
To:	Amy Driessen Alberta Transportation	From:	Leslie Cho and Carrie Murray Stantec Consulting Ltd.
File:	123315222	Date:	June 12, 2022

Reference: North Central Region, Stony Plain, Site NC067 - Highway 216:06 Anthony Henday Bridge, Spring 2022 Instrumentation Monitoring Report

1.0 OBSERVATIONS

1.1 FIELD PROGRAM AND INSTRUMENTATION STATUS

The Spring 2022 monitoring cycle consisted of reading ten slope inclinometers (SI), twenty-two pneumatic piezometers (PN), and twenty-six vibrating wire piezometers (VW). **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 7, 2022.

The SIs 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.

The PNs were read with an RST Instruments C-109 Pneumatic Readout. The VWs were read with an RST VW2106 readout box.

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

1.2 WEST ABUTMENT

A total of ten SIs (SI-01, SI-02, SI-03, SI-04, SI-06, SI-07, SI-08, SI-10, SI-11, and SI-12), ten nested PNs (PN-A1 to PN-A3, PN-B1 to PN-B3 and PN-C1 to PN-C4), and ten nested VWs (VW-A1 to VW-A3, VW-B1 to VW-B3, and VW-C1 to VW-C4) were read on the west abutment.

SI-09 could not be read due to vandalism (cans and rocks were placed in the casings and Stantec was unable to extract the blockage).

1.3 EAST ABUTMENT

A total of thirteen nested PNs (PN-1, PN-2, PN-5 to PN-14, and PN-17) and sixteen nested VWs (VW-1 to VW-16) were read on the east abutment.

PN-7 could be potentially damaged during spring 2022 instrument readings since the readings were erratic.

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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 since initializing each SI are provided in **Table NC067-1** and the attachments.

The groundwater levels from PNs and VWs readings are plotted in the attachments and summarized in **Table NC067-2 to NC067-5**.

2.2 ZONES OF MOVEMENT

No new zones of movement were observed during the Spring 2021 reading cycle.

2.3 MONITORING RESULTS

2.3.1 West Abutment

2.3.1.1 Slope Inclinometers

SI-01 to SI-04 were installed in the pile wall and are summarized below.

- **SI-01** continues to show a negligible amount of incremental movement since about 2015. The total cumulative movement is about 32 mm.
- **SI-02** shows a current rate of movement of 4 mm/yr within the clay fill. The total cumulative movement is about 63 mm. An average movement rate of about 7 mm/yr was observed from Fall 2009 to Fall 2013 which decreased to an average rate of about 2 mm/yr to 3 mm/yr from 2014 on.
- **SI-03** is being monitored near surface and showed decreasing cumulative movement between 2018 and 2021. The cumulative movement increased to 106 mm during the Spring 2022 readings with the current rate of movement at 42 mm/yr.
- **SI-04** shows a rate of movement less than 1 mm/yr since 2015

SI-06 currently shows no discernable movement.

SI-07 has three zones of movement observed at around 3 m, 7 m, and 15 m depths. The current rate of movement is about 32 mm/yr in the upper zone corresponding to an increase in the movement rate of 6 mm/yr since Fall 2021, and about 1 mm/yr in the middle zone. The lower shear zone remains stable since about 2004 with little to no change in cumulative movement observed.

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SI-08 has two zones of movement observed at around 8 m and 16 m depth. The average rate of movement in the upper zone was about 3 mm/yr since 2003. The current rate of movement is 5 mm/yr with a total cumulative movement of about 56 mm. The lower movement zone appears to be creeping at a rate of less than 1 mm/yr since 2003.

SI-10 shows a current rate of movement of about 3 mm/yr corresponding to an increase of 1 mm/yr from the previous reading cycle. The average rate of movement since 2006 is about 2 mm/yr. The total cumulative movement is about 21 mm.

SI-11 has a zone of movement being monitored from 14.2 m to 25.8 m with approximately 12 mm of cumulative movement recorded since 2006. The movement zone appears to be creeping at an overall rate of less than 1 mm/yr.

SI-12 has a zone of movement between 3.2 m and 6.2 m and shows creep at a rate of about 1 mm/yr since 2008 with a total cumulative movement of 44 mm.

Table NC067-1 summarizes the west abutment slope inclinometer readings.

2.3.1.2 Piezometers

In general, the PNs in the west abutment showed piezometric level difference between 0.3 m decrease and 0.1 m increase compared to Fall 2021 readings.

The VWs in the West abutment showed a decrease in the piezometric level up to 0.3 m.

Table NC067-2 and **Table NC067-3** summarize the west abutment PN and VW piezometer readings for the Spring 2022 reading cycle.

2.3.2 East Abutment

2.3.2.1 Piezometers

In general, the PNs in the east abutment show a slight increase in the piezometric level up to 0.6 m since Fall 2021 readings.

In general, the VW piezometers in the east abutment show a decrease in the piezometric level up to 0.5 m since Fall 2021 readings. Piezometers VW-3, VW-4, VW-6, VW-11 and VW-16 were inferred to be dry again this reading cycle. VW-10 continues to be at its highest recorded piezometric levels with no change observed since Spring 2021.

Table NC067-4 and **Table NC067-5** summarizes the east abutment PN and VW readings for the Spring 2022 reading cycle.

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3.0 RECOMMENDATIONS

3.1 FUTURE WORK

It is recommended that all instruments be read in the Fall 2022 reading cycle.

3.2 INSTRUMENTATION REPAIRS

PN-7 showed erratic readings which are an indicator of possible damage to the pneumatic tubing. However, it could also mean the tubes are dirty and need to be purged.

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Table NC067-1: Spring 2022 Slope Inclinometer Reading Summary on West Abutment

Instrument Name	Date Initialized	Coordinates ⁽¹⁾ (UTM 12U, NAD1983) (m)		Total Cumulative Resultant Movement, and Depth of Movement (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							
SI-01	Oct. 3, 2002	5926771	326315	32 over 2.2 m to 5.2 m depth in 337° direction	28 mm/yr in Oct. 2012	Operational	September 9, 2021	<1	<1	<1
SI-02	Oct. 3, 2002	5926745	326302	63 over 1.2 m to 4.2 m depth in 3° direction	24 mm/yr in Oct. 2013	Operational	September 9, 2021	3	4	4
SI-03	Oct. 20, 2002	5926706	326272	106 over 1.2 m to 2.8 m depth in 7° direction	42 mm/yr in May. 2022	Operational	September 9, 2021	28	42	34
SI-04	Oct. 20, 2002	5926663	326254	8 at 2.8 m to 16.2 m depth in 340° direction	3 mm/yr; Jun 2012	Operational	September 9, 2021	<1	<1	<1
SI-06	Oct 20, 2002	5926705	326265	No Discernable Zone of Movement	-	Operational	September 9, 2021	No Discernable Zone of Movement		
SI-07	Oct. 20, 2002	5926754	326300	96 over 0.8 m to 5.2 m depth in 352° direction	33 mm/yr; Aug. 2003	Operational	September 9, 2021	21	32	6
				44 over 5.2 m to 9.2 m depth in 352° direction	17 mm/yr; September 2021	Operational		<1	1	-18
				9 over 13.2 m to 16.2 m depth 352° direction	7 mm/yr; Aug. 2003	Operational		-1	1	4

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Instrument Name	Date Initialized	Coordinates ⁽¹⁾ (UTM 12U, 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							
SI-08	Oct. 22, 2002	5926760	326267	56 over 5.8 m to 11.8 m depth in 6° direction.	18 mm/yr Sep. 2021	Operational	September 9, 2021	-3	-5	-15
				35 over 14.2 m to 17.2 m depth in 6° direction.	35 mm/yr Oct. 2003	Operational		<1	<1	<1
SI-10	Jul. 18, 2003	5927005	326337	21 over 14.2 m to 22.2 m depth in 327° direction	8 mm/yr; Feb. 2004	Operational	September 9, 2021	-2	3	1
SI-11	Jul. 18, 2003	5927116	326378	12 over 14.2 m to 25.8 m depth in 348° direction	7 mm/yr; Sept. 2018	Operational	September 9, 2021	<1	<1	38
SI-12	Jan. 9, 2003	5927242	326423	44 over 3.2 m to 6.2 m depth in 280° direction	14 mm/yr; June, 2016	Operational	September 9, 2021	<1	<1	32
Note: (1) Updated May 7, 2022, with approximate accuracy of ± 3 m.										

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Table NC067-2: Spring 2022 Pneumatic Piezometer Reading Summary on West Abutment

Instrument Name	Date Initialized	Tip Elevation (m aMSL) ⁽¹⁾	Current Status	Maximum Piezometric Elevation (m)	Piezometric Elevation (m aMSL)	Previous Piezometric Elevation (m aMSL)	Change in Piezometric Level Since Previous Reading (m)
PN-A1 (27962)	Oct 14, 2002	614.0	Operational	631.6; Nov 2002	626.3	626.6	-0.3
PN-A2 (27963)	Oct 14, 2002	623.9	Operational	627.2; Sep 2020	626.4	626.6	-0.2
PN-A3 (27964)	Oct 14, 2002	627.7	Operational	628.8; May 2008	628.0	628.0	No change
PN-B1 (27957)	Oct 14, 2002	613.5	Operational	633.0; Oct 2002	627.2	627.2	No change
PN-B2 (27956)	Oct 14, 2002	623.5	Operational	627.0; Jan 2003	624.1	624.0	0.1
PN-B3 (27961)	Oct 14, 2002	627.5	Operational	633.4; May 2004	628.7	628.8	-0.1
PN-C1 (29755)	Oct 14, 2002	620.8	Operational	634.9; Nov 2002	621.4	621.3	0.1
PN-C2 (27958)	Oct 14, 2002	628.8	Operational	634.9; Nov 2002	631.0	631.0	No change
PN-C3 (27959)	Oct 14, 2002	631.6	Operational	646.8; May 2003	636.2	636.4	-0.2
PN-C4 (27960)	Oct 14, 2002	635.7	Operational	638.9; May 2008	637.8	638.0	-0.2

Note:
(1) aMSL = Above Mean Sea Level
(2) Piezometer location (326270 m Easting, 5926722 m Northing, UTM 12U, NAD1983) updated May 7, 2022, with approximate accuracy of ± 3 m.

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Table NC067-3: Spring 2022 Vibrating Wire Piezometer Reading Summary on West Abutment

Instrument Name	Date Initialized	Tip Elevation (m aMSL) ⁽¹⁾	Current Status	Maximum Piezometric Elevation (m aMSL)	Piezometric Elevation (m aMSL)	Previous Piezometric Elevation (m aMSL)	Change in Piezometric Level Since Previous Reading (m)
VW-A1 (75077)	Oct 14, 2002	614.0	Operational	630.8; Nov. 2002	626.4	626.6	-0.2
VW-A2 (75079)	Oct 14, 2002	623.9	Operational	628.0 Sep. 2020	627.4	627.6	-0.2
VW-A3 (75080)	Oct 14, 2002	627.7	Operational	628.8; Nov. 2002	627.8	628.0	-0.2
VW-B1 (75073)	Oct 14, 2002	613.5	Operational	632.9; Oct. 2002	627.2	627.3	-0.1
VW-B2 (75072)	Oct 14, 2002	623.5	Operational	627.9; Sept. 2020	627.2	627.4	-0.2
VW-B3 (75078)	Oct 14, 2002	627.5	Operational	633.5; May 2004	629.7	629.8	-0.1
VW-C1 (75071)	Oct 14, 2002	620.8	Operational	633.6; Nov. 2002	630.8	630.9	-0.1
VW-C2 (75074)	Oct 14, 2002	628.8	Operational	634.8; Nov 2002	630.3	630.4	-0.1
VW-C3 (75075)	Oct 14, 2002	631.6	Operational	646.7; June 2003	636.0	636.3	-0.3
VW-C4 (75076)	Oct 14, 2002	635.7	Operational	637.6; Oct. 2007	636.2	636.5	-0.3

Note:
(1) aMSL = Above Mean Sea Level
(1) Piezometer location (326270 m Easting, 5926722 m Northing, UTM 12U, NAD1983) updated May 7, 2022, with approximate accuracy of ± 3 m.

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Table NC067-4: Spring 2022 Pneumatic Piezometer Reading Summary on East Abutment

Instrument Name	Date Initialized	Tip Elevation (m aMSL) ⁽¹⁾	Current Status	Maximum Piezometric Elevation (m aMSL)	Piezometric Elevation (m aMSL)	Previous Piezometric Elevation (m aMSL)	Change in Piezometric Level Since Previous Reading (m)
PN-1 (26736)	Jul 20, 2001	631.6	Operational	633.9; May 2019	632.0	631.9	0.1
PN-2 (26737)	Jul 20, 2001	632.6	Operational	633.5; Jan 2002	633.1	633.1	No change
PN-3 (26849)	Jul 20, 2001	624.8	Non-operational	626.7; Jan 2002	-	-	-
PN-4 (26846)	Aug 27, 2001	615.0	Non-operational	640.3; Sep 2001	-	-	-
PN-5 (26731)	Jul 20, 2001	631.3	Operational	633.6; May 2019	631.9	631.8	0.1
PN-6 (26735)	Jul 20, 2001	632.2	Operational	634.9; May 2019	632.9	632.6	0.3
PN-7 (26853)	Sep 10, 2001	609.9	Non-operational	634.4; Sep 2001	-	610.2	-
PN-8 (26850)	Sep 11, 2001	617.3	Operational	622.3; May 2019	618.0	617.4	0.6
PN-9 (26733)	Aug 27, 2001	631.8	Operational	632.9; Nov 2001	632.4	632.2	0.2
PN-10 (26734)	Jul 20, 2001	632.9	Operational	633.9; Oct 2009	633.5	633.4	0.1
PN-11 (26851)	Sep 10, 2001	628.4	Operational	640.0; Sep 2001	628.7	628.6	0.1
PN-12 (26847)	Aug 27, 2001	619.0	Operational	623.8, May 2019	622.4	622.4	No change
PN-13 (26730)	Aug 27, 2001	631.8	Operational	633.9; May 2019	632.2	632.1	0.1
PN-14 (26732)	Jul 20, 2001	632.8	Operational	633.9; Oct 2008	633.3	633.2	0.1
PN-17 (22001)	Sep 11, 2001	617.6	Operational	626.2; May 2013	622.7	622.6	0.1

Note:

(1) aMSL = Above Mean Sea Level

(2) Piezometer location (326613 m Easting, 5926513 m Northing, UTM 12U, NAD1983) updated May 7, 2022, with approximate accuracy of ± 3 m.

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Table NC067-5: Spring 2022 Vibrating Wire Piezometer Reading Summary on East Abutment

Instrument Name	Date Initialized	Tip Elevation (m aMSL) ⁽¹⁾	Current Status	Maximum Piezometric Elevation (m aMSL)	Piezometric Elevation (m aMSL)	Previous Piezometric Elevation (m aMSL)	Change in Piezometric Level Since Previous Reading (m)
VW-1 (74856)	Sep 24, 2002	606.9	Operational	630.1; Dec 2002	618.3	618.8	-0.5
VW-2 (74870)	Sep 24, 2002	617.3	Operational	624.7; Nov 2002	621.4	621.5	-0.1
VW-3 (74862)	Sep 24, 2002	627.4	Operational	627.8; Sept 2002	Dry	Dry	-
VW-4 (74863)	Sep 24, 2002	624.4	Operational	624.6; Sept 2002	Dry	Dry	-
VW-5 (74857)	Sep 24, 2002	606.6	Operational	635.6; Dec 2002	616.5	617.0	-0.5
VW-6 (74861)	Sep 24, 2002	627.0	Operational	627.3; Sept 2002	Dry	Dry	-
VW-7 (74860)	Sep 24, 2002	624.0	Operational	624.4; May 2018	624.3	624.4	-0.1
VW-8 (74869)	Sep 24, 2002	616.9	Operational	626.5; Dec 2002	621.8	621.9	-0.1
VW-9 (74858)	Oct 17, 2002	610.7	Operational	628.7; Nov 2002	620.2	620.4	-0.2
VW-10 (74871)	Oct 17, 2002	626.7	Operational	627.2; May 2022]	627.2	627.2	No change
VW-11 (74872)	Oct 17, 2002	623.7	Operational	623.9; Oct 2012	Dry	Dry	-
VW-12 (74873)	Oct 17, 2002	618.8	Operational	623.7; Nov 2002	621.9	622.0	-0.1
VW-13 (74859)	Oct 17, 2002	610.3	Operational	630.4; Dec 2002	618.9	619.2	-0.3
VW-14 (74868)	Oct 17, 2002	618.0	Operational	625.5; Nov 2002	621.3	621.5	-0.2
VW-15 (74874)	Oct 17, 2002	627.5	Operational	629.2; Sept 2021	629.1	629.2	-0.1
VW-16 (74875)	Oct 17, 2002	624.5	Operational	624.7; Oct 2012	Dry	Dry	-
<p>Note:</p> <p>(1) aMSL = Above Mean Sea Level</p> <p>(2) Piezometer location (326613 m Easting, 5926513 m Northing, UTM 12U, NAD1983) updated May 7, 2022, with approximate accuracy of ± 3 m.</p>							

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4.0 CLOSING

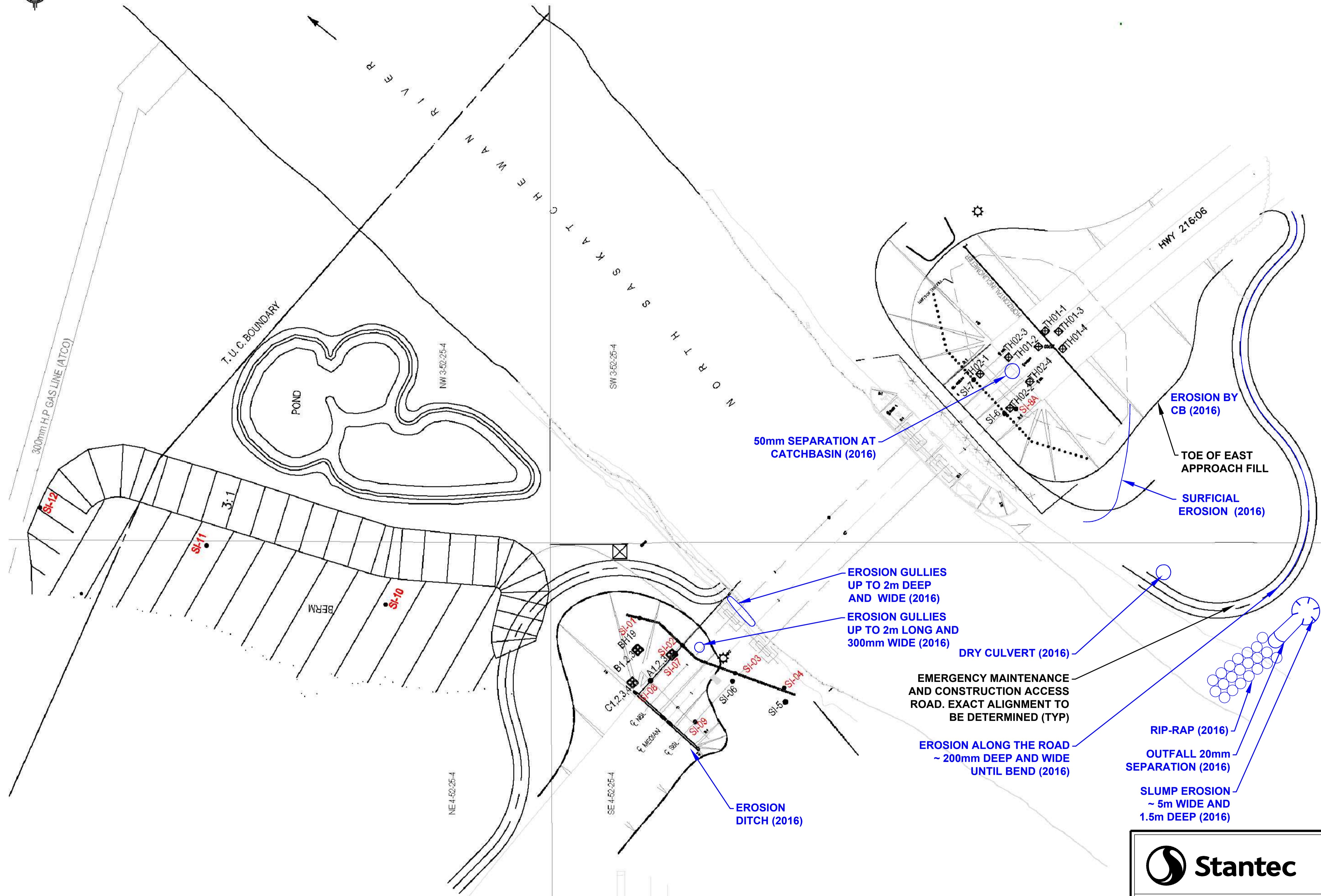
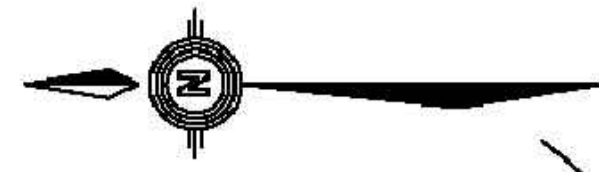
We trust this instrumentation report meets your requirements. If you have any questions, please do not hesitate to contact the undersigned.

Stantec Consulting Ltd.

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Attachment: Figure 1 – Site Plan
SI-01 Slope Inclinator Plots
SI-02 Slope Inclinator Plots
SI-03 Slope Inclinator Plots
SI-06 Slope Inclinator Plots
SI-07 Slope Inclinator Plots
SI-10 Slope Inclinator Plots
SI-11 Slope Inclinator Plots
SI-12 Slope Inclinator Plots
Piezometer Plots West Abutment
Pneumatic Piezometer Plots East Abutment
Vibrating Wire Piezometers Plots East Abutment



LEGEND

- - ACTIVE INCLINOMETER
- - DESTROYED INCLINOMETER
- ⊙ - MONITORING STATION FOR PIEZOMETERS

NOTE

1. PREVIOUS OBSERVATIONS SHOWN IN BLACK
2. 2016 OBSERVATIONS SHOWN IN BLUE

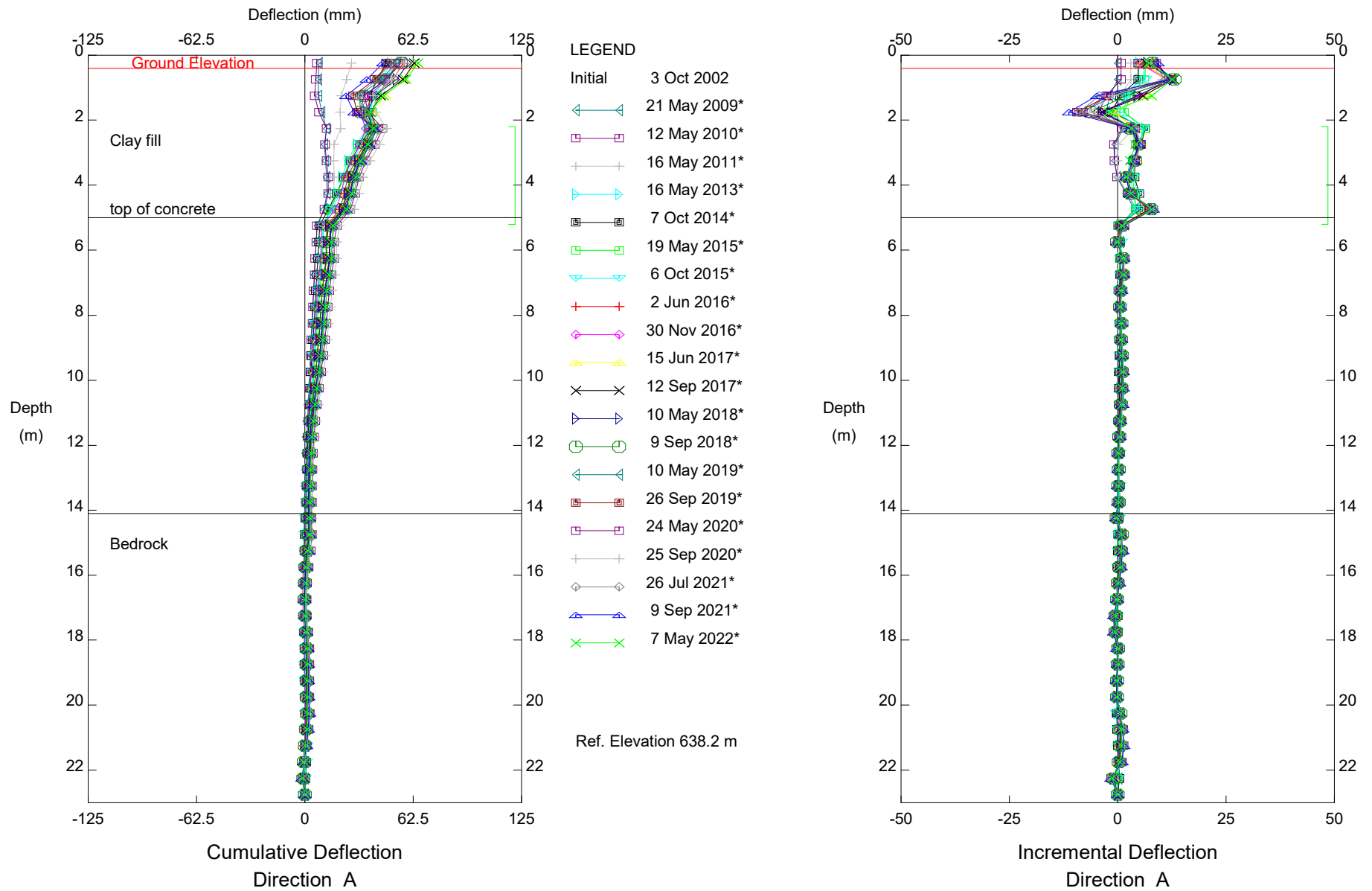


STANTEC CONSULTING
10160-112 STREET
EDMONTON ALBERTA CANADA

ALBERTA TRANSPORTATION
GEOHAZARD MONITORING PROGRAM
NC67 HWY 216-06
SITE PLAN

DRAWN	WW	CHECK	CDM	APPROVE	ID
DATE	22 JULY, 2016	SCALE	AS SHOWN	PROJECT #	123315222

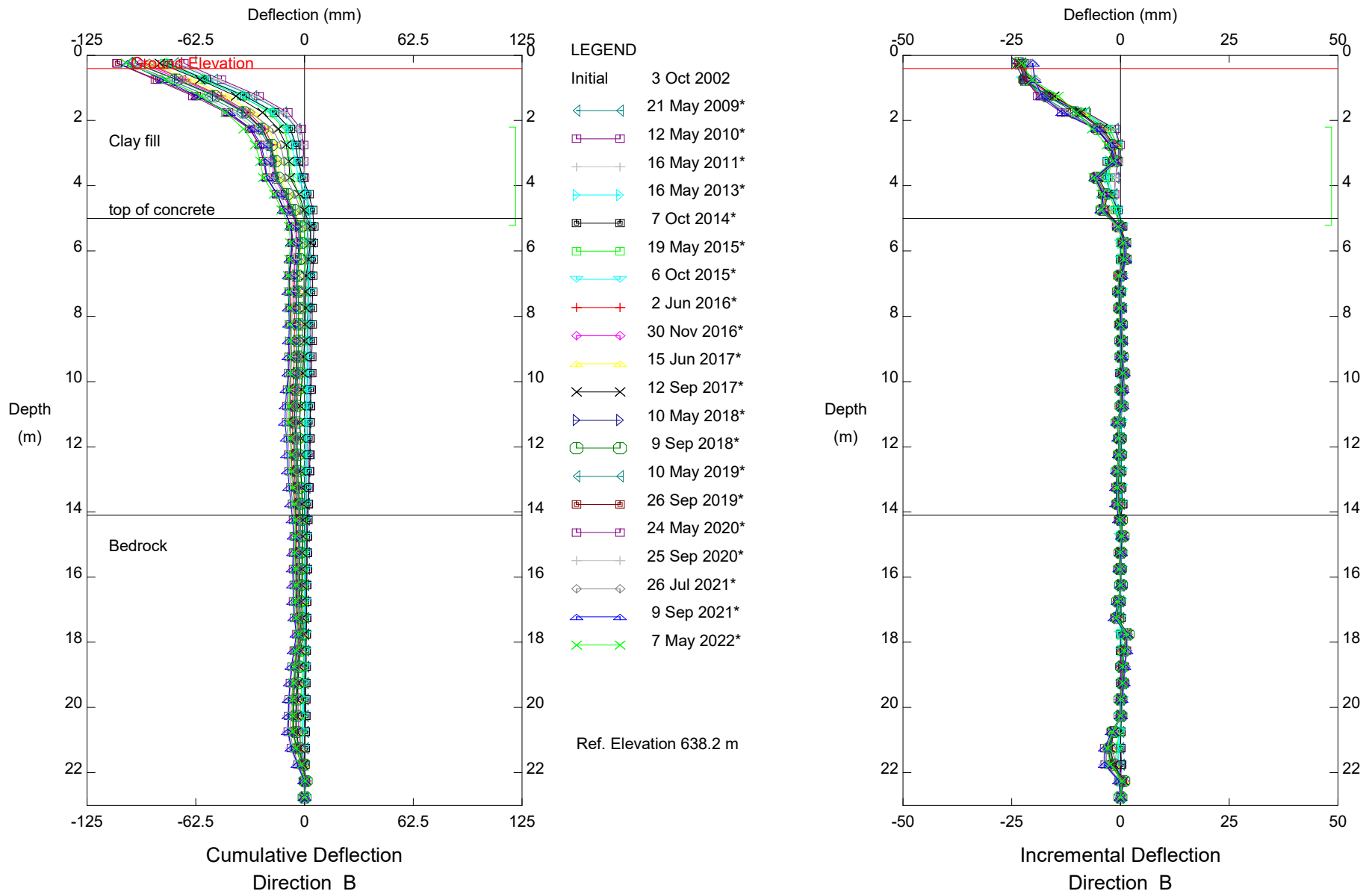
FIGURE - 1



NC067, Inclinometer SI-01

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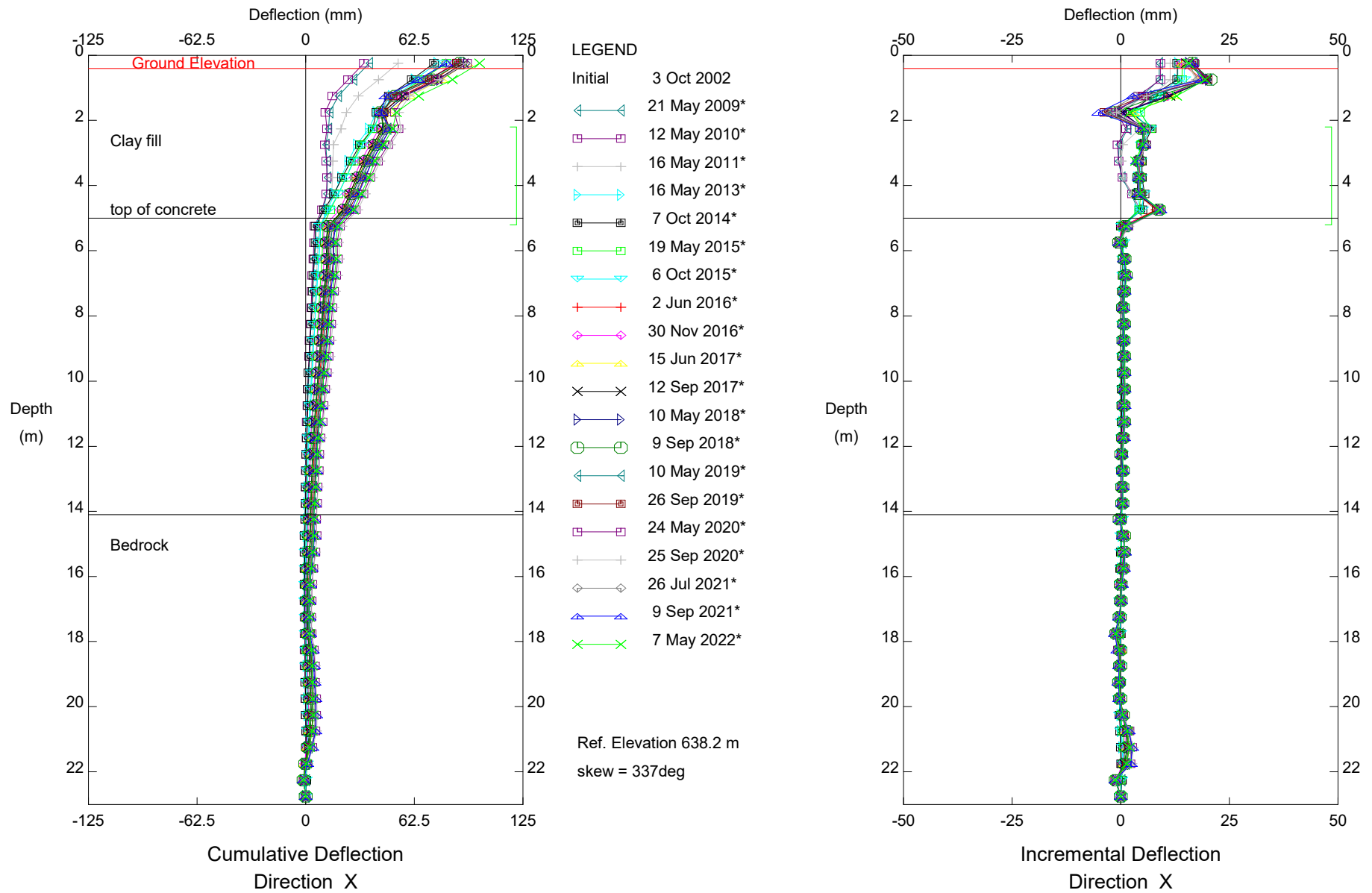
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NC067, Inclinator SI-01

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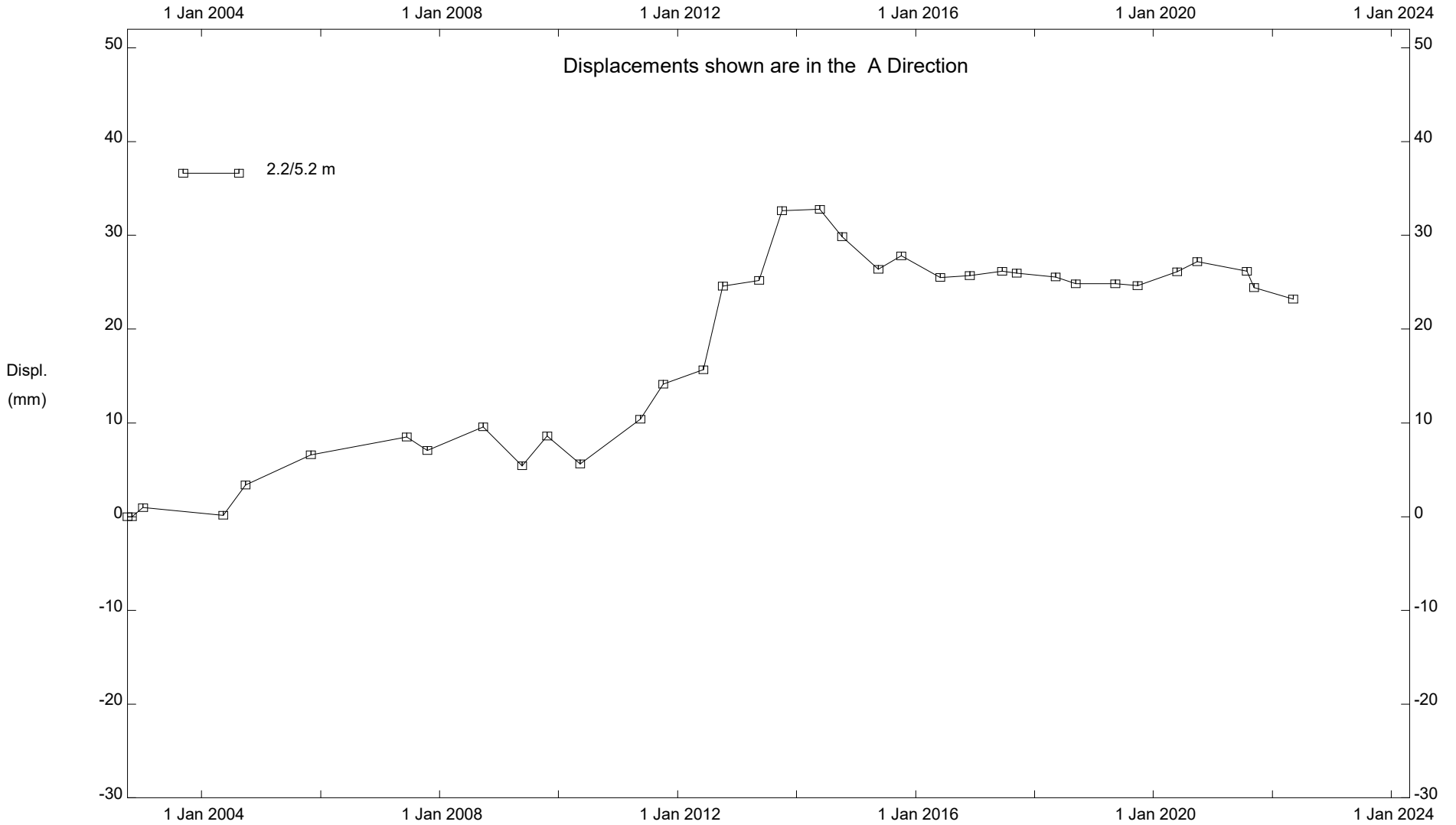


