generally consistent with the data obtained by the previous consultant, except for the following:

- Large deflections that were recorded in the tops of SI-2, SI19-2, and SI19-3 up to an approximate depth of 6 m below ground surface. The deflections are likely due to binwall construction in late 2020. It is noted that SI-2 and SI19-2 were shortened to the binwall bench level and then later raised through the bin wall fill during construction. It also appears the instruments were raised again after the previous consultant took their last reading in October 2020. The exact length of casing added is unknown but was estimated to be 2.5 m. KCB has subsequently extended the data files for SI-2 and SI19-2 by 2.5 m. The instruments have been read to the adjusted depth since June 2022, and the data aligns with the new reading depth. Due to the large deflections, KCB re-initialized the SI data plots to the June 2021 readings. It is noted that the data for SI19-2 is noisy and difficult to interpret, and the instrument may need to be re-initialized again. Based on the absolute plot, SI19-2 is tilted approximately 1.0 m and 2.4 m in the A- and B-directions, respectively.

The SI data plots presented herein only include data taken with KCB's SI reading equipment.

2.2 Zones of Movement

Distributed movement was being recorded in the A-direction of SI-2 between an approximate depth of 6.1 m and 9.1 m below ground surface. However, due to a large deflection that was recorded in the top 6 m of the SI casing since late 2020, KCB re-initialized the instrument to the June 2021 reading. Since June 2021, distributed movement has continued to be recorded in SI-2 from ground surface to an approximate depth of 9.1 m below ground surface.

A relatively large amount of displacement has been recorded in the B-direction (approximately 20 mm to 30 mm) of SI-2 from ground surface to an approximate depth of 5.1 m. The direction of movement varies from positive to negative indicating the displacement may be attributed to movement in the fill placed in 2020, or seasonal temperature fluctuations (i.e., frost penetration). More data is needed to assess the movement trend recorded in SI-2.

Before becoming inoperable, discrete movement (i.e., occurring on a defined failure plane) was previously being recorded in SI-4 between an approximate depth of 5.2 m and 6.7 m below ground surface.

Distributed movement from top to bottom of casing has been recorded in SI19-1 since installation, including negative distributed movement recorded since October 2021 from an approximate depth of 4 m below ground surface to the bottom of the instrument. This movement could be due to the SI not being installed deep enough or installed on enough of an angle (i.e., tilt) that complicates processing of the SI data. Based on the absolute plot for this instrument, it is tilted approximately 0.7 m and 1.5 m in the A- and B-directions, respectively.

No discernible movement had previously (i.e., before bin wall construction) been recorded in SI19-2 or SI19-3. However, since construction, large deflections have been recorded in the tops of these instruments to an approximate depth of 4 m below ground surface. These large deflections are believed to have been caused by cutting back (lowering) and raising the instrument casing during construction. KCB re-initialized the SI data plots to the June 2021 readings because these large deflections were complicating review of the SI data and potentially masking smaller movements that may be occurring. Since June 2021, distributed movement has been recorded in SI19-2 and SI19-3 up to an approximate depth of 9.3 m and 2.5 m, respectively. Since June 2022, some discrete movement has been recorded in SI19-2 at an approximate depth of 3.5 m below ground surface.

2.3 Interpretation of Monitoring Results

The movement recorded in SI-2, SI19-2, and SI19-3 since October 2020 can most likely be attributed to binwall construction in late 2020. Most notably in SI19-3, where a significant amount (approximately 583 mm) of shallow movement has been recorded since October 2020. This shallow movement may be attributed to settlement as the bin wall takes loading from the highway embankment, as well as deflection of the above-ground casing, since casing protectors were not installed for these instruments. Since the SIs were re-initialized to the June 2021 readings, between approximately 12 mm and 85 mm of shallow movement has been recorded in these instruments. Overall, the rate of movement recorded in these instruments is beginning to slow, but ongoing pavement surface distress, including cracking and settlement, has been observed behind the binwall.

A large increase in water level (up to approximately 10.0 m) was recorded in the SPs installed in the winter of 2019 (SP19-6, SP19-7, SP19-8, and SP19-10). The recorded increases were likely due to post-installation stabilization of these instruments. Between mid-to-late 2020 and mid-2021, water levels recorded in SP19-6 and SP19-7 decreased approximately 3 m and have been relatively steady (±1.0 m) since, whereas the water levels recorded in SP19-8 and SP19-10 have remained elevated and relatively steady (±1.0 m) since late 2019.

Between mid to late-2020 and mid-2021, a large decrease in water level (between approximately 2.5 m and 6.0 m) was recorded in all the piezometers installed along the repaired section of highway (PN-4, SP19-6, SP19-7, VW19-2A/B through VW19-5A/B), excluding VW19-2A and VW19-3A, which have been dry or near dry since installation. The recorded decreases could be attributed to the installation of drains during 2020 binwall construction. During the June 2022 Section B inspection, some of the subdrains at the toe of the highway embankment were observed to be flowing and others to be wet around their outlets (site was not inspected during the 2023 or 2024 Section B inspection tours). It is KCB's understanding that the rate of flow from the subdrains has decreased since 2020 binwall construction. Since 2021, water levels recorded in these piezometers have been relatively steady (±1 m). It is noted that VW19-4B has been dry since late-2022/early-2023.

VW19-1A/B are installed outside of the repaired section of highway. VW19-1A has been dry since installation (installed approximately 5 m below ground surface), and the porewater pressure recorded in VW19-1B has been relatively steady since installation (fluctuates between an approximate depth of 9.5 m and 11.4 m below ground surface).

3 RECOMMENDATIONS

3.1 Future Work

All operable instruments should continue to be read once per year (spring) unless movements increase and begin to impact the highway. Spring readings should be completed after late-May or early-June, due to the risk of water inside the instrument casings being frozen earlier in the year.

Ground surface elevation should be re-surveyed for all instruments due to binwall construction in 2020.

The site should continue to be inspected by the Maintenance Contract Inspector (MCI) and as part of the GP South region GRMP Section B inspections.

3.2 Instrument Repairs and Maintenance

As discussed in Section 1.1, KCB recommends replacing SI-4 because the instrument cannot reliably be read (SI probe wheels keep coming out of both the A and B-direction casing grooves). Otherwise, no other instrument repairs or maintenance is required.

4 CLOSING

This report is an instrument of service of Klohn Crippen Berger (KCB). The report has been prepared for the exclusive use of Alberta Transportation and Economic Corridors (Client) for the specific application to the GP South Geohazard Risk Management Program (Contract No. CON0022166), and it may not be relied upon by any other party without KCB's written consent.

KCB has prepared this report in a manner consistent with the level of care, skill and diligence ordinarily provided by members of the same profession for projects of a similar nature at the time and place the services were rendered. KCB makes no warranty, express or implied.

Use of or reliance upon this instrument of service by the Client is subject to the following conditions:

1. The report is to be read in full, with sections or parts of the report relied upon in the context of the whole report.
2. The observations, findings and conclusions in this report are based on observed factual data and conditions that existed at the time of the work and should not be relied upon to precisely represent conditions at any other time.
3. The report is based on information provided to KCB by the Client or by other parties on behalf of the client (Client-supplied information). KCB has not verified the correctness or accuracy of such information and makes no representations regarding its correctness or accuracy. KCB shall not be responsible to the Client for the consequences of any error or omission contained in Client-supplied information.

4. KCB should be consulted regarding the interpretation or application of the findings and recommendations in the report.
5. This report is electronically signed and sealed and its electronic form is considered the original. A printed version of the original can be relied upon as a true copy when supplied by the author or when printed from its original electronic file.

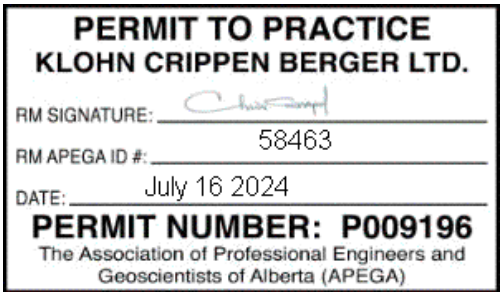
Yours truly,

KLOHN CRIPPEN BERGER LTD.

Courtney Mulhall, M.Sc., P.Eng.
Geotechnical Engineer

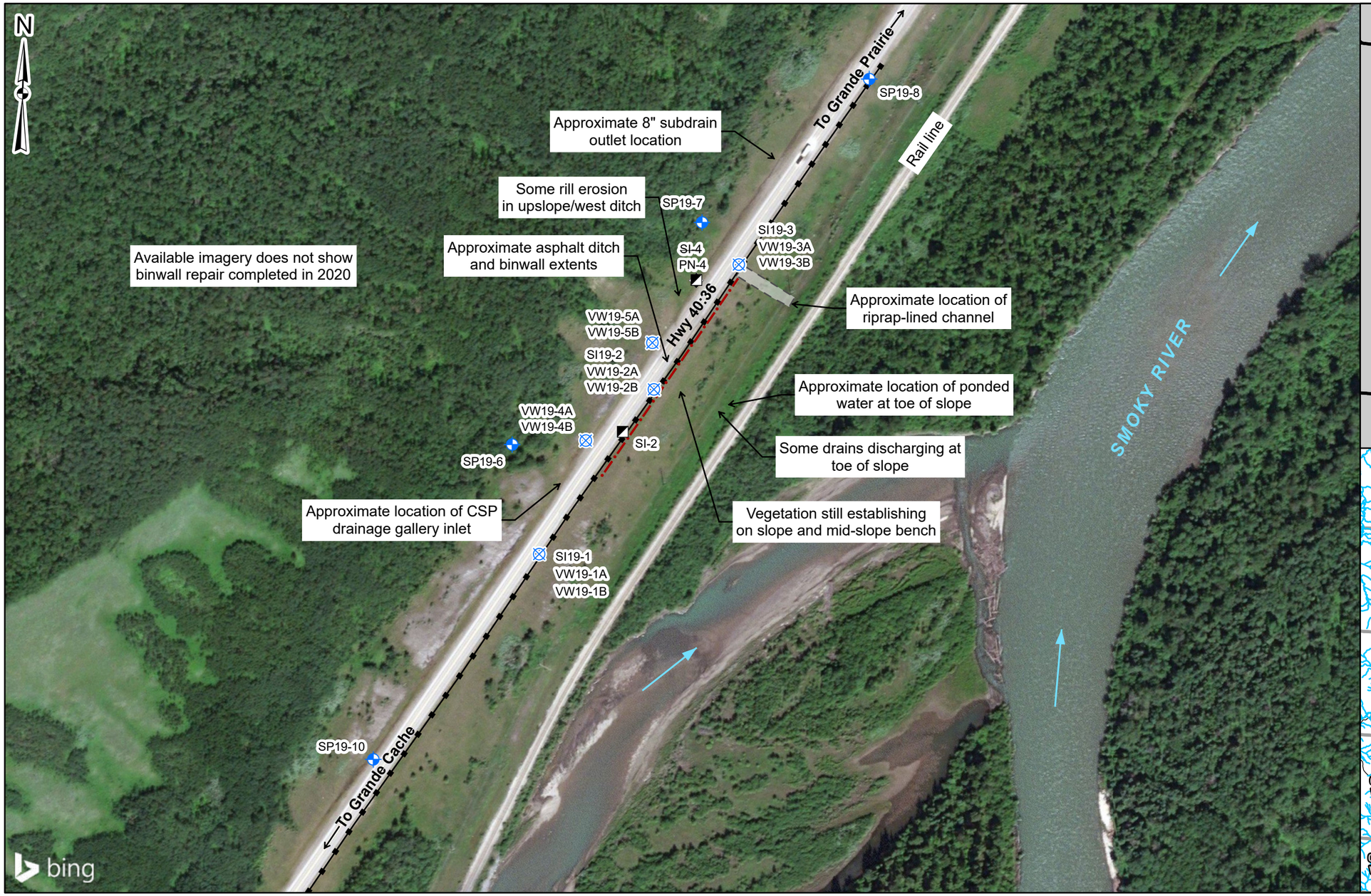
Tim Hillman, E.I.T.
Geotechnical Engineer-in-Training

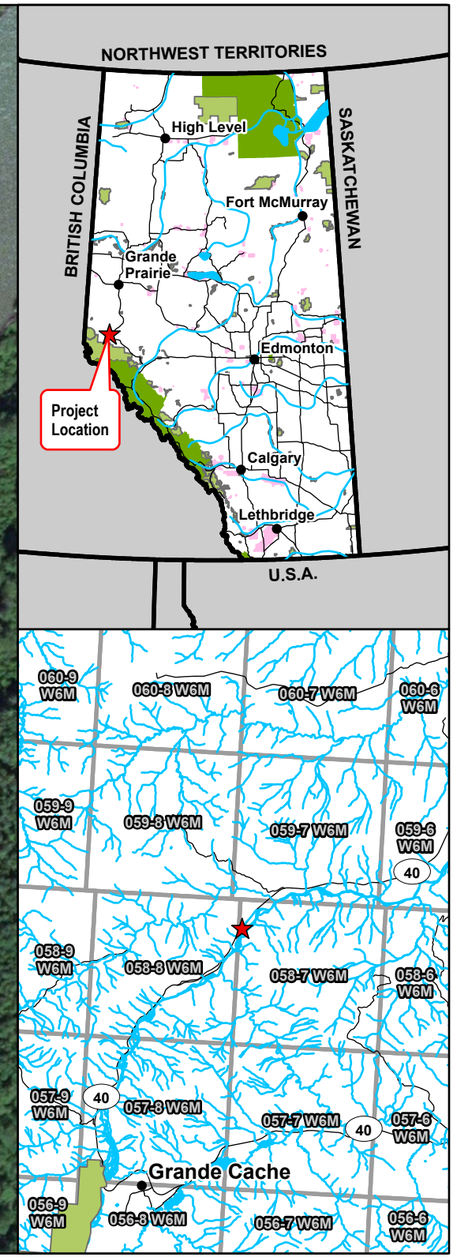
CM/TH/GB:bb



ATTACHMENTS
Figure
Appendix I Instrumentation Plots

FIGURE





Legend

- Approximate Pneumatic Piezometer Location
- Approximate Slope Inclinometer Location
- Approximate Standpipe Piezometer Location
- Approximate Vibrating Wire Piezometer Location
- Flow Direction
- Binwall Extent
- Guardrail
- Riprap-Lined Channel

0 125 Metres

NOTES:
1. HORIZONTAL DATUM: NAD83
2. GRID ZONE: UTM ZONE 11N
3. IMAGE SOURCE: 2022 MICROSOFT CORPORATION, 2022 MAXAR CNES, DISTRIBUTION AIRBUS DS
4. STRIKETHROUGH INDICATES INSTRUMENT IS INACTIVE

CLIENT: Alberta

Klohn Crippen Berger

PROJECT: PEACE REGION (GRANDE PRAIRIE DISTRICT-SOUTH) GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE: Site Plan
GP006 - Sheep Creek Embankment
(Three Teardrops Slide)
Hwy 40:36, km 21.779

SCALE	PROJECT No.	FIG No.
1:3,000	A05116A01	1

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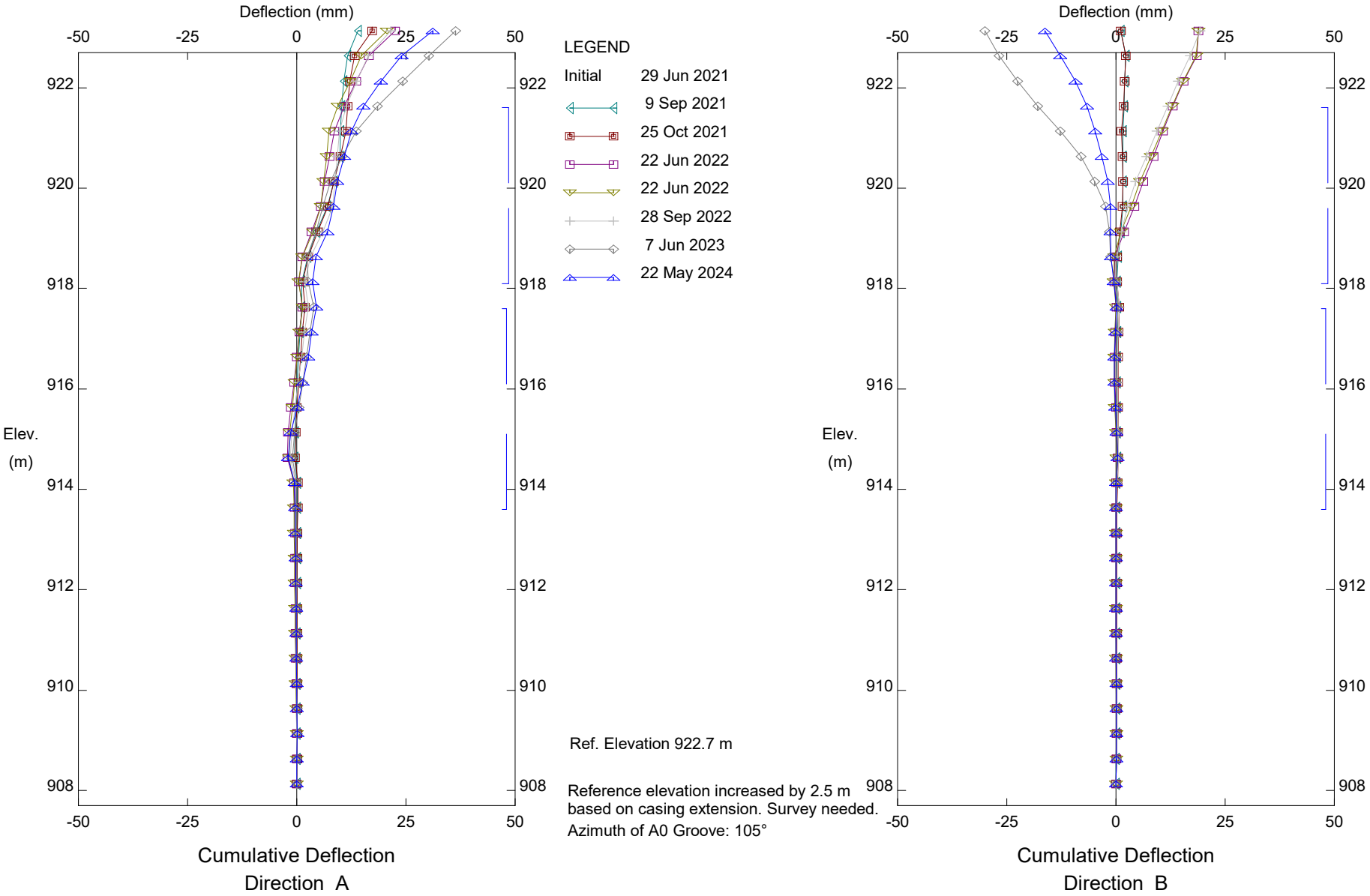
APPENDIX I

