

ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS GRMP
PEACE REGION – (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING - FALL 2024



Site Number	Location	Name	Hwy	km
PH059	Station 34+770 to 35+680	Peace River East Hill	2:60	Km 34.8 to 35.7
Legal Description:		UTM Co-ordinates		
6-28-83-21 W5		11U E 484136.86	N	6231088.27

Current Monitoring:	21-Sep-2024	Previous Monitoring	19-May-2024
Instruments Read By:	Mr. Niraj Regmi, G.I.T and Mr. Nixon Mationg, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): SI-67 SI-69 SI-75 SI-81	Pneumatic Piezometers (PN):	Vibration Wire Piezometers (VW):	Standpipe Piezometers (SP): SP-003 SP-004
Load Cell (LC):	Strain Gauges:	SAs:	Others:

Readout Equipment Used			
Slope Inclinometers: Two RST Digital Inclinomometer probes with 2 ft. wheelbases and RST Pocket PC readouts	Pneumatic Piezometers:	Vibration Wire Piezometers:	Standpipe Piezometers: DGSI dipmeter
Load Cell:	Strain Gauges:	SAs:	Others:
Note:			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	<p>Slope indicator SI-67 is located upslope of the highway and SI-69, 75 and 81 are all located downslope of the highway.</p> <p>SI-67 showed no discernible movement although there are many zones of very subtle movement at significant depth.</p> <p>SI-69 showed no discernible movement although there are many zones of very subtle movement at significant depth.</p> <p>SI-75 showed a rate of movement of 10.5 mm/yr over 0.0 m to 5.4 m depth since the spring of 2024 readings. This represents an increase in rate of movement of 6.7 mm/yr since the spring of 2024 readings. An overall accelerated movement rate has been present since the spring of 2023 readings (6 mm/yr after spring 2023 versus 2 mm/yr between about spring 2007 to spring 2023).</p> <p>SI-81 showed rates of movement of 5.0 mm/yr and 3.0 mm/yr over 1.9 m to 6.1 m depth and 8.8 mm/yr over 6.1 m to 9.2 m depth, respectively, since the spring of 2024 readings. The movement rates over 6.1 m to 9.2 m and 6.1 m to 9.2 m depth decreased by 4.6 mm/yr and 5.8 mm/yr, respectively, since the spring of 2024 readings.</p>

	Standpipe piezometer SP-003 showed an increase in groundwater level of 0.01 m since the spring of 2024 reading. SP-004 showed a decrease in groundwater level of 0.04 m since the spring of 2024 readings.
Future Work:	The instruments should be read again in the spring of 2025.
Instrumentation Repairs:	No instrument repairs are required at this time.
Additional Comments:	

Attachments:	<ul style="list-style-type: none"> ▪ Table PH059-1: Fall 2024 – Peace River East Hill Site # 2 Slope Inclinometer Instrumentation Reading Summary ▪ Table PH059-2: Fall 2024 – Peace River East Hill Site # 2 Pneumatic Piezometer Instrumentation Reading Summary ▪ Table PH059-3: Fall 2024 – Peace River East Hill Site # 2 Standpipe Piezometer Instrumentation Reading Summary ▪ Statement of Limitations and Conditions ▪ APPENDIX A - PH059 FALL 2024 <ul style="list-style-type: none"> □ Field Inspector's report □ Site Plan Showing Approximate Instrument Locations (Drawing No. 32121 PH059) □ SI Reading Plots □ Figure PH059-1 (Piezometric Readings)
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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.
Roger Skirrow, M.Sc., P. Eng.
Senior Geotechnical Engineer

Lucas Green, P.Eng.
Geotechnical Engineer

Table PH059-1: Fall 2024 – Peace River East Hill Site # 2 Slope Incliner Instrumentation Reading Summary

Date Monitored: September 21, 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-67	Sept. 24, 1996	No discernible movement	N/A	Operational	May 19, 2024	N/A	N/A	N/A
SI-69	Oct. 2, 1996	No discernible movement	N/A	Operational	May 19, 2024	N/A	N/A	N/A
SI-75	Oct. 2, 1996	72.0 mm over 0 m to 5.4 m depth in 208° direction	33.7 mm/yr In Nov. 1996	Operational	May 19, 2024	3.6	10.5	6.7
SI-76	Oct. 2, 1996	<i>Not Known</i>	<i>Not Known</i>	<i>Discontinued</i>	<i>May 20, 2004</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
SI-81	Oct. 2, 1996	99.0 mm over 1.9 m to 6.1 m depth in 191° direction	34.9 mm/yr in September 1997	Operational	May 19, 2024	1.7	5.0	4.5
		81.5 mm over 6.1 m to 9.2 m depth in 179° direction	16.9 mm/yr in September 1997			3.0	8.8	5.8
SI-82	Oct. 2, 1996	59.5 mm over 11 m to 14 m depth in 220° direction	19.6 mm/yr between Nov. 1996 and Oct. 1997	Sheared at 11.7 mBGS	September 30, 2012	N/A	N/A	N/A

Drawing 32121-PH059 in Appendix A provides a sketch of the approximate locations of the monitoring instrumentation for this site.

Table PH059-2: Fall 2024 – Peace River East Hill Site # 2 Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: Not Monitored

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER LEVEL BGS (m)	MEASURED PORE PRESSURE (kPa)	CURRENT WATER LEVEL BGS (m)	PREVIOUS WATER LEVEL BGS (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
<i>PN-001 (26207)</i>	<i>N/A</i>	<i>19.8</i>	<i>N/A</i>	<i>Damaged</i>	<i>13.50 on May 24, 2008</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<i>PN-002 (26210)</i>	<i>N/A</i>	<i>19.8</i>	<i>N/A</i>	<i>Destroyed</i>	<i>9.60 on Oct .3, 2002</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<i>PN-004 (26205)</i>	<i>N/A</i>	<i>20.6</i>	<i>N/A</i>	<i>Damaged</i>	<i>18.05 on Oct. 3, 2002</i>	<i>N/A</i>	<i>N/A</i>	<i>20.59 (October 13, 2021)</i>	<i>N/A</i>

Drawing 32121-PH059 in Appendix A provides a sketch of the approximate locations of the monitoring instrumentation for this site.

Notes:

PN - pneumatic piezometer.

BGS - below ground surface

Table PH059-3: Fall 2024 – Peace River East Hill Site # 2 Standpipe Piezometer Instrumentation Reading Summary

Date Monitored: September 21, 2024

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER LEVEL BGS (m)	MEASURED WATER LEVEL BGS (m)	PREVIOUS READING (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
SP-001	N/A	N/A	N/A	Discontinued	N/A	N/A	N/A	N/A
SP-002	N/A	N/A	N/A	Discontinued	0.6 m on Oct. 1, 2003	N/A	N/A	N/A
SP-003	N/A	19.42	N/A	Active	10.23 in June 2016	10.68	10.69	0.01
SP-004	N/A	10.60	N/A	Active	3.76 in September 2014	5.27	5.23	-0.04

Drawing 32121-PH059 in Appendix A provides a sketch of the approximate locations of the monitoring instrumentation for this site

Notes:

- SP - standpipe (for water level monitoring, 1" diameter PVC).
- BGS - below ground surface.



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.

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- 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.
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THURBER ENGINEERING LTD.

