

**ALBERTA TRANSPORTATION AND  
ECONOMIC CORRIDORS GRMP  
PEACE REGION  
(GRANDE PRAIRIE DISTRICT - NORTH)  
INSTRUMENTATION MONITORING - FALL 2024**



Site Number	Location	Name	Hwy	km
PH026	HWY 726:02 km 9.91, 10.30	North Eureka River Slide	726:02	Km 9.9, 10.3
<b>Legal Description:</b> 8-14-86-8 W6		<b>UTM Co-ordinates</b>		
		11U E 368433	N	6258811

<b>Current Monitoring:</b>	24-Sep-2024	<b>Previous Monitoring</b>	27-May-2024
<b>Instruments Read By:</b>	Mr. Neil McDonald and Mr. Nixson Mationg, of Thurber		

Instruments Read During This Site Visit			
<b>Slope Inclinometers (SIs):</b> SI11-3 and SI11-4 at Sites 5 and 6; SI12-P9U, SI12-P17U and SI12 P26U (Site 3 in the upper wall)  SI12-P3L, SI12-P9L and SI12-P14L (Site 3 in the lower wall)	<b>Pneumatic Piezometers (PN):</b> PN11-3	<b>Vibration Wire Piezometers (VW):</b> VW11-7	<b>Standpipe Piezometers (SP):</b>
<b>Load Cell (LC):</b> VC1759 (50U), VC1760(50L), VC1761(76L), VC1762(77U), VC1763(26L) and VC1764(27U) (All Site 3 upper wall)	<b>Strain Gauges:</b>	<b>SAAs:</b>	<b>Others:</b>

Readout Equipment Used			
<b>Slope Inclinometers:</b> Two RST Digital Inclinometer probes with 2 ft. wheelbases and RST Pocket PC readouts	<b>Pneumatic Piezometers:</b> RST C108 pneumatic piezometer readout	<b>Vibration Wire Piezometers:</b> Geokon GK 404 vibrating wire readout	<b>Standpipe Piezometers:</b>
<b>Load Cell:</b> RST Multichannel DTLINK software	<b>Strain Gauges:</b>	<b>SAAs:</b>	<b>Others:</b>
<b>Notes:</b> Significant noise was detected in the reading of SI12-P9L. The reading should be checked during the spring 2025 reading.			

Discussion	
<b>Zones of New Movement:</b>	None
<b>Interpretation of Monitoring Results:</b>	<p>Slope Indicators</p> <p>Slope inclinometer SI11-3 showed no discernible movement of over 0.5 m to 3.5 m depth since the spring of 2024 readings. Since 2013 the rate of movement has fluctuated and shows an overall rates of about 2.9 mm per year.</p> <p>SI11-4 shows subtle indefinite movement zones.</p> <p>Slope inclinometers SI12-P9U, SI12-P17U, SI12-P26U were installed in the upper wall. All three Sis showed similar deflection profiles</p>

wherein the anchors pull the piles and waler into the uphill side and the cantilever supported backfill above the waler pushes the Sis downhill.

SI12-P9U showed a rate of movement of 4.5 mm/yr over the length of the pile and waler from 2.7 m to 29.5 m depth and a rate of movement of 3.4 mm/yr over the length of the pile from 5.1 m to 29.0 5 m depth, since the spring of 2024 readings. The average rate of movement over the last 10 years has been near 0 mm/yr, excluding relative spring/fall oscillations. The total pile head movement to date has been 14.8 mm in the upslope direction of which about 3 mm of movement has occurred since 2014.

SI12-P17U showed a rate of movement of 7.7 mm/yr over the length of the pile and waler from 2.8 m to 29.0 m depth and a rate of movement of 6.2 mm/yr over the length of the pile from 5.2 m to 29.0 m depth, since the spring of 2024 readings. The average rate of movement over the last 10 years has been in the order of <-1 mm/yr, (or in the uphill direction), excluding relative spring/fall oscillations. The total pile head movement to date has been 21.7 mm in the upslope direction of which about 5 mm of movement has occurred since 2014.