NC067, Inclinometer SI-01

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

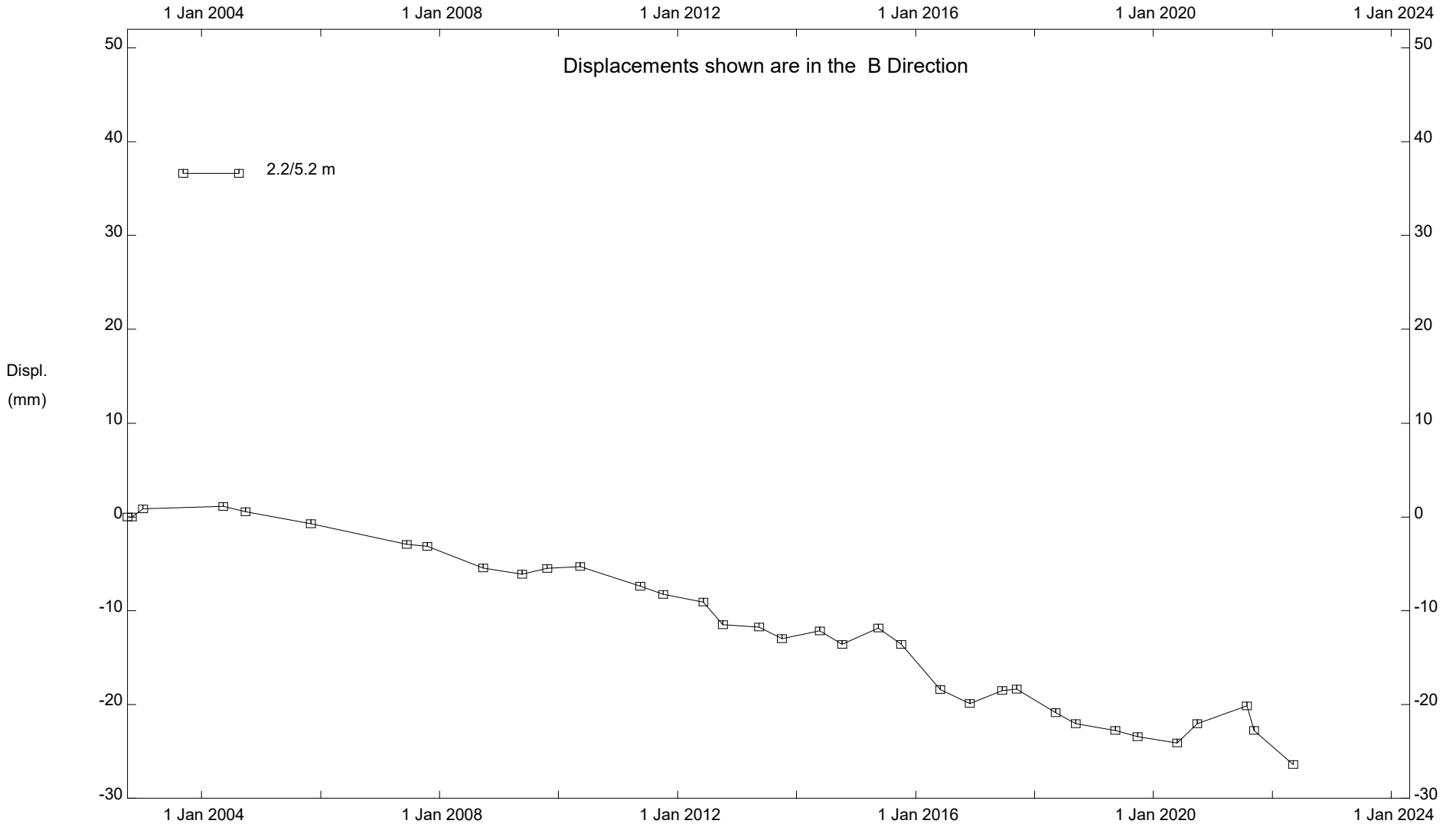
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NC067, Inclinator SI-01

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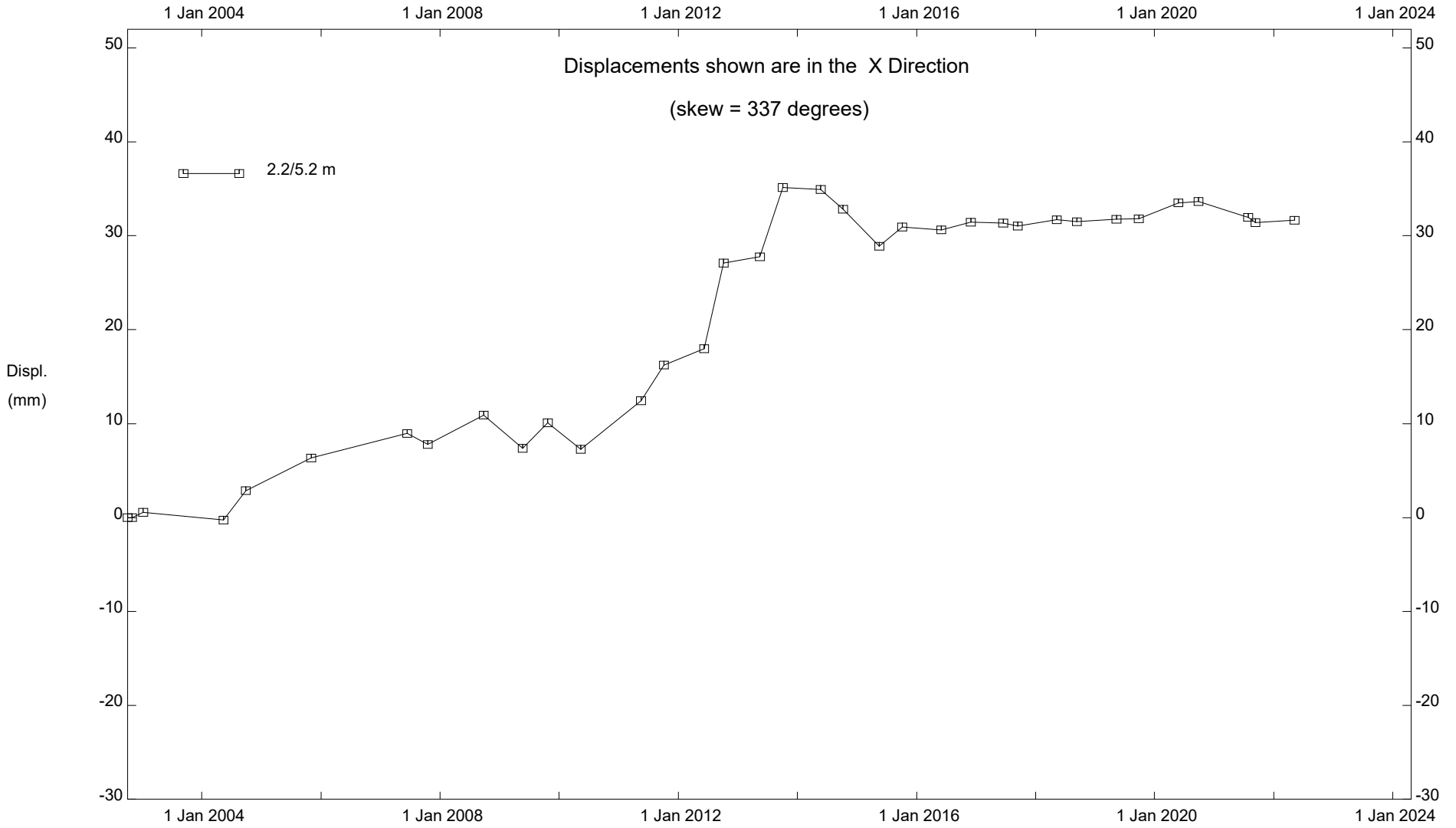
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NC067, Inclinator SI-01

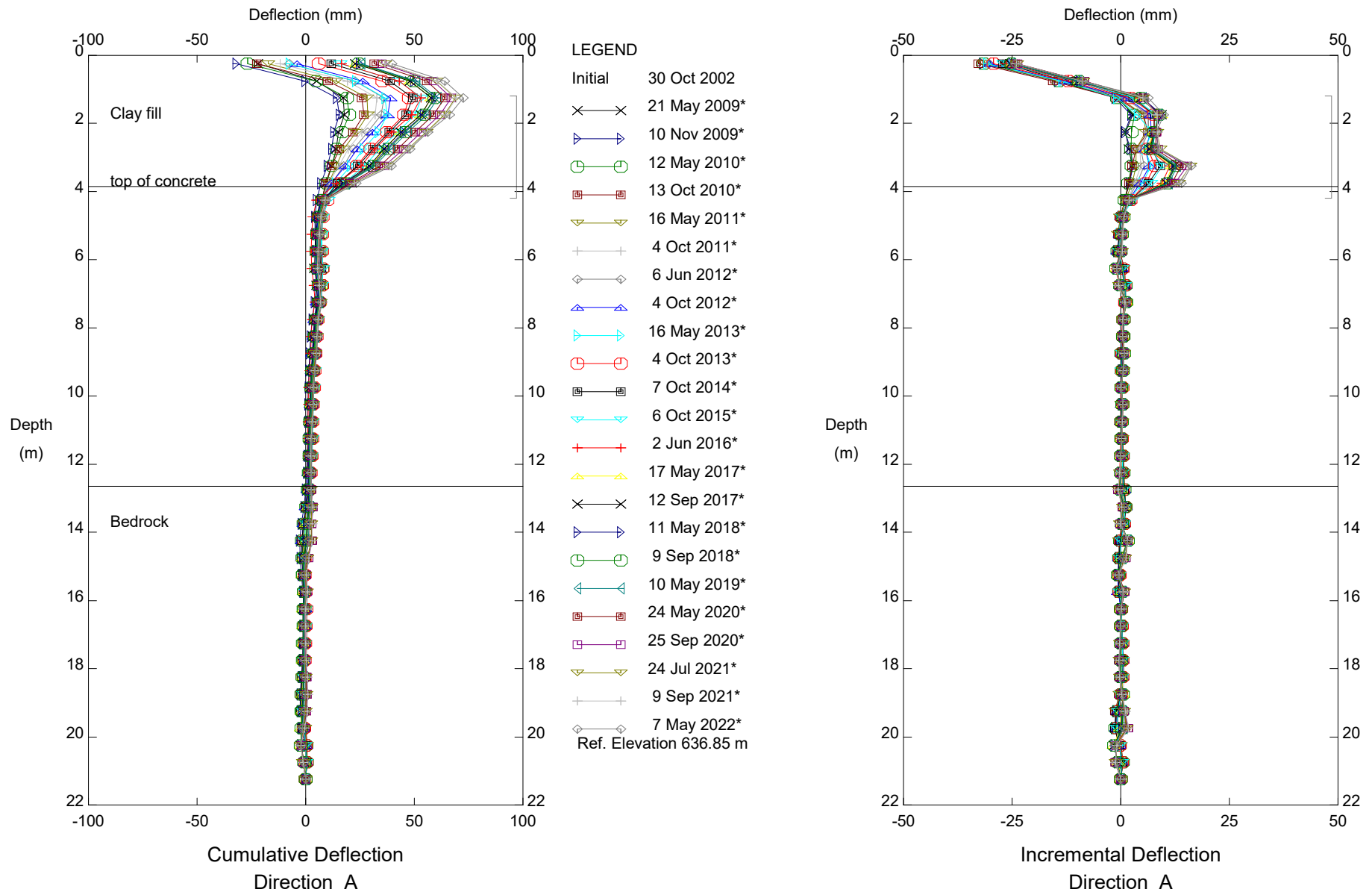
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NC067, Inclinator SI-01

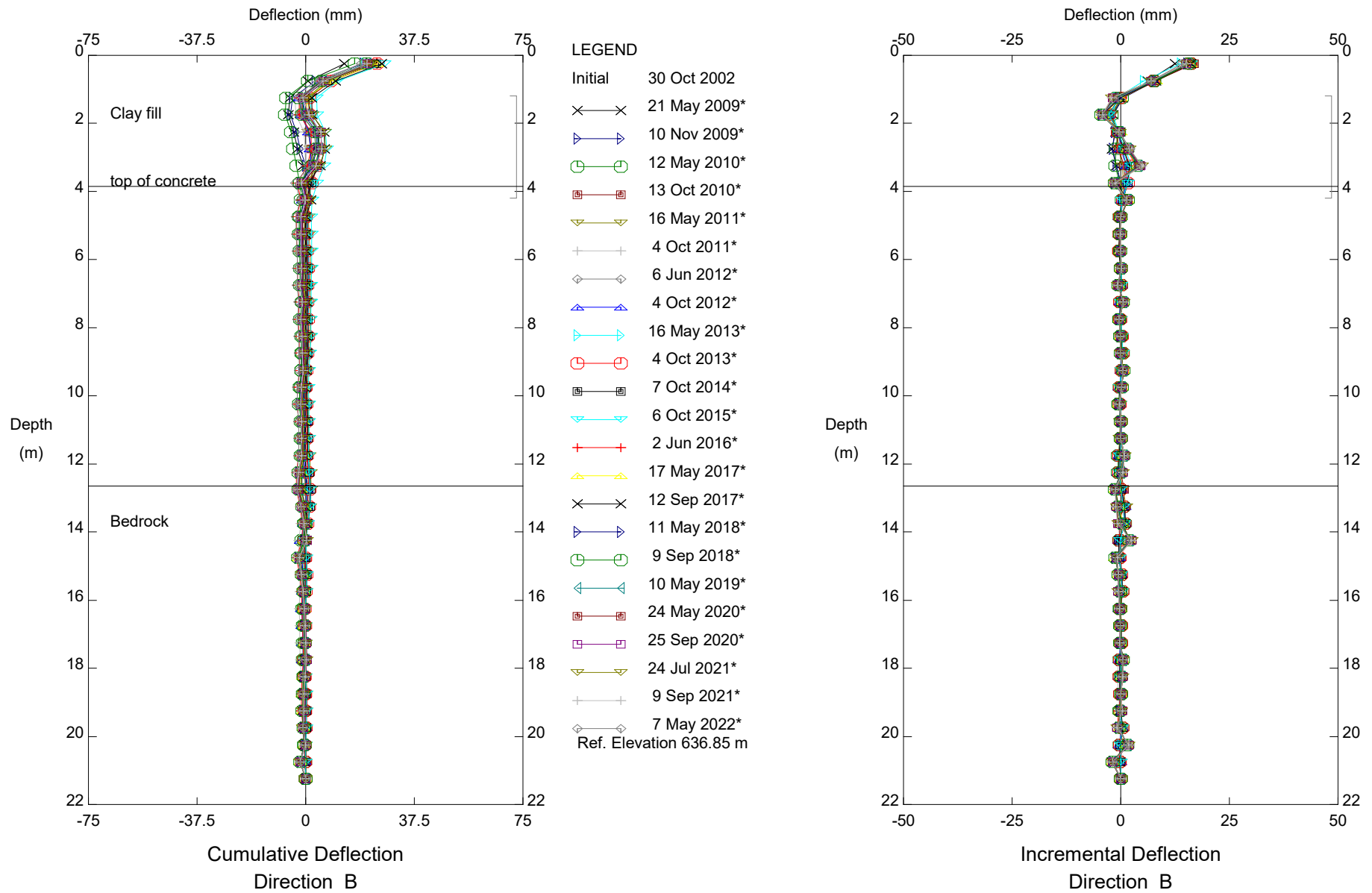
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NC067, Inclinometer SI-02

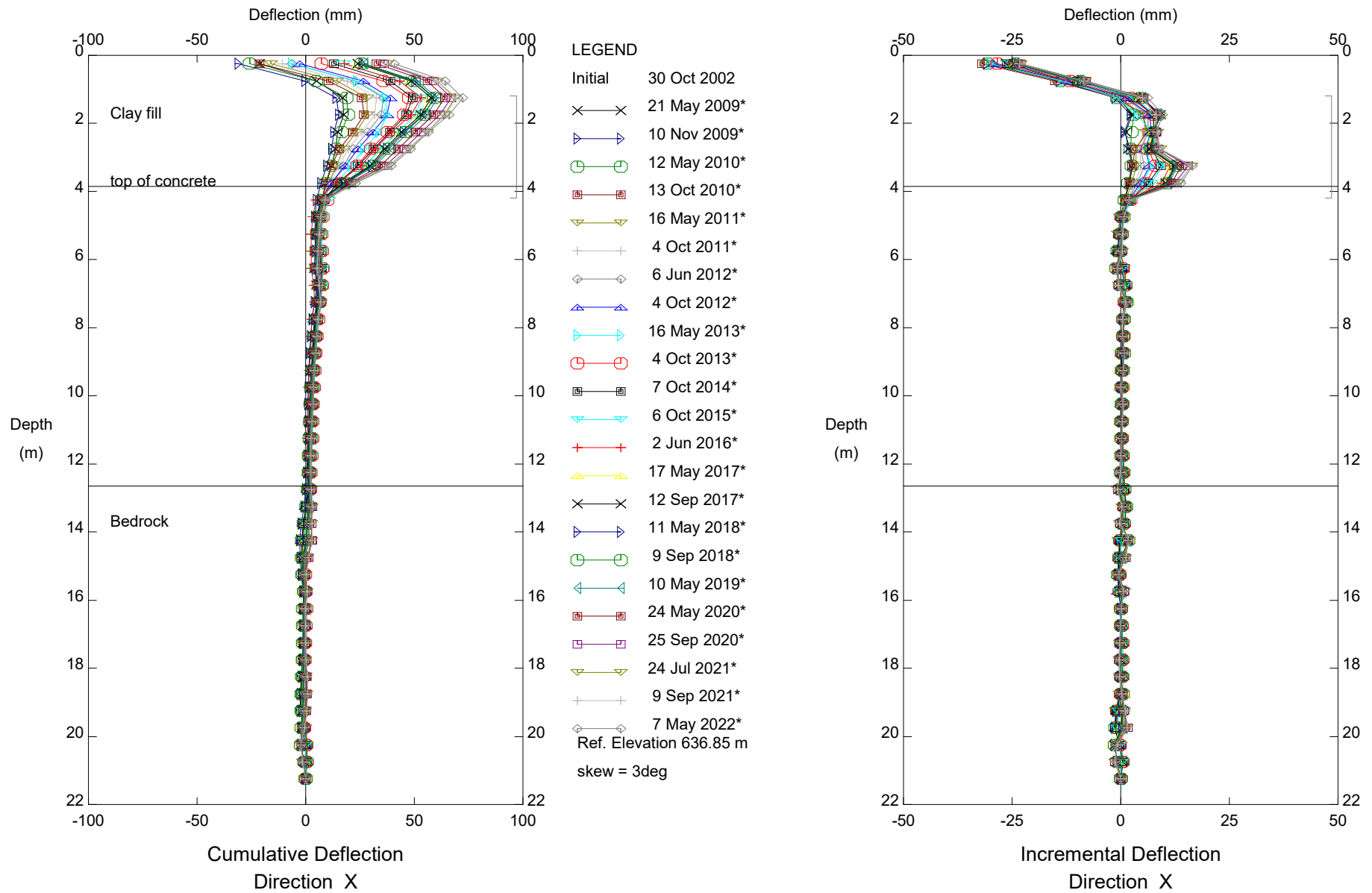
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Sets marked * include zero shift and/or rotation corrections.



NC067, Inclinator SI-02
 Alberta Transportation

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

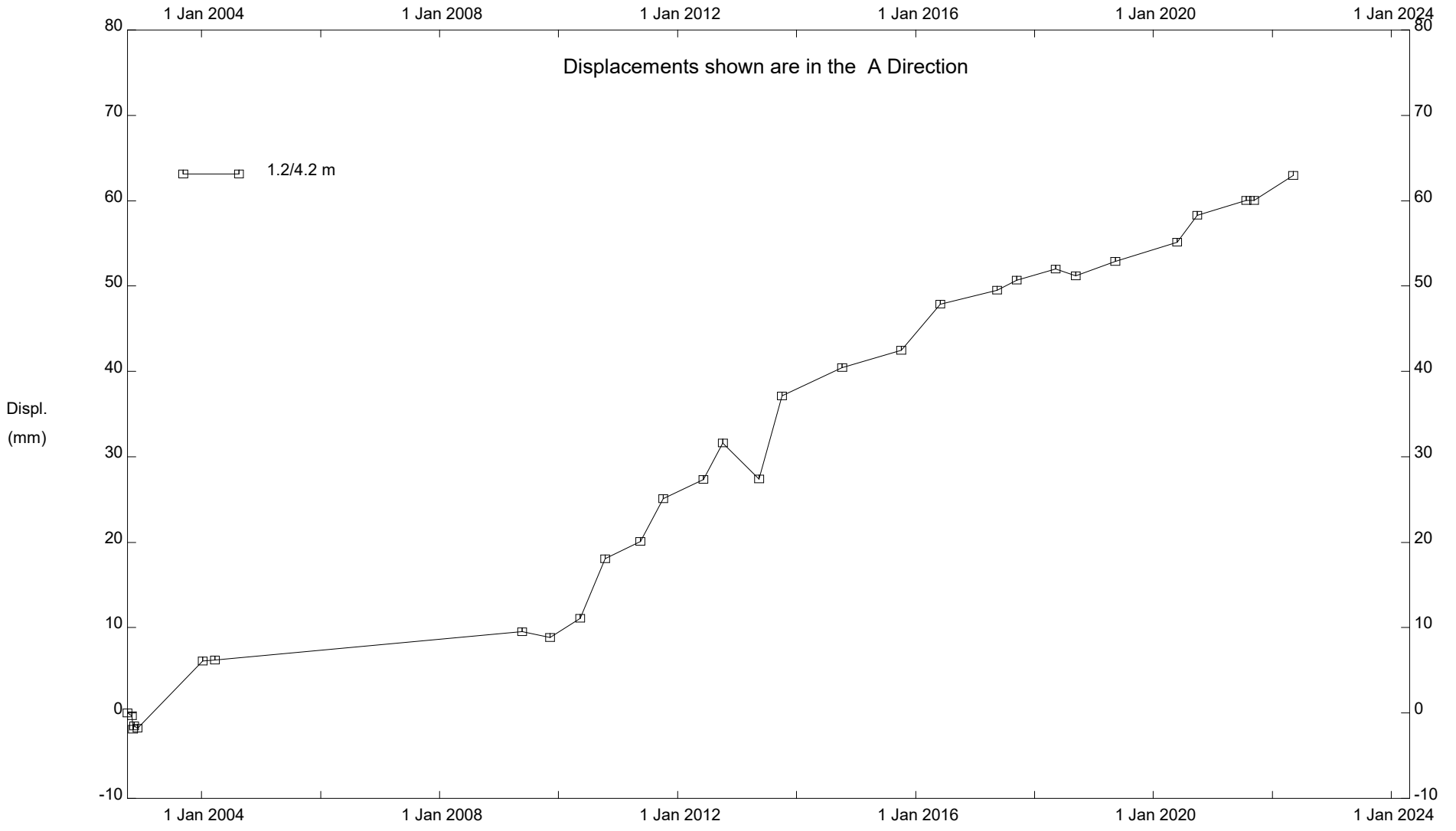


NC067, Inclinometer SI-02

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

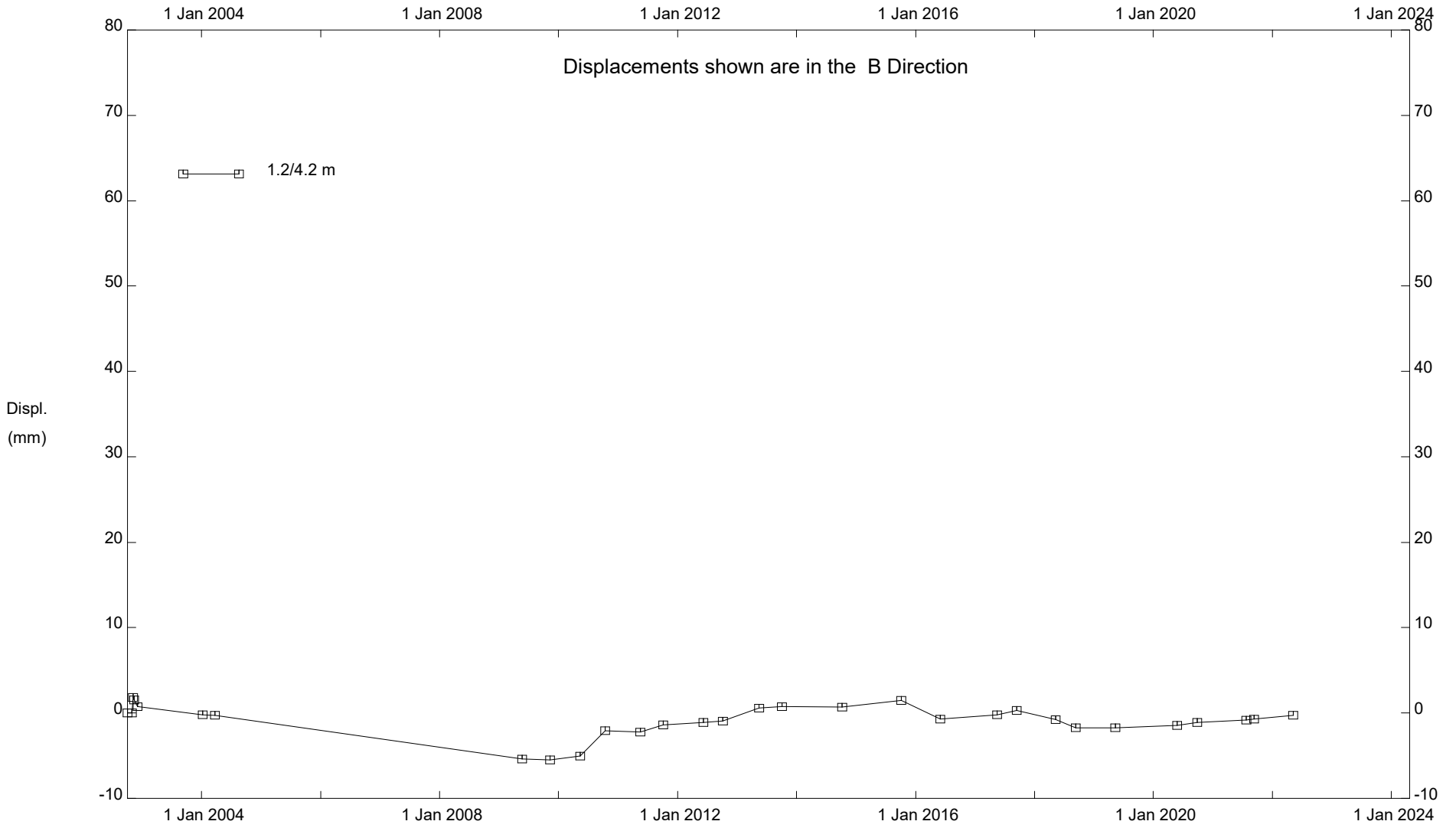
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NC067, Inclinator SI-02

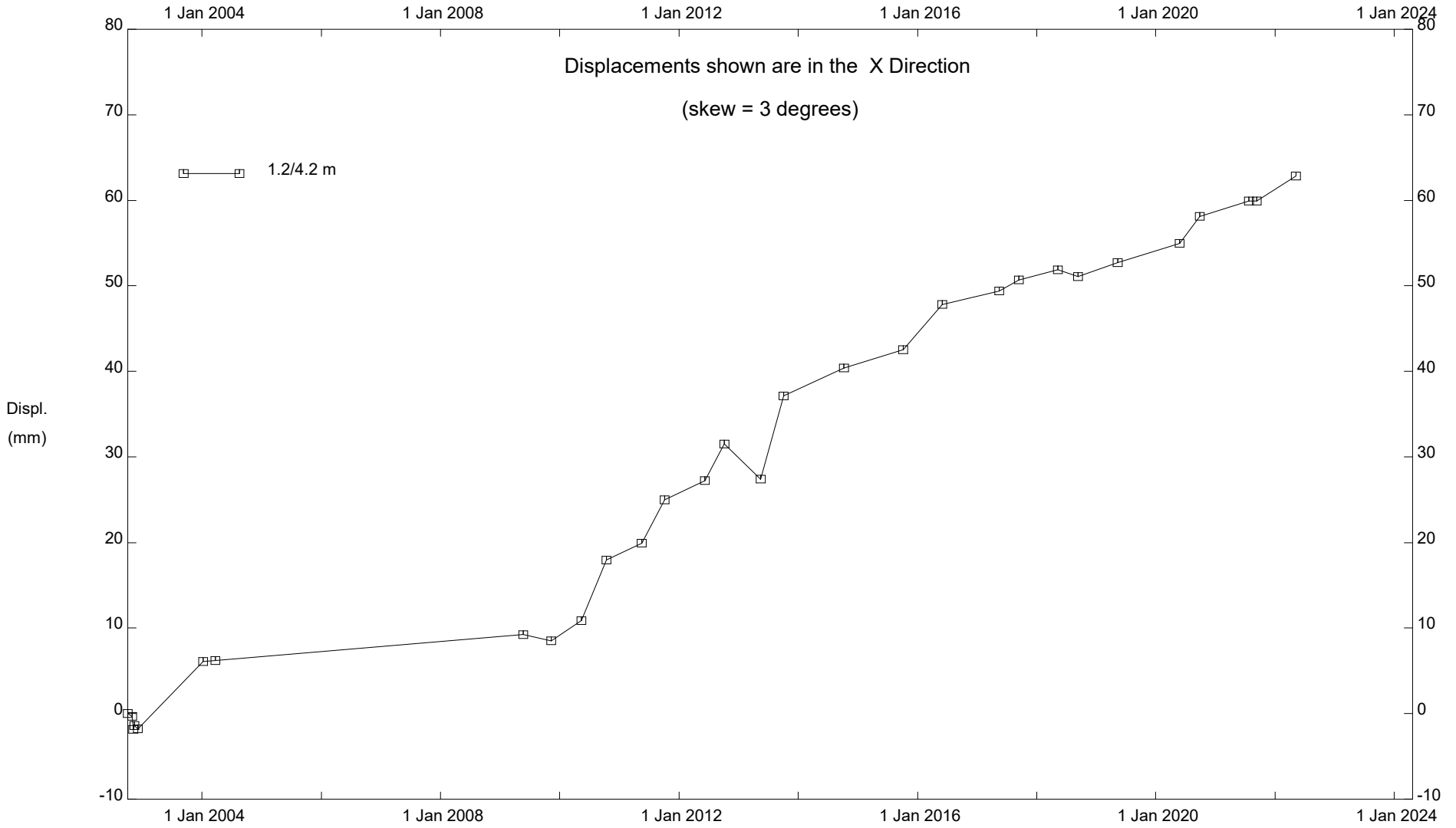
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NC067, Inclinator SI-02
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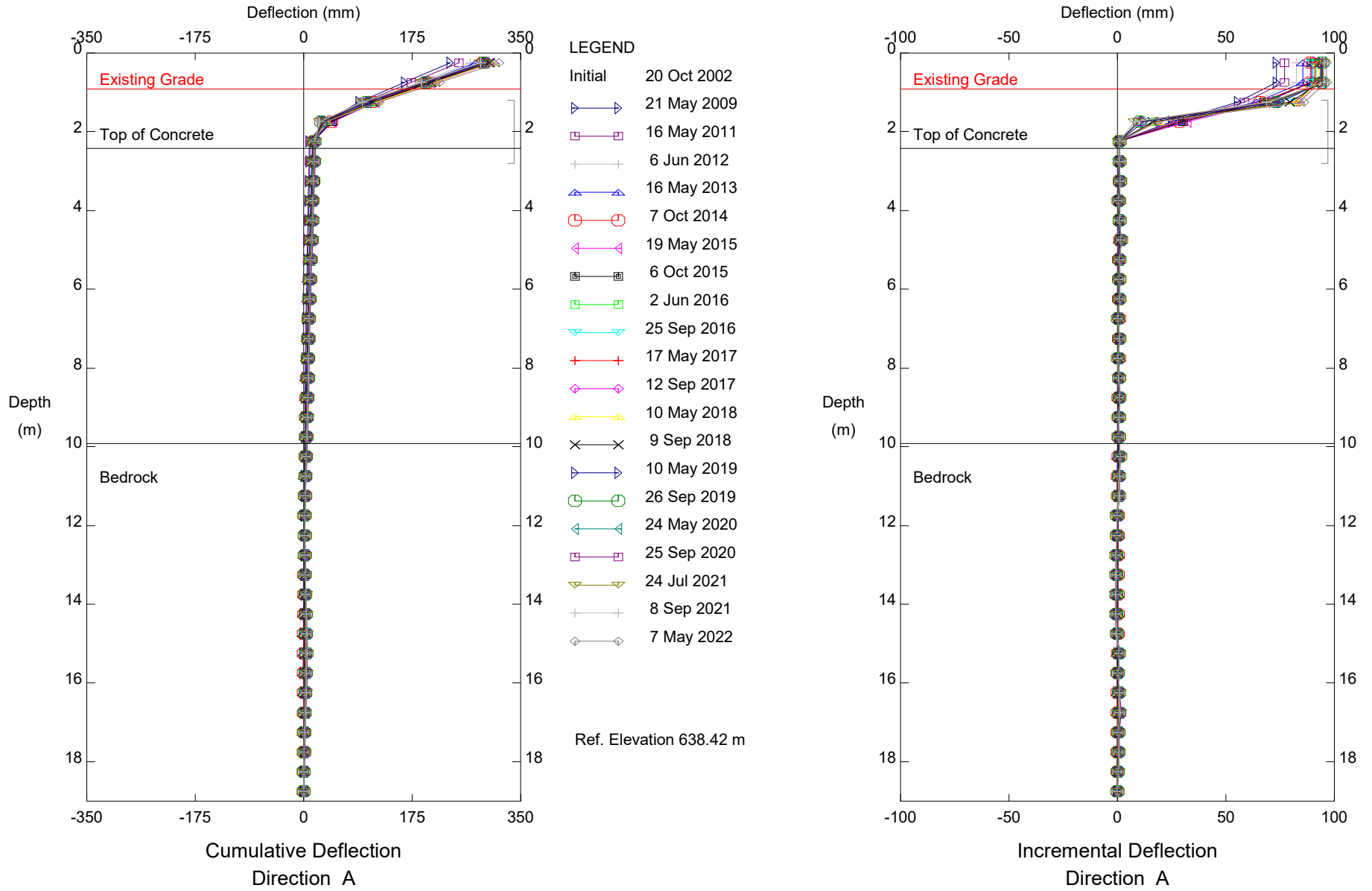
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NC067, Inclinator SI-02