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

FALL 2024

**APPENDIX A
DATA PRESENTATION**

**SITE PH059: HWY 2:60, PEACE RIVER EAST HILL
(SITE # 2, STATION 34+770 TO 35+680)**

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (PH059)
FALL 2024**

Location: Peace River East Hill (HWY 2:60 C1 35.241)	Readout: RST PN C108 Unit 1/DGSI Dipmeter
File Number: 32121	Casing: 3.34 " Ø
Probe: RST Set 5R & 8R	Temp: 5
Cable: RST Set 5R & 8R	Read by: NRM

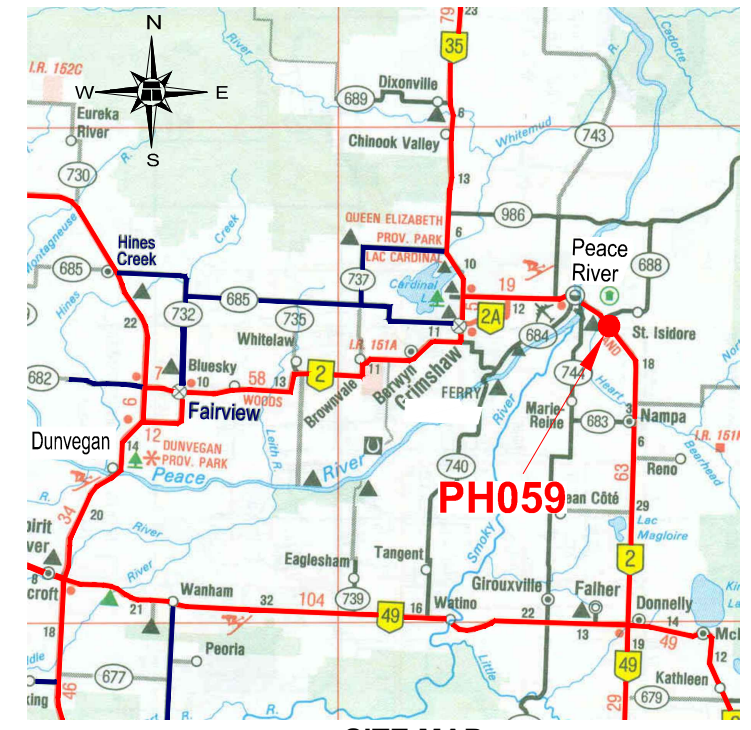
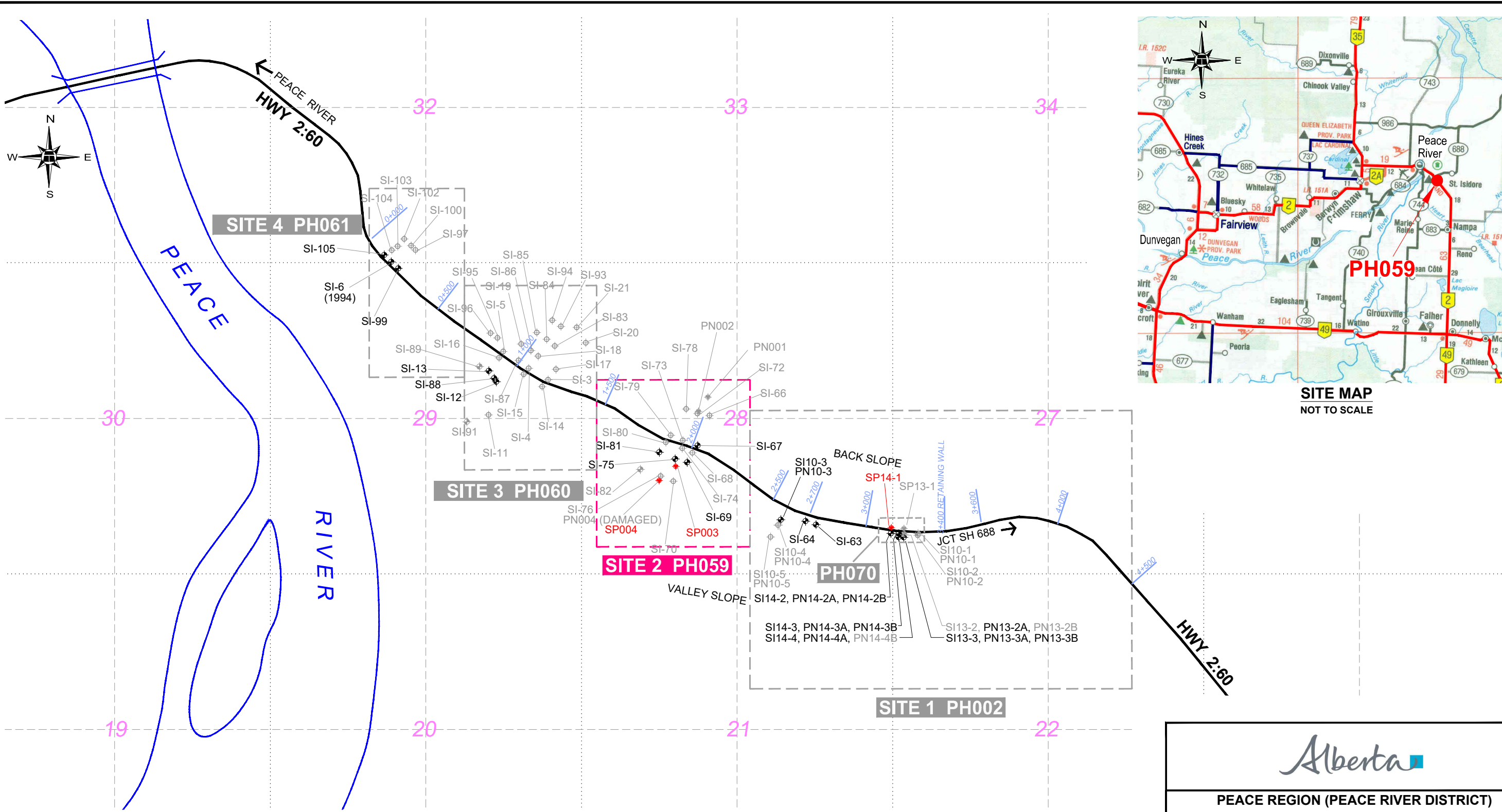
SLOPE INCLINOMETER (SI) READINGS

Site#	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-			
2	SI-67	484136.86	6231088.27	21-Sep-24	0.55	150 to 2	210	-229	239	1104	-1103	8R/8R	3.34	
	SI-69	484090.16	6231034.68	21-Sep-24	0.45	148 to 2	187	585	-573	578	-595	5R/5R	3.34	
	SI-75	484042.68	6231057.12	21-Sep-24	0.37	148 to 2	192	937	-926	-129	108	5R/5R	3.34	
	SI-81	484000.42	6231079.54	21-Sep-24	0.56	148 to 2	175	41	-33	-35	13	5R/5R	3.34	

STANDPIPE PIEZOMETER READINGS

SP#	GPS Location (UTM 11)		Date	Stick-up (m)	Reading below top of casing (m)	Bottom Pipe Depth (below top of casing (m))
	Easting (m)	Northing (m)				
SP-003	484042.59	6231031.19	21-Sep-24	0.97	11.65	20.12
SP-004	483976.22	6230977.57	21-Sep-24	0.7	5.97	11.40

DAILY INSPECTOR REPORT



LEGEND :

- SLOPE INCLINOMETER (currently using)
- SP STANDPIPE PIEZOMETER
- PN PNEUMATIC PIEZOMETER
- SLOPE INCLINOMETER (not in use)
- PNEUMATIC PIEZOMETER (not in use)

SITE PLAN
1:20,000 (APPROX.)

