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

| 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:** | 25 & 26 September, 2025 | **Previous Monitoring** | 9-June-2025 |
| **Instruments Read By:** | Mr. Niraj Regmi, G.I.T and Mr. Angelo Castillo, of Thurber | | |

| **Instruments Read During This Site Visit** | | | |
|---|---|---|---|
| **Slope Inclinometers (SIs):**<br>SI-67<br>SI-69<br>SI-75<br>SI-81 | **Pneumatic Piezometers (PN):** | **Vibrating Wire Piezometers (VW):** | **Standpipe Piezometers (SP):**<br>SP-003<br>SP-004 |
| **Load Cell (LC):** | **Strain Gauges:** | **SAAs:** | **Others:** |

| **Readout Equipment Used** | | | |
|---|---|---|---|
| **Slope Inclinometers:**<br>Two RST Digital Inclinometer probes with 2 ft. wheelbases and RST Pocket PC readouts | **Pneumatic Piezometers:** | **Vibration Wire Piezometers:** | **Standpipe Piezometers:**<br>DGSI dipmeter |
| **Load Cell:** | **Strain Gauges:** | **SAAs:** | **Others:** |
| **Note:** | | | |

| **Discussion** | |
|---|---|
| **Zones of New Movement:** | None |
| **Interpretation of Monitoring Results:** | SI-67 is located upslope of the highway and SI-69, 75 and 81 are all located downslope of the highway.<br><br>SI-67 and SI-69 showed no discernible movement although there are many zones of very subtle movements within the 45 m depth of these slope indicators.<br><br>SI-75 showed a rate of movement of 15.4 mm/yr over 0.0 m to 5.4 m depth since the spring of 2025 readings. The rate of movement increased by 15.8 mm per year between the spring of 2025 and the fall of 2025.<br><br>SI-81 showed no discernable movement over 1.9 m to 6.1 m depth and 3.2 mm/yr over 6.1 m to 9.2 m depth since the spring of 2025 readings. The movement rate over 1.9 m to 6.1 m depth decreased by 6.3 mm/yr and the movement rate over 6.1 m to 9.2 m depth increased by 7.8 mm/yr since the spring of 2025 readings. The movement pattern at SI-75 and SI-81 is consistent with a trendline of accelerated movement since the fall of 2022, relative to the movement trendline between 2010 and 2022. There are also several zones of very subtle movements at greater depth in SI-75 and 81. |

| | |
|---|---|
| | Standpipe piezometer SP-003 showed a decrease in groundwater level of 0.03 m since the spring of 2025 reading. The groundwater level at SP-003 has been generally steady since 2002. SP-004 showed a decrease in groundwater level of 0.06 m since the spring of 2025 readings. This slow downward trend has persisted at SP-004 since 2014. |
| **Future Work:** | The instruments should be read again in the spring of 2026. |
| **Instrumentation Repairs:** | No instrument repairs are required currently. |
| **Additional Comments:** | |

| | |
|---|---|
| **Attachments:** | ▪ Table PH059-1: Fall 2025 – Peace River East Hill Site<br>▪ # 2 Slope Inclinometer Instrumentation Reading Summary<br>▪ Table PH059-2: Fall 2025 – Peace River East Hill Site<br>▪ # 2 Pneumatic Piezometer Instrumentation Reading Summary<br>▪ Table PH059-3: Fall 2025 – Peace River East Hill Site<br>▪ # 2 Standpipe Piezometer Instrumentation Reading Summary<br>▪ Statement for Use and Interpretation of Report<br>▪ APPENDIX A - PH059 FALL 2025<br>□ Field Inspector's report<br>□ Site Plan Showing Approximate Instrument Locations (Drawing No. 32121 PH059)<br>□ SI Reading Plots<br>□ Figure PH059-1 (Piezometric Readings) |

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

November 27, 2025

PROFESSIONAL ENGINEER ALBERTA
ROGER KEVIN SKIRROW
ID 36792
2025-11-27

**PERMIT TO PRACTICE**
**THURBER ENGINEERING LTD.**
RM SIGNATURE:
RM APEGA ID #: 51674
DATE: November 27, 2025
**PERMIT NUMBER: P005186**
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Yasir Khan, E.I.T.
Geotechnical Engineer-In-Training

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*Table PH059-1: Fall 2025 – Peace River East Hill Site # 2 Slope Inclinometer Instrumentation Reading Summary*

Date Monitored: September 26, 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-67 | Sept. 24, 1996 | No discernible movement | N/A | Operational | June 9, 2025 | N/A | N/A | N/A |
| SI-69 | Oct. 2, 1996 | No discernible movement | N/A | Operational | June 9, 2025 | N/A | N/A | N/A |
| SI-75 | Oct. 2, 1996 | 76.4 mm over 0 m to 5.4 m depth in 208° direction | 33.7 mm/yr In Nov. 1996 | Operational | June 9, 2025 | 4.6 | 15.4 | 15.8 |
| *SI-76* | *Oct. 2, 1996* | *Not Known* | *Not Known* | *Discontinued* | *May 20, 2004* | *N/A* | *N/A* | *N/A* |
| SI-81 | Oct. 2, 1996 | 100.4 mm over 1.9 m to 6.1 m depth in 191° direction | 34.9 mm/yr in September 1997 | Operational | June 9, 2025 | No Discernable Movement | N/A | -6.3 |
| | | 86.6 mm over 6.1 m to 9.2 m depth in 179° direction | 16.9 mm/yr in September 1997 | | | 3.2 | 10.6 | 7.8 |
| *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.

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*Table PH059-2: Fall 2025 – 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) |
|---|---|---|---|---|---|---|---|---|---|
| *PN-001 (26207)* | *N/A* | *19.8* | *N/A* | *Damaged* | *13.50 on May 24, 2008* | *N/A* | *N/A* | *N/A* | *N/A* |
| *PN-002 (26210)* | *N/A* | *19.8* | *N/A* | *Destroyed* | *9.60 on Oct .3, 2002* | *N/A* | *N/A* | *N/A* | *N/A* |
| *PN-004 (26205)* | *N/A* | *20.6* | *N/A* | *Damaged* | *18.05 on Oct. 3, 2002* | *N/A* | *N/A* | *20.59 (October 13, 2021)* | *N/A* |

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

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*Table PH059-3: Fall 2025 – Peace River East Hill Site # 2 Standpipe Piezometer Instrumentation Reading Summary*

Date Monitored: September 25, 2025

| 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 | 10.69 | 10.66 | -0.03 |
| SP-004 | N/A | 10.60 | N/A | Active | 3.76 in September 2014 | 5.36 | 5.30 | -0.06 |

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.

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## 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 TOTHE 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.

### 4. USE OF THE REPORT

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

The information, interpretations and conclusions in the Report are based on Thurber's interpretation of conditions revealed through limited investigation conducted within a defined scope of services. Thurber does not accept responsibility for independent conclusions, interpretations, interpolations and/or decisions of the Client, or other parties who may come into possession of the Report, or any part thereof, which may be based on information contained in the Report. This restriction of liability includes, but is not limited to, decisions made to develop, purchase, or sell land, unless such decisions expressly form part of the stated purpose of the Report as described in Paragraph 3.