Instrumentation Plots

Klohn Crippen Berger - Edmonton

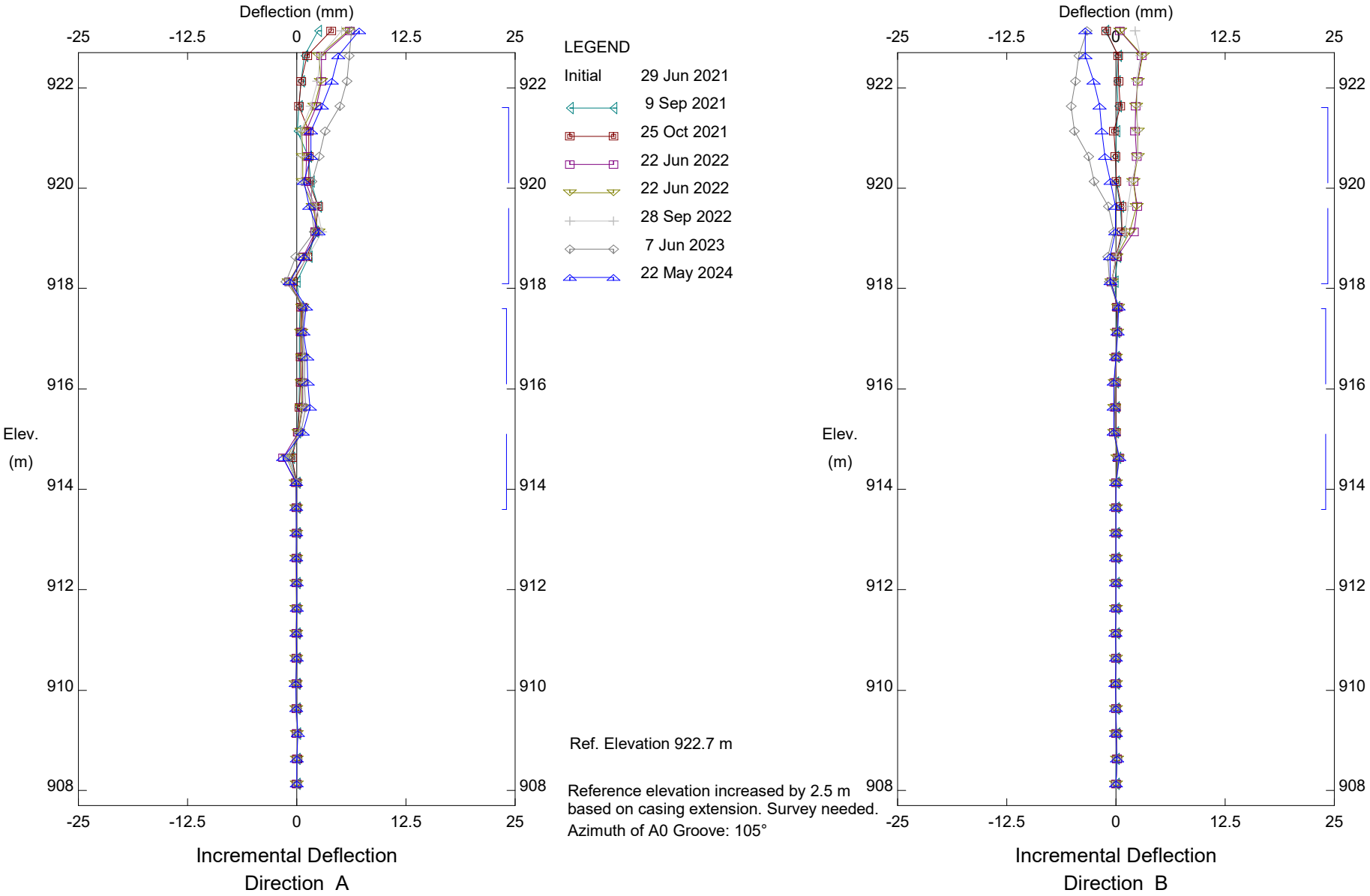


GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

Klohn Crippen Berger - Edmonton

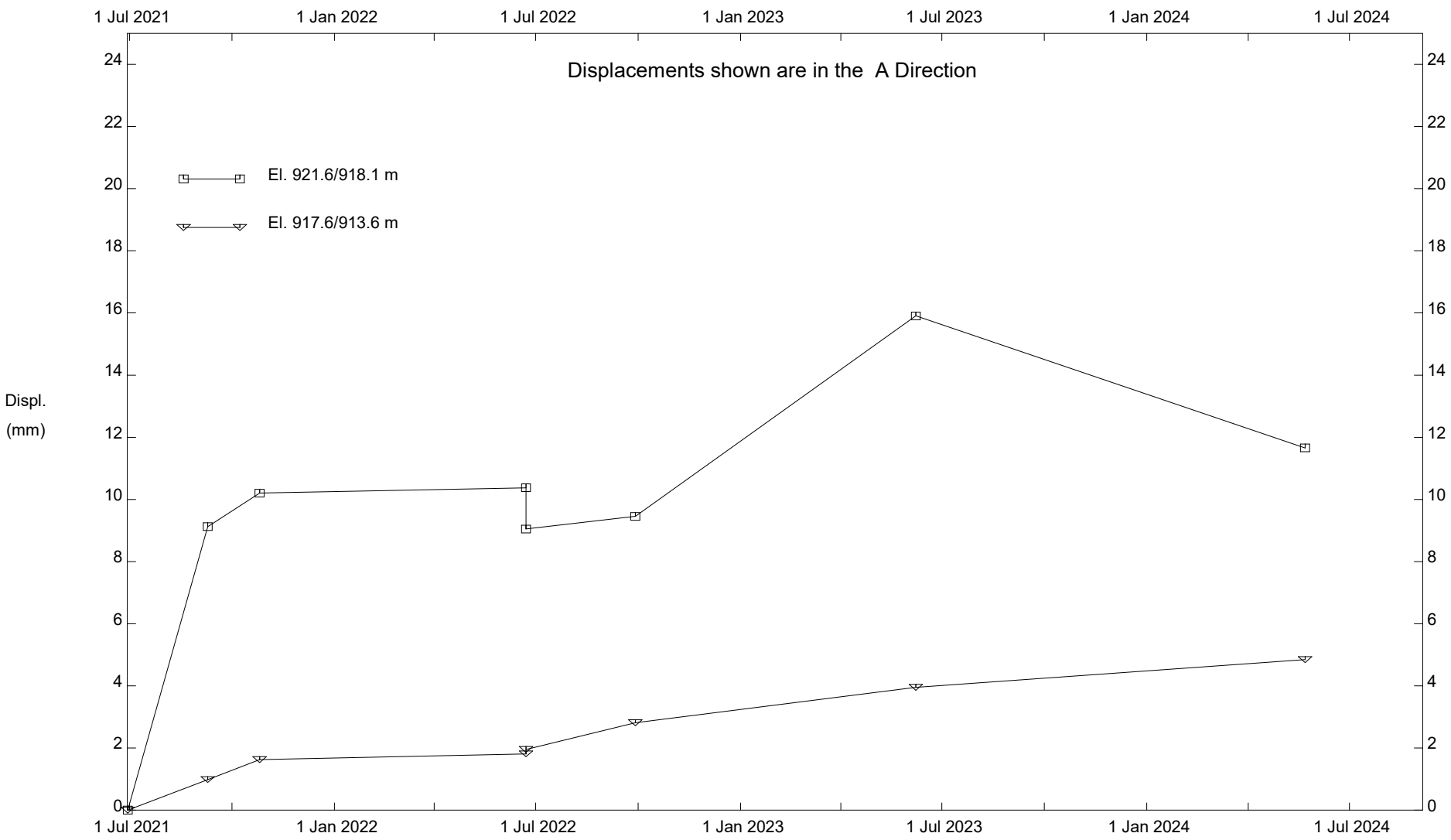


GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

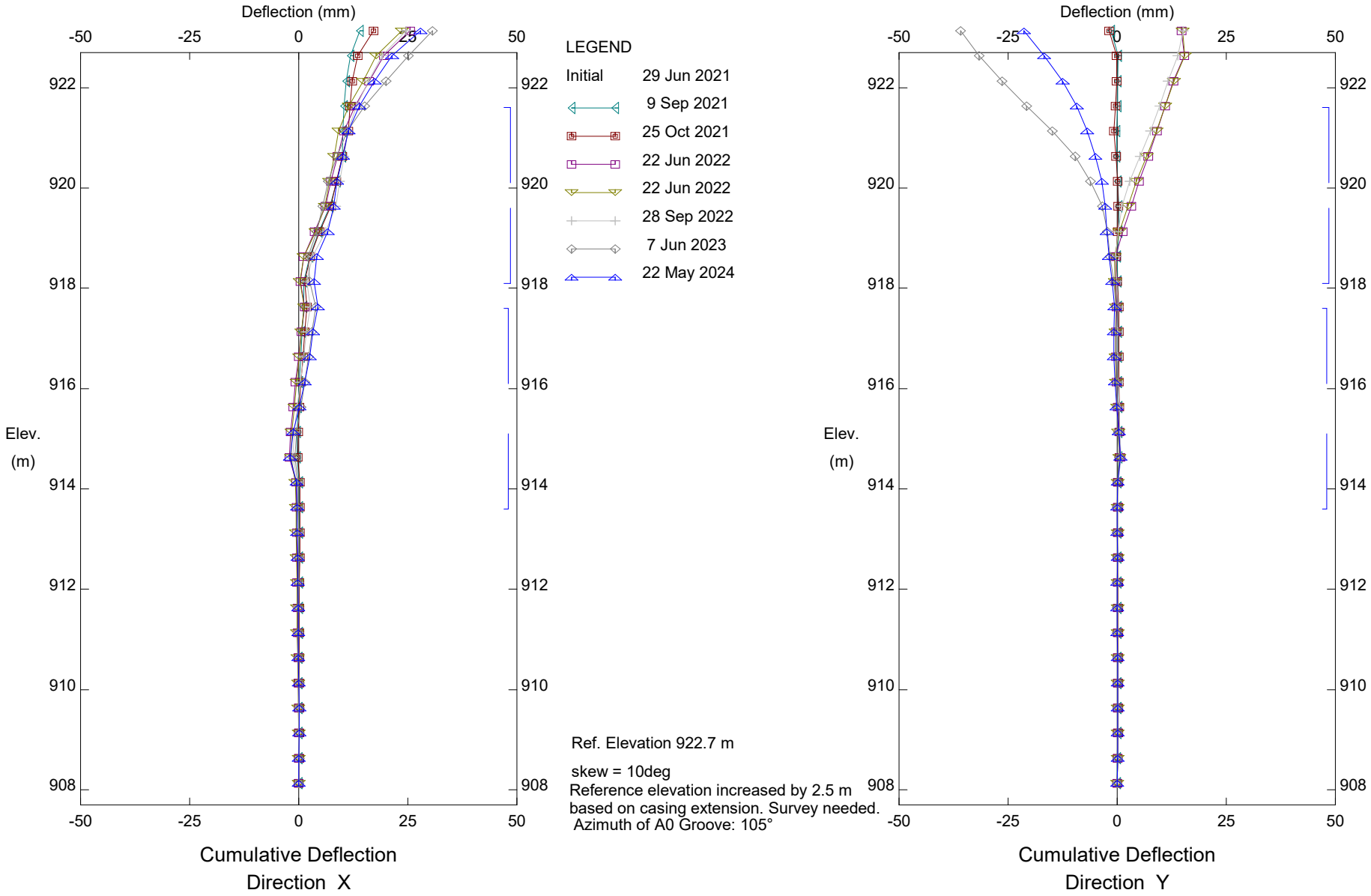
Klohn Crippen Berger - Edmonton



GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

Alberta Transportation

Klohn Crippen Berger - Edmonton

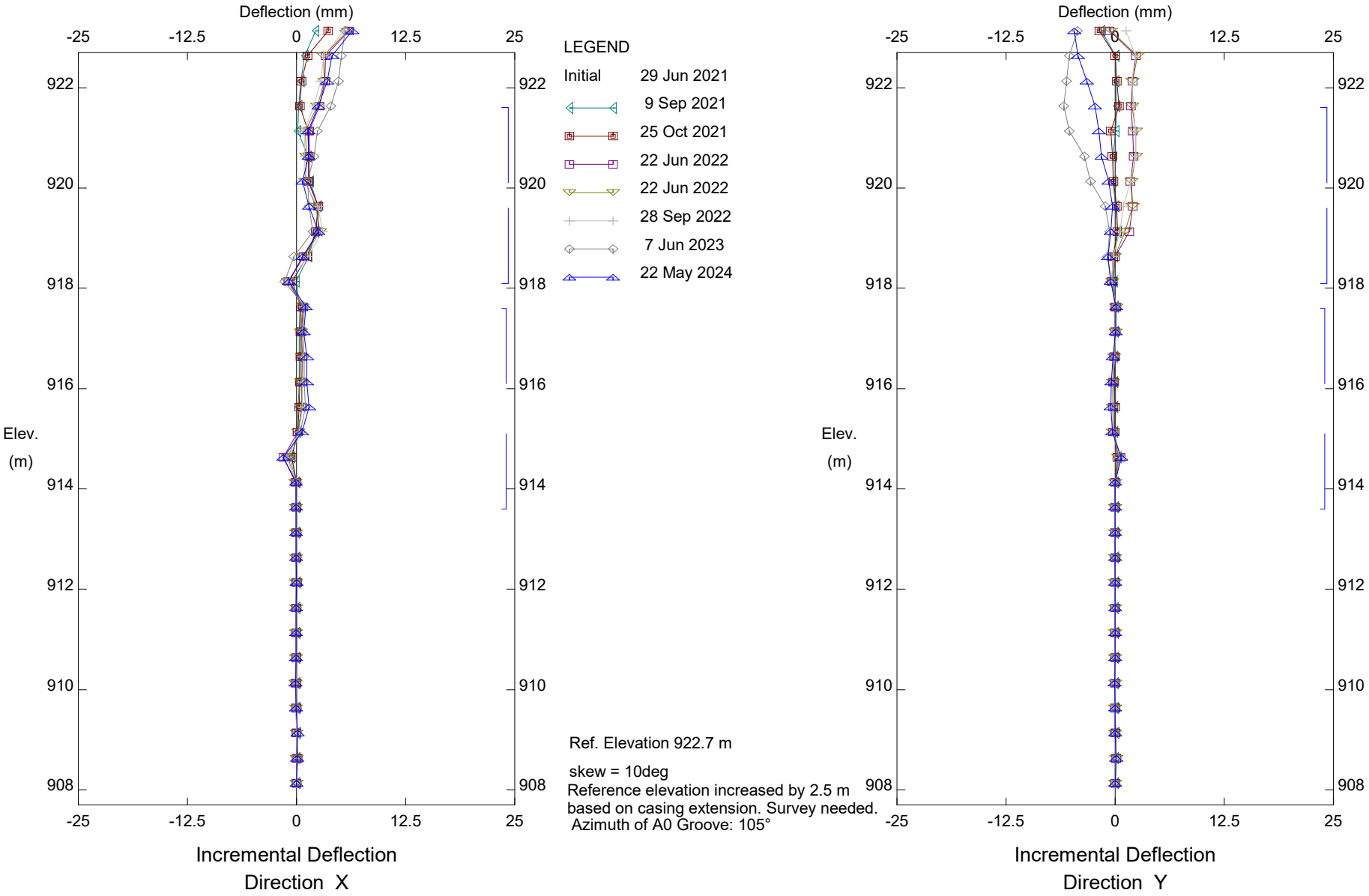


GP006; H40:36, Sheep Creek Embankment, Inclinometer SI-2

Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

Klohn Crippen Berger - Edmonton



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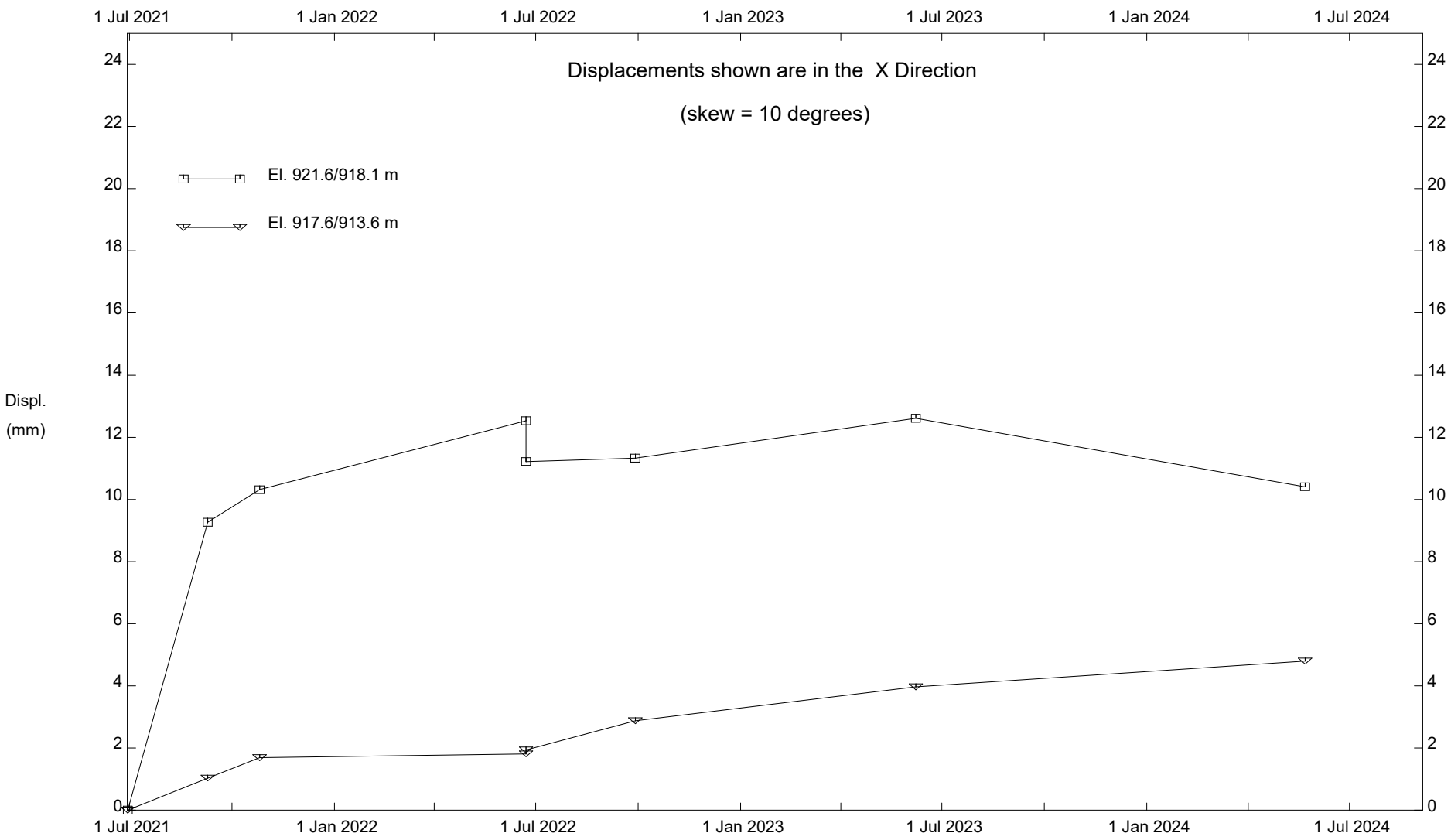
Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

Klohn Crippen Berger - Edmonton



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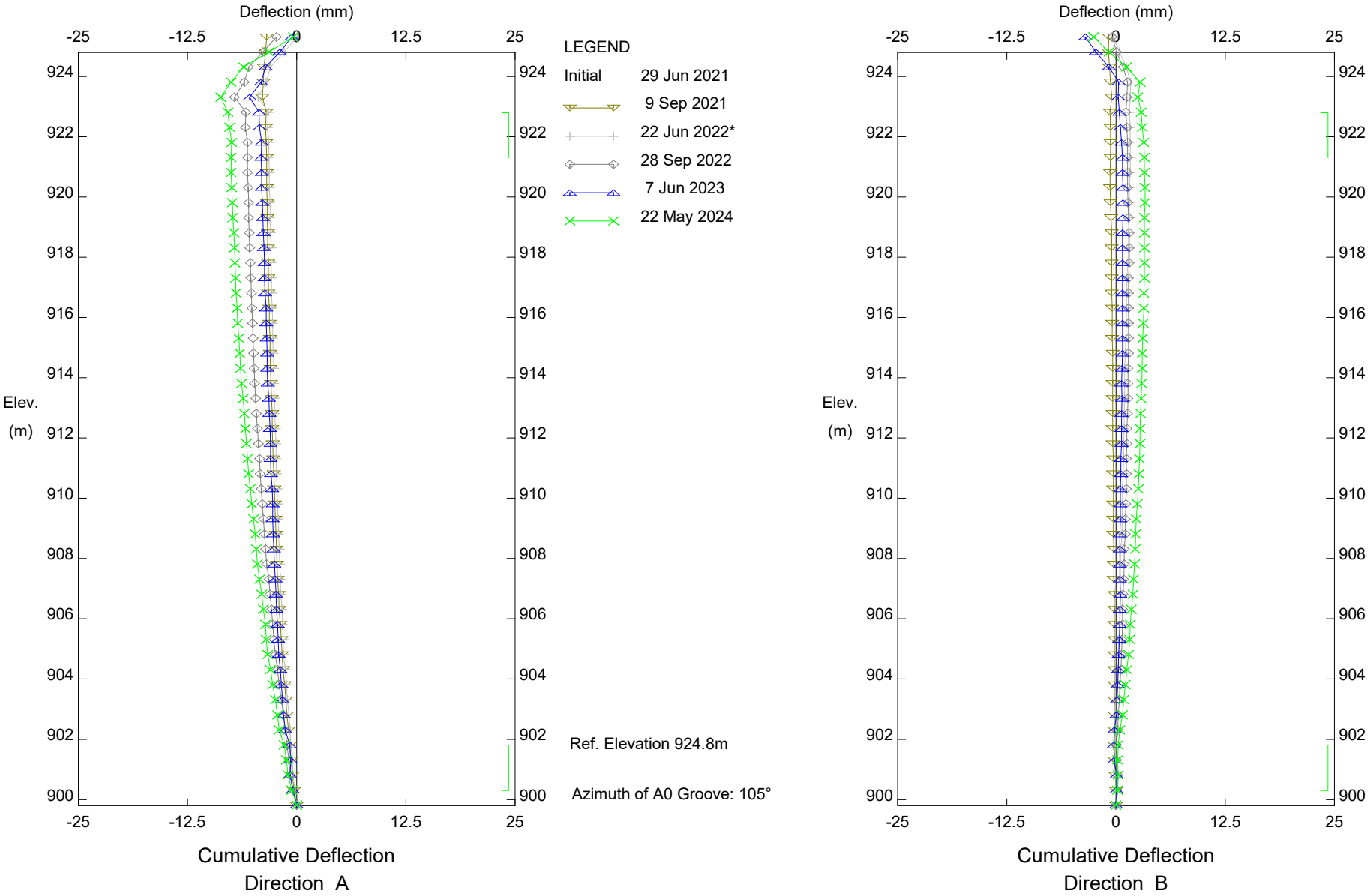
Alberta Transportation

Klohn Crippen Berger - Edmonton



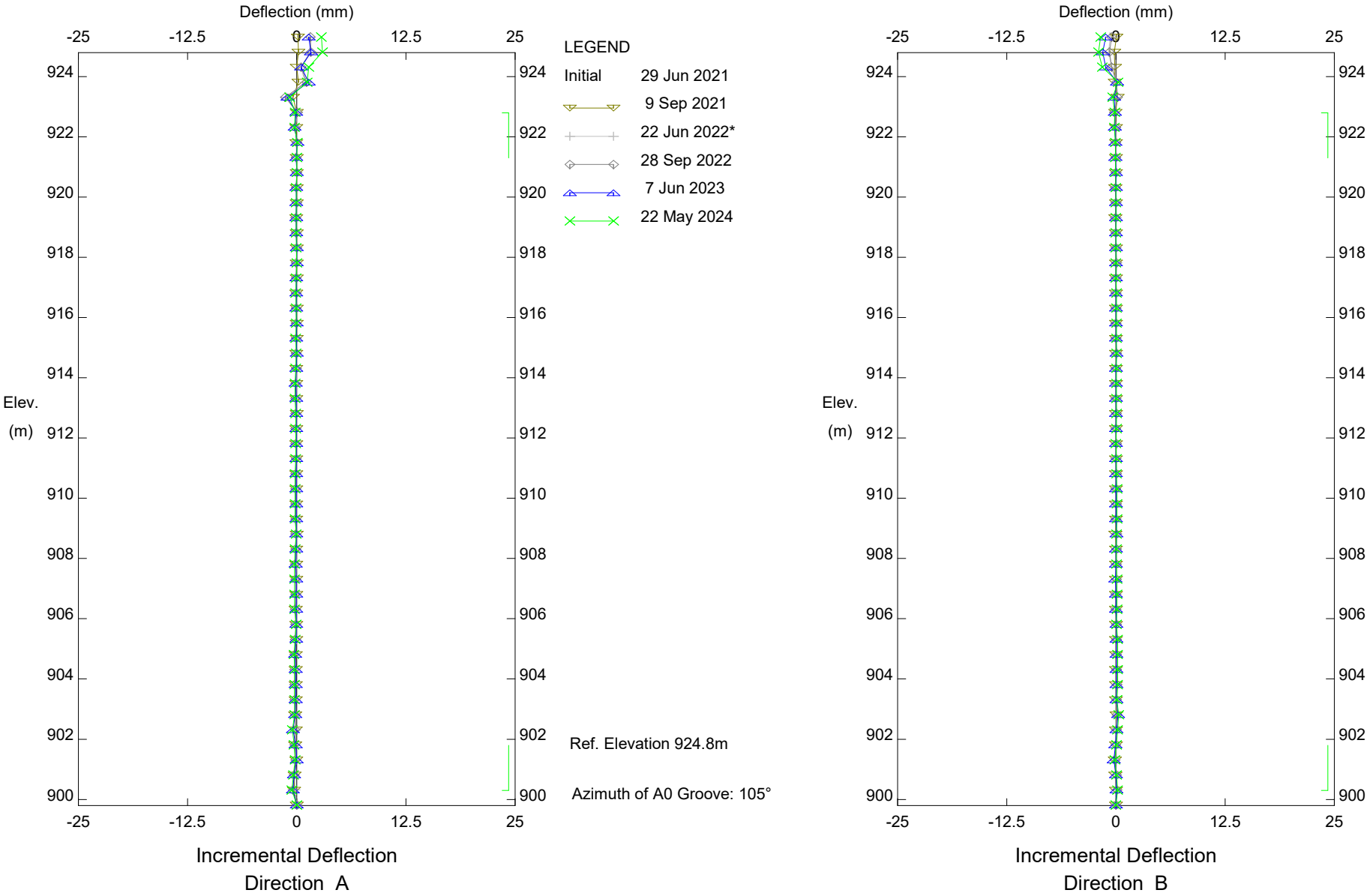
GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-1

Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

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

Klohn Crippen Berger - Edmonton



GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-1

Alberta Transportation

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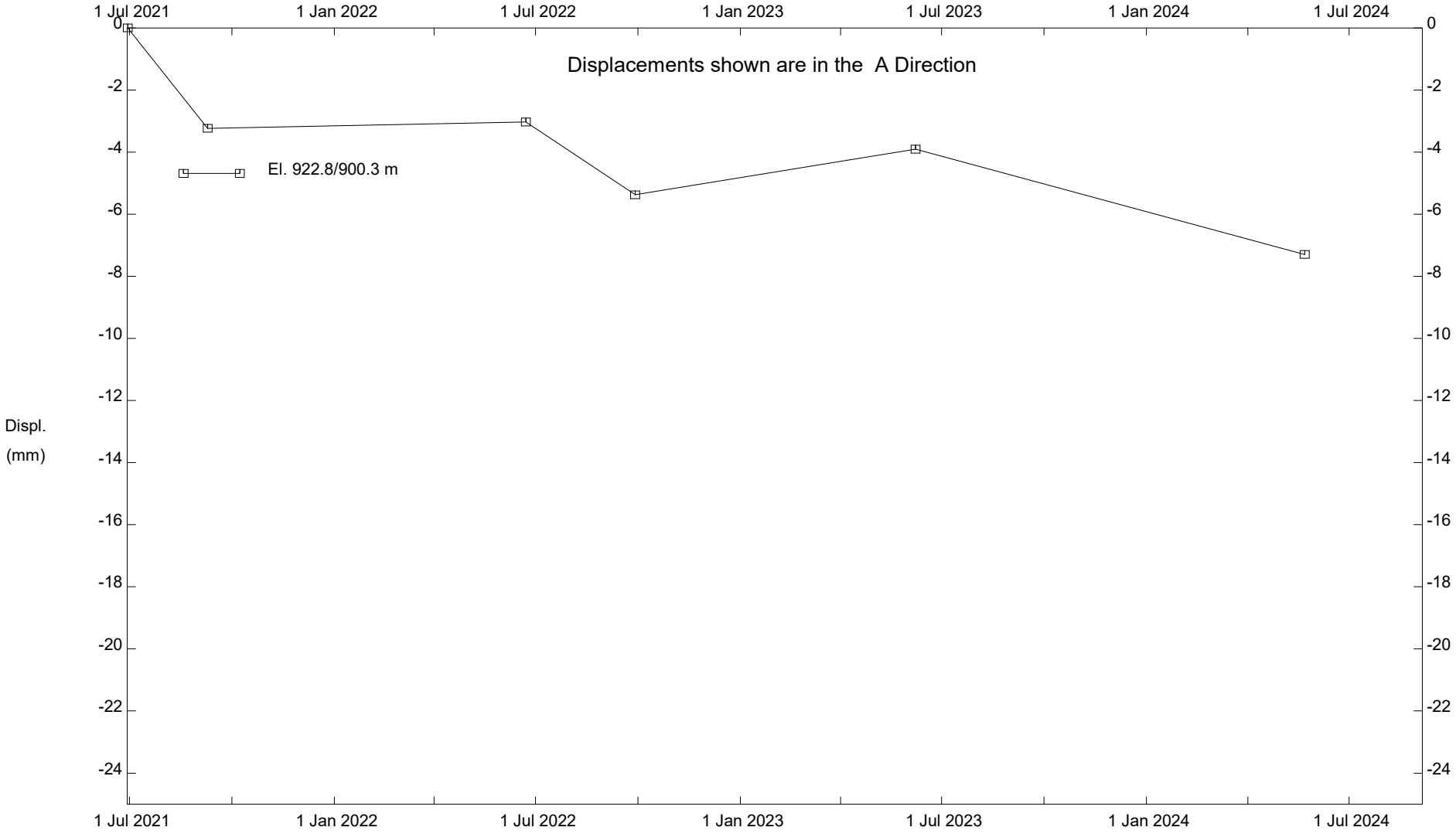
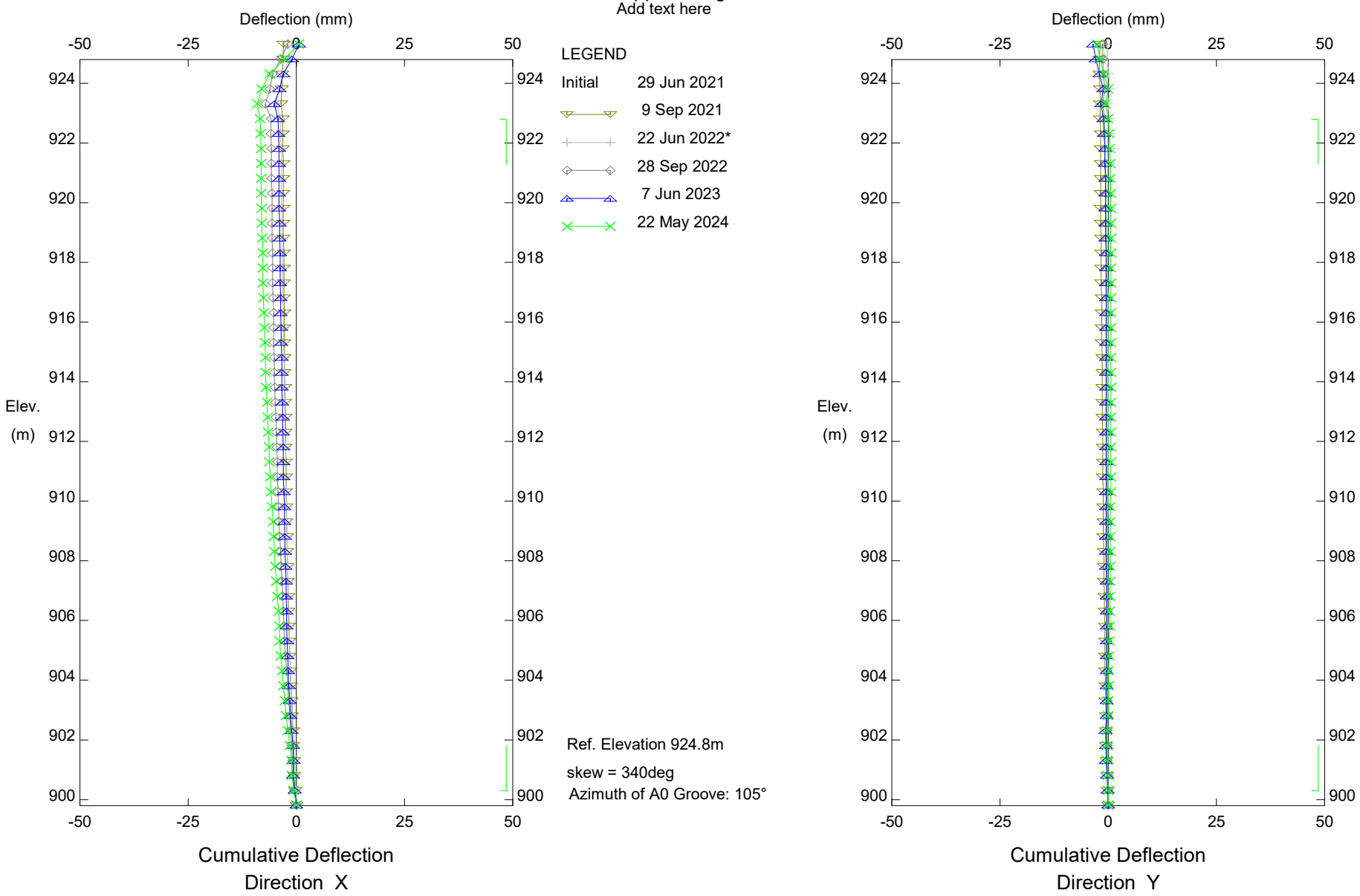


GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-1

Alberta Transportation

Klohn Crippen Berger - Edmonton

Add text here



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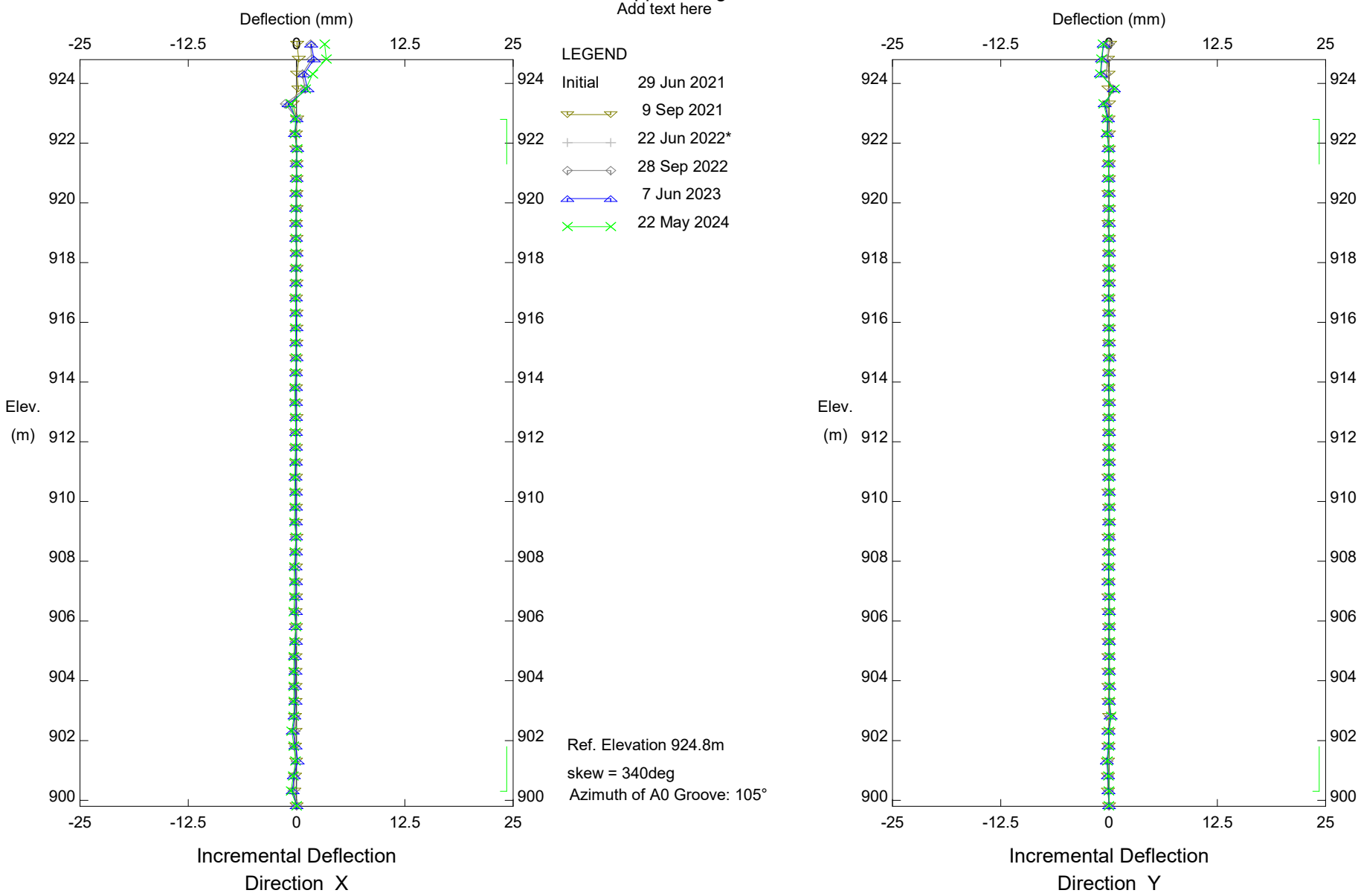

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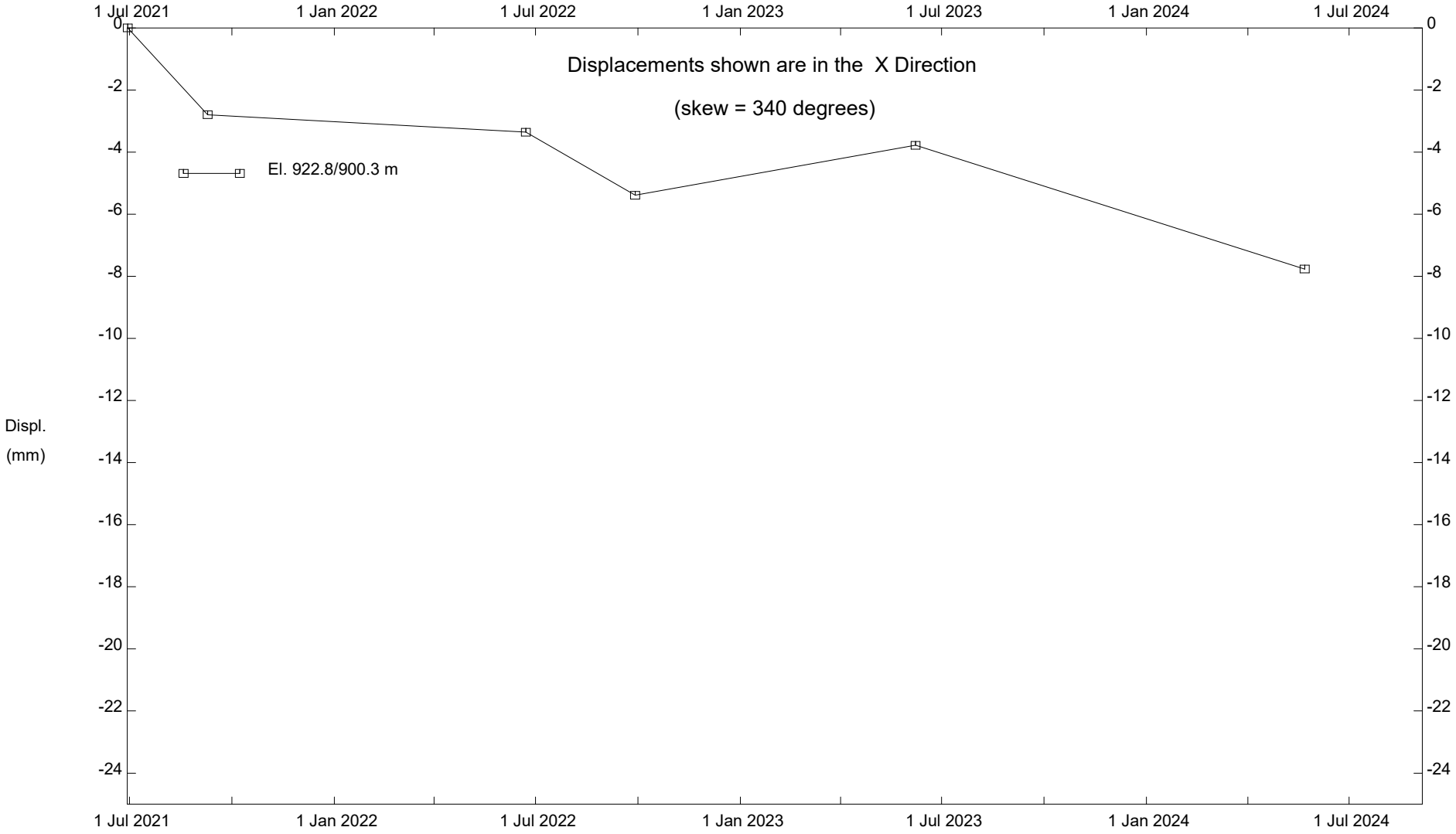

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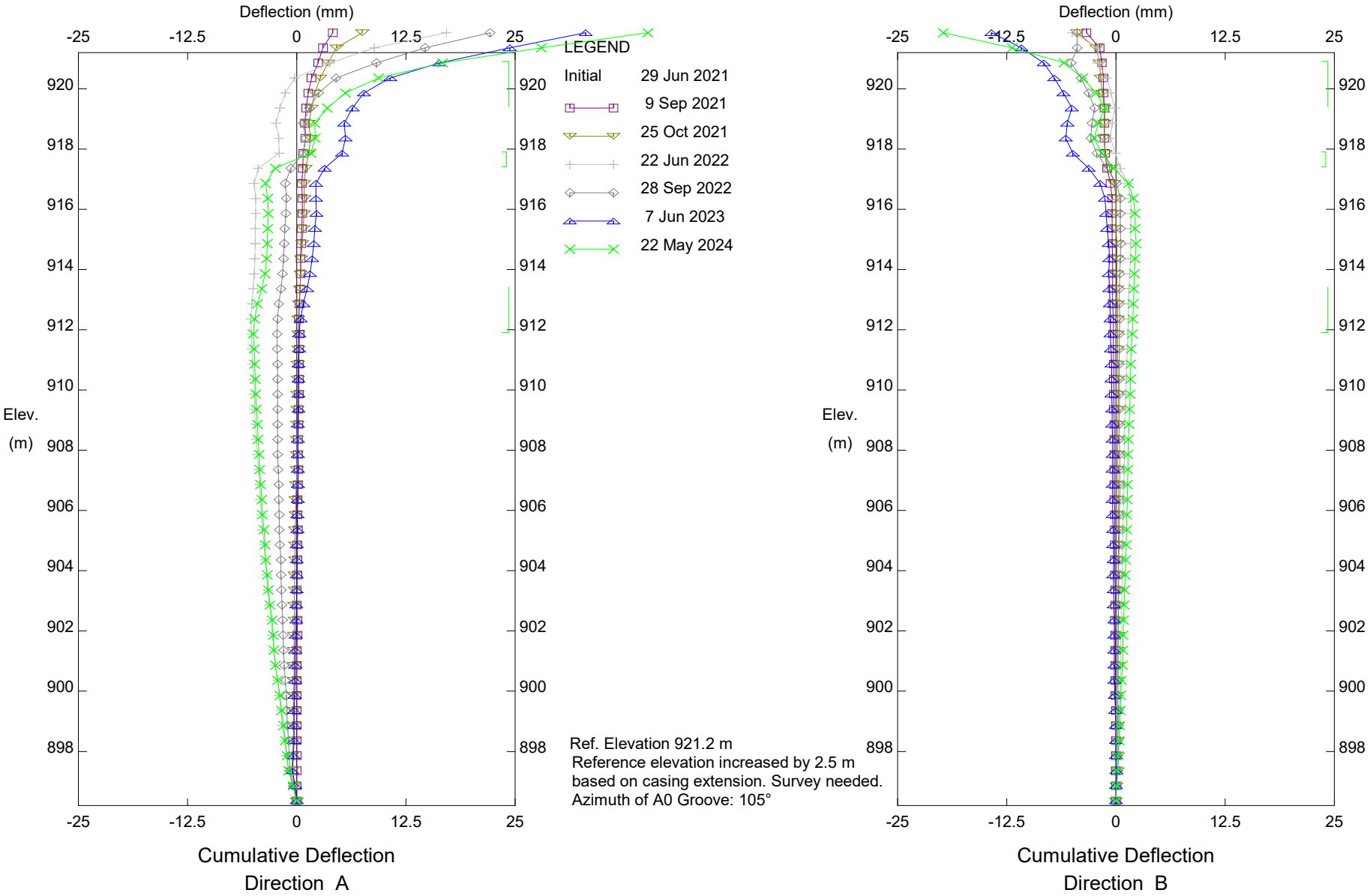

GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-2

Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

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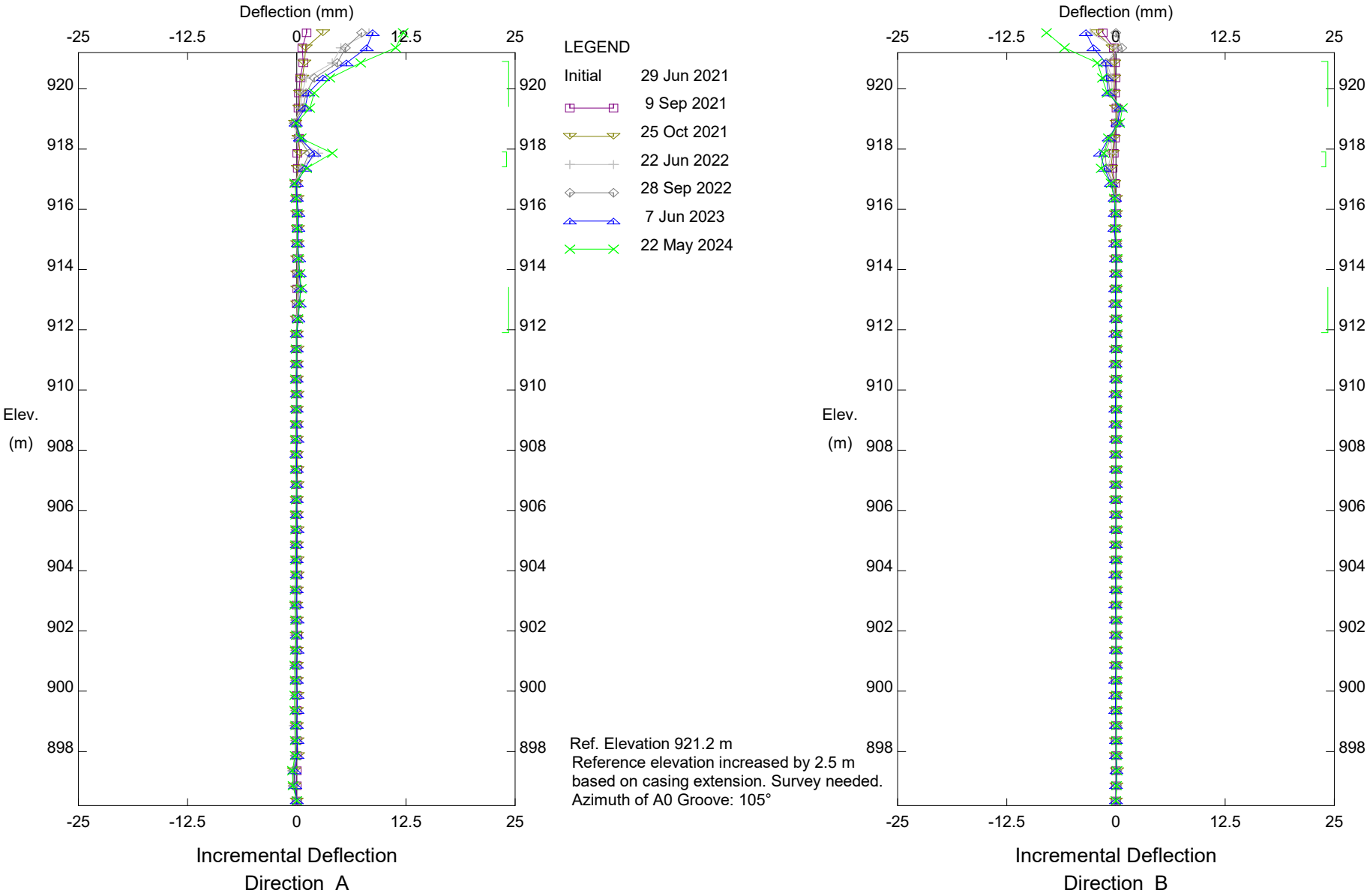