PEACE REGION (PEACE RIVER DISTRICT)

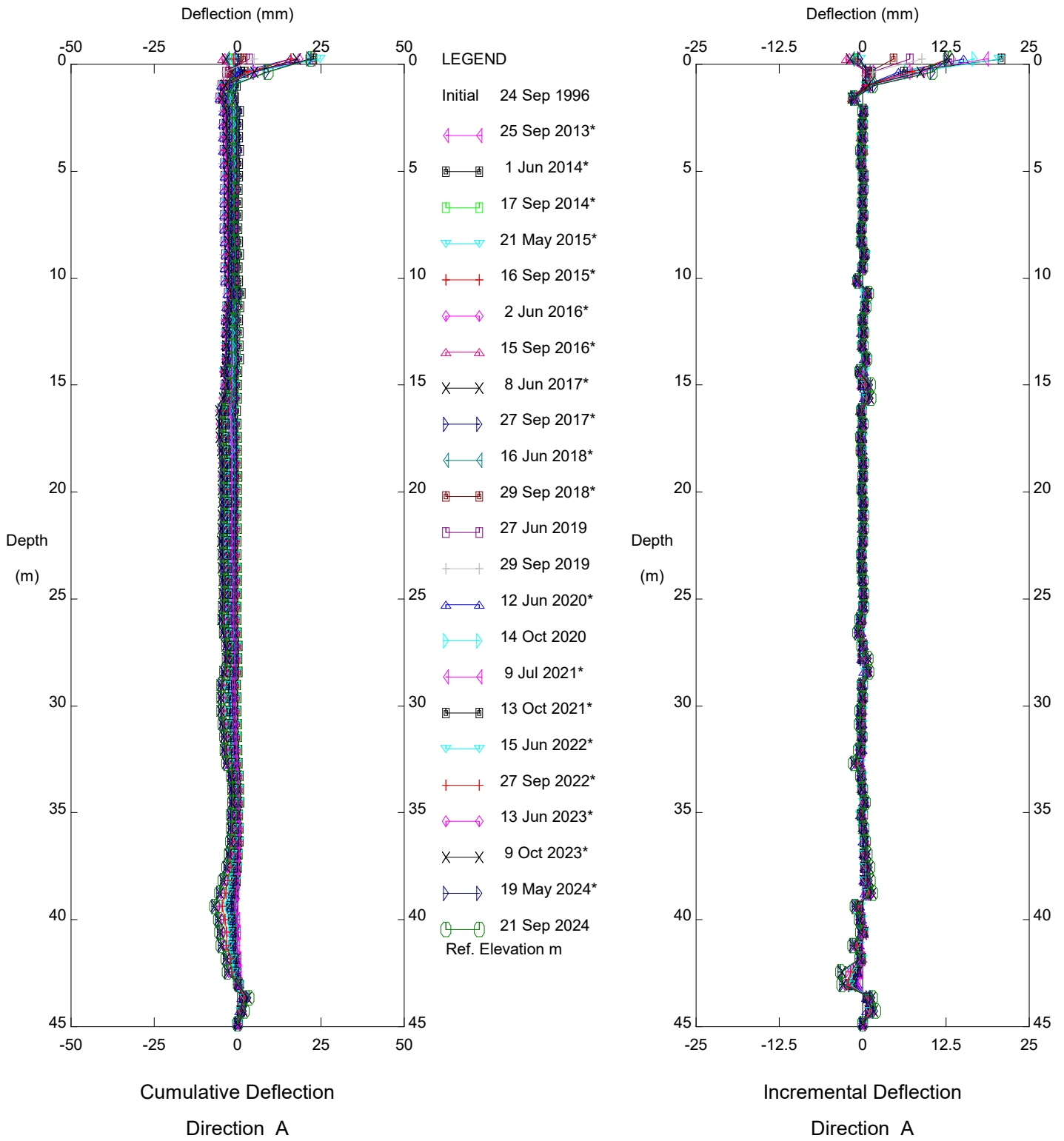
PH059: PEACE RIVER EAST HILL SITE #2
(STATION 1+450 TO STATION 2+350)
INSTRUMENTATION READINGS

DWG No. 32121-PH059

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	DWP
SCALE	AS SHOWN
DATE	NOVEMBER 2024
FILE No.	32121



Thurber Engineering Ltd.

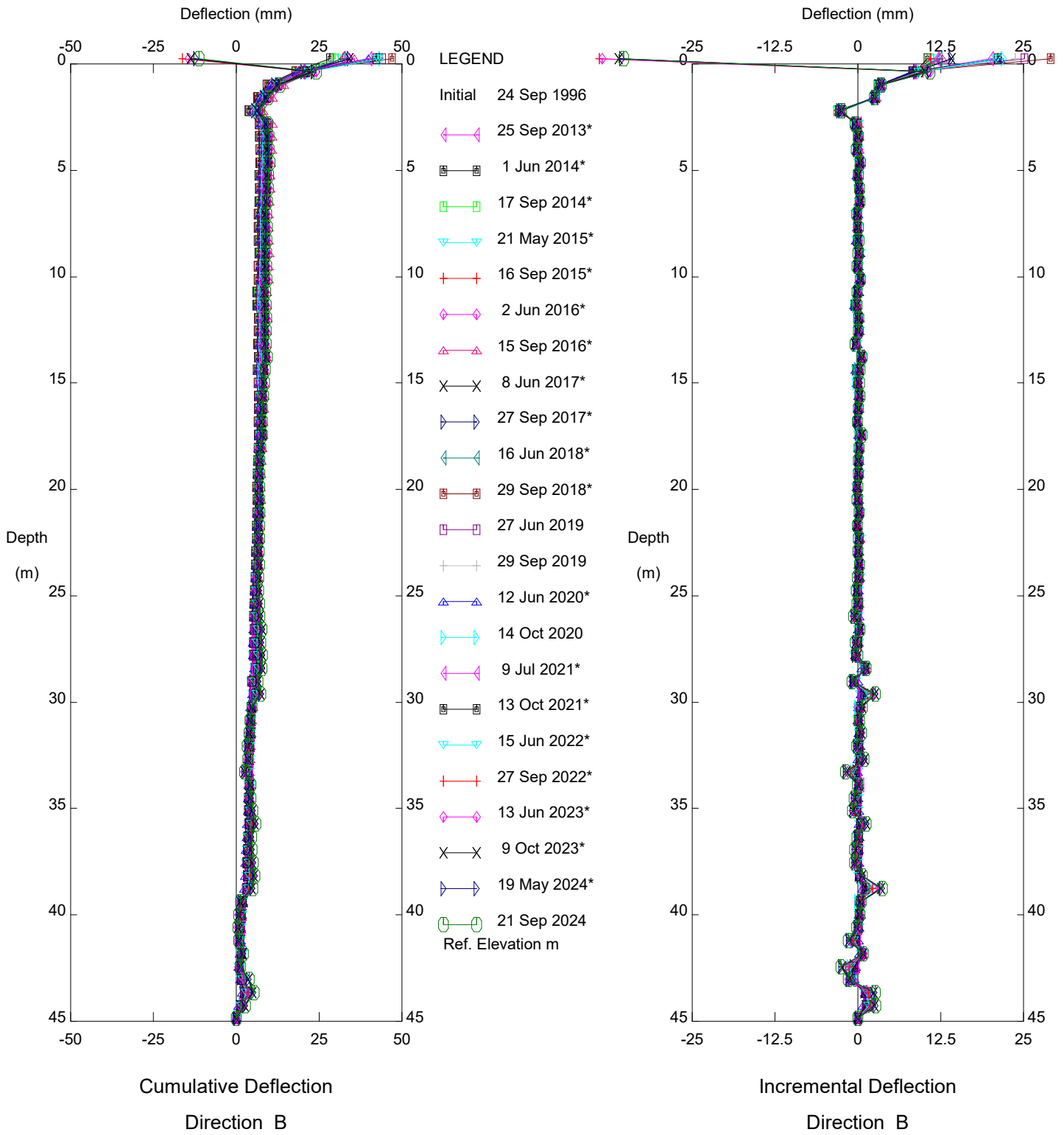


(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-67

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

Thurber Engineering Ltd.