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

## FALL 2025

## 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 2025**

| | | | |
|---|---|---|---|
| **Location:** | Peace River East Hill (HWY 2:60 C1 35.241) | **Readout:** | DGSI Dip |
| **File Number:** | 32121 | **Casing:** | 3.34 " Ø |
| **Probe:** | RST SET 5R and 8R | **Temp:** | 10 |
| **Cable:** | RST SET 5R and 8R | **Read by:** | NKR/AF( |

**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 | 25-Sep-25 | 0.55 | 150 to 2 | 210 | -217 | 233 | 1111 | -1110 | 8R/8R | 3.34 | |
| | SI-69 | 484090.16 | 6231034.68 | 25-Sep-25 | 0.45 | 148 to 2 | 187 | 596 | -586 | 575 | -598 | 5R/5R | 3.34 | |
| | SI-75 | 484042.68 | 6231057.12 | 25-Sep-25 | 0.37 | 148 to 2 | 192 | 935 | -929 | -123 | 100 | 5R/5R | 3.34 | |
| | SI-81 | 484000.42 | 6231079.54 | 25-Sep-25 | 0.56 | 148 to 2 | 175 | 39 | -35 | -45 | 20 | 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 | 25-Sep-25 | 0.97 | 11.66 | 20.12 |
| SP-004 | 483976.22 | 6230977.57 | 25-Sep-25 | 0.7 | 6.06 | 11.4 |

**DAILY INSPECTOR REPORT**

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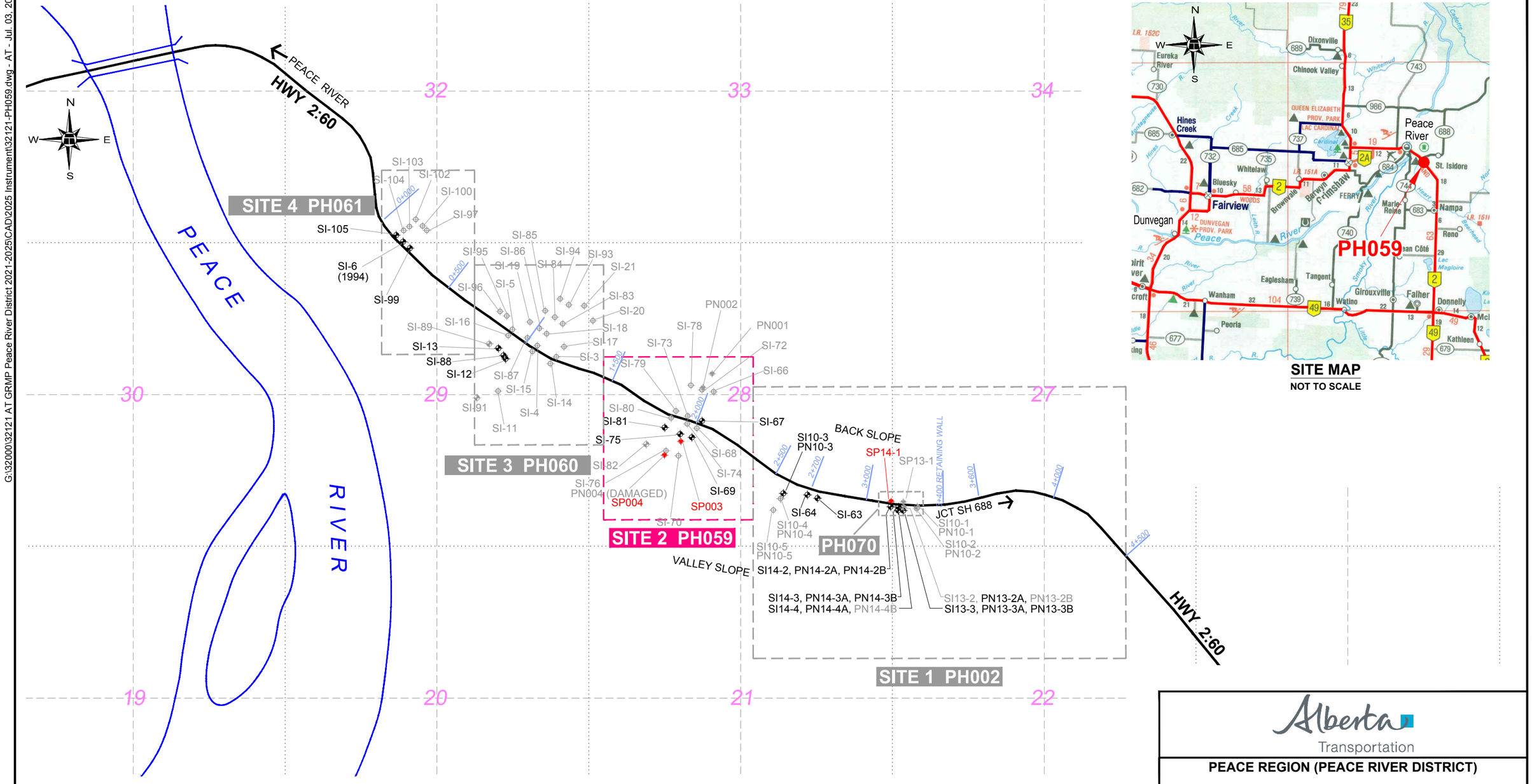


## SITE PLAN
1:20,000 (APPROX.)




## SITE MAP
NOT TO SCALE

## LEGEND :

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

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**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 | JULY 2025 |
| FILE No. | 32121 |

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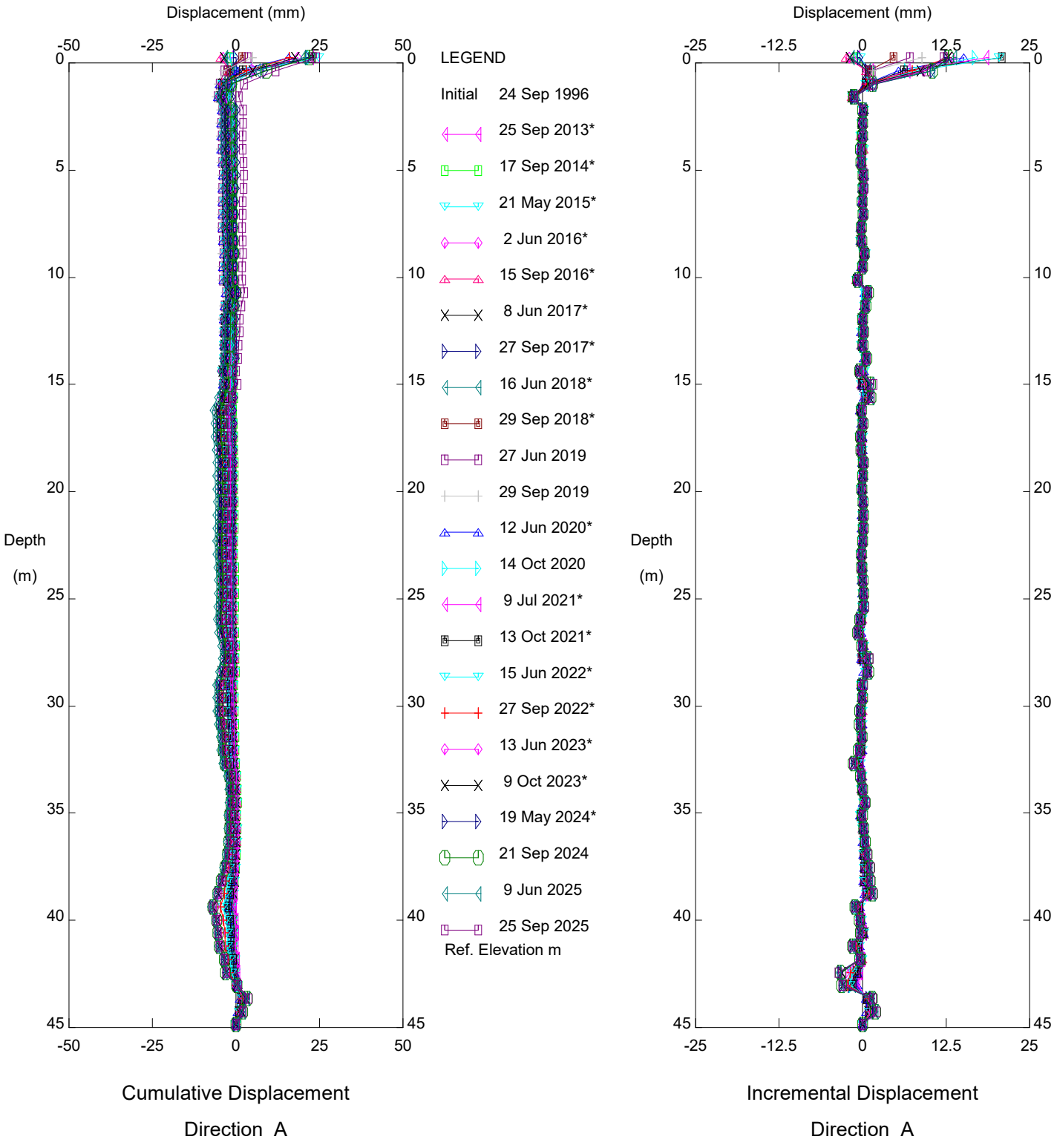


