

Site Number	Location	Name	Hwy	km
PH030	HWY 744:04 C1 57.4	Lookout Slide - Judah Hill	744:04	km 57.4
<b>Legal Description:</b>		<b>UTM Co-ordinates</b>		
8-20-83-21 W5		11U E 483185	N	6229488

<b>Current Monitoring:</b>	21-Sep-2024	<b>Previous Monitoring</b>	22-May-2024
<b>Instruments Read By:</b>	Mr. Niraj Regmi, G.I.T and Mr. Nixson Mationg, of Thurber		

Instruments Read During This Site Visit			
<b>Slope Inclinometers (SIs):</b> SI10-1 SI10-2	<b>Pneumatic Piezometers (PN):</b> PN10-1 PN10-2	<b>Vibration Wire Piezometers (VW):</b> N/A	<b>Standpipe Piezometers (SP):</b> N/A
<b>Load Cell (LC):</b> N/A	<b>Strain Gauges:</b> N/A	<b>SAAs:</b> N/A	<b>Others:</b>

Readout Equipment Used			
<b>Slope Inclinometers:</b> RST Digital Inclinator probes with 2 ft. wheelbases and RST Pocket PC readouts.	<b>Pneumatic Piezometers:</b> RST C108 pneumatic piezometer readout	<b>Vibration Wire Piezometers:</b>	<b>Standpipe Piezometers:</b>
<b>Load Cell:</b>	<b>Strain Gauges:</b>	<b>SAAs:</b>	<b>Others:</b>
<b>Note:</b>			

<b>Zones of New Movement:</b>	None
<b>Interpretation of Monitoring Results:</b>	<p>Both SI10-1 and SI10-2 are located adjacent to slide areas near the Sagitawa Lookout at the south end of Judah Hill. Movement zones are subtle and suggest several zones of movement may be occurring in response to loss of ground support within the main slide areas. The plots focus on movement within upper clay stratum and the base of a lower dense sand layer.</p> <p>SI10-1 showed a rate of movement of 2.1 mm/yr over 1.4 m to 6.3 m depth and a rate of movement of 0.2 mm/yr over 14.2 m to 15.4 m depth since the spring of 2024 readings.</p> <p>SI10-2 showed no discernible movement over 0.4 m to 4.1 m depth and a rate of movement of 11.8 mm/yr over 4.1 m to 8.3 m depth since the spring of 2024 readings which is the highest movement rate measured at this instrument since initiation 2010. A trend of accelerating movement rates has been observed at approximately 6 m depth in SI10-2 since the fall 2021 readings. This correlates with an increase in landslide related pavement damage observed during the annual inspections since 2021.</p> <p>Pneumatic piezometer PN10-1 showed a decrease in groundwater levels of 0.01 m compared to the spring of 2024 readings. The current groundwater level measured in PN10-1 is the lowest measured in the instrument since it was initialized. Pneumatic piezometer PN10-2</p>

	showed no change in groundwater level since the spring of 2024 readings.
<b>Future Work:</b>	The instruments should be read again during the spring of 2025 program.
<b>Instrumentation Repairs:</b>	No instrument repairs are required at this time.
<b>Additional Comments:</b>	

<b>Attachments:</b>	<ul style="list-style-type: none"> <li>▪ Table PH030-1: Fall 2024– Hwy 744:04 Judah Hill (Lookout Slide) Slope Inclinator Instrumentation Reading Summary</li> <li>▪ Table PH030-2: Fall 2024 – Hwy 744:04 Judah Hill (Lookout Slide) Pneumatic Piezometer Instrumentation Reading Summary</li> <li>▪ Statement of Limitations and Conditions</li> <li>▪ APPENDIX A – PH030-1 FALL 2024 <ul style="list-style-type: none"> <li>□ Field Inspector's report</li> <li>□ Site Plan Showing Approximate Instrument Locations (Drawing No.32121-PH030)</li> <li>□ SI Reading Plots</li> <li>□ Figure PH030-1 (Piezometric Elevations)</li> <li>□ Figure PH030-2 (Piezometric Depths)</li> </ul> </li> </ul>
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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 PH030-1: Fall 2024 – Hwy 744:04 Judah Hill (Lookout Slide) Slope Inclinomometer 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)	RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI10-1	March 26, 2010	14.4 mm over 1.4 m to 6.3 m depth in 271° direction	5.8 mm/yr in September 2018	Operational	May 22, 2024	0.7	2.1	2.4
		1.8 mm over 14.2 m to 15.4 m depth in 251° direction	0.9 mm/yr in September 2013			<0.1	0.2	<0.1
SI10-2	March 26, 2010	16.8 mm over 0.4 m to 4.1 m depth in 291° direction	11.1 mm/yr in June 2017	Operational	May 22, 2024	No Discernible Movement	N/A	-5.7
		37.6 mm over 4.1 m to 8.3 m depth in 291° direction	11.8 mm/yr In September 2024			4.0	11.8	7.7
SI10-3	March 26, 2010	147.9 mm over 2.5 m to 5.6 m depth in 241° direction	264 mm/yr in June 2015	Sheared at 2.8 mBGS in August 2015	August 13, 2015	N/A	N/A	N/A
		13.7 mm over 5.6 m to 8.0 m depth in 241° direction	59.9 mm/yr in July 2015			N/A	N/A	N/A
		5.8 mm over 8.0 m to 10.5 m depth in 241° direction	32.2 mm/yr in July 2015			N/A	N/A	N/A
		167.4 mm over 2.5 m to 10.5 m depth in 241° direction	250.1 mm/yr in August 2015			N/A	N/A	N/A

Drawing 32121-PH030 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

**Table PH030-2: Fall 2024 – Hwy 744:04 Judah Hill (Lookout Slide) Pneumatic Piezometer Instrumentation Reading Summary**

Date Monitored: September 21, 2024

INSTRUMENT #	DATE INITIALIZED	TIP ELEV. (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER ELEVATION (m)	MEASURED PORE PRESSURE (kPa)	CURRENT WATER ELEVATION (m)	PREVIOUS WATER ELEVATION (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
PN10-1 (33093)	March 26, 2010	523.72	N/A	Operational	525.62 on June 3, 2016	1.8	523.90	523.91	-0.01
PN10-2 (33095)	March 26, 2010	520.71	N/A	Operational	520.91 on October 9, 2023	0.3	520.74	520.74	0
PN10-3 (33096)	March 26, 2010	516.82	N/A	Destroyed	518.37 on July 4, 2015	N/A	N/A	N/A	N/A

Drawing 32121-PH030 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.



## STATEMENT OF LIMITATIONS AND CONDITIONS

### 1. STANDARD OF CARE

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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.
- 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.