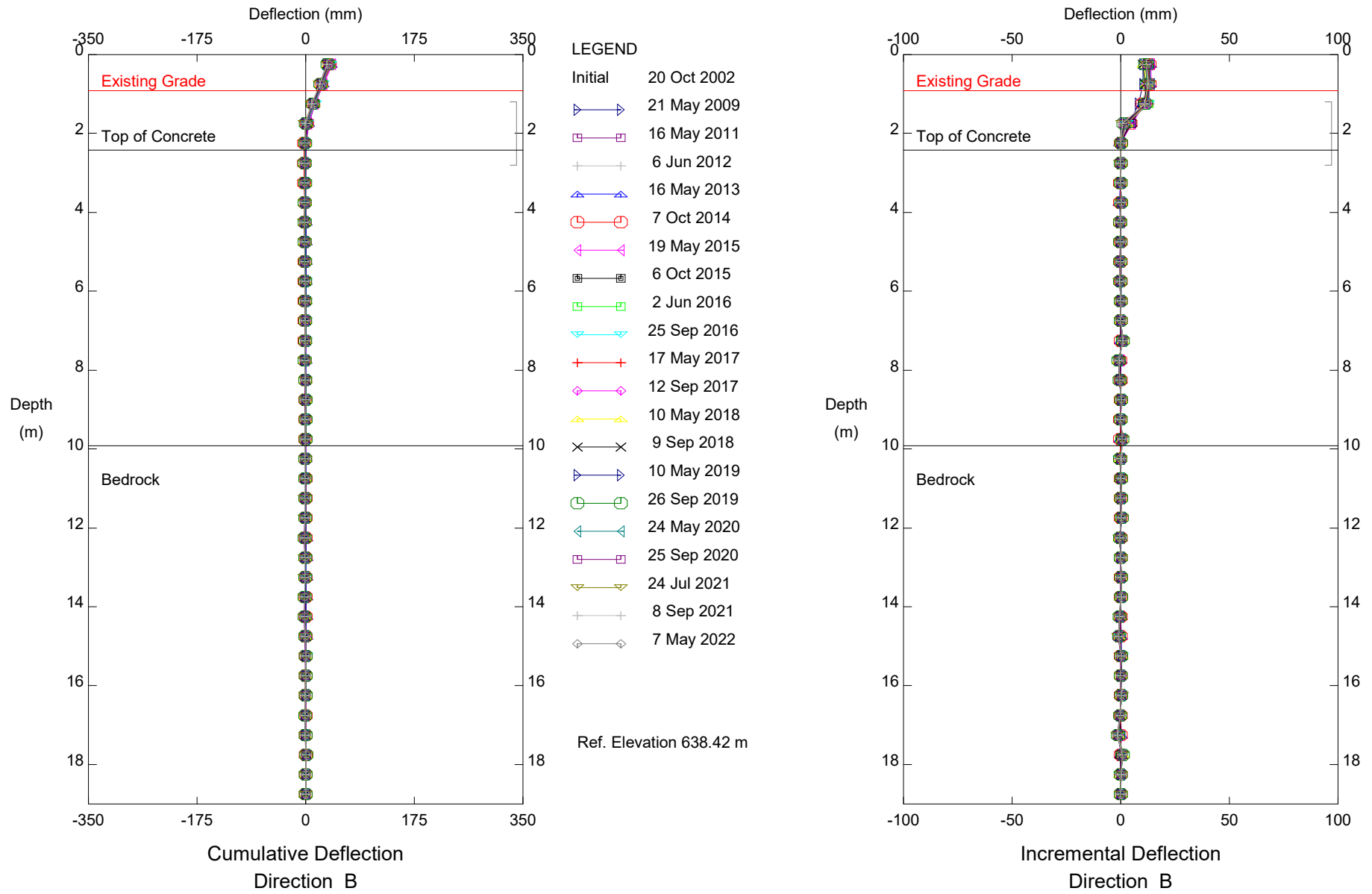
Alberta Transportation

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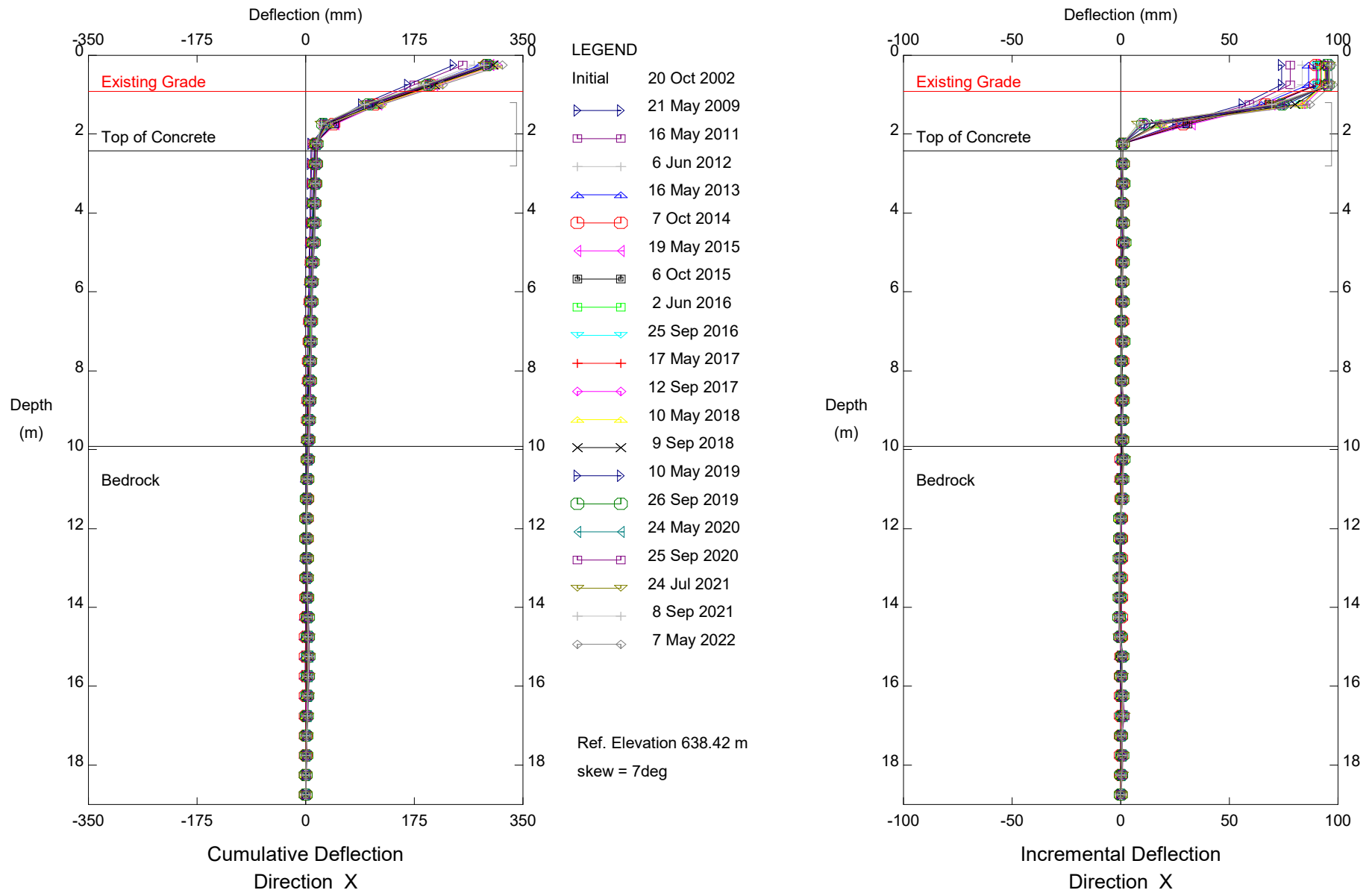


NC067, Inclinometer SI-03
 Alberta Transportation

Stantec Consulting Ltd - Edmonton

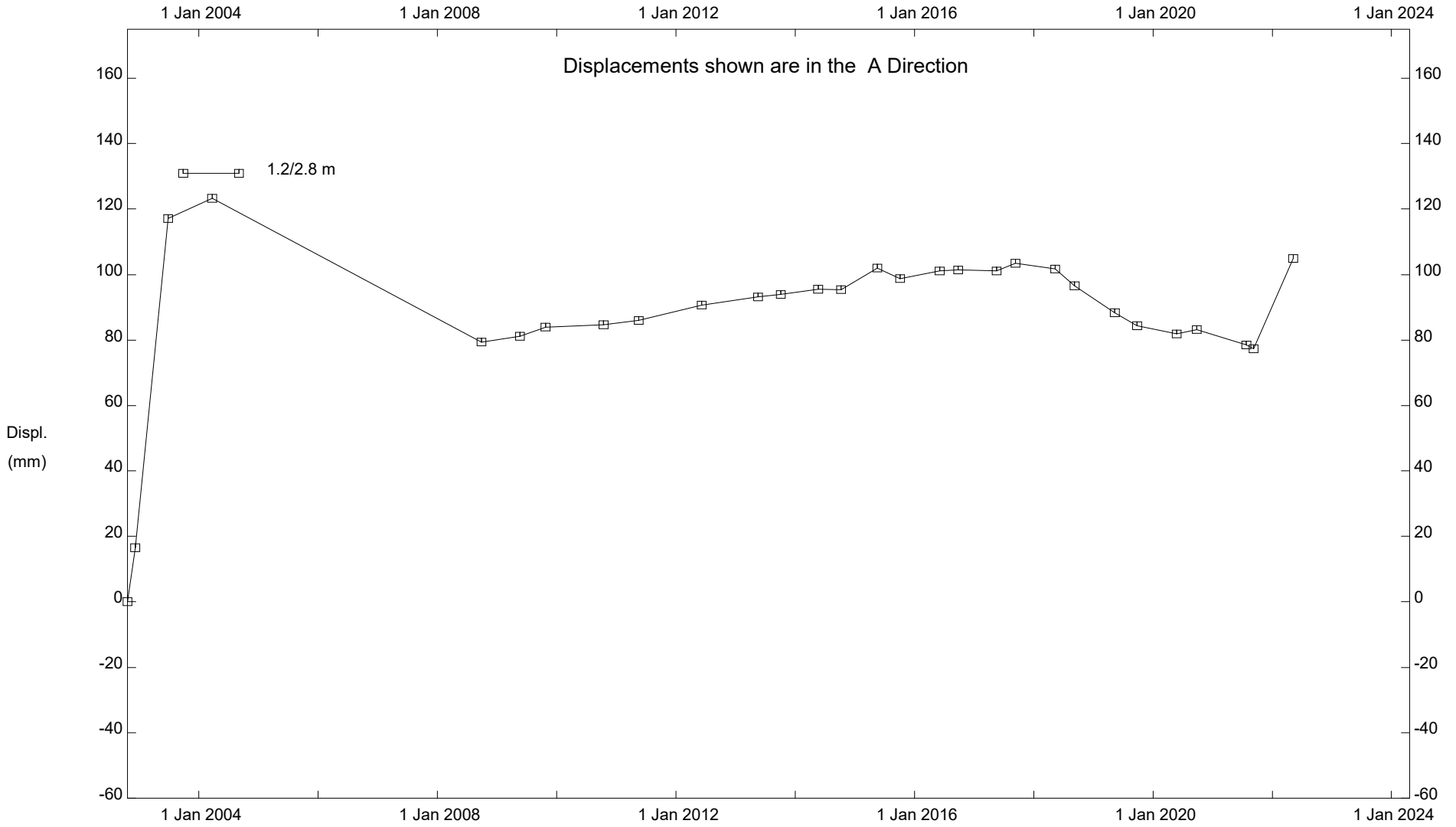


NC067, Inclinometer SI-03
 Alberta Transportation



NC067, Inclinometer SI-03
Alberta Transportation

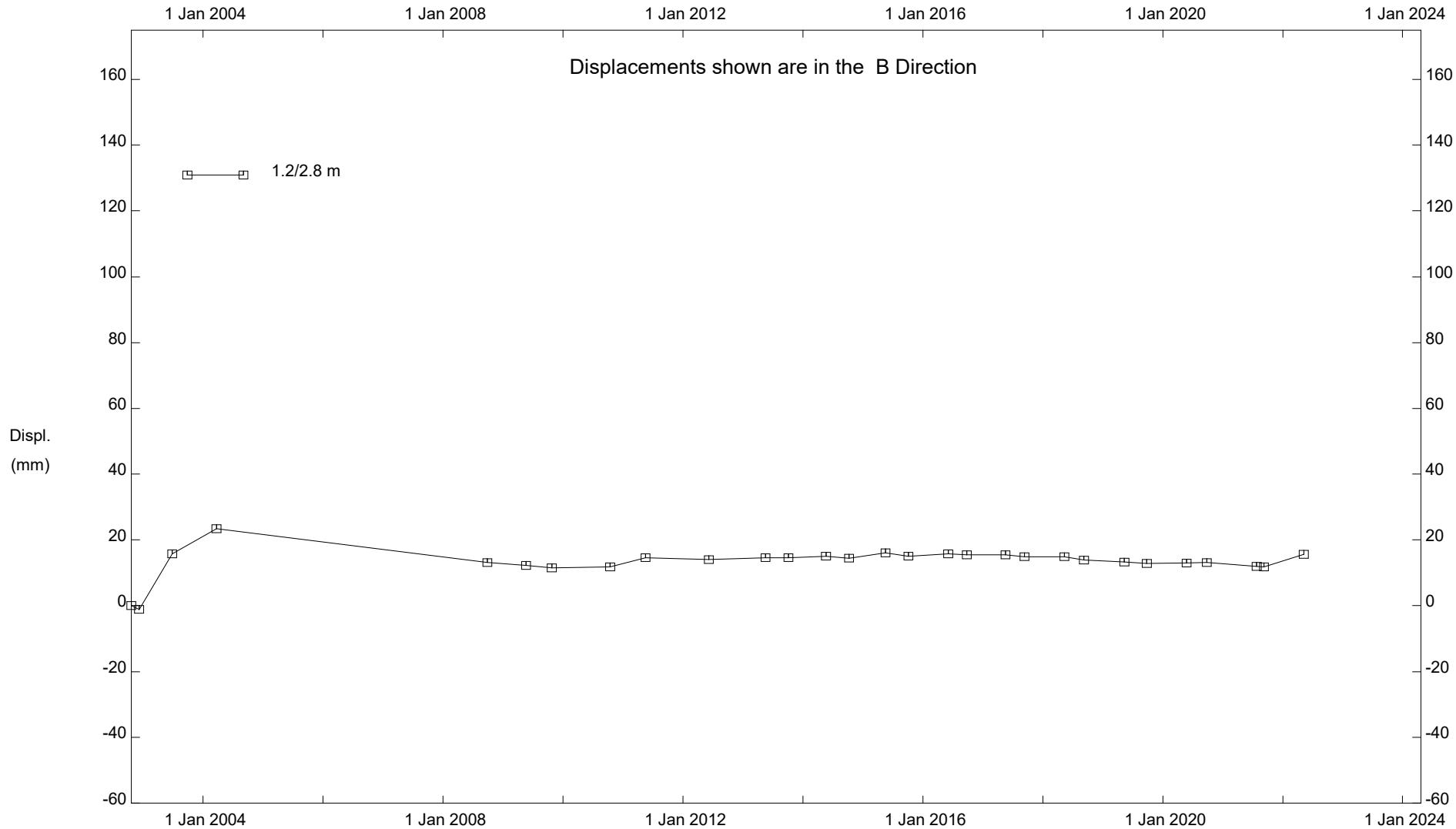
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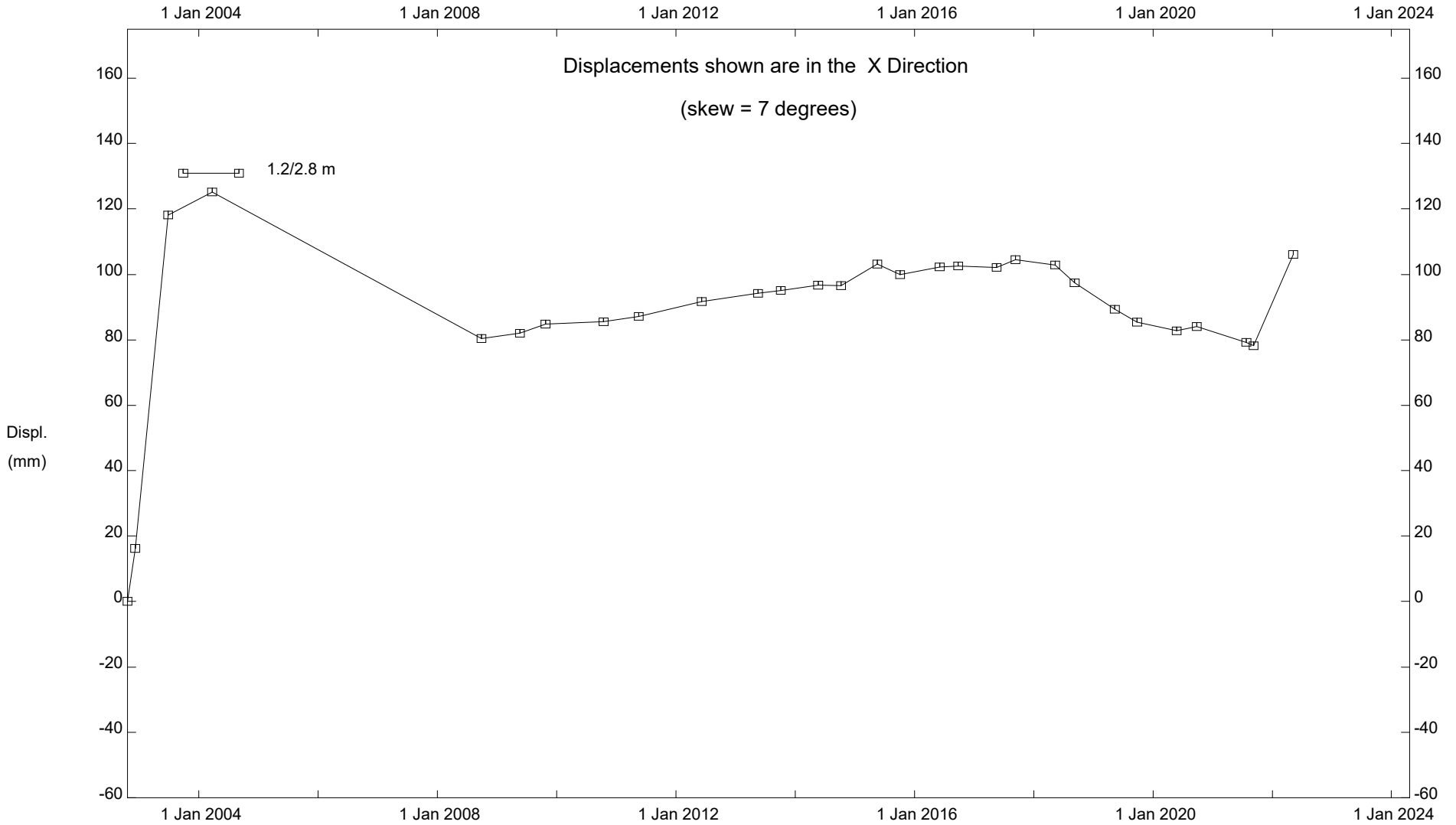
Alberta Transportation

Stantec Consulting Ltd - Edmonton



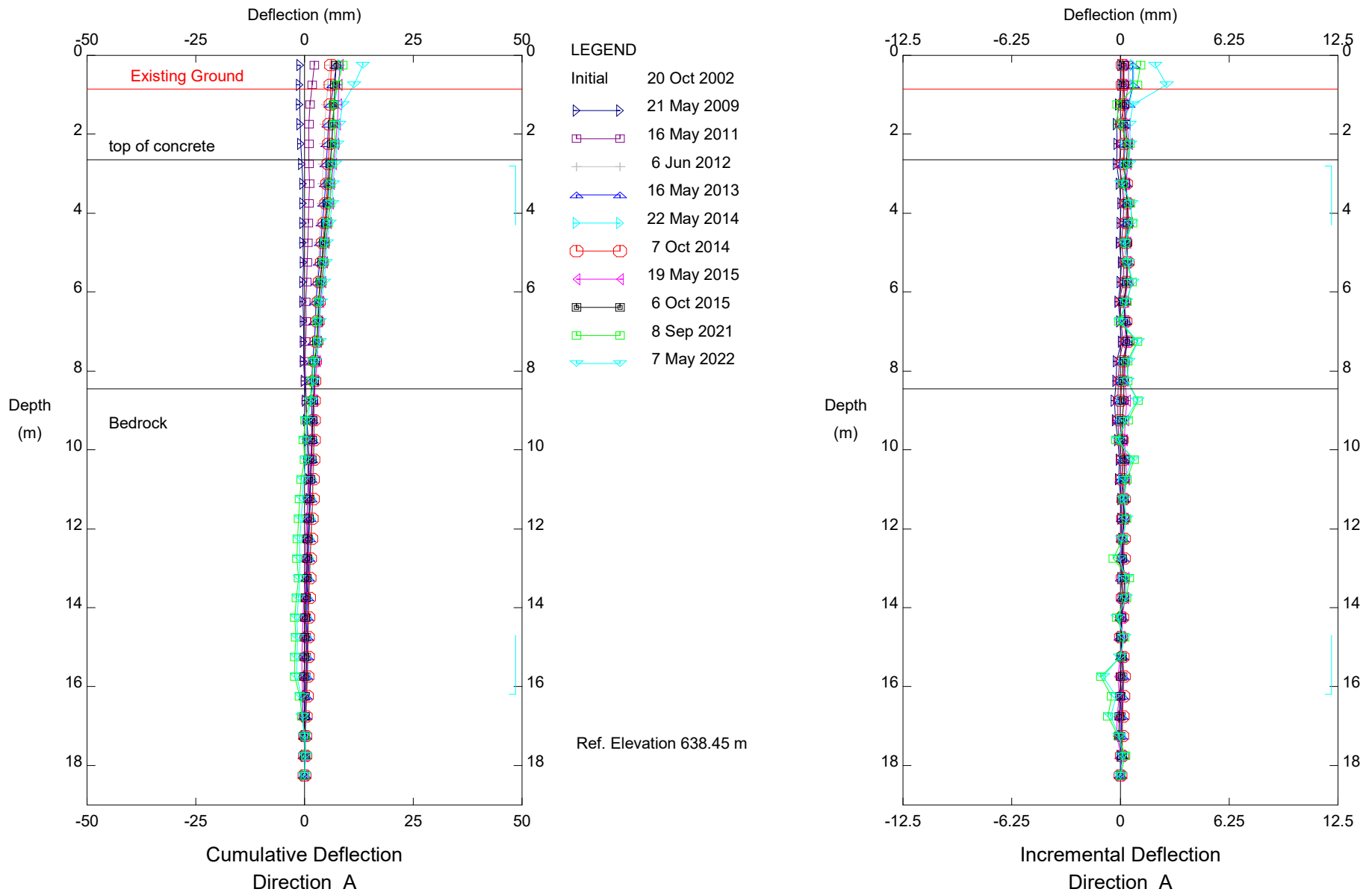
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Alberta Transportation

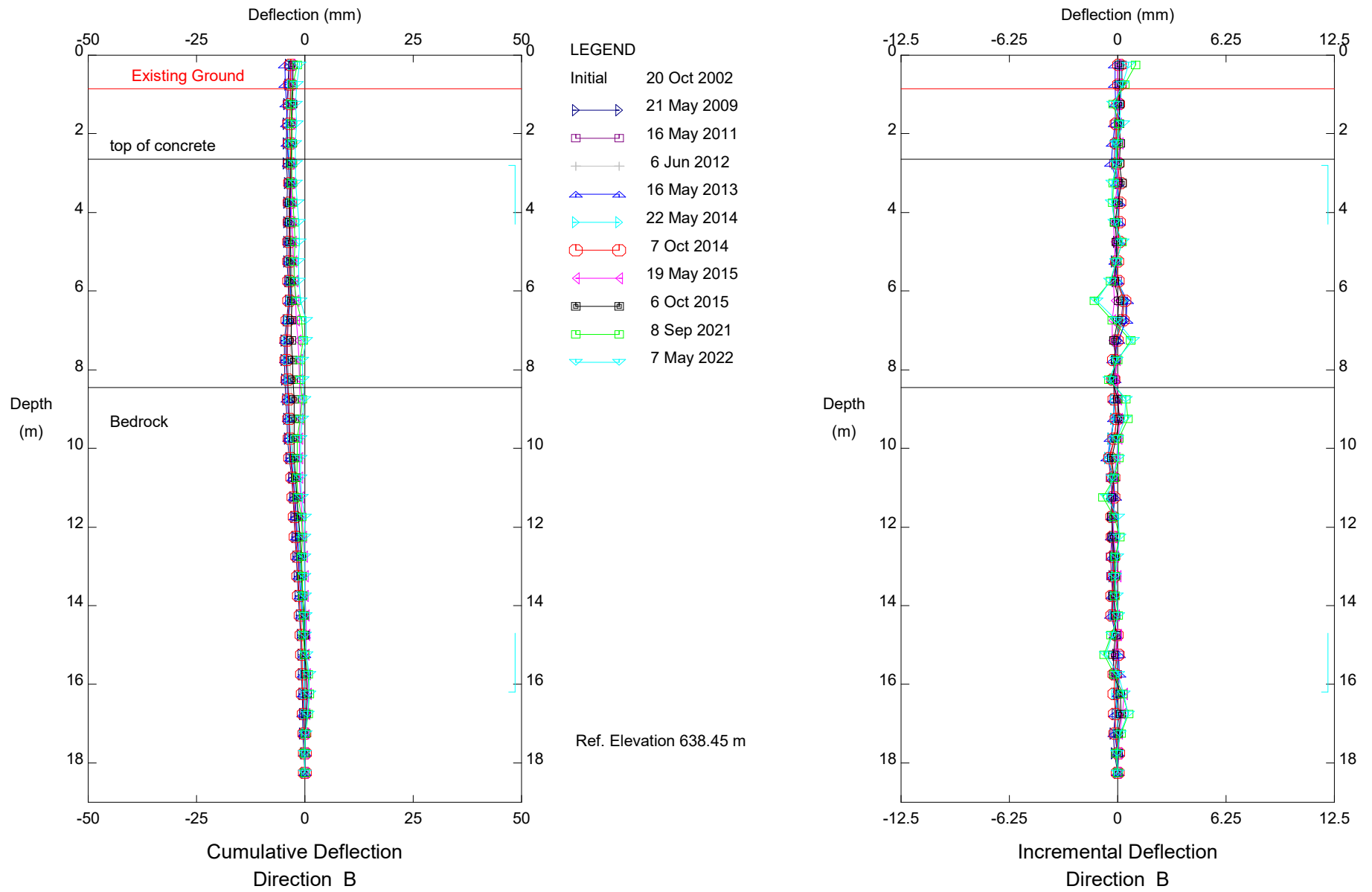


NC067, Inclinator SI-03

Alberta Transportation

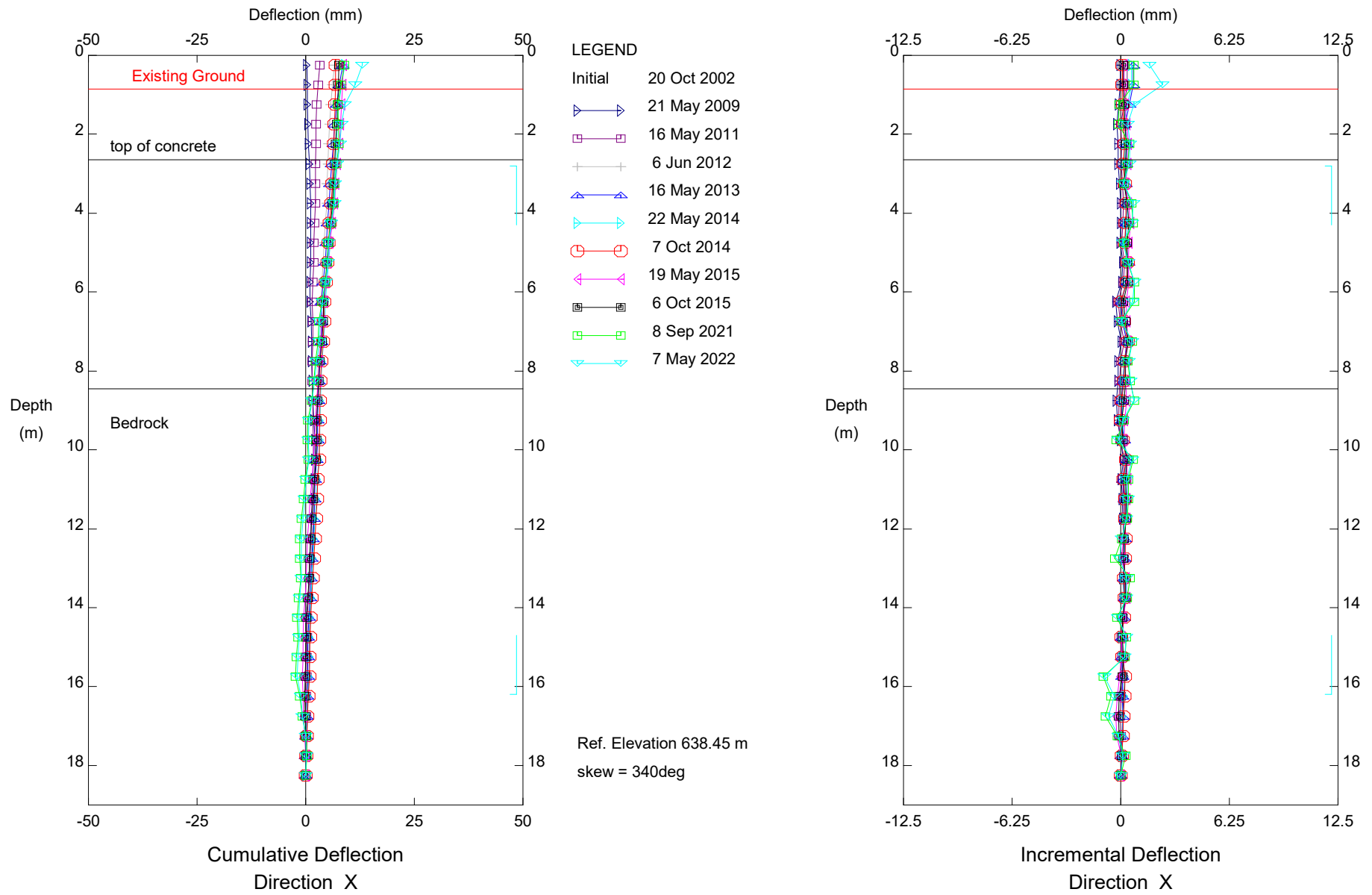


NC067, Inclinometer SI-04
 Alberta Transportation



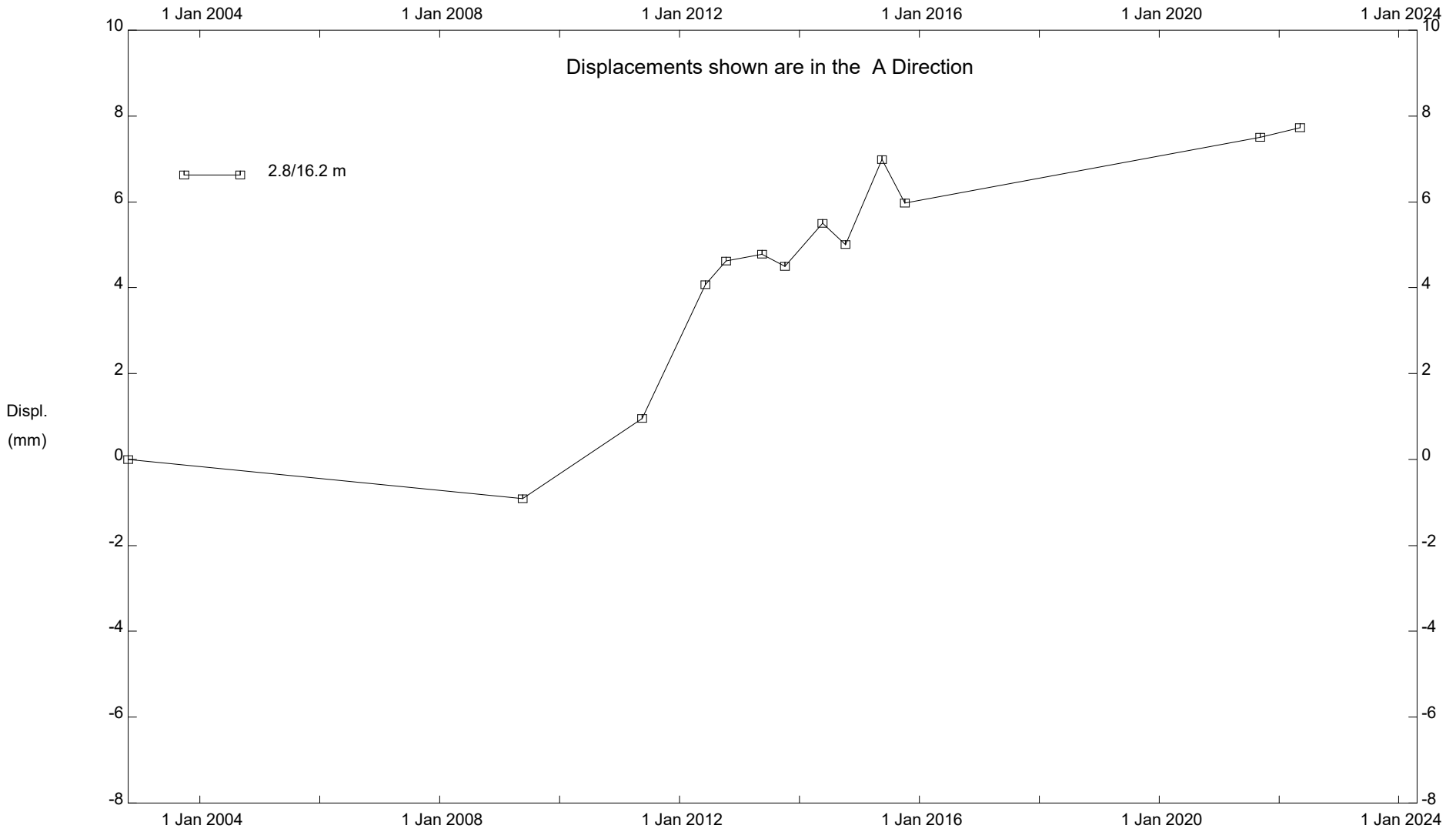
NC067, Inclinometer SI-04
 Alberta Transportation

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NC067, Inclinator SI-04
 Alberta Transportation

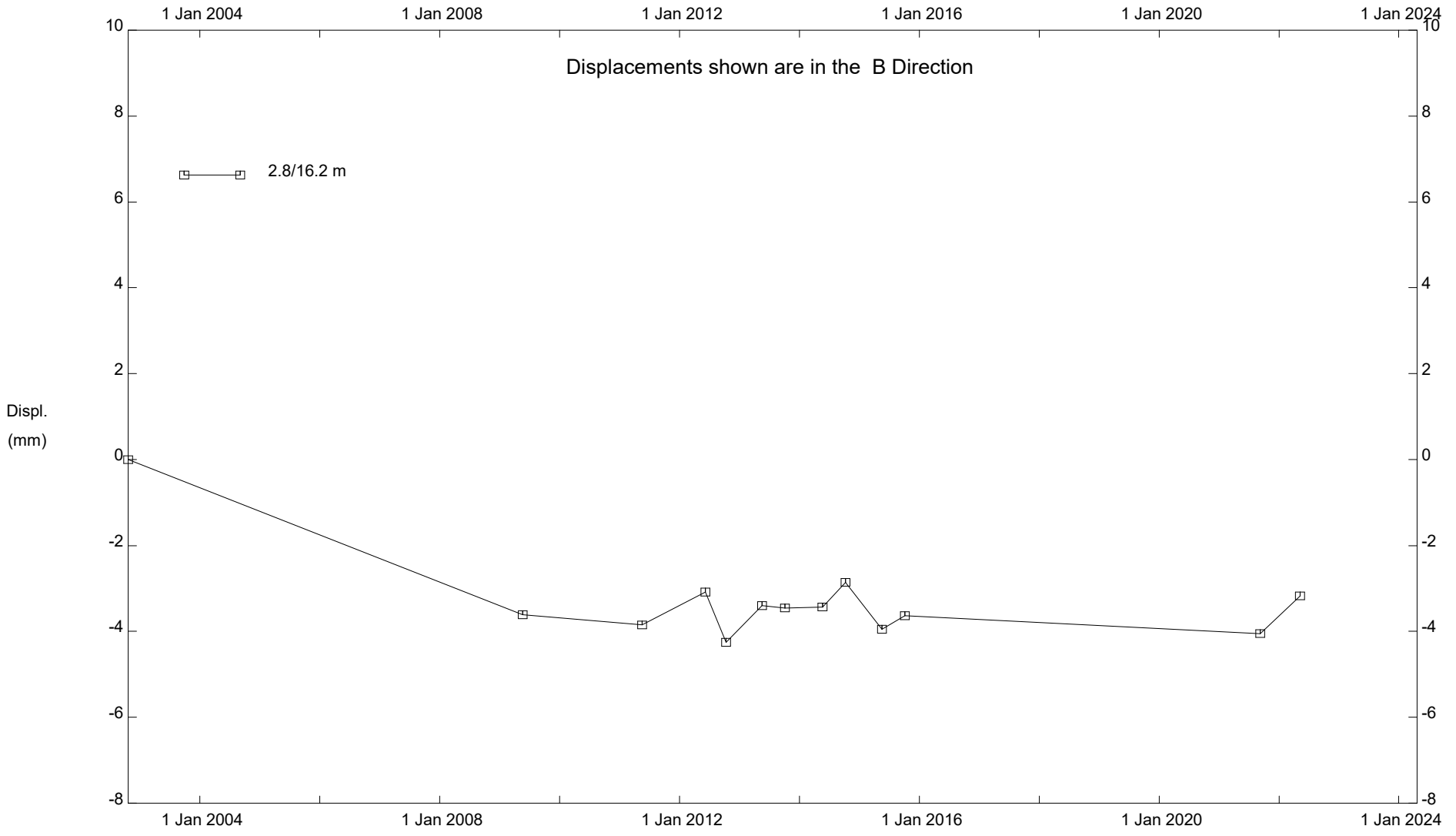
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NC067, Inclinator SI-04