Cumulative Displacement

Direction A

Incremental Displacement

Direction A

(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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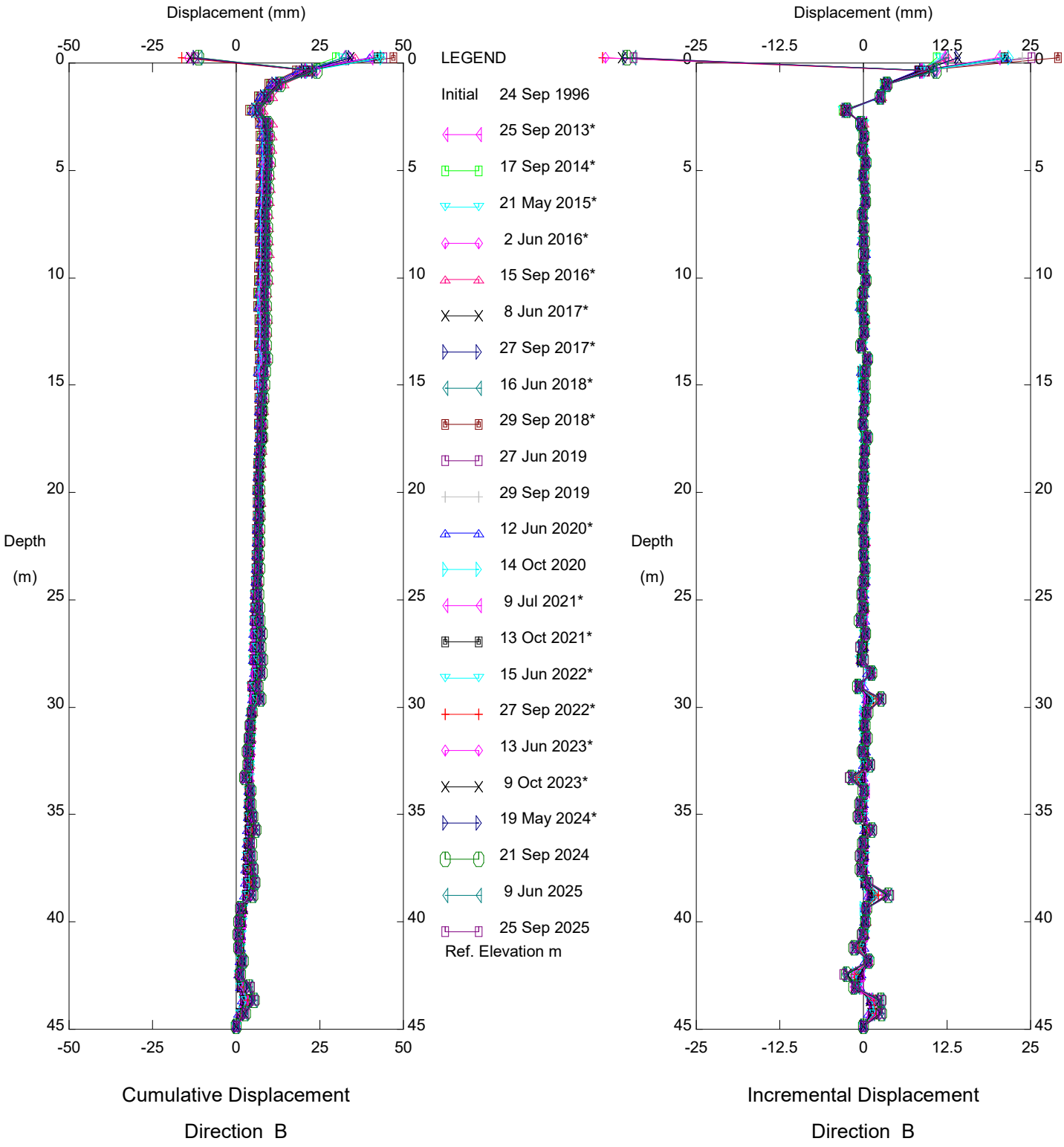


Cumulative Displacement

Direction B

Incremental Displacement

Direction B

(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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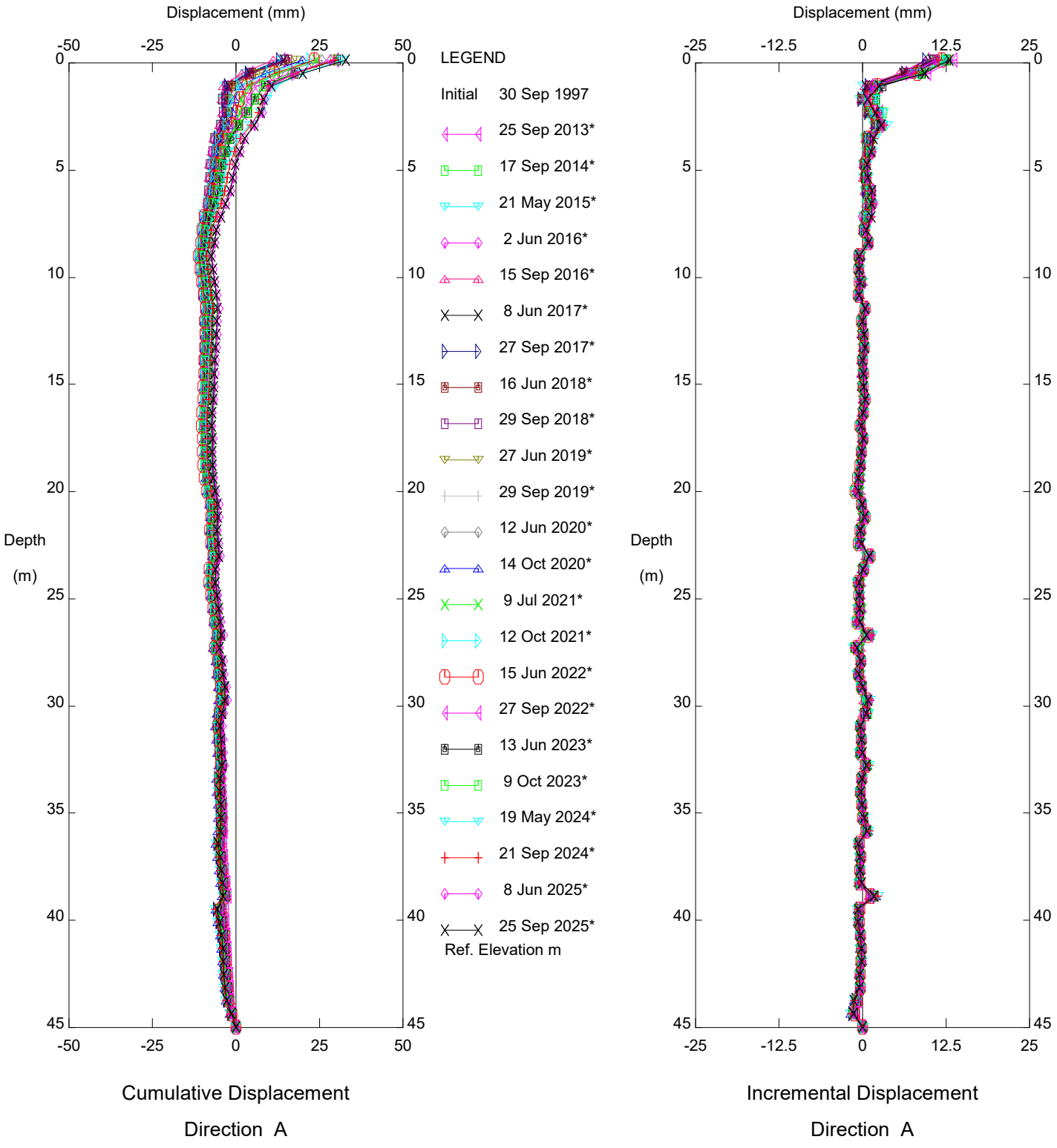


