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

Site Number	Location	Name	Hwy	km
PH034	HWY 744:04 C1 59.177	Fence Slide - Judah Hill	744:04	Km 59.2
Legal Description:		**UTM Co-ordinates**		
7-29-83-21 W5		11U E 482858.86	N 6230922.58	

Current Monitoring:	10-Jun-2025	**Previous Monitoring**	22-Sep-2024
Instruments Read By:	Mr. Niraj Regmi, G.I.T and Mr. Godfred Etiendem, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): SI05-15, SI10-15	**Pneumatic Piezometers (PN):** PN10-12, PN10-15	**Vibration Wire Piezometers (VW):**	**Standpipe Piezometers (SP):**
Load Cell (LC):	**Strain Gauges:**	**SAAs:**	**Others:**

Readout Equipment Used			
Slope Inclinometers: RST Digital Inclinometer probe with 2 ft wheelbases and RST pocket readout	**Pneumatic Piezometers:** RST C108 pneumatic piezometer readout	**Vibrating Wire Piezometers:**	**Standpipe Piezometers:**
Load Cell:	**Strain Gauges:**	**SAAs:**	**Others:**
Note:			

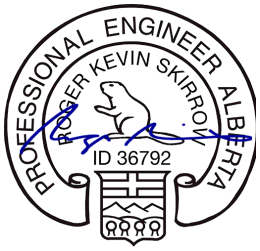
Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	Slope inclinometer SI05-15, located at the top of the backslope outside the main slide area, has shown some reading noise but no discernible movement since installation in 2005. SI10-15 showed a rate of movement of 1.7 mm/yr over 2.4 m to 5.5 m depth since the fall of 2024 readings. The rate of movement has decreased by 2.7 mm/yr since the fall of 2024 readings. Over the long term, movement rates at this depth have been relatively steady at about 4 mm/yr since 2011. There are no distinct movement zones in SI10-15, rather the movement pattern shows the upper geogrid reinforced fill acting as a confined mass that is tilting about a pivot point in the underlying undisturbed soils. Pneumatic piezometers PN10-12 and PN10-5 showed decreases in groundwater level of 0.02 m and 0.03 m, respectively since the fall of 2024 readings. PN10-15 shows a more variable groundwater level response while PN10-12 shows a steady and persistent groundwater level.
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:	• Table PH034-1: Spring 2025 – HWY 744:04 Judah Hill (Fence Slide) Slope Inclinometer Instrumentation Reading Summary • Table PH034-2: Spring 2025 – HWY 744:04 Judah Hill (Fence Slide) Pneumatic Piezometer Instrumentation Reading Summary • Statement for Use and Interpretation of Report • APPENDIX A - PH034 SPRING 2025 o Field Inspector's report o Site Plan Showing Approximate Instrument Locations (Drawing No. 32121 PH034) o SI Reading Plots o Figure PH034-1 (Pneumatic Piezometer 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

July 11, 2025



2025-07-11

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
RM SIGNATURE: _____
RM APEGA ID #: 51674
DATE: July 11, 2025
PERMIT NUMBER: P005186
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Lucas Green, P.Eng.
Geotechnical Engineer

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Table PH034-1: Spring 2025 – HWY 744:04 Judah Hill (Fence Slide) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: June 10, 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)	RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI98-2i	*Oct. 26, 2000*	*Not Known*	*Not Known*	*Destroyed*	*May 18, 2004*	*N/A*	*N/A*	*N/A*
SI98-8i	*Oct. 26, 2000*	*Not Known*	*Not Known*	*Destroyed*	*Oct. 22, 2005*	*N/A*	*N/A*	*N/A*
SI05-15	Apr. 27, 2005	No discernible movement	No discernible movement	Operational	September 22, 2024	N/A	N/A	N/A
SI10-12	*March 27, 2010*	*69.4 mm over 2.2 m to 4.6 m depth in 256º direction*	*23.3 mm/yr in September 2011*	*Sheared at 4.9 m depth*	*June 28, 2019*	*N/A*	*N/A*	*N/A*
SI10-13	*March 27, 2010*	*114.3 mm over 3.4 m to 9.4 m depth in 180º direction*	*111.2 mm/yr in September 2011*	*Sheared at 6.4 m depth*	*June 1, 2014*	*N/A*	*N/A*	*N/A*
		7.5 mm over 10.7 m to 14.9 m depth in 225º direction	*13.1 mm/yr in September 2011*			*N/A*	*N/A*	*N/A*
SI10-14	*March 27, 2010*	*70.9 mm over 3.4 m to 6.4 m depth in 230º direction*	*61.9 mm/yr in September 2011*	*Sheared at 5.7 m depth*	*September 16, 2014*	*N/A*	*N/A*	*N/A*
SI10-15	March 27, 2010	58.9 mm over 2.4 m to 5.5 m depth in 251º direction	10.7 mm/yr in October 2020	Operational	September 22, 2024	1.2	1.7	-2.7