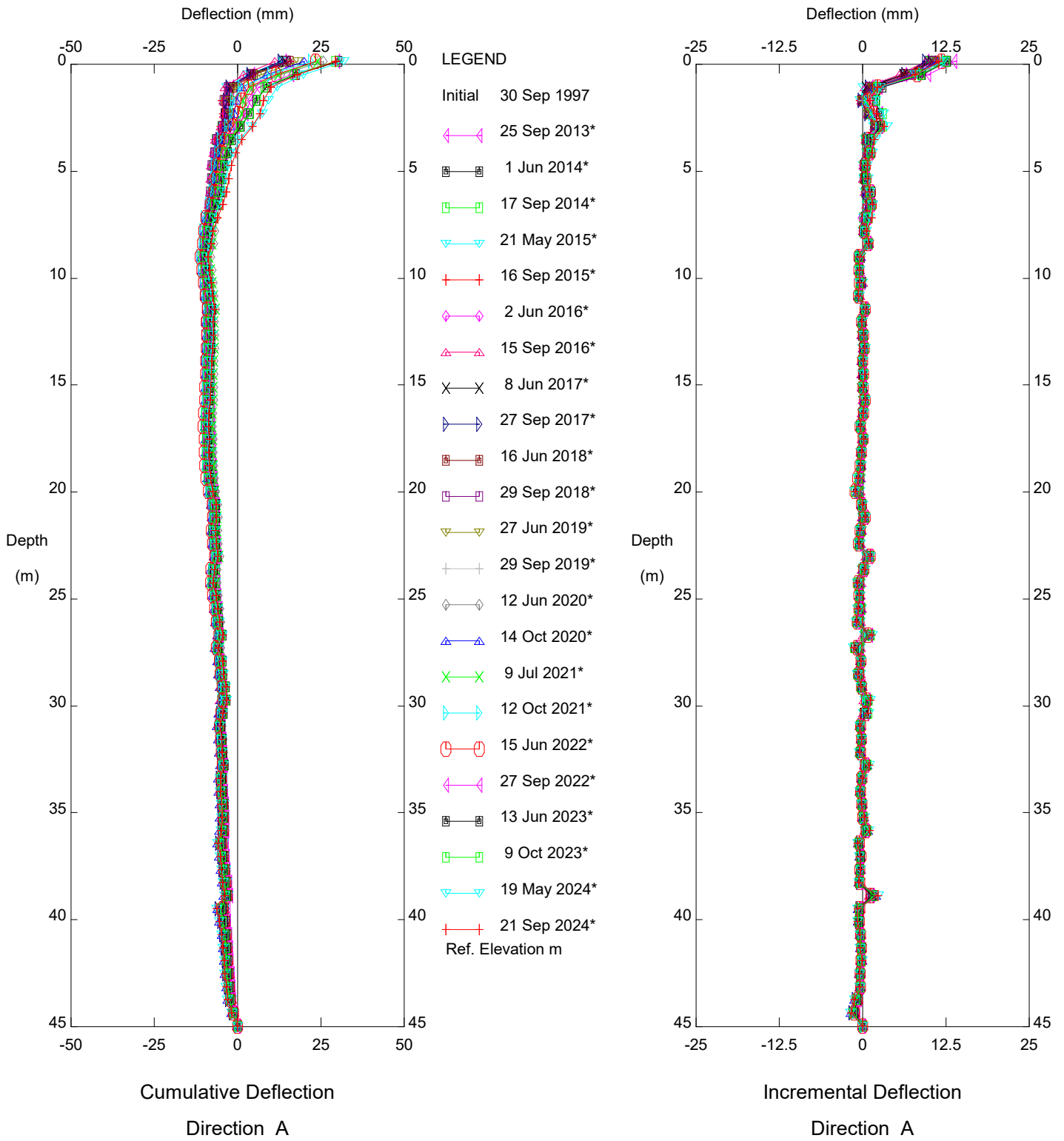


(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-67

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

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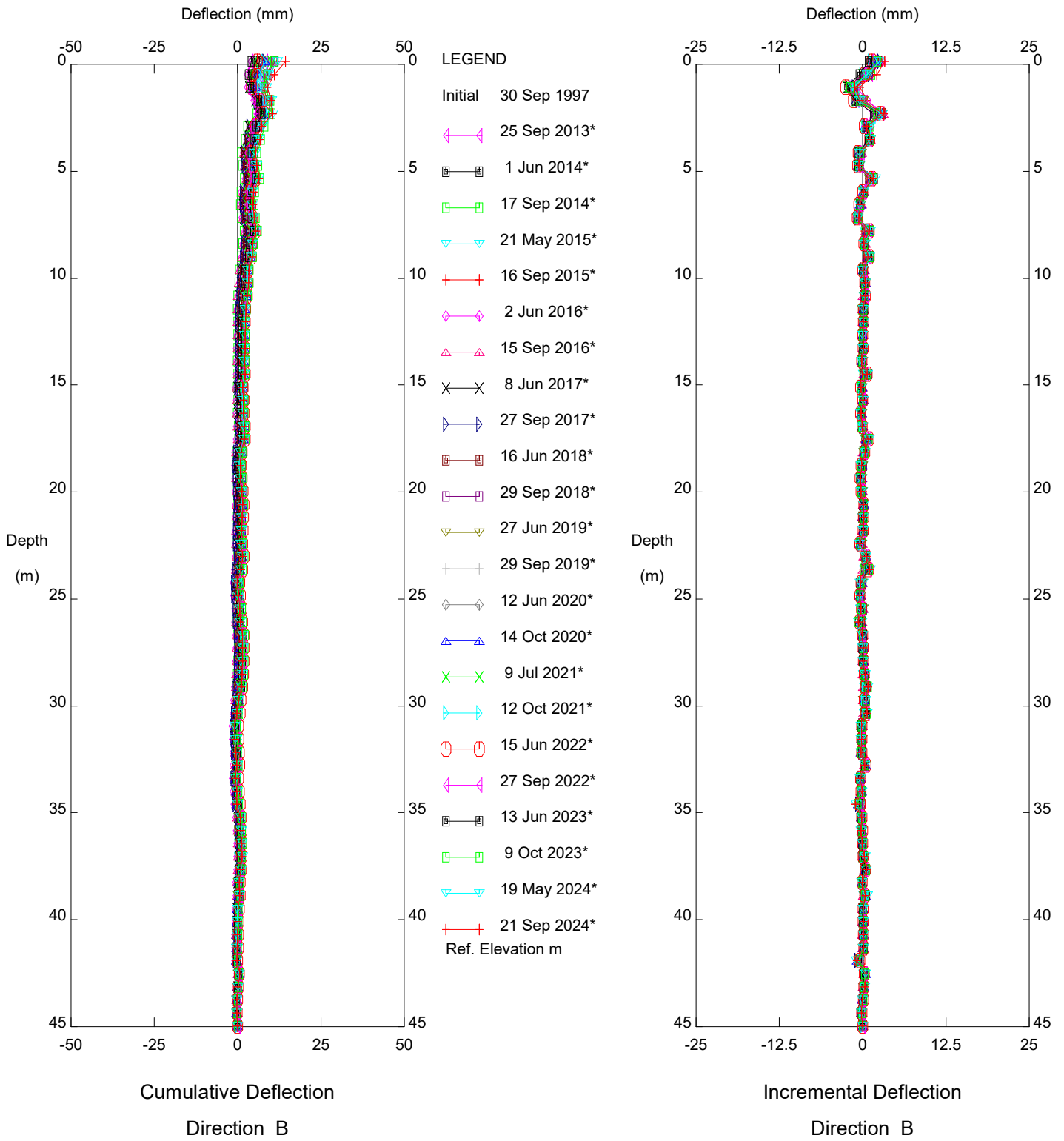