Cumulative Displacement

Direction A

Incremental Displacement

Direction A

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

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

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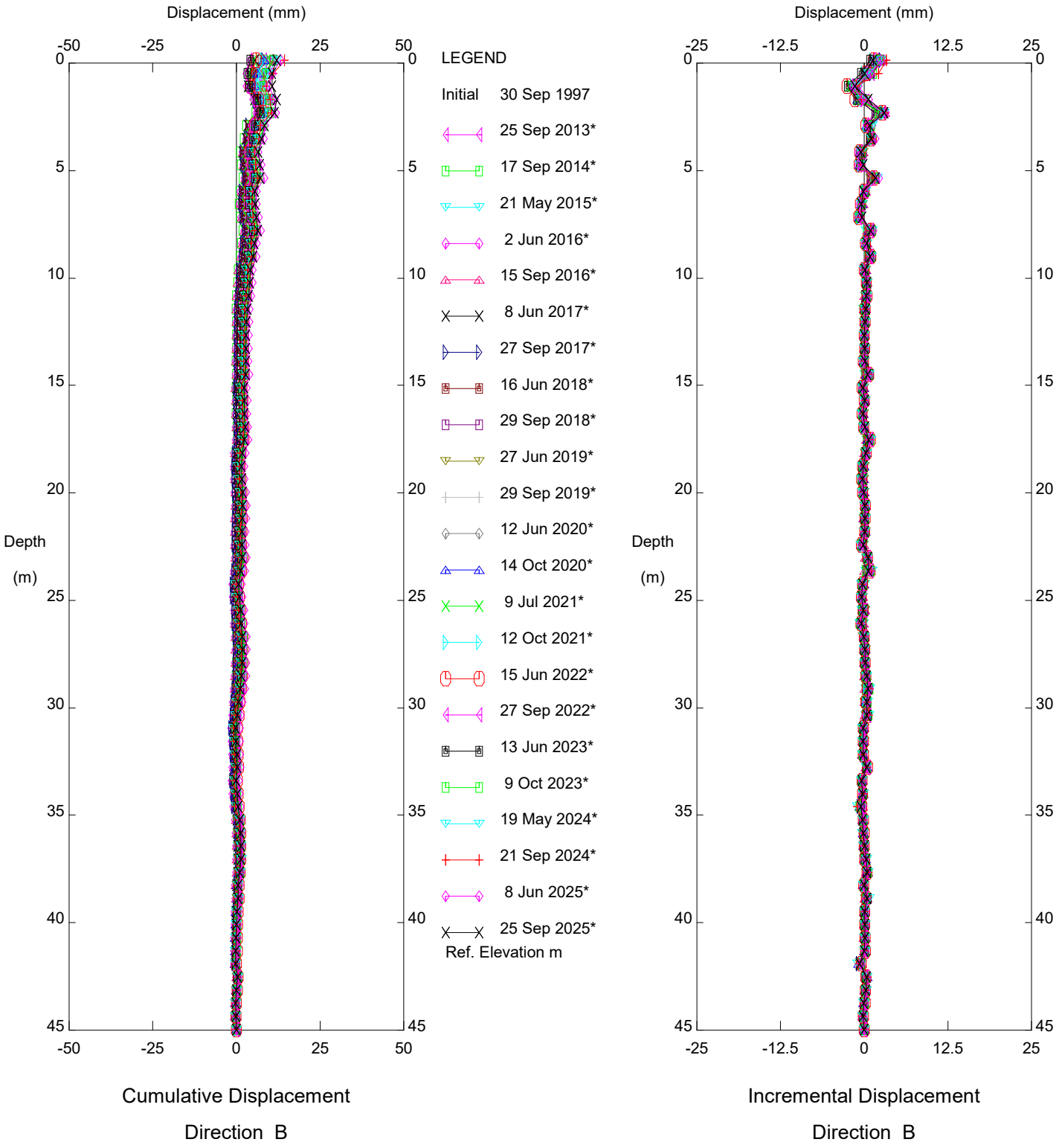


