ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP
PEACE REGION – (PEACE RIVER DISTRICT)
SPRING 2024

THURBER ENGINEERING LTD.

Site Number	Location	Name	Hwy	km
PH043	HWY 986:01 C1 33.357	Daishowa Retaining Wall	986:01	Km 33.4
Legal Description: 9-7-85-20 W5		**UTM Co-ordinates**		
		11U E 491412.57	N 6246098.92	

Current Monitoring:	20-May-2024	**Previous Monitoring**	15-Jun-2023
Instruments Read By:	Mr. Niraj Regmi, G.I.T and Mr. Nixson Mationg, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): SI-4 SI-5 SI-6 SI-7 SI-8 SI-9 SI03-6 SI04-1 SI04-3	**Pneumatic Piezometers (PN):** PN03-1 and PN03-2	**Vibration Wire Piezometers (VW):** N/A	**Standpipe Piezometers (SP):** N/A
Load Cell (LC): N/A	**Strain Gauges:** N/A	**SAAs:** N/A	**Others:**

Readout Equipment Used			
Slope Inclinometers: Two RST Digital Inclinometer probes with 2 ft. wheelbases and RST Pocket PC readouts	**Pneumatic Piezometers:** RST C108 pneumatic piezometer reader	**Vibration Wire Piezometers:**	**Standpipe Piezometers:**
Load Cell:	**Strain Gauges:**	**SAAs:**	**Others:**
Note: -			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	**Pile Wall Site (PH043-1)** Slope inclinometers SI-4, SI-5 and SI-6 are located east of the wall and the main slide block. All three SI's have shown a consistent rate of movement trend, however the shallow movement zones in SI-5 and SI-6 show some acceleration in movement since the spring of 2023 readings. Slope inclinometer SI-4 showed rates of movement of 4.2 mm/yr and 1.1 mm/yr over 2.6 m to 6.3 m depth and 6.3 m to 8.1 m depth, respectively, since the spring of 2023 readings. SI-5 showed rates of movement of 5.3 mm/yr and 1.5 mm/yr over 0.5 m to 1.7 m depth and 1.7 m to 4.1 m depth, respectively. SI-6 showed a rate of movement of 9.5 mm/yr over 0.1 m to 5.0 m depth and no discernible movement over 5.0 m to 6.8 m depth. Slope inclinometer SI03-6, installed upslope of the pile wall and highway, showed a rate of movement of 0.1 mm/yr over 4.7 m to 6.0 m depth since the spring of 2023 readings. Only two (SI04-1 and SI04-3) of the three slope inclinometers installed in the pie wall are currently operational.

	SI04-1 showed a rate of movement of 7.0 mm/yr over 0.1 to 2.6 m since spring of 2023 and a rate of movement of 3.1 mm/yr over the length of the pile The pile head has deflected a total of 65.8 mm to date SI04-3 showed a rate of movement of 16.1 mm/yr over 0.1 to 1.4 m depth since the spring of 2023 readings and a rate of movement of 4.1 mm/yr over the length of the pile. The pile head has deflected 110.4 mm to date . There was a noticeable increase in movement in SI04-1 during 2017 and 2018 when a landslide movement occurred downslope of the wall during erosion repairs of erosion and construction of a gabion drop structure at the creek level. A driven steel pile wall and grading were carried out to mitigate those movements. The increased movement rate trend is still observed within the upper 2 m. Some slope flattening was also carried out consisting of removing some soil from the top of the pile wall near SI04-3. Pneumatic piezometer PN03-1 showed a decrease in groundwater level of 0.51 m since the spring of 2023 readings, which represents the lowest groundwater level measured in the instrument since October 2007. Pneumatic piezometer PN03-2 showed an increase in groundwater level of 0.02 m since the spring of 2023 readings. **Site B (PH043-2)** Slope inclinometers SI-7, SI-8 and SI-9 are located in the highway side slope (Station 33+820), about 300 m north of the pile wall. SI-7 continued to show no discernible movement. SI-8 showed a rate of movement of 5.7 mm/yr over 0.3 m to 1.5 m depth and a rate of movement of 0.6 mm/yr over 1.5 m to 4.0 m depth since the spring of 2023 readings. SI-9 showed a rate of movement of 10.4 mm/yr over 0.3 m to 2.7 m depth since the spring of 2023 readings.
Future Work:	The instruments should be read again in the spring of 2025.
Instrumentation Repairs:	The repair of SI-5 was finalized during the fall of 2023 readings with the installation of a larger diameter casing stickup protector.
Additional Comments:	

Attachments:	• Table PH043-1-1 Spring 2024 – HWY 986:01, Daishowa East Hill Pile Wall (PH043-1) Slope Inclinometer Instrumentation Reading Summary • Table PH043-1-2 Spring 2024 – HWY 986:01, Daishowa East Hill Pile Wall (PH043-1) Pneumatic Piezometer Instrumentation Reading Summary • Table PH043-2-1 Spring 2024 – HWY 986:01, Daishowa East Hill, Site B (PH043-2) Slope Inclinometer Instrumentation Reading Summary • Statement of Limitations and Conditions • APPENDIX A - PH043 SPRING 2024 o Field Inspector's report o Site Plan Showing Approximate Instrument Locations (Drawing No.32121 PH043)

	○ SI Reading Plots ○ Figure PH043-1 (Piezometric Elevations) ○ Figure PH043-2 (Piezometric Depths)

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.
Roger Skirrow, M.Sc., P. Eng.
Senior Geotechnical Engineer

PROFESSIONAL ENGINEER ALBERTA
BRUCE W. NESTOR
ID 161284
2024-07-15

Bruce Nestor, P.Eng.
Geotechnical Engineer

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
RM SIGNATURE: _____
RM APEGA ID #: 51674
DATE: July 15, 2024
PERMIT NUMBER: P005186
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Table PH043-1-1 Spring 2024 – Daishowa East Hill Pile Wall (PH043-1) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: May 20, 2024

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-4	Jun. 7, 1996	98.3 mm over 2.6 m to 6.3 m depth in 18° Direction	10.0 mm/yr between May and Sept. 1997	Operational	June 15, 2023	3.9	4.2	2.2
		30.2 mm over 6.3 m to 8.1 m depth in 3° Direction	2.9 mm/yr between May and Sept. 2003			1.0	1.1	<0.1
SI-5	Nov. 16, 1994	56.6 mm over 0.5 m to 1.7 m depth in 7° Direction	16.7 mm/yr in May 2003	Operational	June 15, 2023	4.9	5.3	3.7
		33.7 mm over 1.7 m to 4.1 m depth in 7° Direction	6.8 mm/yr In September 1997			1.4	1.5	-0.2
SI-6	Apr. 9, 1996	196.0 mm over 0.1 m to 5.0 m depth in 26° Direction	48.3 mm/yr in May 2005	Operational	June 15, 2023	8.9	9.5	7.3
		45.0 mm over 5.0 m to 6.8 m depth in 26° Direction	7.9 mm/yr in May 2004			No discernible movement	N/A	-1.1

Drawing 32121-PH043 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Table PH043-1-1 – Continued… Spring 2024 – Daishowa East Hill Pile Wall (PH043-1) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: May 20, 2024

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)
SI03-1	*Sept. 14, 2003*	*Not Known*	*Not Known*	*Sheared off at 11.3 m*	*May 21, 2004*	*N/A*	*N/A*	*N/A*
SI03-2	*Sept. 14, 2003*	*Not Known*	*Not Known*	*Sheared off at 8.2 m*	*May 21, 2004*	*N/A*	*N/A*	*N/A*
SI03-3	*Sept. 16, 2003*	*Not Known*	*Not Known*	*Sheared off at 9.5 m*	*Oct. 9, 2003*	*N/A*	*N/A*	*N/A*
SI03-4	*Sept. 16, 2003*	*Not Known*	*Not Known*	*Sheared off at 7.5 m*	*Oct. 9, 2003*	*N/A*	*N/A*	*N/A*
SI03-5	*Sept. 16, 2003*	*Not Known*	*Not Known*	*Could not be read (partially covered with asphalt)*	*Aug. 12, 2004*	*N/A*	*N/A*	*N/A*
SI03-6	Sept. 16, 2003	14.1 mm over 4.7 m to 6.0 m depth in 346° direction	9.1 mm/yr Oct. 2003	Operational	June 15, 2023	0.1	0.1	-0.1

Drawing 32121-PH043 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

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Table PH043-1-1 – Continued… Spring 2024 – Daishowa East Hill Pile Wall (PH043-1) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: May 20, 2024

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)
SI04-1 (In Pile Wall)	Reinitialized on Aug. 12, 2004	143.7 mm over 0.1 m to 2.6 m depth in 353° direction	34.5 mm/yr in September 2019	Operational	May 20, 2024	6.5	7.0	-1.9
		65.8 mm over 1.9 m to 22.1 m depth in 353° direction	20.2 mm/yr in September 2016			2.9	3.1	1.3
SI04-2 (In Pile Wall)	*Apr. 19, 2004*	*Not Known*	*Not Known*	*Not Read*	*May 21, 2004*	*N/A*	*N/A*	*N/A*
SI04-3 (In Pile Wall)	Apr. 19, 2004	159.8 mm over 0.1 m to 1.4 m depth in 26° direction	563.1 mm/yr June 2004	Operational	May 20, 2024	15.0	16.1	17.4
		110.4 mm over 1.4 m to 20.9 m depth in 26° direction	107.7 mm/yr July 2004			3.9	4.1	-3.4

Drawing 32121-PH043 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

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Table PH043-1-2 Spring 2024 – Daishowa East Hill Pile Wall (PH043-1) Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: May 20, 2024

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER LEVEL (m)	MEASURED PORE PRESSURE (kPa)	CURRENT GROUNDWATER ELEVATION (m)	PREVIOUS GROUNDWATER ELEVATION (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
PN03-1 (27284)	October 21, 2005 (Thurber)	8.0	596.85	Operational	592.99 on June 14, 2018	33.2	592.24	592.75	-0.51
PN03-2 (28177)	October 21, 2005 (Thurber)	7.2	593.41	Operational	586.82 on June 14, 2018	3.1	586.53	586.51	0.02

Drawing 32121-PH043 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Notes:
PN - pneumatic piezometer.

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Table PH043-2-1 Spring 2024 – Daishowa East Hill Site B (PH043-2) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: May 20, 2024

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-7	Jul. 19, 1996	No discernible movement	N/A	Operational	June 15, 2023	N/A	N/A	N/A
SI-8	Apr. 9, 1996	78.4 mm over 0.3 m to 1.5 m depth in 16° direction	30.2 mm/yr in May 2001	Operational	June 15, 2023	5.3	5.7	3.8
		19.8 mm over 1.5 m to 4.0 m depth In 16°direction	10.8 mm/yr in September 2011			0.5	0.6	<0.1
SI-9	Apr. 9, 1996	129.5 mm over 0.3 m to 2.7 m depth in 11° direction	26.4 mm/yr In May 2003	Operational	June 15, 2023	9.7	10.4	5.2

Drawing 32121-PH043 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

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THURBER

STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment 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.

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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.

4. USE OF THE REPORT

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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 are judgmental in nature. 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 persons making use of such documents or records with our express written consent should 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 persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should 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 on the basis of conditions in evidence at the time of site inspections and on the basis of 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 as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons 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 should 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 detailed in the contract documents should 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 in order to confirm and document that the site conditions do not materially differ from those interpreted 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. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

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THURBER ENGINEERING LTD.

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

SPRING 2024

APPENDIX A
DATA PRESENTATION

SITE PH043-1: HWY 986:01, DAISHOWA EAST HILL PILE WALL
SITE PH043-2: HWY 986:01, DAISHOWA EAST HILL SITE B

ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (PH043)
SPRING 2024

Location:	Daishowa Retaining Wall (HWY 986:01 C1 33.357)	**Readout:**	RST PN C108 U
File Number:	32121	**Casing:**	SI03-6, SI04-1 a
Probe:	RST SI SET 5R and 8R	**Temp:**	13
Cable:	RST SI SET 5R and 8R	**Read by:**	NKR/NRM

SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 11)		Date	Stickup (m)	Depth from top of casing (ft)	Magn. North A+ Groove	Current Bottom Depth Readings				Probe/ Reel #	Size (")	Remarks
	Easting (m)	Northing (m)					A+	A-	B+	B-			
SI-4	491412.57	6246098.92	20-May-24	1.02	66 to 2	2	1025	-1005	553	-537	5R/5R	3.34	
SI-5	491402.28	6246115.63	20-May-24	0.75	66 to 2	9	262	-254	2512	-2496	5R/5R	3.34	
SI-6	491428.09	6246136.06	20-May-24	1.12	56 to 2	5	486	-472	-858	873	5R/5R	3.34	
SI-7	491636.72	6245933.41	20-May-24	1.2	56 to 2	3	-10	31	-1752	1767	5R/5R	3.34	
SI-8	491651.19	6245968.66	20-May-24	0.89	66 to 2	20	770	-750	23	-10	5R/5R	3.34	
SI-9	491662.61	6245996.46	20-May-24	0.91	66 to 2	355	-186	201	-363	377	5R/5R	3.34	
SI03-6	491312.58	6246058.38	20-May-24	0.75	52 to 2	10	442	-433	-623	615	8R/8R	2.75	
SI04-1	491309.71	6246169.69	20-May-24	1.1	74 to 2	10	-498	509	344	-358	8R/8R	2.75	
SI04-3	491374.51	6246132.38	20-May-24	1.08	68 to 2	10	353	-342	22	-39	8R/8R	2.75	*

PNEUMATIC PIEZOMETER READINGS

PN#	GPS Location (UTM 11)		Date	Reading (kPa)	Identification Number
	Easting (m)	Northing (m)			
PN03-1	491340.54	6246138.02	20-May-24	33.2	27284
PN03-2	491346.76	6246156.59	20-May-24	3.1	28177

INSPECTOR REPORT

* Bottom of SI04-3 sitting at 69ft

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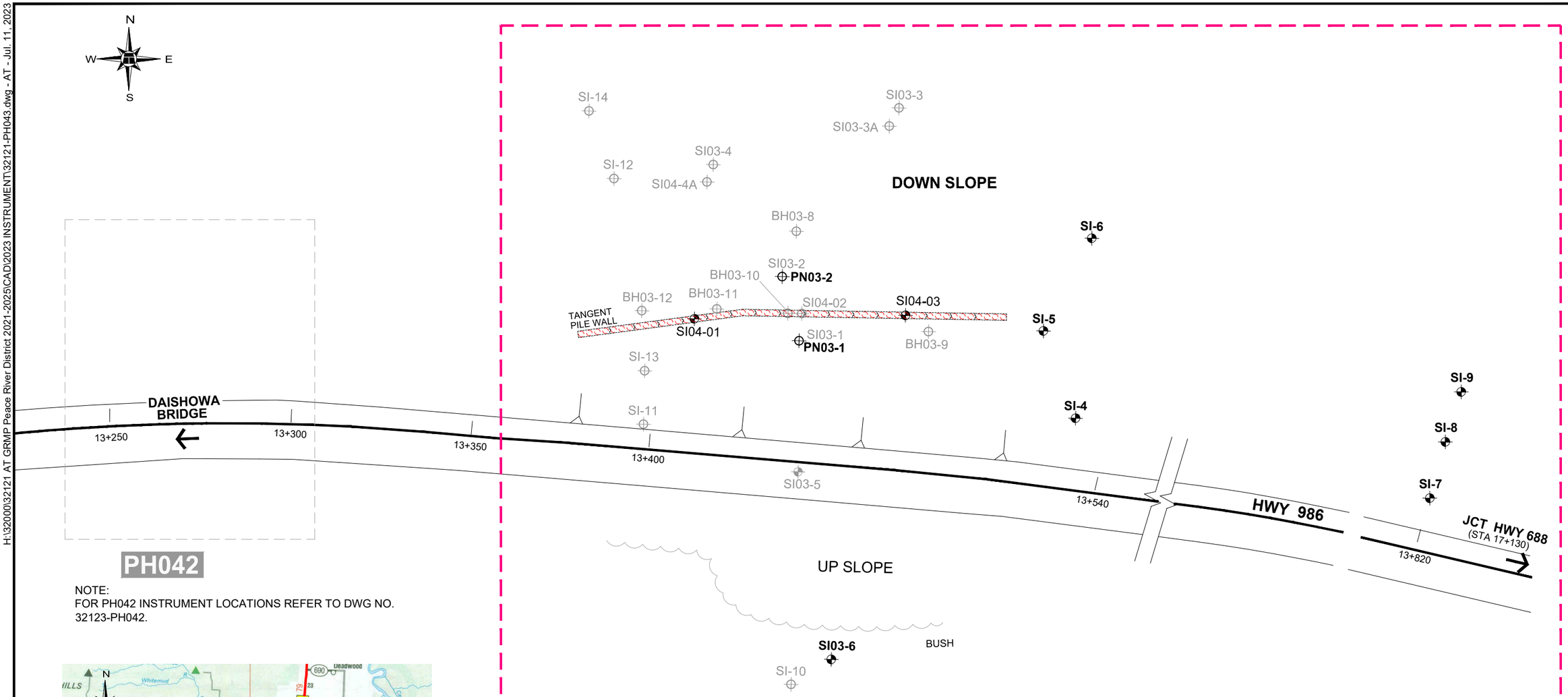
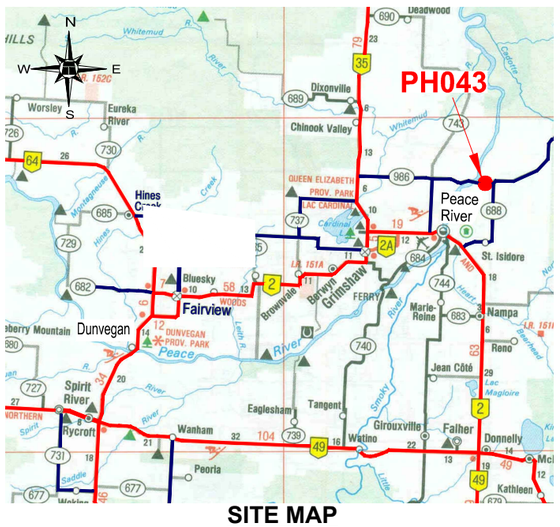


PH042

NOTE:
FOR PH042 INSTRUMENT LOCATIONS REFER TO DWG NO. 32123-PH042.



SITE MAP
NOT TO SCALE

PH043

SITE PLAN
NOT TO SCALE

LEGEND :

- SLOPE INCLINOMETERS *(currently using)*
- SLOPE INCLINOMETERS *(Installed in 2001, not in use)*
- SLOPE INCLINOMETER *(not in use)*
- PN PNEUMATIC PIEZOMETER

NOTES :

1. BASE PLAN COPIED FROM "GAEA ENGINEERING" DRAWING (DATED MAY. 1997)
2. LOCATIONS OF 2003 SLOPE INDICATORS OBTAINED FROM AMEC DRAWING NO. : EG08628.37-002.dwg DATED MARCH 2004.

