

ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS GRMP
PEACE REGION – (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING - SPRING 2025



Site Number	Location	Name	Hwy	km
PH045	Hwy 35:08 C1 26.2	Meikle Pile Wall	35:08	Km 26.2
Legal Description:		UTM Co-ordinates		
6-7-94-22 W5		11U E 467580.75	N	6333080.85

Current Monitoring:	11-Jun-2025	Previous Monitoring	23-Sep-2024
Instruments Read By:	Mr. Niraj Regmi, G.I.T., and Mr. Godfred Etiendem, Thurber		

Instruments Read During This Site Visit			
Slope Inclonometers (SIs): SI-49 SI-50 SI-51 SI23-100	Pneumatic Piezometers (PN): N/A	Vibrating Wire Piezometers (VW): VW23-100A VW23-100B VW23-101 VW23-102 VW23-103	Standpipe Piezometers (SP): N/A
Load Cell (LC): N/A	Strain Gauges: N/A	SAs: N/A	Others: N/A

Readout Equipment Used			
Slope Inclonometers: Two RST Digital Inclonometer probes with 2 ft. wheelbases and RST Pocket PC readouts	Pneumatic Piezometers:	Vibrating Wire Piezometers: Geokon GK404	Standpipe Piezometers:
Load Cell:	Strain Gauges:	SAs:	Others:
Note:			

Zones of New Movement:	None
Interpretation of Monitoring Results:	<p>Slope inclinometers SI-49, -50, and -51 were installed inside the pile wall along the south shoulder of the highway. The movement zones for the slope inclinometers installed in the piles are defined over the length of the pile and waler.</p> <p>SI-49 is installed near the east end of the wall. Since the fall of 2024 readings, SI-49 showed a rate of movement of 2.7 mm/yr over 1.5 m to 14.3 m depth with a total cumulative deflection of 164.7 mm. The current rate of movement in SI-49 is lower than the overall rate of movement of 6.0 mm/yr measured since initialization. Overall, the movement pattern at SI-49 appears to have been unaffected by the repairs undertaken in 2016.</p> <p>SI-50 is installed in the central portion of the wall and showed a rate of movement of 0.8 mm/yr since the fall of 2024 readings with a total</p>

	<p>cumulative movement of 166.0 mm. The overall movement rate in this SI since initialization is also 6.0 mm/yr. SI-50 showed a marked reduction in movement rate post-construction but has since increased although at a slower rate than prior to construction.</p> <p>SI-51 is installed in near the west end of the wall and may be outside of the influence of the main slide area. SI-51 showed no discernible movement since the fall of 2024 readings with a total cumulative movement of 79.7 mm. The overall movement rate at SI-51 since initialization is 2.9 mm/yr. The pattern at SI-51 is irregular likely due to the casing damage (at depth and near surface); however, the overall trend indicates that this inclinometer was also unaffected by the 2016 repairs.</p> <p>Slope inclinometer SI23-100 is located immediately downslope of the pile wall and showed a rate of movement of 6.4 mm/yr over 4.8 m to 7.8 m depth, and no discernible movement over 21.9 m to 24.3 m depth since the Fall 2024 readings. This lower zone does not appear to be movement and may have been a grouting issue as the initial displacement has stabilized with no measurable displacement over the last two sets of readings. There is also a potential shallower zone developing at about 3 m which is the contact between the fill and native materials.</p> <p>The vibrating wire piezometers show current groundwater depths ranging from 2.97 m in VW23-100B to 9.13 m below existing ground surface in VW23-103. VW23-100A, VW23-101, and VW23-103 showed decreases in groundwater level of 0.10 m, 0.33 m, and 0.21 m, respectively, since the fall of 2024 readings. VW23-100B and VW23-102 showed increases in groundwater level of 0.01 m and 0.07 m, respectively. The current groundwater level reading in VW23-100B is the highest since the instruments were initialized. The nested piezometers at VW23-100 indicate an upward groundwater flow pattern. The vibrating wire piezometer readings are summarized in Table PH045-2 below and are plotted on Figure PH045-1 in Appendix A.</p>
Future Work:	The instruments should be read again in the fall of 2025.
Instrumentation Repairs:	No instrument repairs are required at this time.
Additional Comments:	

Attachments:	<ul style="list-style-type: none"> • Table PH045-1: Spring 2025 – Meikle River (km 26.2 Pile Wall) Slope Inclinometer Instrumentation Reading Summary • Table PH045-2: Spring 2025 – Meikle River (km 26.2 Pile Wall) Vibrating Wire Piezometer Instrumentation Reading Summary • Statement for Use and Interpretation of Report • APPENDIX A - PH045 SPRING 2025 <ul style="list-style-type: none"> ○ Field Inspector's report ○ Site Plan Showing Approximate Instrument Locations (Drawing No. 32121 PH045) ○ SI Reading Plots ○ Figure PH045-1 (Vibrating Wire Piezometer Depths) ○ Figure PH045-1 (Vibrating Wire Piezometer Elevations)
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We trust this report meets your requirements at present. If you have any questions, please contact the undersigned at your convenience.

Yours very truly,
Thurber Engineering Ltd.
Don Proudfoot, M.Eng., P. Eng.
Senior Geotechnical Engineer

Lucas Green, P.Eng.
Geotechnical Engineer



STATEMENT FOR USE AND INTERPRETATION OF REPORT

1. STANDARD OF CARE

This Report has been prepared in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality and in compliance with all applicable laws.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment, including this Statement For Use and Interpretation of Report, are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT, AS DESCRIBED ABOVE. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TO THE WHOLE OF THE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives, and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

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The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client for the development, design objectives, and/or purposes described to Thurber by the Client. **NO OTHER PARTY MAY USE OR RELY ON THE REPORT OR ANY PORTION THEREOF FOR OTHER THAN THE CLIENT'S BENEFIT IN CONNECTION WITH THE PURPOSES DESCRIBED IN THE REPORT.** Any use which a third party makes of the Report is the sole responsibility of such third party and is always subject to this Statement for Use and Interpretation of Report. Thurber accepts no liability or responsibility for damages suffered by any third party resulting from use of the Report for purposes outside the reasonable contemplation of Thurber at the time it was prepared or in any manner unintended by Thurber.

5. INTERPRETATION OF THE REPORT

- a) **Nature and Exactness of Soil and Contaminant Description:** Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors is inherently judgement-based. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other parties making use of such documents or records with or without our express written consent need to be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other parties. Some conditions are subject to change over time and those making use of the Report need to be aware of this possibility and understand that the Report only presents the interpreted conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client must disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.
- b) **Reliance on Provided Information:** The evaluation and conclusions contained in the Report have been prepared based on conditions in evidence at the time of site inspections and based on information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report resulting from misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other parties providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- c) **Design Services:** The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber is recommended to be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design need to be reported to Thurber immediately so that Thurber can address potential conflicts.
- d) **Construction Services:** During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions to confirm and document that the site conditions do not materially differ from those conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. INDEPENDENT JUDGEMENTS OF CLIENT

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Table PH045-1: Spring 2025 – Meikle River (km 26.2 Pile Wall) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: June 11, 2025

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AT NOTED DEPTH SINCE INITIAL READING (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)
SI-49	Dec. 15, 1997	164.7 mm over 1.5 m to 14.3 m depth in 216° direction	15.2 mm/y In June 1999	Operational	September 23, 2024	1.9	2.7	-0.9
SI-50	Dec. 15, 1997	166.0 mm over 1.7 m to 13.9 m depth in 241° direction	14.2 mm/yr in Sept. 2011	Operational	September 23, 2024	0.6	0.8	-4.1
SI-51	Dec. 15, 1997	79.7 mm over 1.8 m to 12.2 m depth in 267° direction	48.8 mm/yr In May 1998	Operational	September 23, 2024	No Discernible Movement	N/A	-19.7
SI23-100	May 11, 2023	20.8 mm over 4.8 m to 7.8 m depth in the 160° direction	34.1 mm/yr in October 2023	Operational	September 23, 2024	4.6	6.4	-2.6
		4.3 mm over 21.9 m to 24.3 m depth in the 207° direction	23.3 mm/yr in June 2023			No Discernible Movement	N/A	-0.2

Drawing 32121-PH045 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Table PH045-2: Spring 2025 – Meikle River (km 26.2 Pile Wall) Vibrating Wire Piezometer Instrumentation Reading Summary

Date Monitored: June 11, 2025

INSTRUMENT	DATE INITIALIZED	GROUND ELEVATION (m)	TIP DEPTH (m)	CURRENT STATUS	MAXIMUM WATER ELEVATION (m)	MEASURED GROUNDWATER ELEVATION (m)	PREVIOUS GROUNDWATER ELEVATION (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
VW23-100A	May 10, 2023	463.39	23.37	Operational	454.60 on May 10, 2023	454.37	454.47	-0.10
VW23-100B	May 10, 2023	463.39	11.37	Operational	460.42 on June 11, 2025	460.42	460.41	0.01
VW23-101	May 10, 2023	463.06	15.00	Operational	458.08 on Sep. 23, 2024	457.75	458.08	-0.33
VW23-102	May 11, 2023	465.26	19.10	Operational	460.51 on June 15, 2023	459.73	459.66	0.07
VW23-103	May 11, 2023	468.23	15.40	Operational	461.79 on May 11, 2023	459.10	459.31	-0.21

Drawing 32121-PH045 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.