Drawing 32121-PH034 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site

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Table PH034-2: Spring 2025 – HWY 744:04 Judah Hill (Fence Slide) Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: June 10, 2025

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)
PN10-12 (33079)	March 26, 2010	18.0	N/A	Active	17.80 on May 14, 2010	0.5	17.93	17.91	-0.02
PN10-13 (33078)	*March 26, 2010*	*13.7*	*N/A*	*Blocked*	*13.45 on September 23, 2010*	*N/A*	*N/A*	*N/A*	*N/A*
PN10-14 (33080)	*March 26, 2010*	*14.5*	*N/A*	*Pinched/ Blocked*	*14.36 on September 23, 2010*	*N/A*	*N/A*	*N/A*	*N/A*
PN10-15 (33092)	March 26, 2010	3.7	N/A	Active	1.66 on September 22, 2011	3.5	3.30	3.27	-0.03

Drawing 32121-PH034 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site

Notes:
PN - pneumatic piezometer.
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.

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

SPRING 2025

APPENDIX A
DATA PRESENTATION

SITE PH034: HWY 744:04, JUDAH HILL (FENCE SLIDE)

ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (PH034)
SPRING 2025

Location:	Fence Slide - Judah Hill (HWY 744:04 C1 59.177)	**Readout:**	RST PN C108 Unit 8
File Number:	32121	**Casing:**	2.27
Probe:	RST Set 8R	**Temp:**	15
Cable:	RST Set 8R	**Read by:**	NKR/GE

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-			
SI05-15	482858.86	6230922.58	10-Jun-25	0.25	127 to 3	245	574	-562	2691	-2691	8R/8R	2.27	See notes
SI10-15	482770.6	6230978.58	10-Jun-25	0.33	42 to 4	240	1410	-1399	-488	487	5R/5R	2.27	

PNEUMATIC PIEZOMETER READINGS

PN#	GPS Location (UTM 11)		Date	Reading (kPa)	Identification Number
	Easting (m)	Northing (m)			
PN10-12	482817.23	6230854.85	10-Jun-25	0.5	33079
PN10-15	482770.60	6230978.58	10-Jun-25	3.5	33092

INSPECTOR REPORT

If using RST probe, need small diameter extension to read.