Alberta Transportation

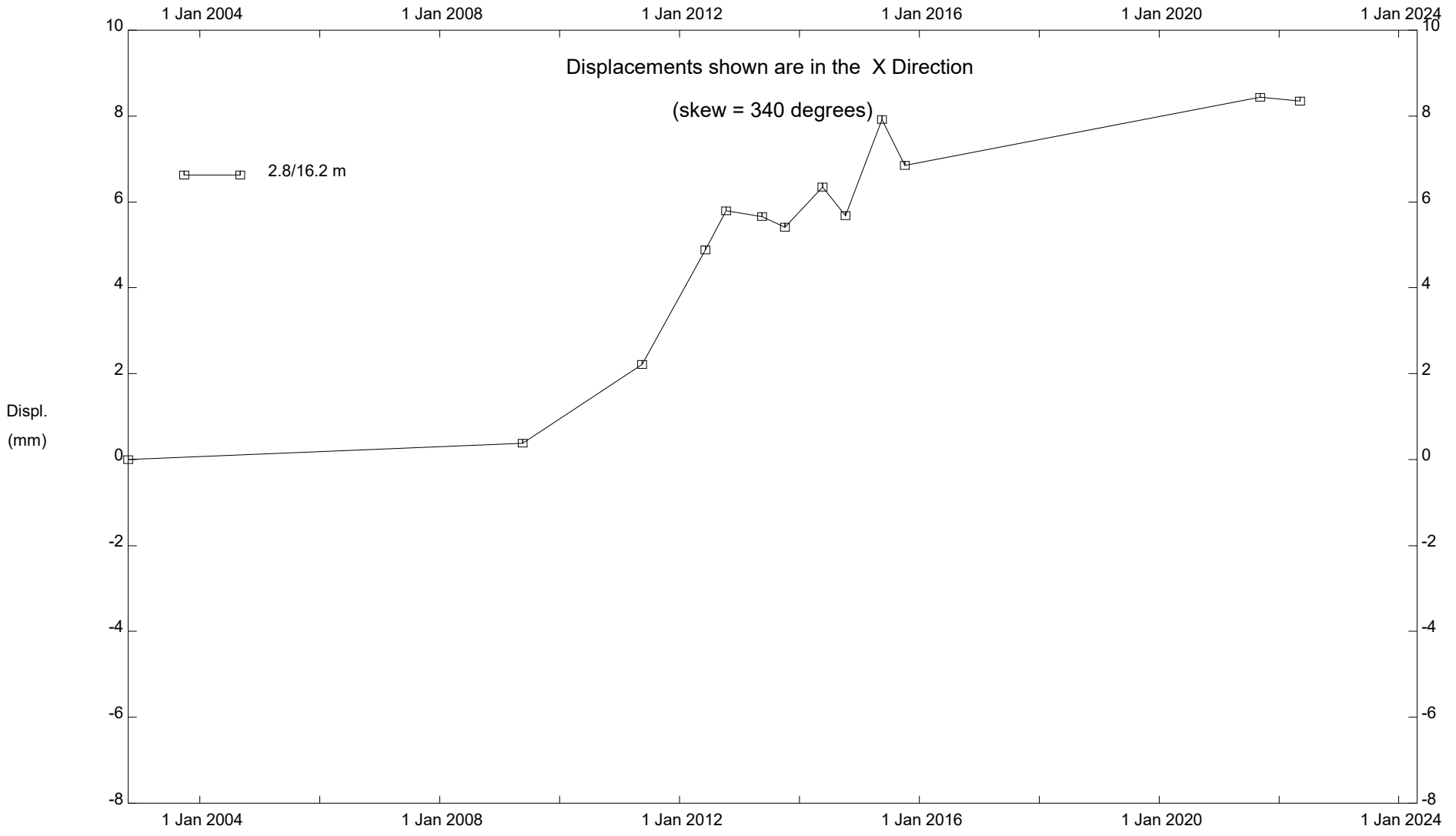
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Alberta Transportation

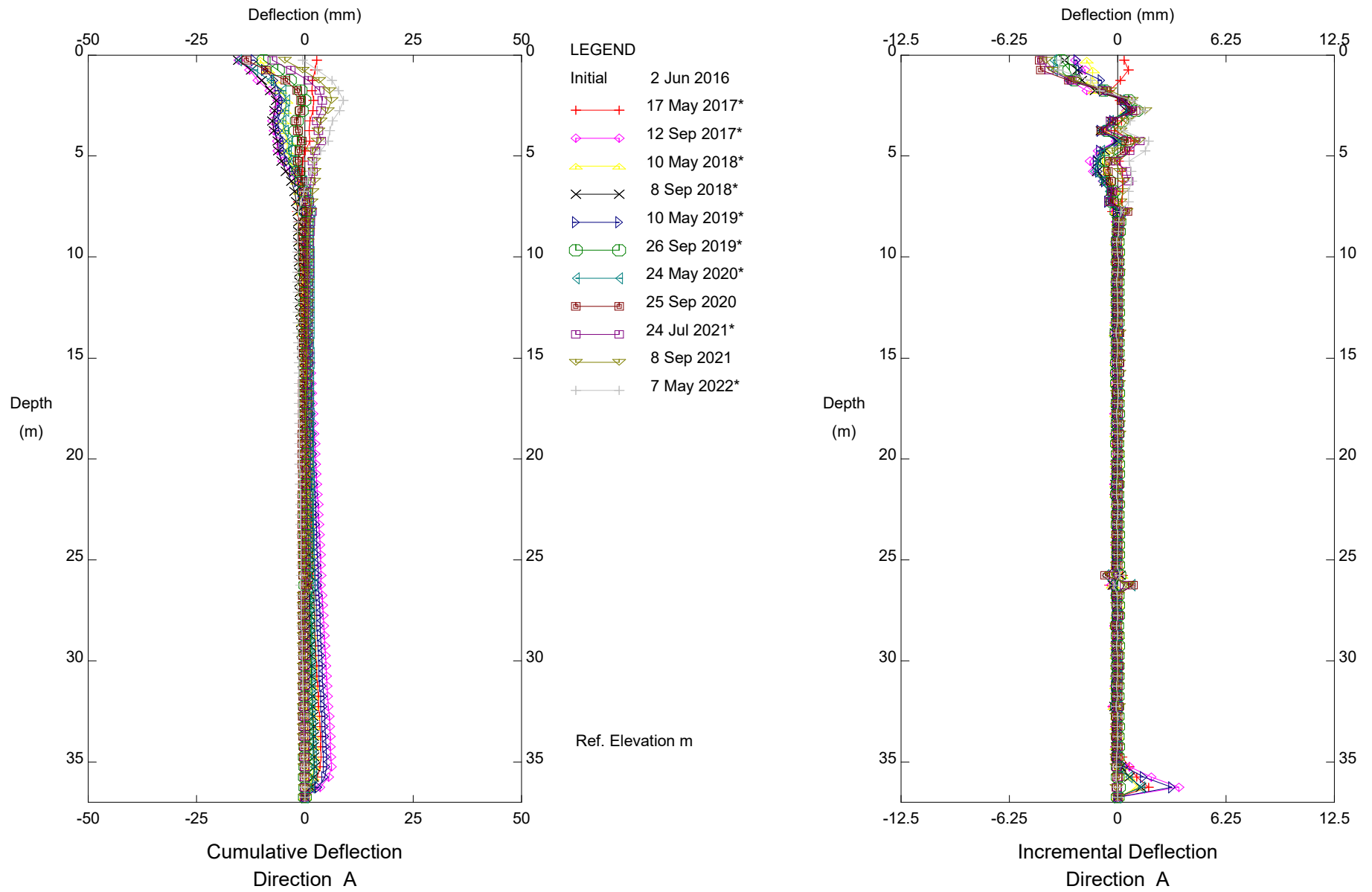
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Alberta Transportation

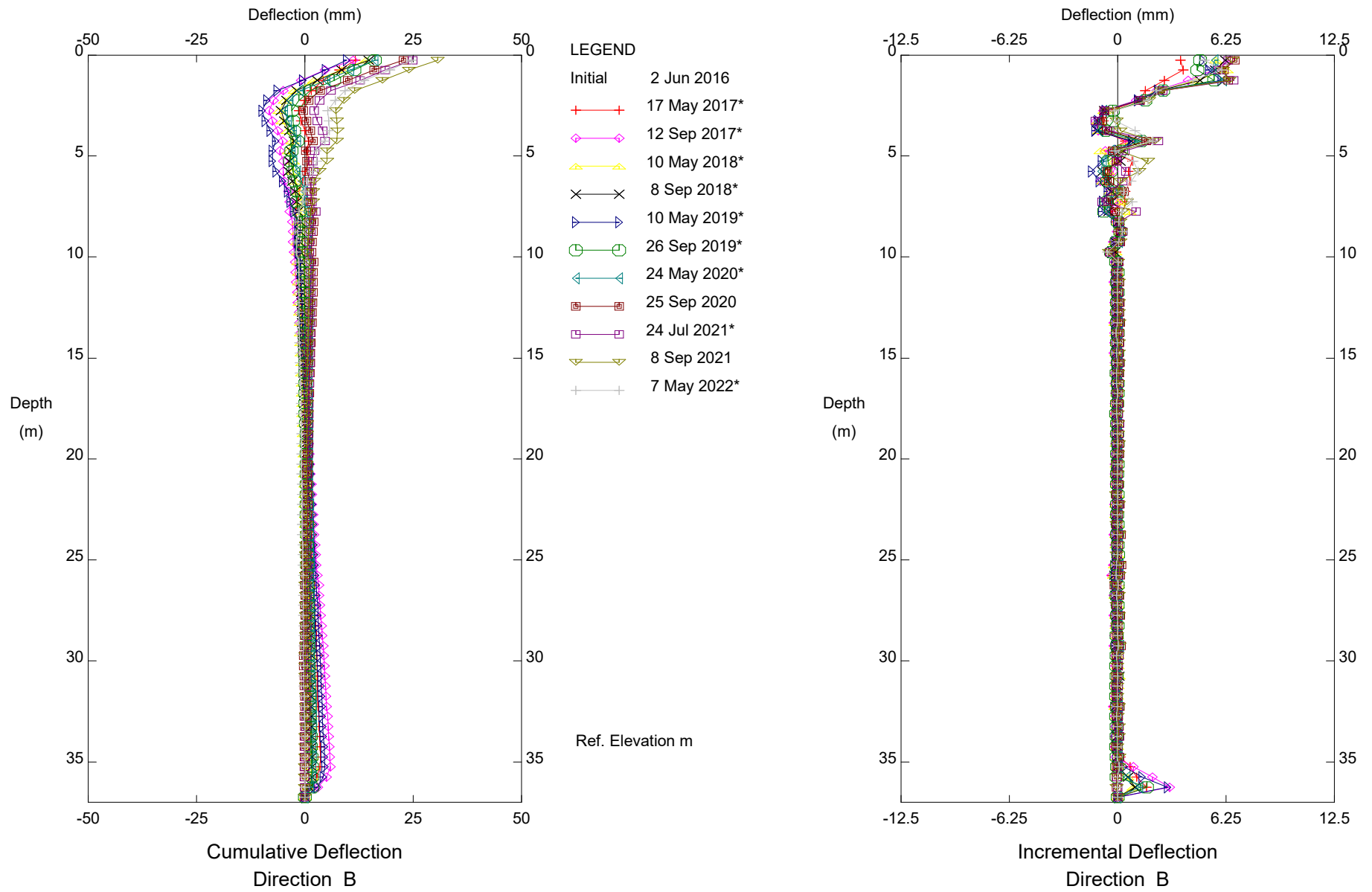
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NC067, Inclinometer SI-06

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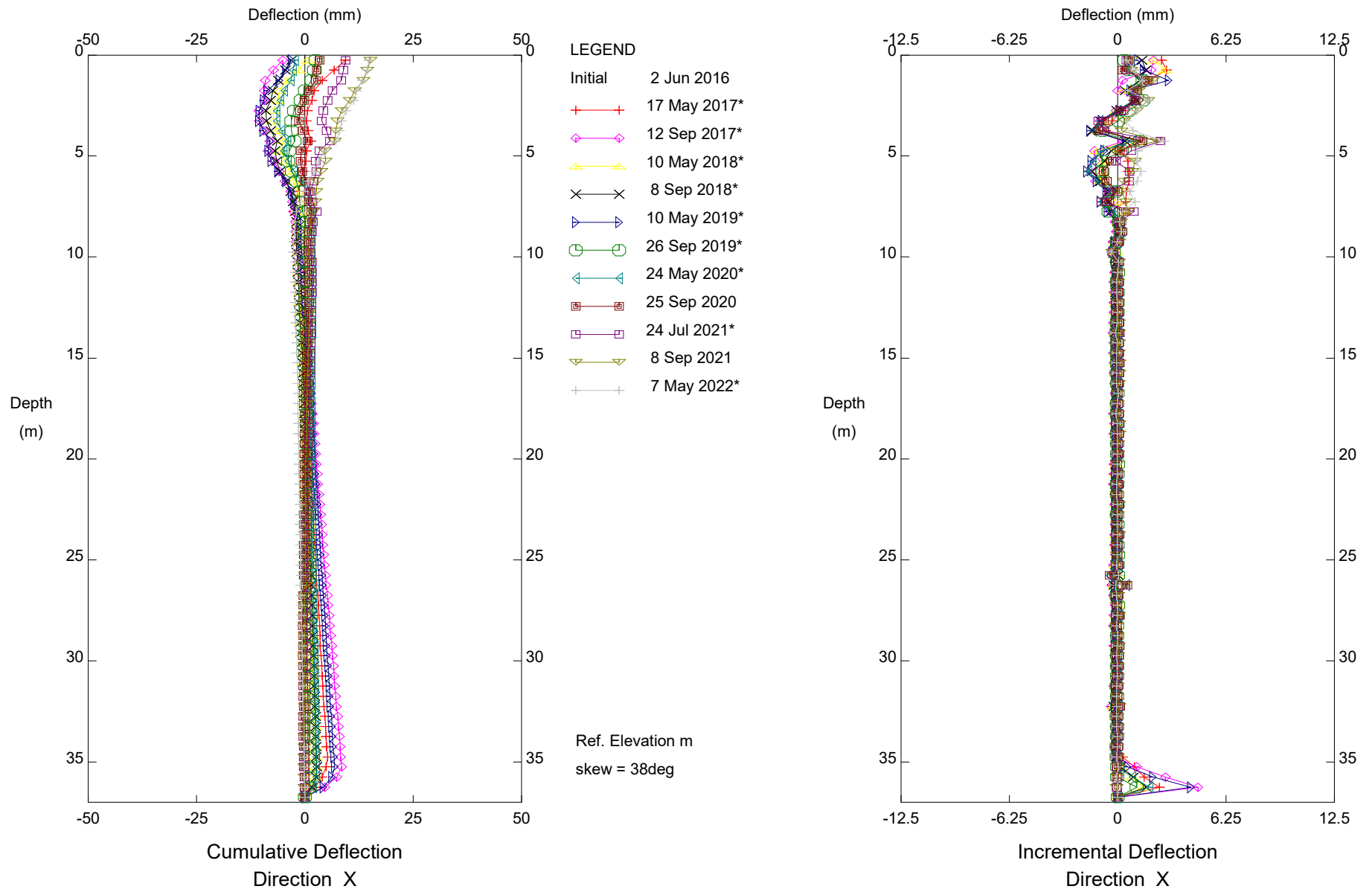
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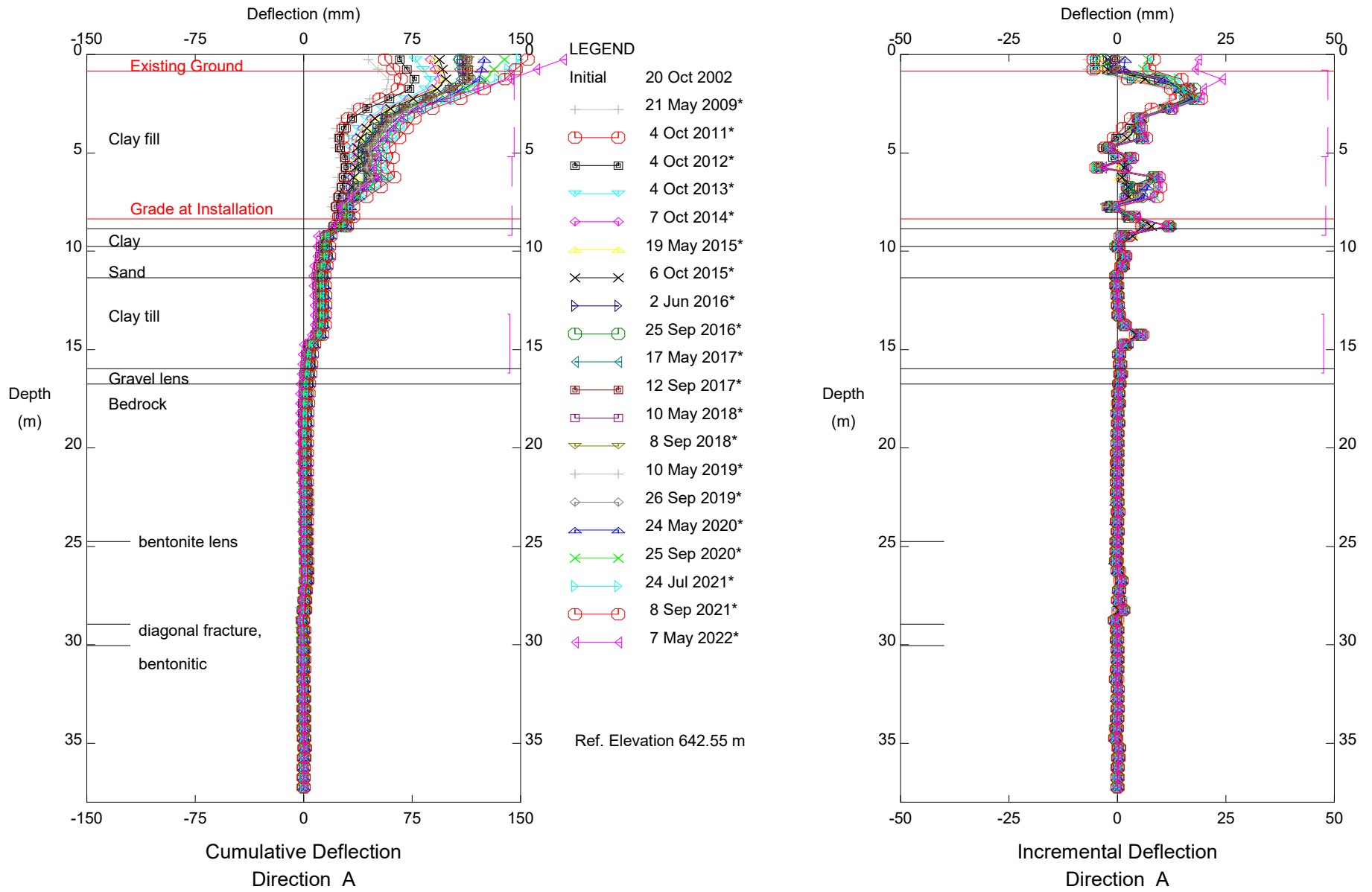
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Stantec Consulting Ltd - Edmonton



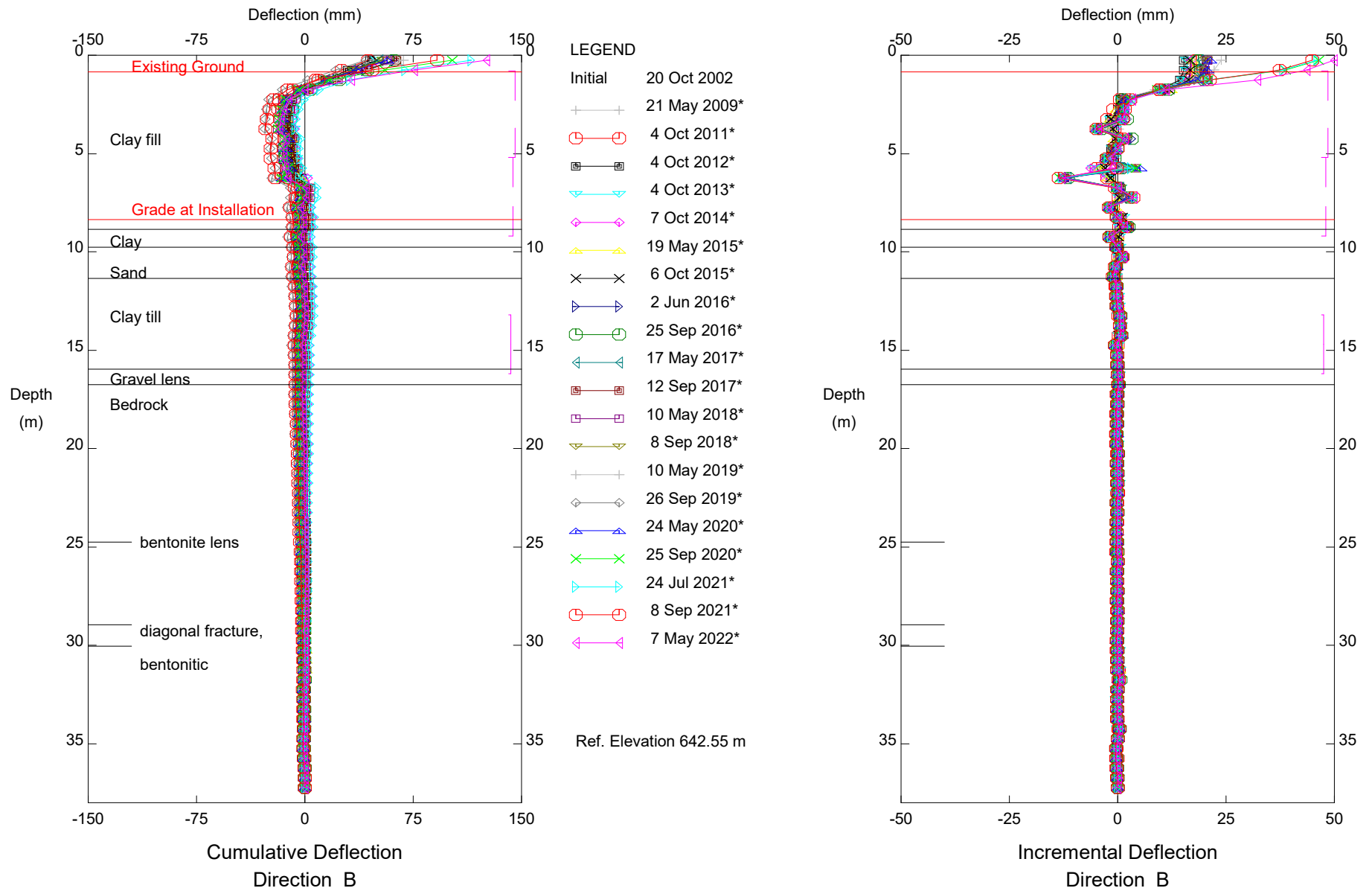
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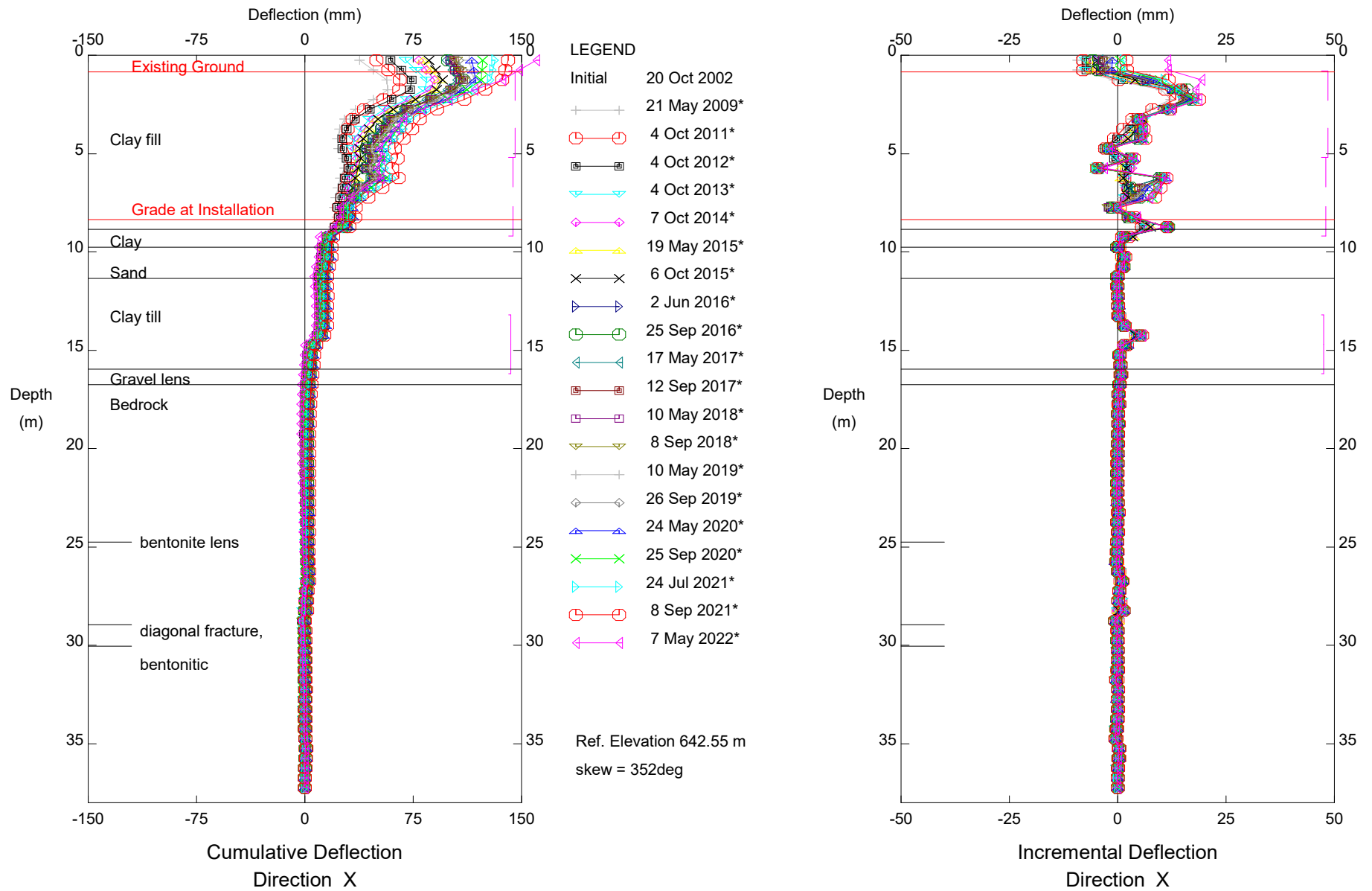
NC067, Inclinometer SI-07
 Alberta Transportation

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NC067, Inclinometer SI-07
 Alberta Transportation

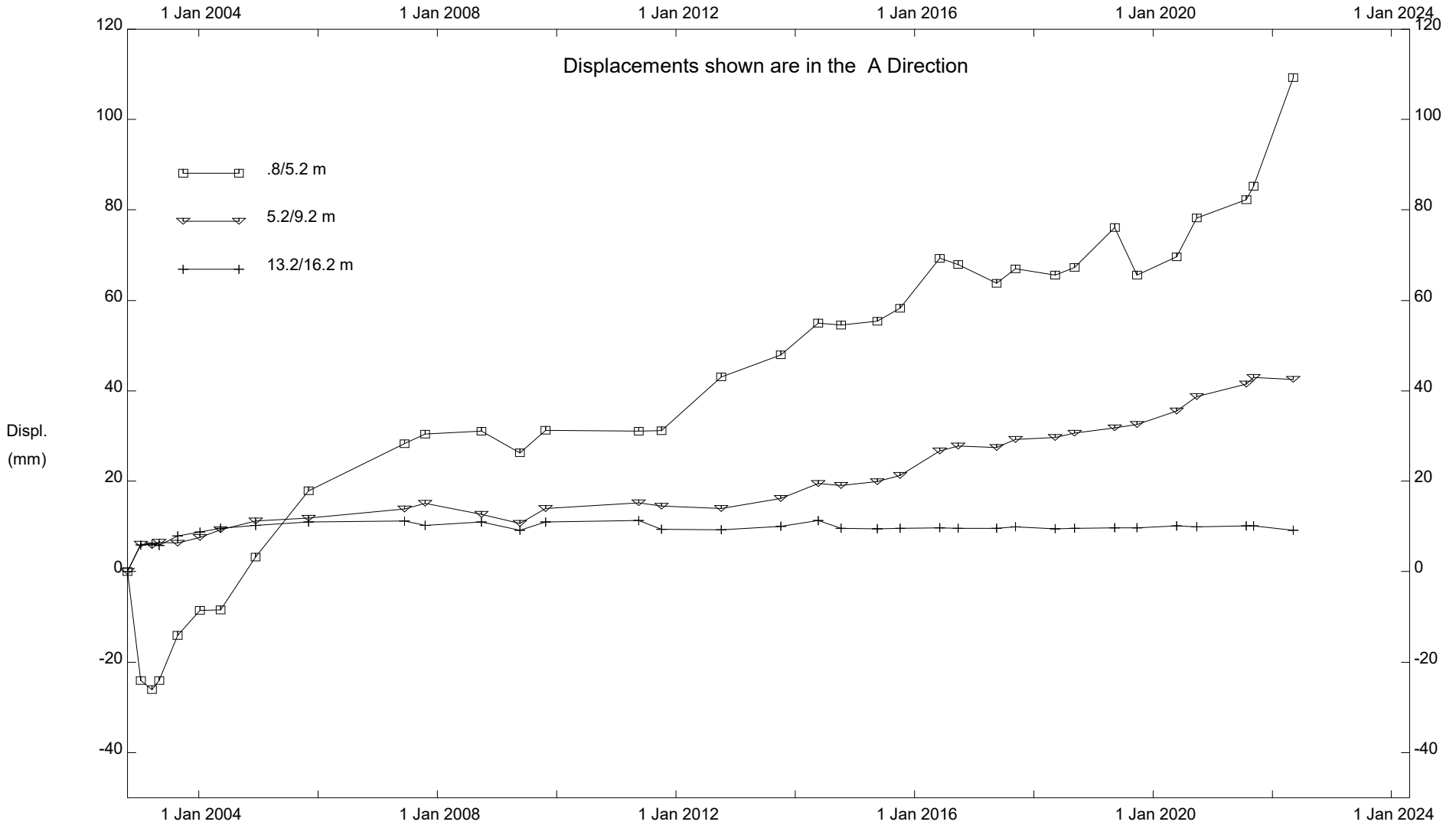
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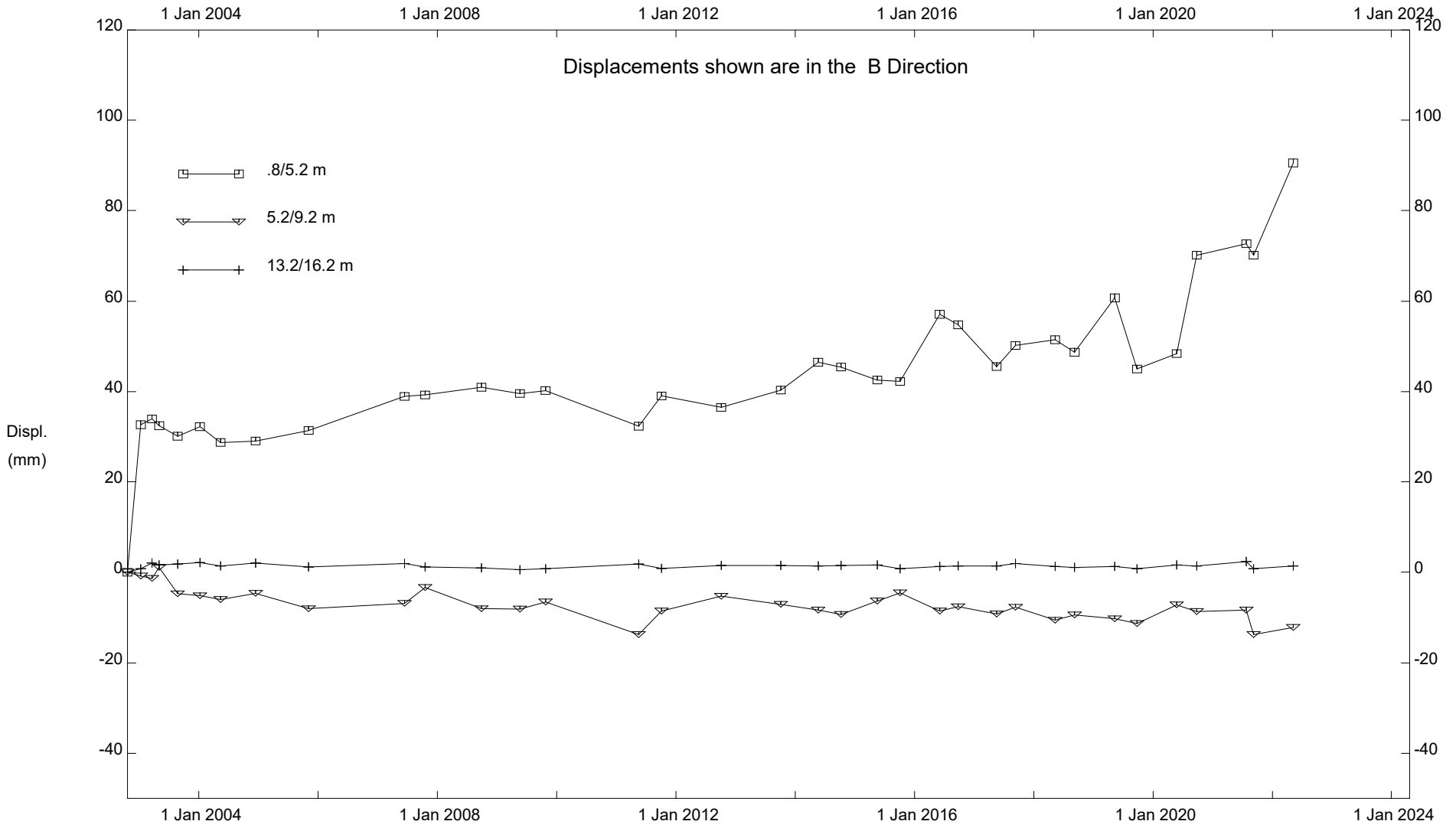
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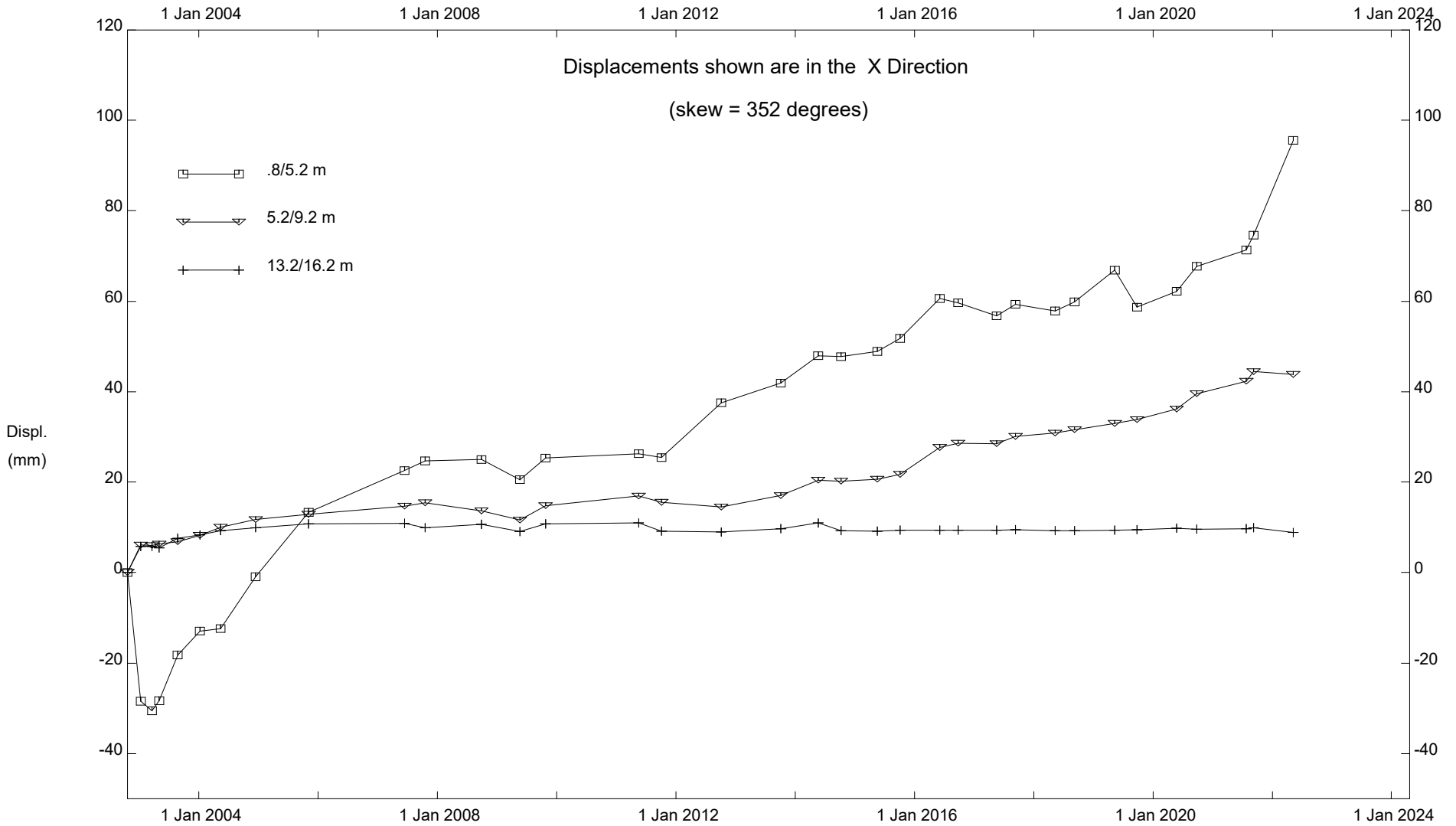
Alberta Transportation