**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP (CON0022164)
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING RESULTS**

SPRING 2025

**APPENDIX A
DATA PRESENTATION**

SITE PH045: HWY 35:08, MEIKLE RIVER (km 26.2 PILE WALL)

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (PH45)
SPRING 2025**

Location: Meikle Pile Wall (Hwy 35:08 C1 26.2) File Number: 32121 (read under 36776 project number) Probe: RST 5R and 8R Cable: RST 5R and 8R	Readout: GK 404 SN 364 Casing Size: 3.34 Temp: 11 Read by: NKR/GE
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SLOPE INCLINOMETER (SI) READINGS

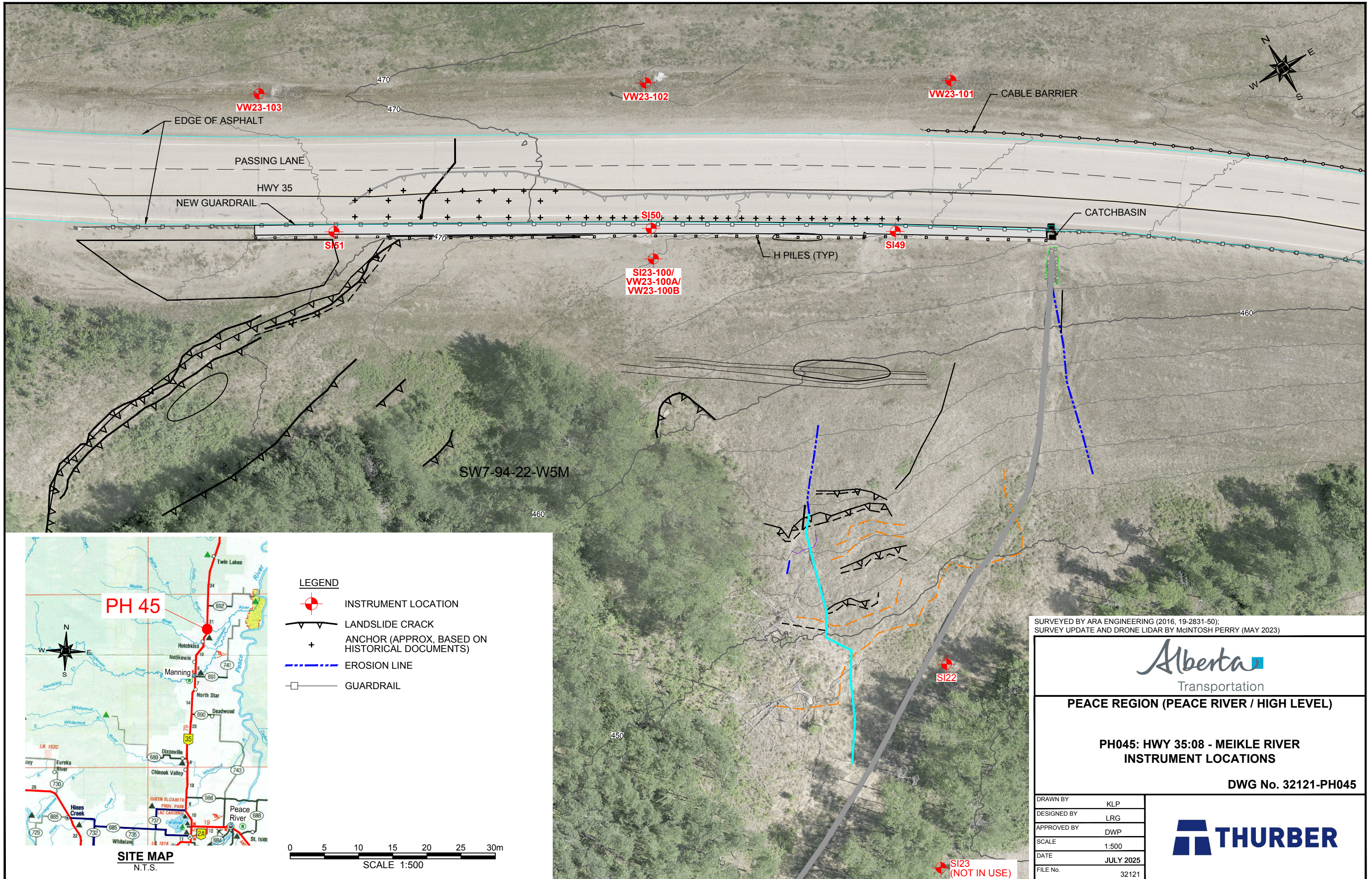
SI#	GPS Location (UTM 11)		Date	Stickup (m)	Depth from top of casing (ft)	Magn. North A+ Groove degree	Current Bottom Depth Readings				Probe/ Reel #	Size (")	Remarks
	Easting	Northing					A+	A-	B+	B-			
SI-49	467580.75	6333080.85	11-Jun-25	0.37	78 to 2	215°	113	-99	87	-88	8R/8R	3.34	
SI-50	467545.56	6333099.72	11-Jun-25	0.1	76 to 2	225°	81	-63	235	-235	8R/8R	3.34	**
SI-51	467545.72	6333120.09	11-Jun-25	0	70 to 2	145°	169	-186	-320	278	5R/5R	3.34	*
SI23-100	467550	6333091	11-Jun-25	1	84 to 0	181°	506	-491	323	-316	10R	3.34	

VIBRATING WIRE PIEZOMETER (VW) READINGS

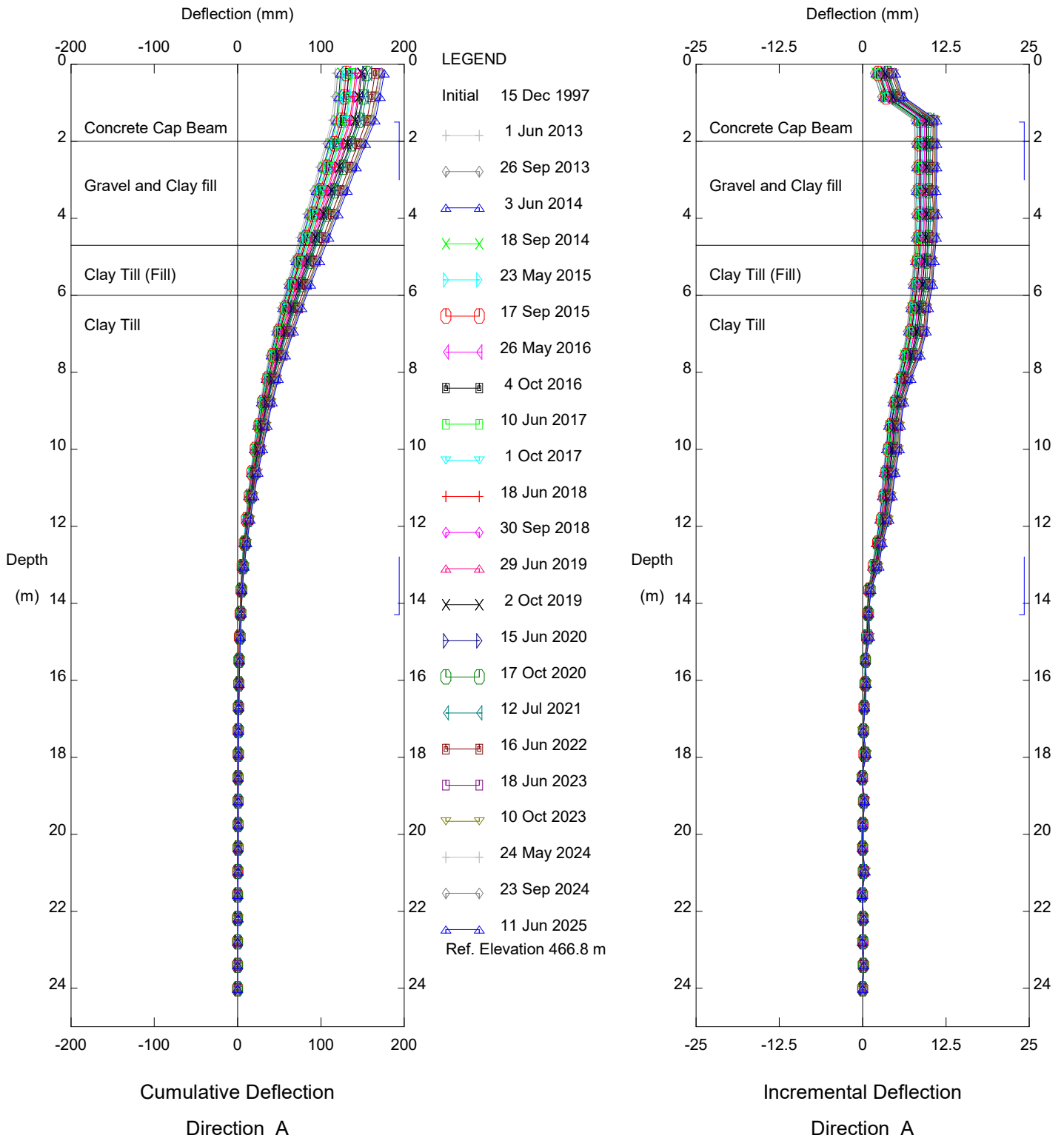
VW#	GPS Location (UTM 11)		Date	Reading (B)	Temp (°C)	Identification Number
	Easting	Northing				
VW23-100A	467550	6333091	11-Jun-25	8320.4	5.6	158306
VW23-100B	467550	6333091	11-Jun-25	8016.3	6.2	163218
VW23-101	467601	6333093	11-Jun-25	8759.6	5.9	160947
VW23-102	467564	6333115	11-Jun-25	8468	5.7	160933
VW23-103	467562	6333140	11-Jun-25	9005	5.5	160869

DAILY INSPECTOR REPORT

* SI-51 probe comes to surface not in grooves, may be damaged at 2 feet depth. Top of casing damaged
*SI-51 Probe did not go past 65 ft, SI was read from 2 ft to 64 ft
** SI-50 - top of SI slightly damaged



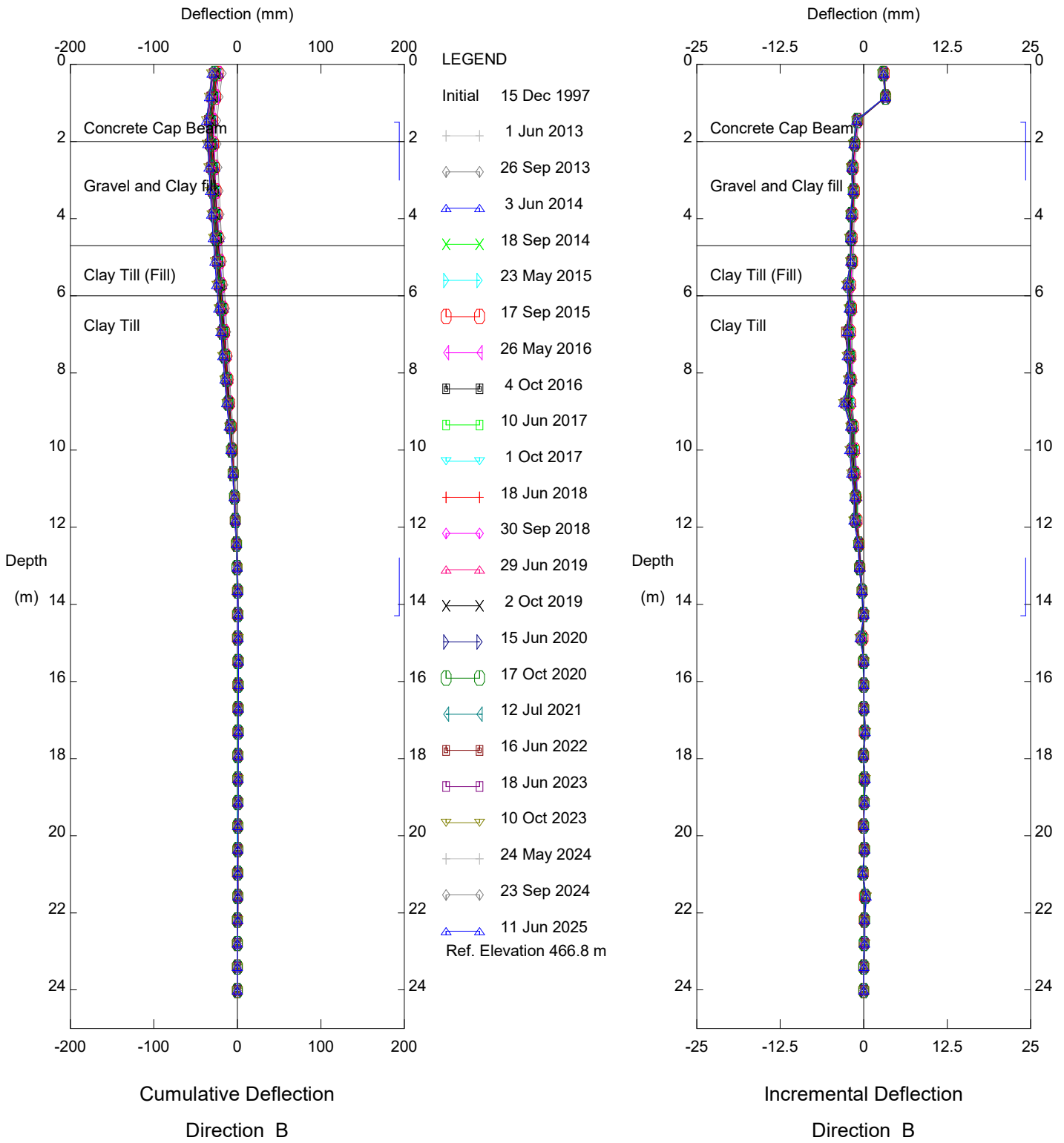
Thurber Engineering Ltd.