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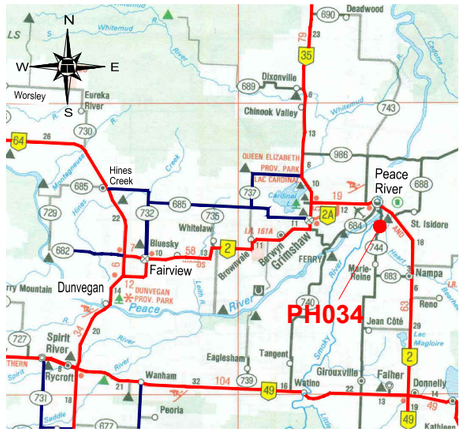
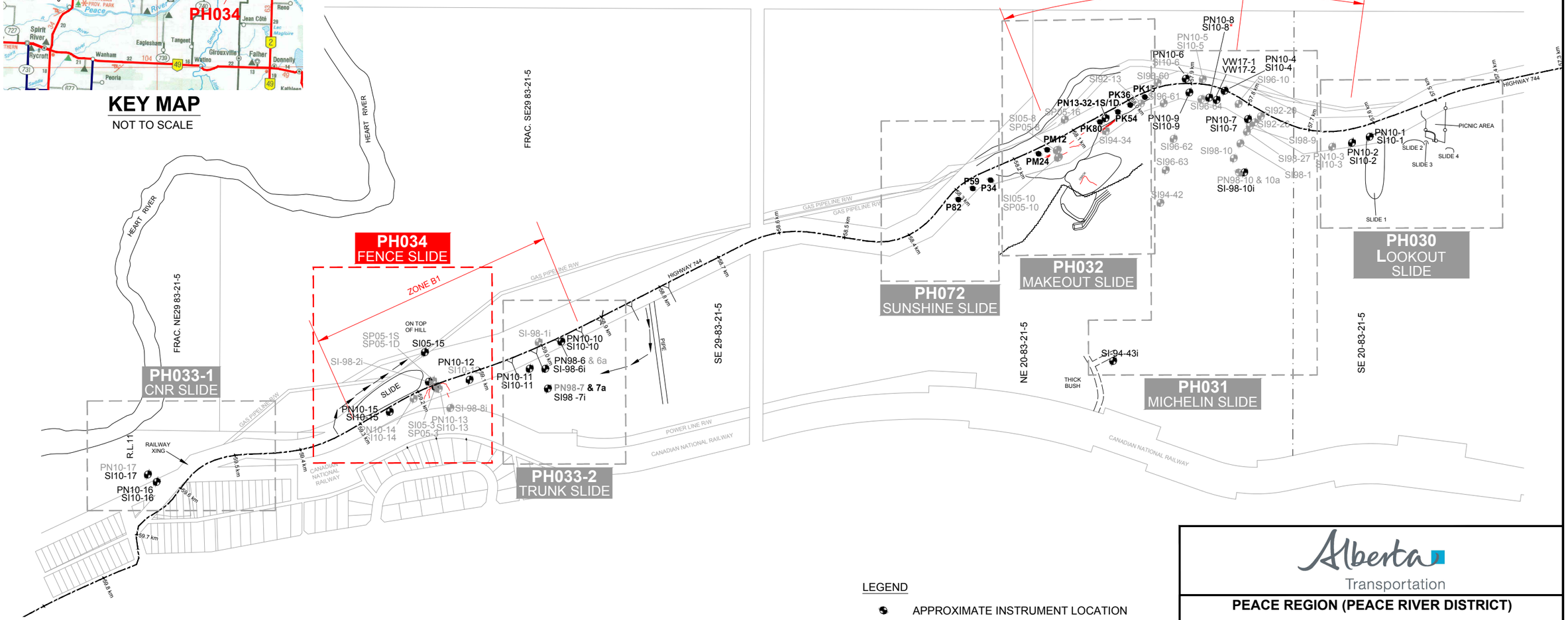


KEY MAP

NOT TO SCALE



LEGEND

- APPROXIMATE INSTRUMENT LOCATION
- INSTRUMENT NOT IN USE
- PN PNEUMATIC PIEZOMETER
- SP STANDPIPE PIEZOMETER
- SI SLOPE INCLINOMETER
- VW VIBRATING WIRE PIEZOMETER
- APPROXIMATE PILE LOCATION

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PEACE REGION (PEACE RIVER DISTRICT)

PH034: HWY 744:02 - JUDAH HILL (FENCE SLIDE) INSTRUMENT LOCATIONS

DWG No. 32121-PH034

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	DWP
SCALE	APPROX. 1:6000
DATE	JULY 2025
FILE No.	32121