Stantec Consulting Ltd - Edmonton



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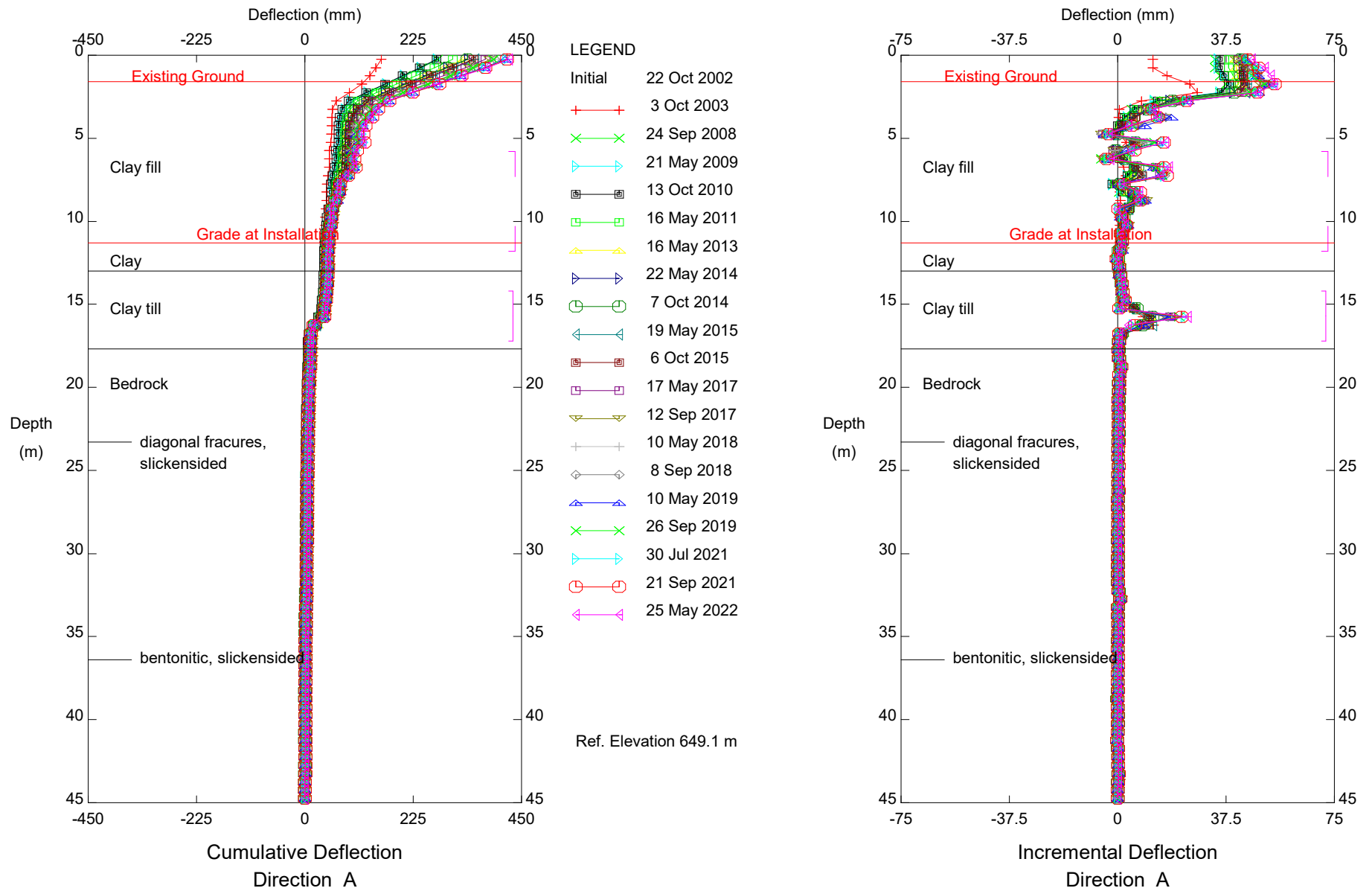
Alberta Transportation



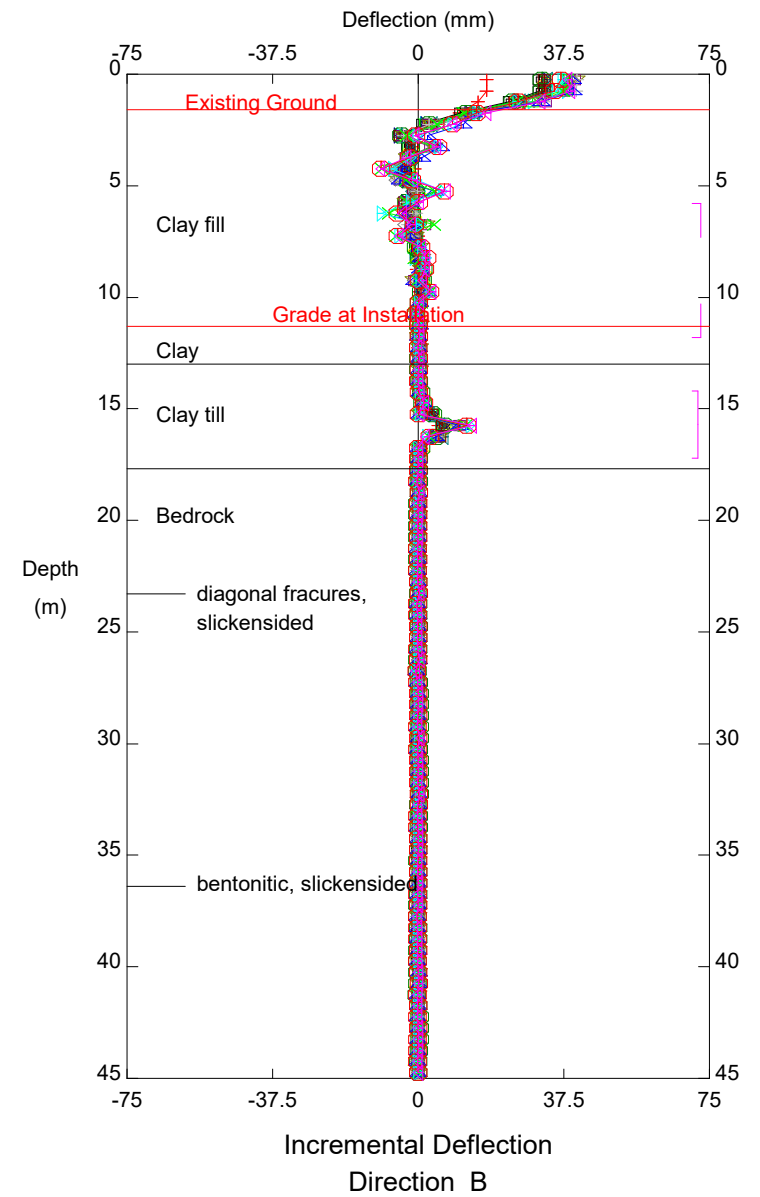
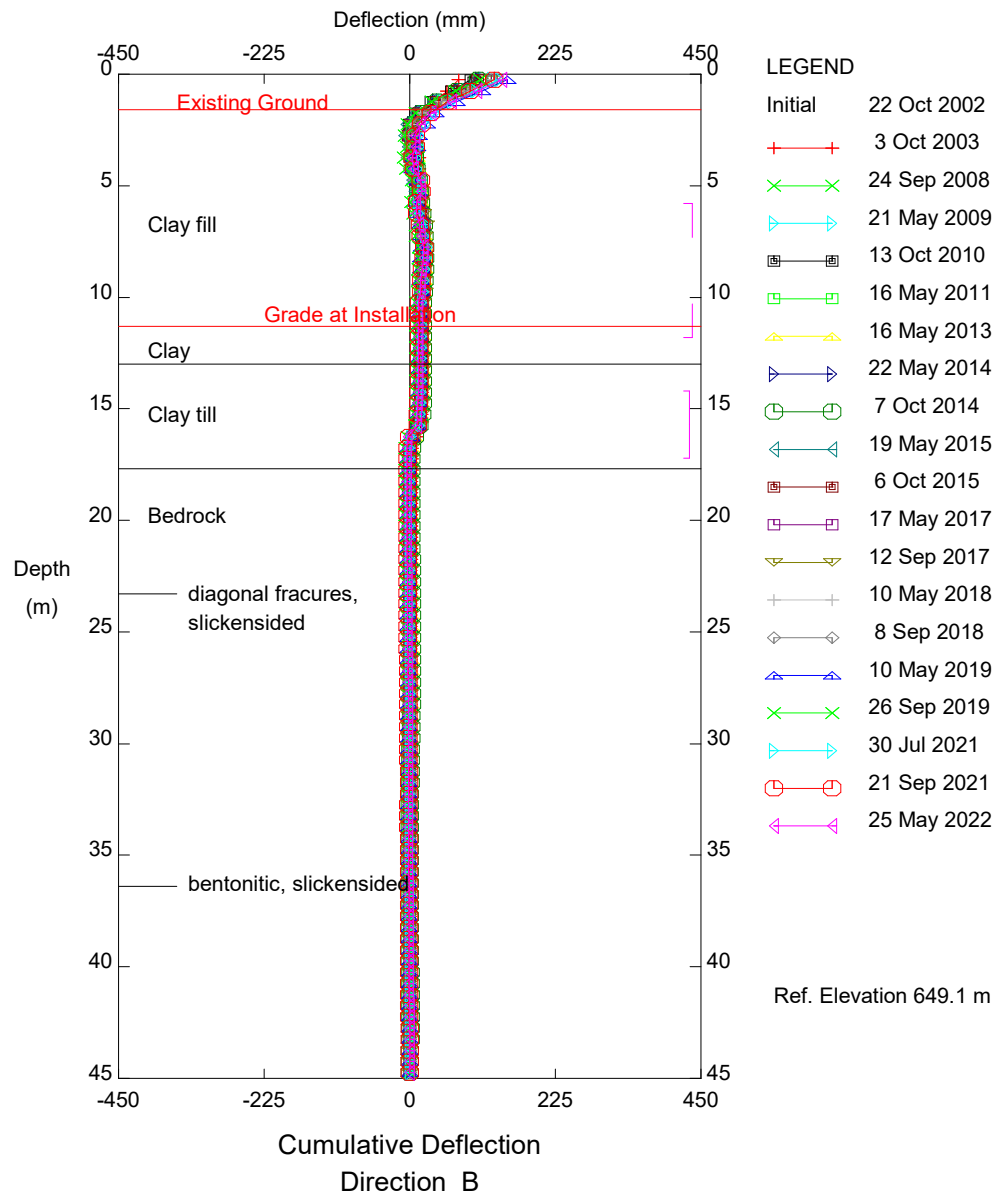
NC067, Inclinometer SI-07

Alberta Transportation

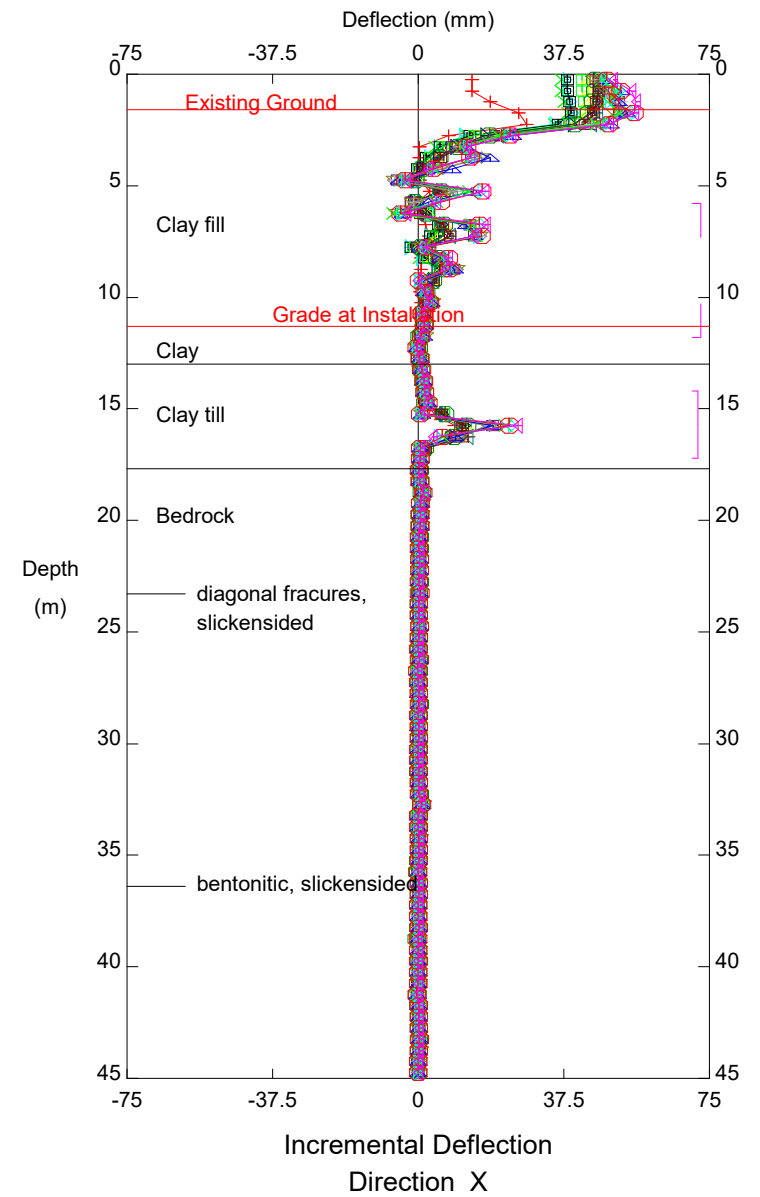
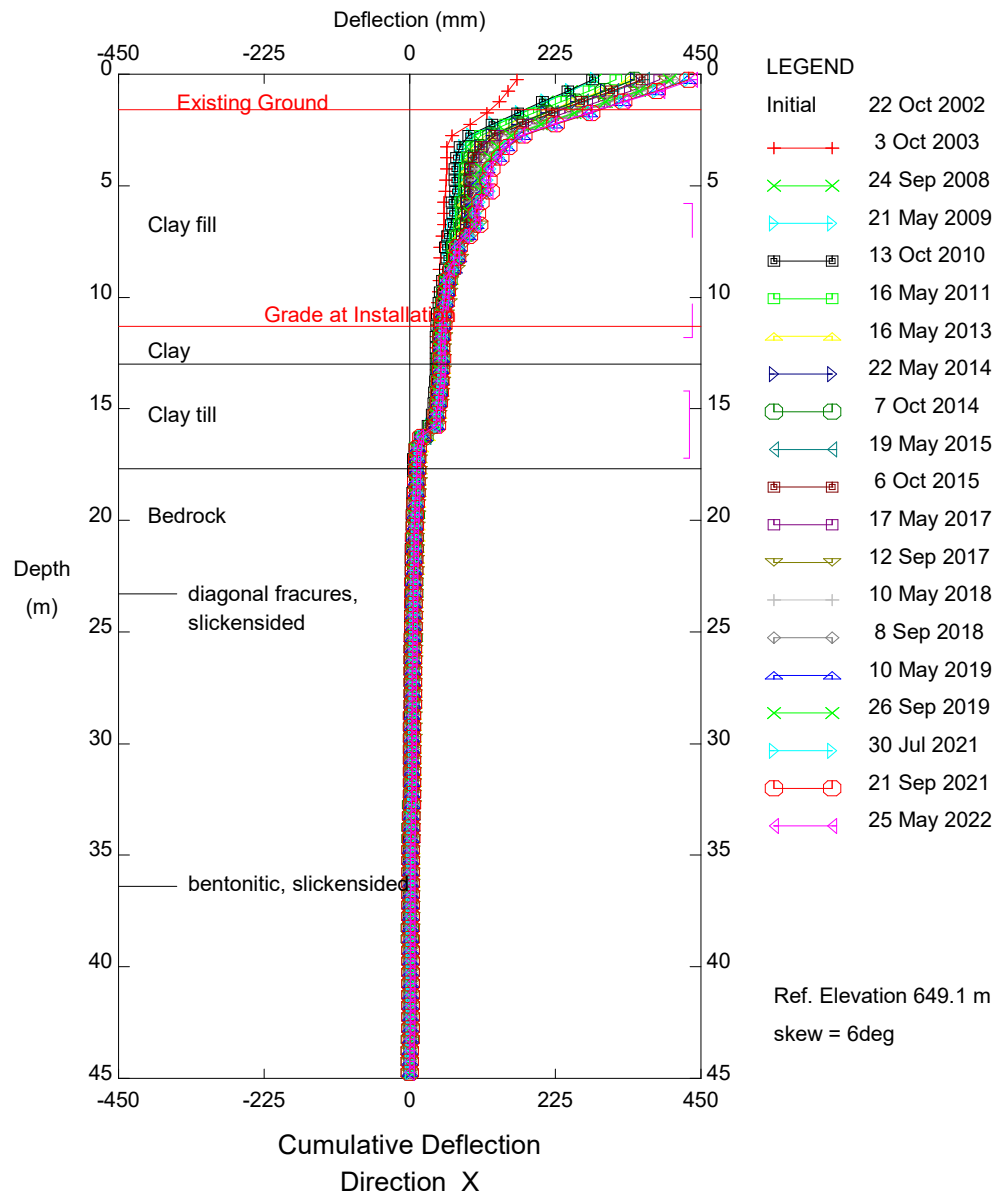
Stantec Consulting Ltd - Edmonton



NC067, Inclinometer SI-08
Alberta Transportation

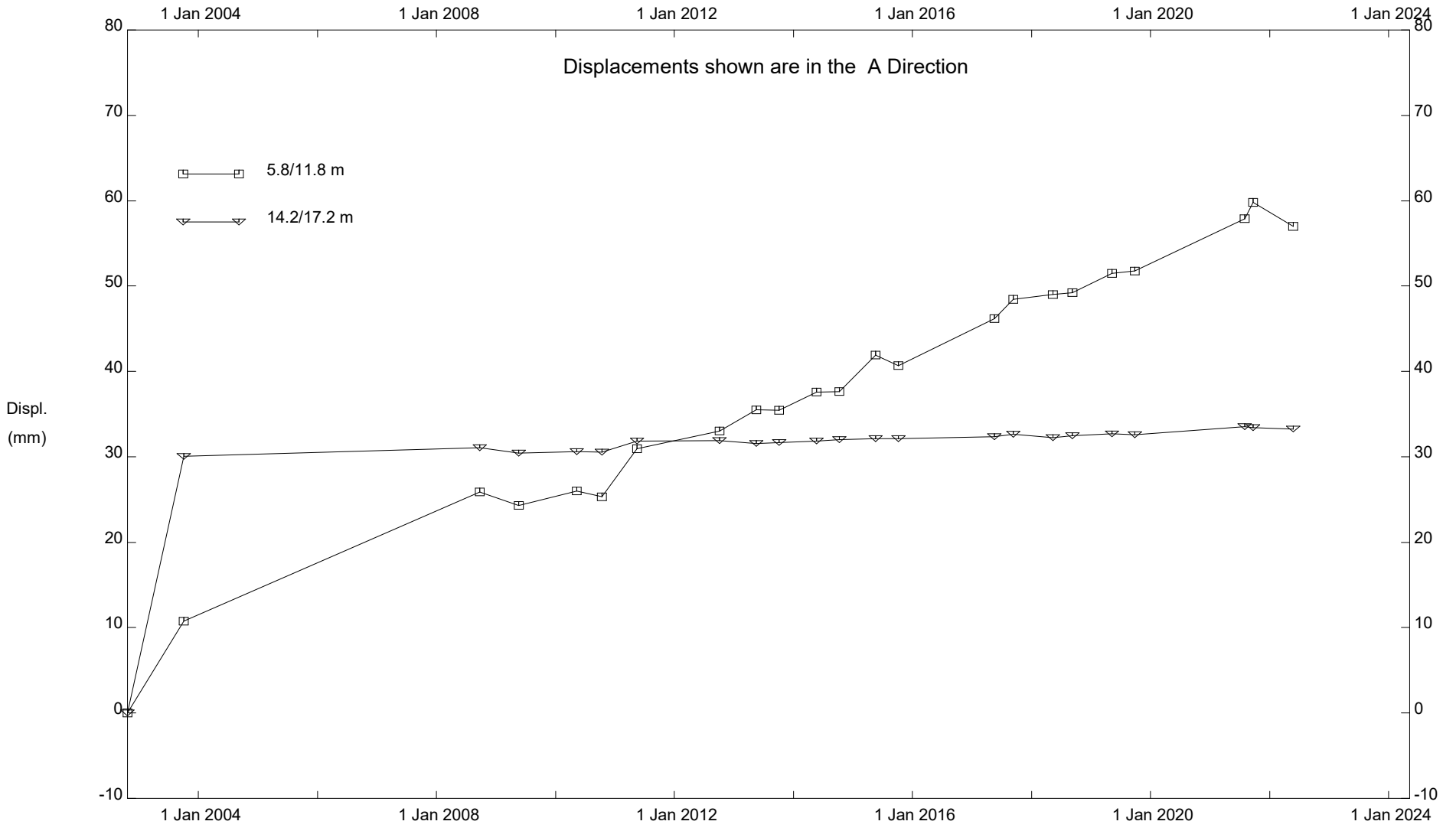


NC067, Inclinator SI-08
Alberta Transportation



NC067, Inclinerometer SI-08
Alberta Transportation

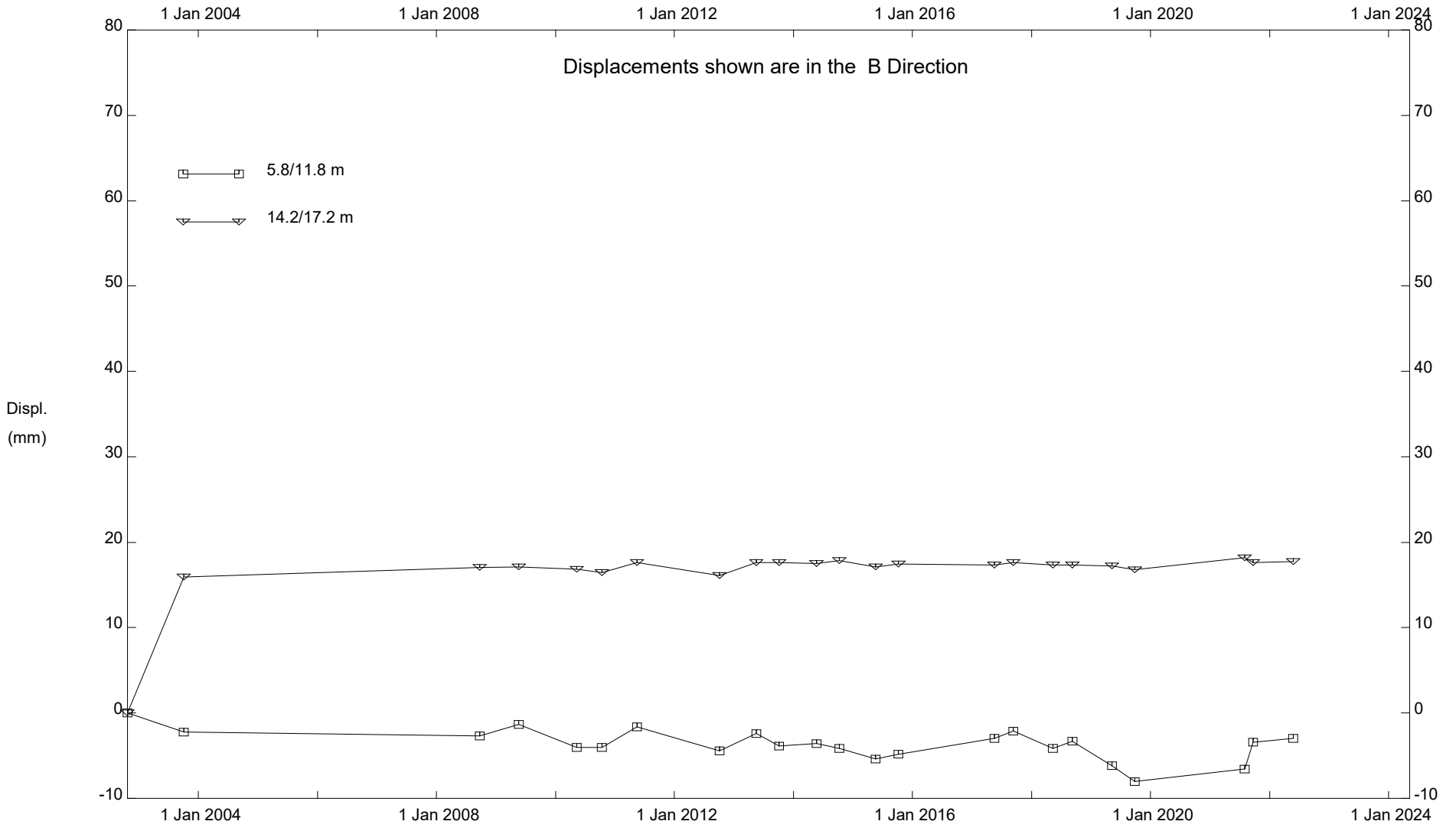
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NC067, Inclinator SI-08

Alberta Transportation

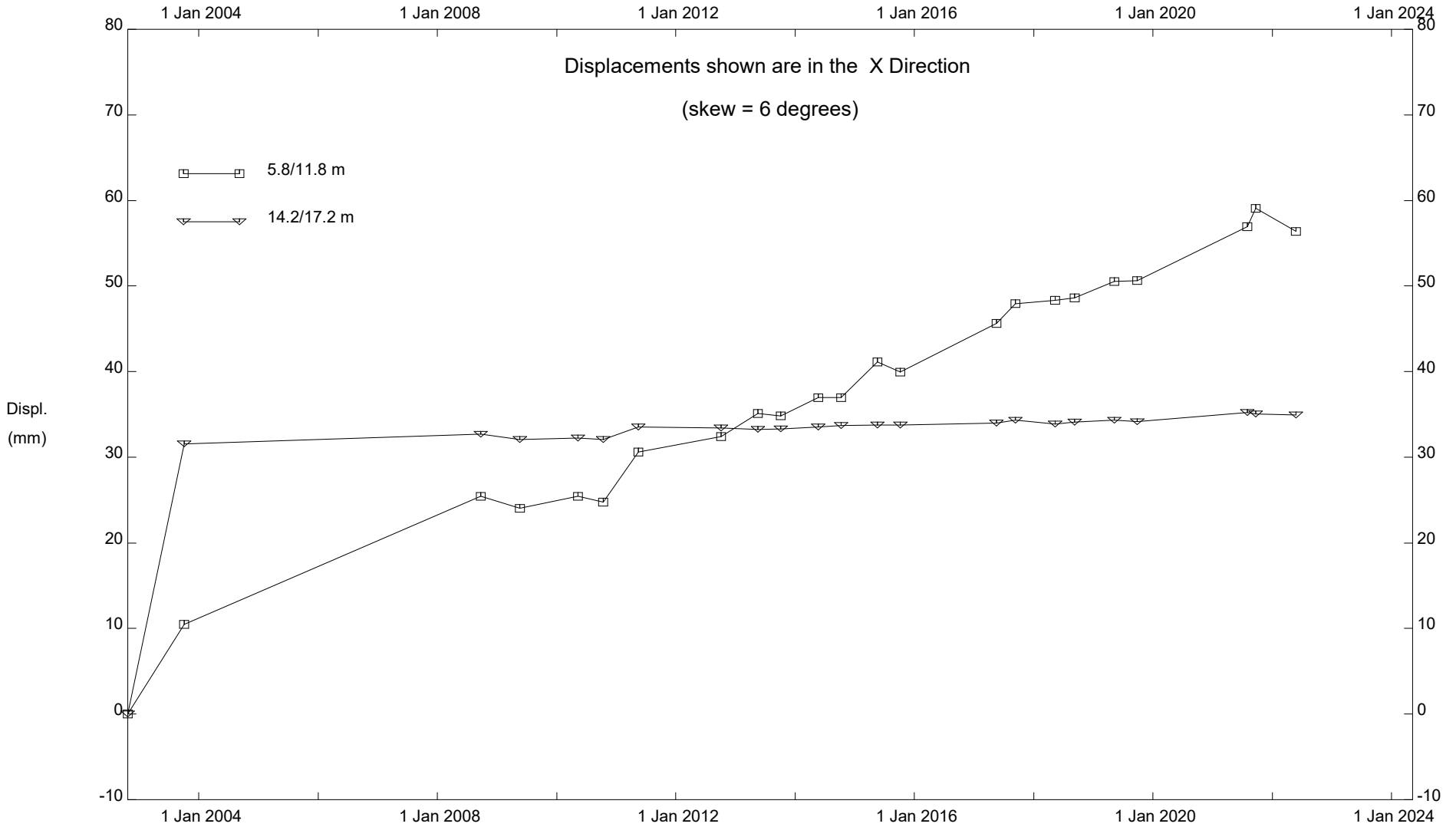
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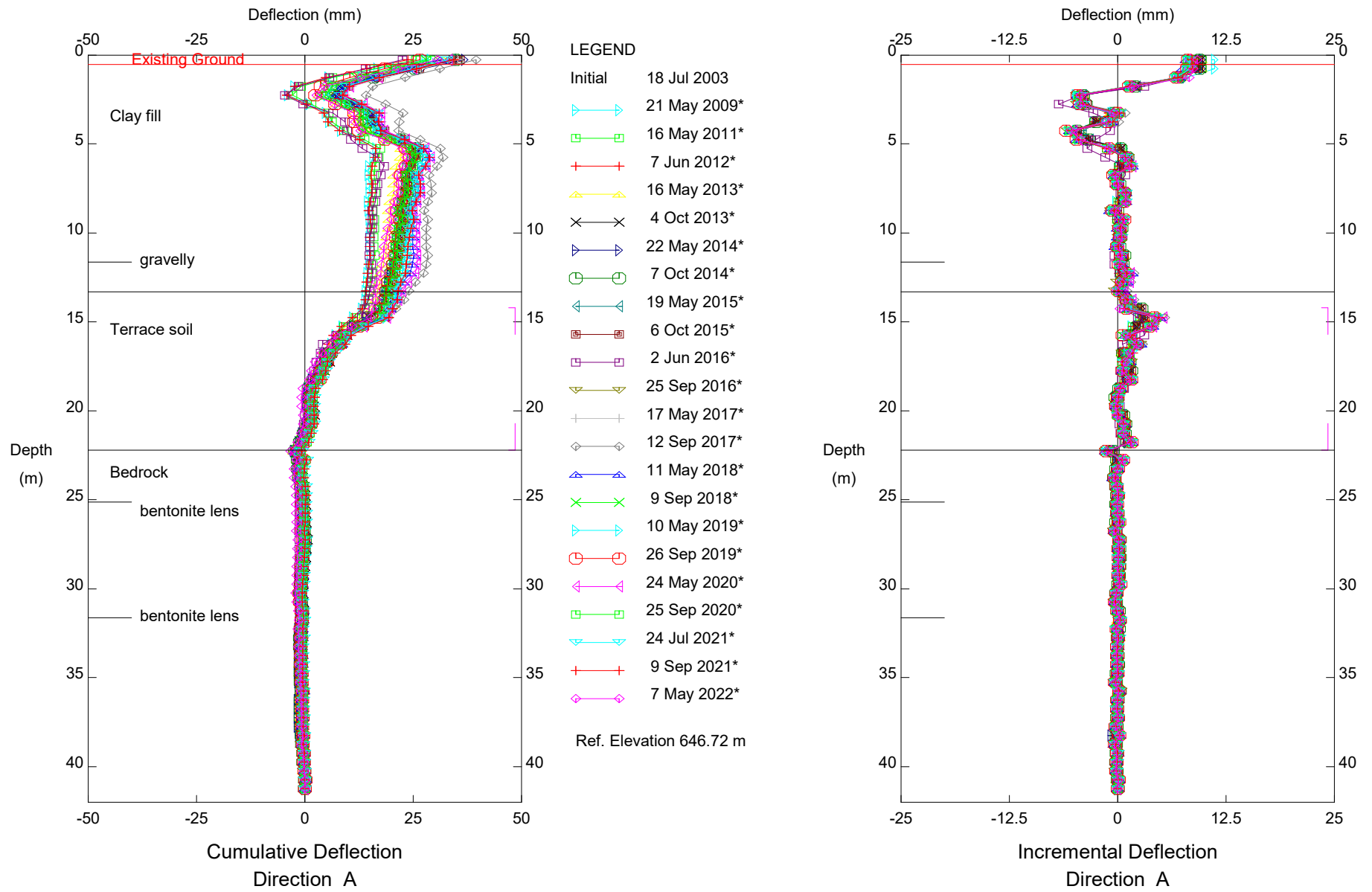
Alberta Transportation

Stantec Consulting Ltd - Edmonton



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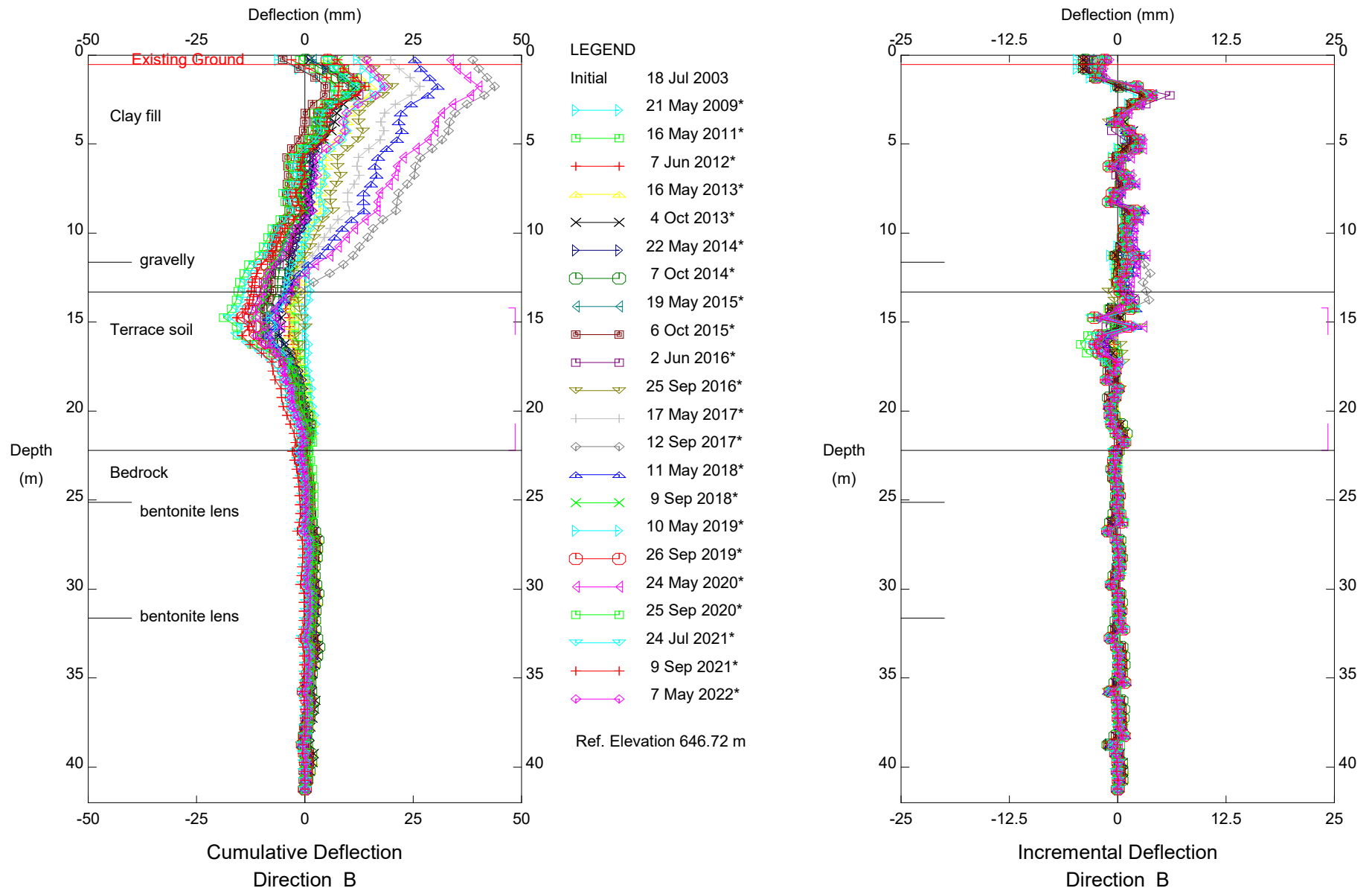
Alberta Transportation