Alberta

PEACE REGION (PEACE RIVER DISTRICT)

PH043: HWY 986:01 - DAISHOWA EAST HILL INSTRUMENT LOCATIONS

DWG No. 32121-PH043

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	DWP
SCALE	N.T.S.
DATE	JULY 2023
FILE No.	32121

THURBER ENGINEERING LTD.

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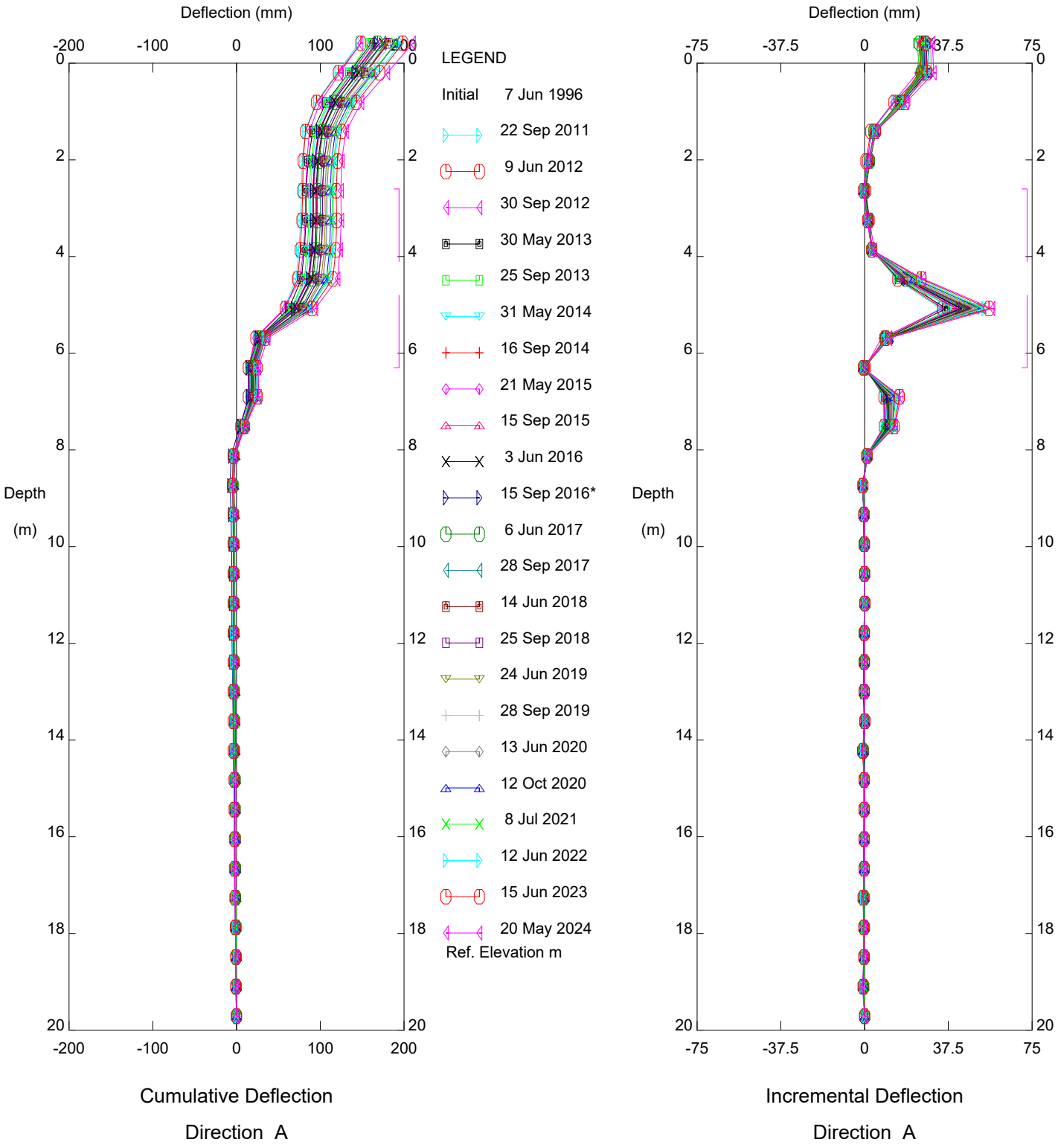

Cumulative Deflection

Direction A

Incremental Deflection

Direction A

HWY 986:01 - STA. 13+540, Inclinometer SI-4

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

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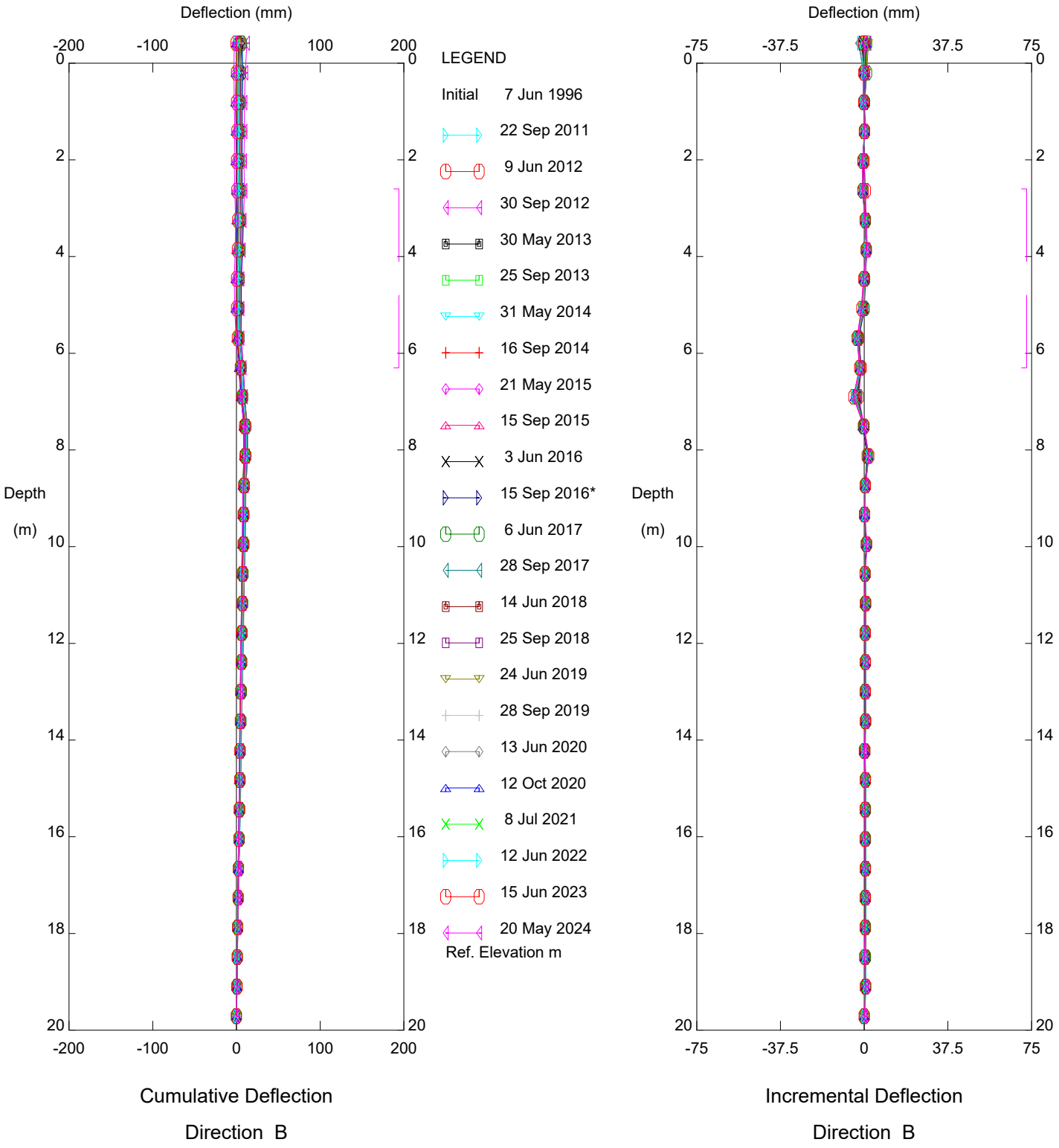

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+540, Inclinometer SI-4

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

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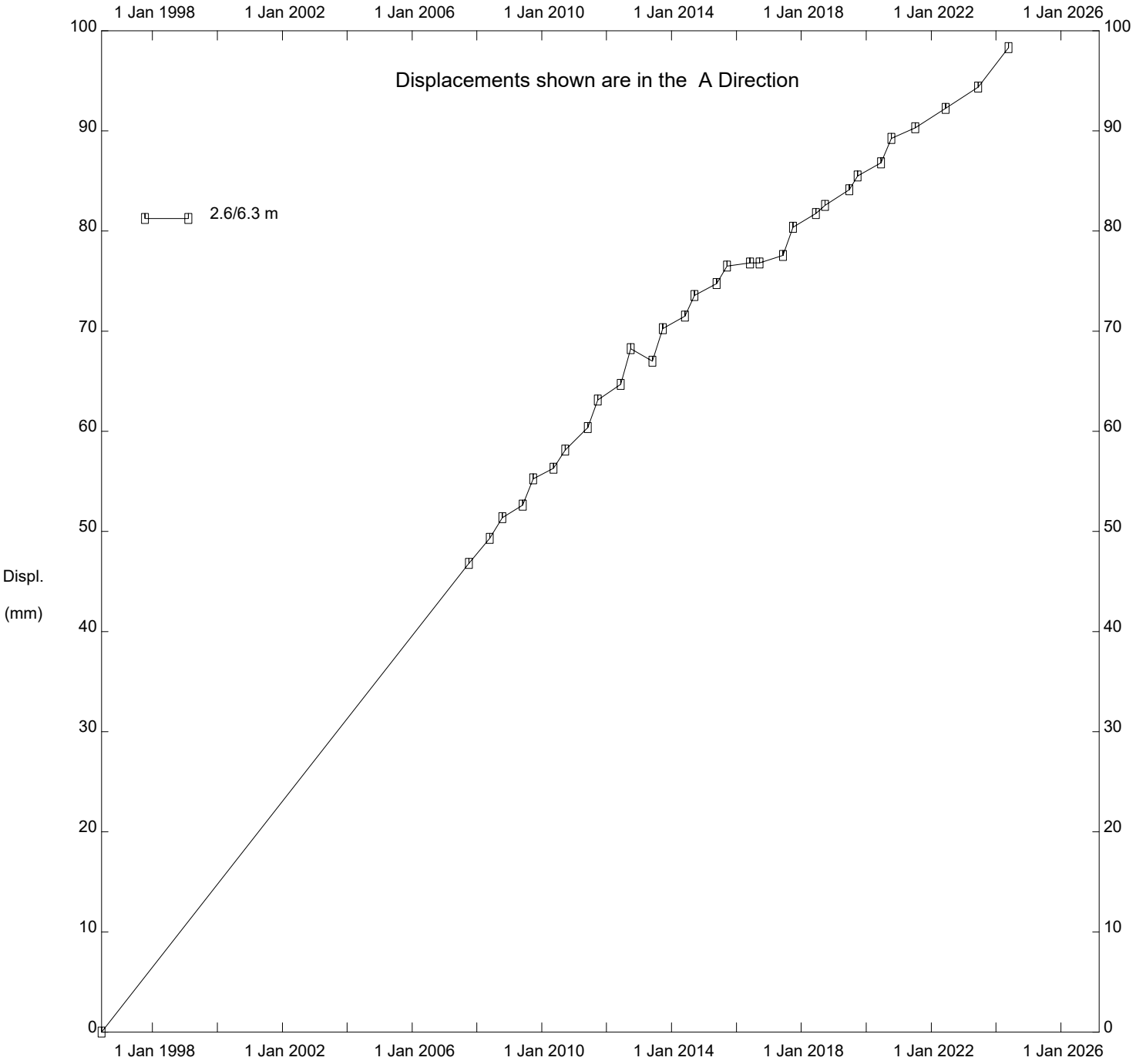

HWY 986:01 - STA. 13+540, Inclinometer SI-4

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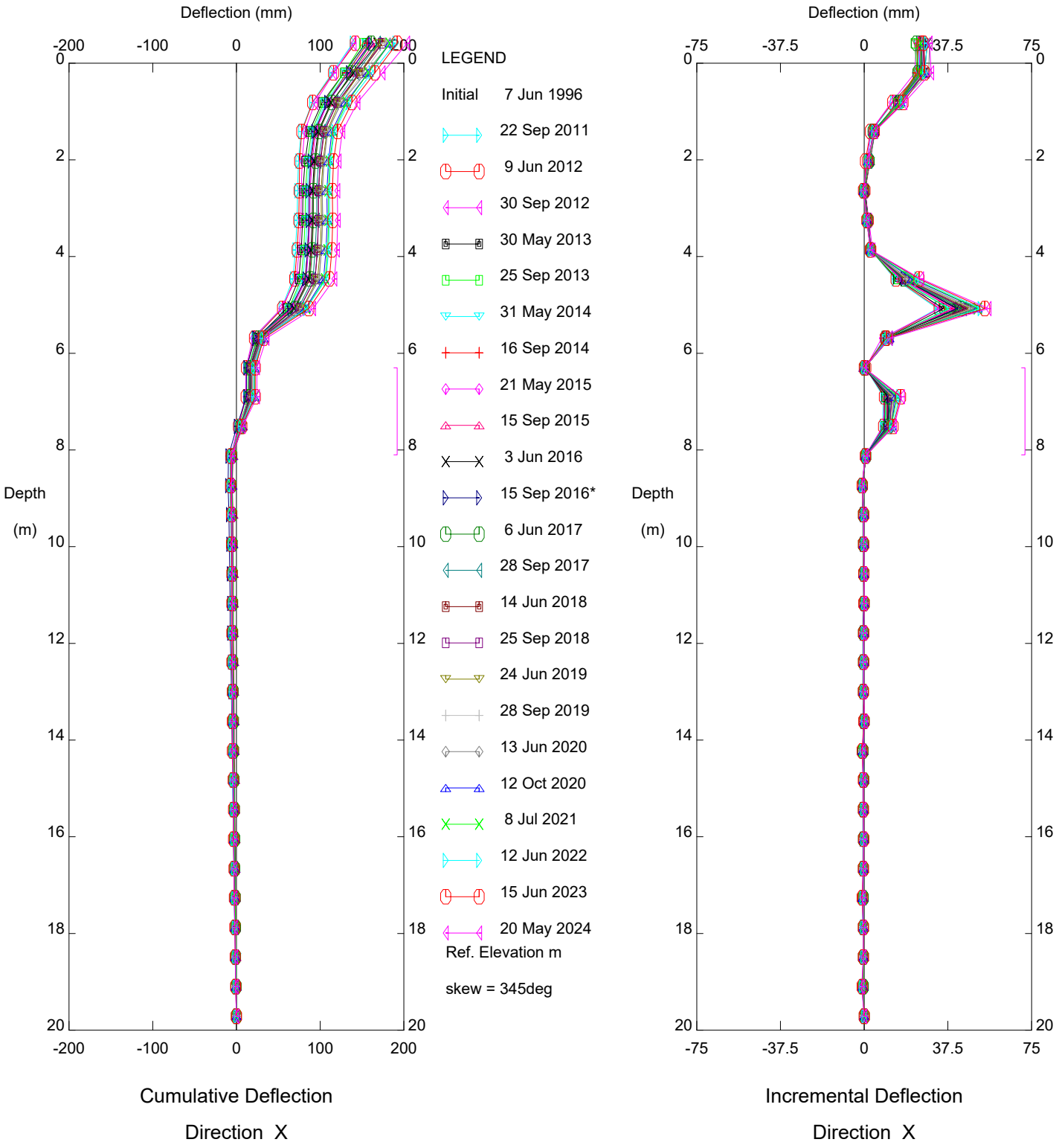