HWY 35:08 (PH045), Inclinator SI-49

Alberta Transportation

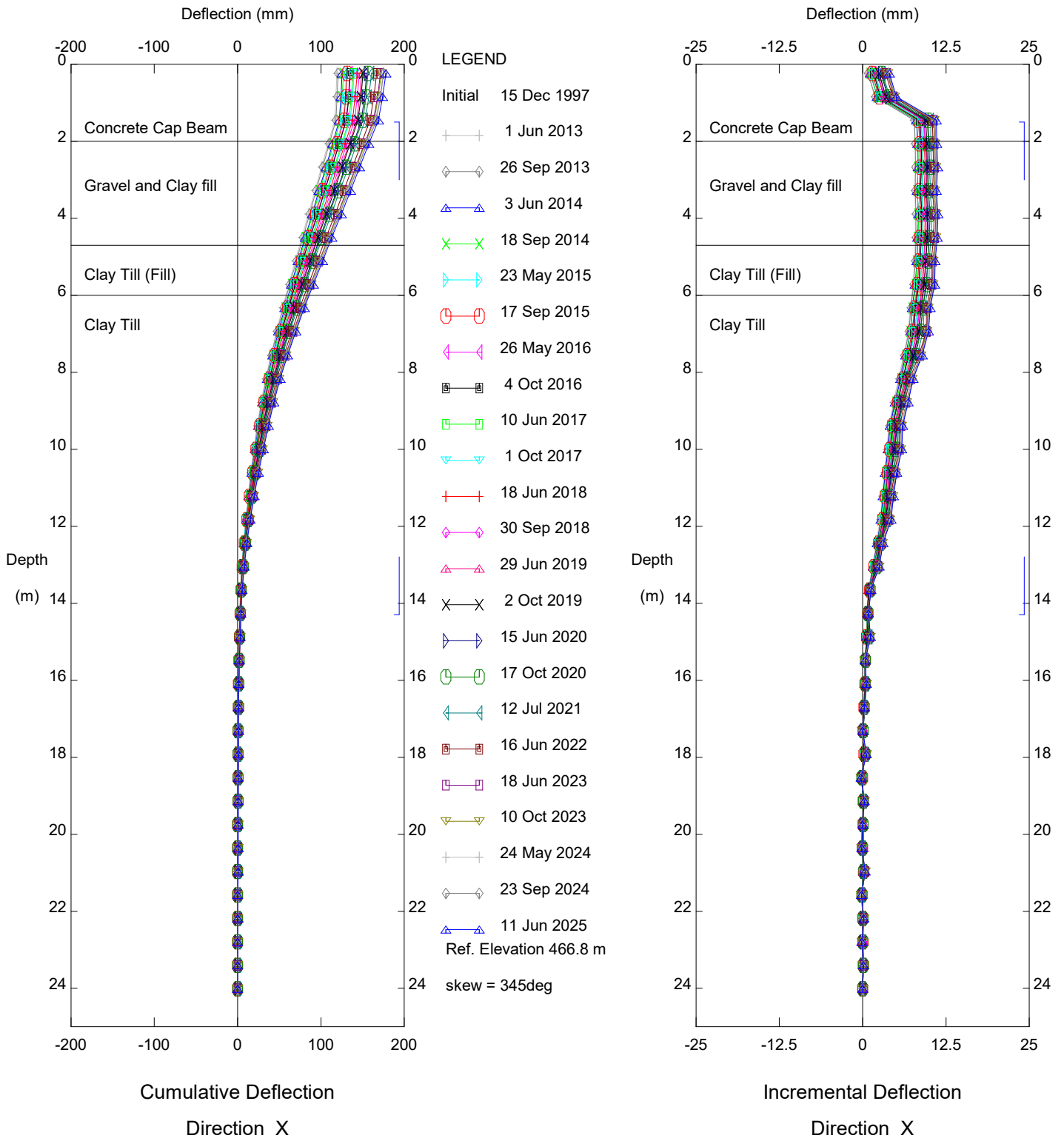
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HWY 35:08 (PH045), Inclinometer SI-49

Alberta Transportation

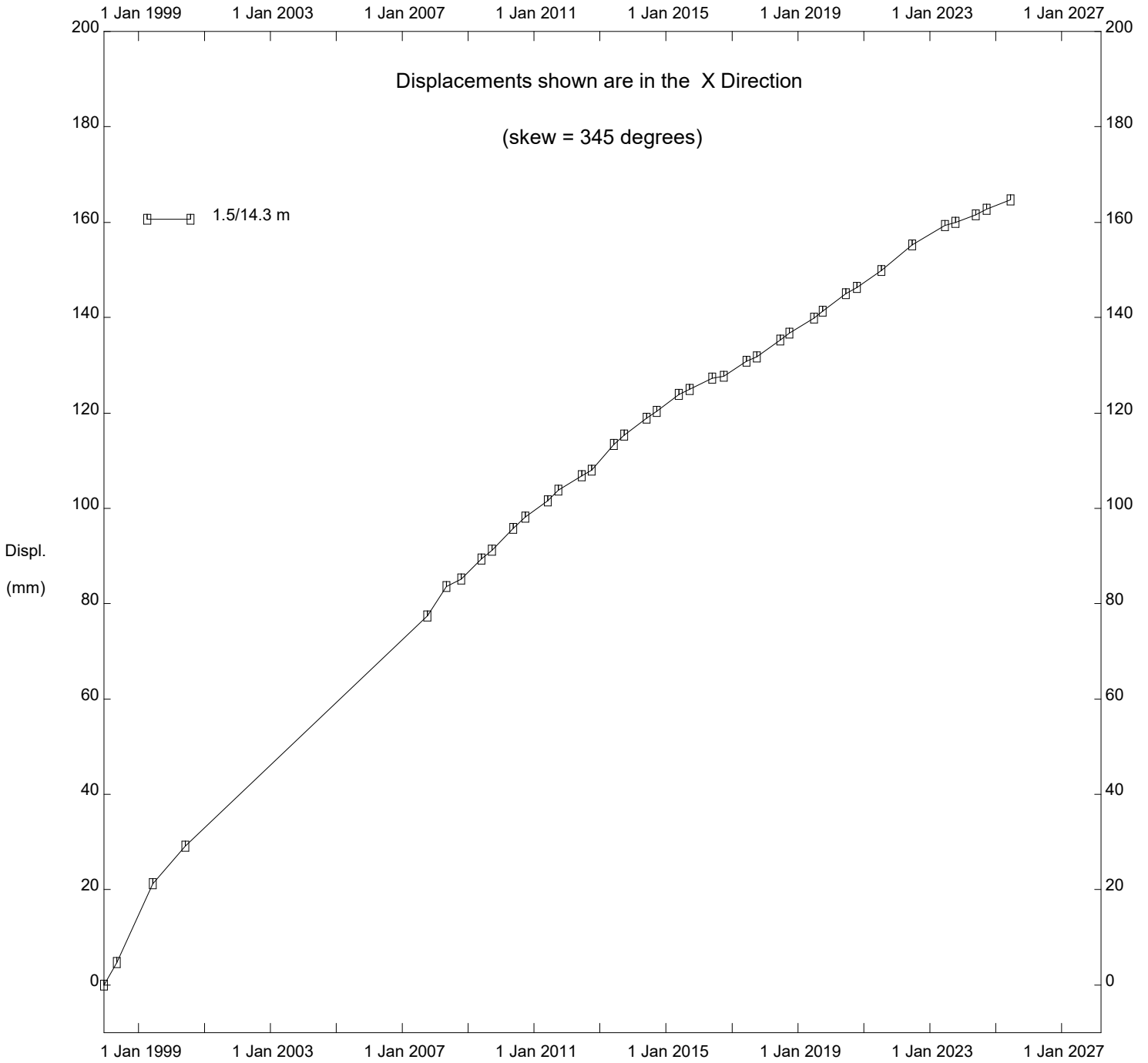
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HWY 35:08 (PH045), Inclinator SI-49