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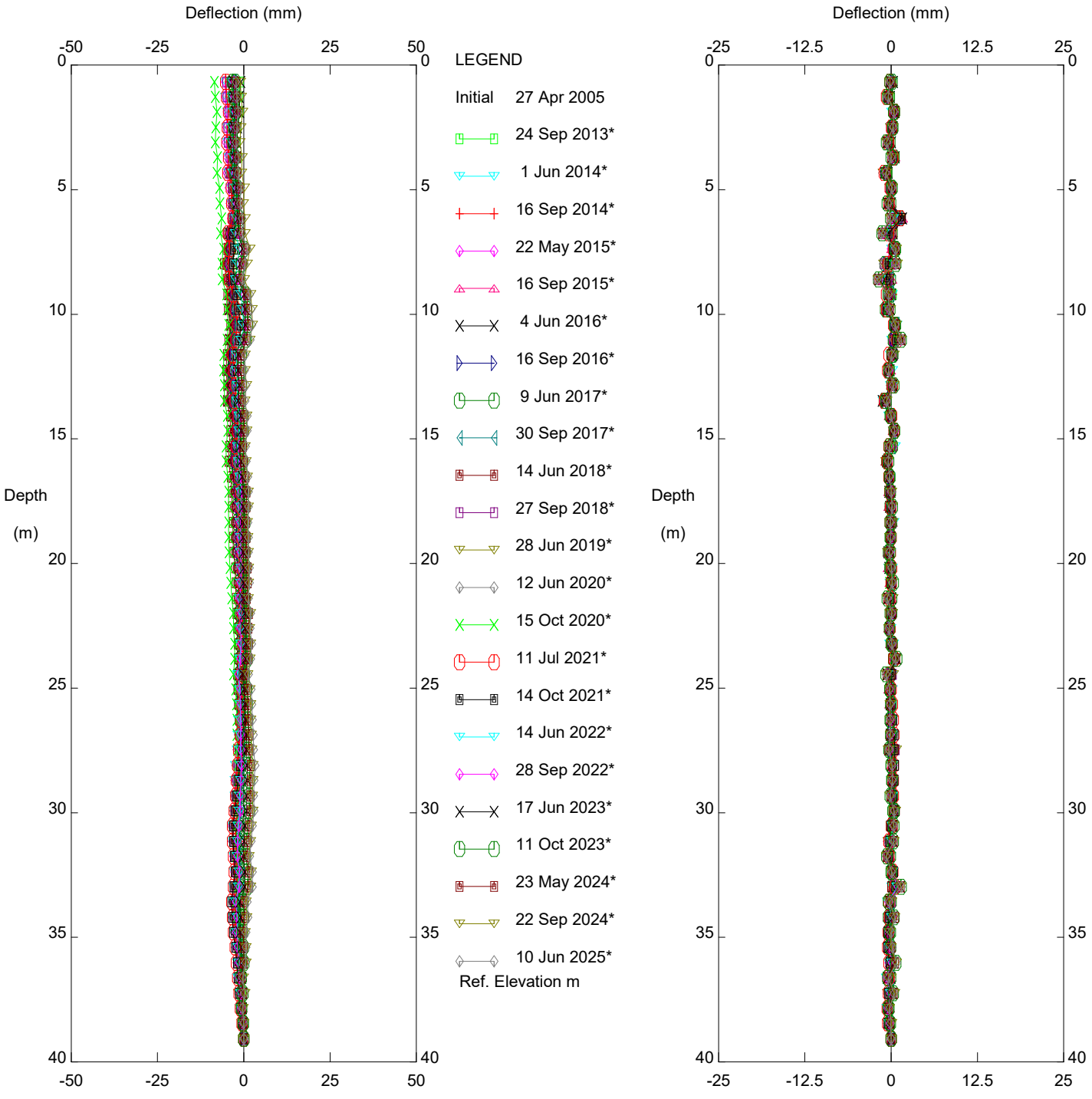

Cumulative Deflection

Direction A

Incremental Deflection

Direction A

PH034 Judah Hill Fence Slide, Inclinometer SI05-15

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

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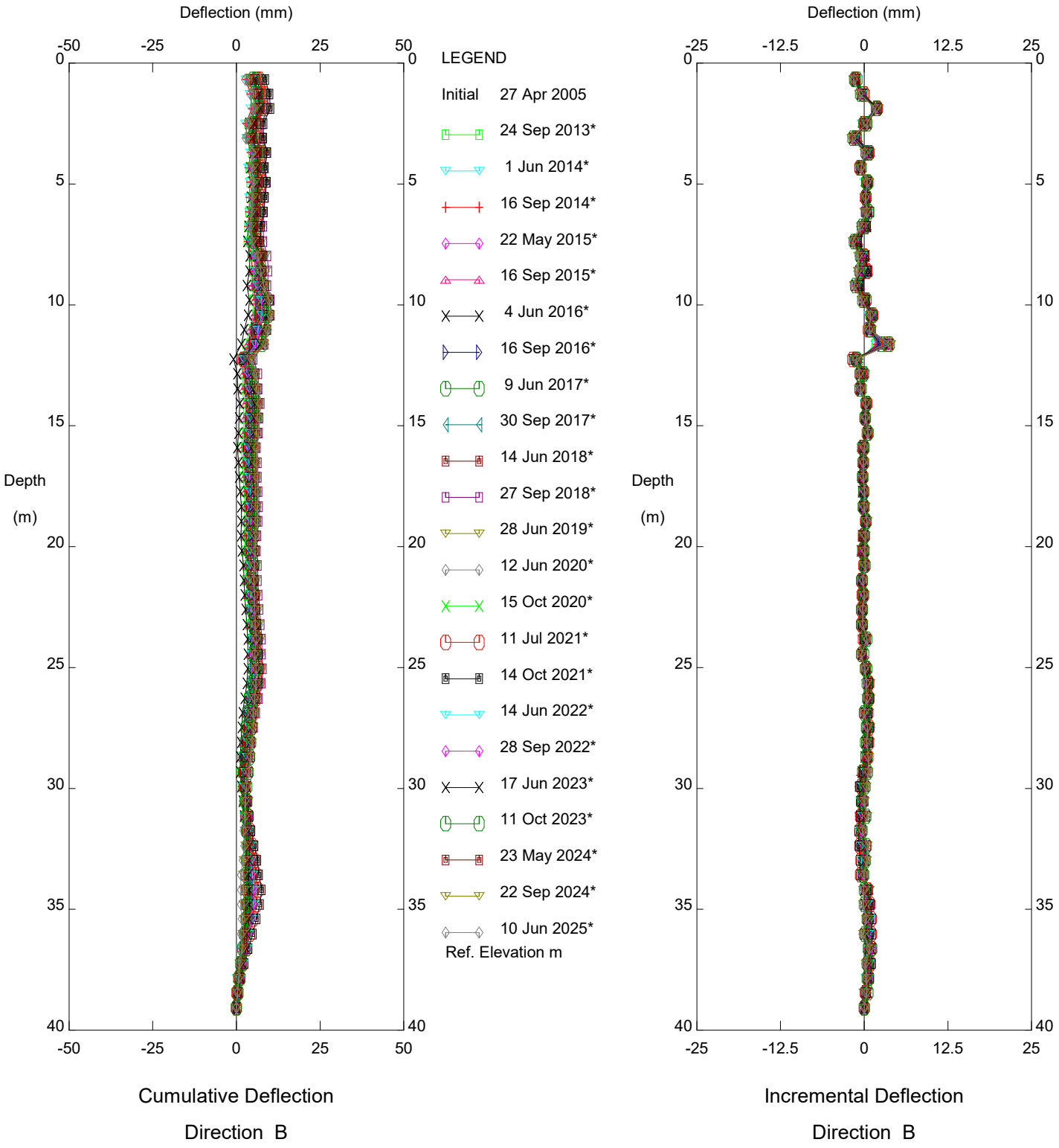