(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-69

Alberta Transportation

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

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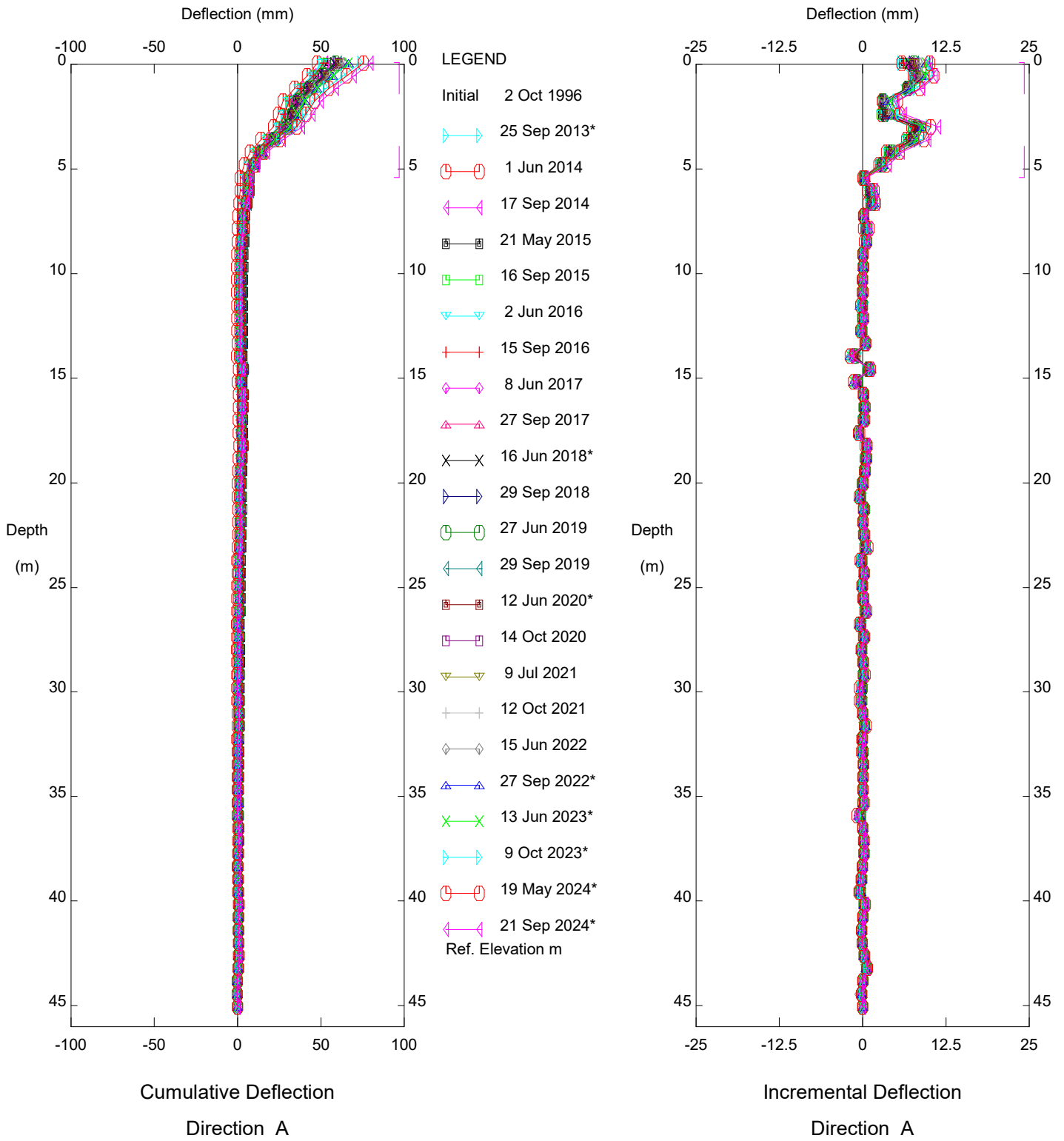


(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-69

Alberta Transportation

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

Thurber Engineering Ltd.