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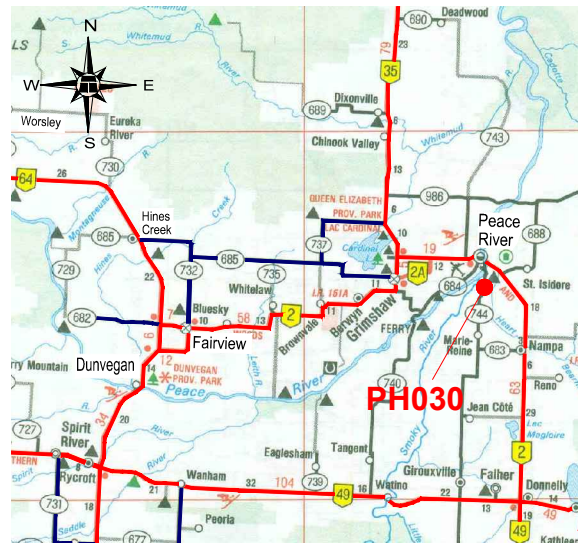
**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP (CON0022164)  
PEACE REGION (PEACE RIVER DISTRICT)  
INSTRUMENTATION MONITORING RESULTS**

**FALL 2024**

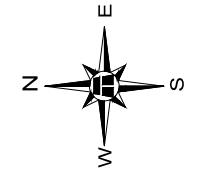
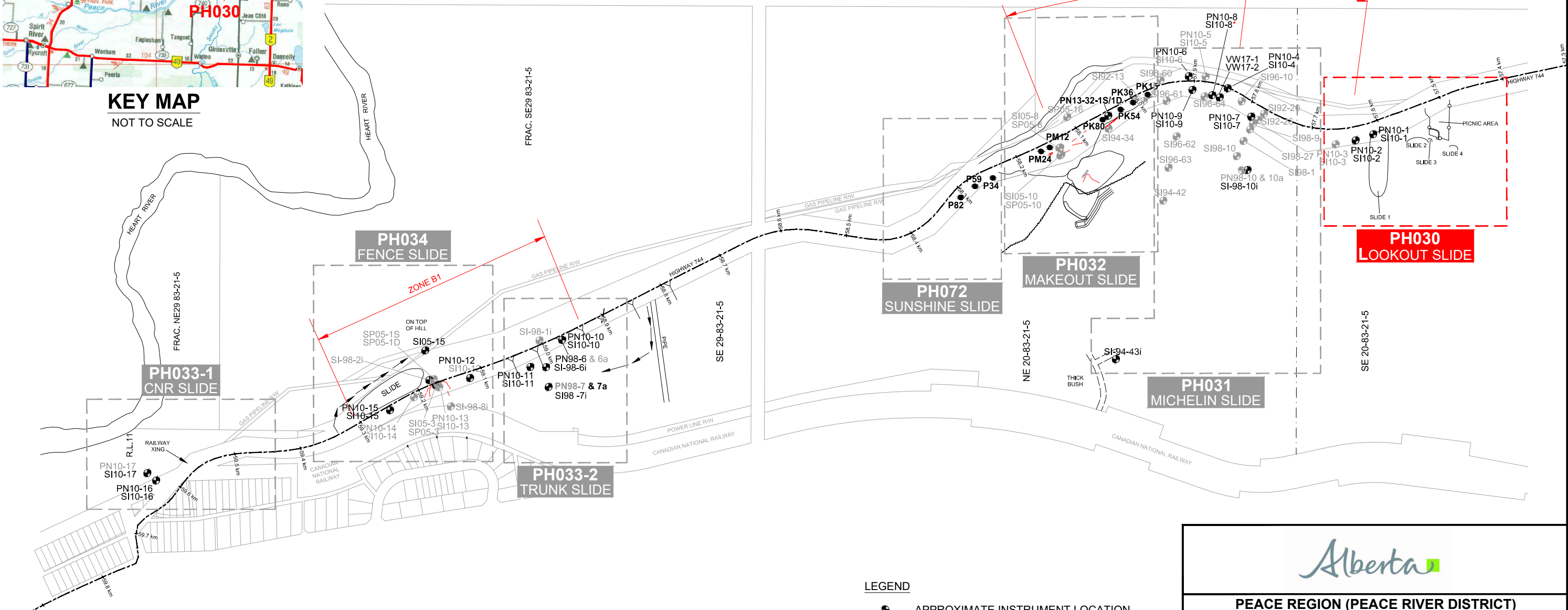
**APPENDIX A  
DATA PRESENTATION**

**SITE PH030: HWY 744:04, JUDAH HILL (LOOKOUT SLIDE)**






**KEY MAP**  
NOT TO SCALE



- LEGEND**
- APPROXIMATE INSTRUMENT LOCATION
  - INSTRUMENT NOT IN USE
  - PNEUMATIC PIEZOMETER
  - STANDPIPE PIEZOMETER
  - SLOPE INCLINOMETER
  - VIBRATING WIRE PIEZOMETER
  - APPROXIMATE PILE LOCATION