Alberta Transportation

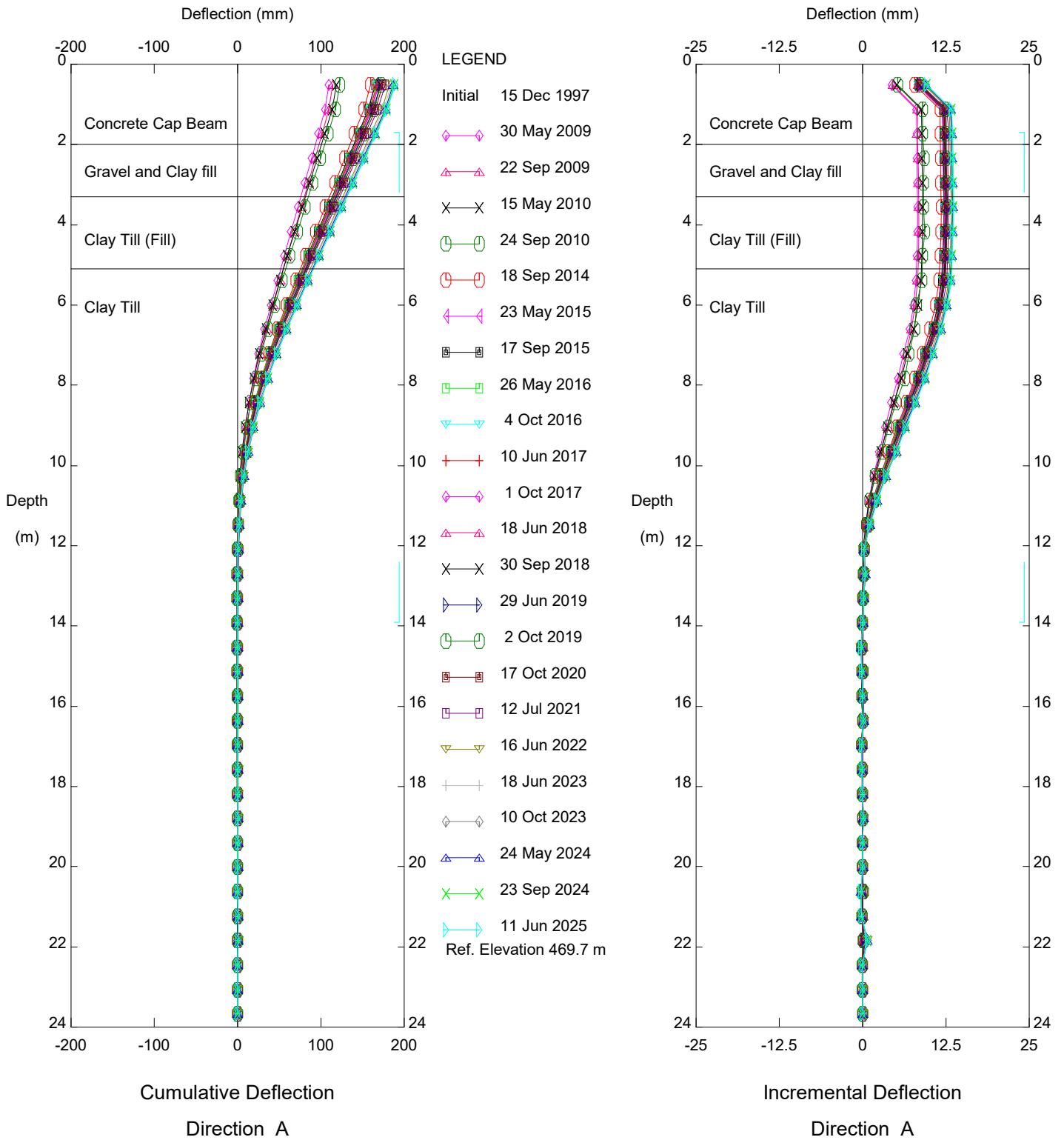
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HWY 35:08 (PH045), Inclinator SI-49

Alberta Transportation

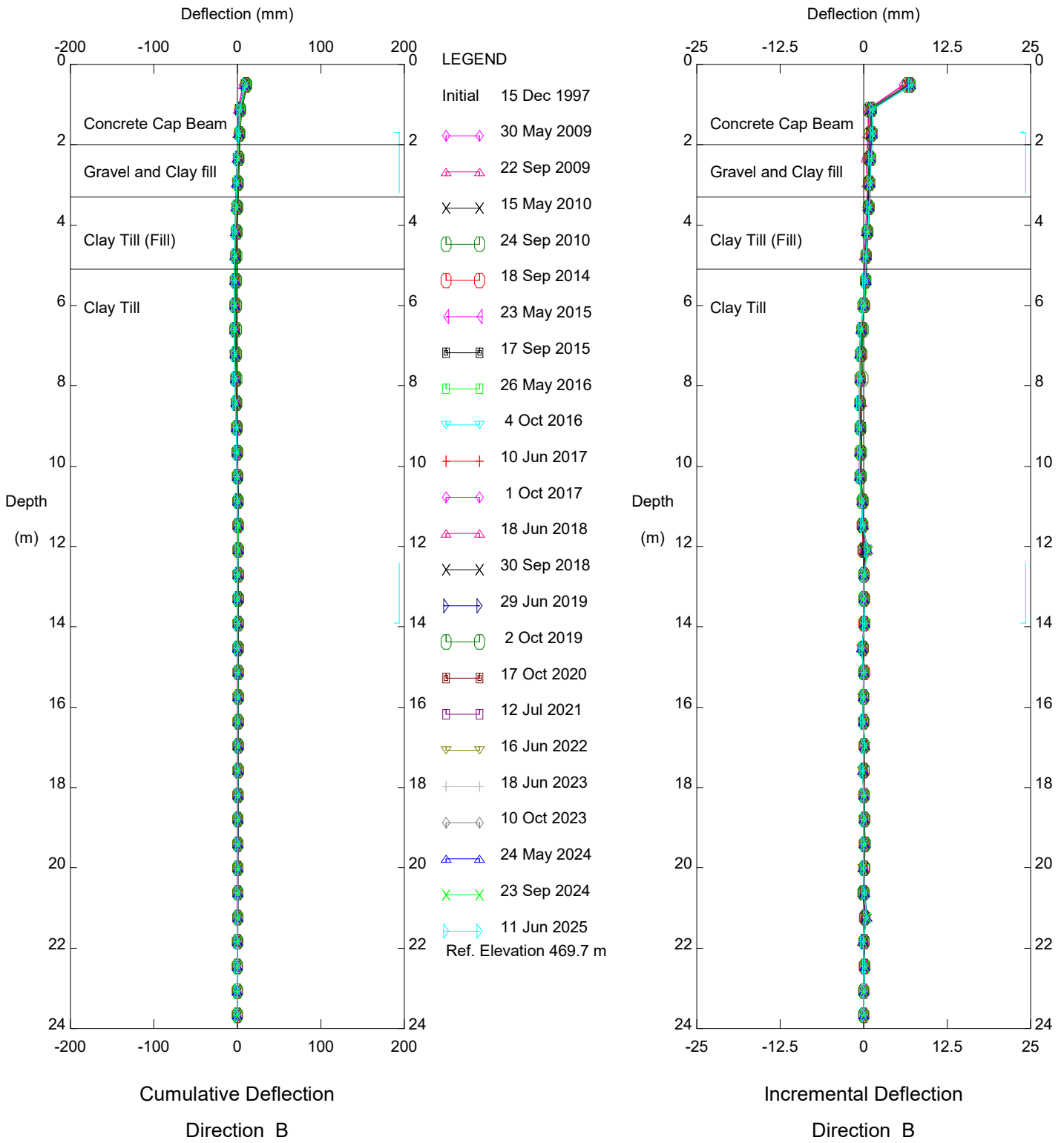
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HWY 35:08 (PH045), Inclinometer SI-50

Alberta Transportation

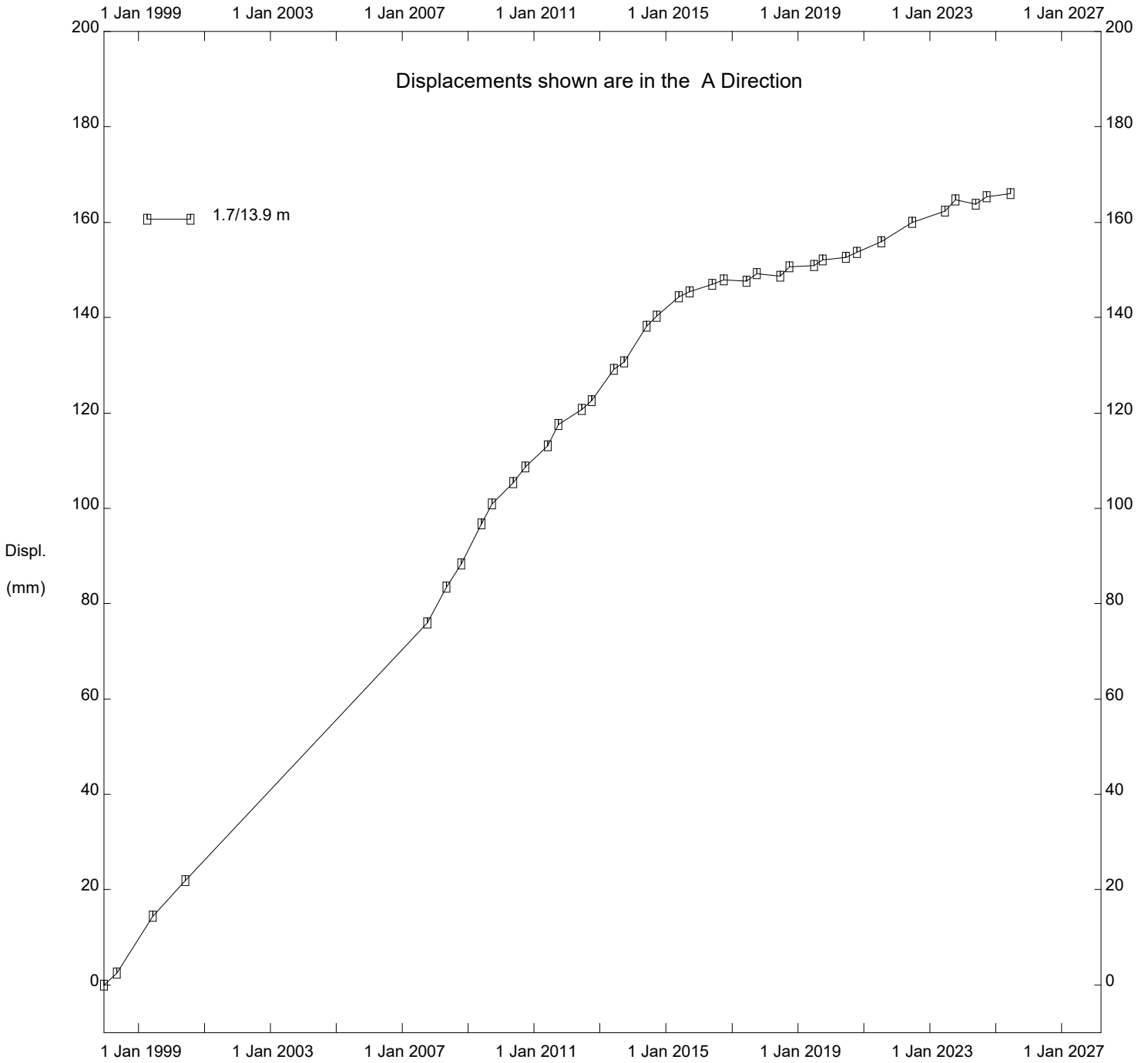
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HWY 35:08 (PH045), Inclinometer SI-50