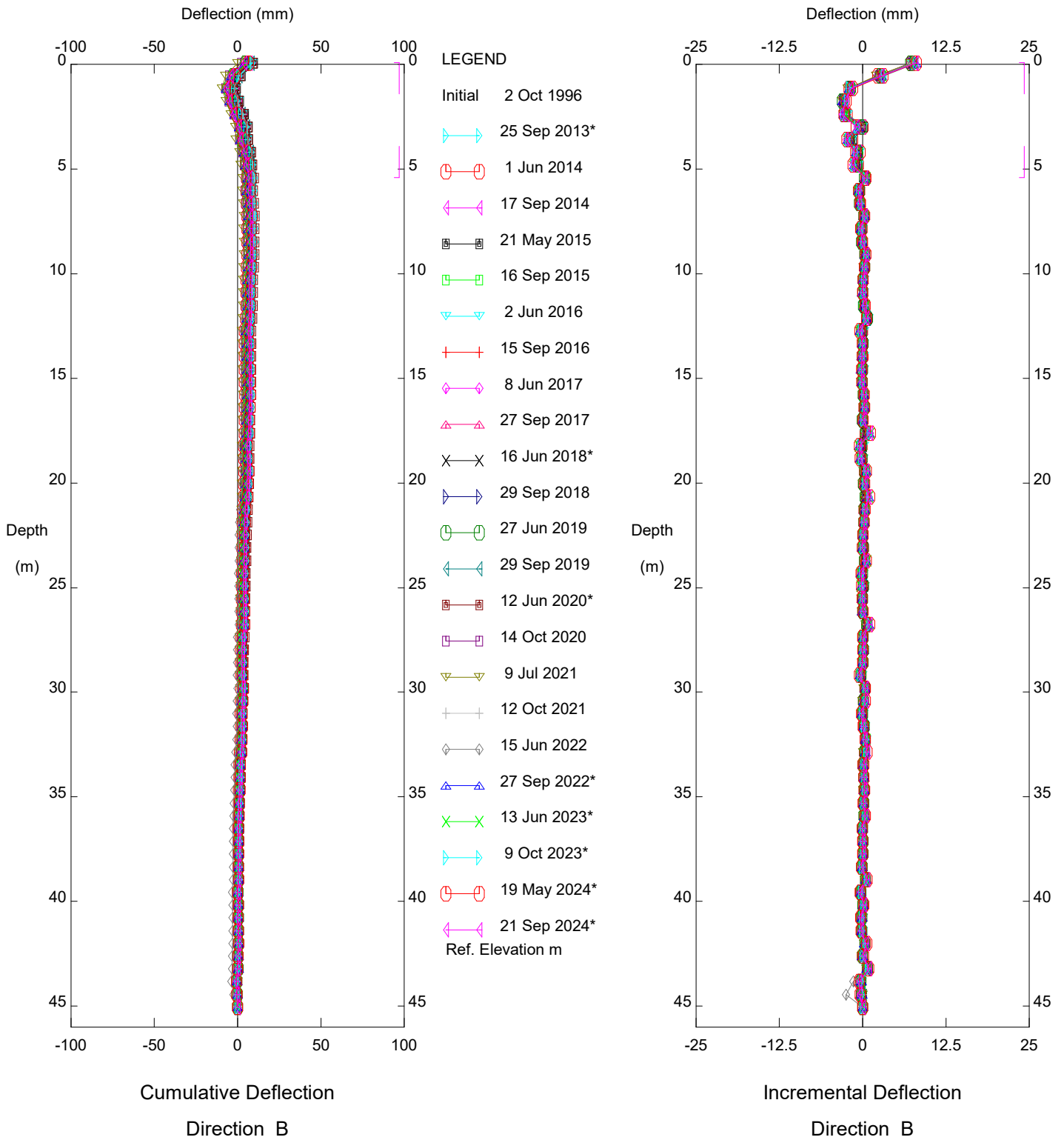


(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-75

Alberta Transportation

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

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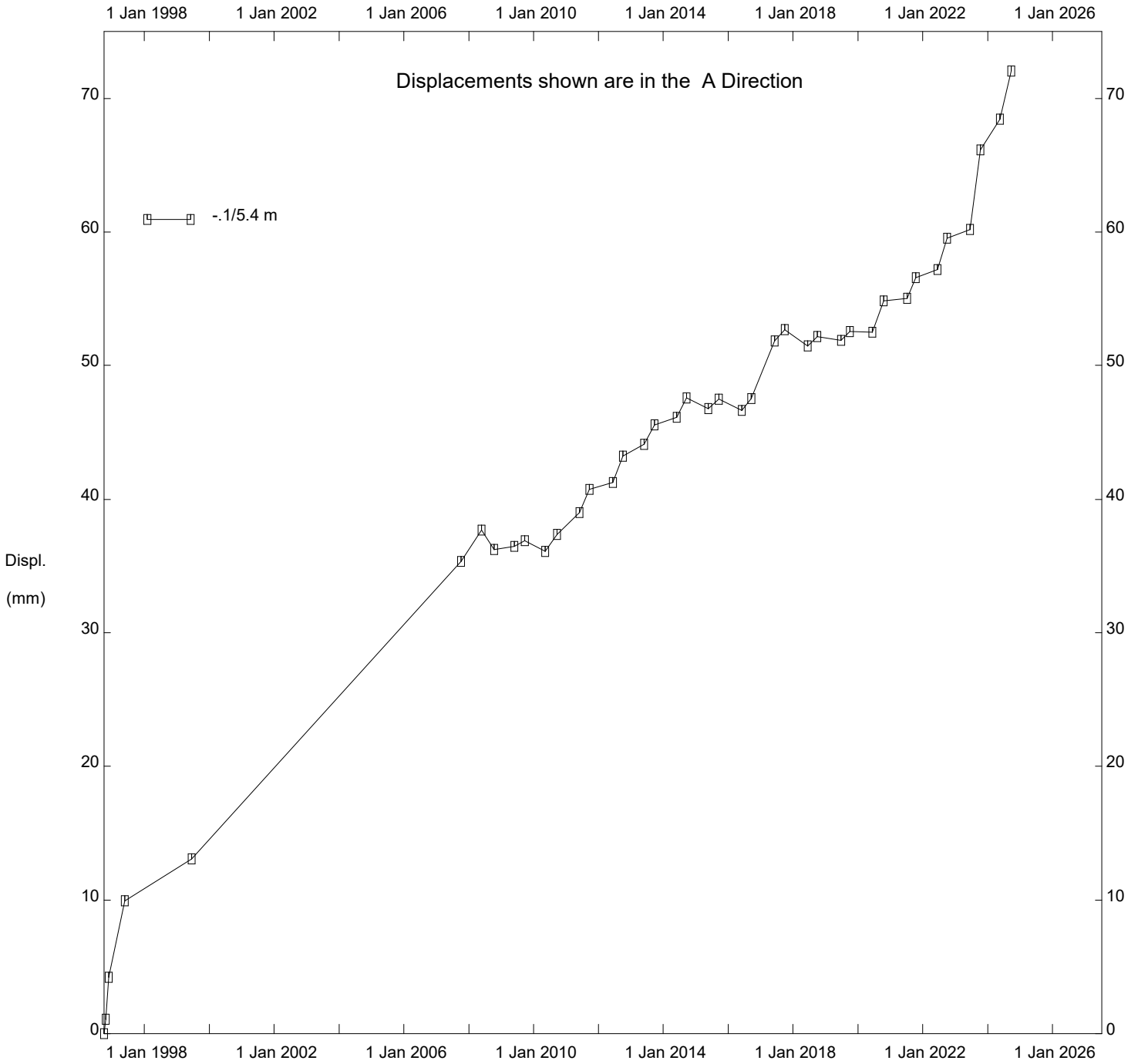


(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-75

Alberta Transportation

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

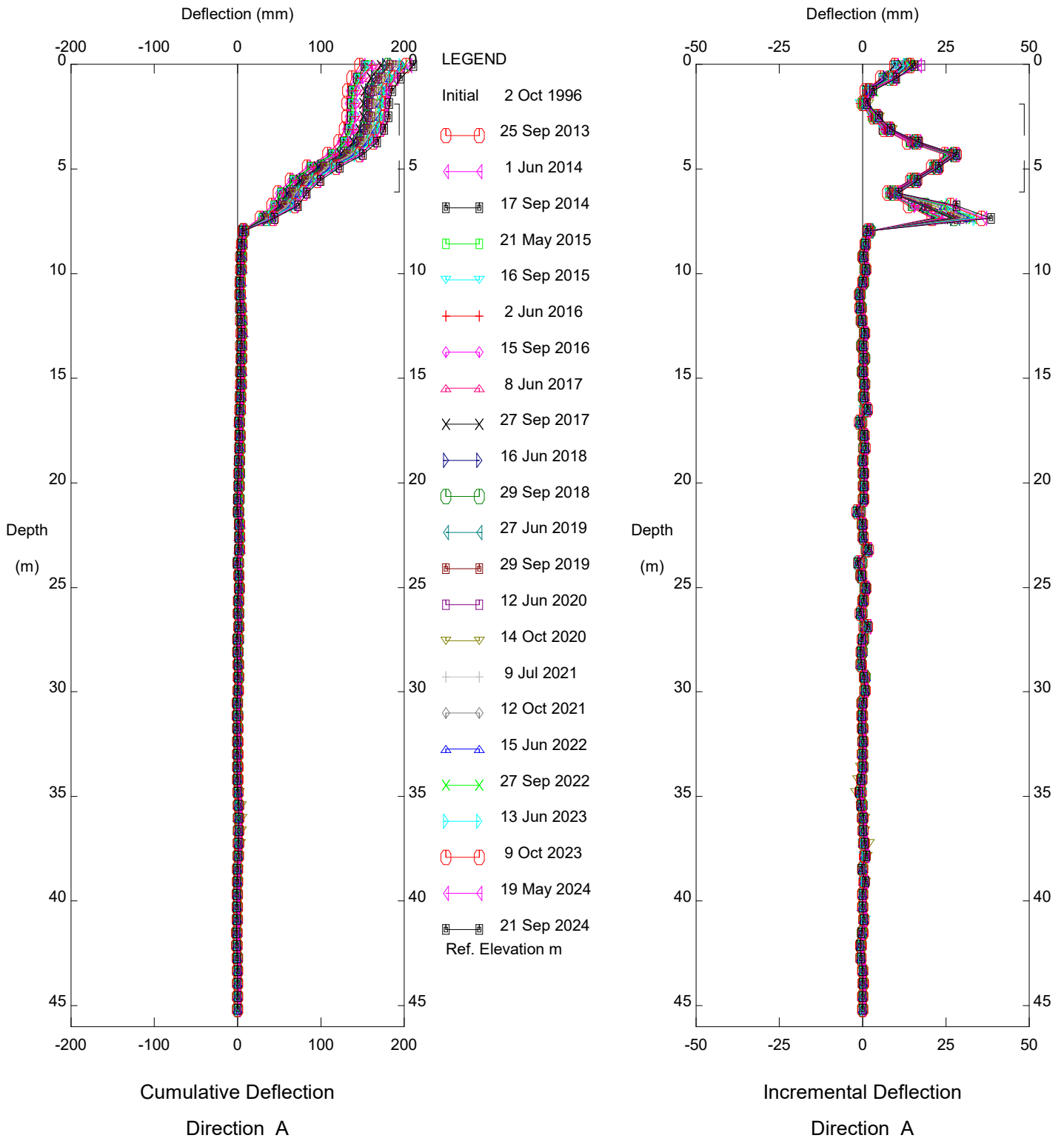
Thurber Engineering Ltd.