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

HWY 986:01 - STA. 13+540, Inclinometer SI-4

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

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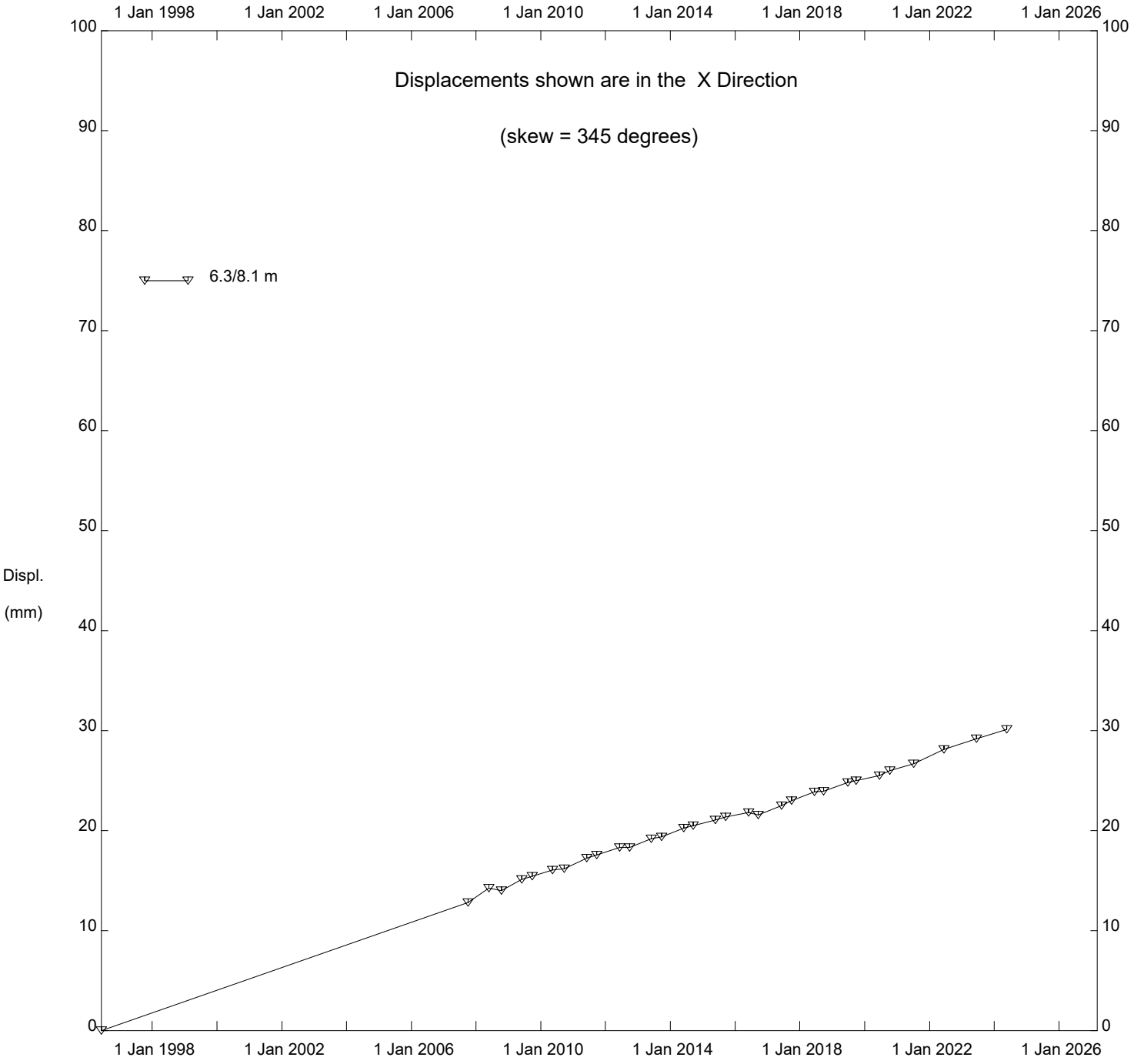
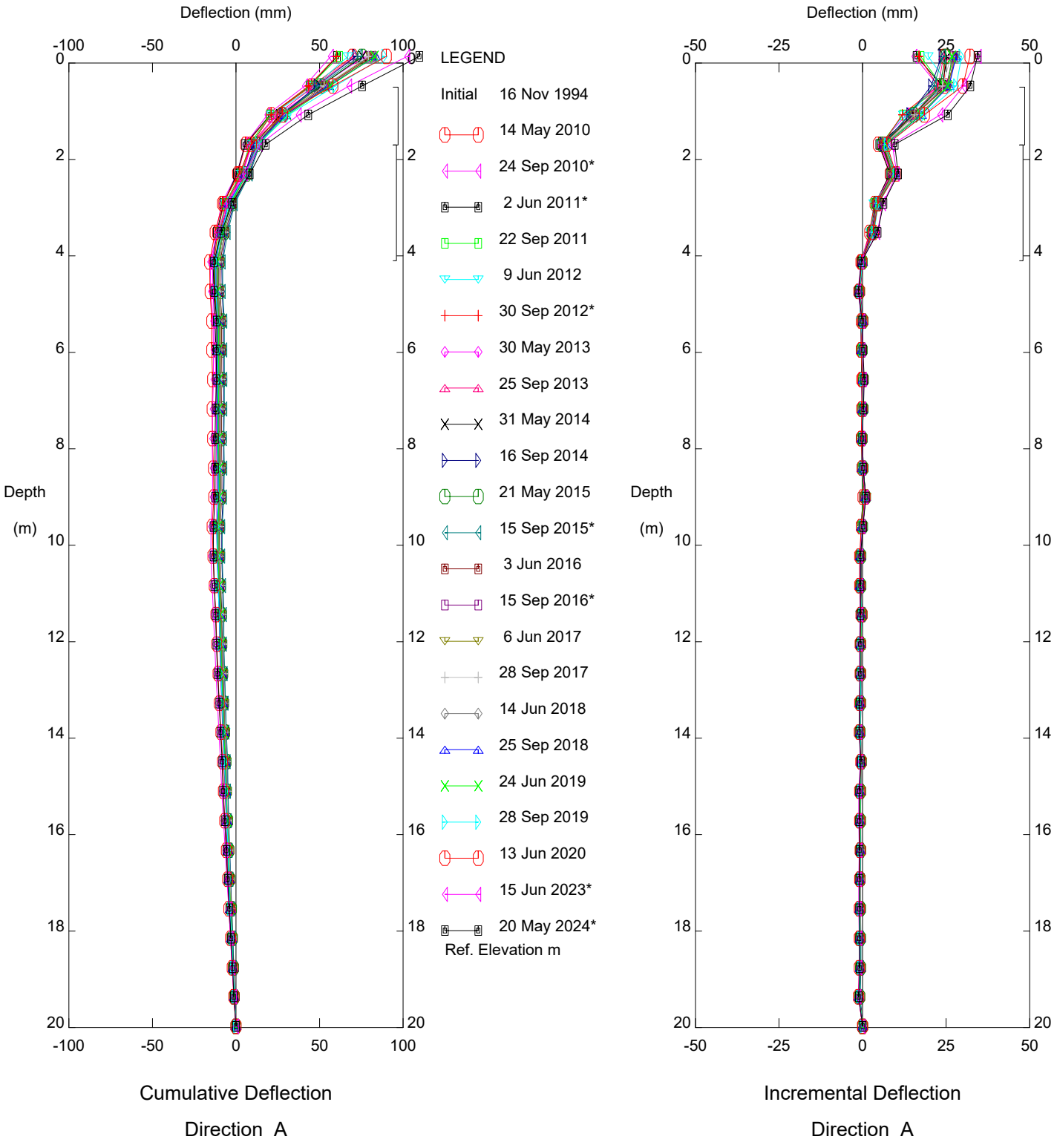


HWY 986:01 - STA. 13+540, Inclinometer SI-4

Alberta Transportation

Thurber Engineering Ltd



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

HWY 986:01 - STA. 13+540, Inclinometer SI-5

Alberta Transportation

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

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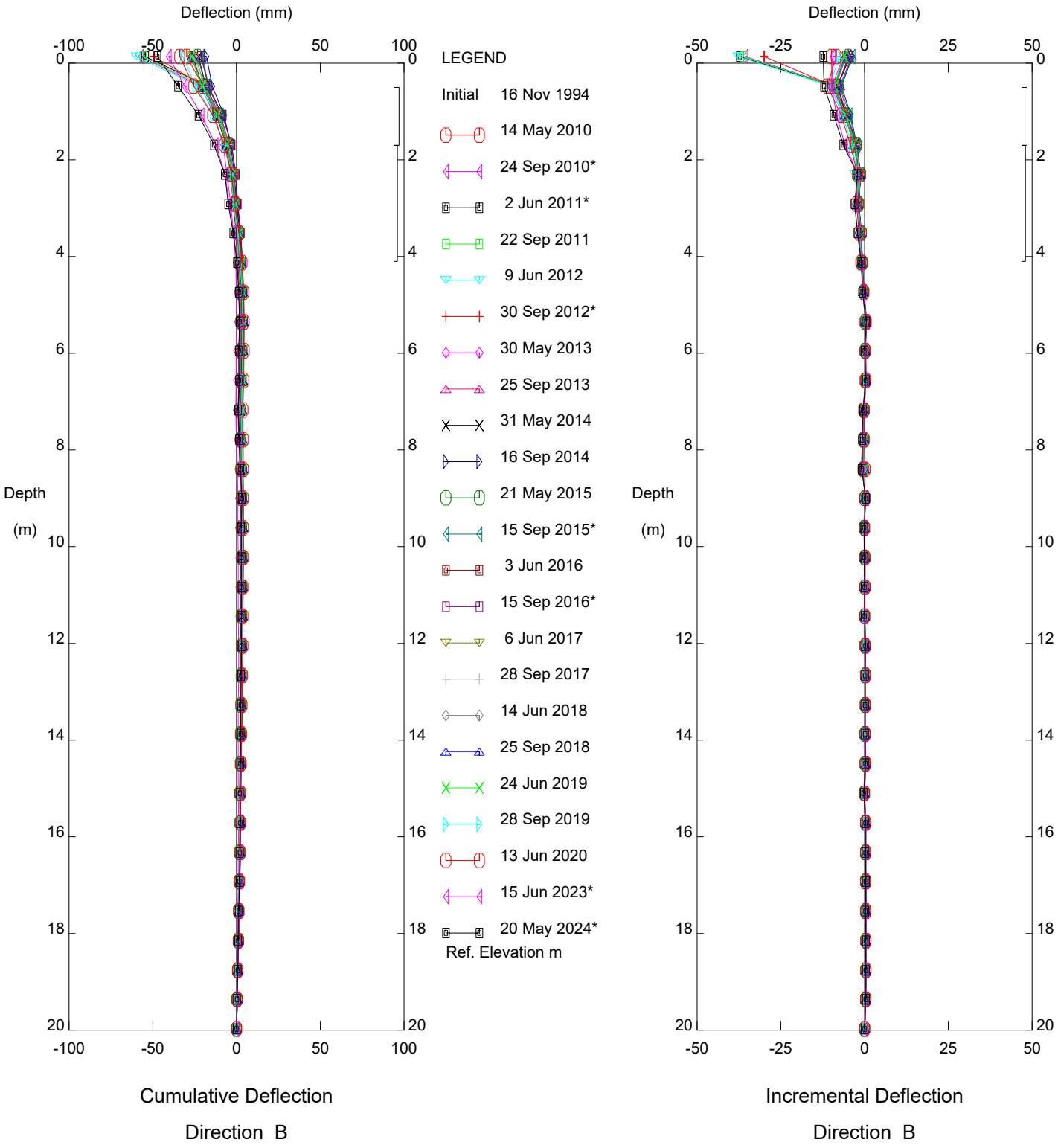
Thurber Engineering Ltd



Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+540, Inclinometer SI-5

Alberta Transportation

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

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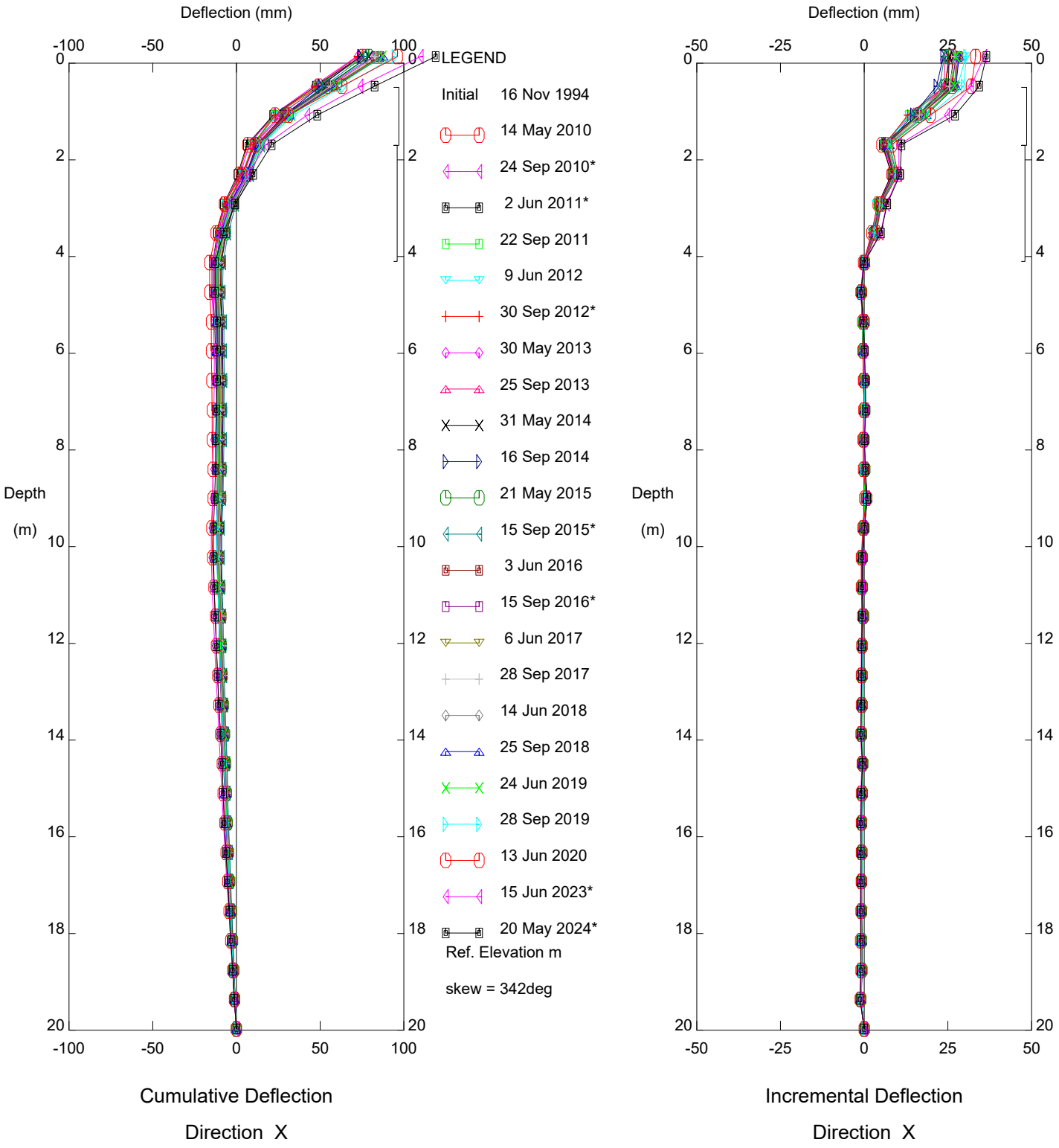

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

HWY 986:01 - STA. 13+540, Inclinometer SI-5

Alberta Transportation

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

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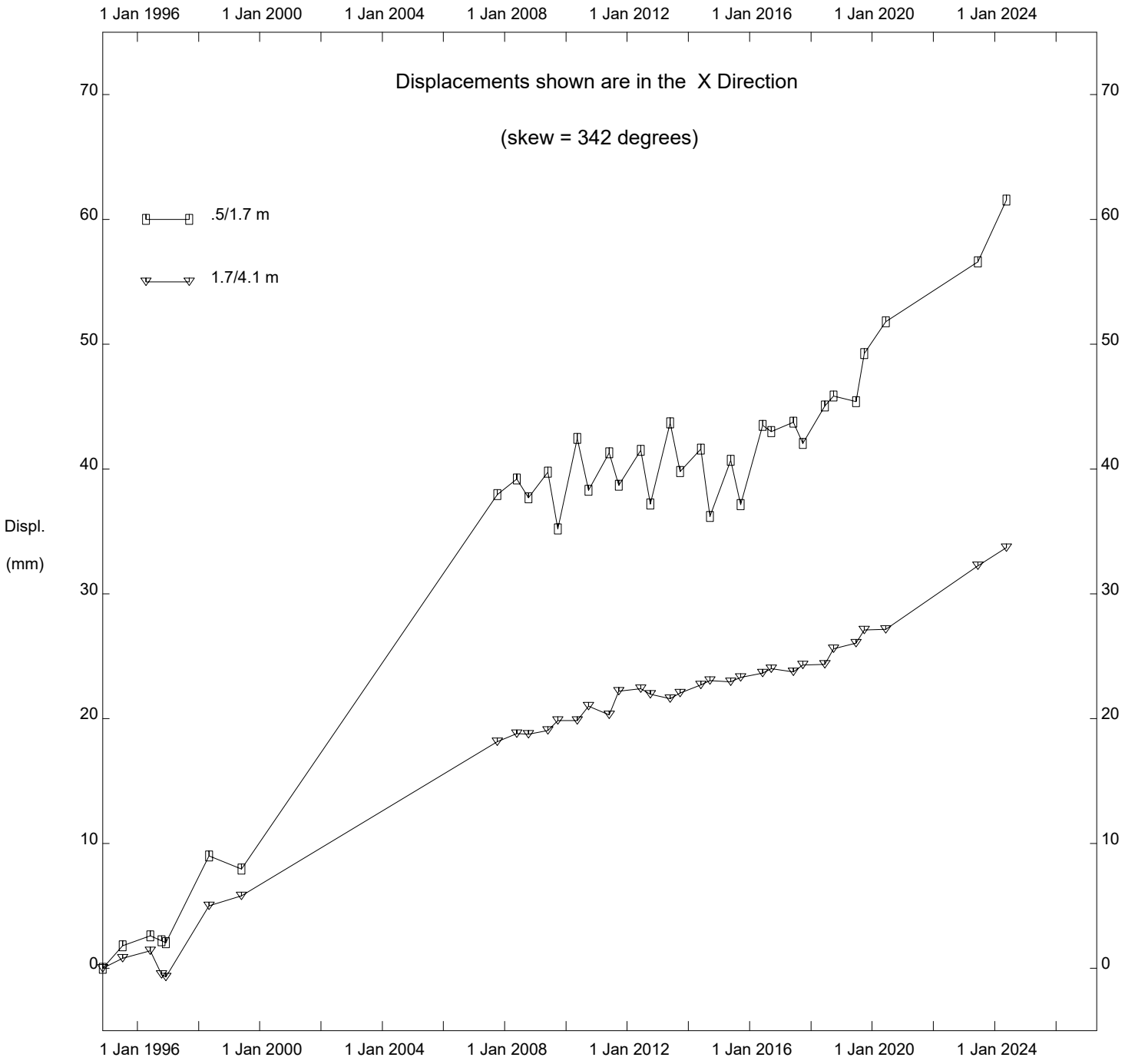
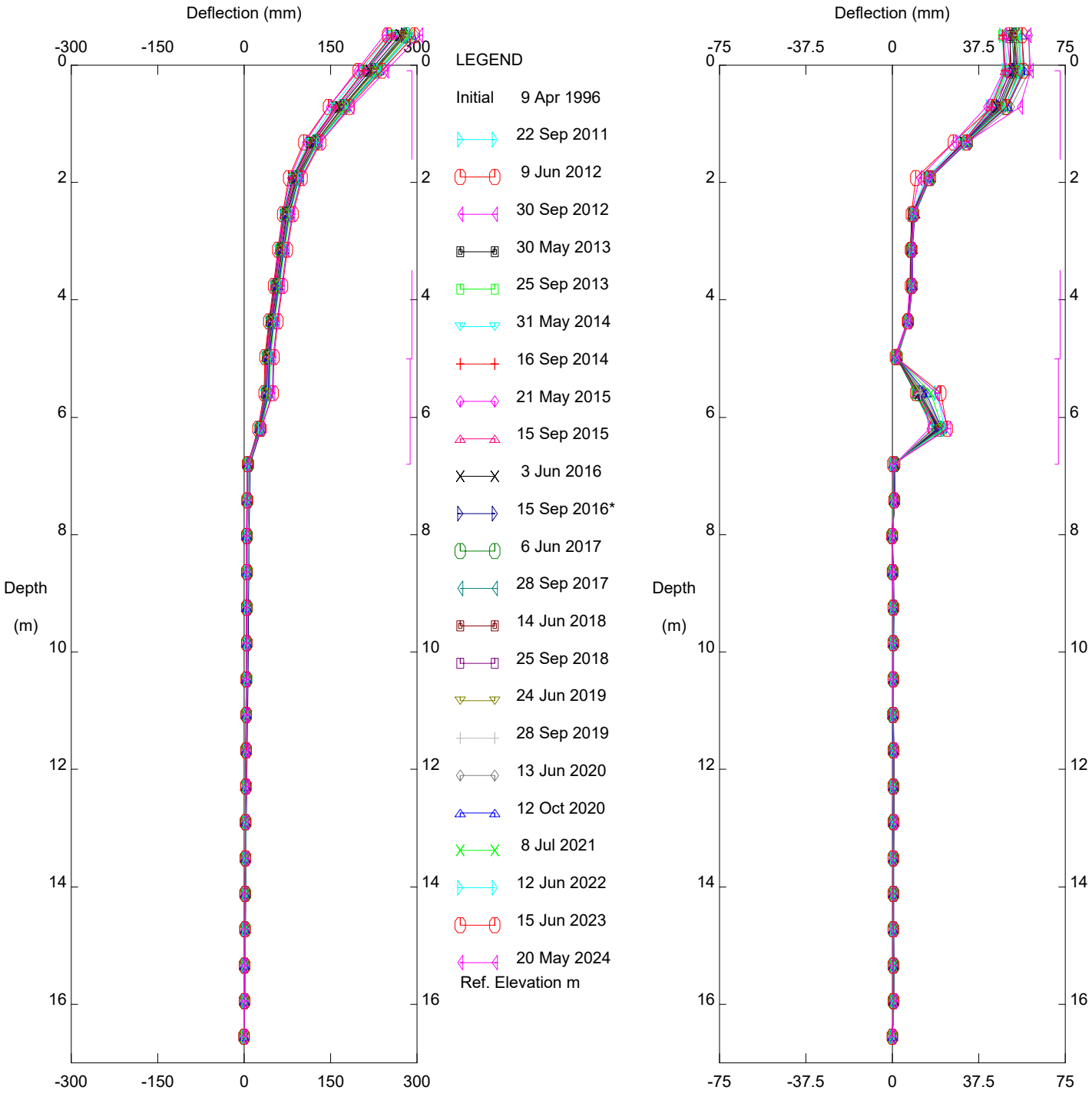