**PEACE REGION (PEACE RIVER DISTRICT)**

**PH030: HWY 744:04 - JUDAH HILL  
(LOOKOUT SLIDE)  
INSTRUMENT LOCATIONS**

**DWG No. 32121-PH030-1**

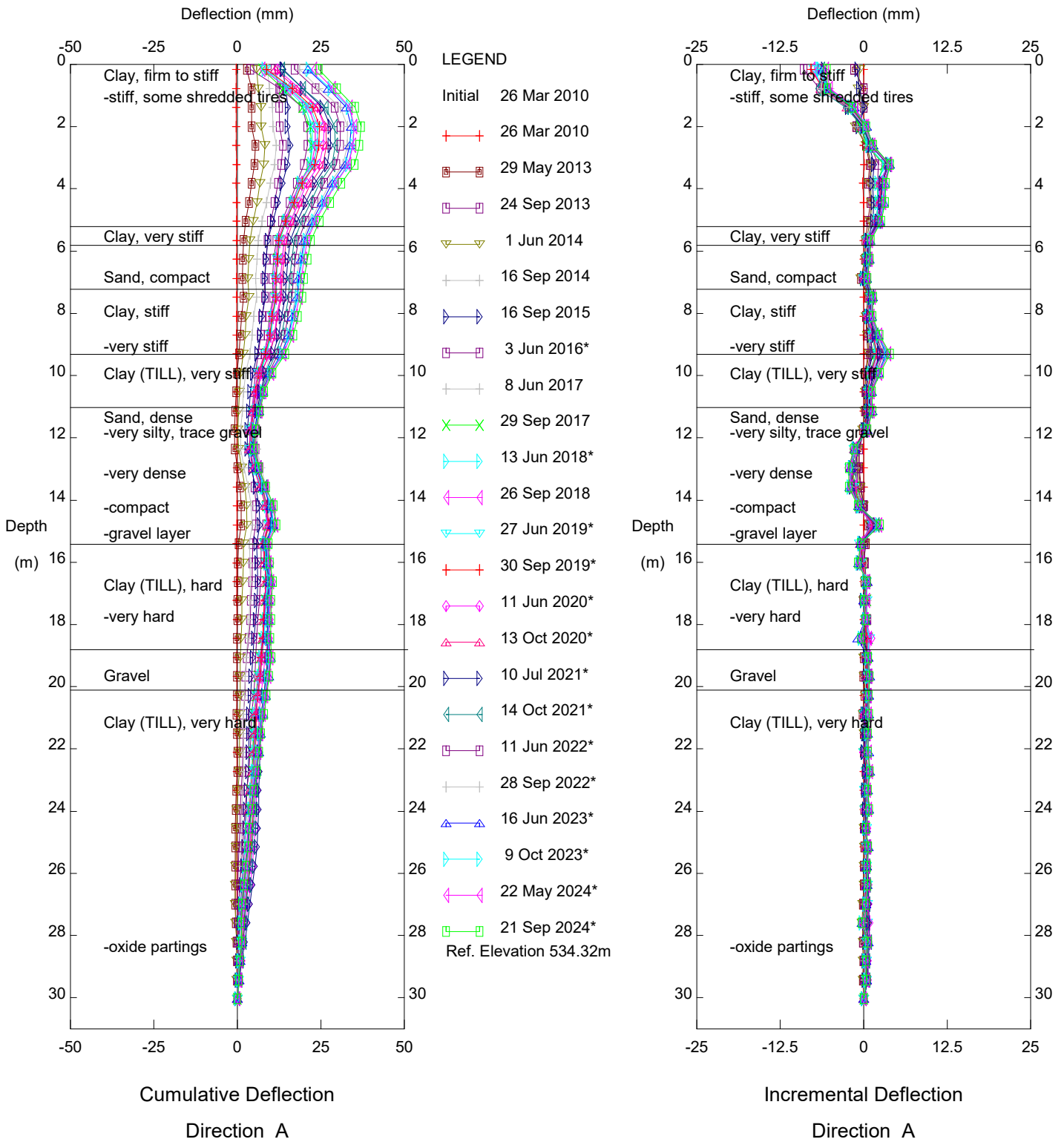
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DESIGNED BY	BWN
APPROVED BY	DWP
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FILE No.	32121



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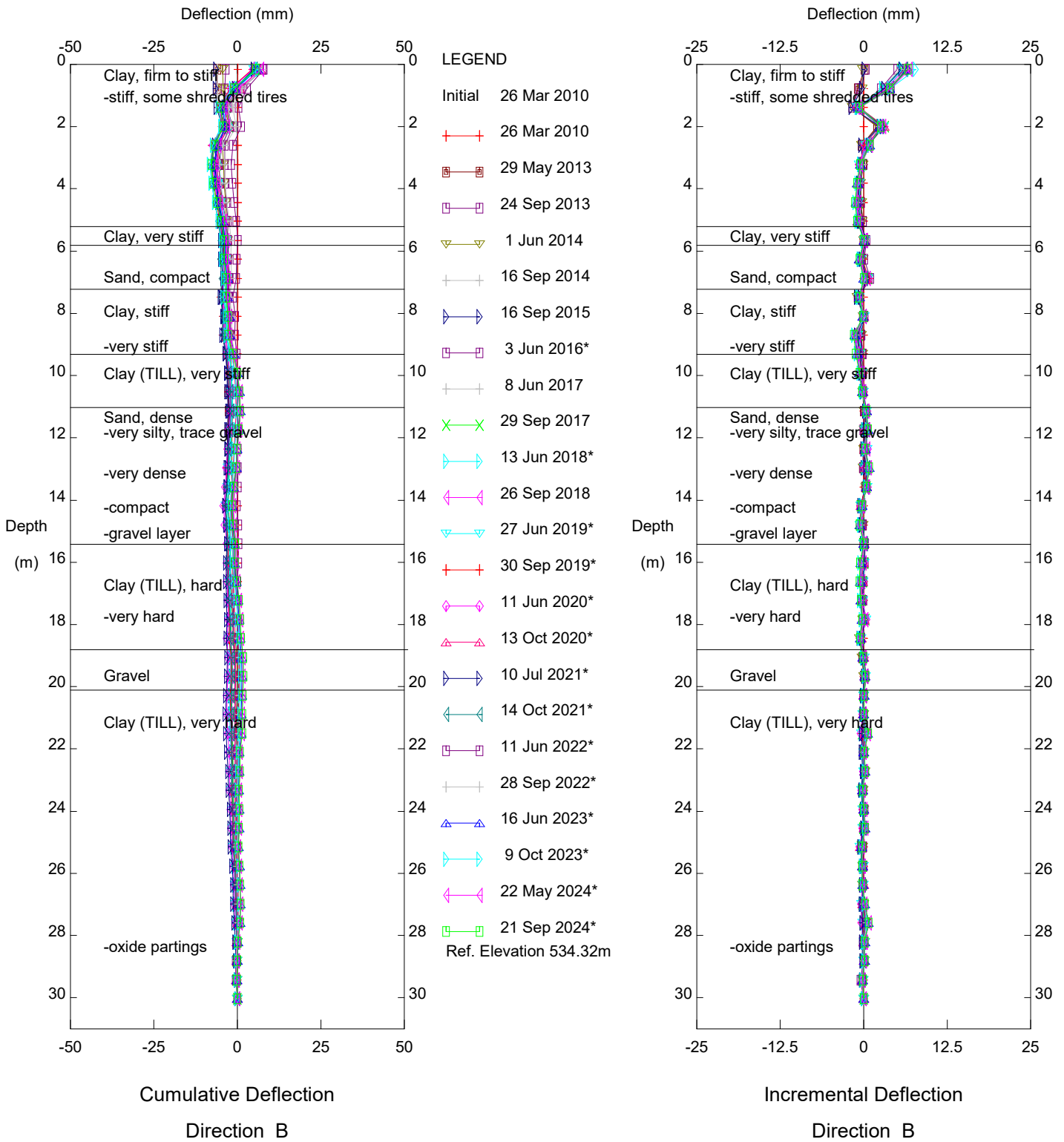