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

PH034 Judah Hill Fence Slide, Inclinometer SI05-15

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

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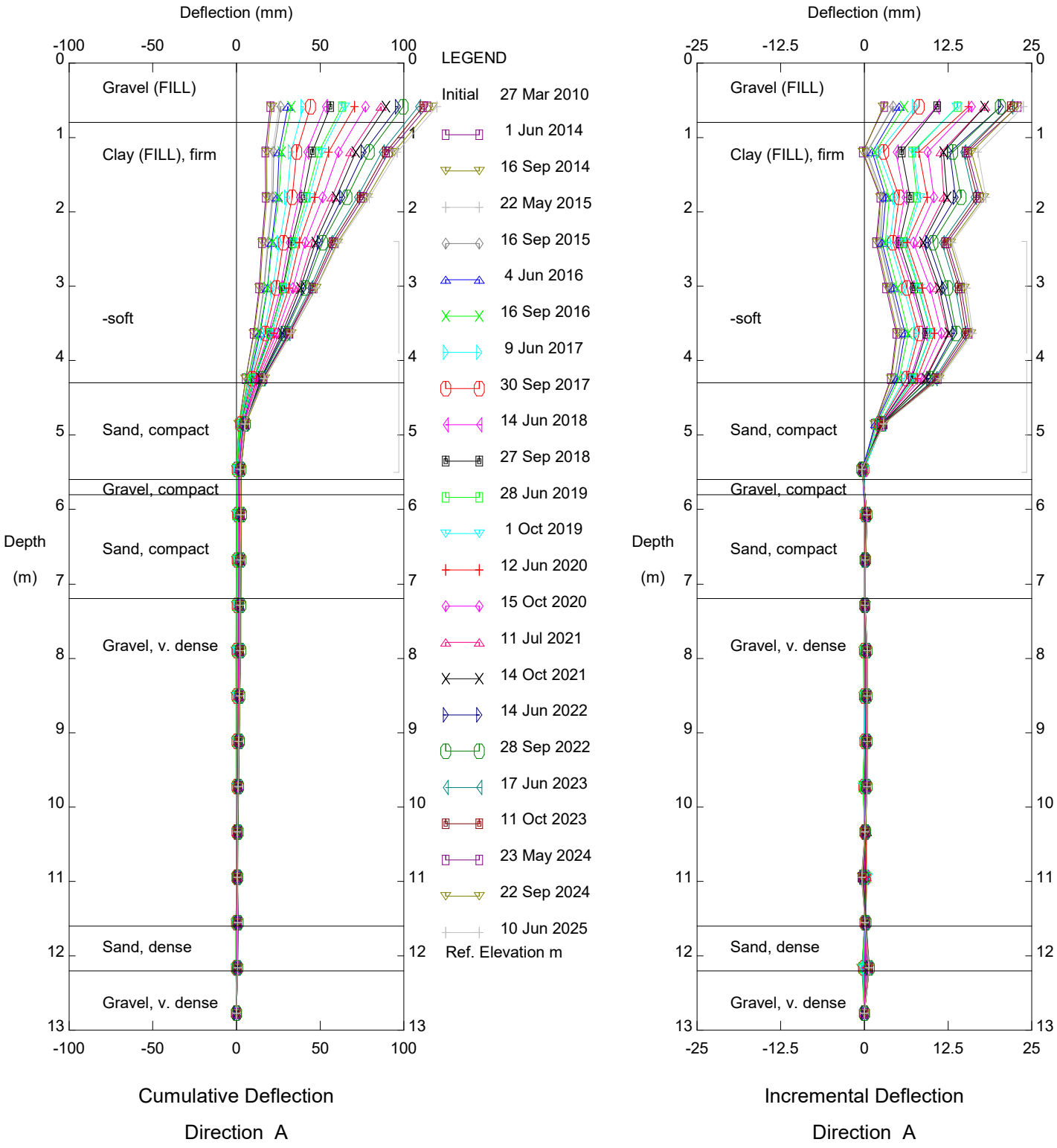