Cumulative Displacement

Direction B

Incremental Displacement

Direction B

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

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

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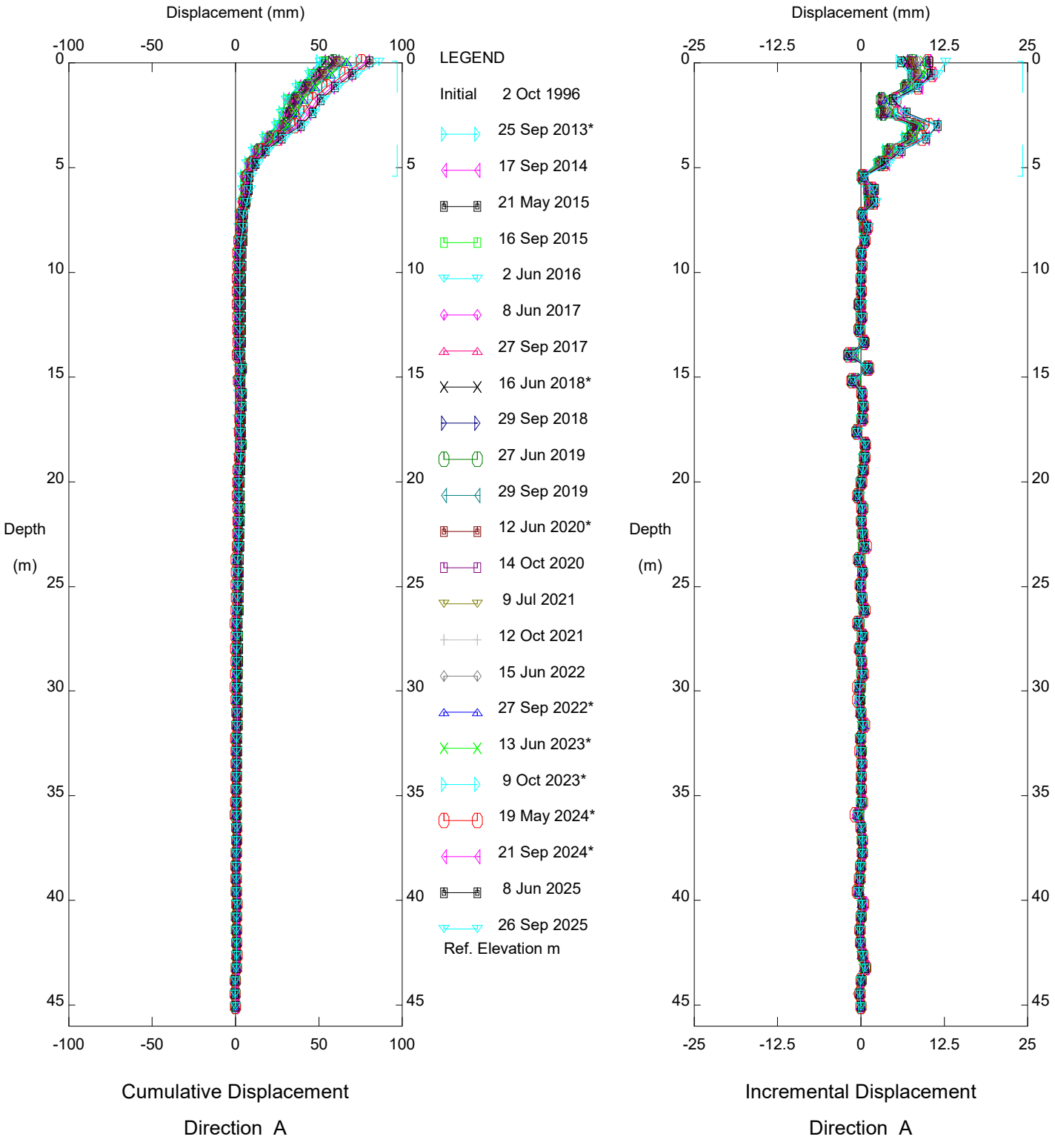


Cumulative Displacement

Direction A

Incremental Displacement

Direction A

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

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

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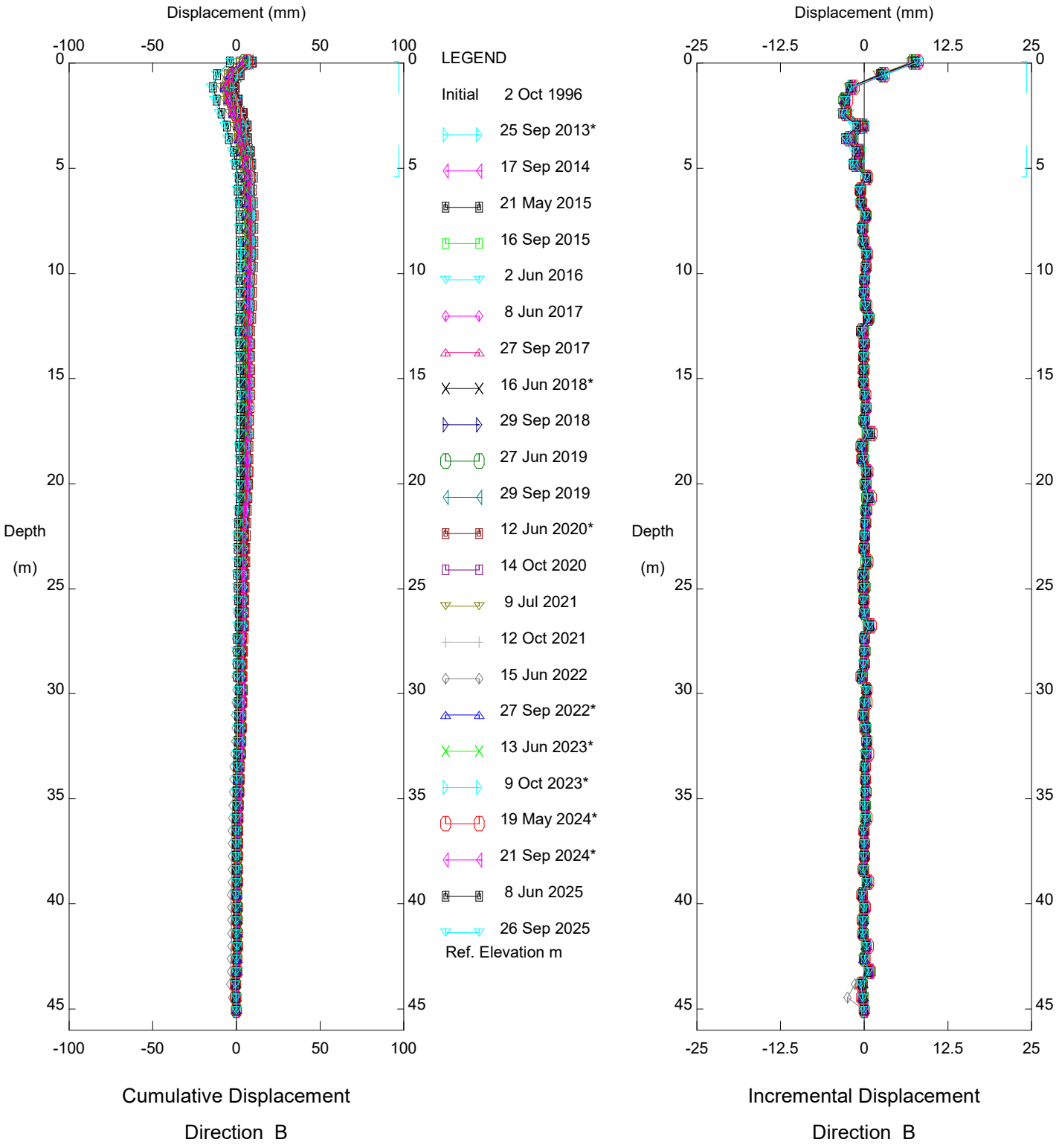