Judah Hill PH030, Inclinator SI10-1

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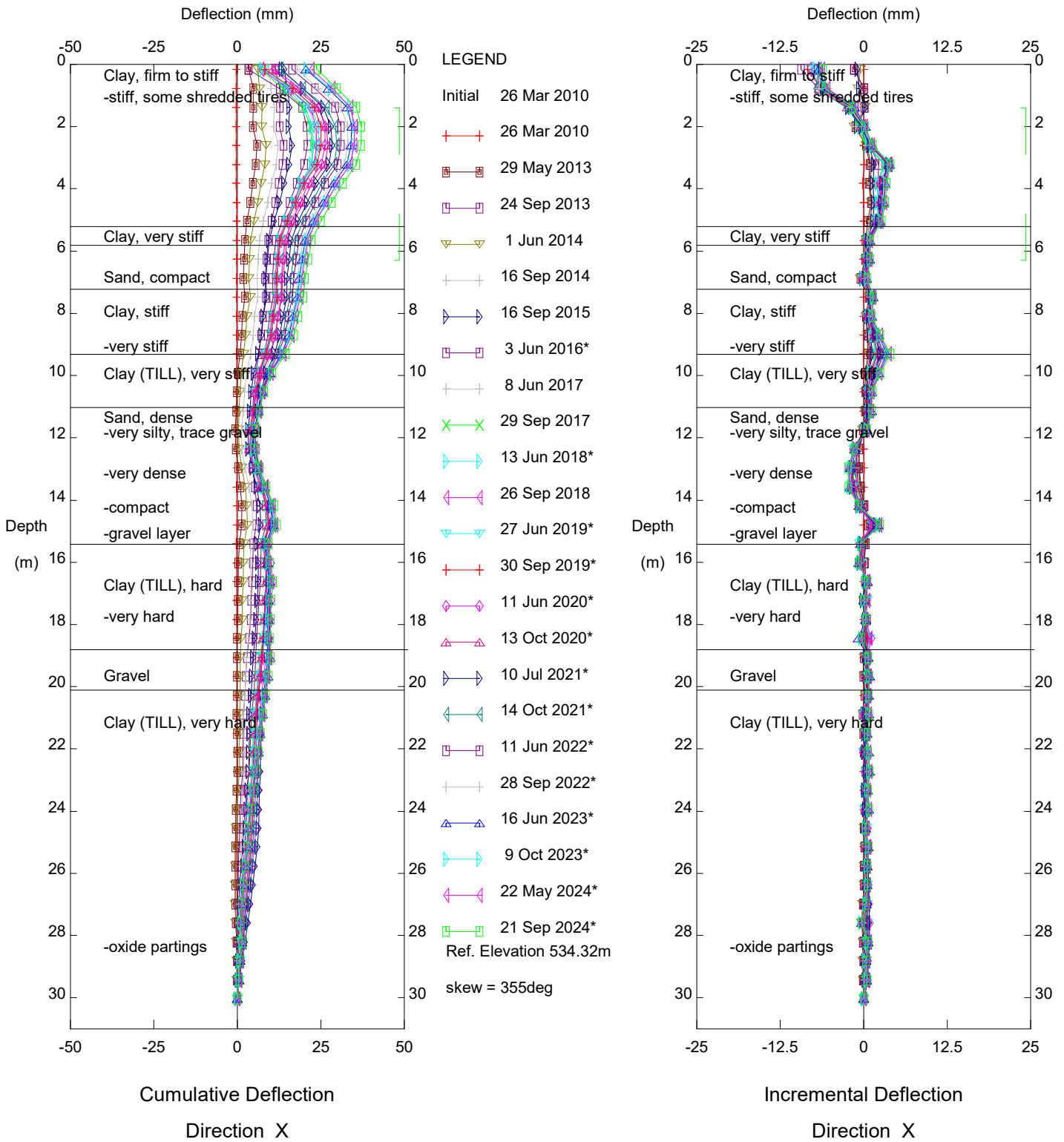


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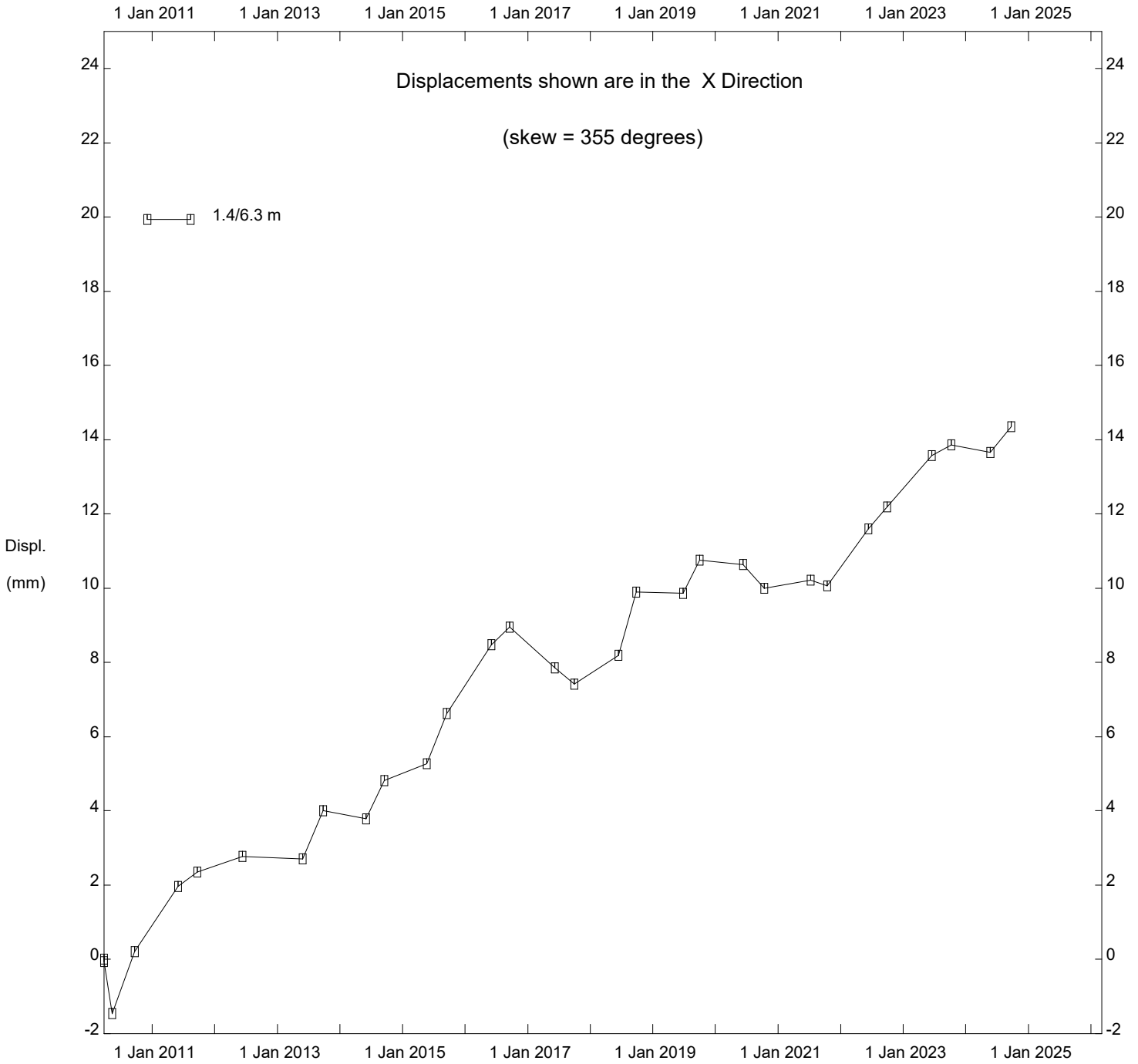