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Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

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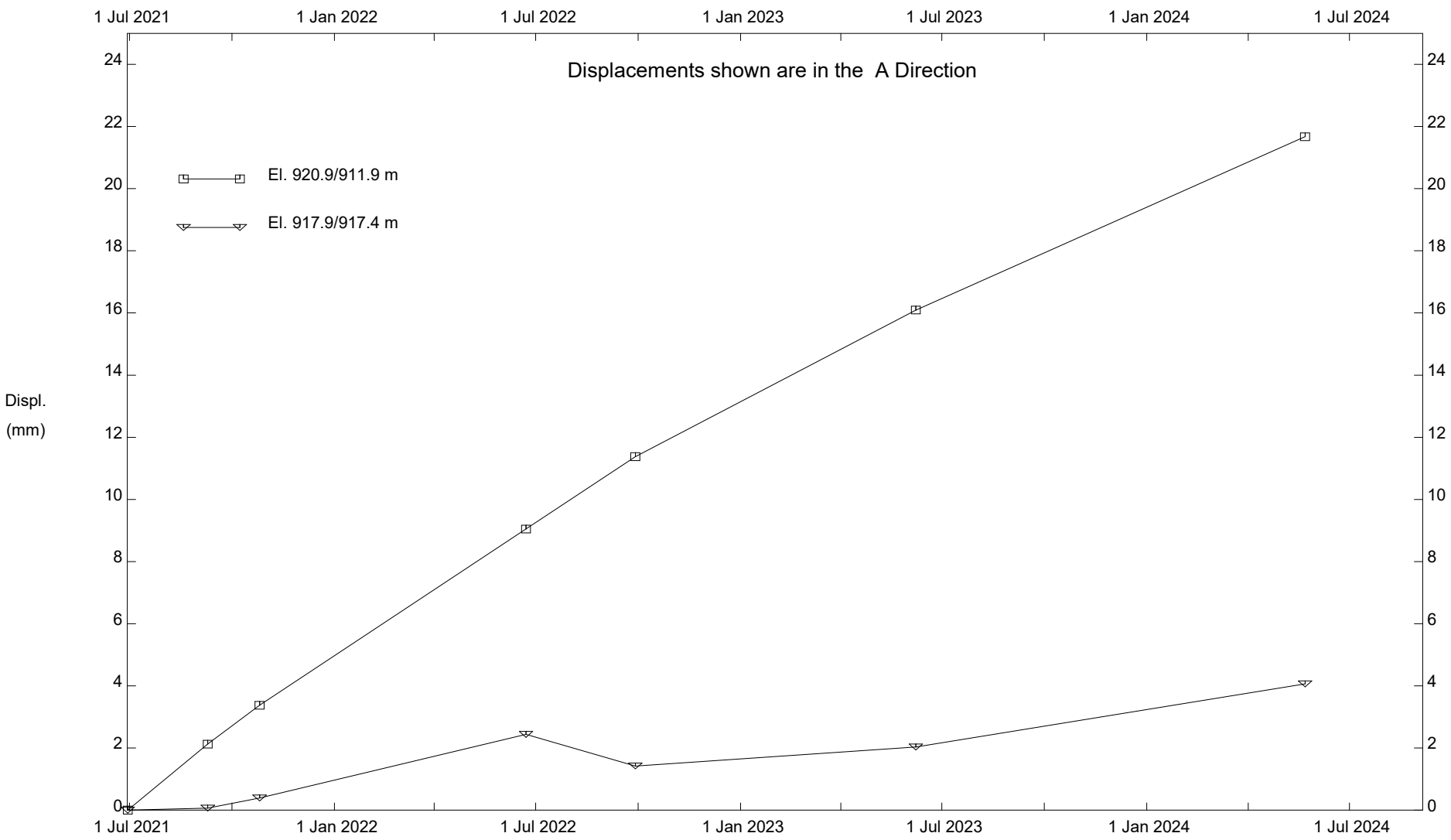

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Alberta Transportation

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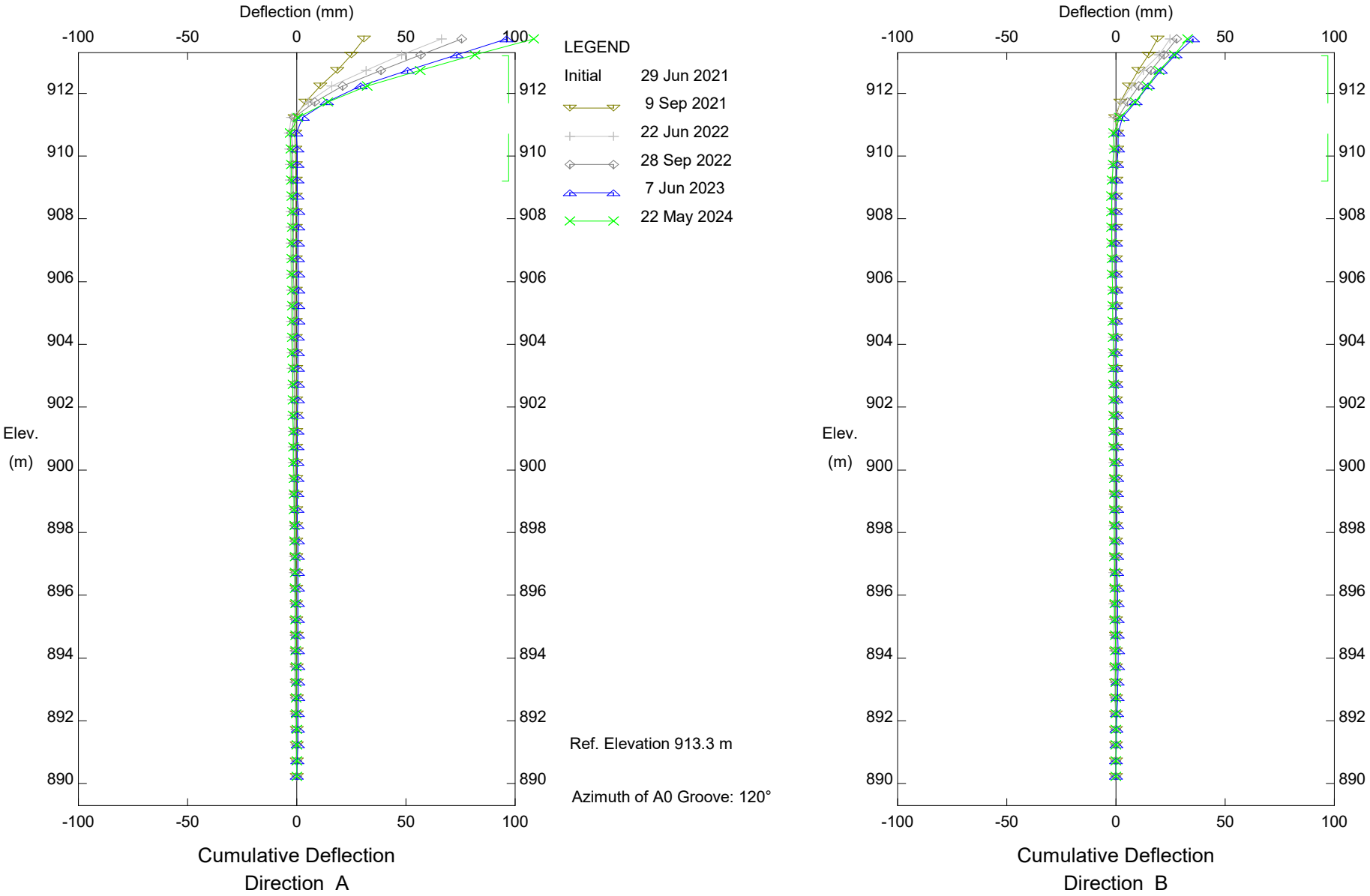
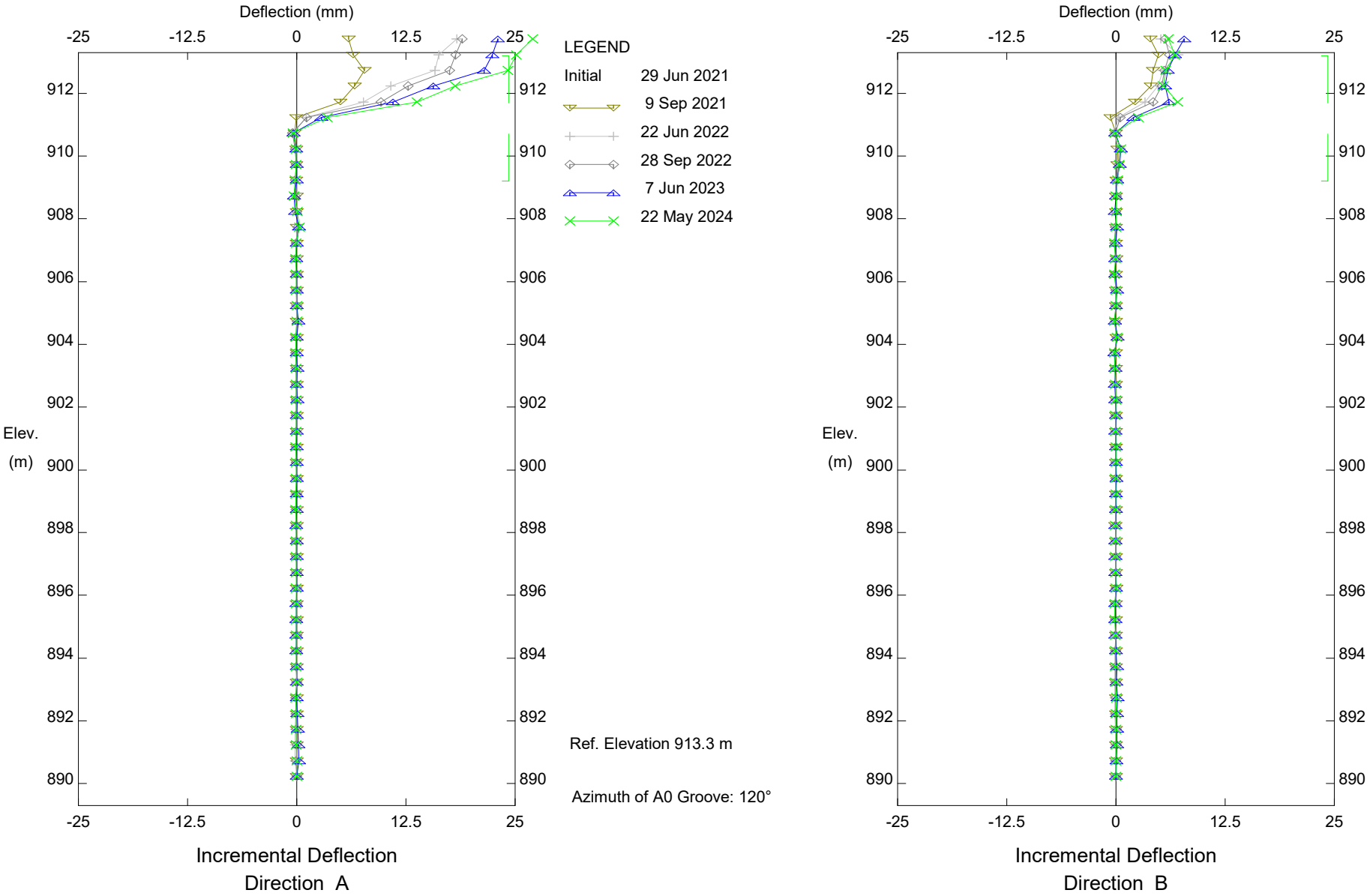


GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-3

Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

Klohn Crippen Berger - Edmonton



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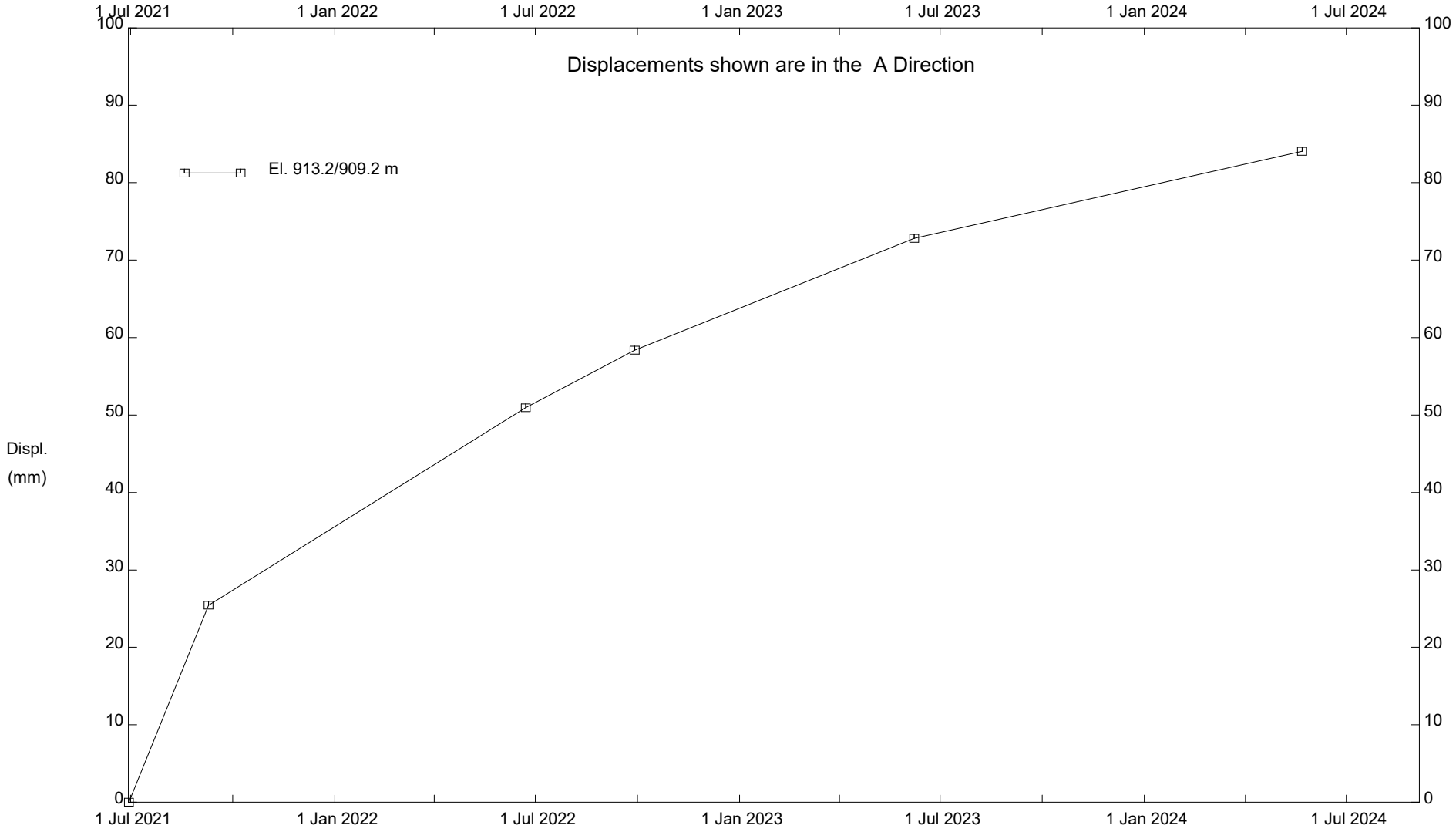
Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