Cumulative Displacement

Direction B

Incremental Displacement

Direction B

(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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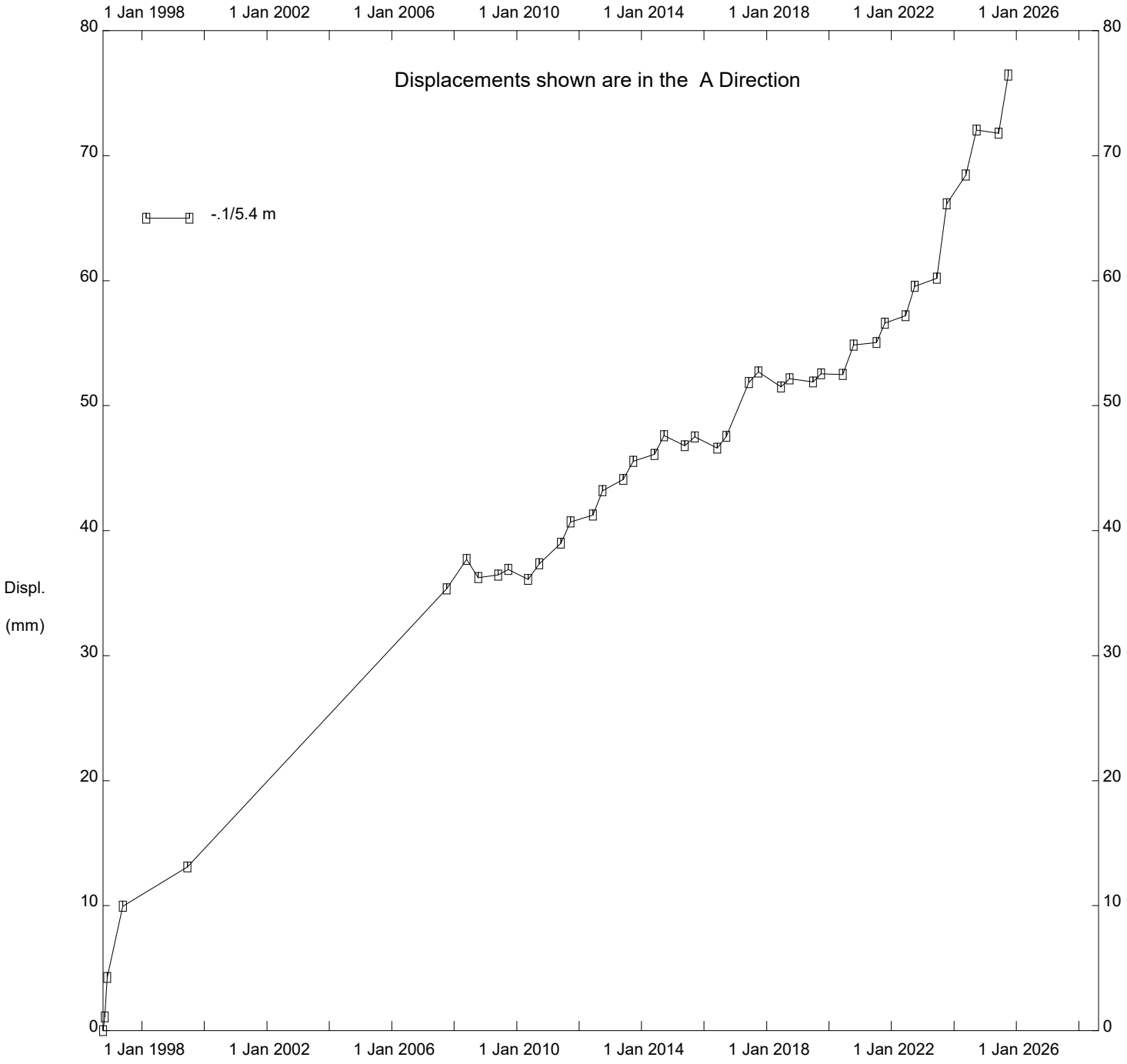


(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-75

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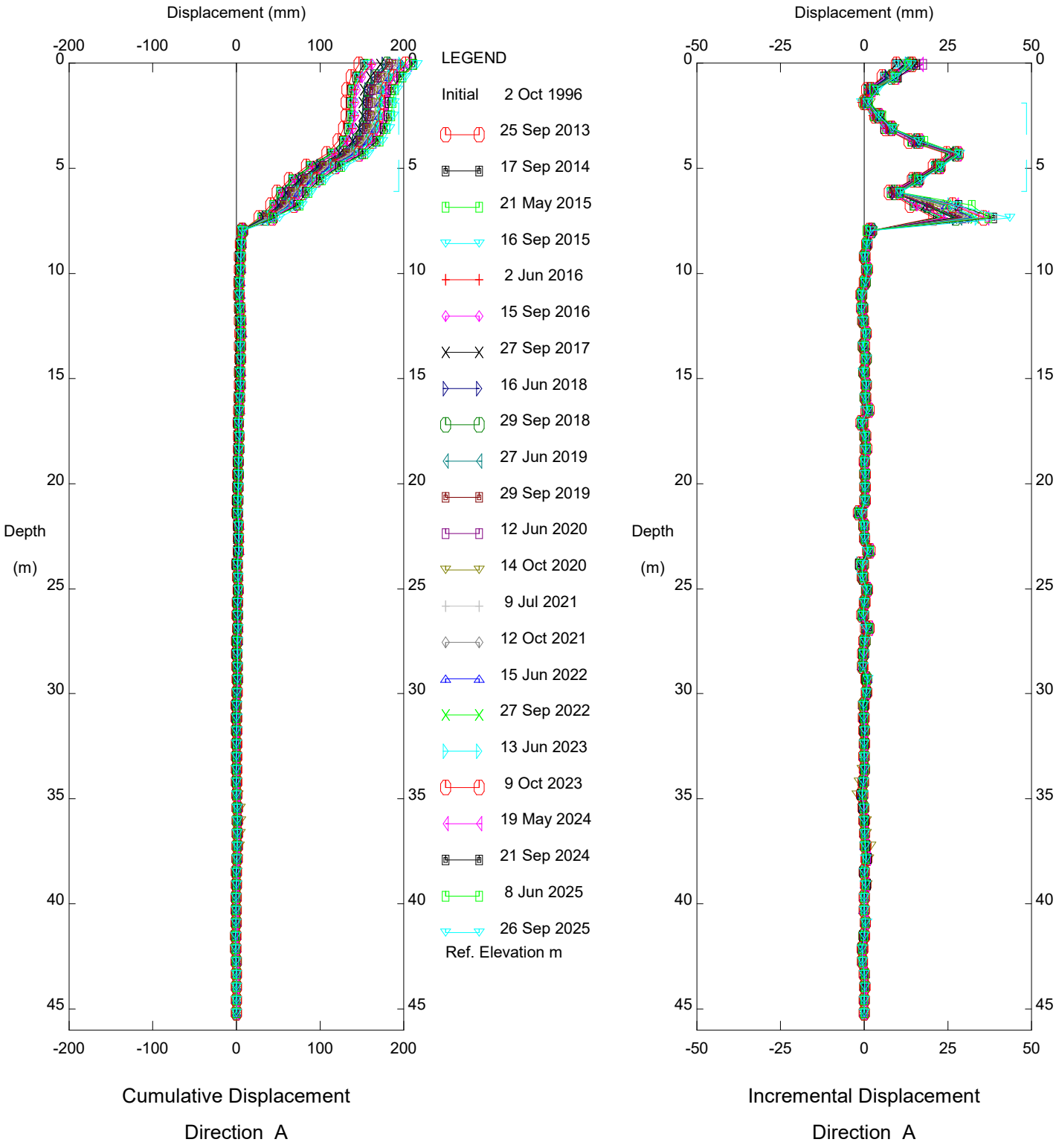