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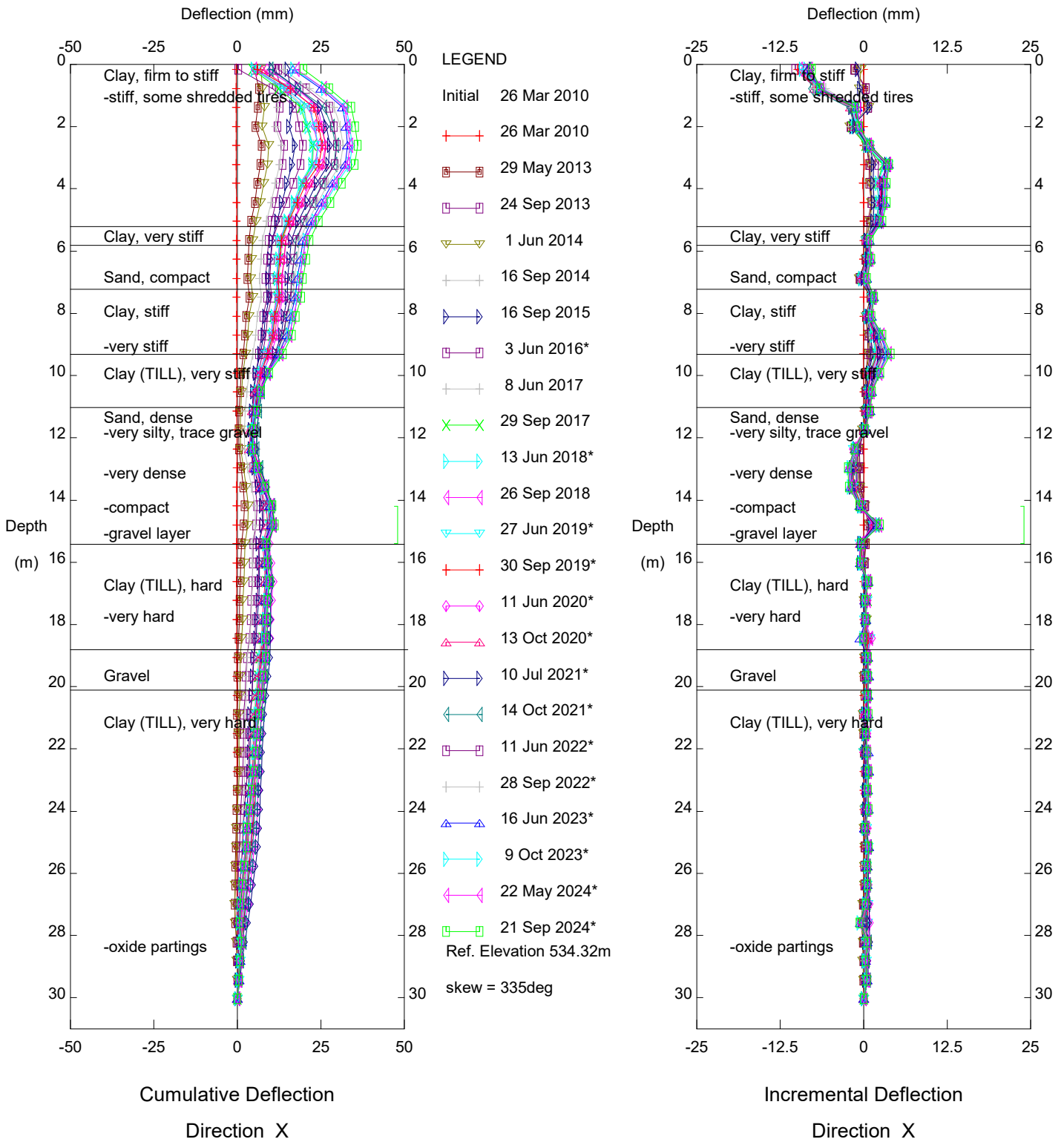
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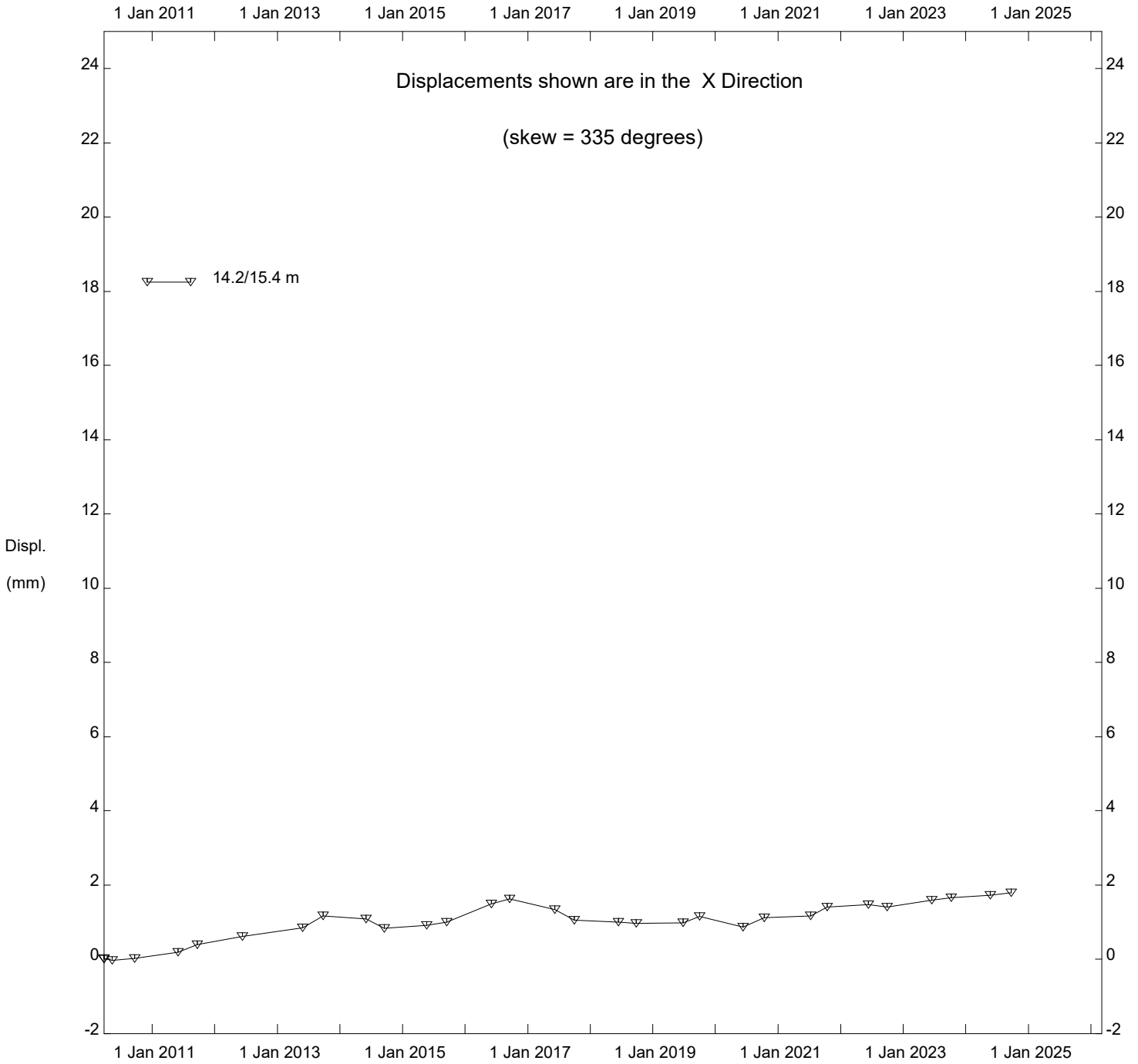