HWY 986:01 - STA. 13+540, Inclinometer SI-5

Alberta Transportation

Thurber Engineering Ltd



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

HWY 986:01 - STA. 13+540, Inclinometer SI-6

Alberta Transportation

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

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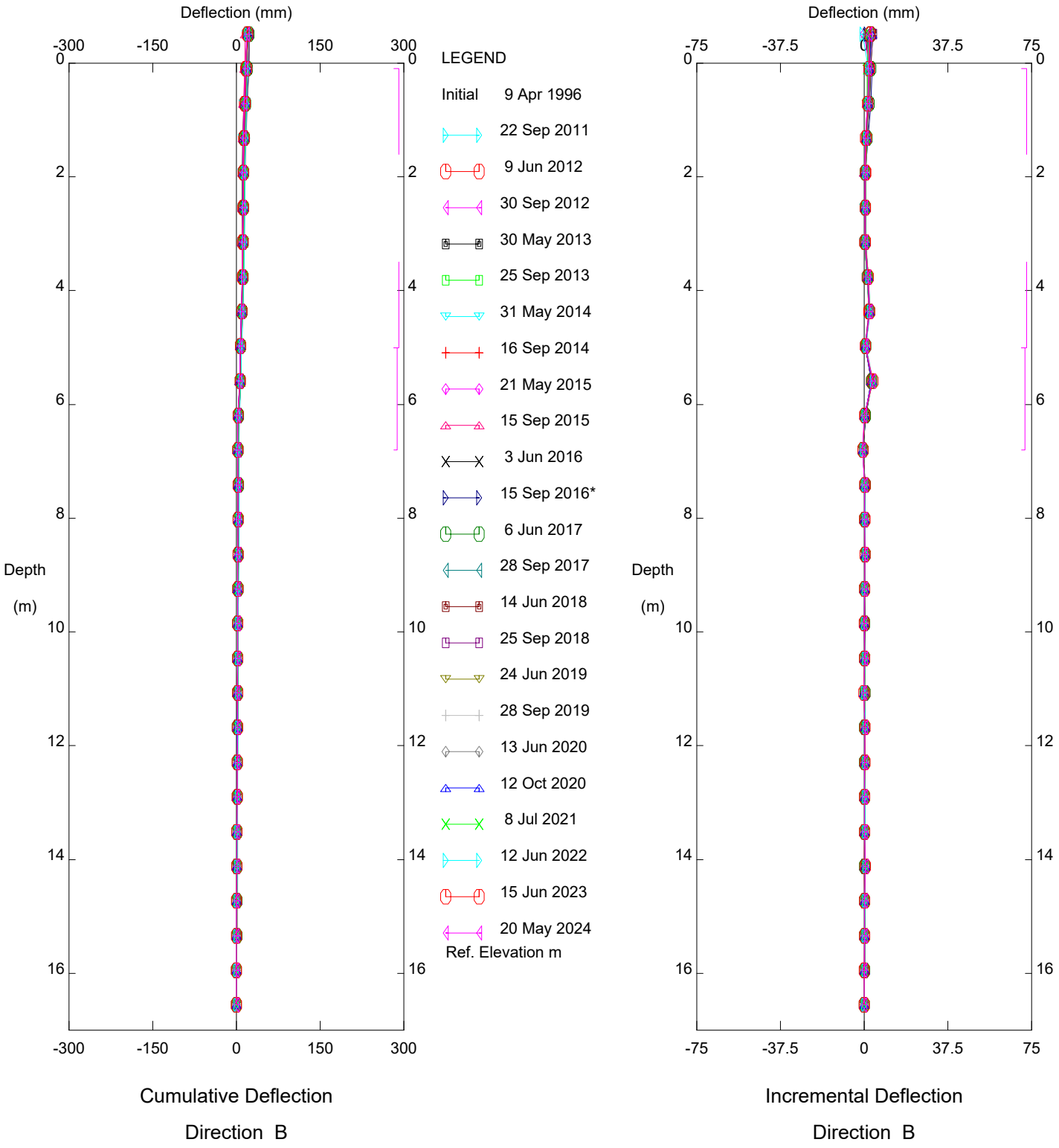

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+540, Inclinometer SI-6

Alberta Transportation

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

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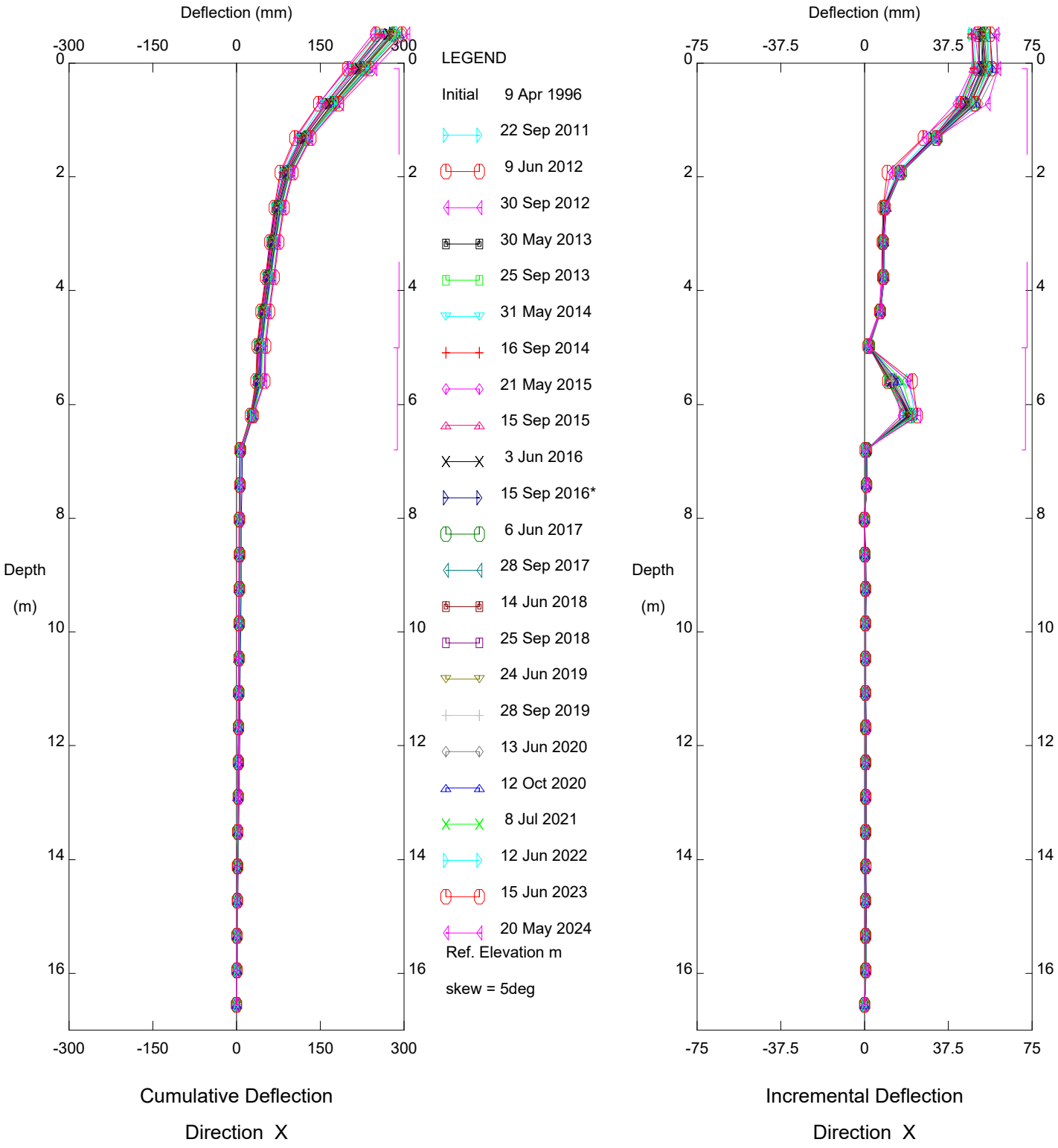

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

HWY 986:01 - STA. 13+540, Inclinometer SI-6

Alberta Transportation

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

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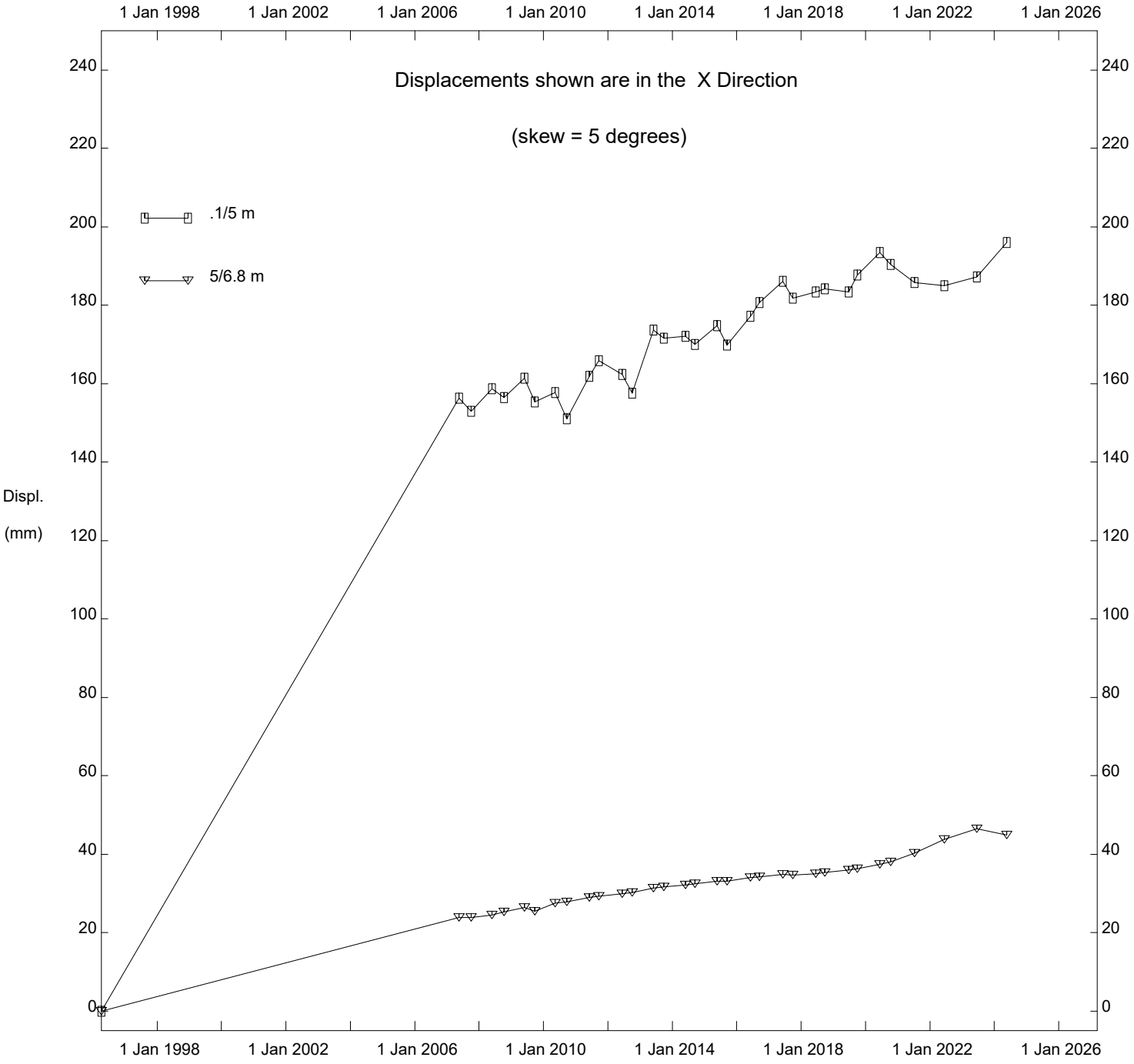
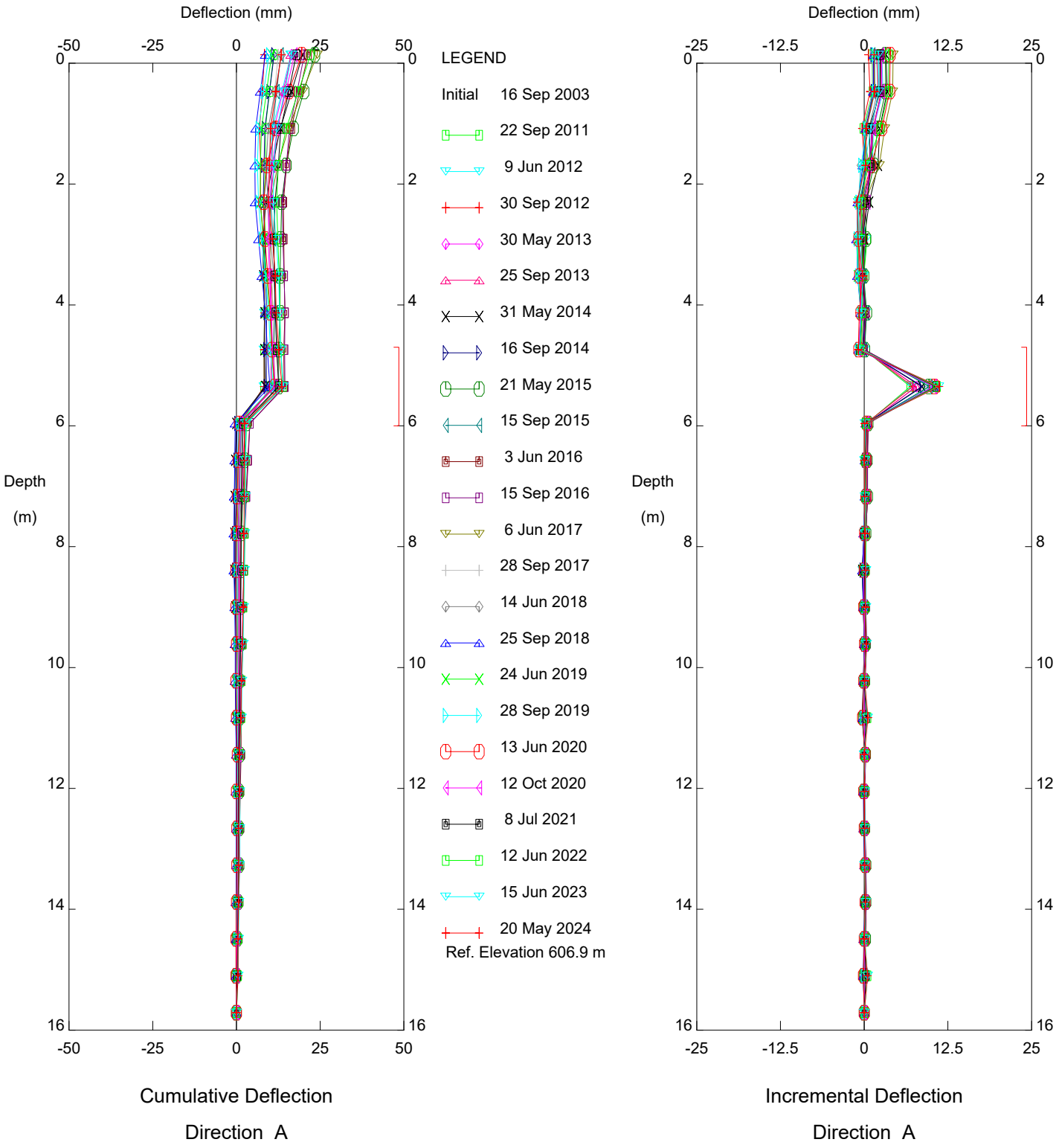


HWY 986:01 - STA. 13+540, Inclinometer SI-6

Alberta Transportation

Thurber Engineering Ltd



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

HWY 986:01 - STA. 13+540, Inclinometer SI03-6

Alberta Transportation

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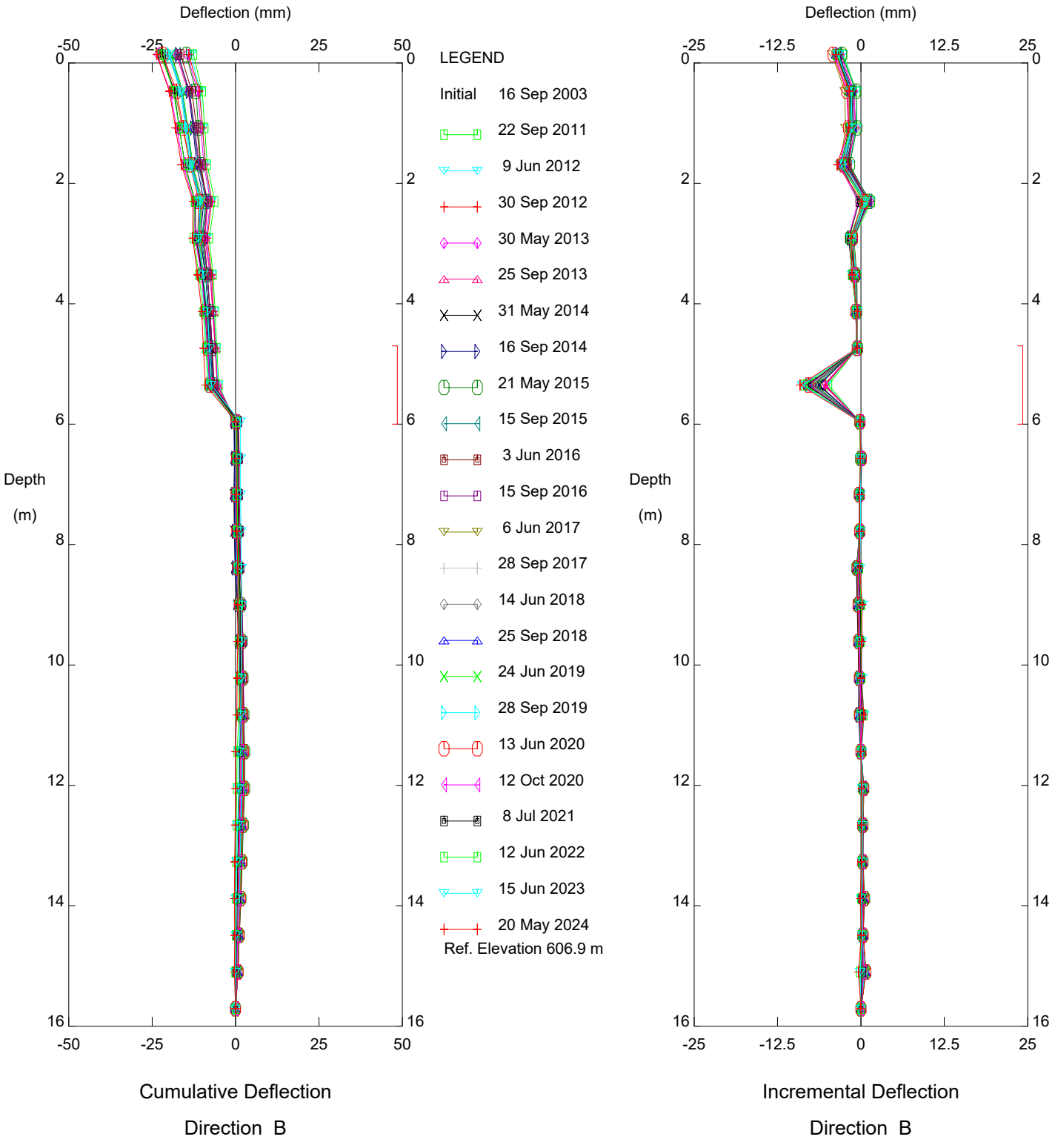
Thurber Engineering Ltd



Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+540, Inclinometer SI03-6

Alberta Transportation

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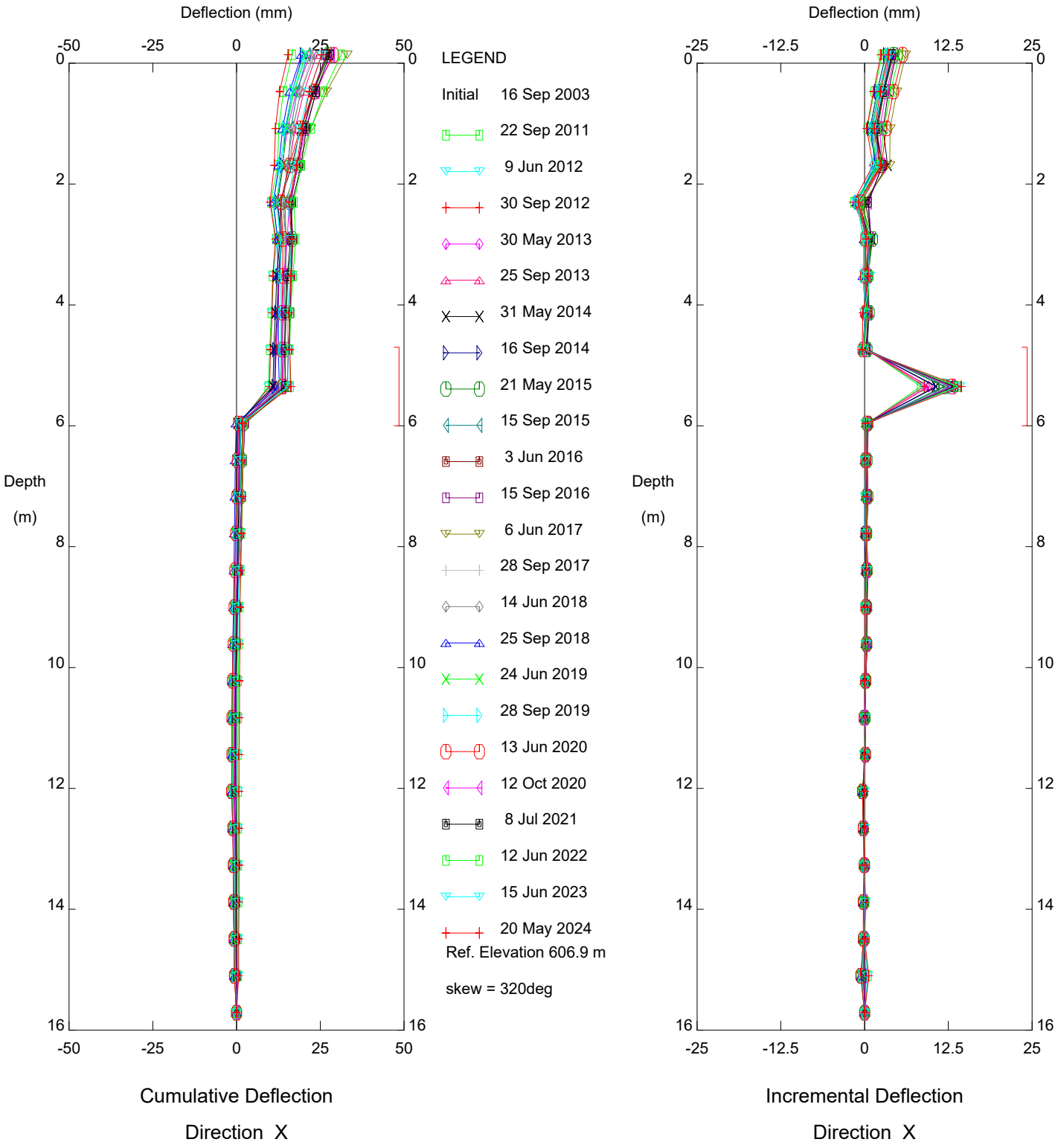

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

HWY 986:01 - STA. 13+540, Inclinometer SI03-6

Alberta Transportation

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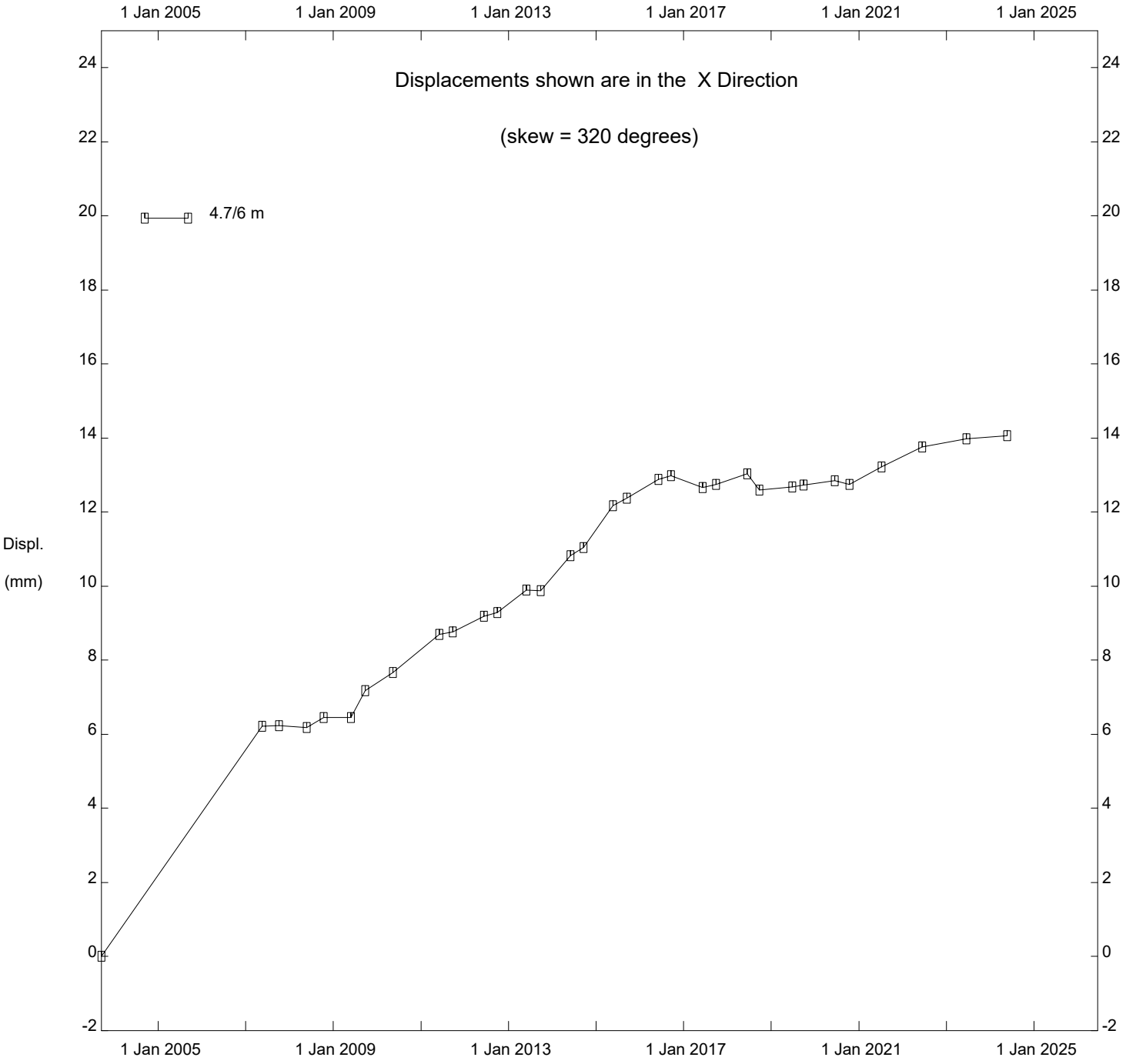

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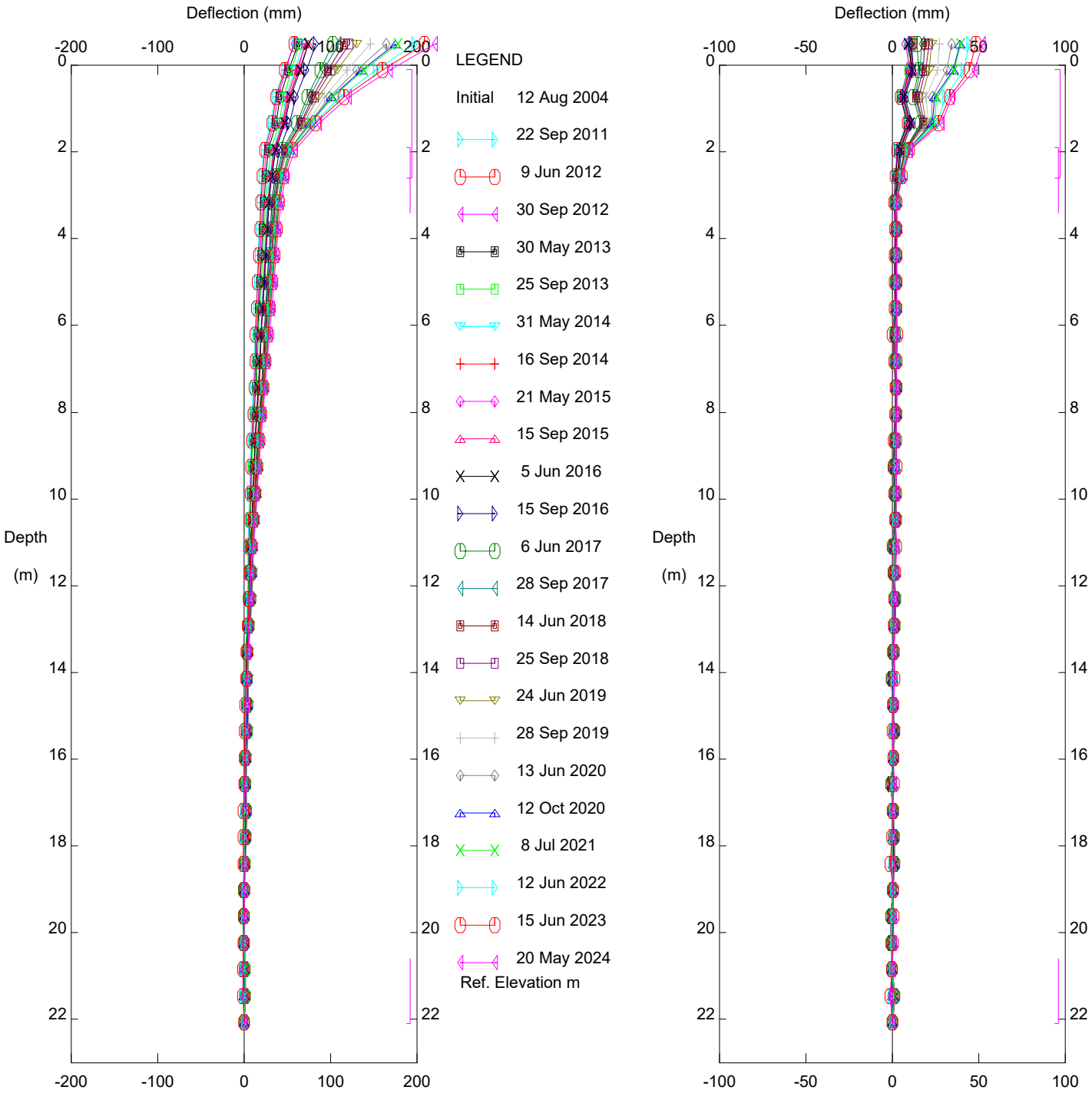
Alberta Transportation

Thurber Engineering Ltd



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

HWY 986:01 - STA. 13+540, Inclinometer SI04-1

Alberta Transportation

H:\32000\32121 AT GRMP Peace River District 2021-2025\Section C\2024A-Spring\SI Readings\PH043\SI04-1.GTL

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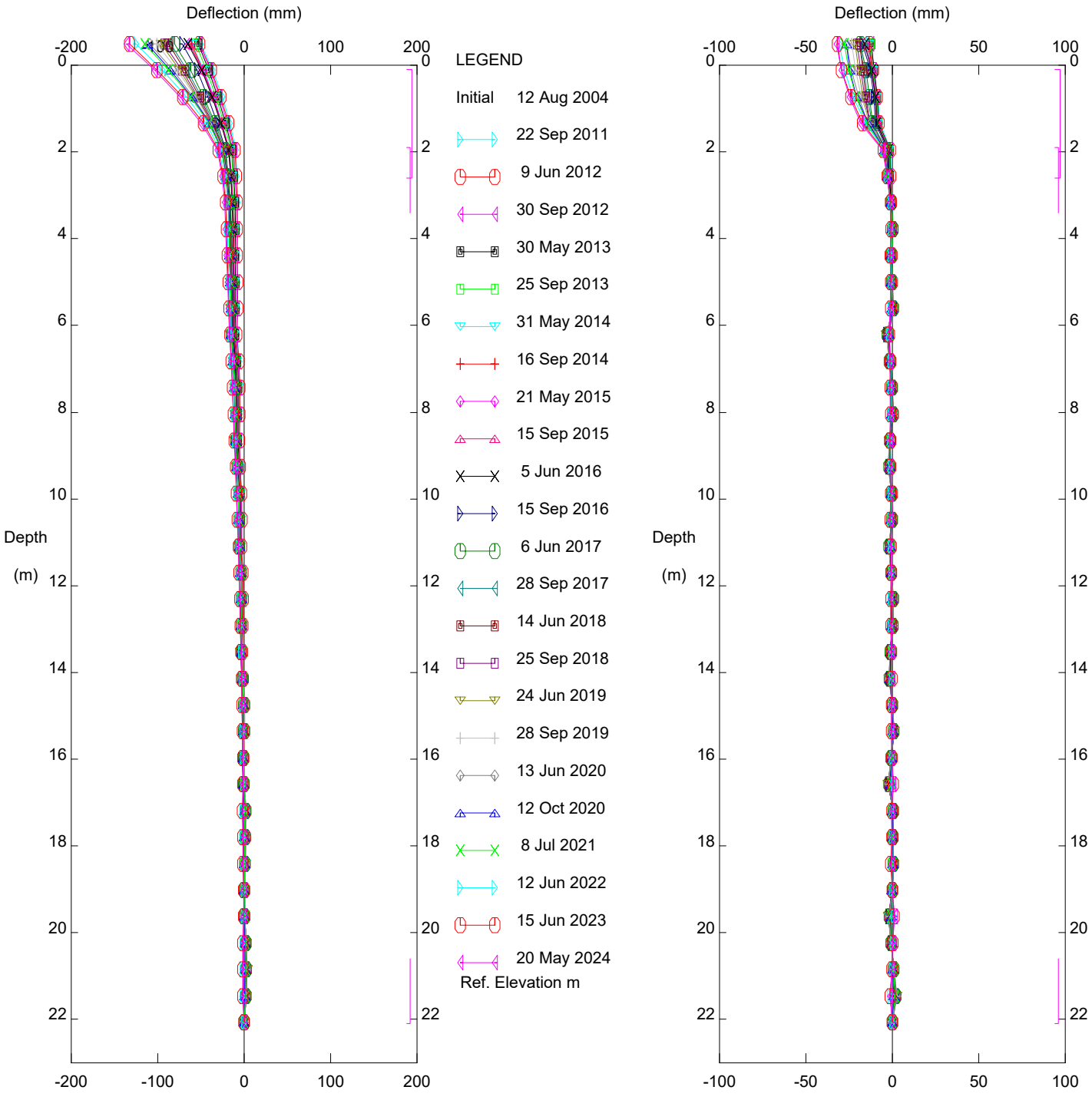

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+540, Inclinometer SI04-1

Alberta Transportation

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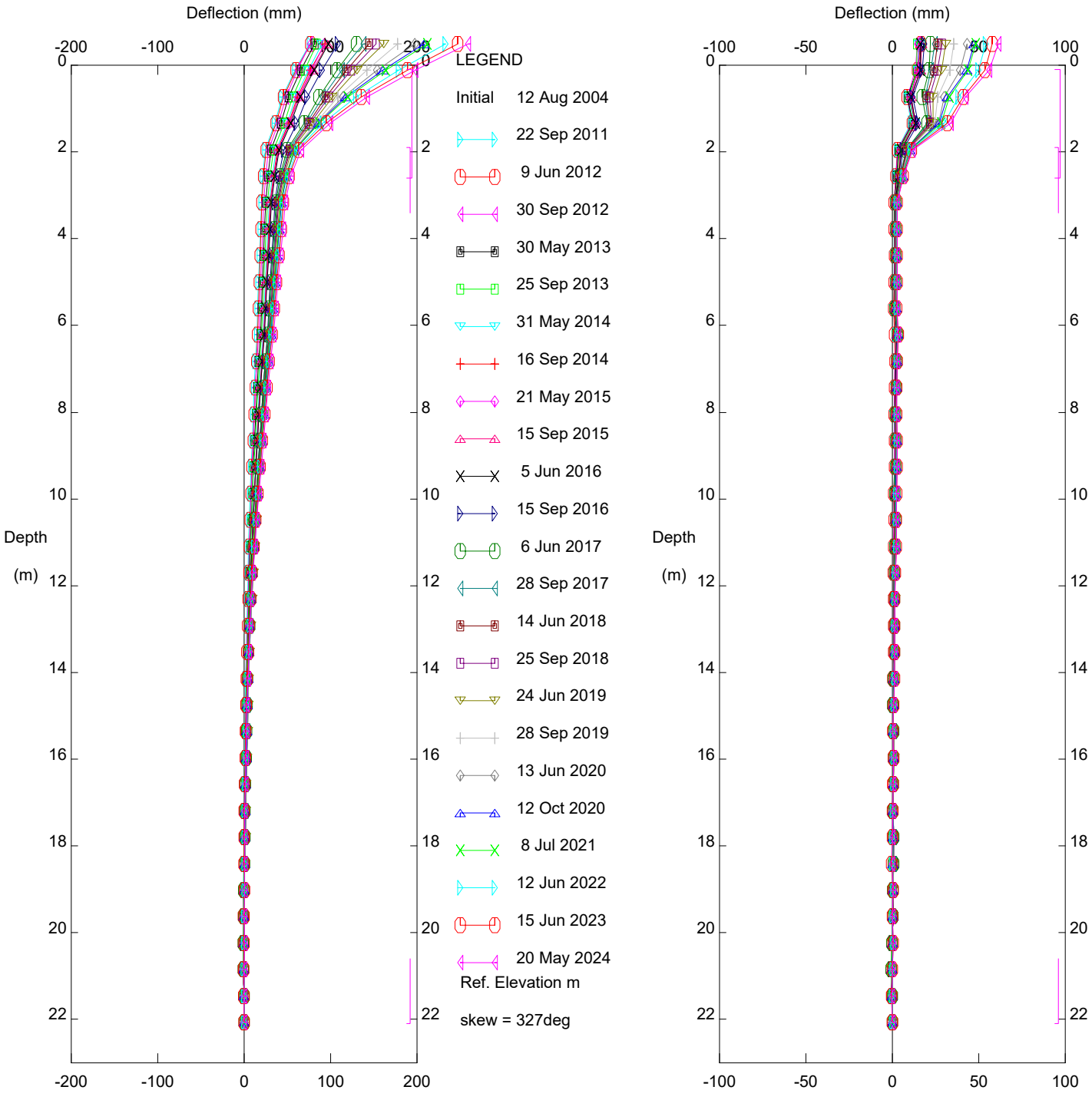