Cumulative Deflection

Direction A

Incremental Deflection

Direction A

PH034 Judah Hill Fence Slide, Inclinometer SI10-15

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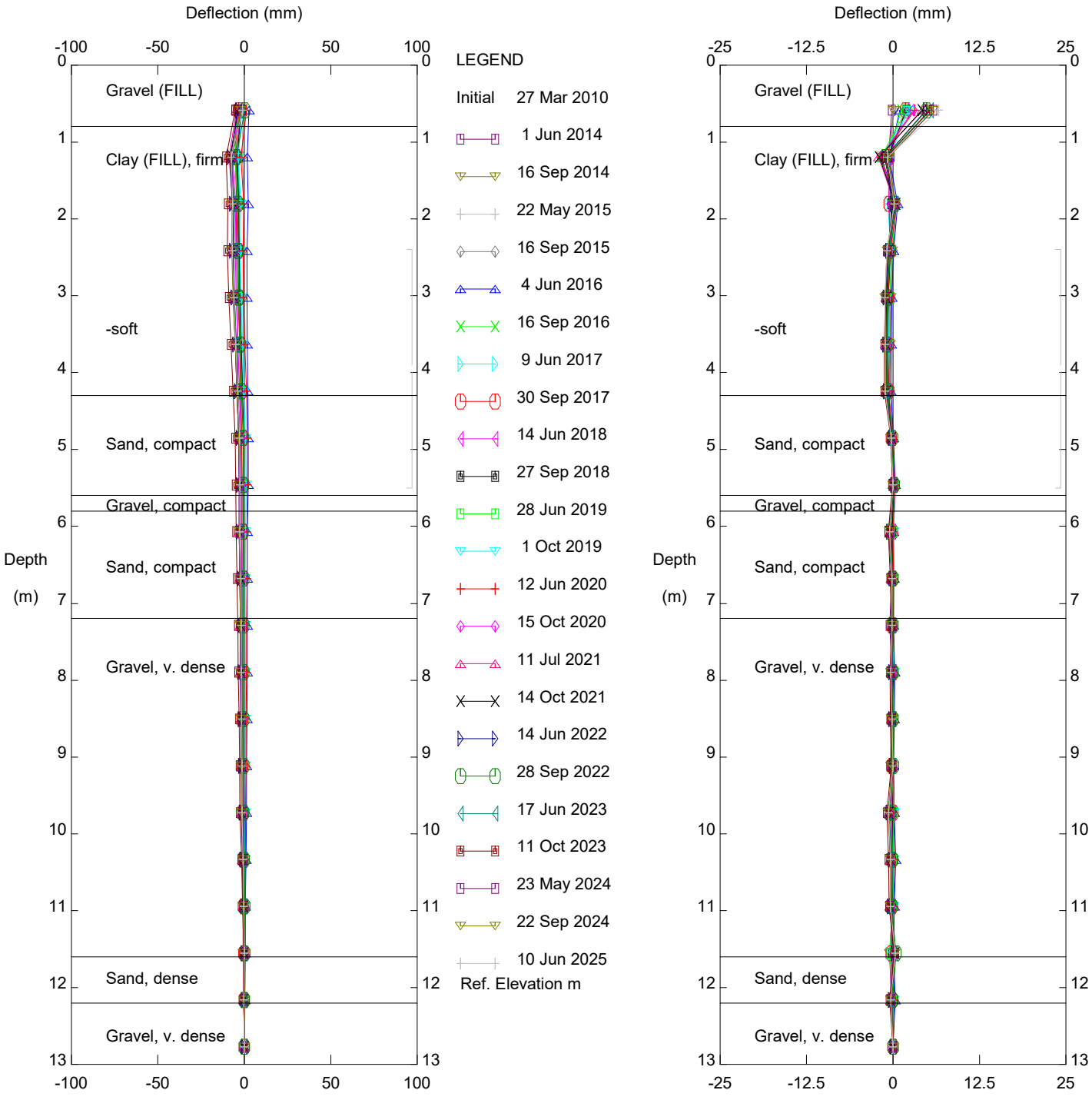