Alberta Transportation

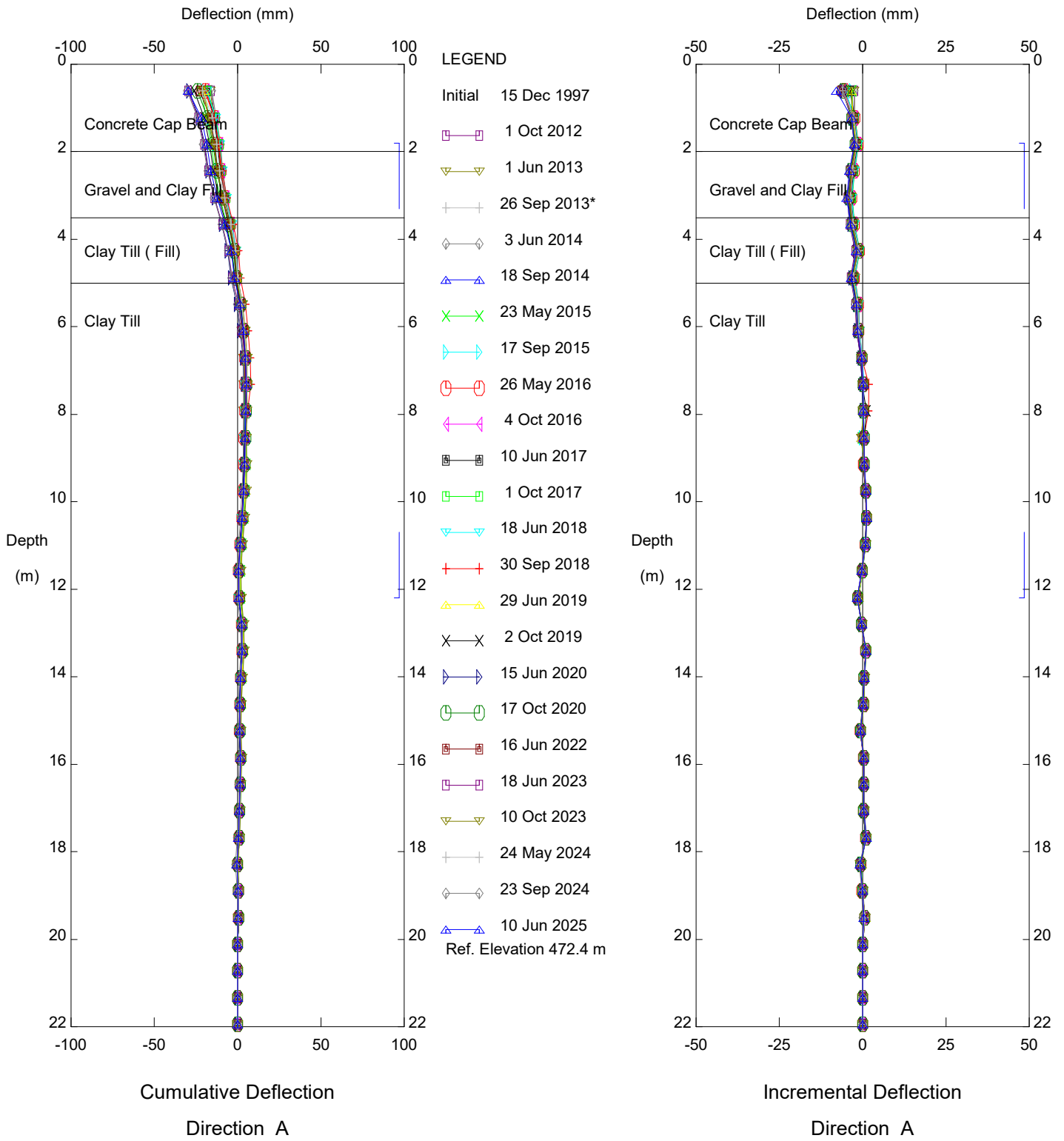
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HWY 35:08 (PH045), Inclinator SI-50

Alberta Transportation

Thurber Engineering Ltd.

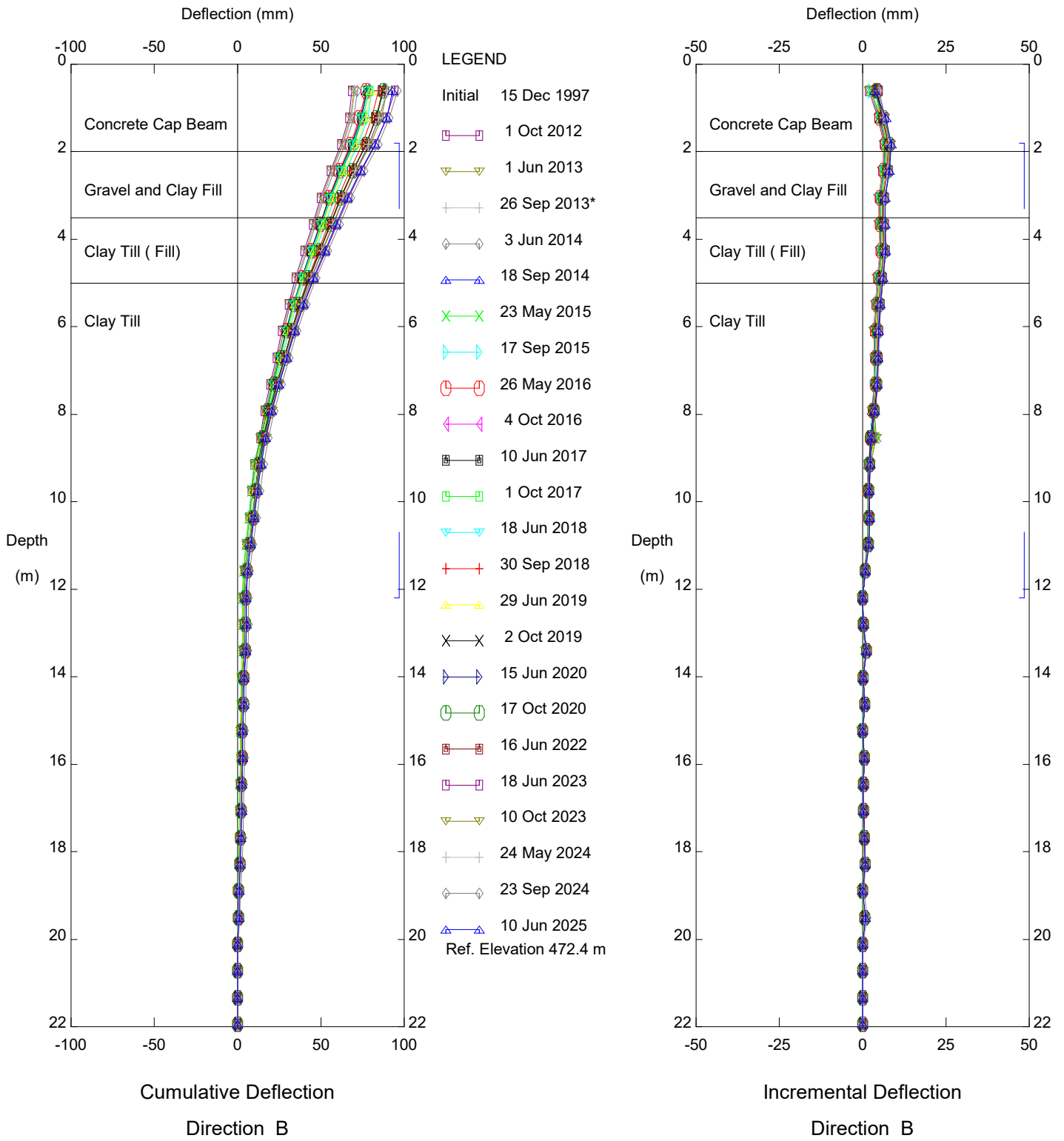


HWY 35:08 (PH045), Inclinometer SI-51

Alberta Transportation

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

Thurber Engineering Ltd.

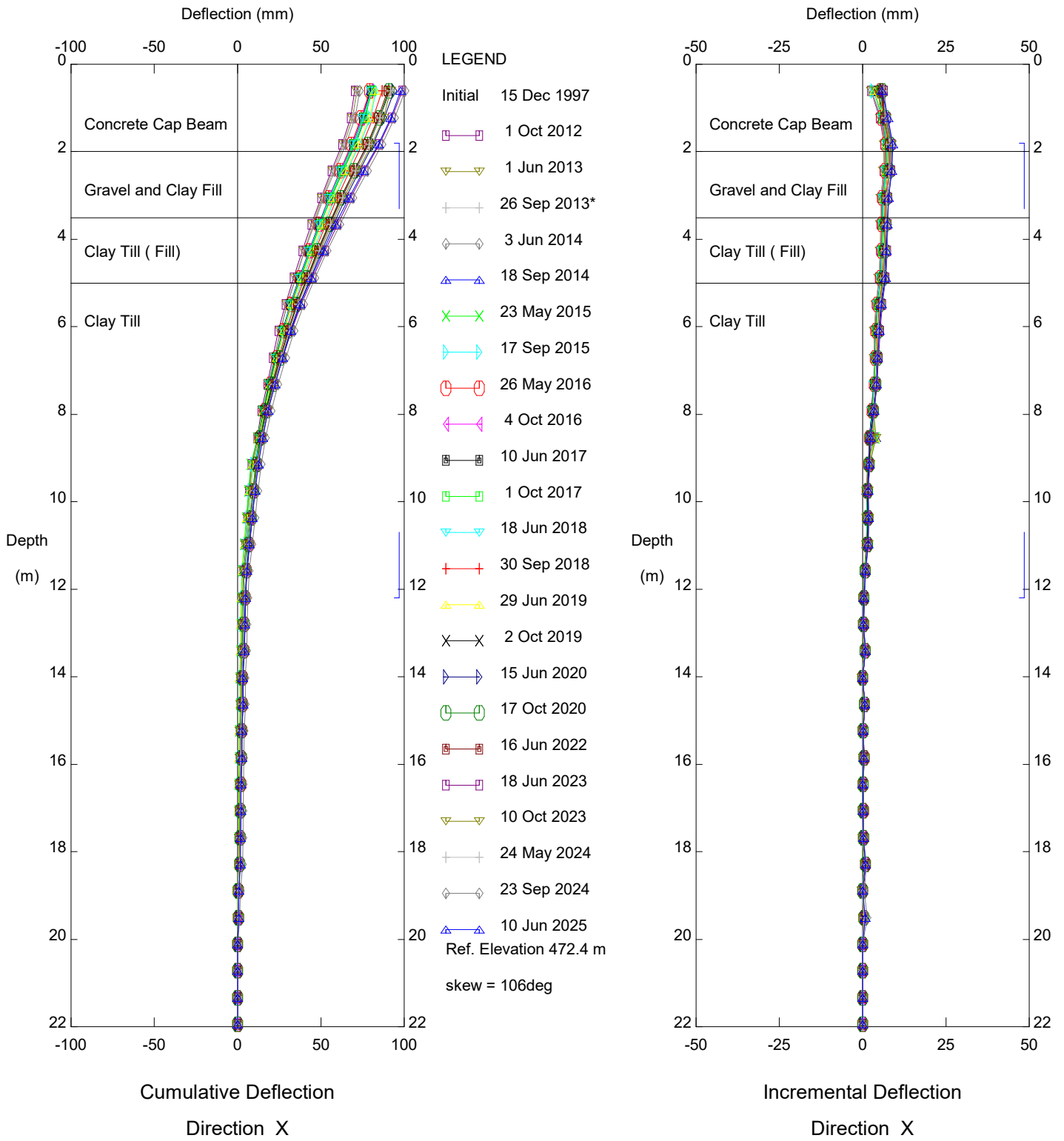


HWY 35:08 (PH045), Inclinometer SI-51

Alberta Transportation

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

Thurber Engineering Ltd.