NC067, Inclinometer SI-10

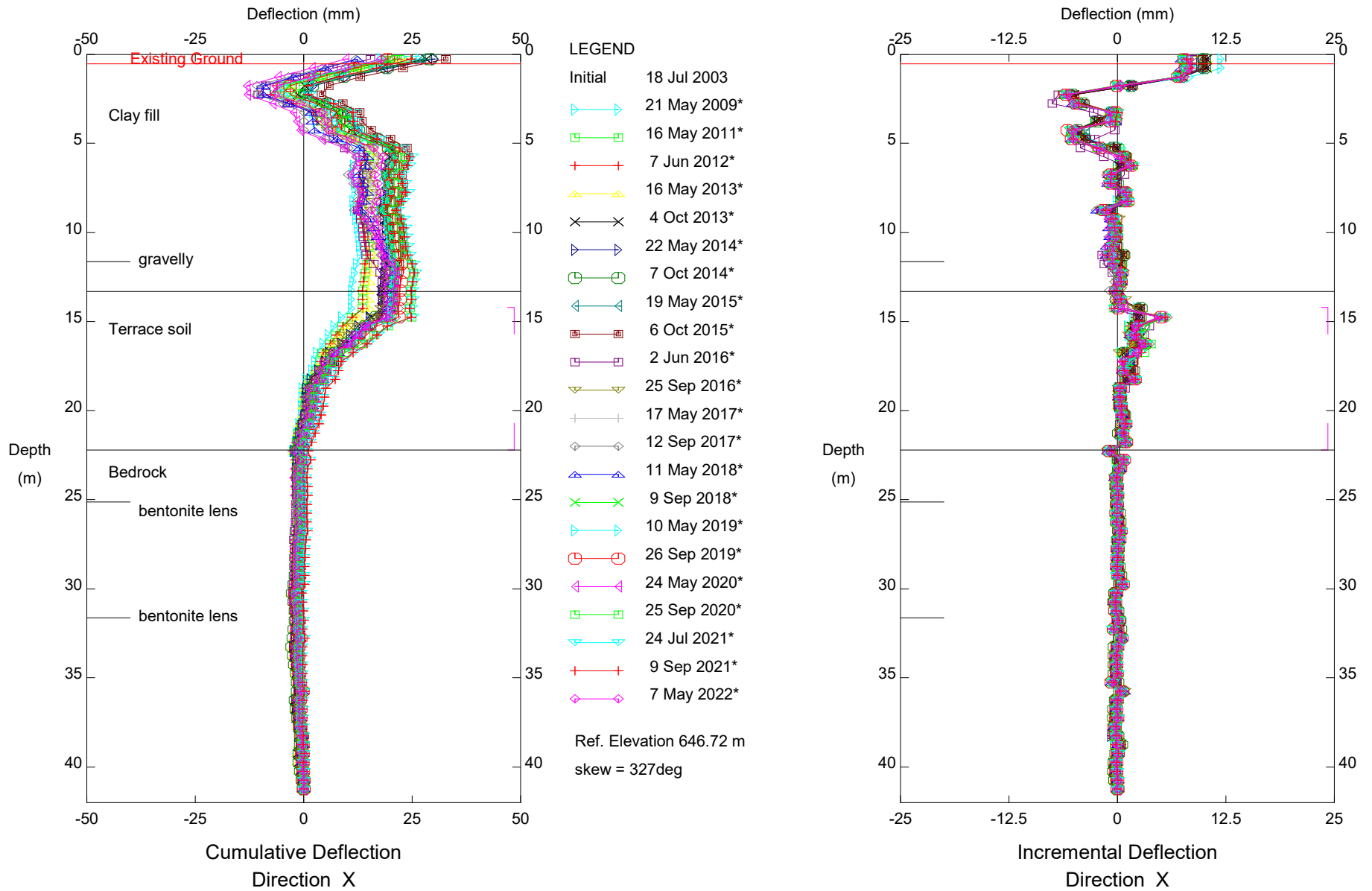
Alberta Transportation

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NC067, Inclinator SI-10
 Alberta Transportation

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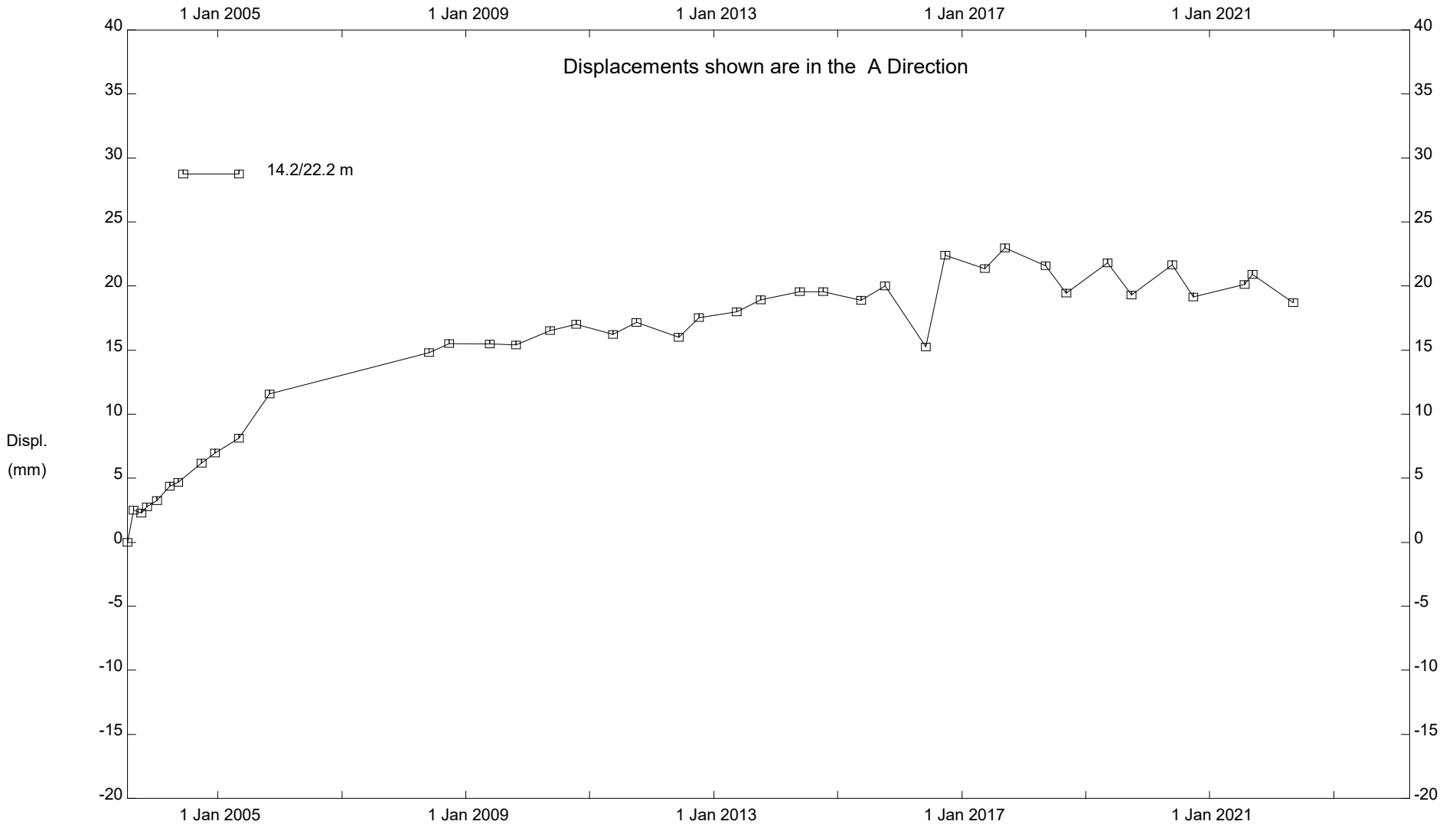


NC067, Inclinometer SI-10

Alberta Transportation

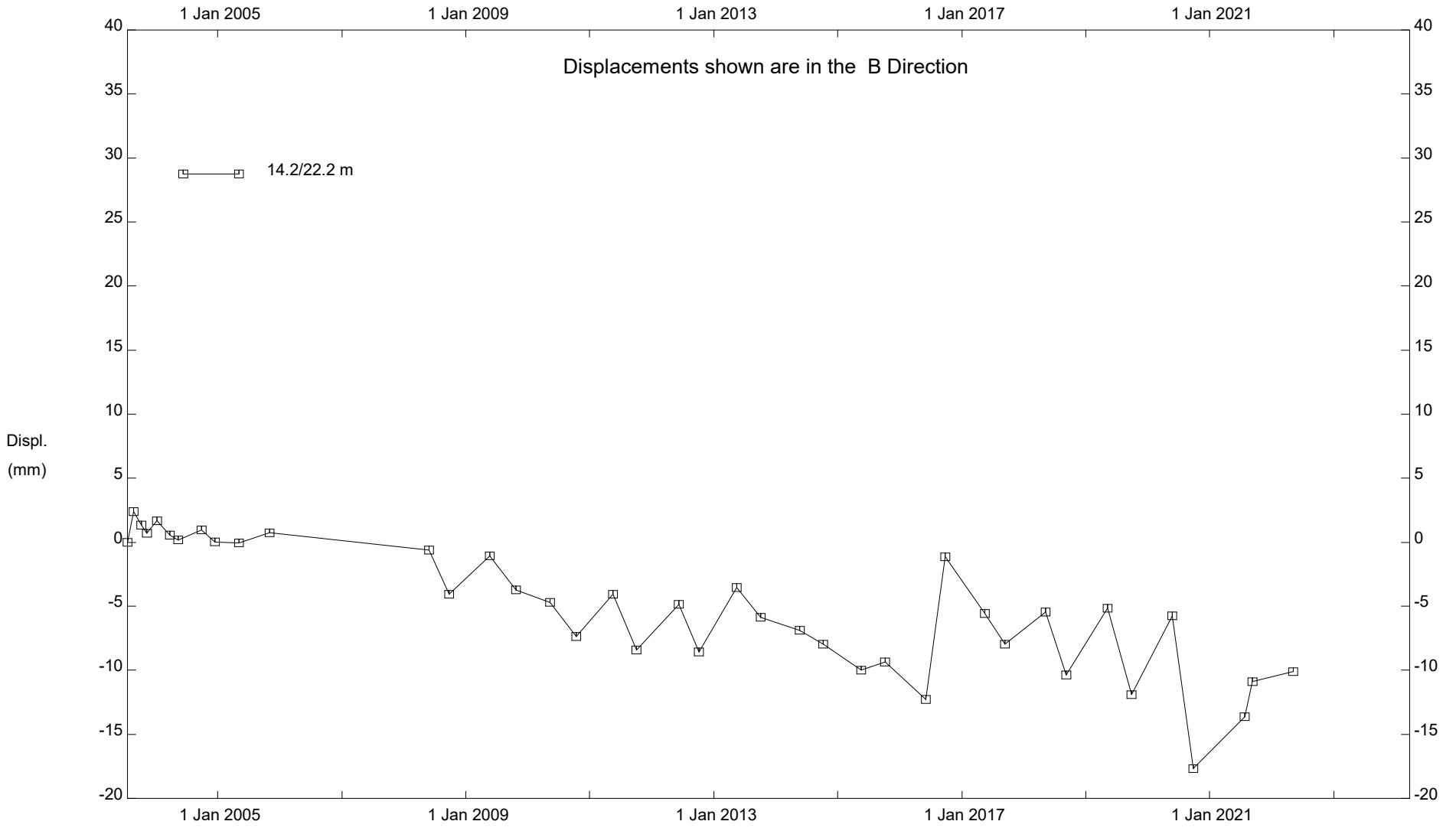
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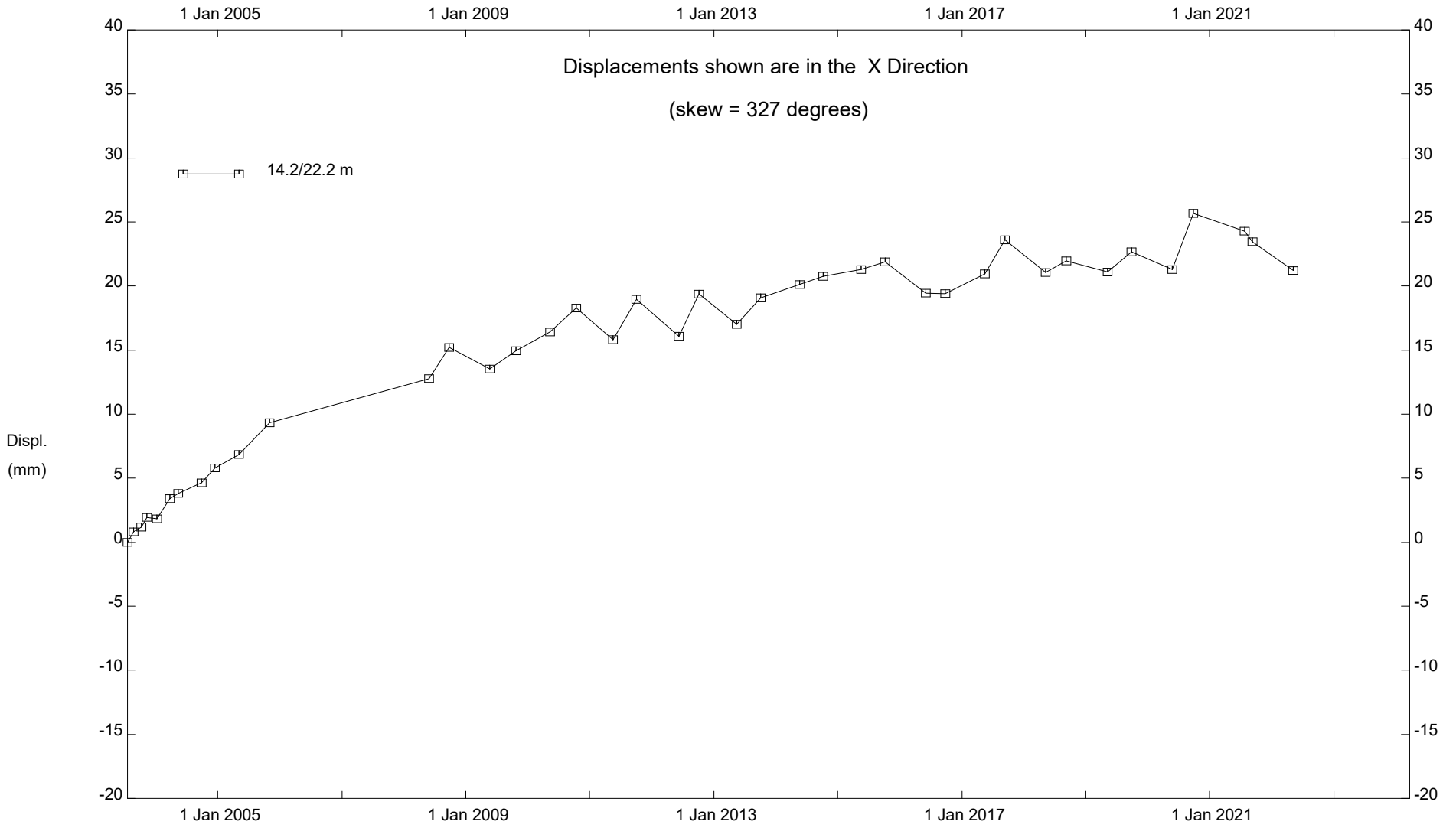
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NC067, Inclinometer SI-10

Alberta Transportation

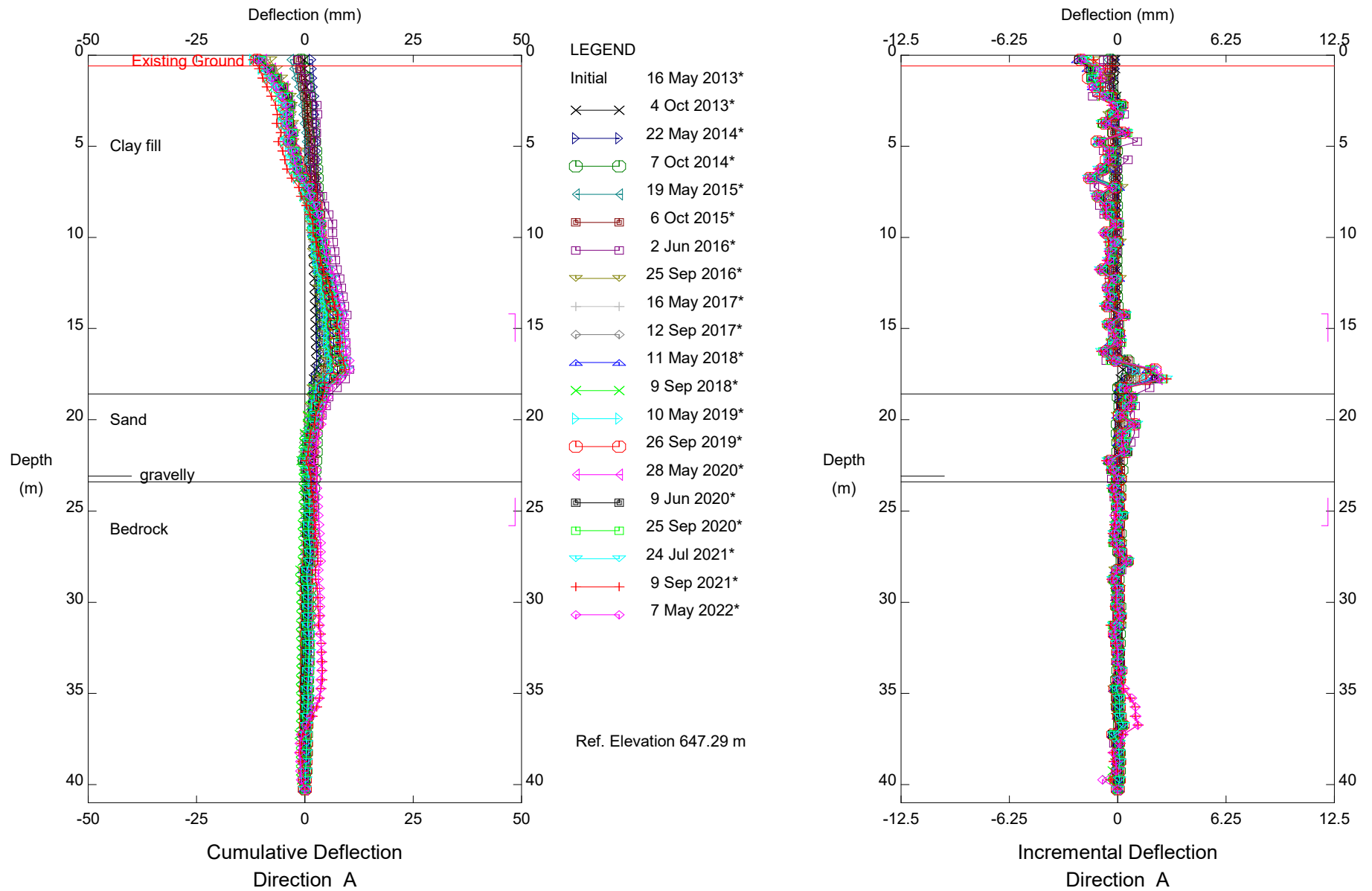
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NC067, Inclinator SI-10

Alberta Transportation

Stantec Consulting Ltd - Edmonton

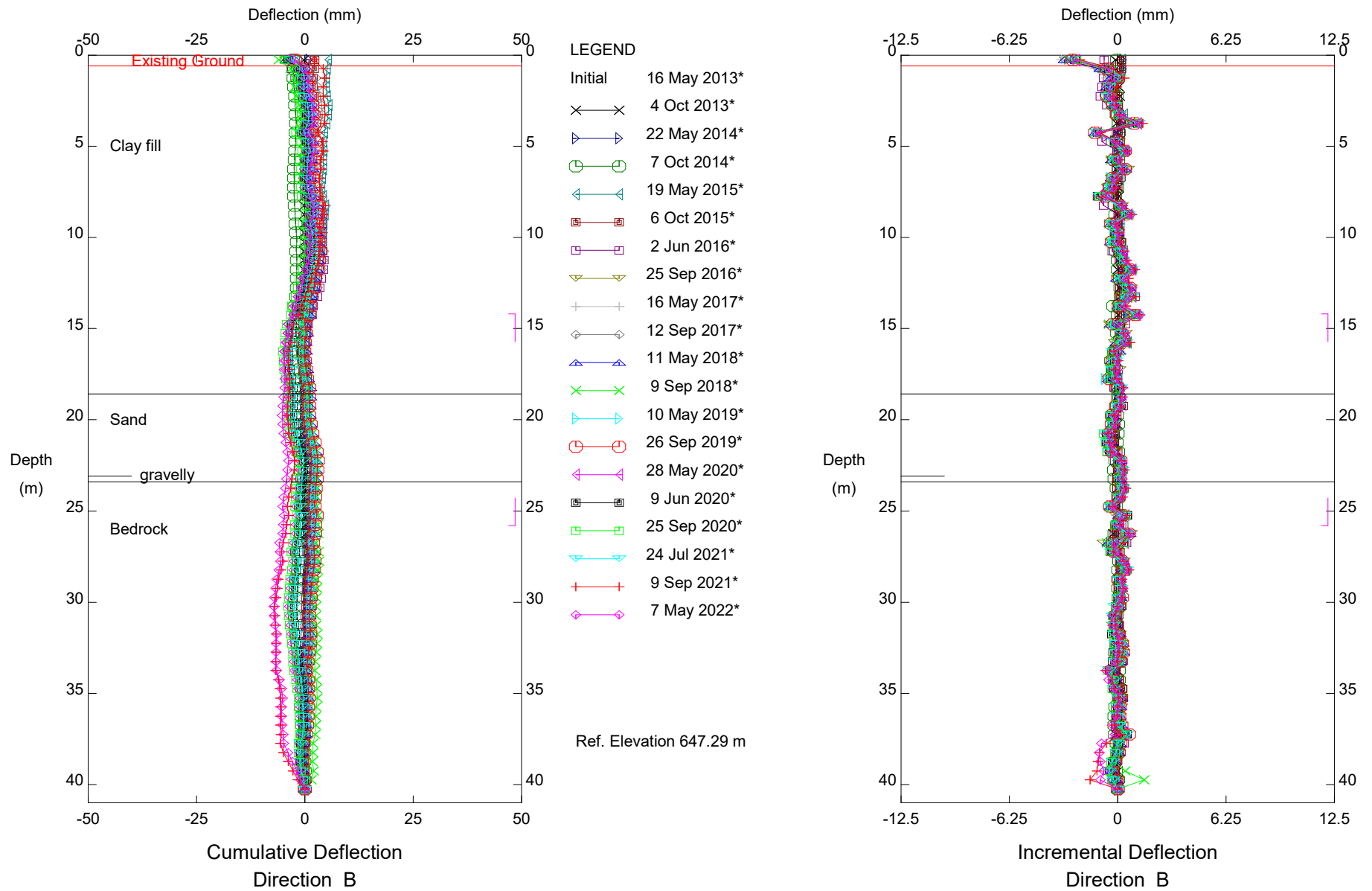


NC067, Inclinometer SI-11

Alberta Transportation

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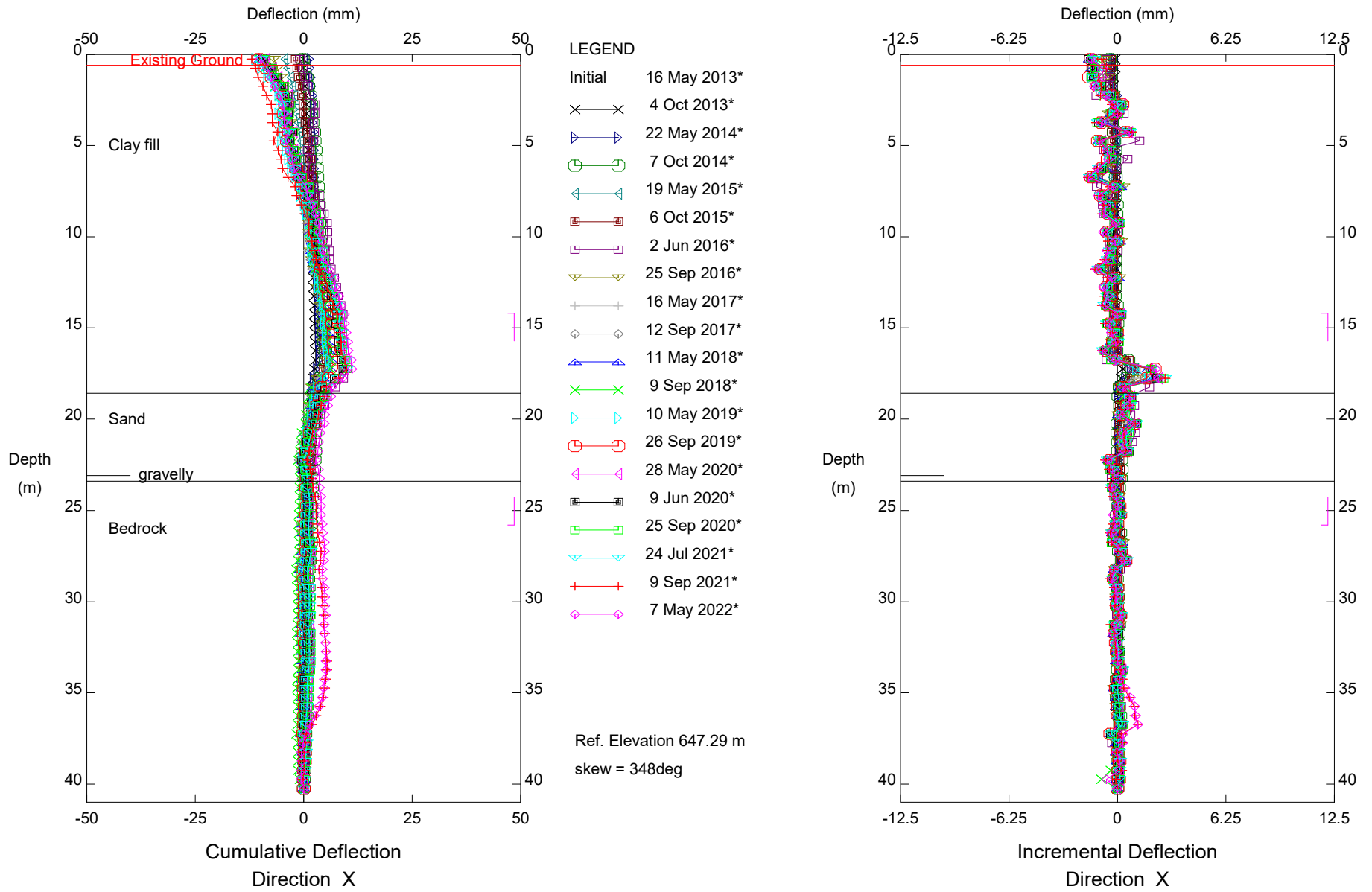
Stantec Consulting Ltd - Edmonton



NC067, Inclinometer SI-11

Alberta Transportation

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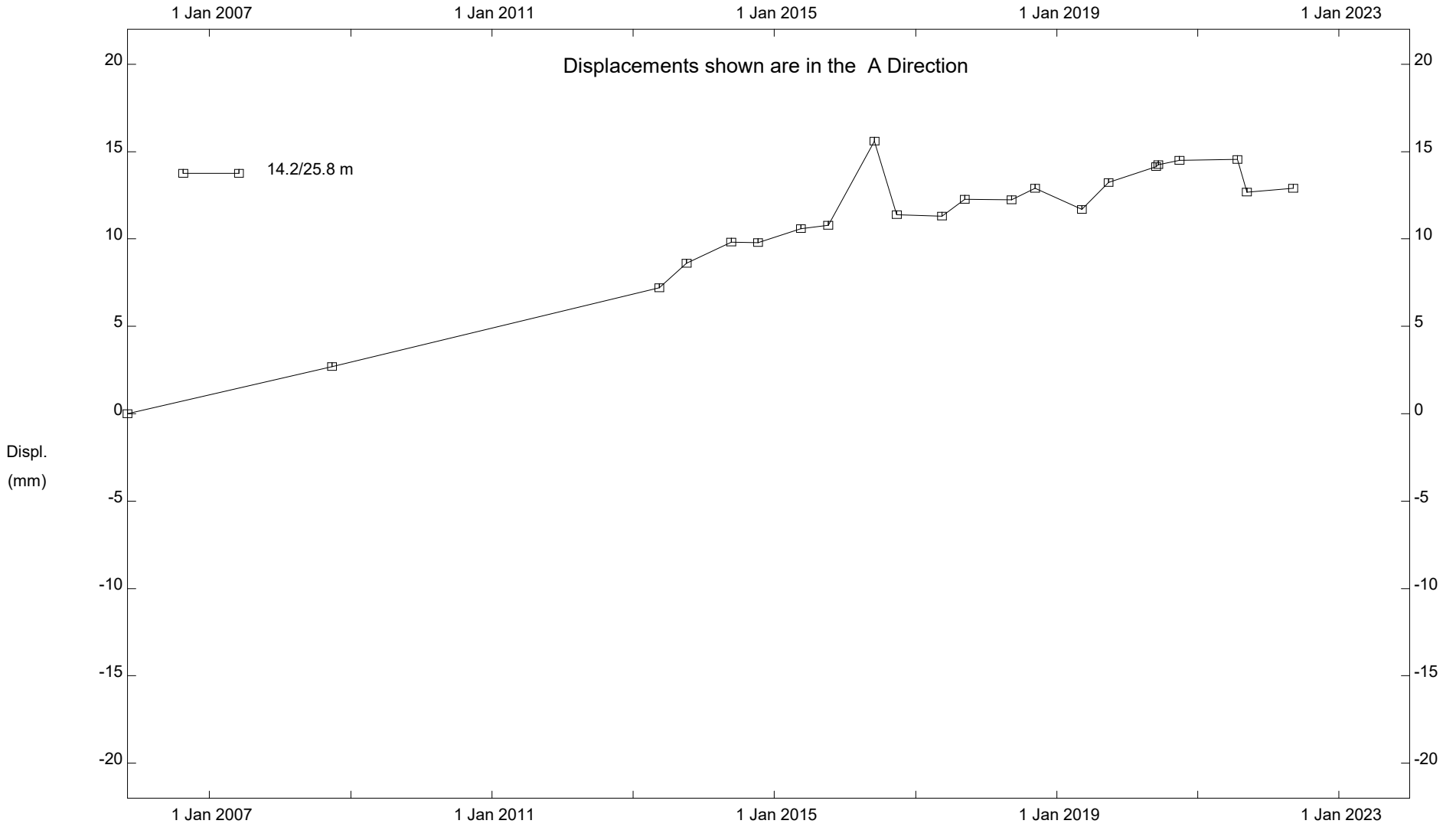


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Alberta Transportation

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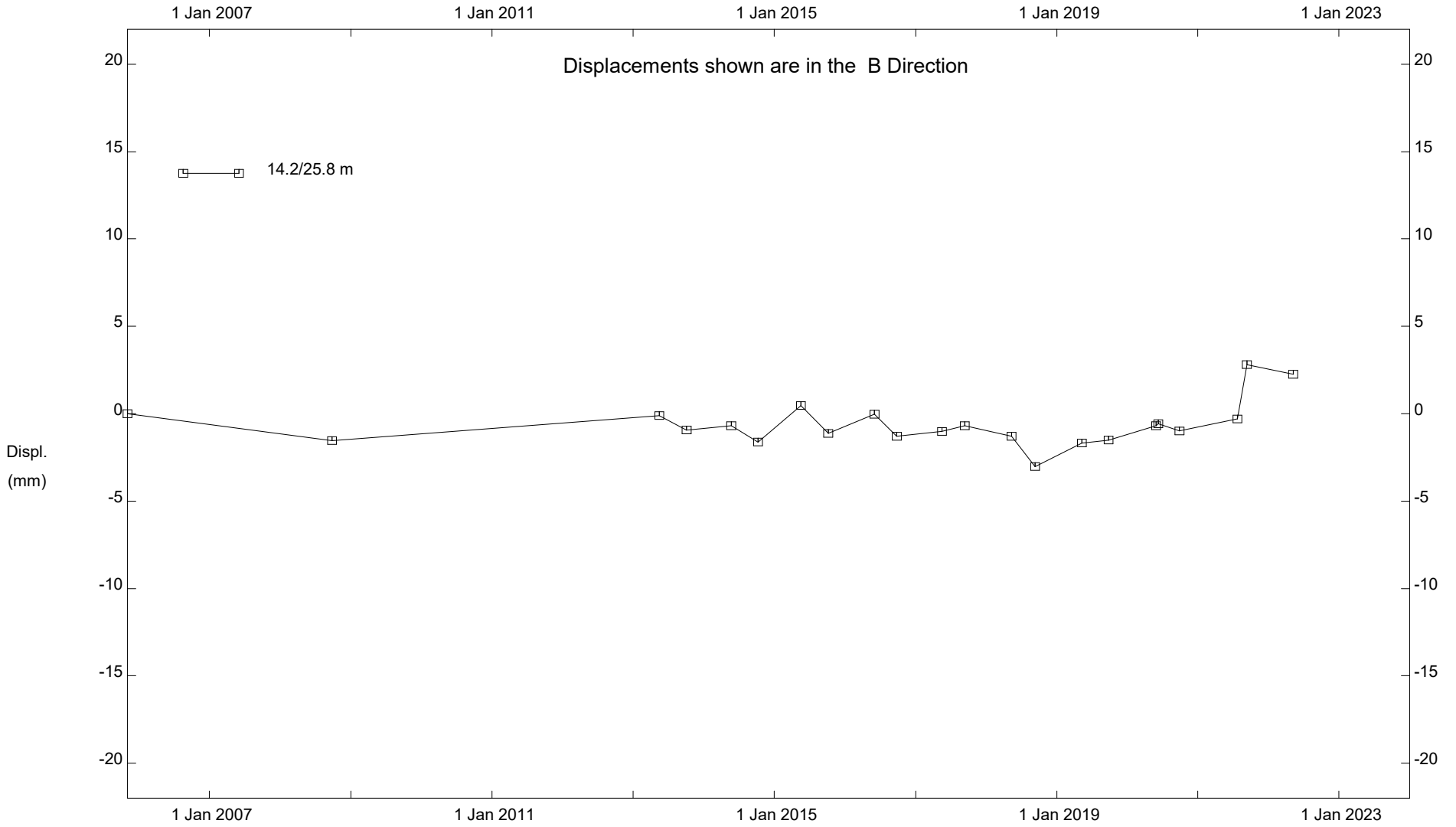
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Alberta Transportation