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

PH034 Judah Hill Fence Slide, Inclinometer SI10-15

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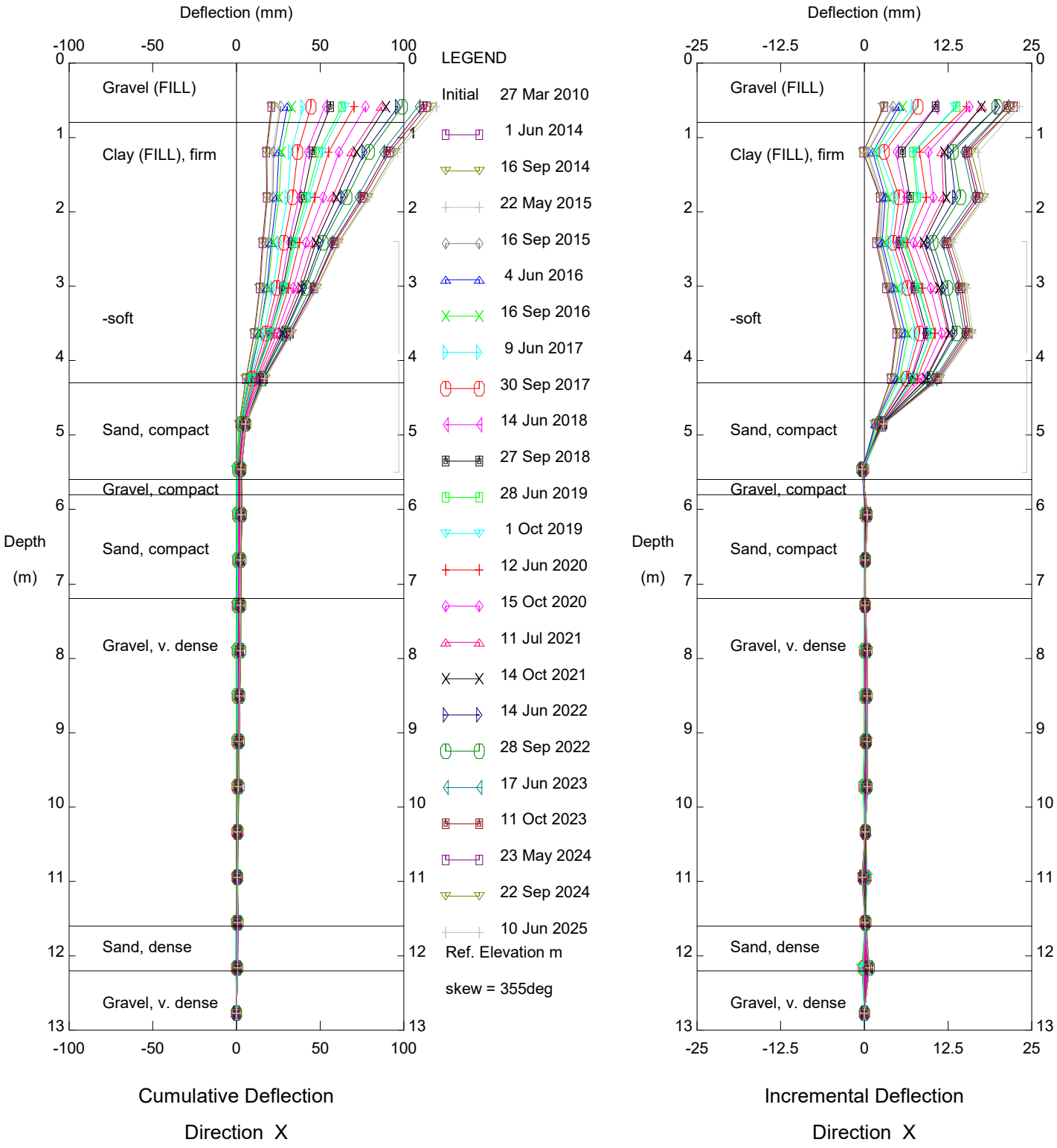