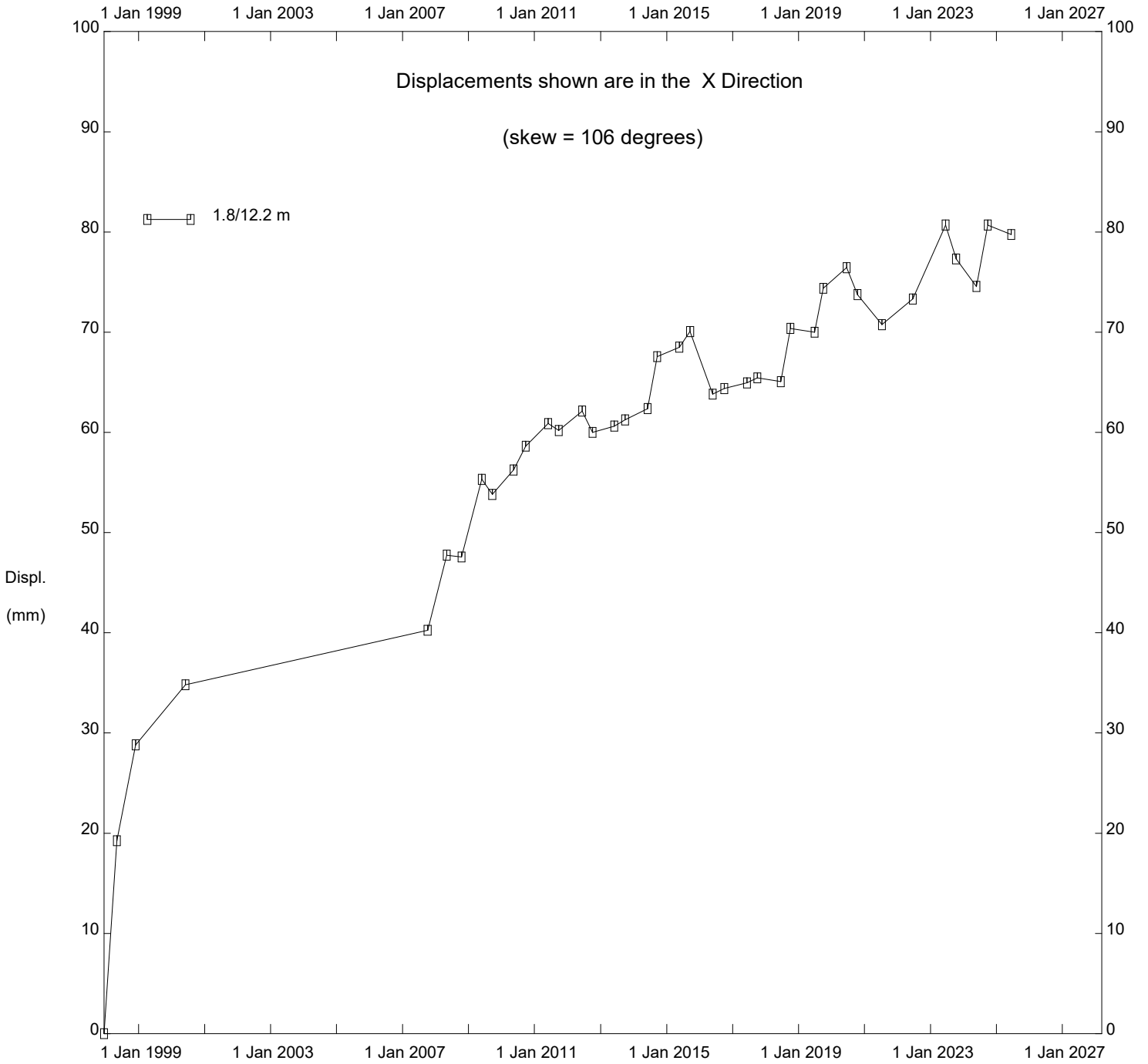


HWY 35:08 (PH045), Inclinometer SI-51

Alberta Transportation

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

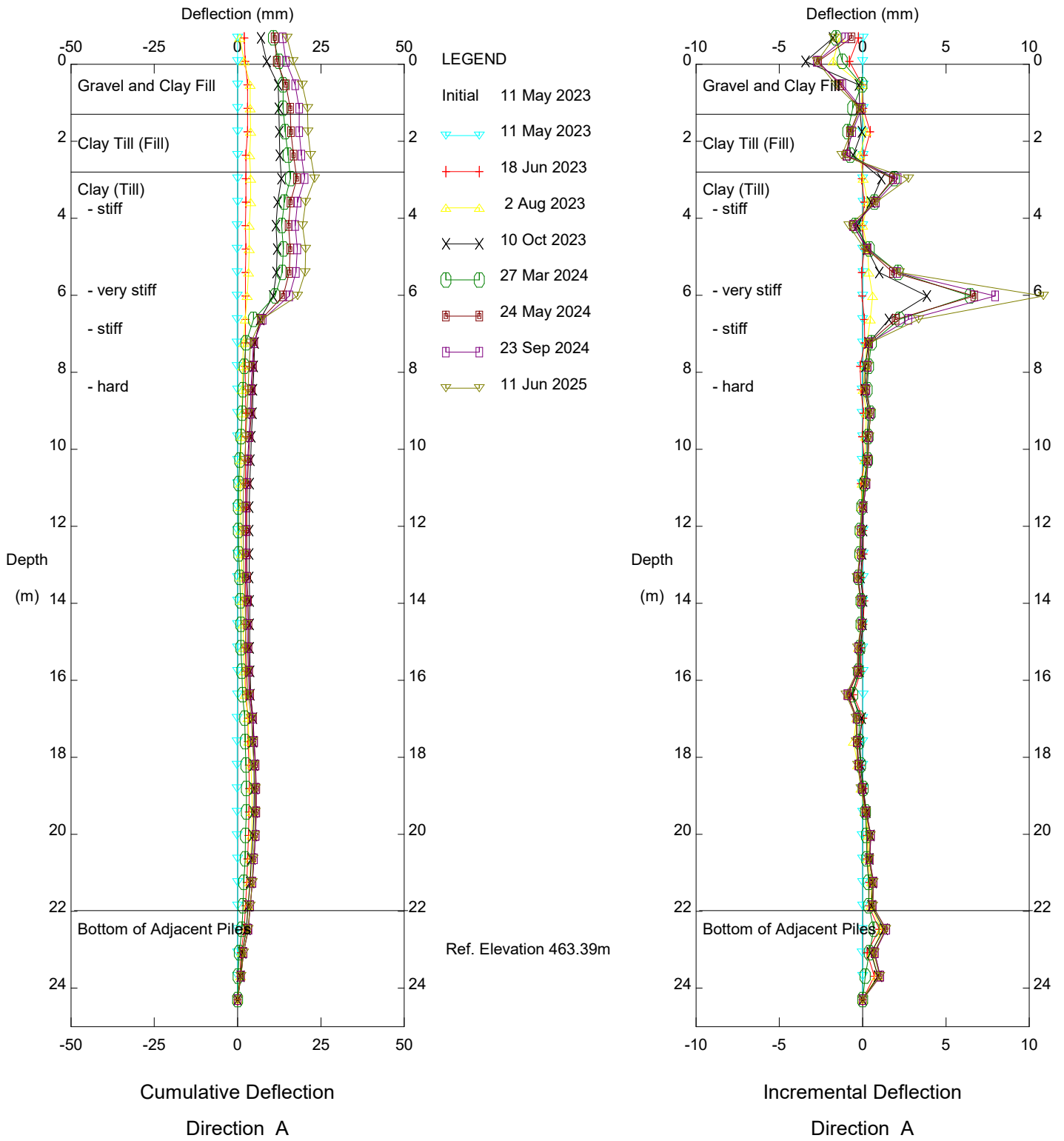
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HWY 35:08 (PH045), Inclinator SI-51