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

HWY 986:01 - STA. 13+540, Inclinometer SI04-1

Alberta Transportation

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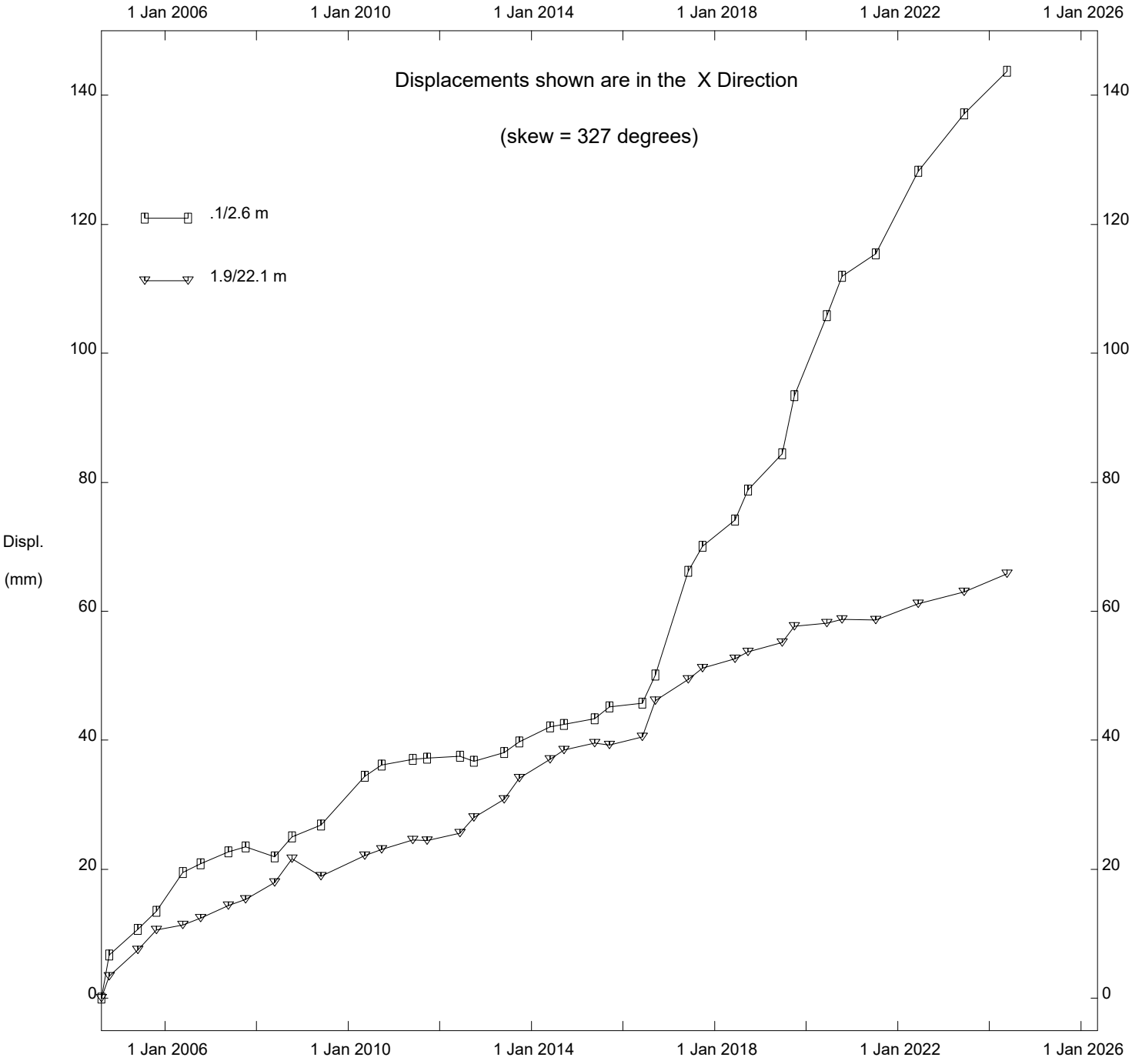
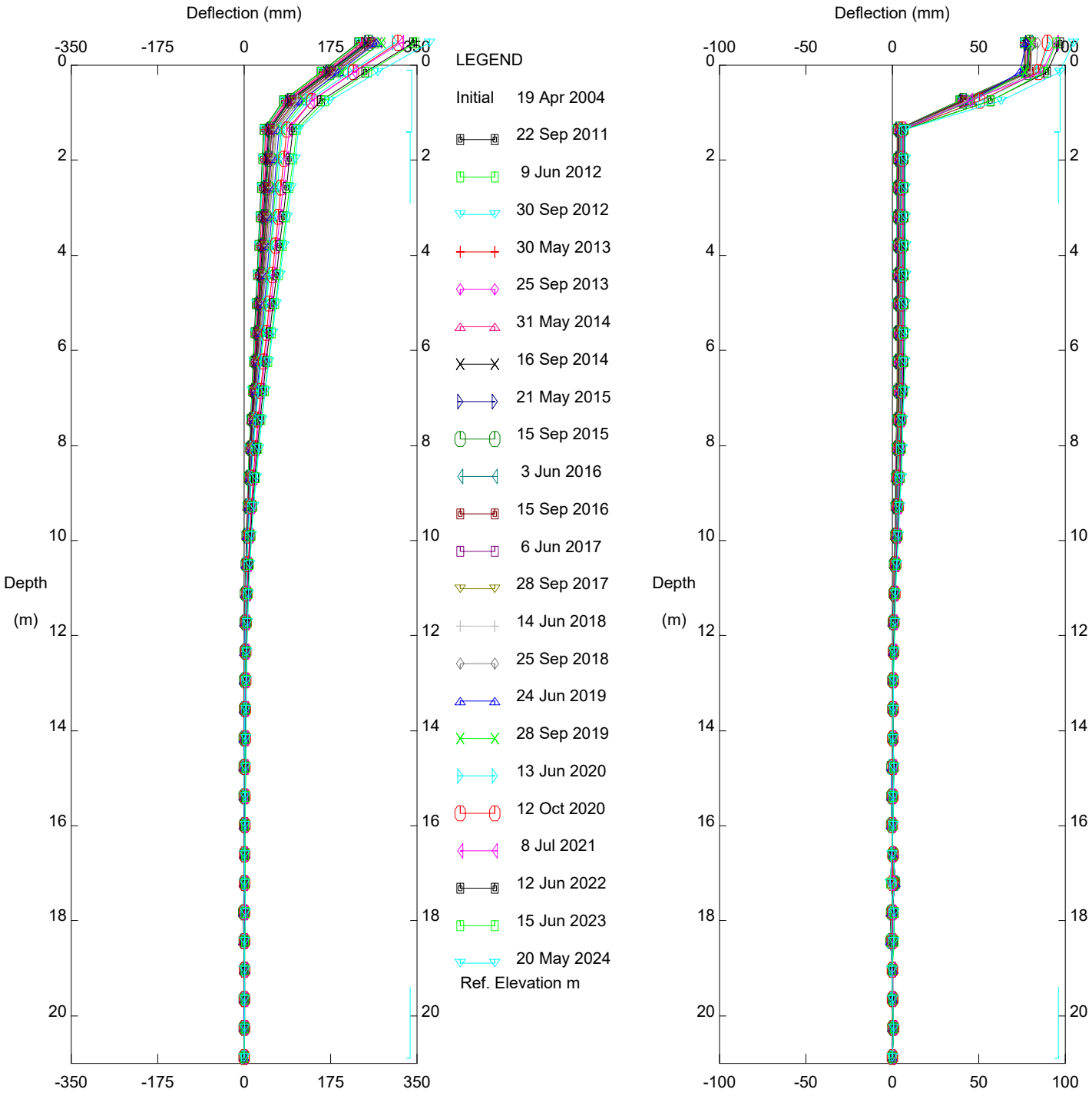


HWY 986:01 - STA. 13+540, Inclinometer SI04-1

Alberta Transportation

Thurber Engineering Ltd



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

HWY 986:01 - STA. 13+540, Inclinometer SI04-3

Alberta Transportation

H:\32000\32121 AT GRMP Peace River District 2021-2025\Section C\2024A-Spring\SI Readings\PH043\SI04-3.GTL

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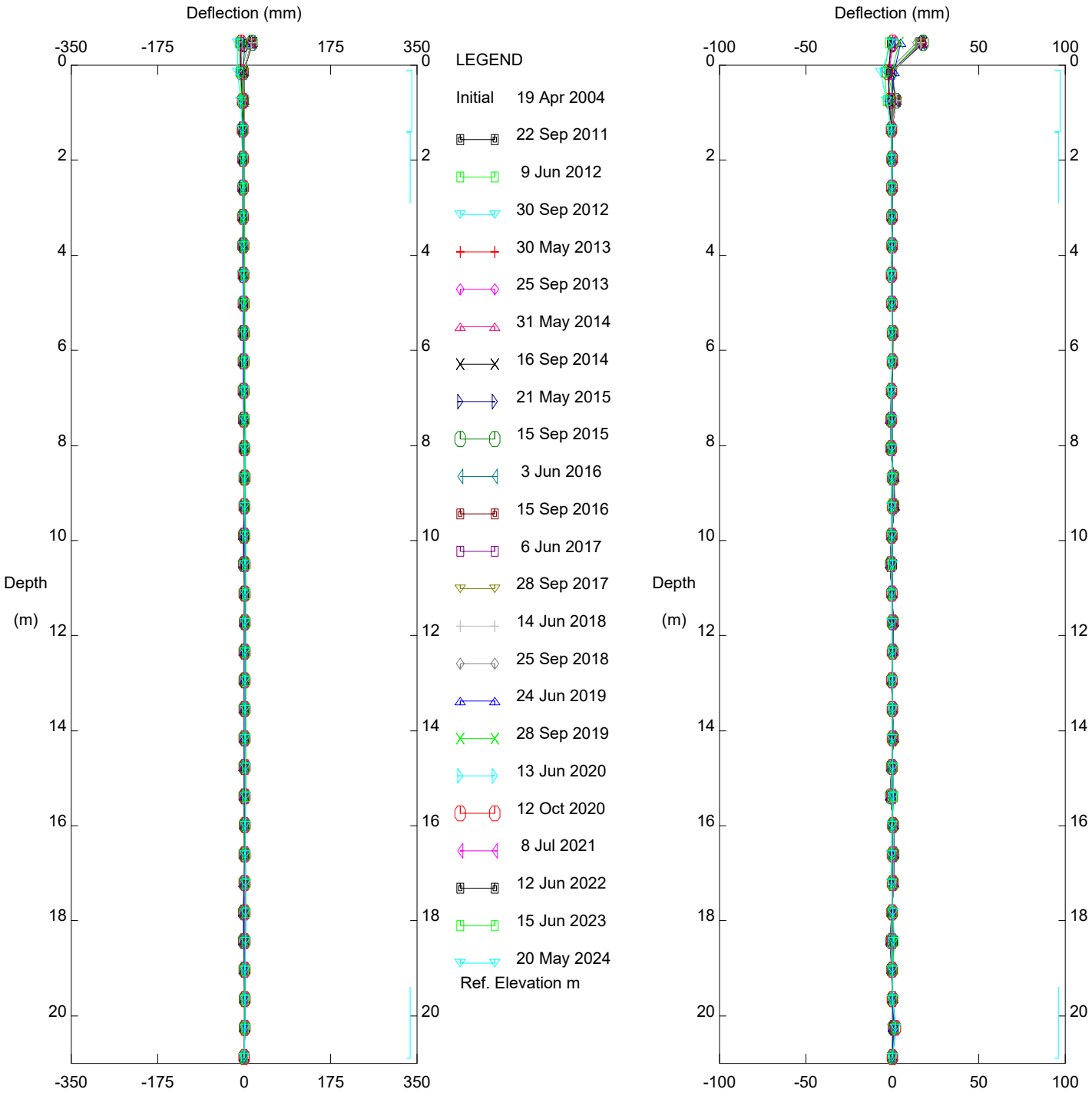

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+540, Inclinometer SI04-3

Alberta Transportation

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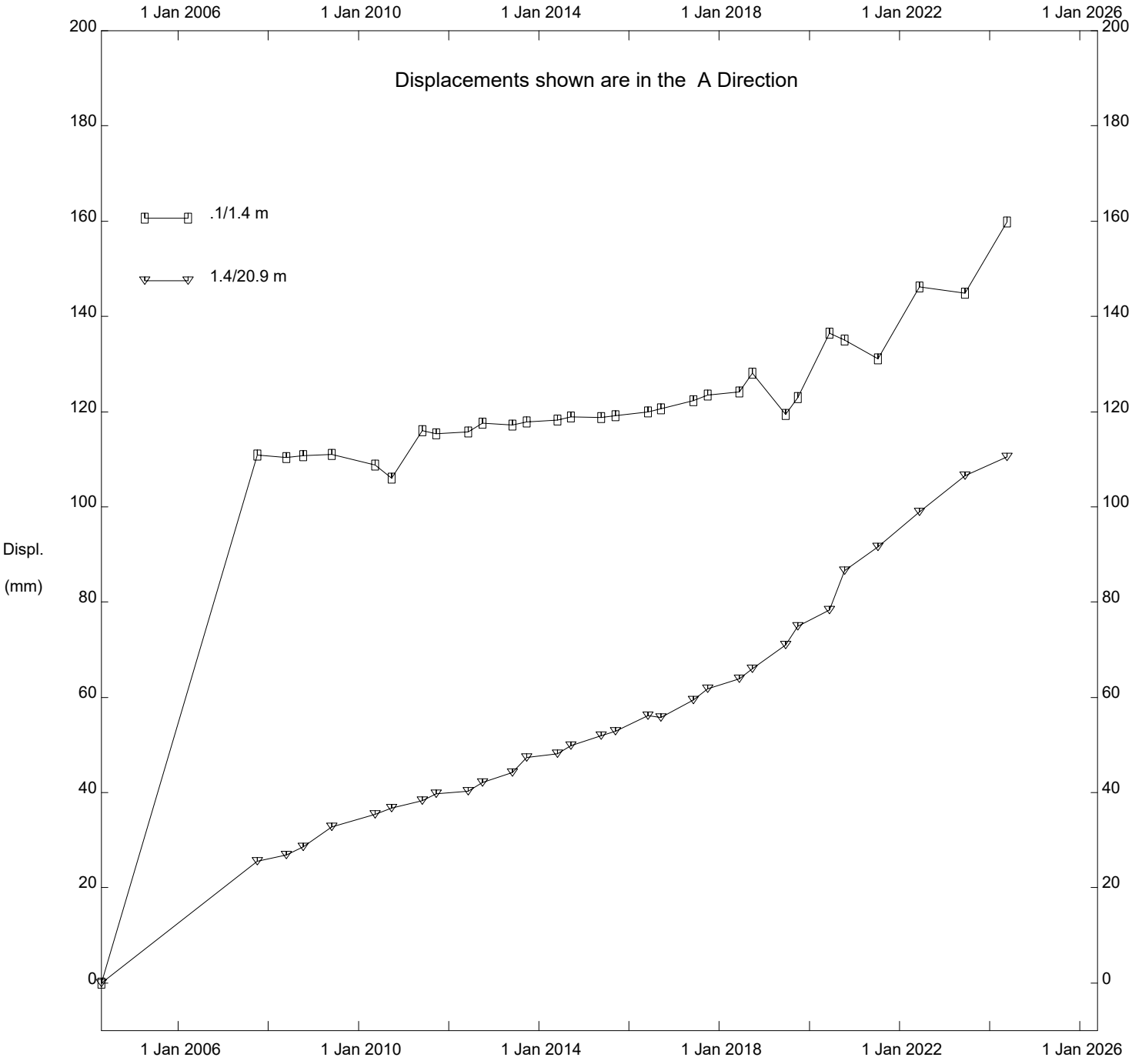
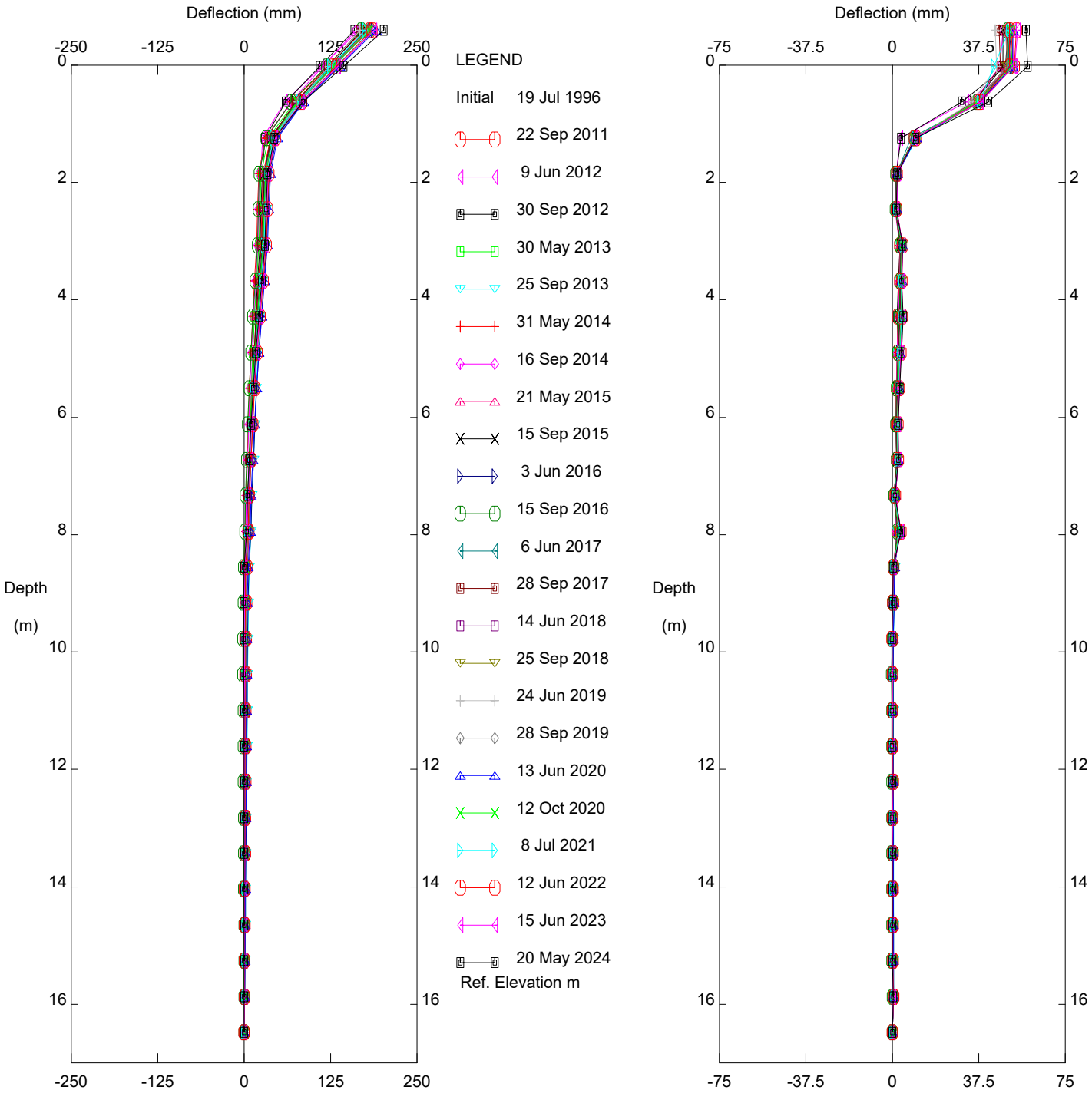