Klohn Crippen Berger - Edmonton



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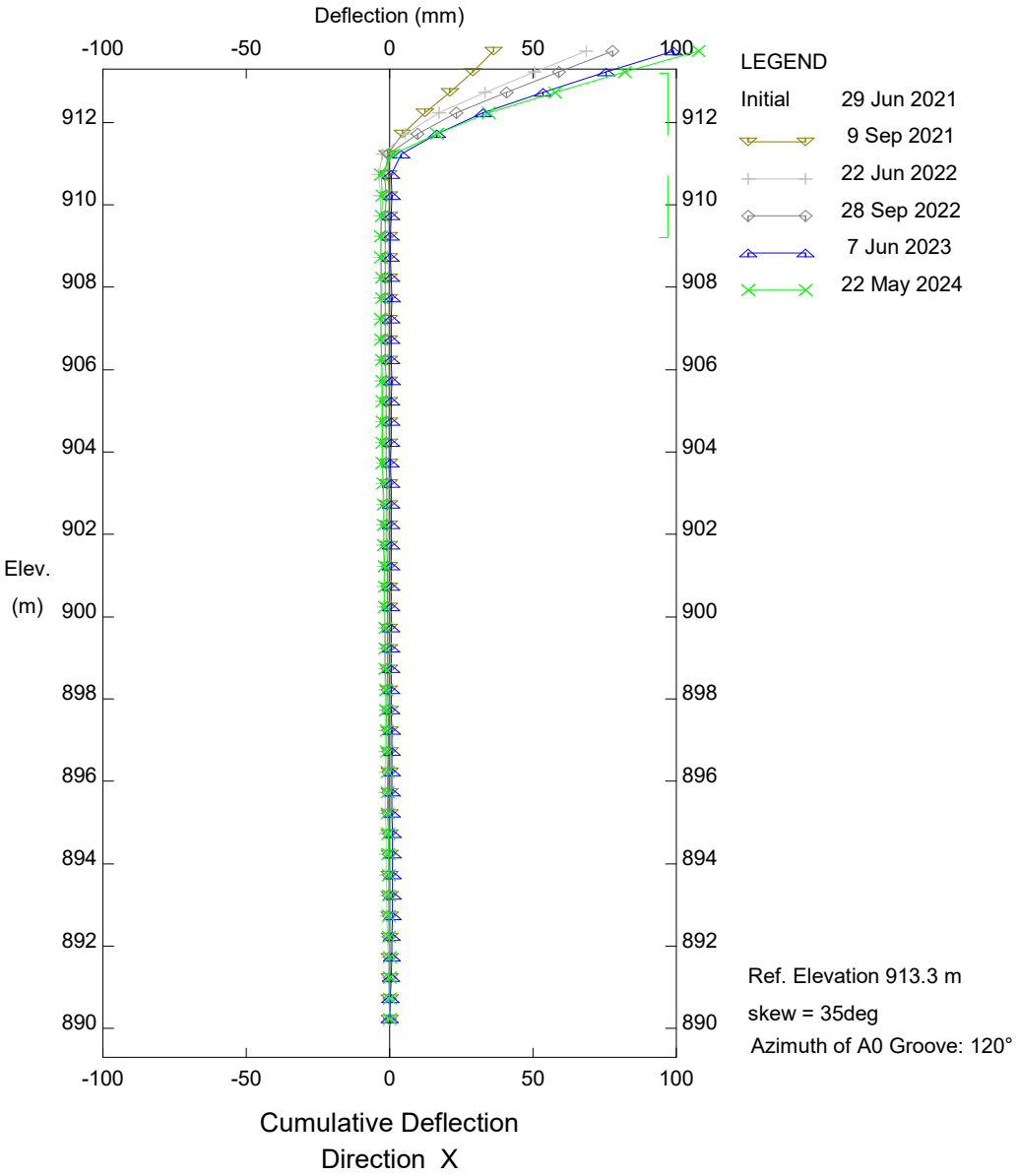
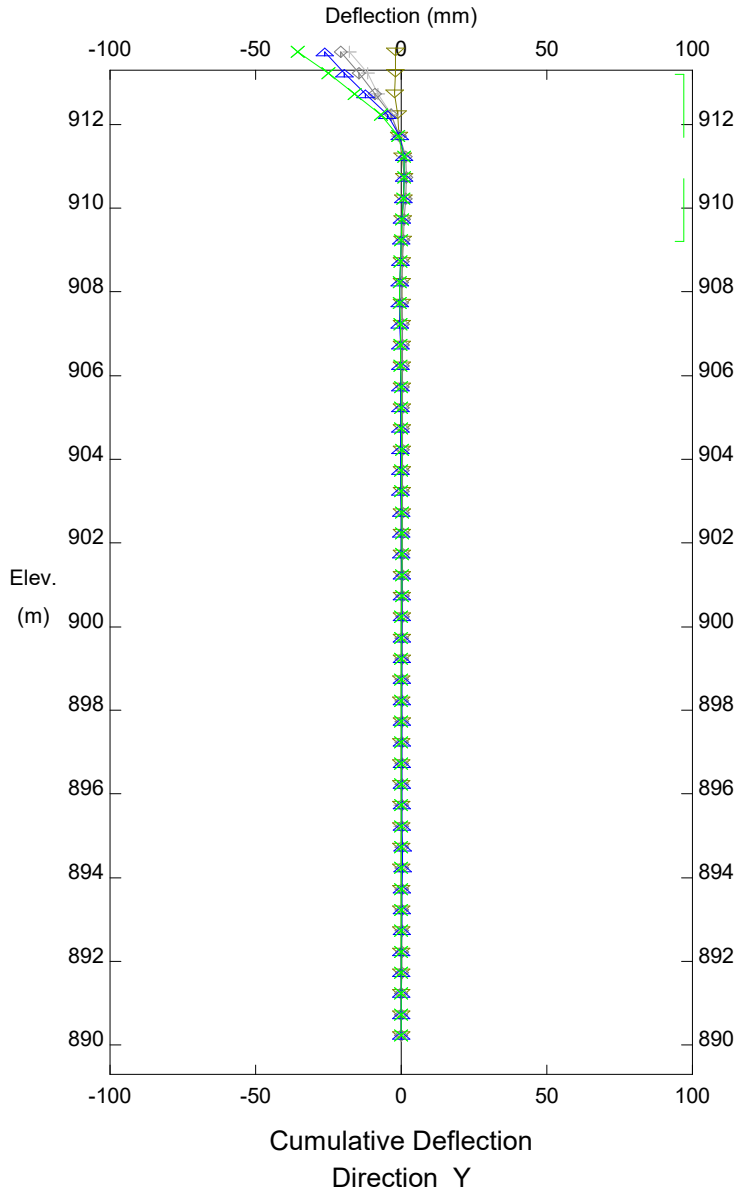
Alberta Transportation

Klohn Crippen Berger - Edmonton





GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-3

Alberta Transportation

GP006; H40:36, Sheep Creek Embankment

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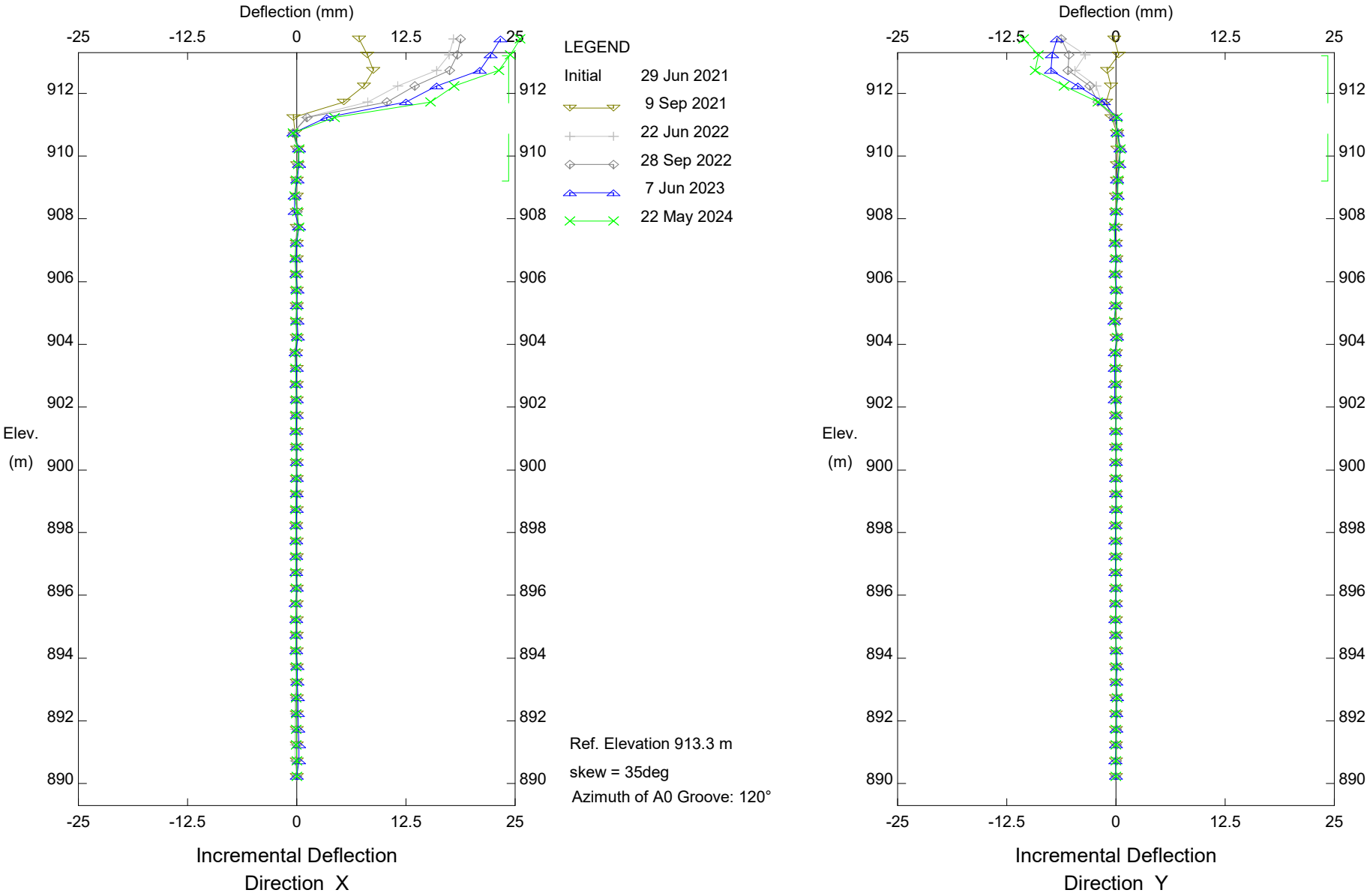

GP006; H40:36, Sheep Creek Embankment, Inclinometer SI19-3

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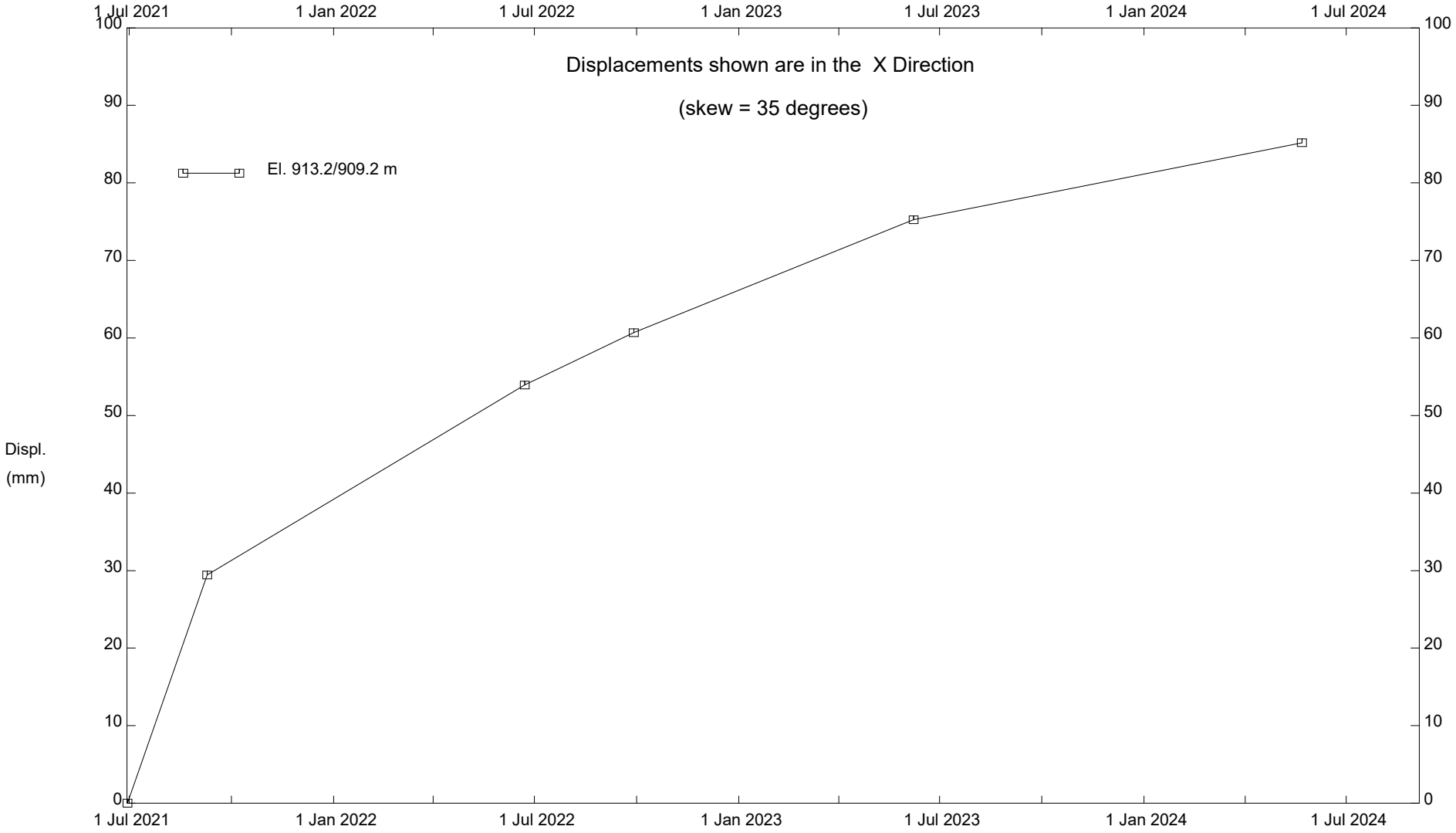

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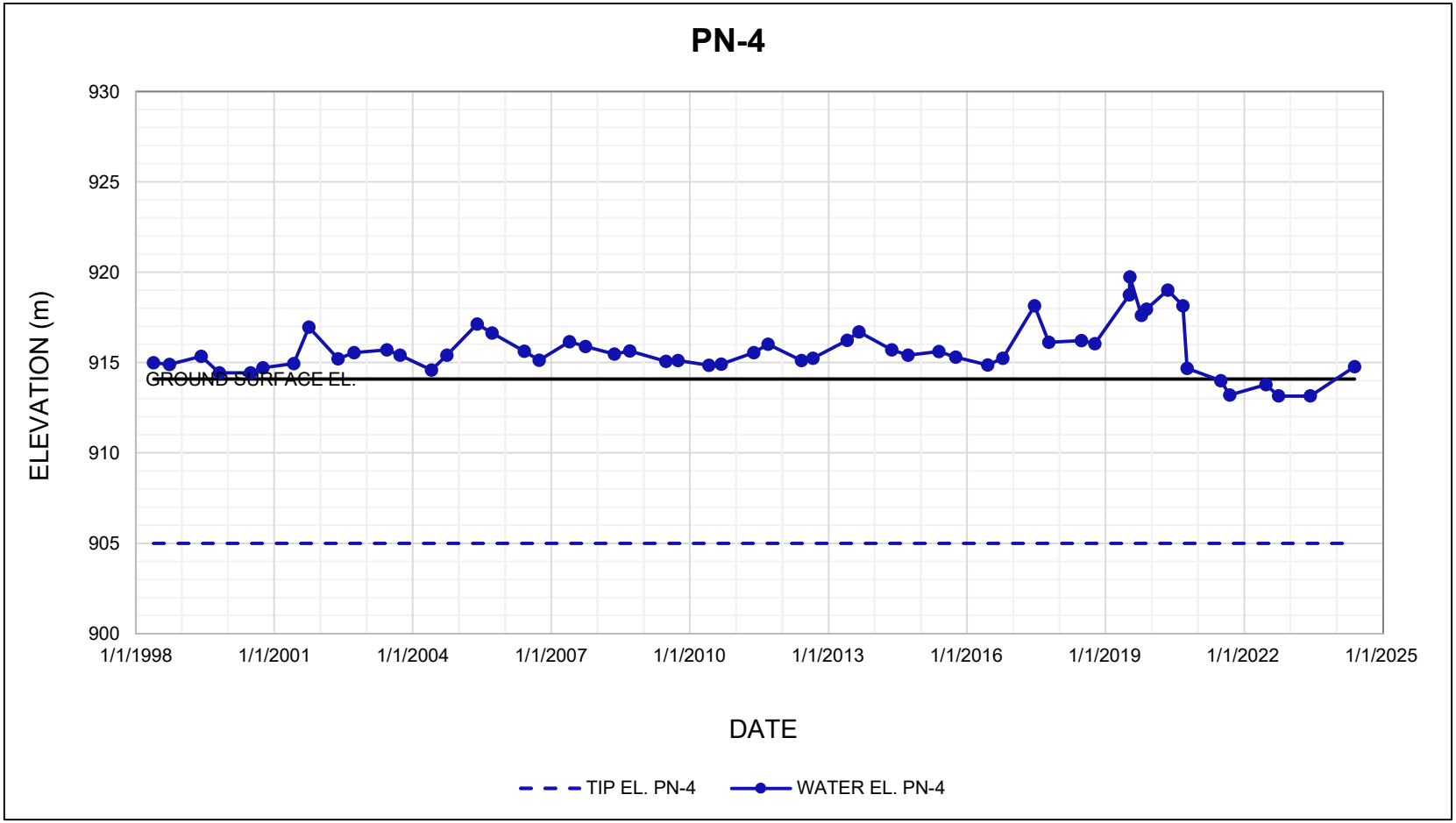
Alberta Transportation