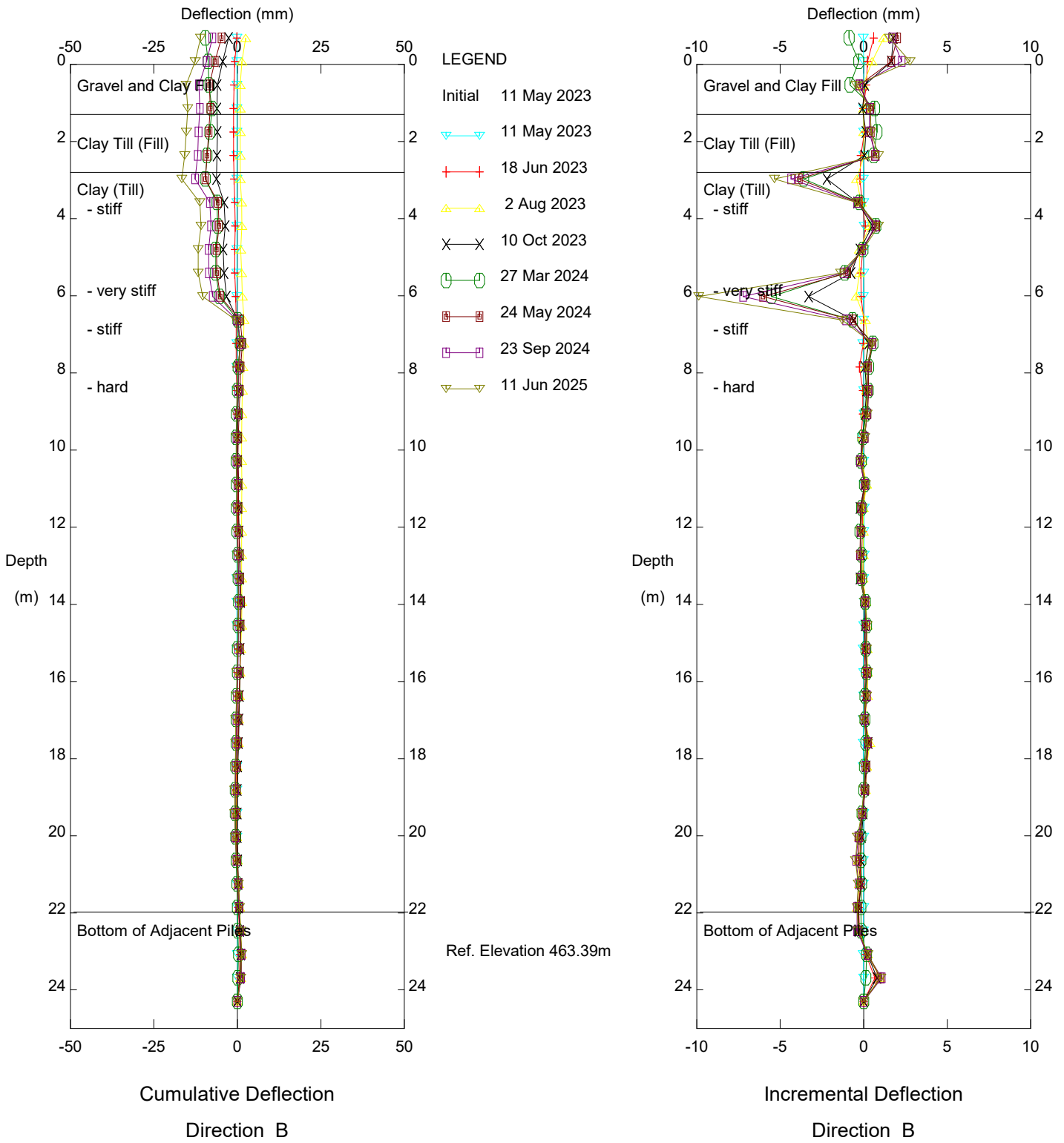
Alberta Transportation

Thurber Engineering Ltd.



PH045 Hwy 35:08 Meikle River Pile Wall, Inclinator SI23-100

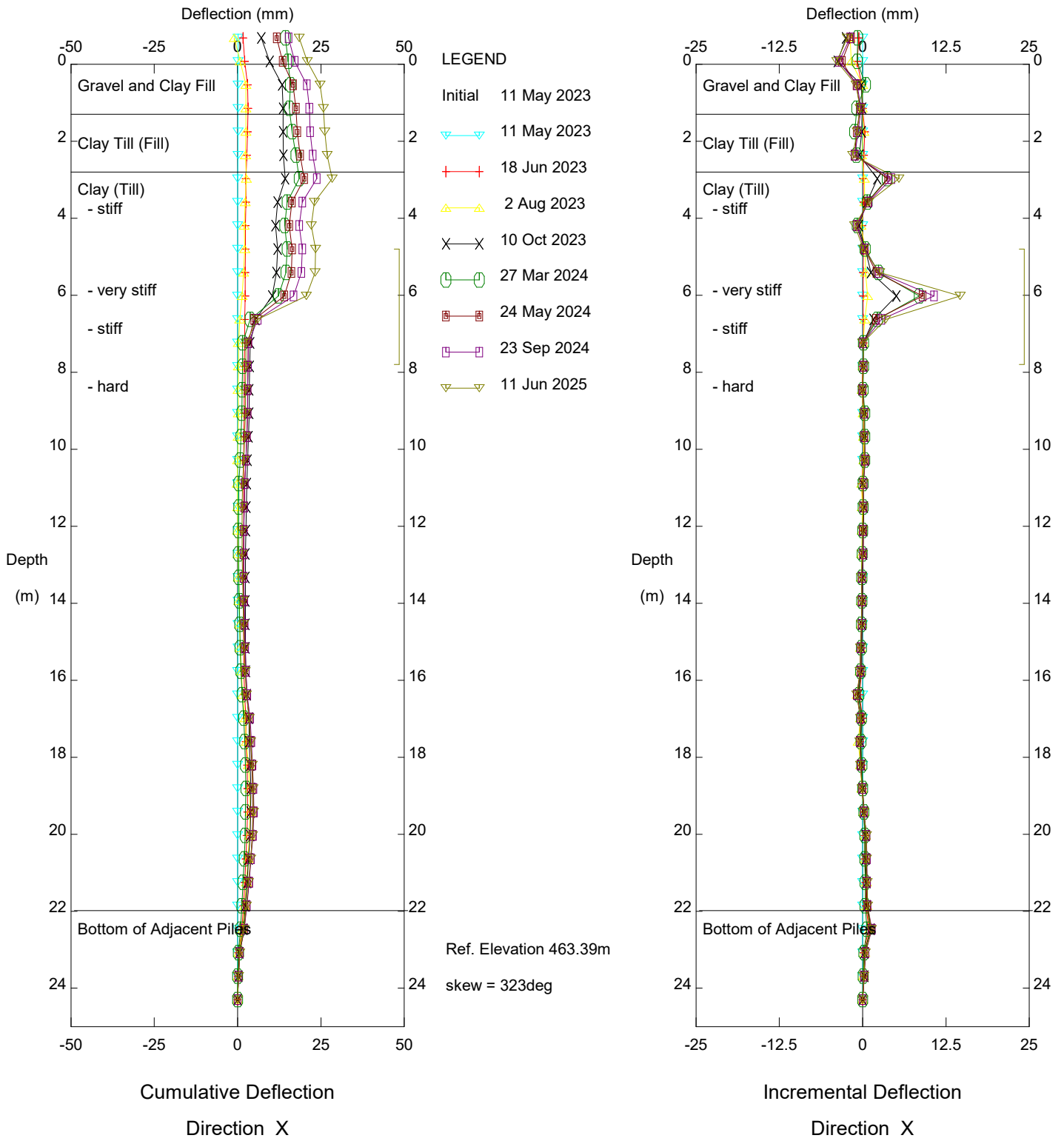
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PH045 Hwy 35:08 Meikle River Pile Wall, Inclinator SI23-100