Cumulative Displacement

Direction A

Incremental Displacement

Direction A

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

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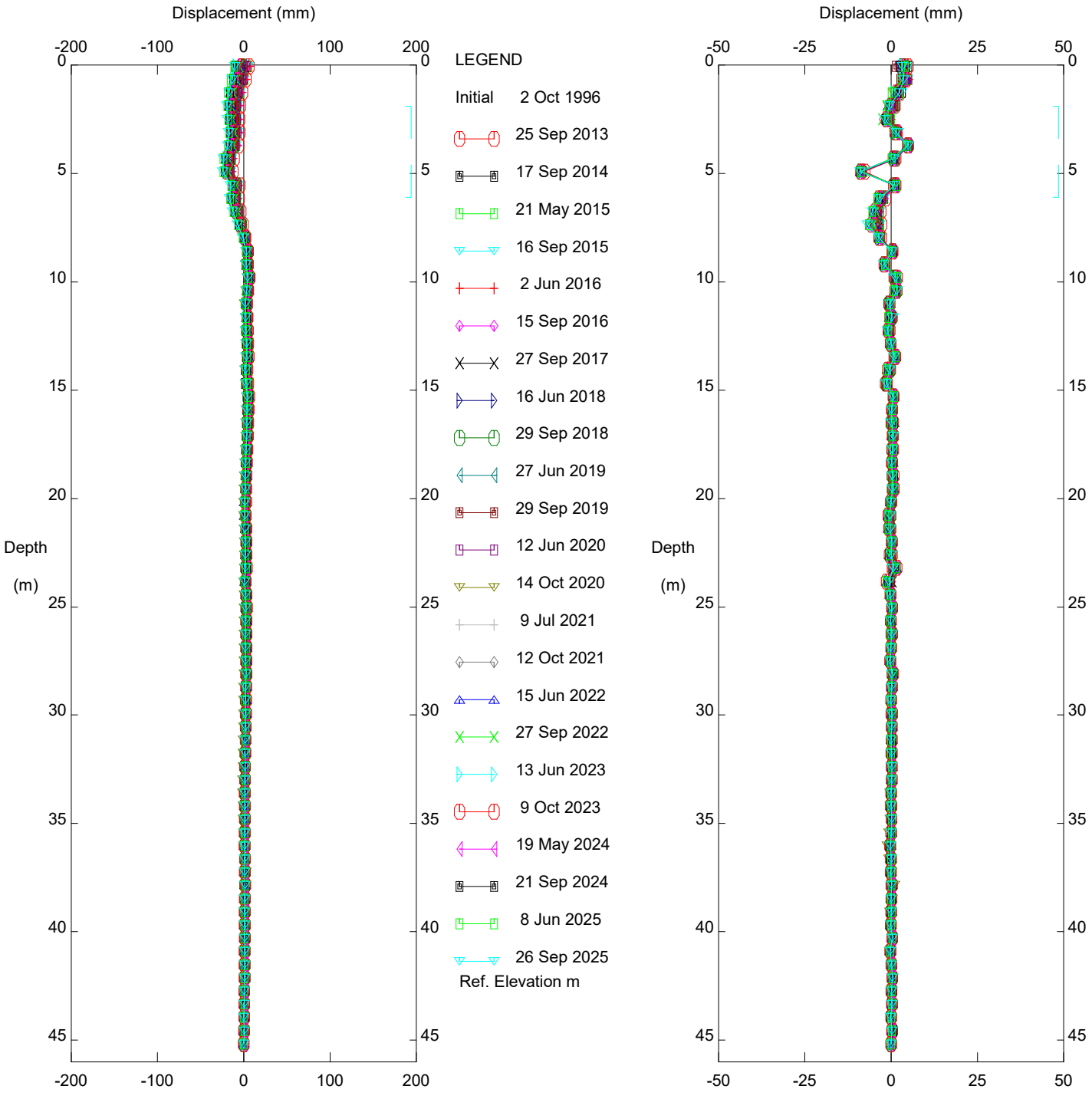


Cumulative Displacement

Direction B

Incremental Displacement

Direction B

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

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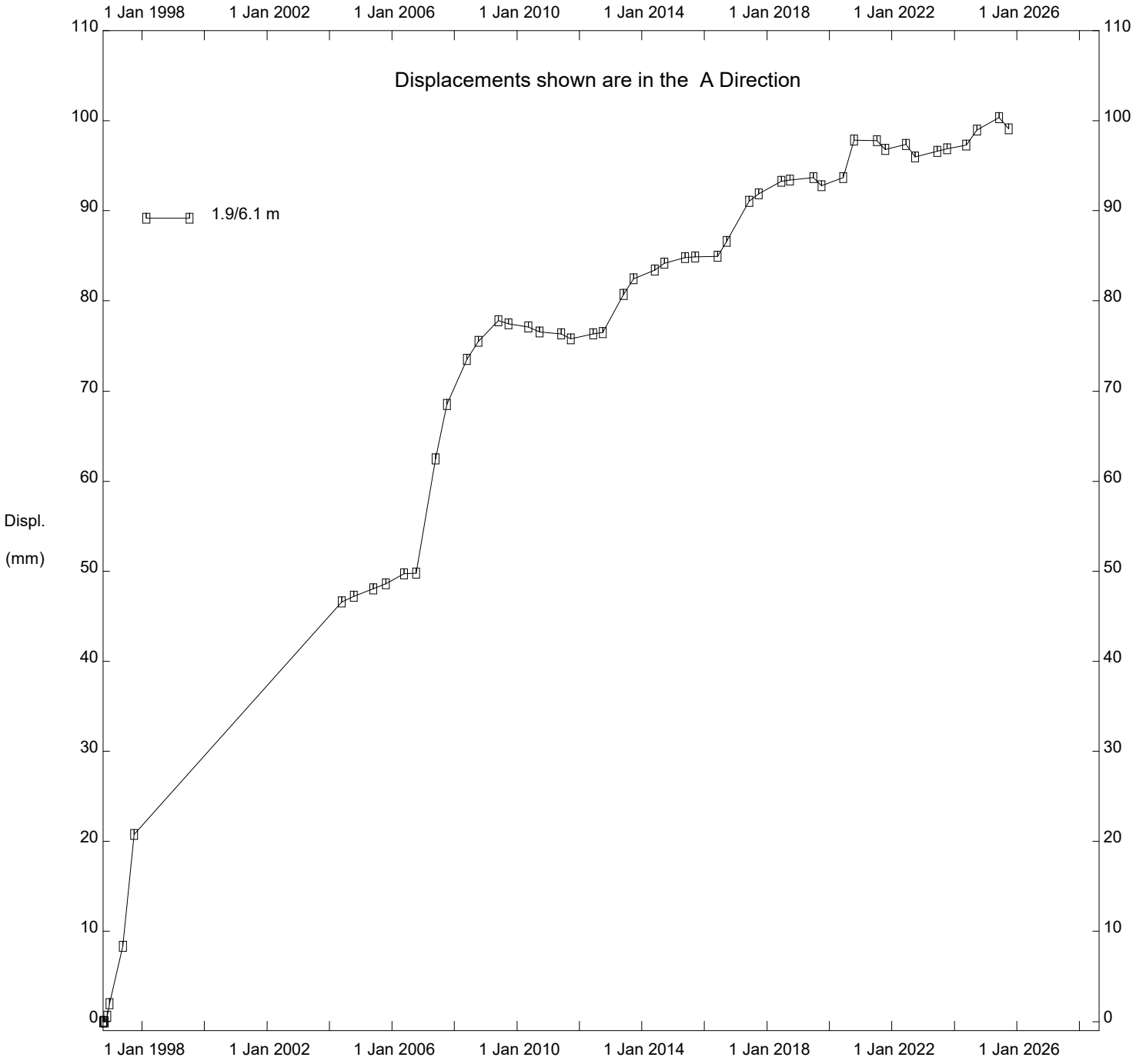
Thurber Engineering - Edmonton