(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinator SI-75

Alberta Transportation

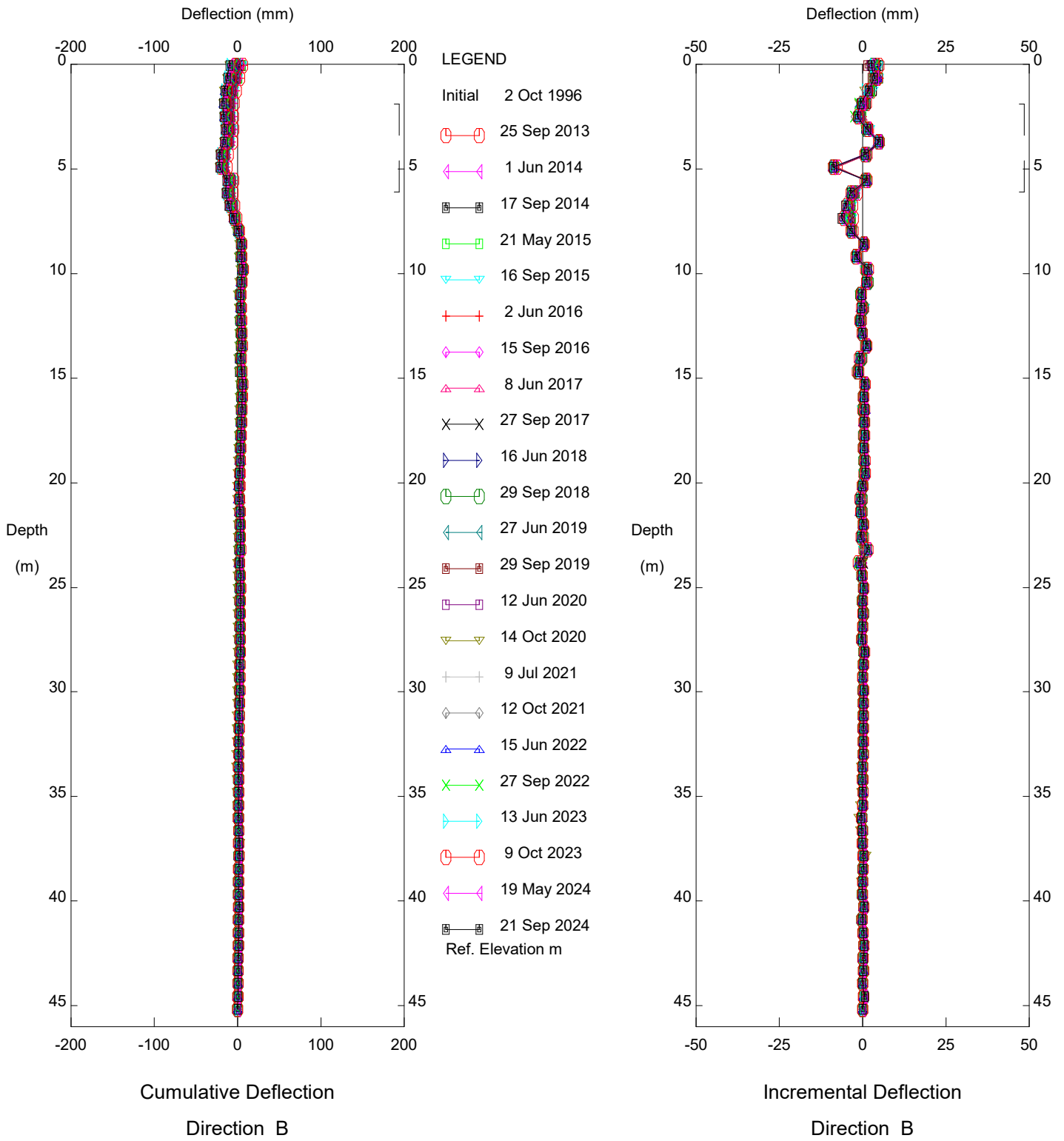
Thurber Engineering Ltd.



(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-81

Alberta Transportation

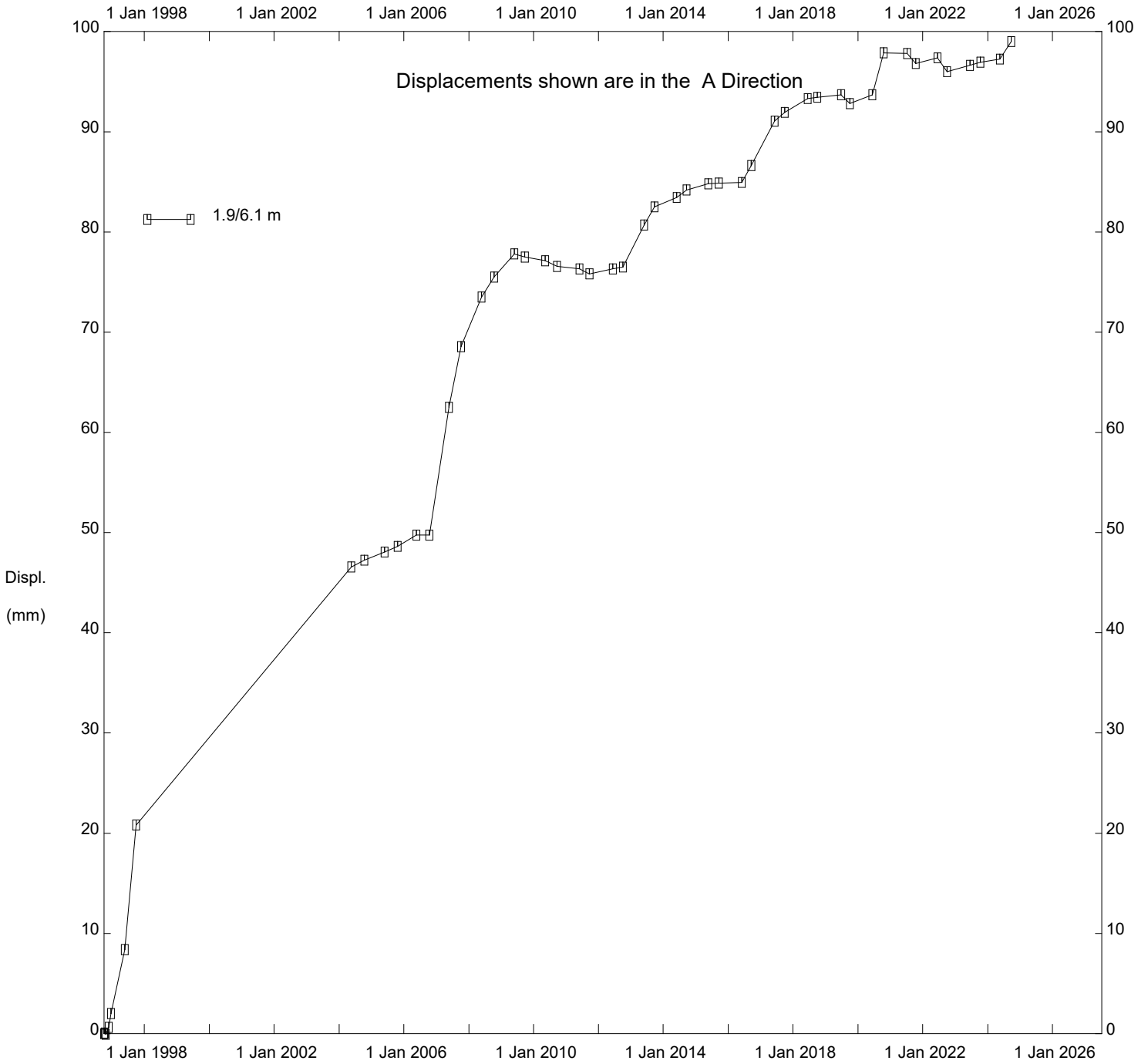
Thurber Engineering Ltd.