NOTES:
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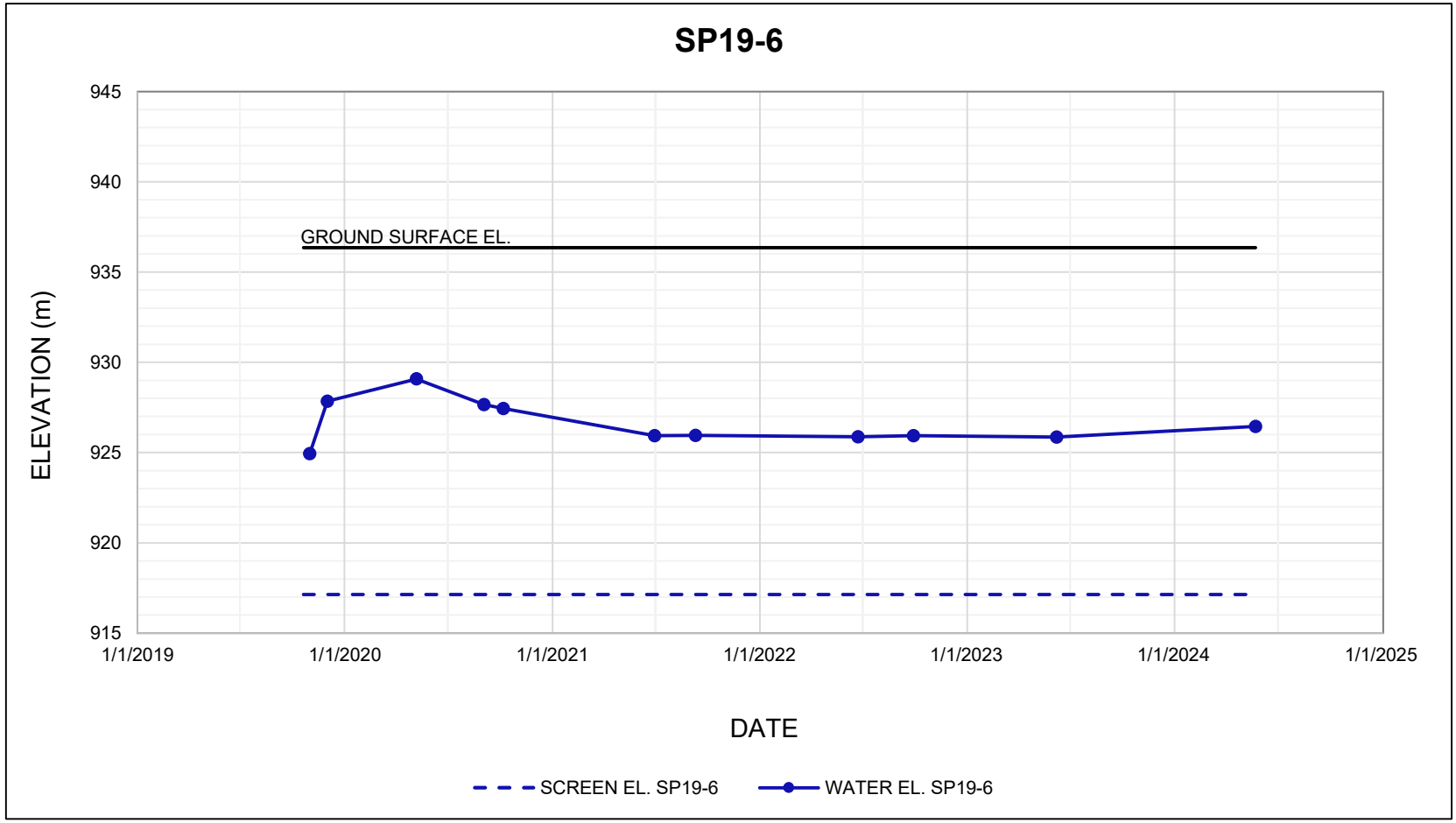
CLIENT
Alberta
Klohn Crippen Berger

PROJECT
PEACE REGION (GRANDE PRAIRIE DISTRICT - SOUTH)
GEOHAZARD RISK MANAGEMENT PROGRAM

TITLE
Piezometer Data
GP006 - Sheep Creek Embankment
(Three Teardrops Slide)
Hwy 40:36, km 21.779

SCALE	PROJECT No.	FIG No.
--	A05116A01	



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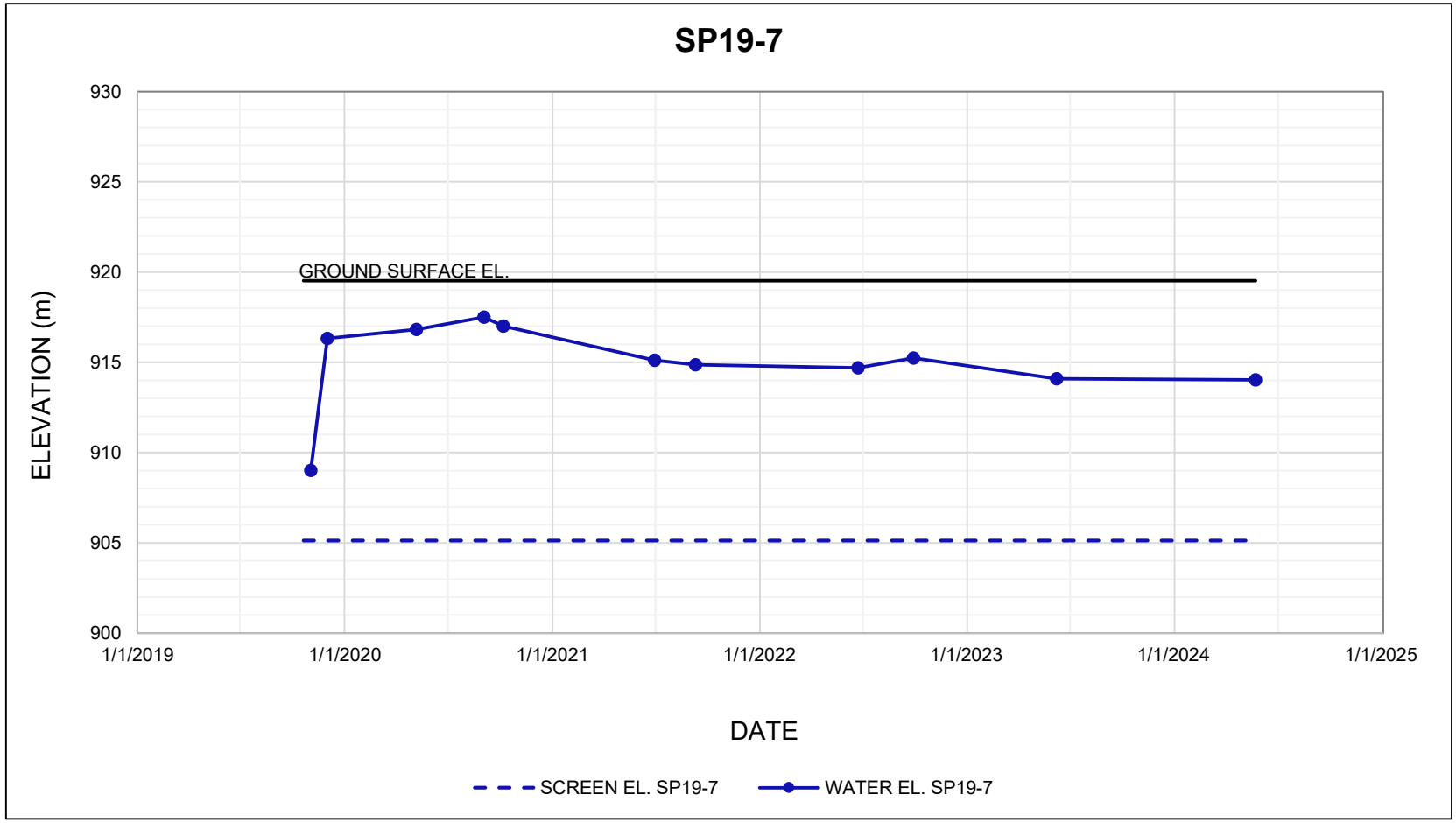

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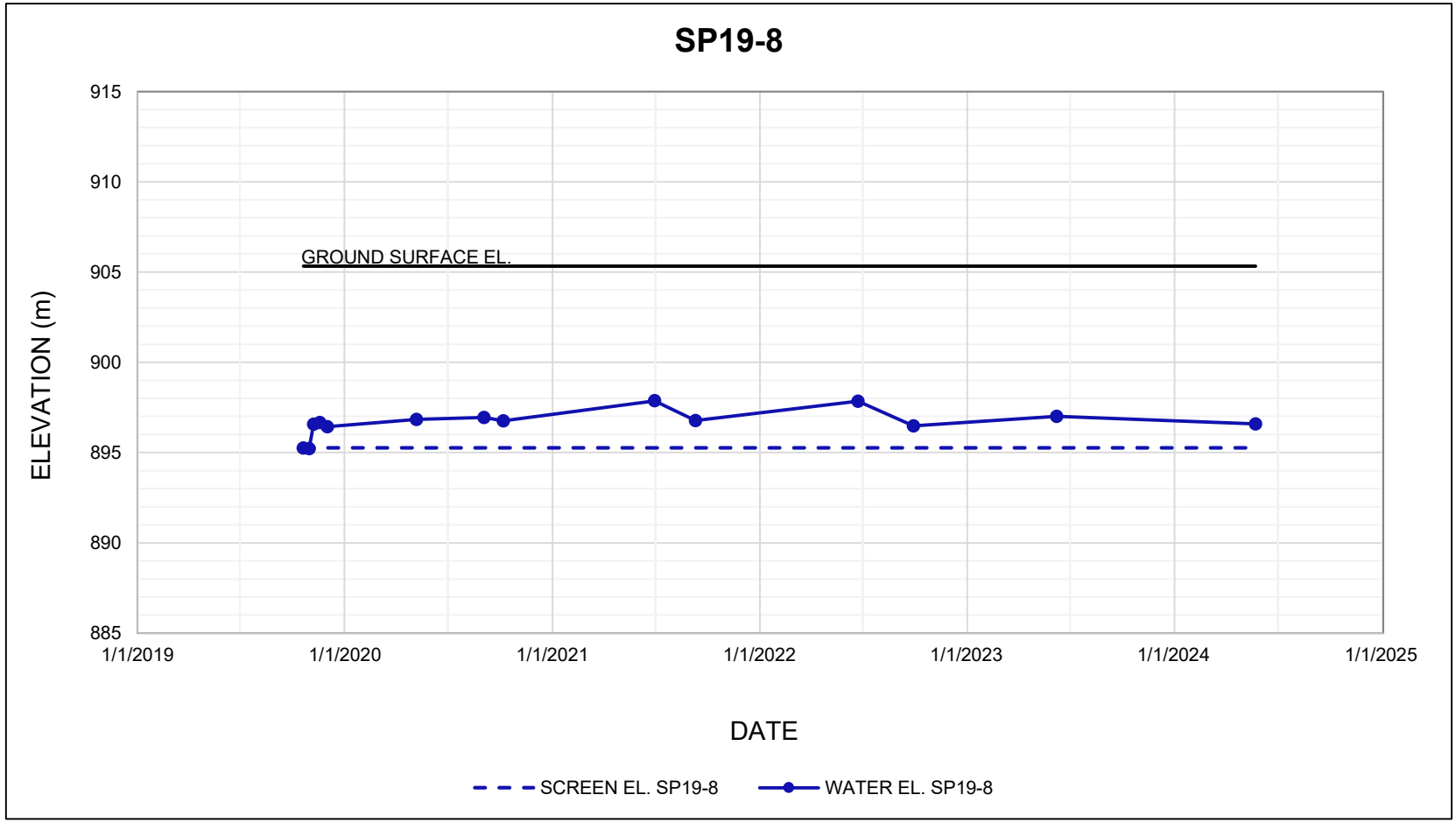

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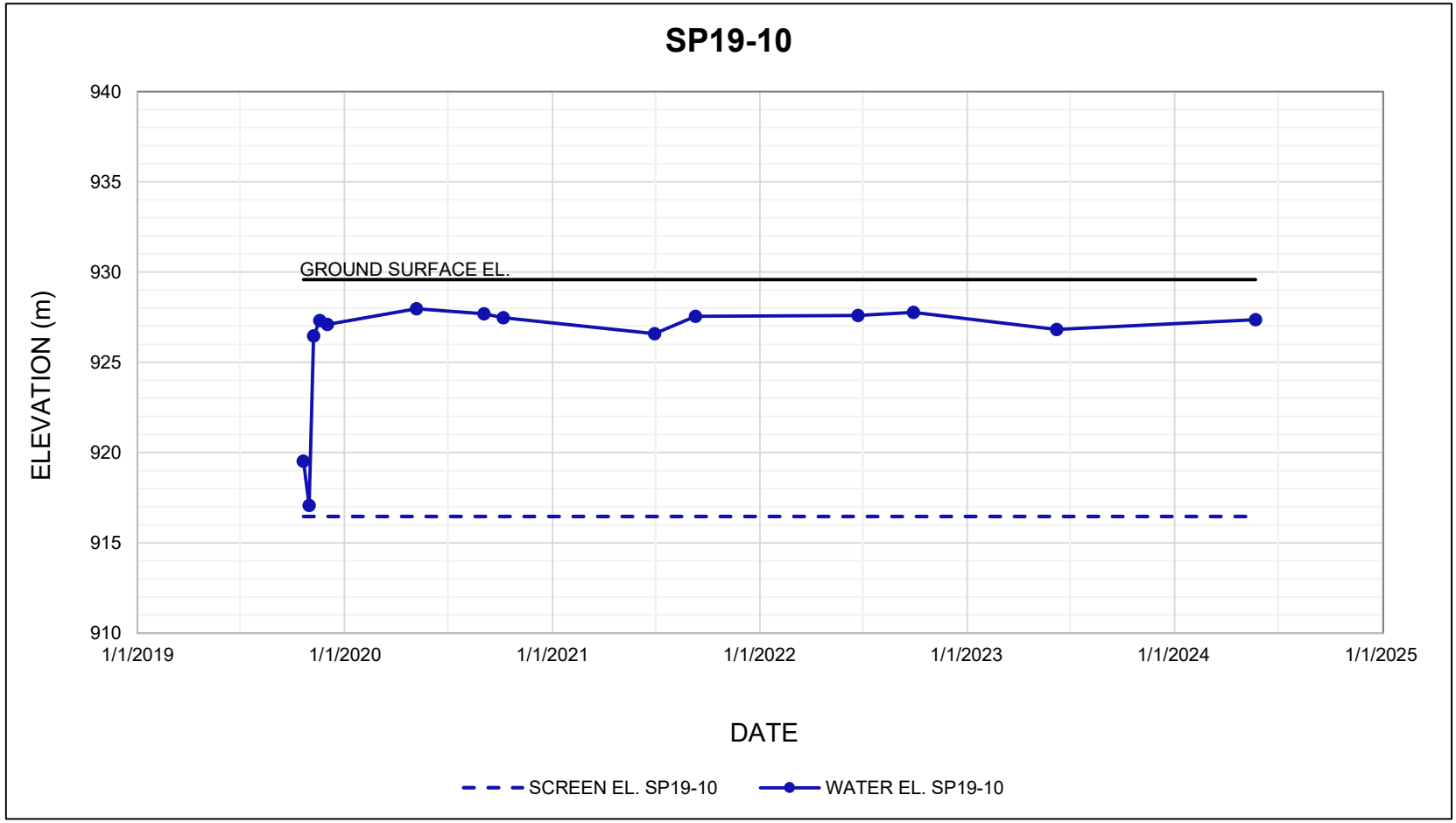