HWY 986:01 - STA. 13+540, Inclinometer SI04-3

Alberta Transportation

Thurber Engineering Ltd



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

HWY 986:01 - STA. 13+820, Inclinometer SI-7

Alberta Transportation

H:\32000\32121 AT GRMP Peace River District 2021-2025\Section C\2024A-Spring\SI Readings\PH043\SH986-07.GTL

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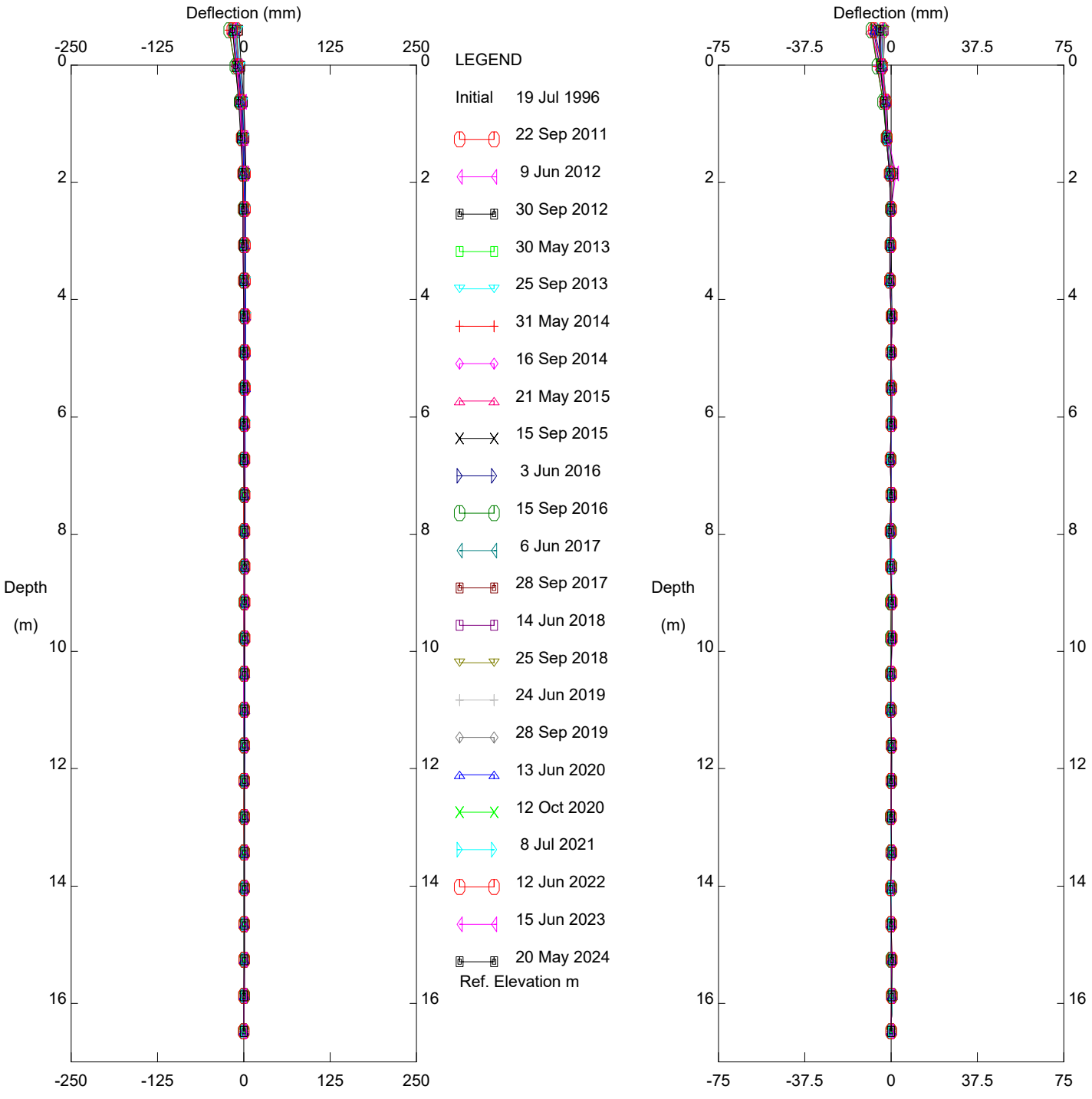

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+820, Inclinometer SI-7

Alberta Transportation

H:\32000\32121 AT GRMP Peace River District 2021-2025\Section C\2024A-Spring\SI Readings\PH043\SH986-07.GTL

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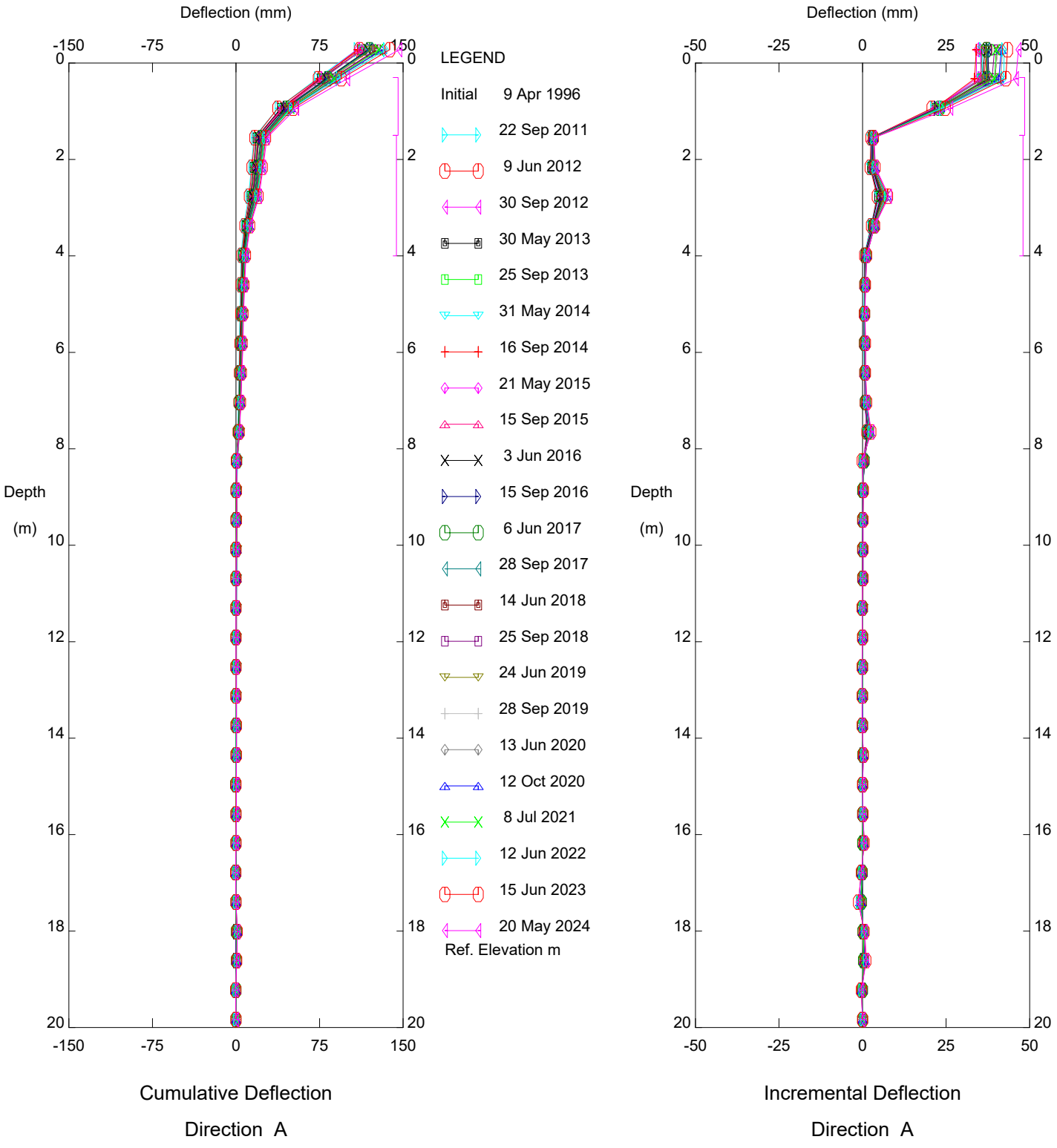


Cumulative Deflection

Direction A

Incremental Deflection

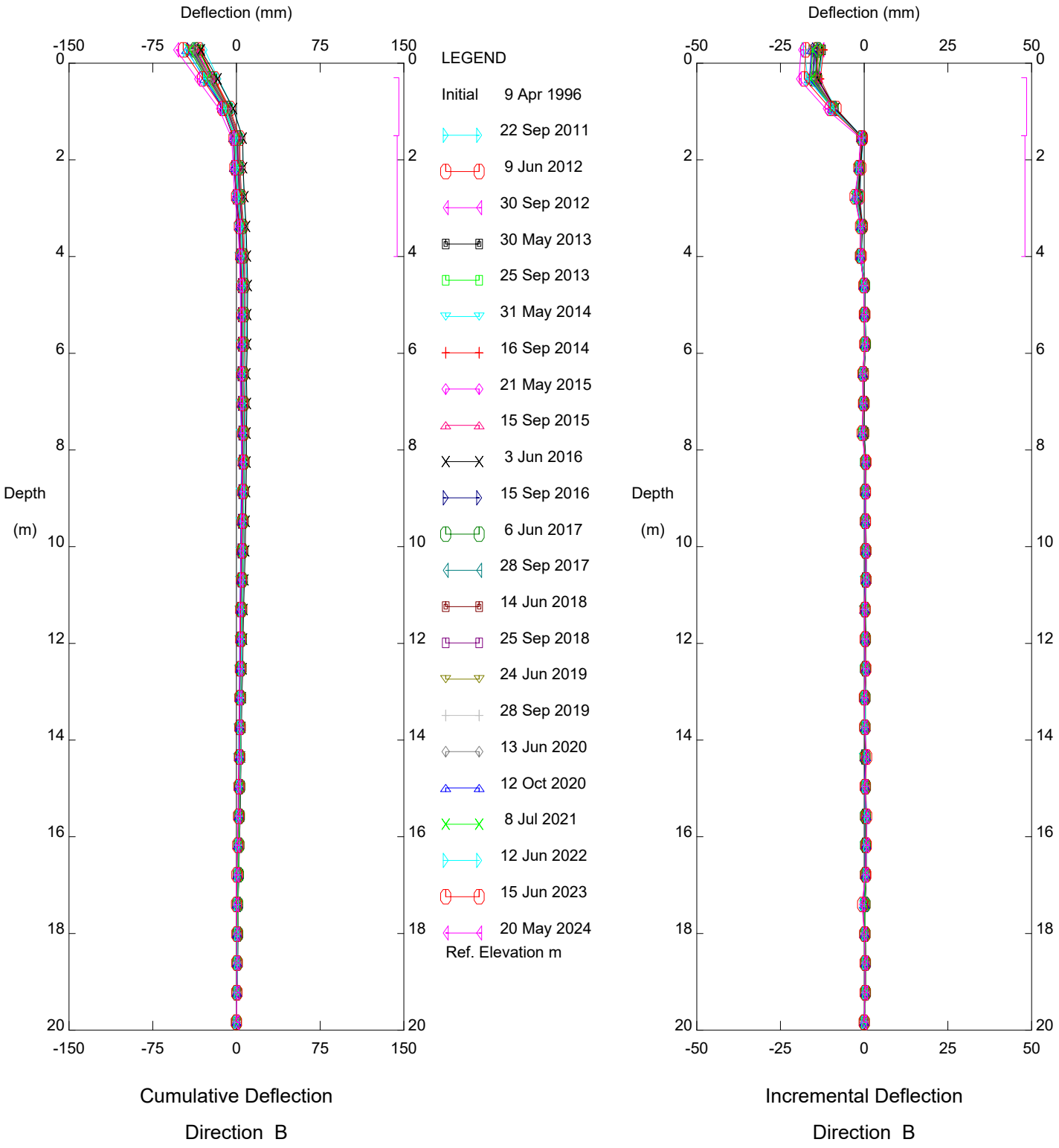
Direction A

HWY 986:01 - STA. 13+820, Inclinometer SI-8

Alberta Transportation

H:\32000\32121 AT GRMP Peace River District 2021-2025\Section C\2024A-Spring\SI Readings\PH043\SH986-08.GTL

Thurber Engineering Ltd



Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+820, Inclinometer SI-8

Alberta Transportation

H:\32000\32121 AT GRMP Peace River District 2021-2025\Section C\2024A-Spring\SI Readings\PH043\SH986-08.GTL

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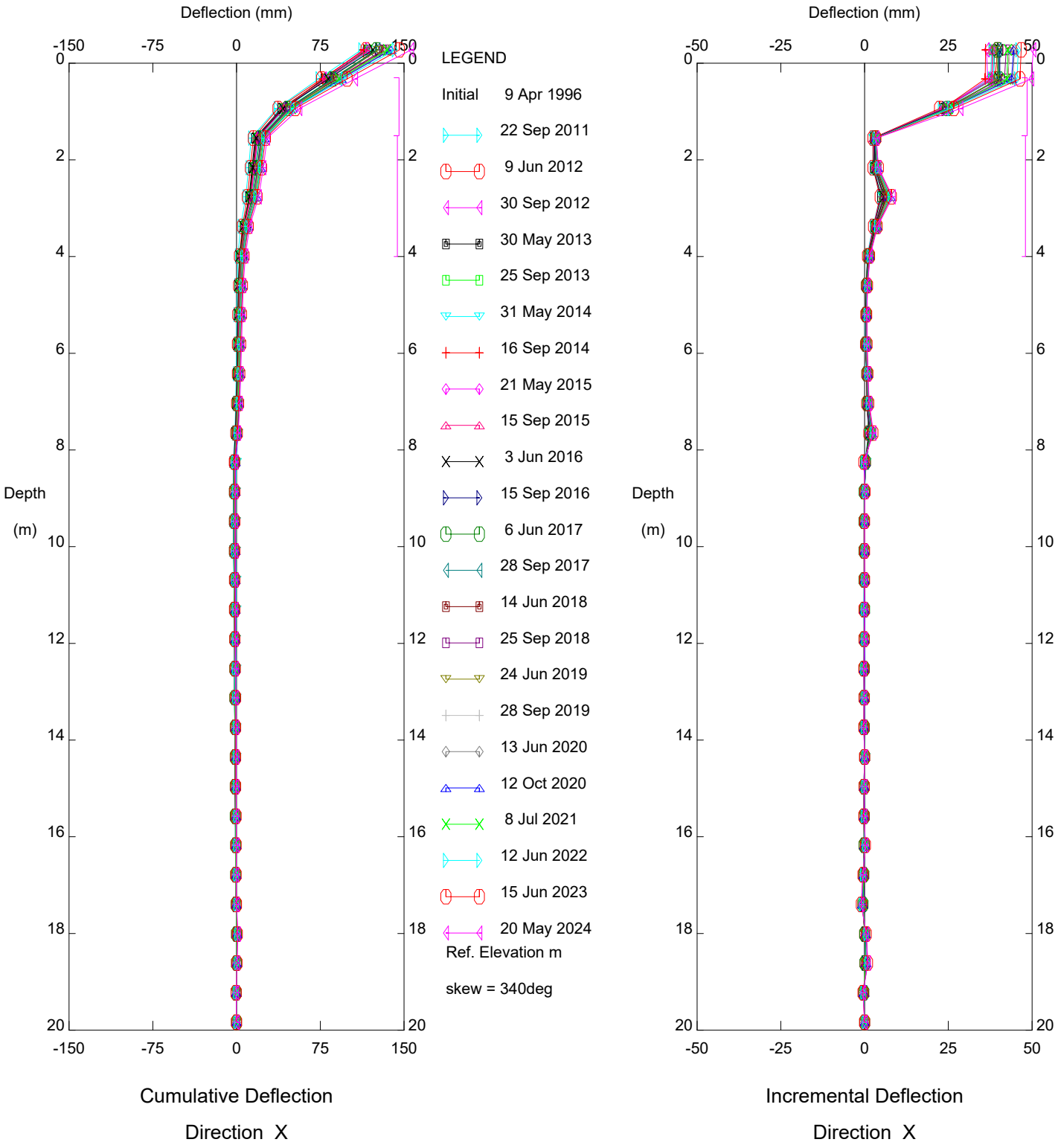

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

HWY 986:01 - STA. 13+820, Inclinometer SI-8

Alberta Transportation

H:\32000\32121 AT GRMP Peace River District 2021-2025\Section C\2024A-Spring\SI Readings\PH043\SH986-08.GTL