(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-81

Alberta Transportation

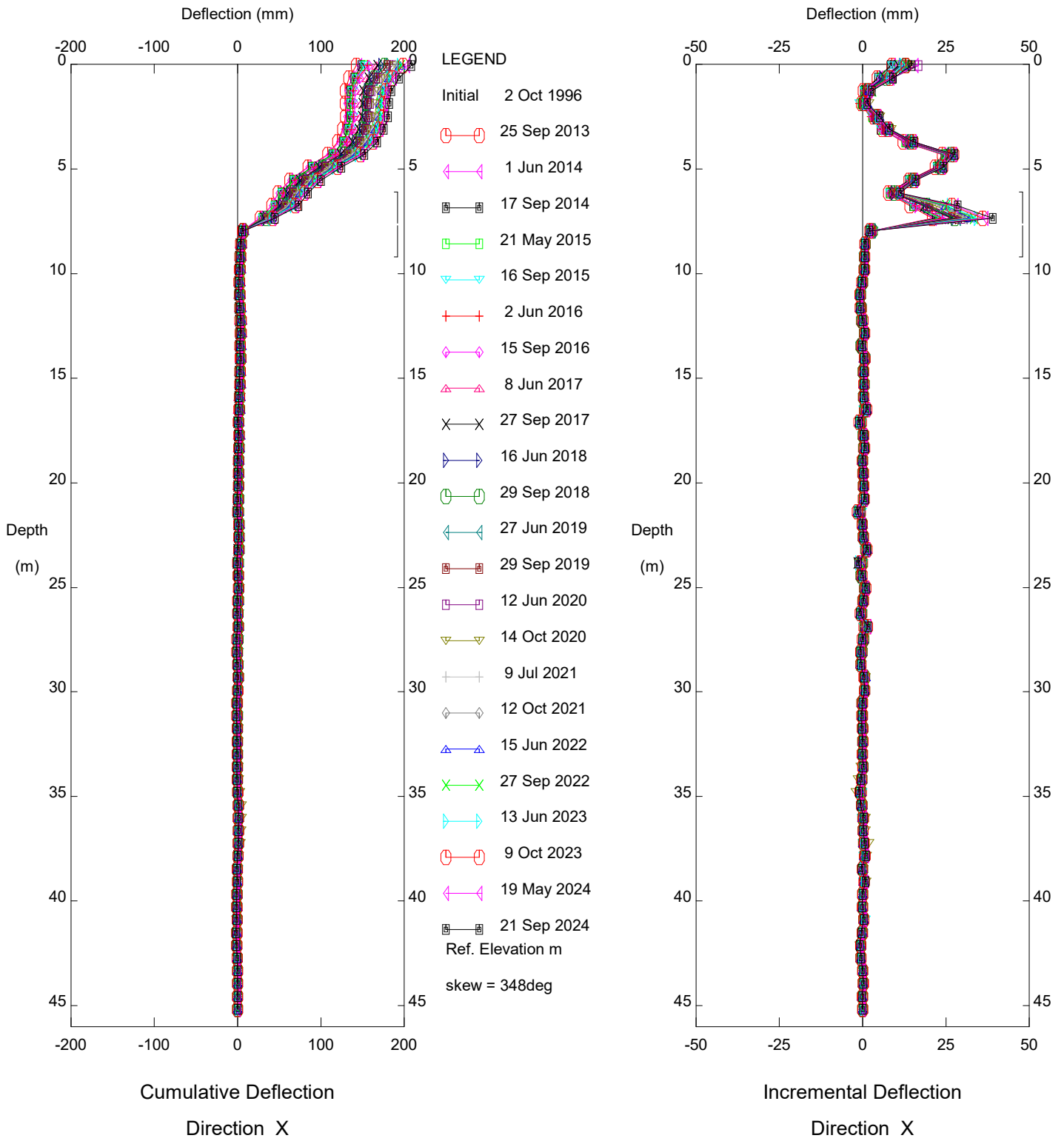
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(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinator SI-81

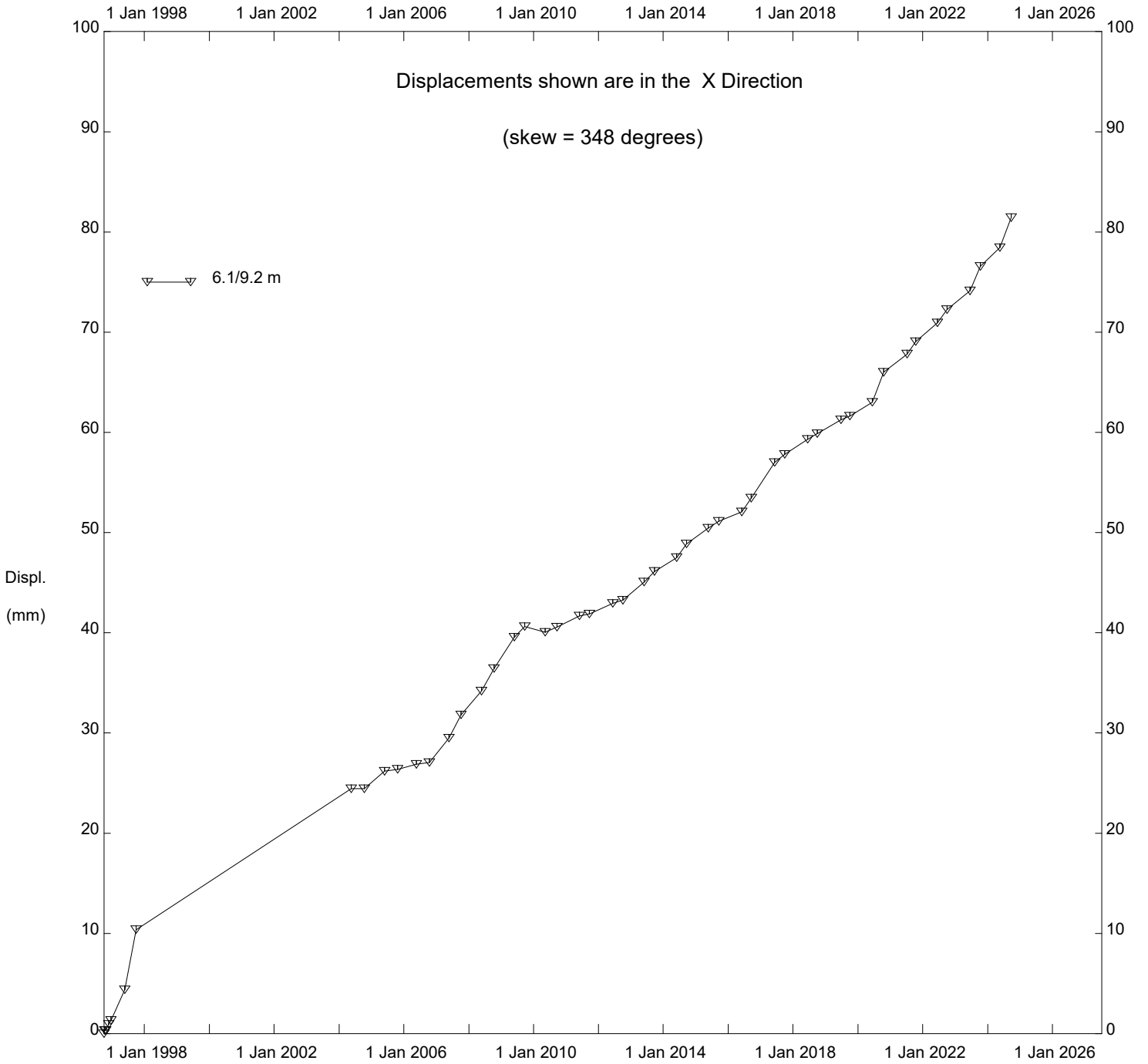
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(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-81

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(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinator SI-81

**FIGURE PH059-1
PIEZOMETER DATA: PEACE RIVER EAST HILL SITE #2**