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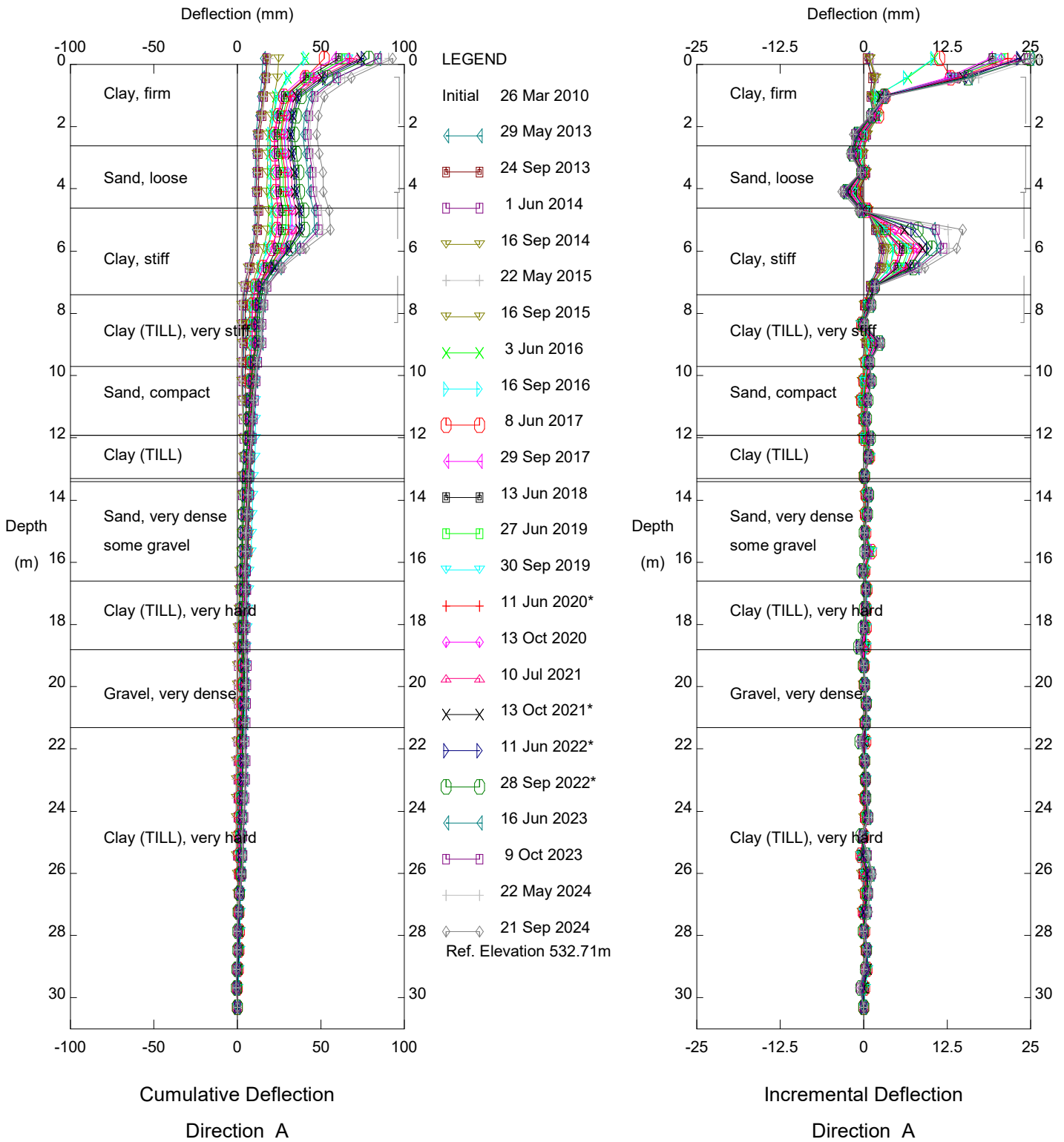
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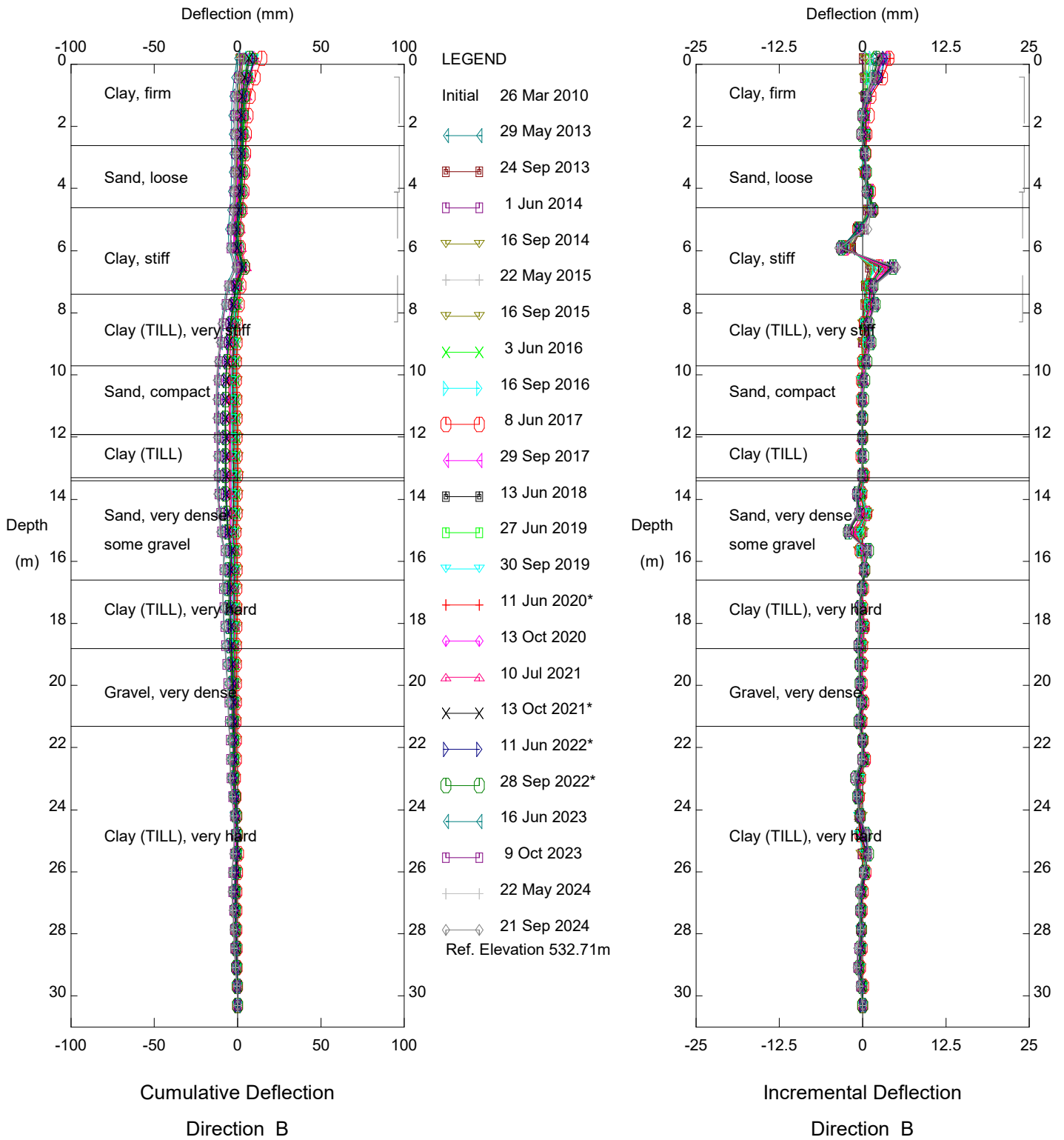