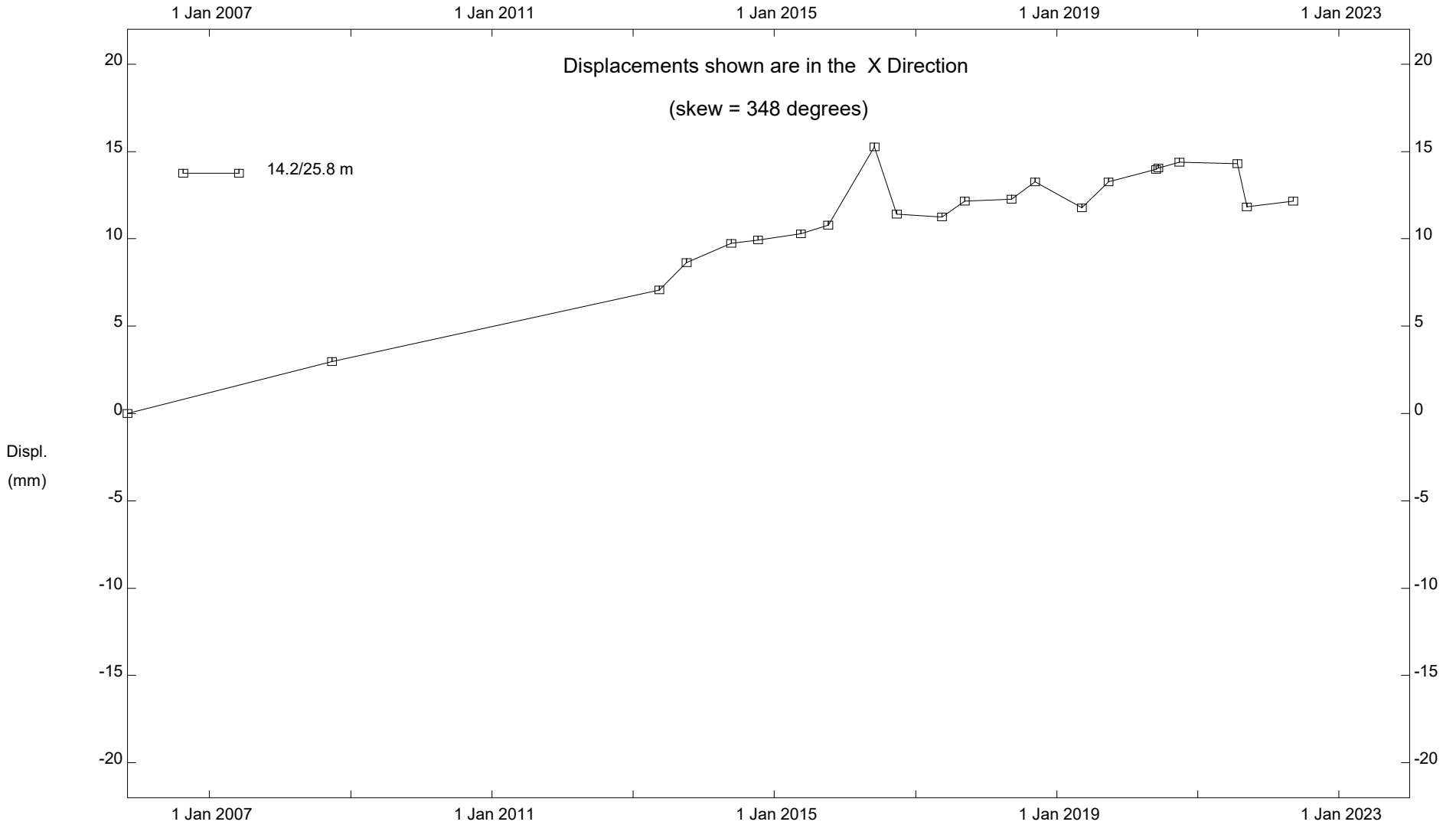
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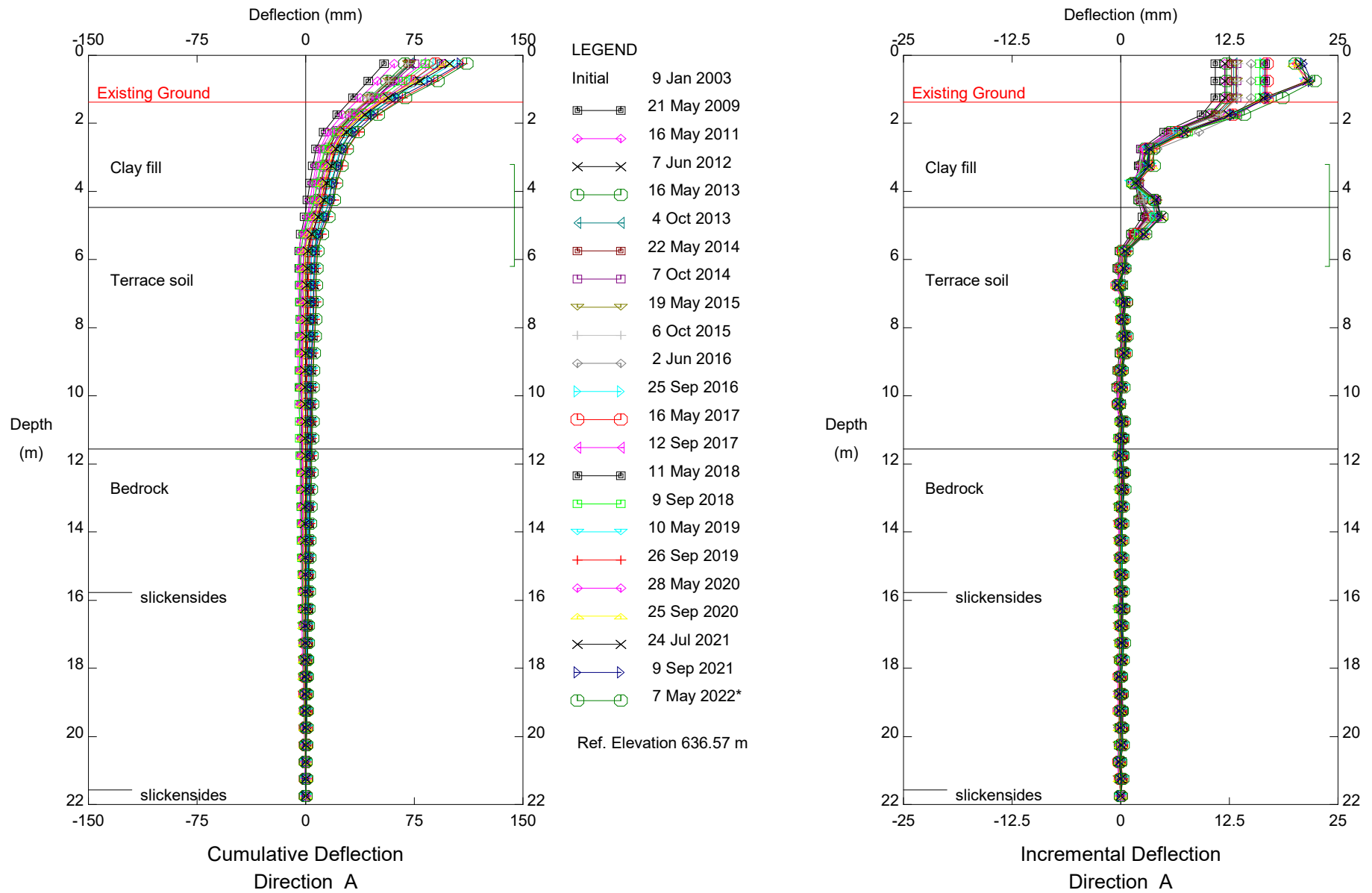
Alberta Transportation

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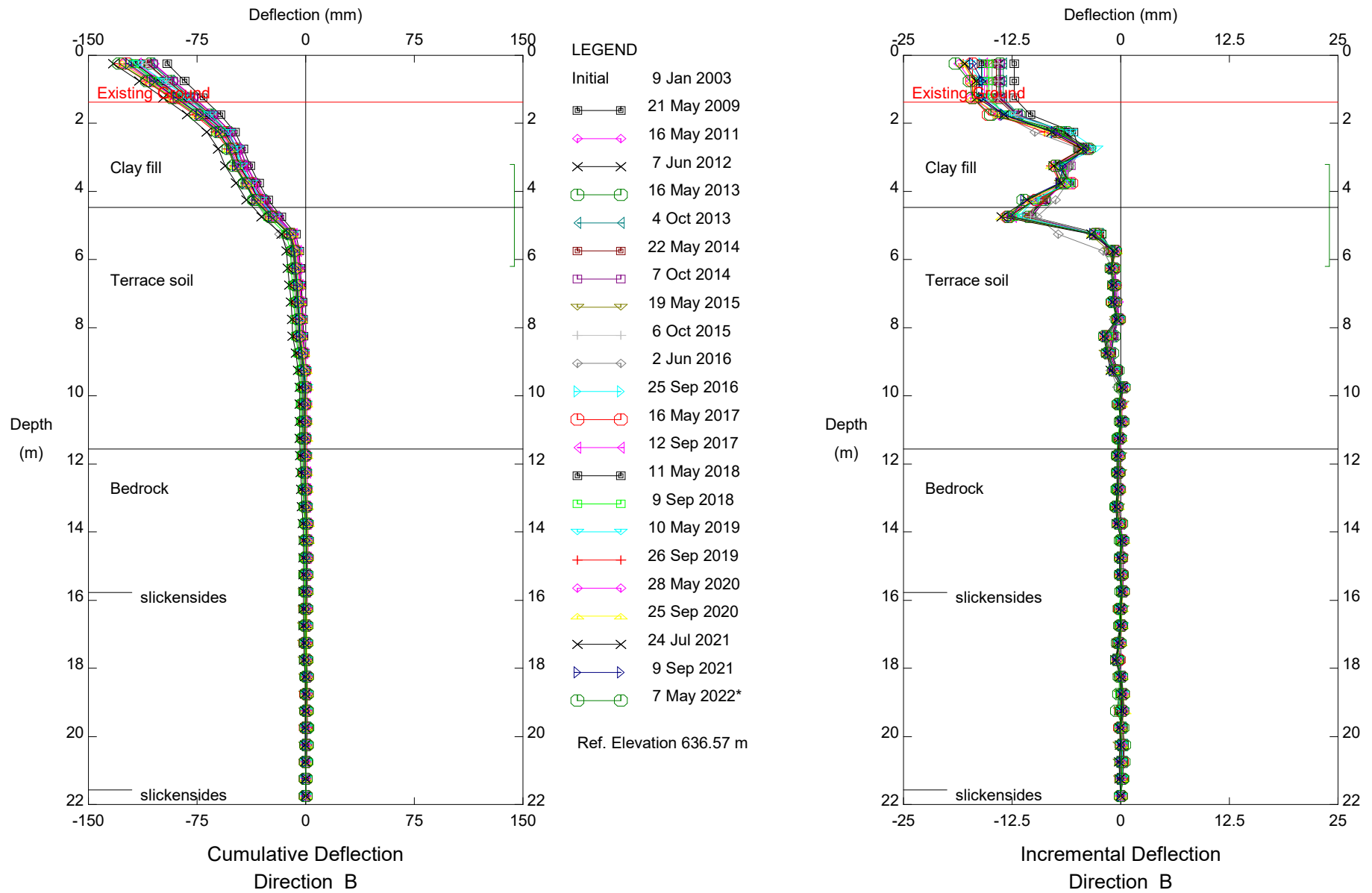
Alberta Transportation



NC067, Inclinometer SI-12

Alberta Transportation

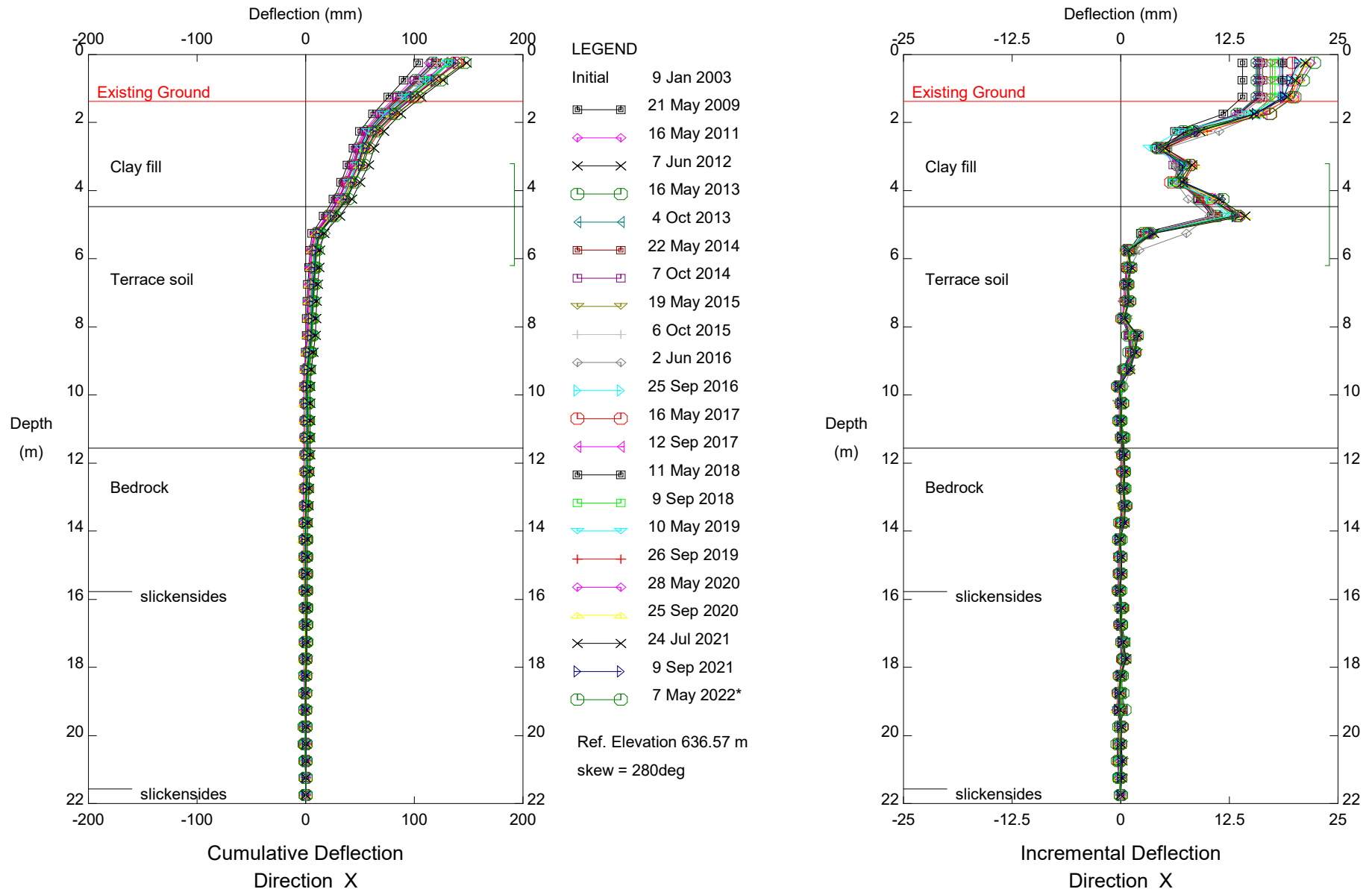
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NC067, Inclinometer SI-12

Alberta Transportation

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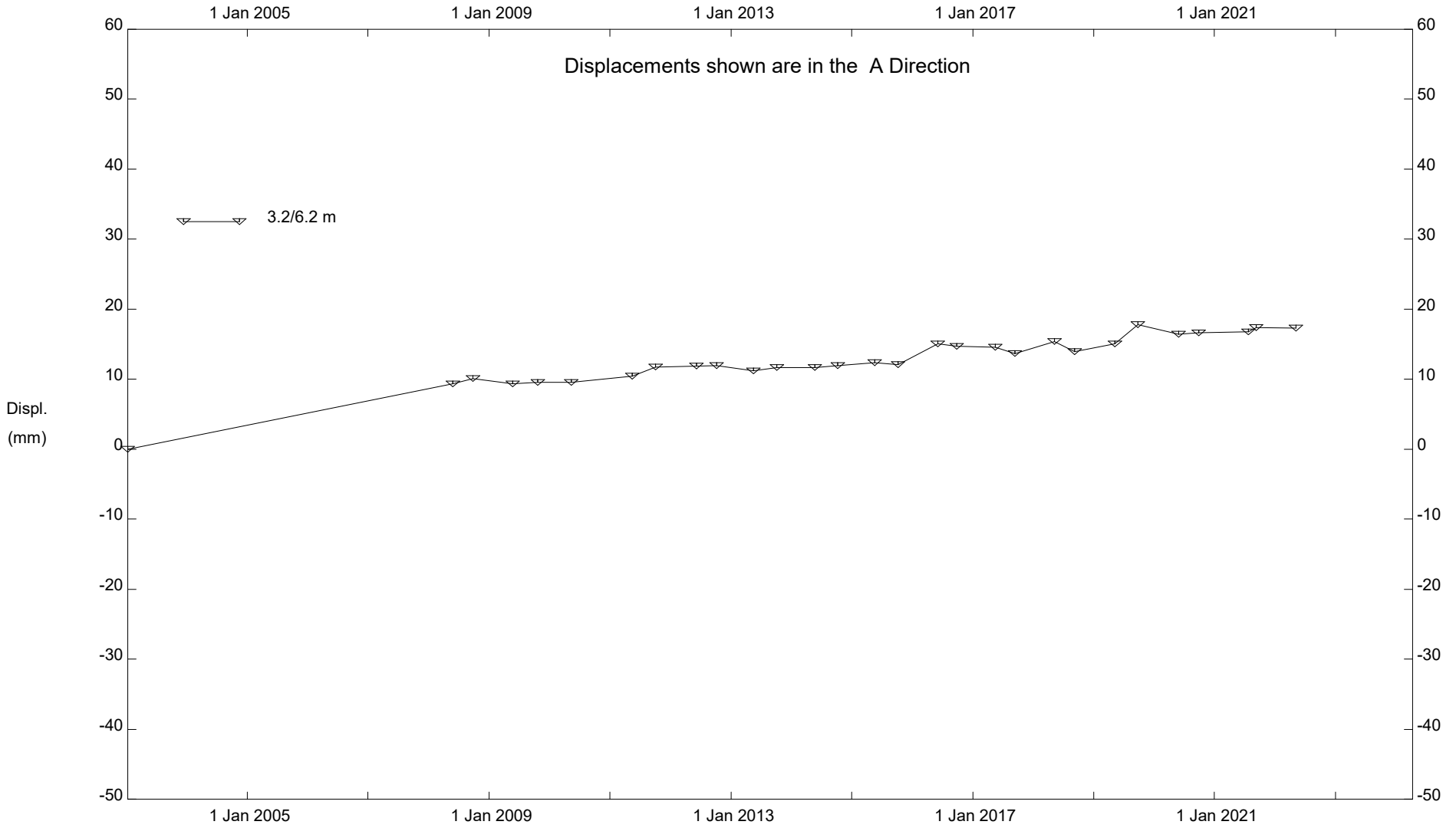


NC067, Inclinometer SI-12

Alberta Transportation

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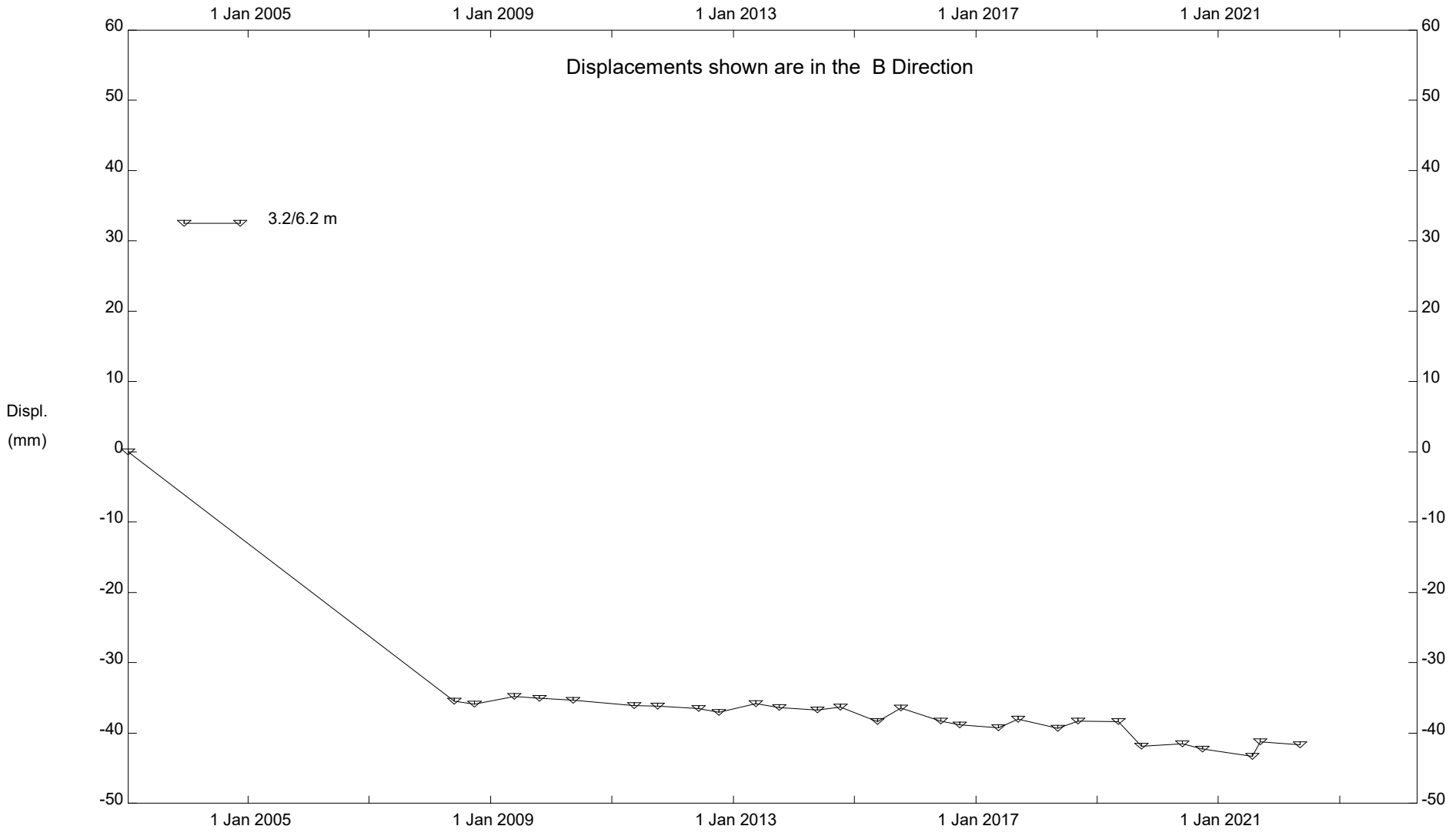
Stantec Consulting Ltd - Edmonton



NC067, Inclinometer SI-12

Alberta Transportation

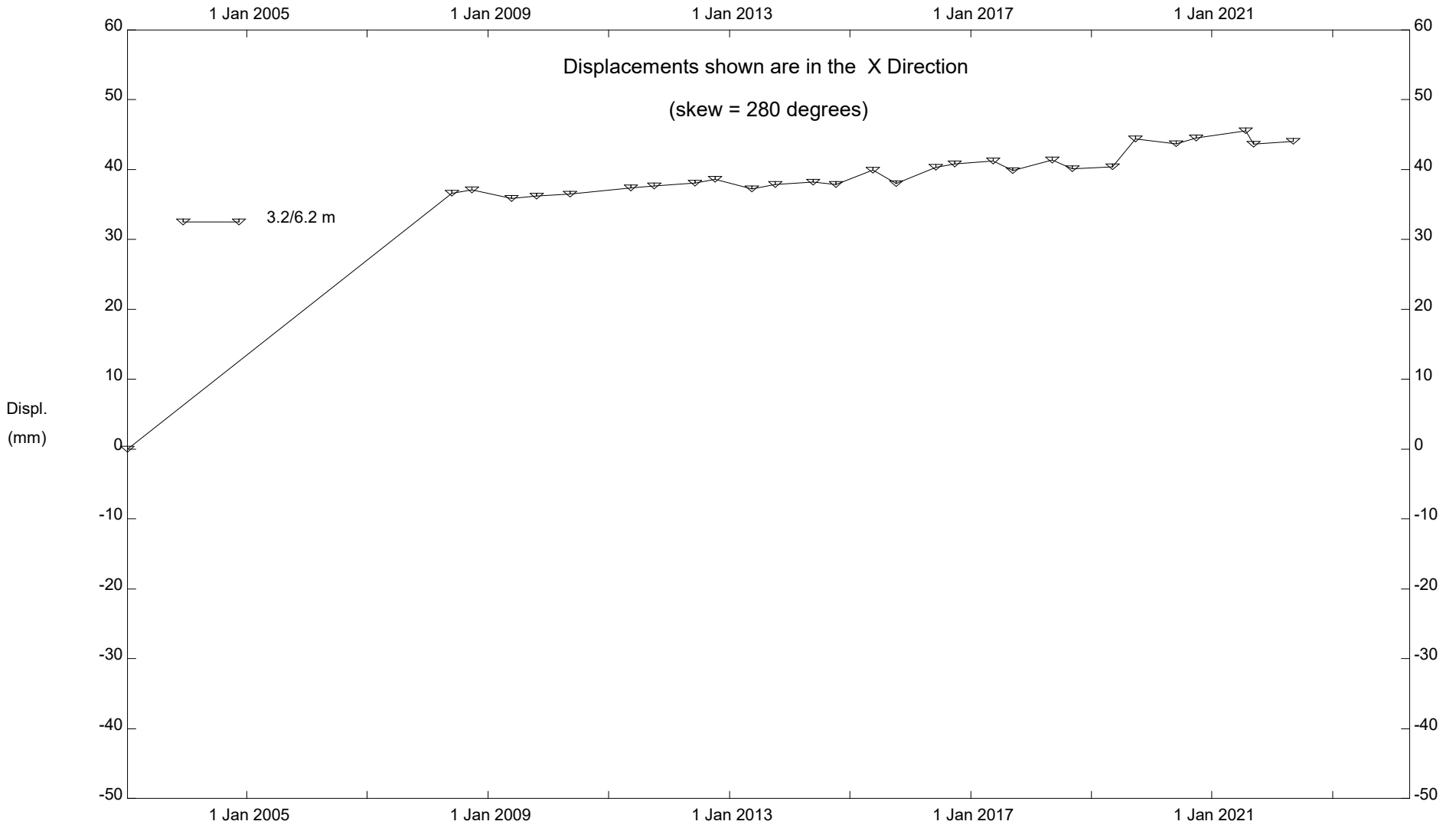
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Alberta Transportation

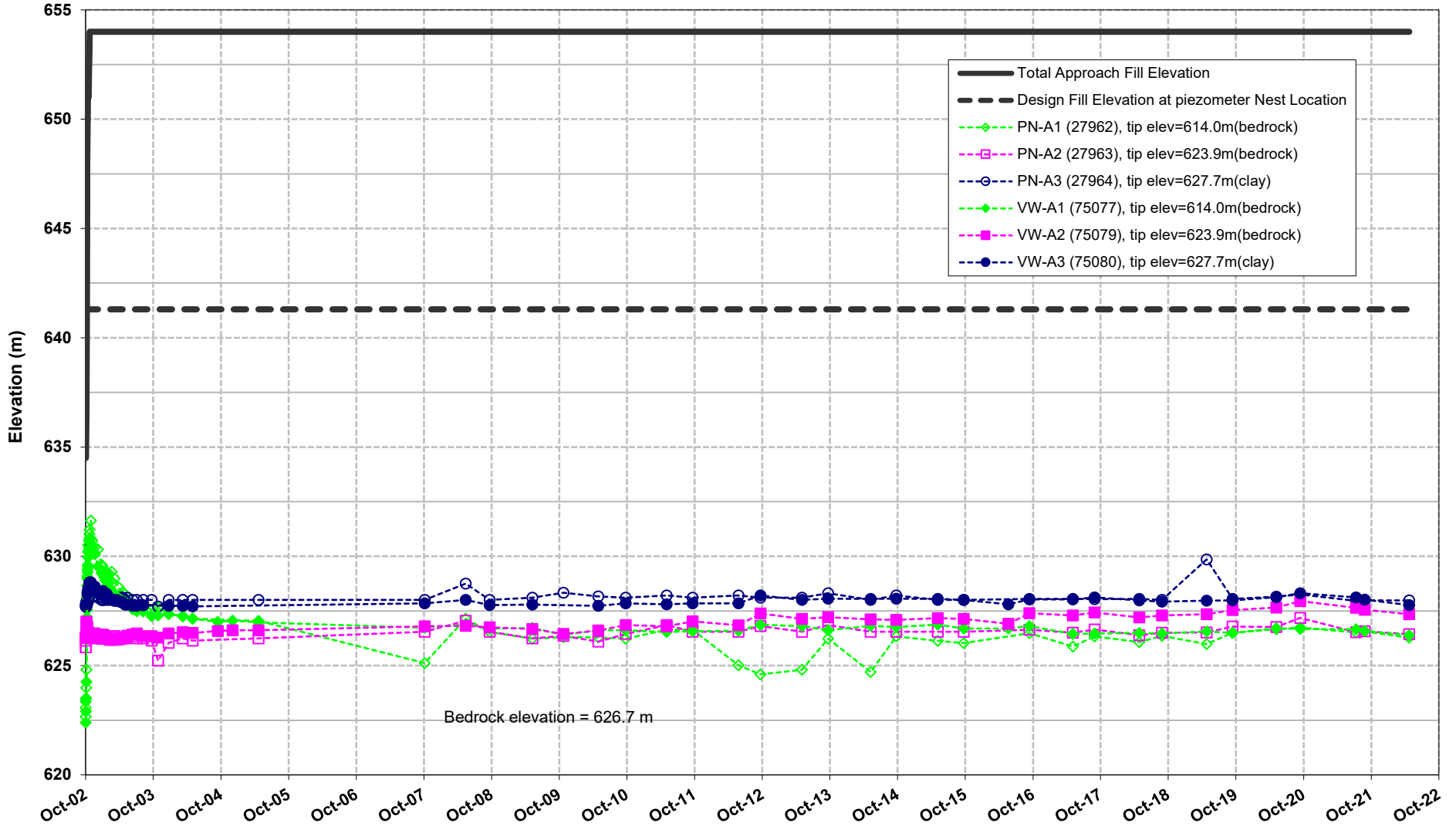
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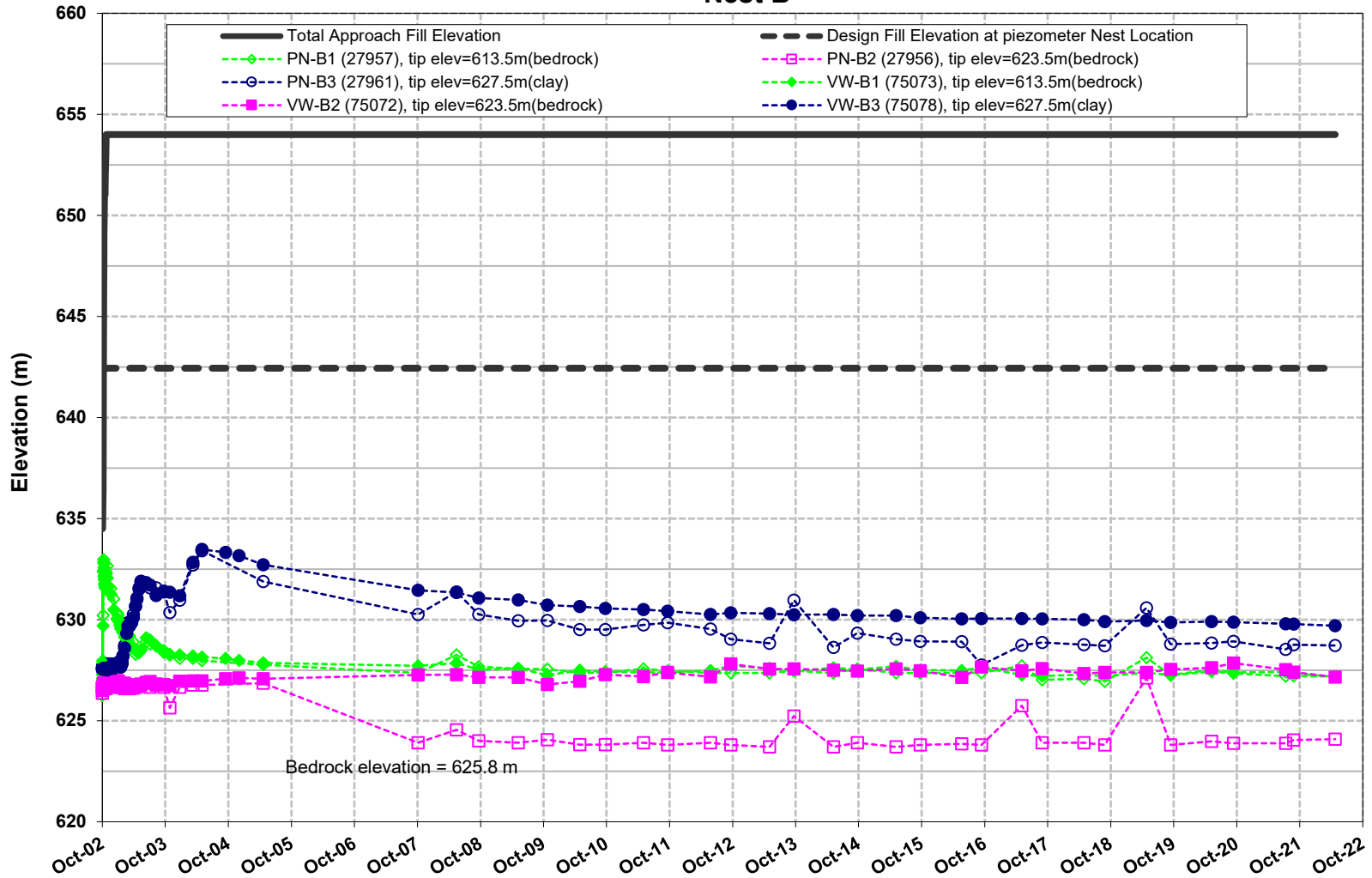
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Alberta Transportation

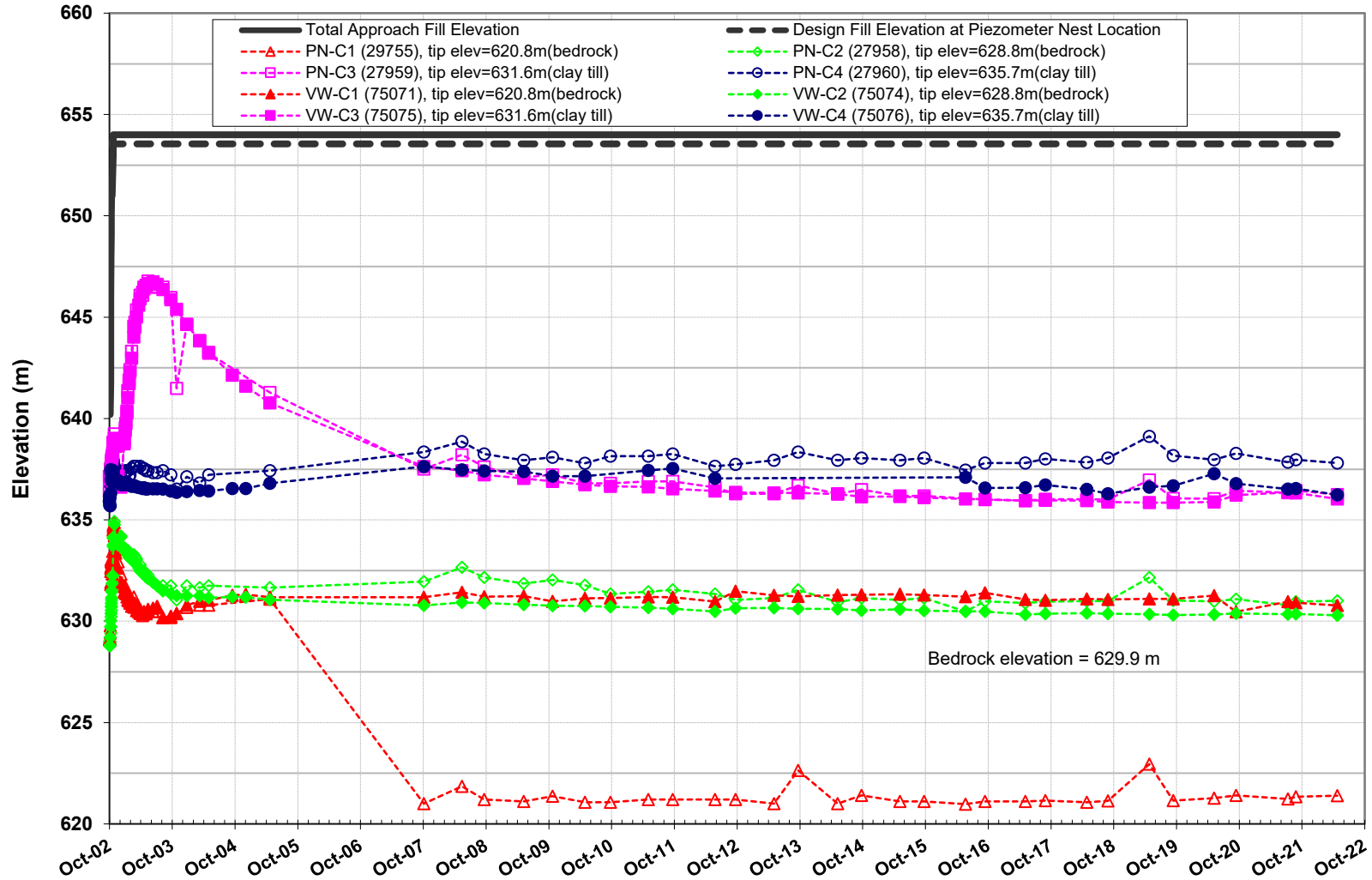
Piezometer Plots West Abutment Nest A



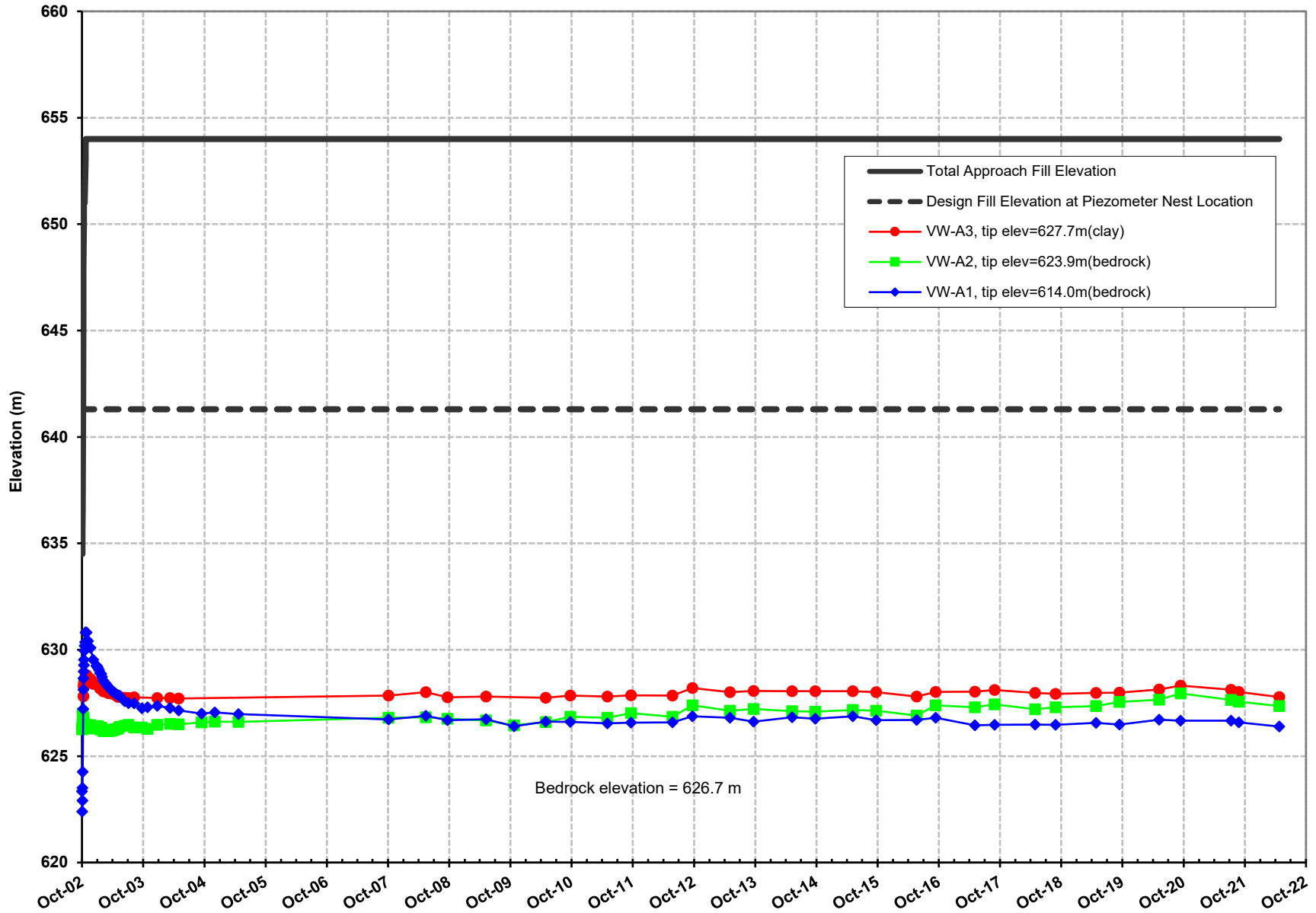
**Piezometer Plots
West Abutment
Nest B**