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

PH034 Judah Hill Fence Slide, Inclinometer SI10-15

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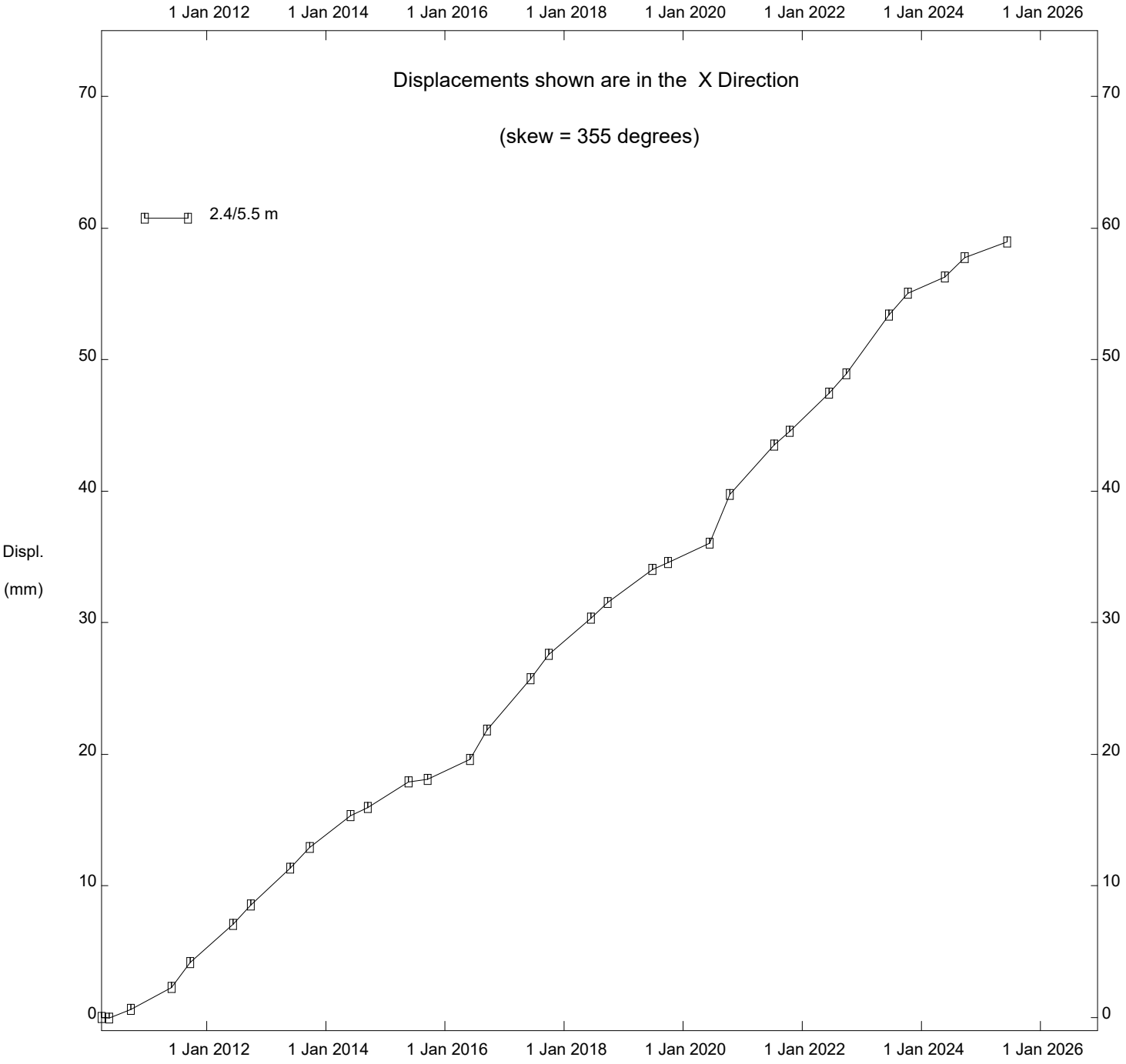

PH034 Judah Hill Fence Slide, Inclinometer SI10-15

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FIGURE PH034-1
PIEZOMETER DATA FOR HWY 744:04, JUDAH HILL (FENCE SLIDE)