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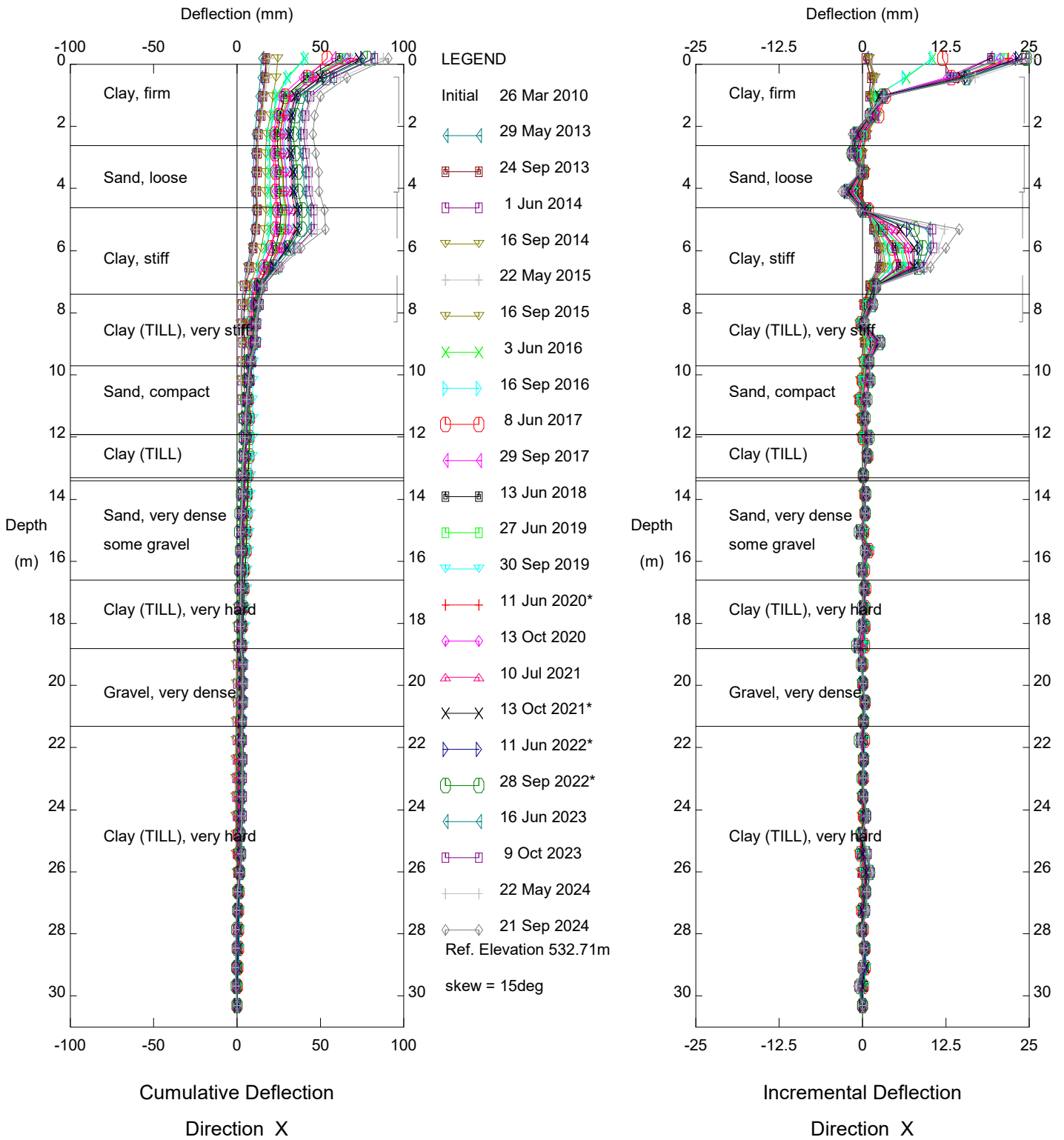
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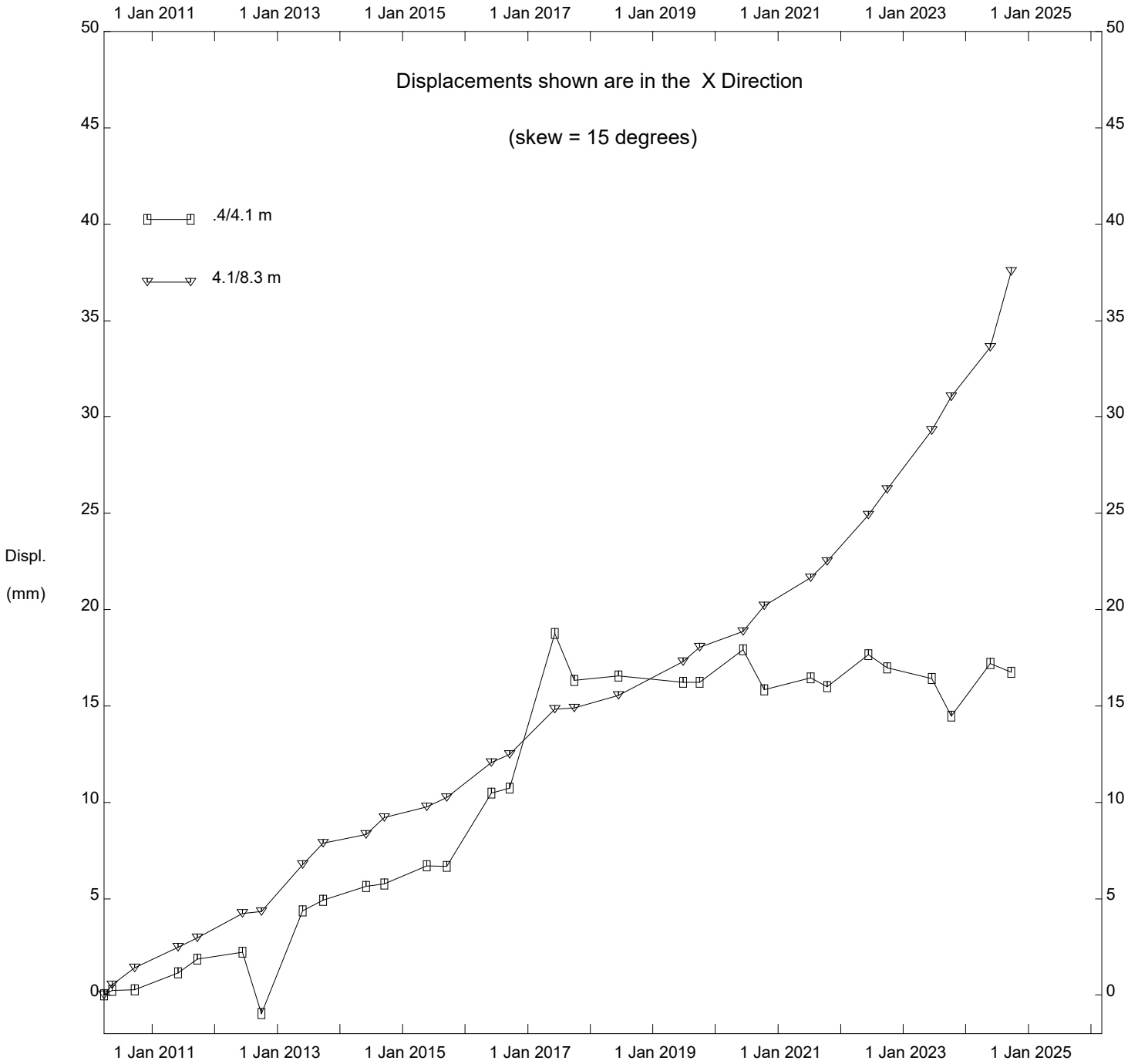