TEC

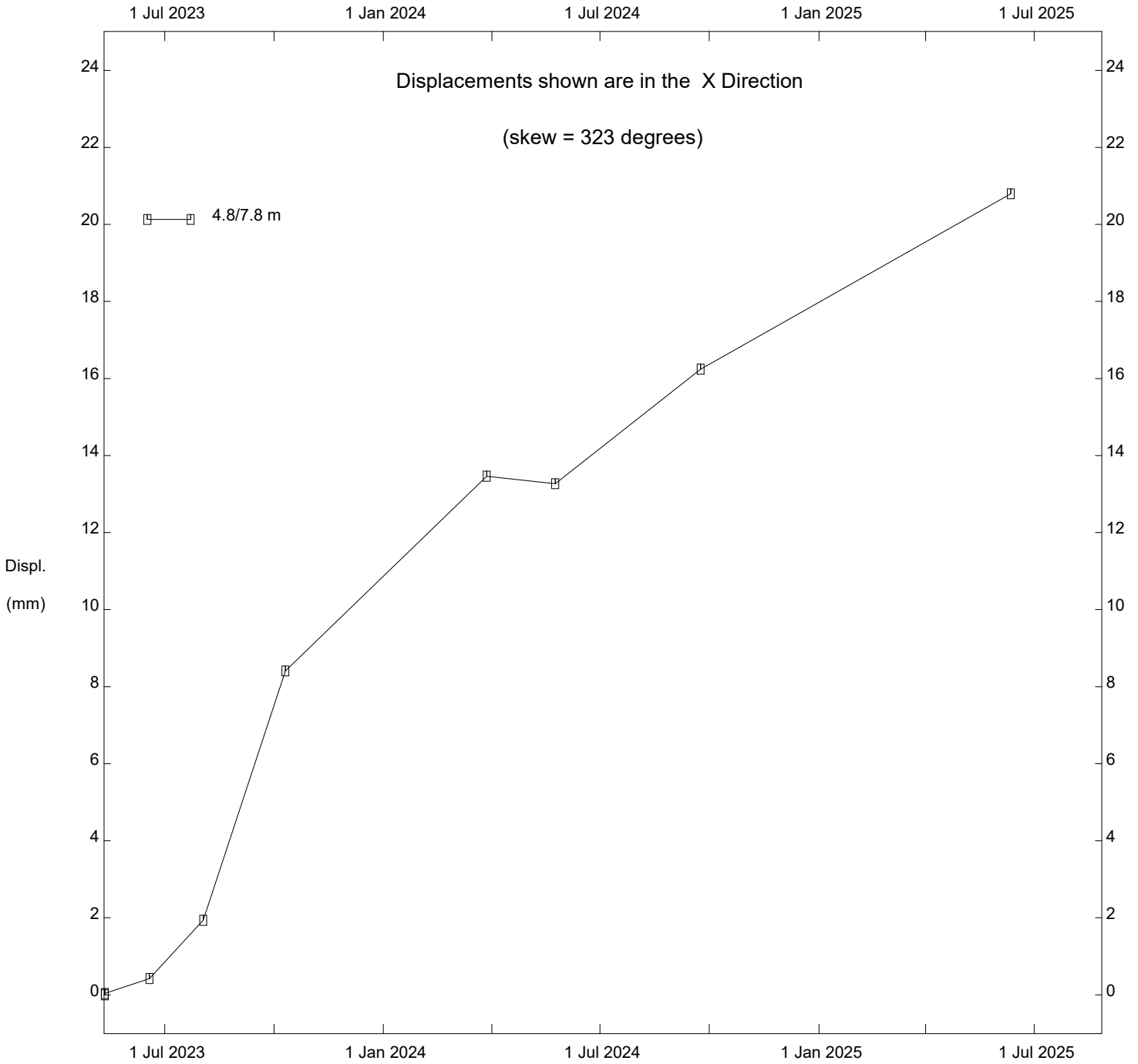
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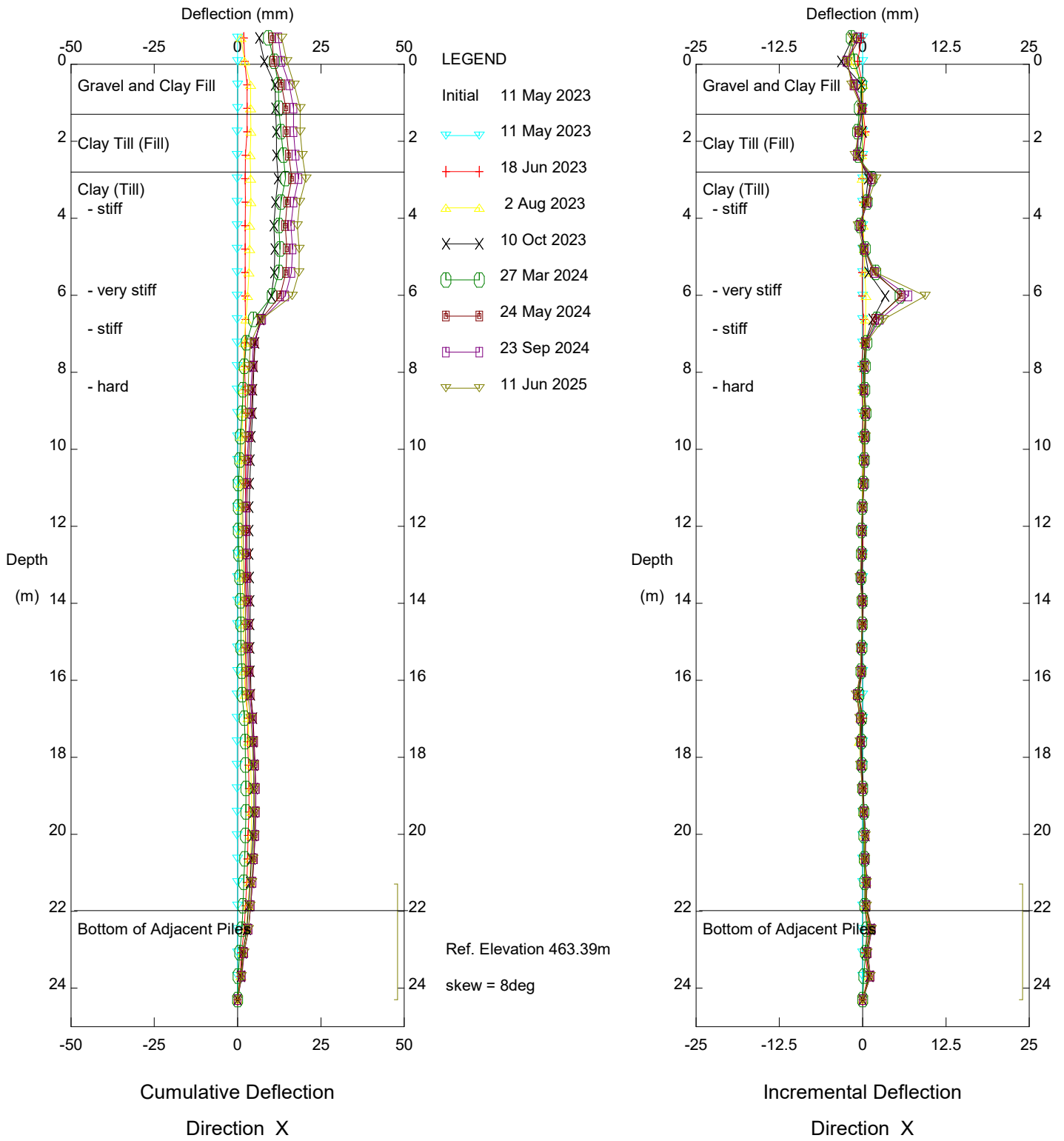
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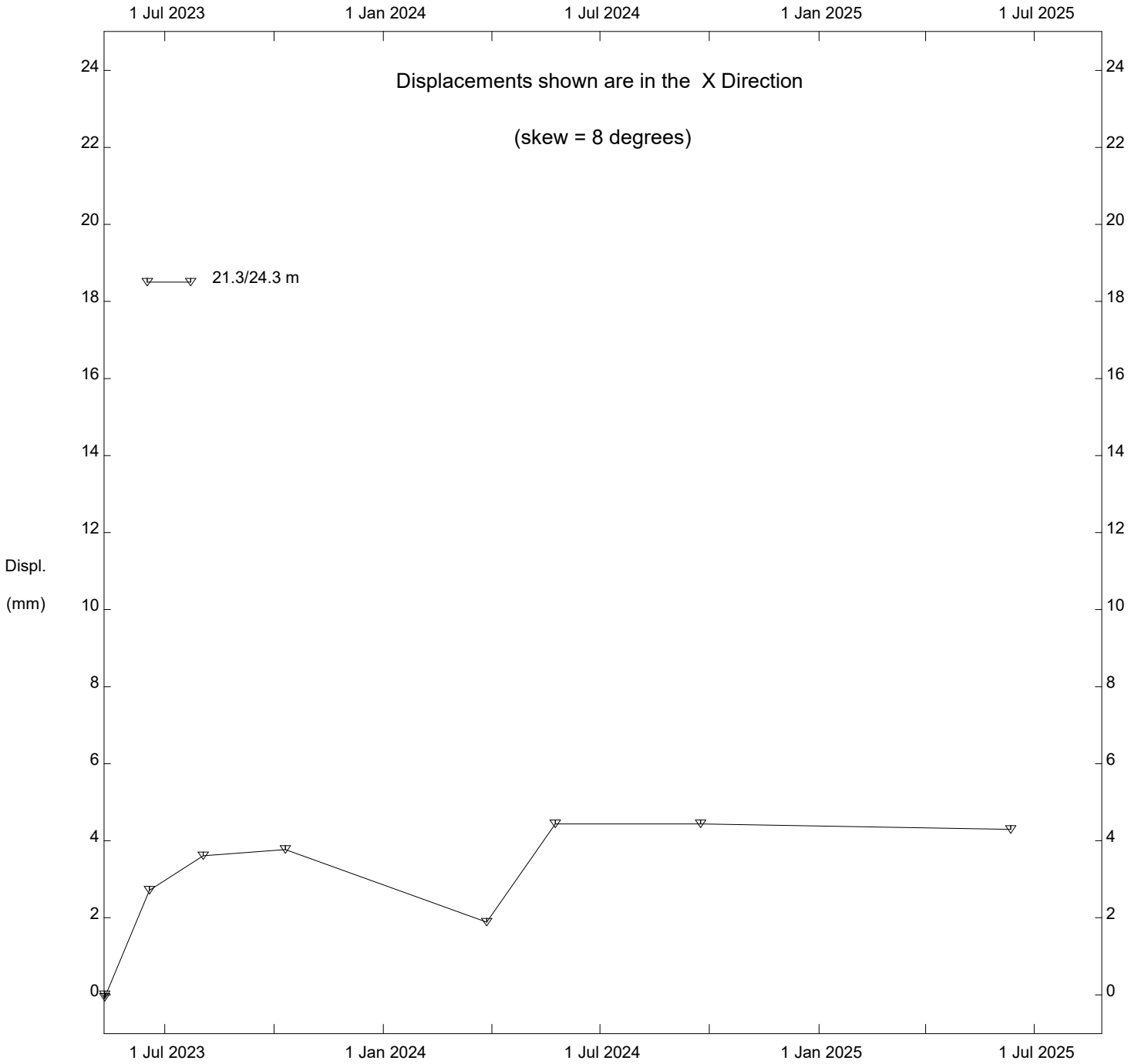
Thurber Engineering Ltd.



PH045 Hwy 35:08 Meikle River Pile Wall, Inclinator SI23-100

TEC

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PH045 Hwy 35:08 Meikle River Pile Wall, Inclinator SI23-100

TEC

FIGURE PH045-1
HWY 35:08 MEIKLE RIVER PILE WALL VIBRATING WIRE PIEZOMETER DATA

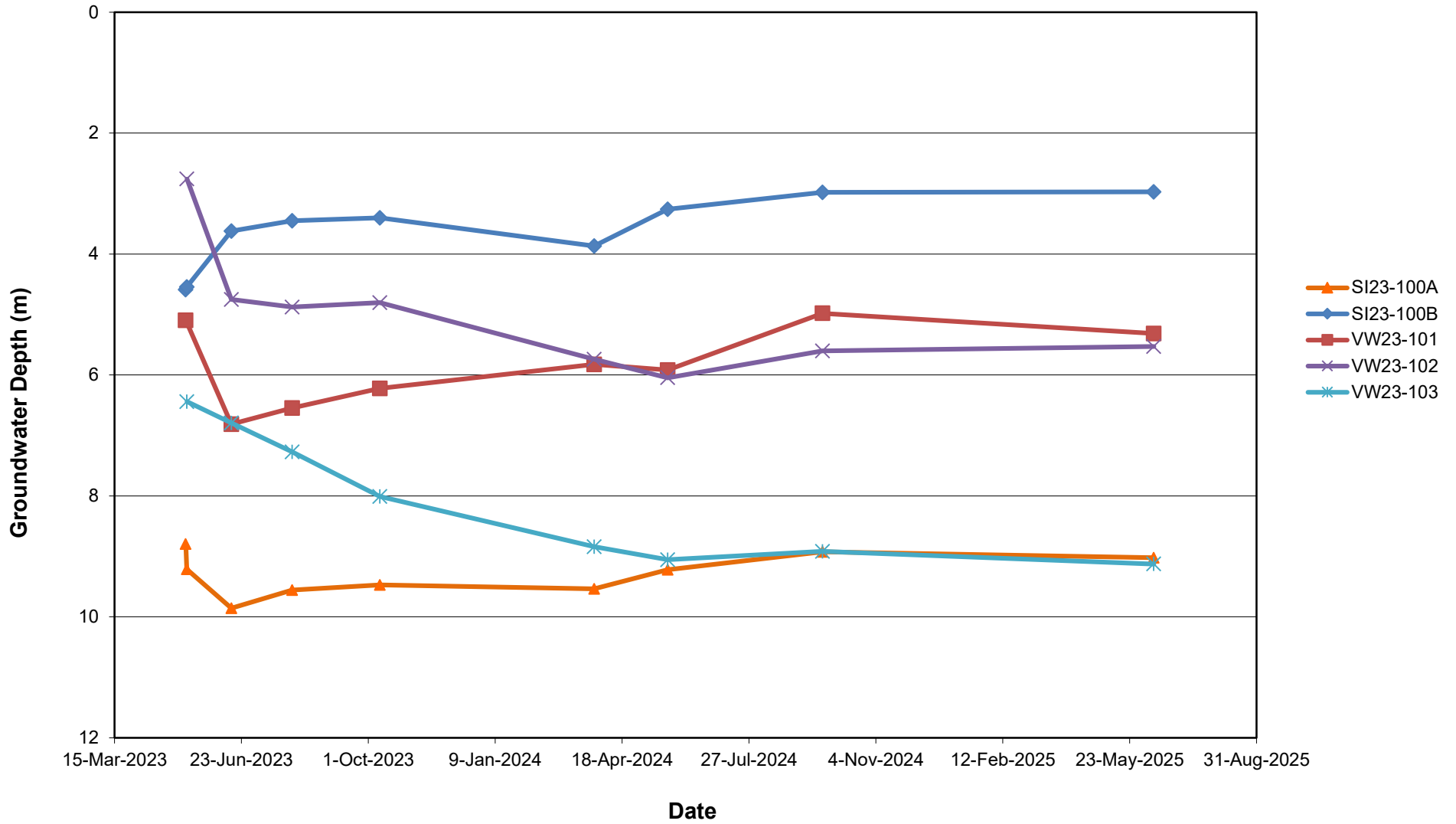


FIGURE PH045-2
HWY 35:08 MEIKLE RIVER PILE WALL VIBRATING WIRE PIEZOMETER DATA