Piezometer Plots West Abutment Nest C

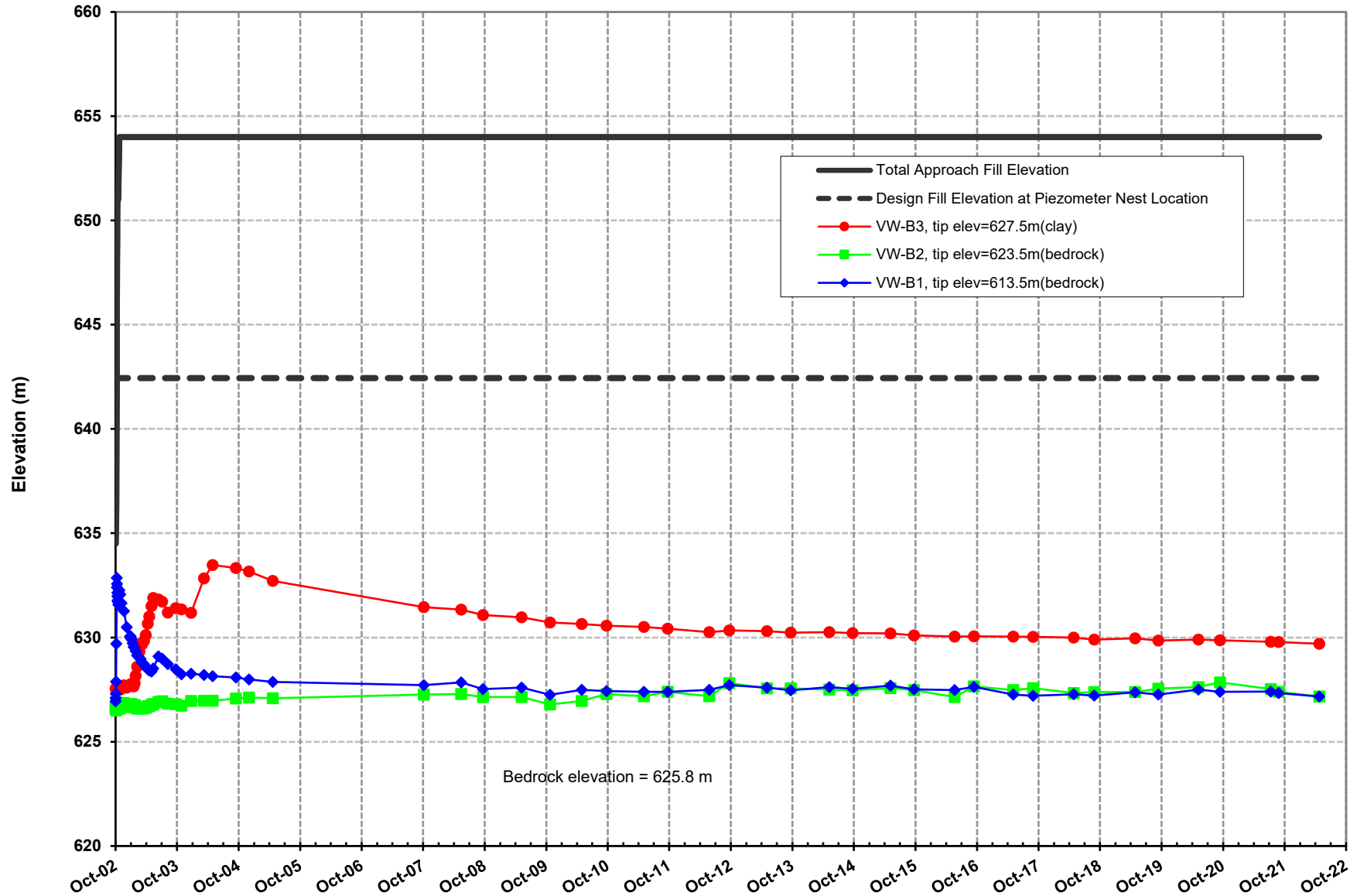


North Saskatchewan River Bridge - West Approach
Anthony Henday Drive (West)
Piezometer Nest Location A
Vibrating Wire Piezometers Only



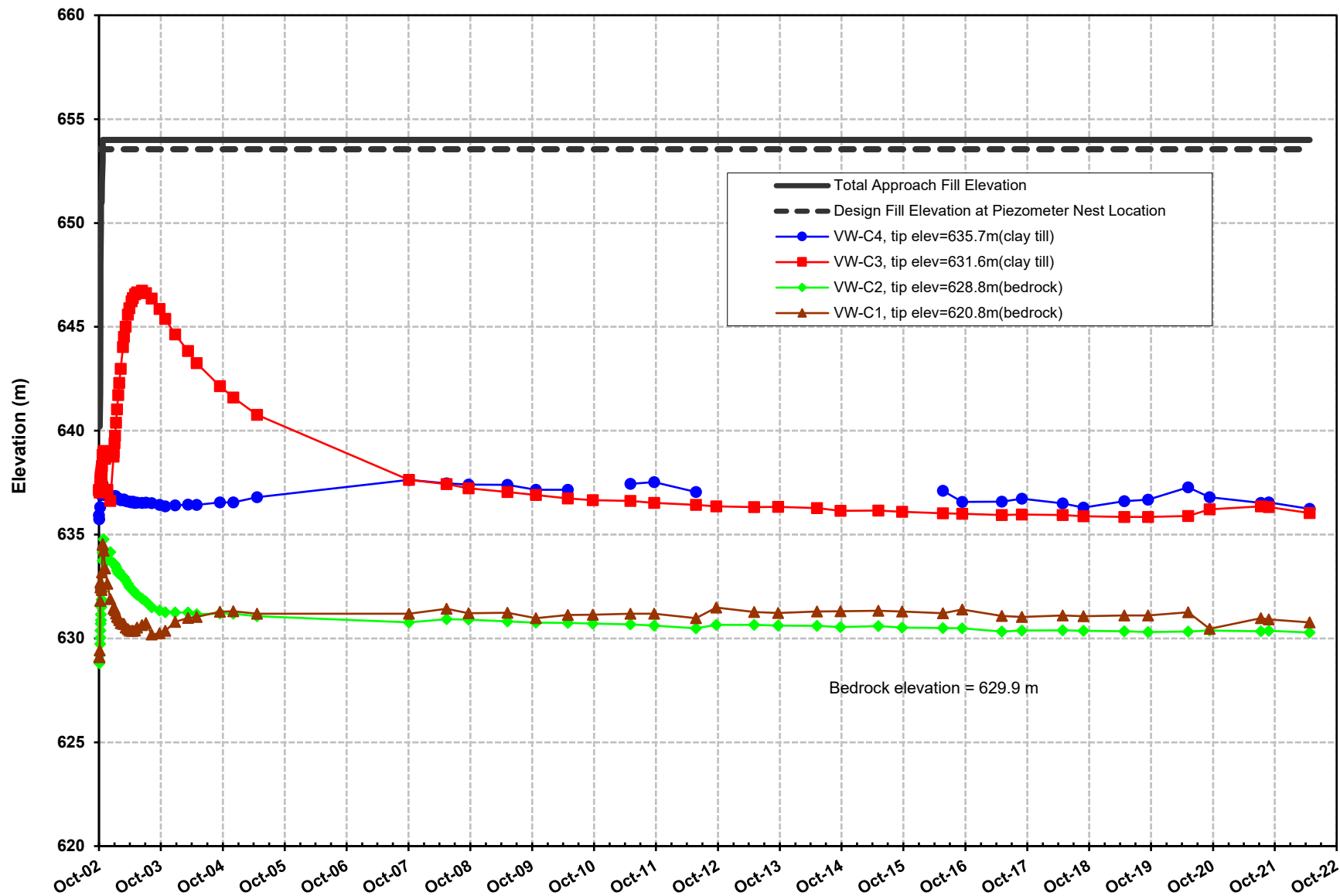
North Saskatchewan River Bridge - West Approach

Anthony Henday Drive (West)
Piezometer Nest Location B
Vibrating Wire Piezometers Only

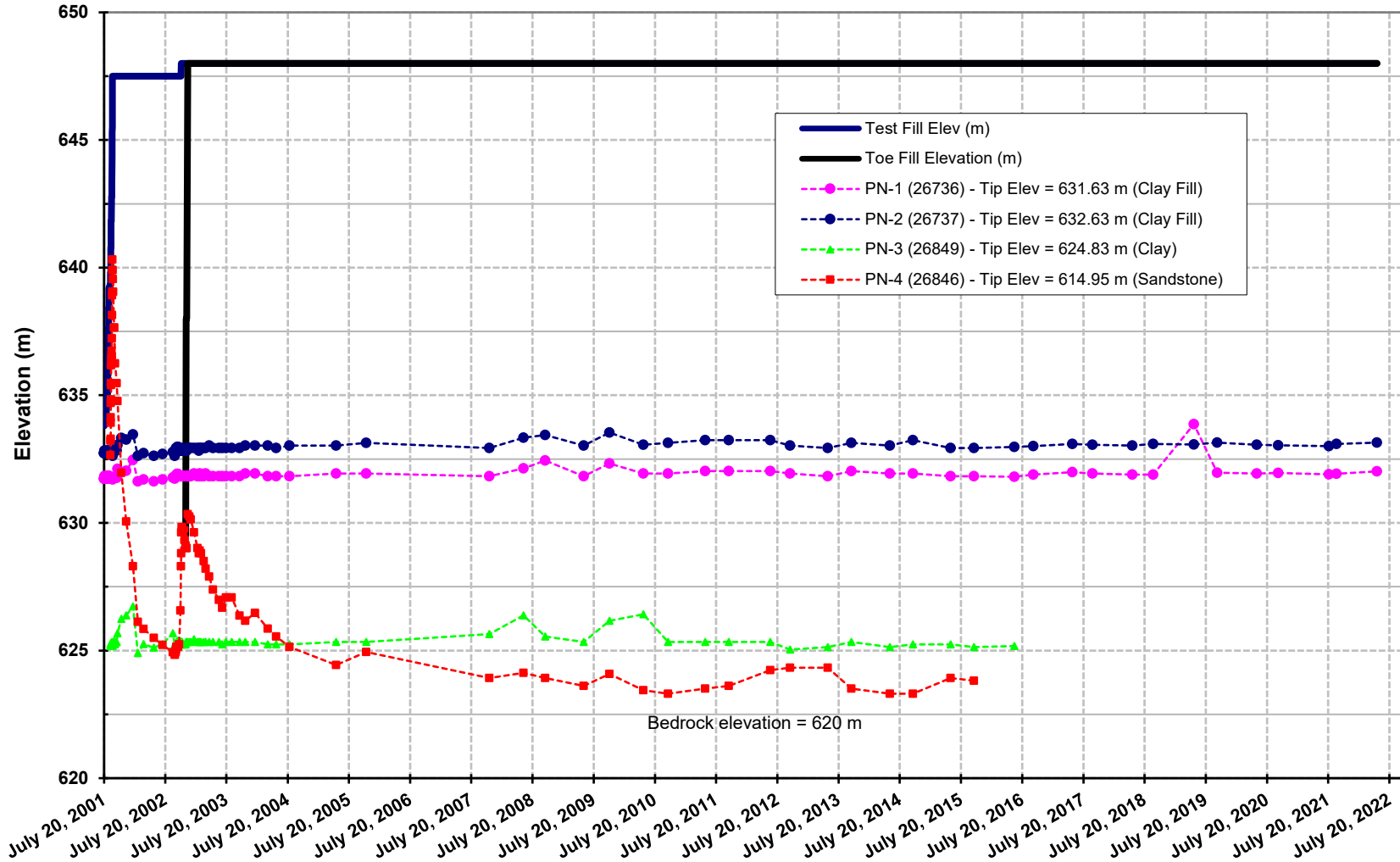


North Saskatchewan River Bridge - West Approach

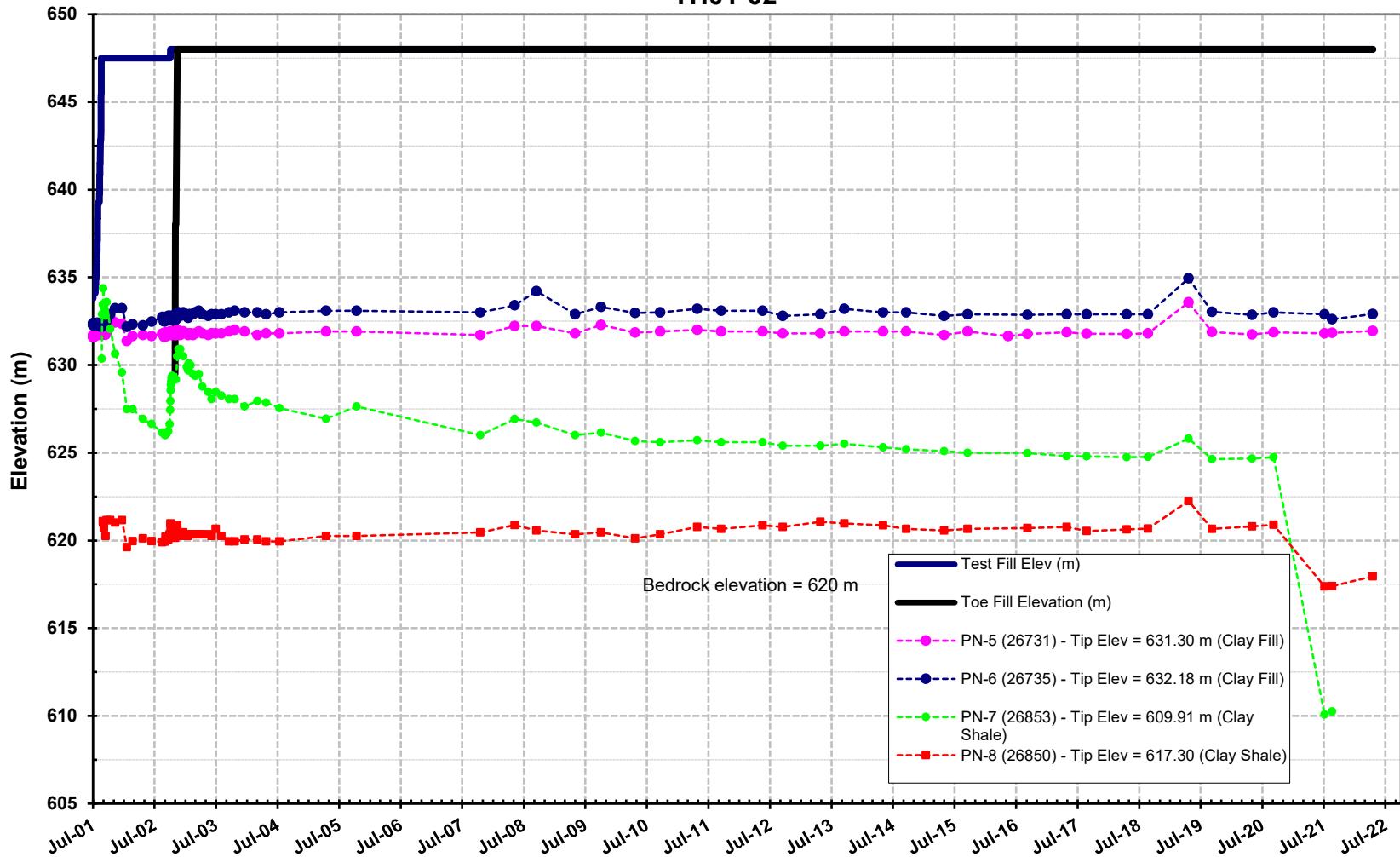
Anthony Henday Drive (West)
Piezometer Nest Location C
Vibrating Wire Piezometers Only



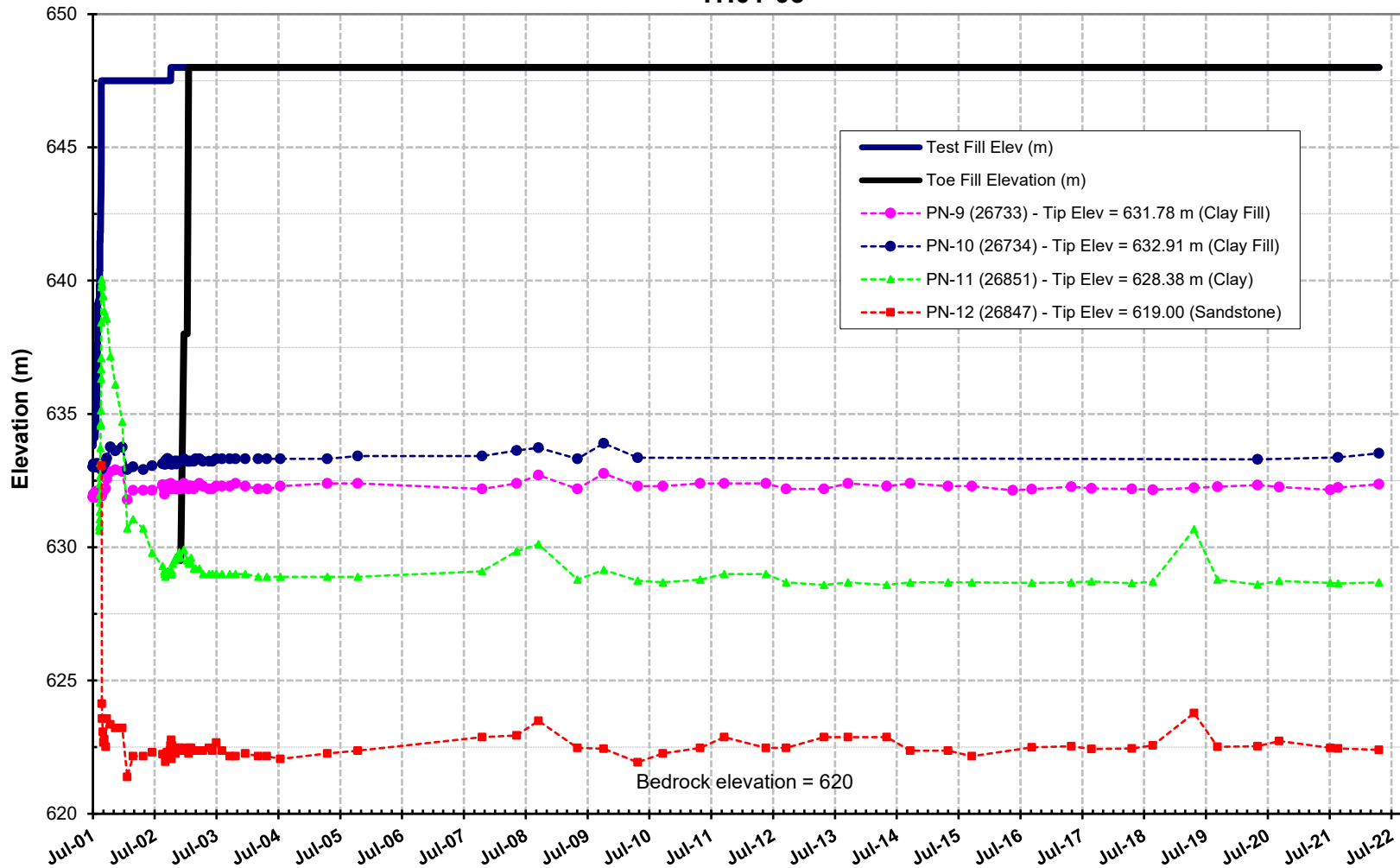
Pneumatic Piezometer Plots
East Abutment
TH01-01



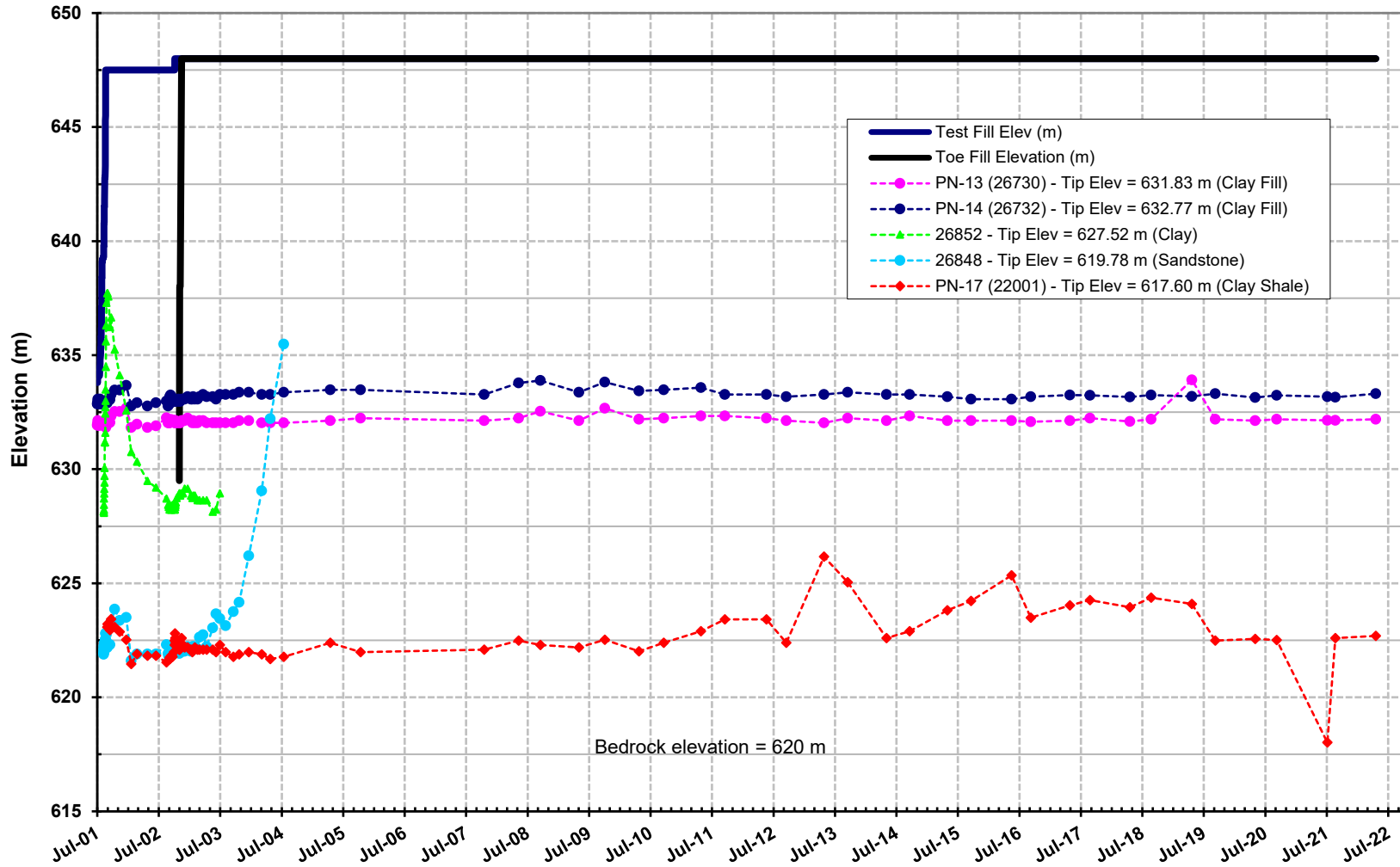
Pneumatic Piezometer Plots
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TH01-02



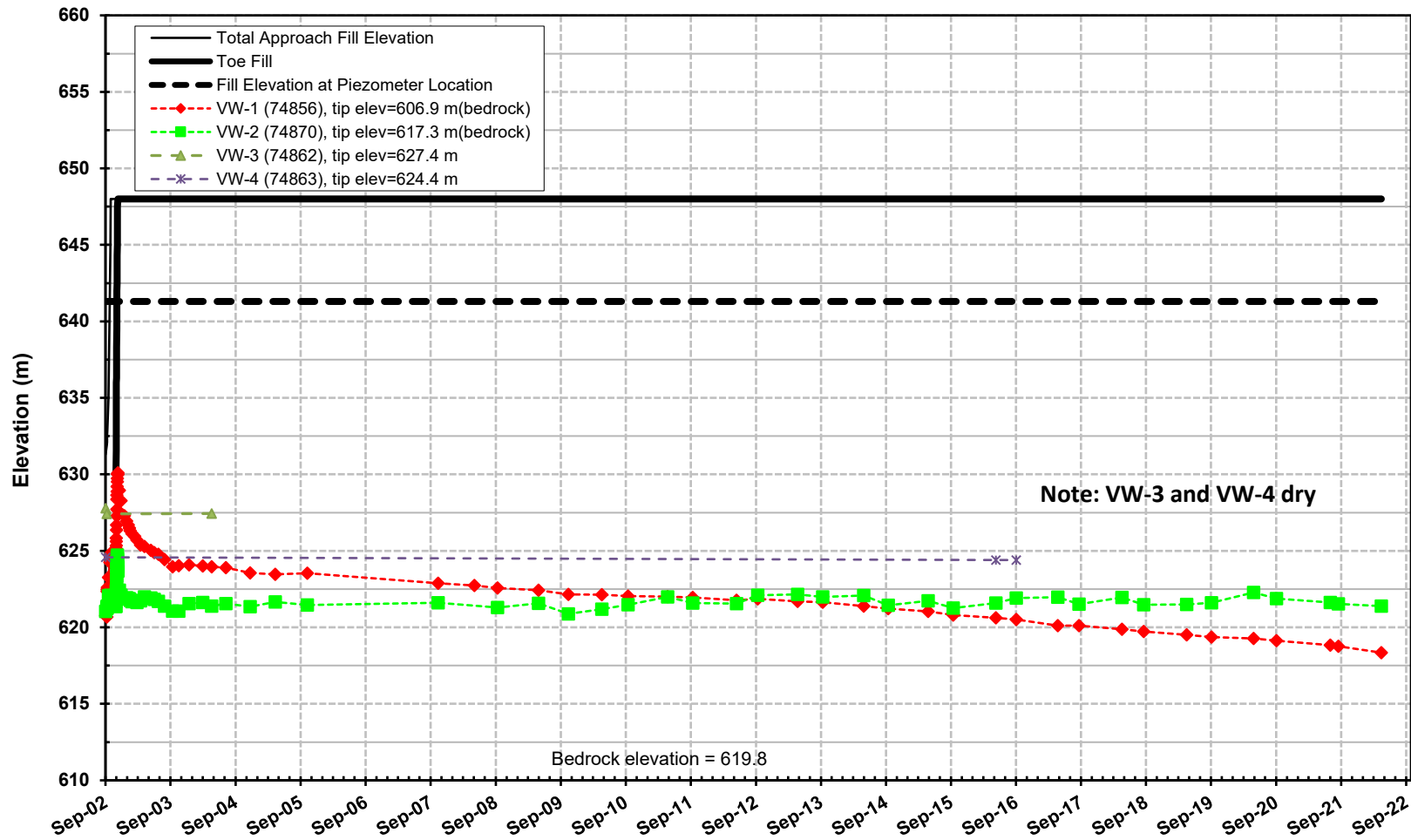
Pneumatic Piezometer Plots
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TH01-03



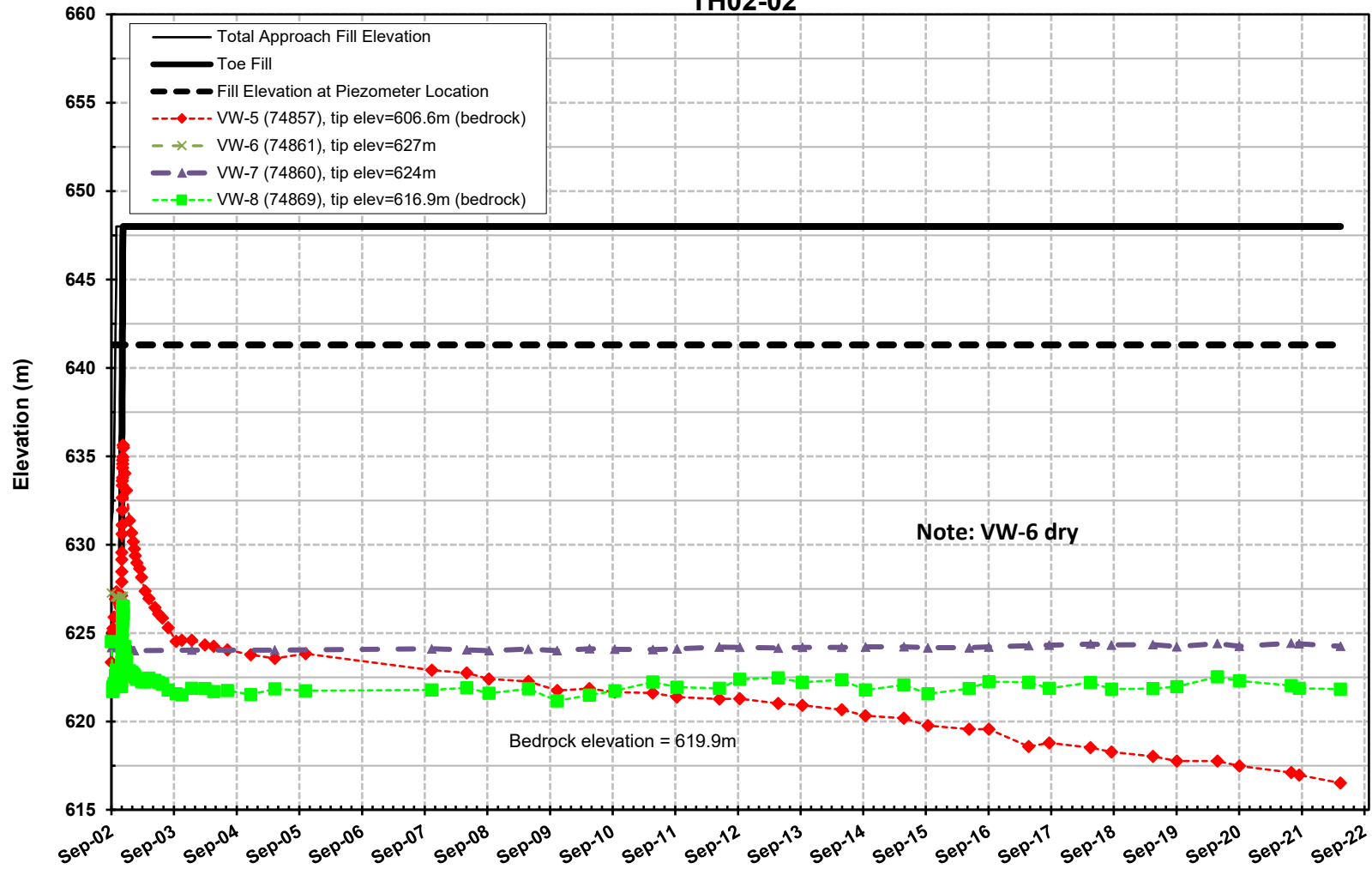
Pneumatic Piezometer Plots
East Abutment
TH01-04



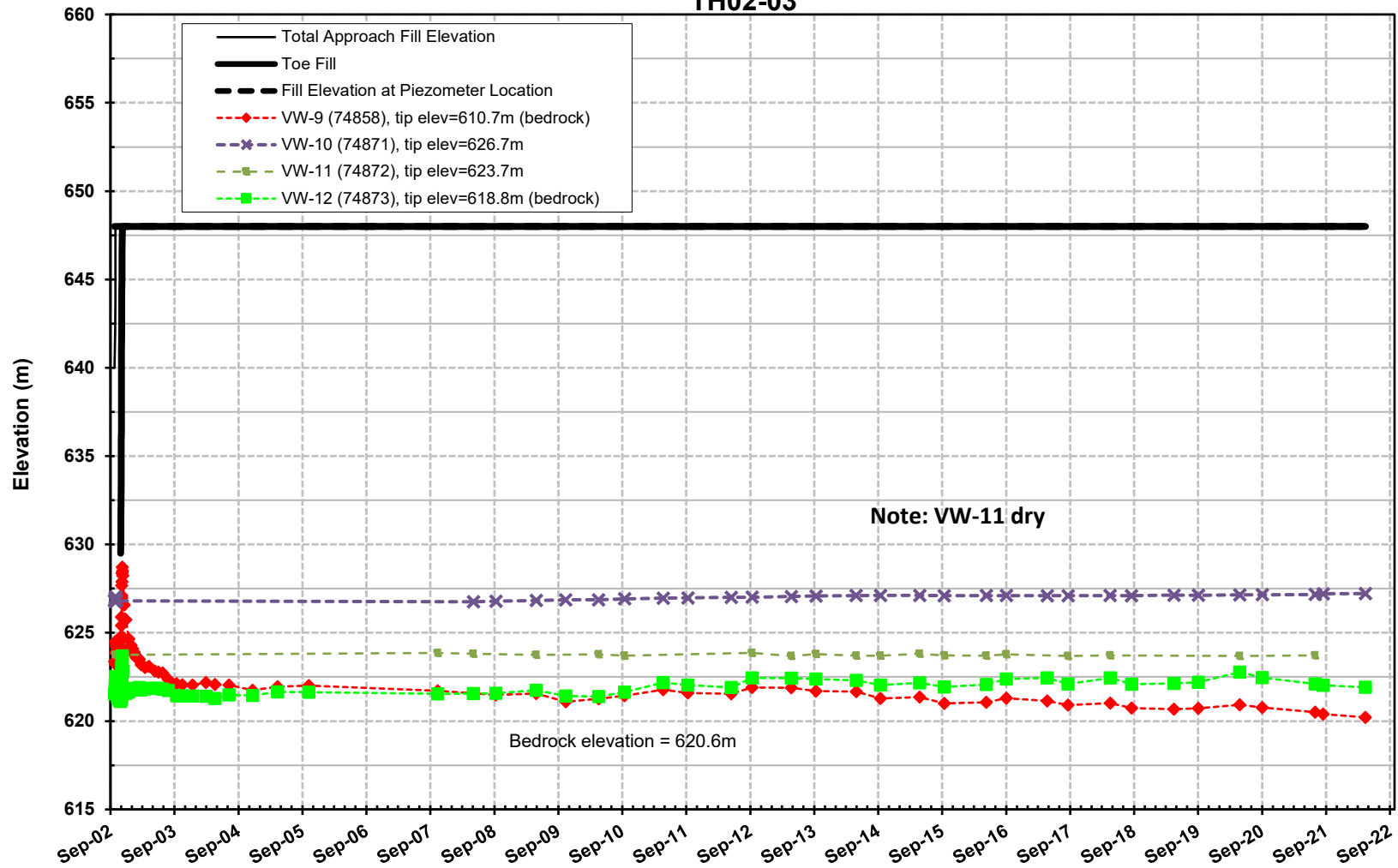
Vibrating Wire Piezometers Plots East Abutment TH02-01



Vibrating Wire Piezometers Plots
East Abutment
TH02-02



Vibrating Wire Piezometers Plots
East Abutment
TH02-03



Vibrating Wire Piezometers Plots
East Abutment
TH02-04