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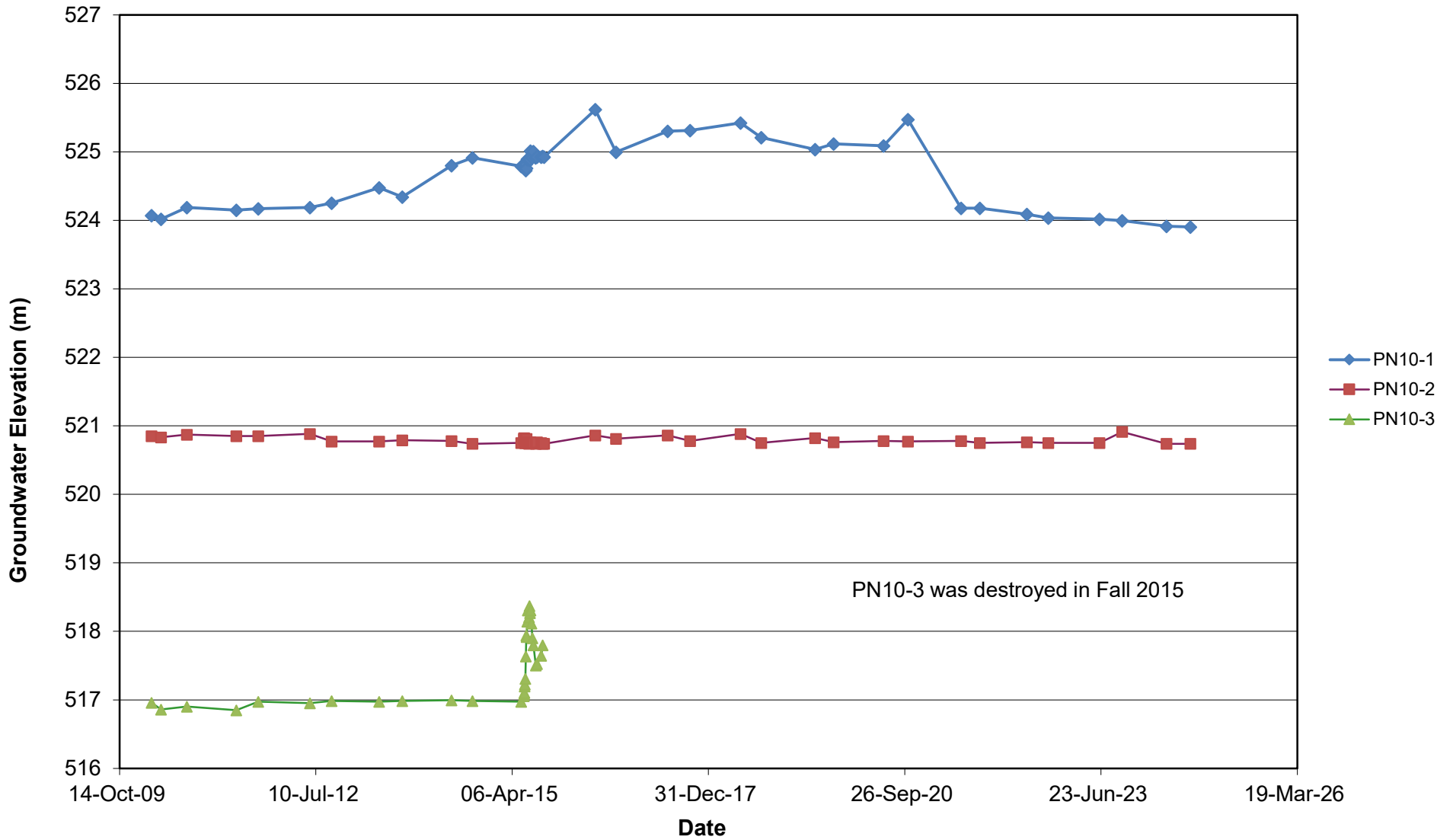
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**FIGURE PH030-1  
PIEZOMETRIC ELEVATIONS FOR HWY 744:04: JUDAH HILL (LOOKOUT SLIDES)**



**FIGURE PH030-2**  
**PIEZOMETRIC DEPTHS FOR HWY 744:04: JUDAH HILL (LOOKOUT SLIDES)**