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

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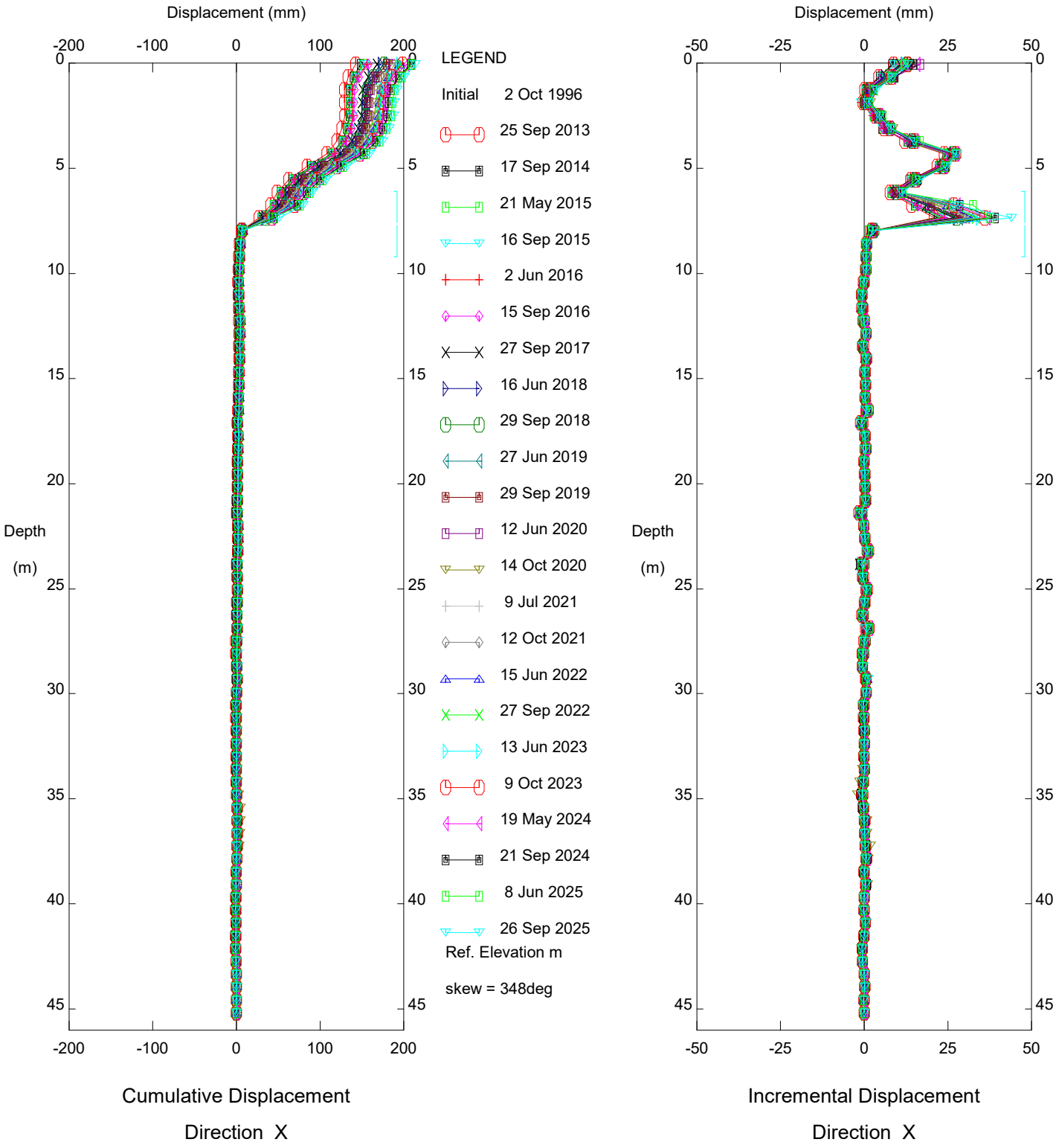
Thurber Engineering - Edmonton




Cumulative Displacement

Direction X

Incremental Displacement

Direction X

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

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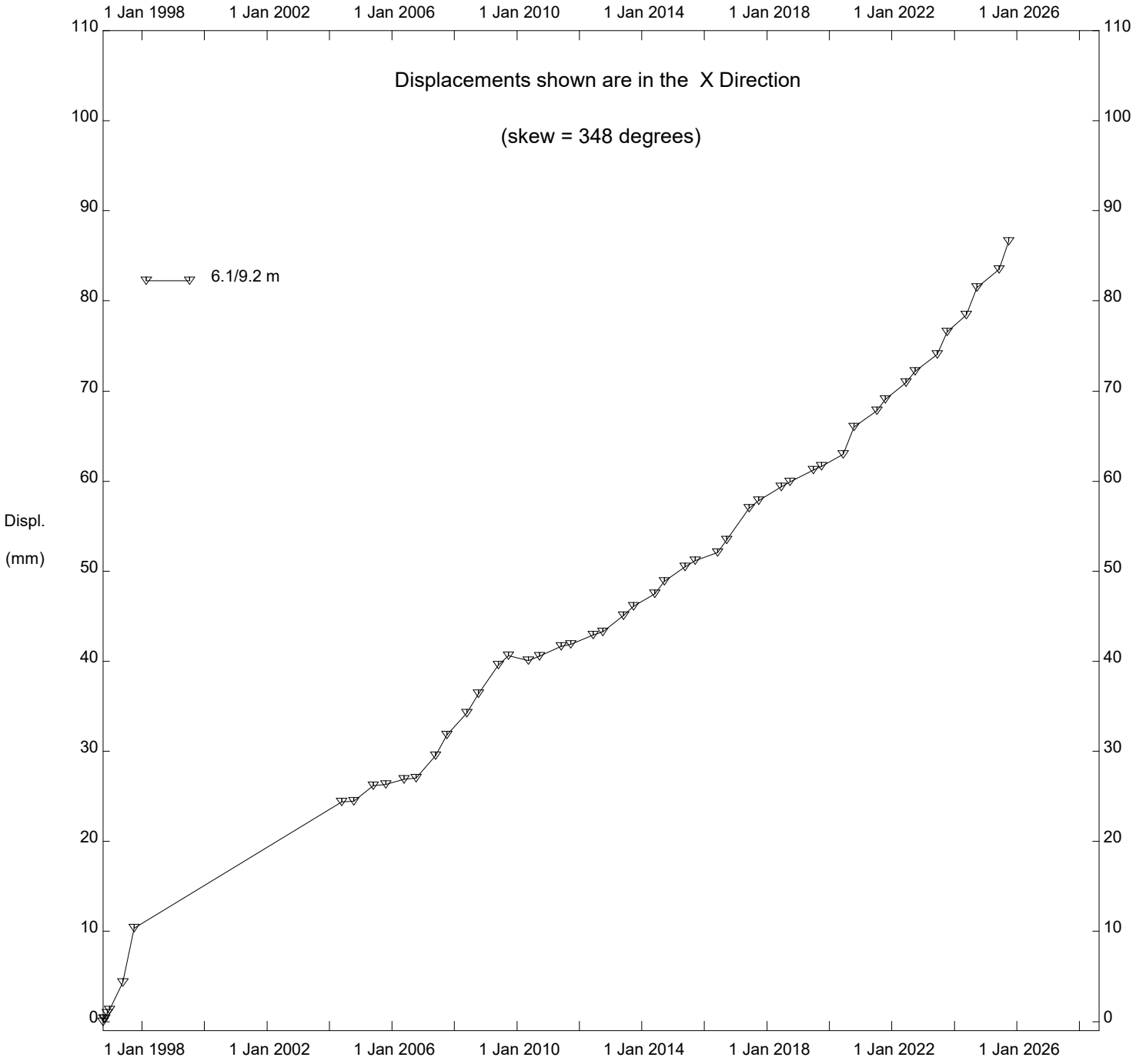


(PH059) PEACE RIVER EAST HILL -SITE 2, Inclinometer SI-81

Alberta Transportation

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