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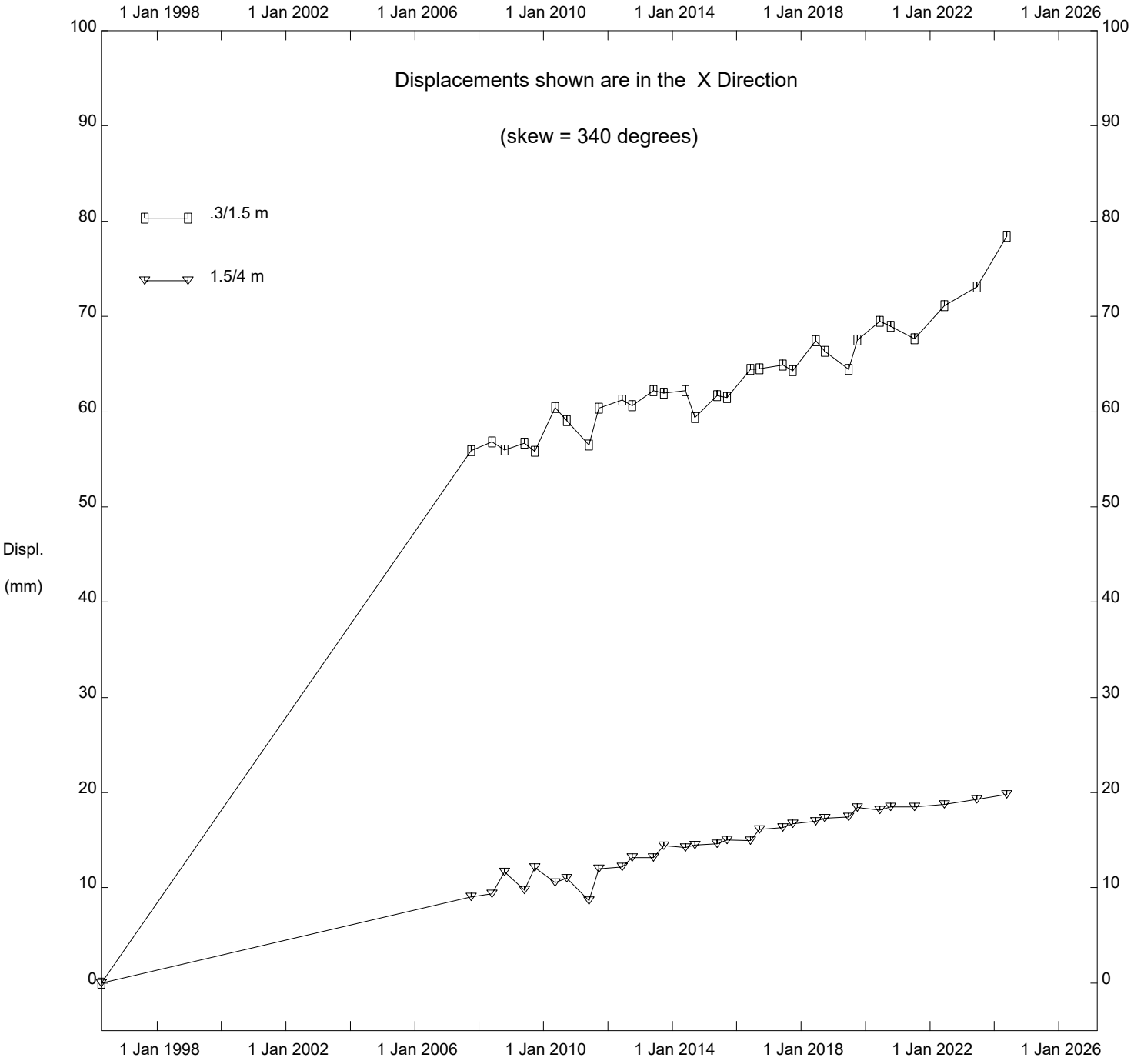
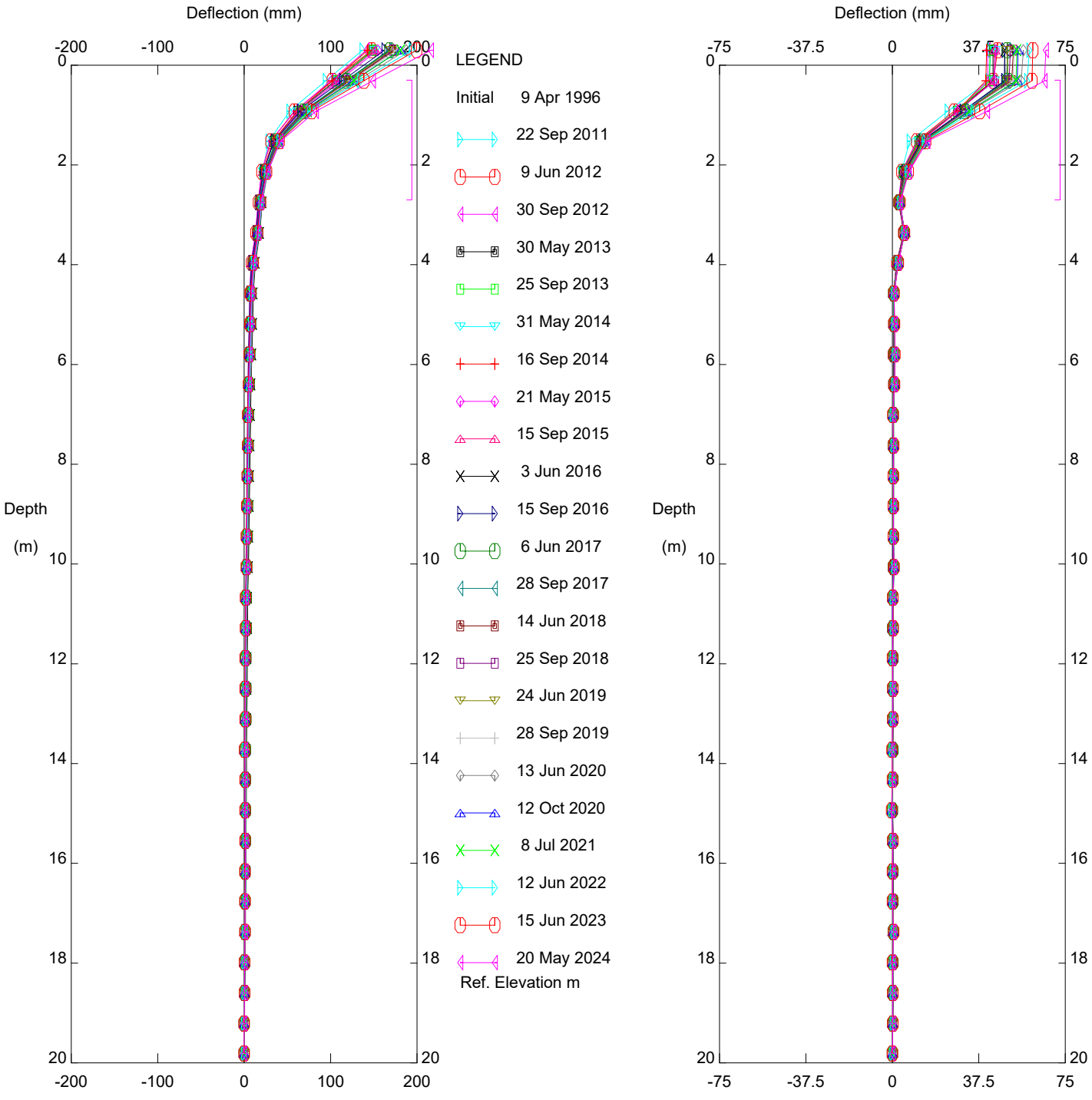


HWY 986:01 - STA. 13+820, Inclinometer SI-8

Alberta Transportation

Thurber Engineering Ltd



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

HWY 986:01 - STA. 13+820, Inclinometer SI-9

Alberta Transportation

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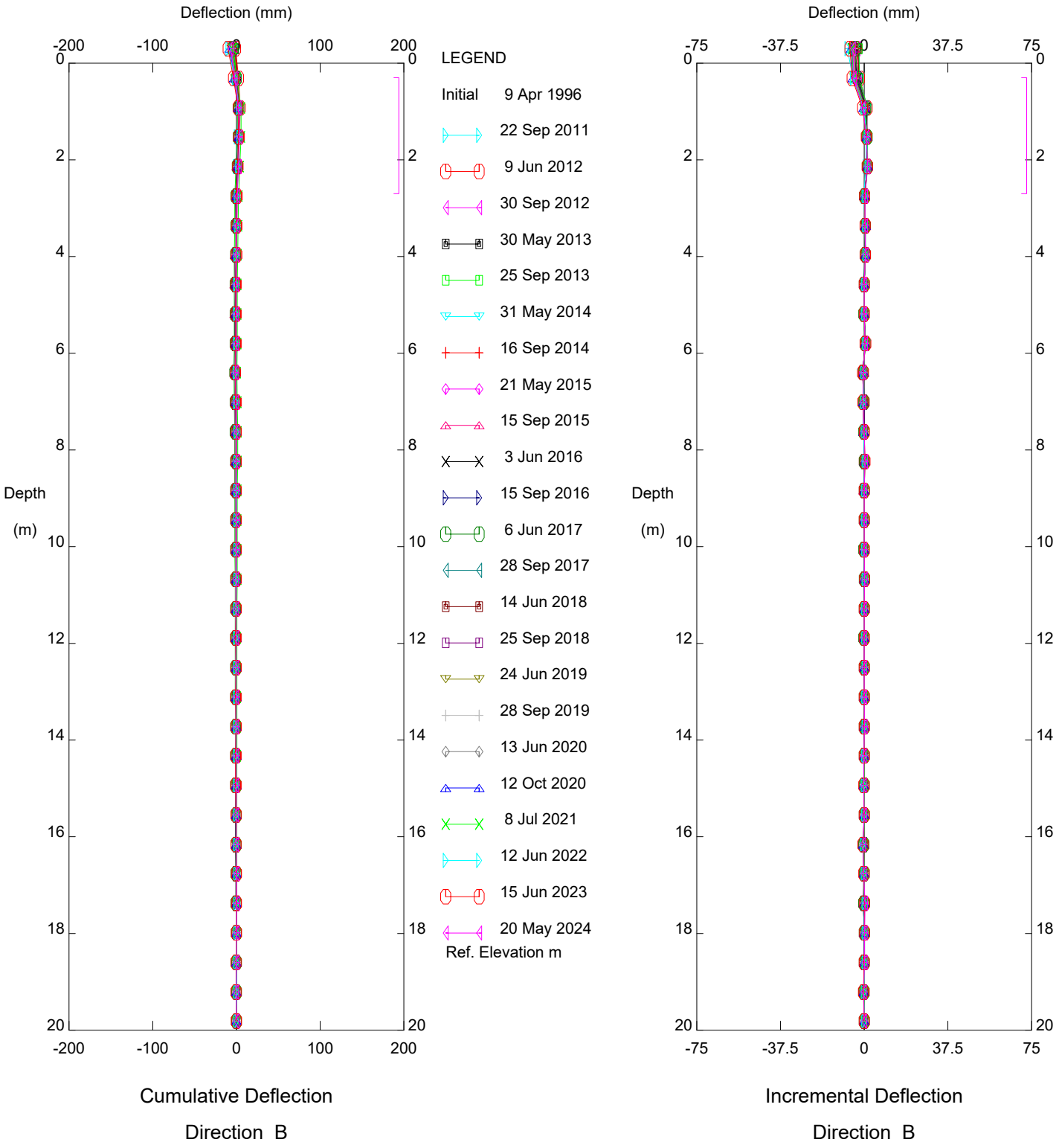

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

HWY 986:01 - STA. 13+820, Inclinometer SI-9

Alberta Transportation

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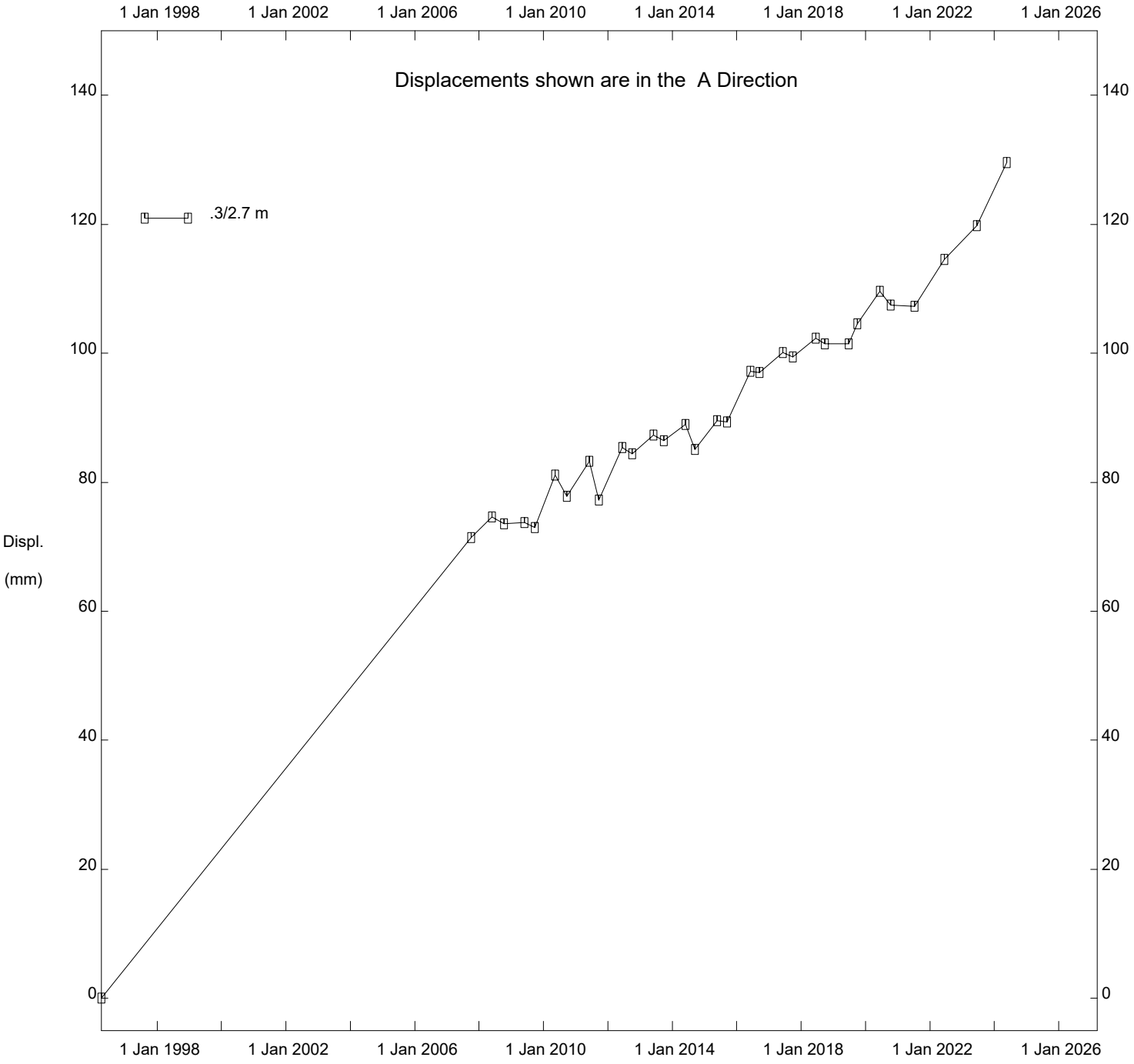
Thurber Engineering Ltd



HWY 986:01 - STA. 13+820, Inclinometer SI-9

Alberta Transportation

FIGURE PH043-1
PIEZOMETRIC ELEVATIONS FOR HWY 986:01 DAISHOWA EAST HILL

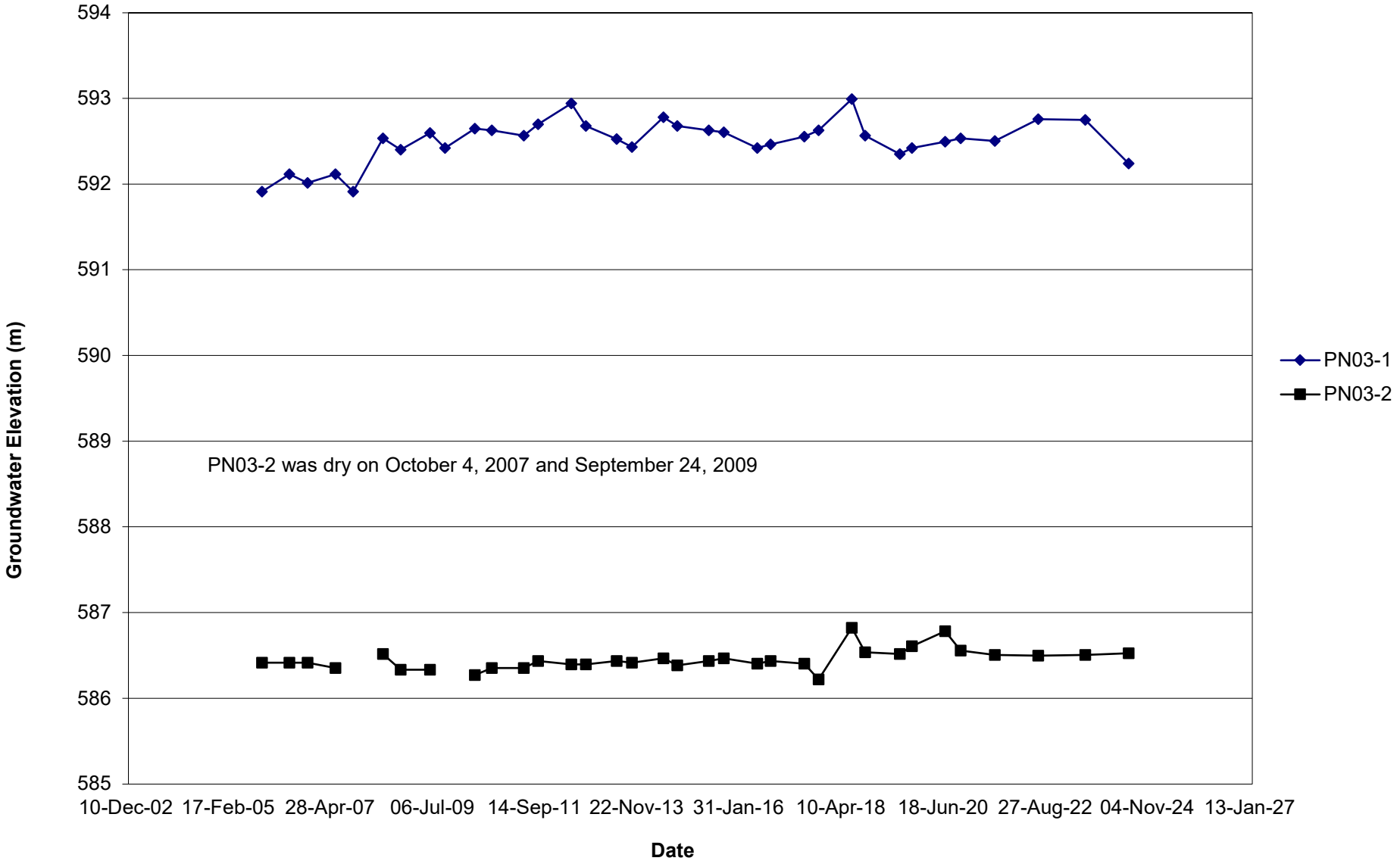


FIGURE PH043-2
PIEZOMETRIC DEPTHS FOR HWY 986:01 DAISHOWA EAST HILL