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SCALE	PROJECT No.	FIG No.
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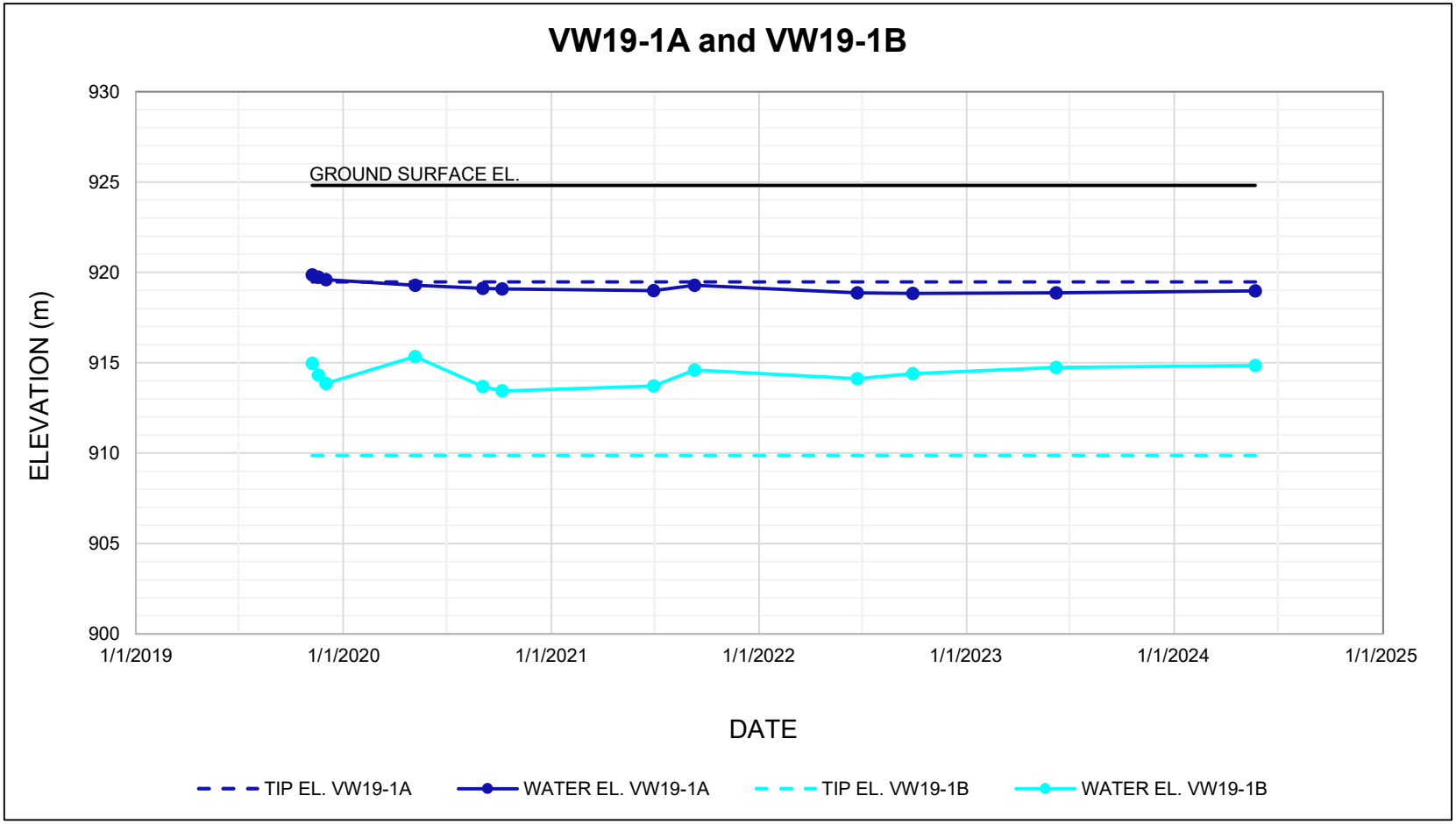

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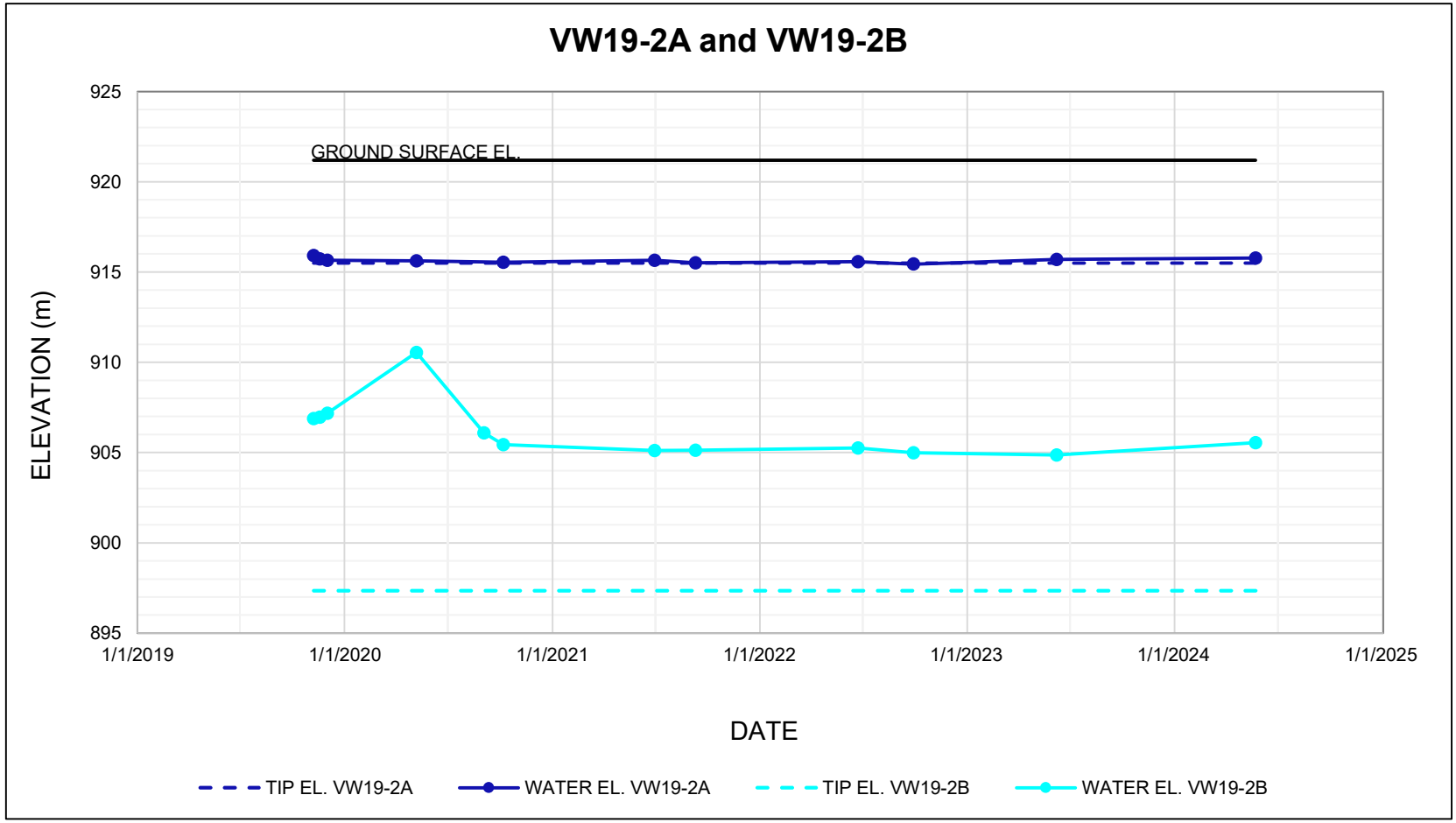

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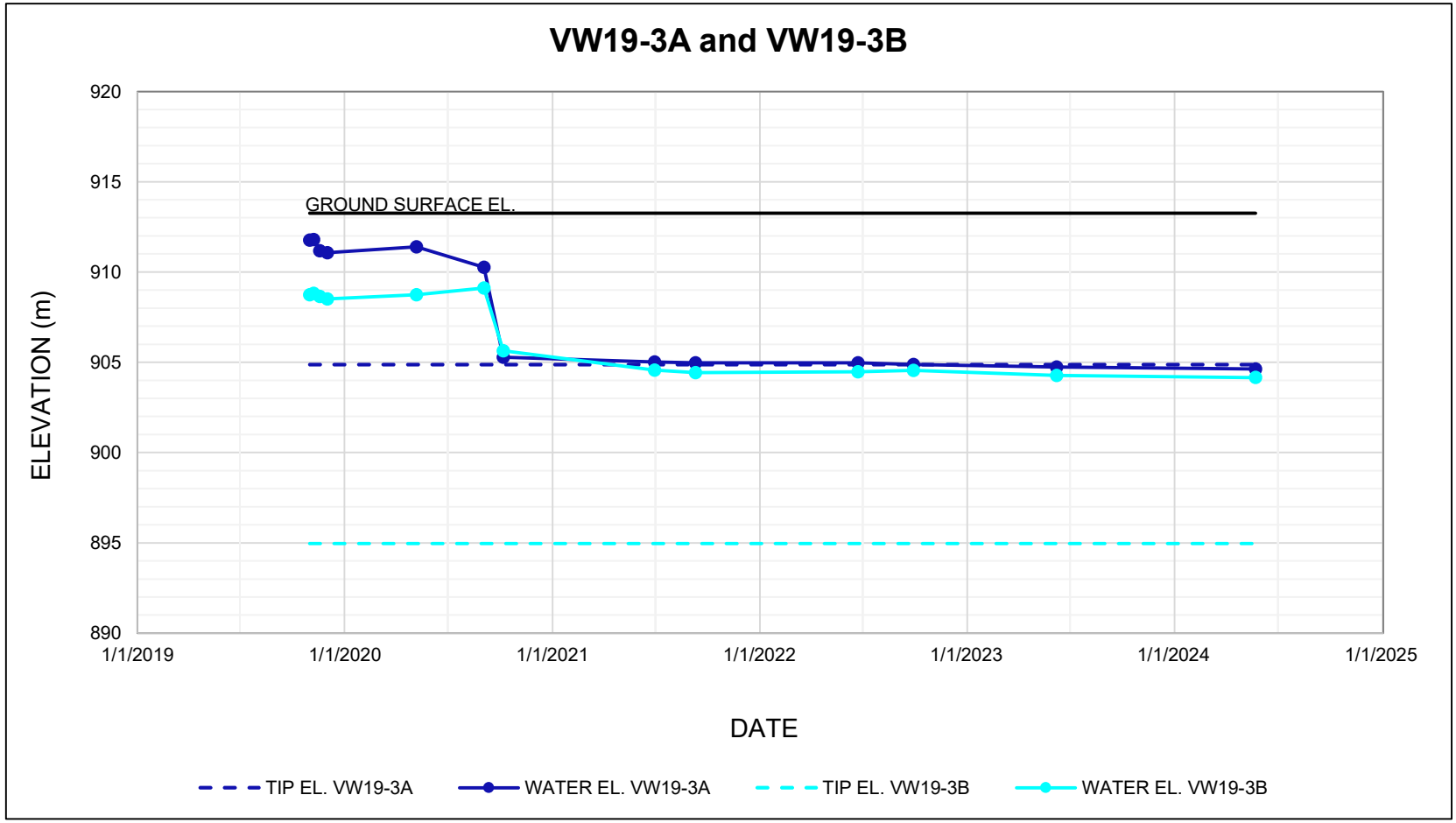

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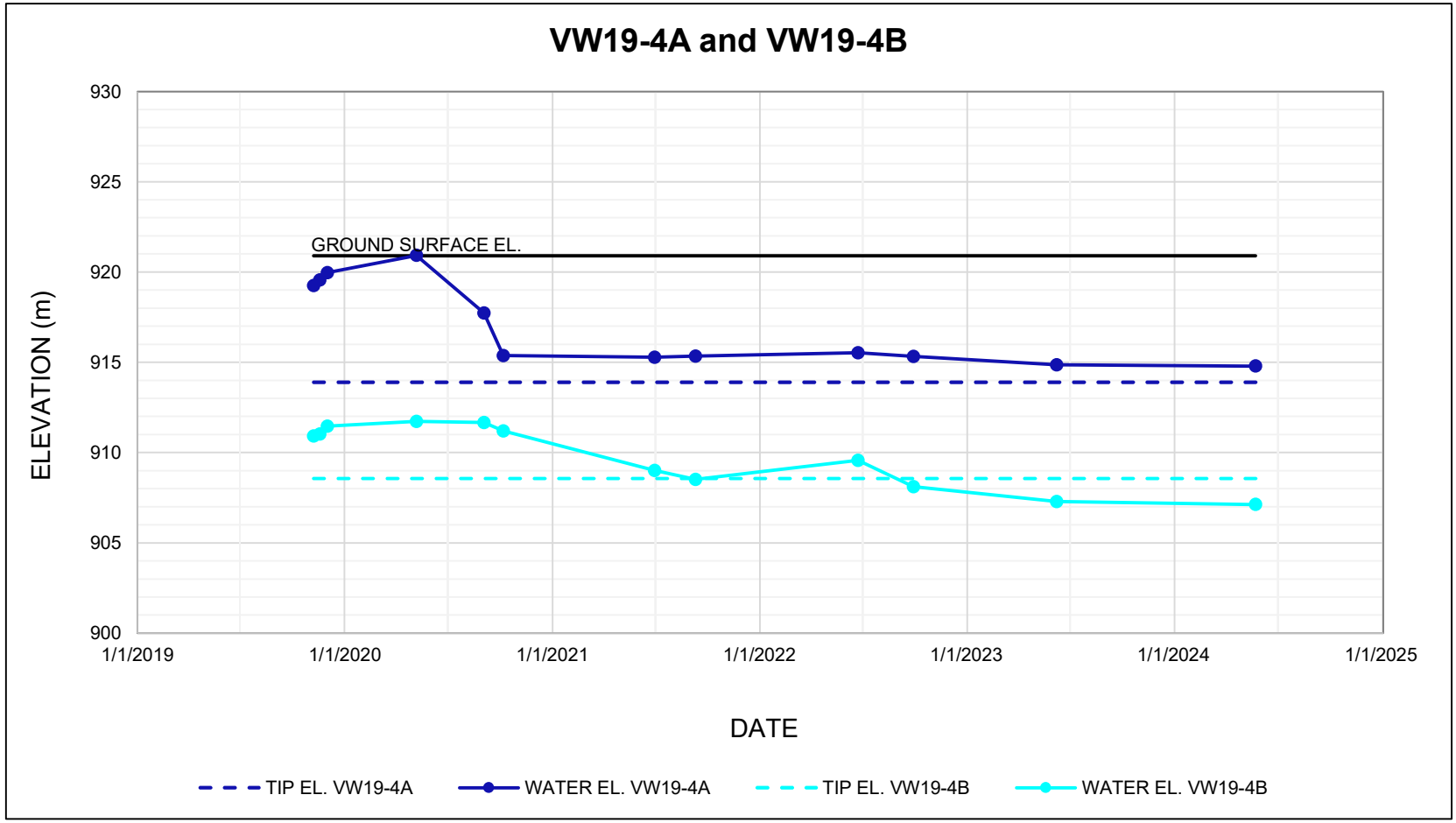

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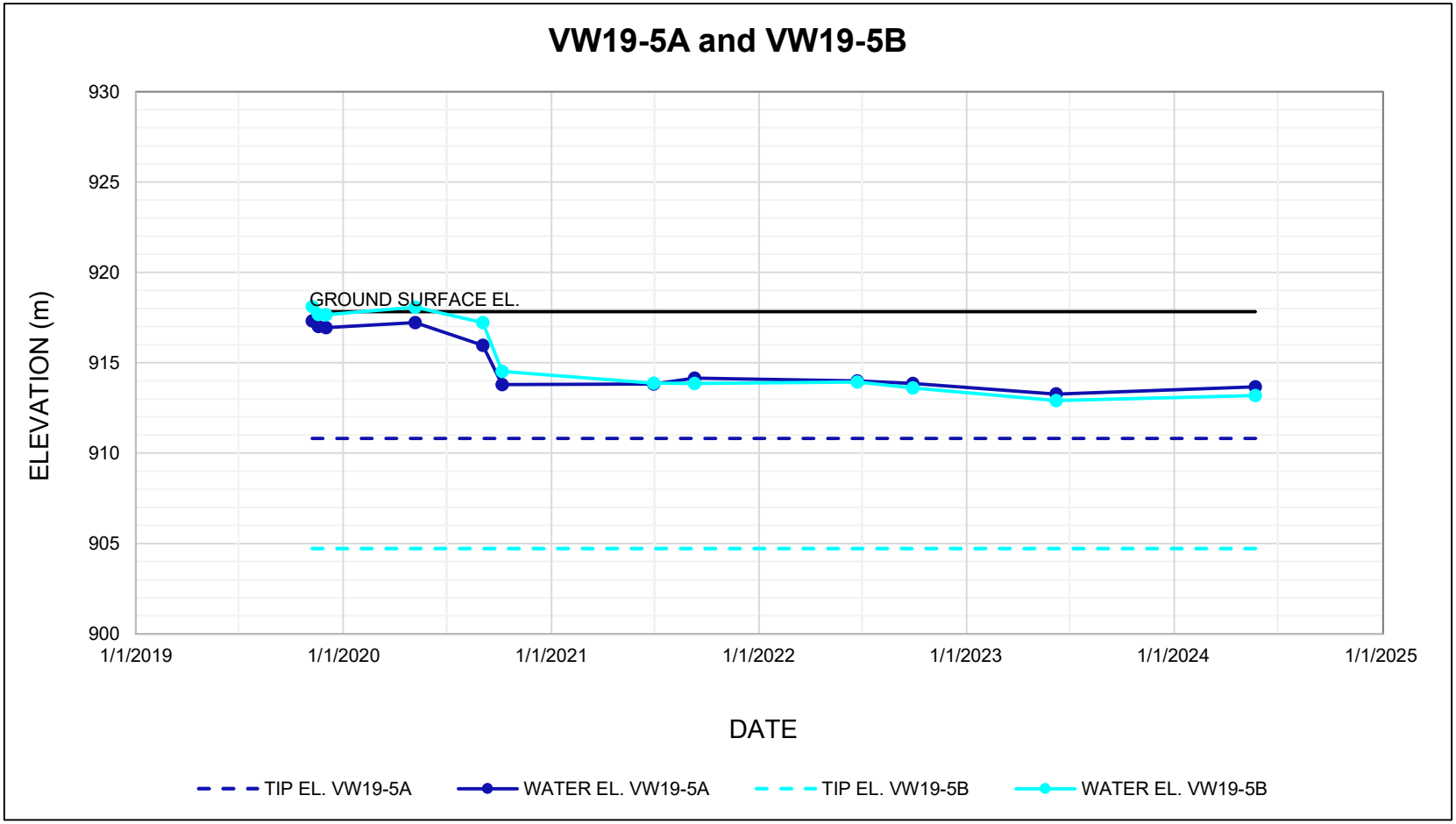

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