SI12-P26U showed a rate of movement of 2.0 mm/yr over the length of the pile and waler from 2.5 m to 26.3 m depth and a rate of movement of 1.1 mm/yr over the length of the pile only from 4.9 m to 26.3 m depth. The average rate of movement over the last 10 years has been in the order of <-1 mm/yr, (or in the uphill direction), excluding relative spring/fall oscillations, except that the readings in the last year have shown a general trend reversal of about 2 mm/yr (or in the downhill direction) that may be attributed to the 2023 construction measures that occurred in this area. The total pile head movement to date has been 18.7 mm in the upslope direction of which about 7 mm has occurred since 2014.

Slope inclinometers SI12-P3L, SI12-P9L and SI12-P14L were installed in the lower wall adjacent to Eureka River.

SI12-P3L has shown a total pile head movement of 14.8 mm towards the river since installation, with a rate of movement of 4.4 mm/yr over 0.1 m to 19.6 m since the spring of 2024 readings. SI12-P9L has shown a total pile head movement of 10.9 mm in the downslope direction since installation, with no discernible movement over the length of the pile since the spring of 2024 readings. Significant noise was detected in the reading of SI12-P9L, so the movement rate should be reevaluated during the next readings. SI12-P14L has shown a total pile head movement of 3.2 mm in the downslope direction since installation, with no discernible movement since the spring of 2024 readings. The average rate of movement over the last 2 to 3 years has been near 0 mm/yr in all three of these lower pile wall pile inclinometers, except that the readings in the last year in only SI12-9L and SI12-14L have shown a trend change to about -3 to -4 mm/yr (or in the uphill direction) which may be attributed to the 2023 construction measures that occurred in close vicinity to this area.

#### Piezometers

Since the previous readings in the spring of 2024, the groundwater level in pneumatic piezometer PN11-3 increased by 0.32 m. Vibrating wire piezometer VW11-7 showed an increase in groundwater level of 0.05 m since the spring of 2024 readings. Over the longer term, since about 2014, both of these piezometers have shown a decreasing trend in groundwater levels

#### Load Cells

Anchors 26L and 27U are installed at pile P9 towards the north end of the pile wall. Anchors G50U and G50L are installed at pile P17 in the

	<p>central portion of the wall. Anchors G76L and G77U are installed at P26 towards the south end of the wall.</p> <p>Since the spring of 2024, the load cells showed minor changes in measured load ranging from a decrease in the measured load of 1.69 kN in VC1762 (anchor 77U) to an increase of 3.82 kN in VC1764 (anchor 27U). The current readings on the load cells varied from 171.10 kN in VC1762 (anchor 77U) to 227.67 kN in VC1764 (anchor 27U). The anchor design load was 300 kN and the anchors were locked off at 240 kN.</p> <p>The load cells at P9 (anchors 26L and 27U) show an increasing load trend while the load cells at P26 (anchors G76L and G77U) show a decreasing load trend. The lload cell readings at the middle pile, P17, are split with the lower anchor G50L showing a decreasing load pattern and the upper load cell, G50U, showing an increasing load pattern. This trend of diverging load trends is unlikely to be a concern for now, but if it continues there may be a concern for the load sharing of the wall structure, which could overstress the wall. All load cells readings are below the design load of 300 kN.</p> <p>The instrument readings at this site indicate that the landslide repairs at this site have been successful in stabilizing the slope movements.</p>
<b>Future Work:</b>	The instruments should be read again in the spring of 2025.
<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 PH026-1 Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Slope Inclinometer Instrumentation Reading Summary</li> <li>• Table PH026-2 Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Pneumatic Piezometer Instrumentation Reading Summary</li> <li>• Table PH026-3 Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Vibrating Wire Piezometer Instrumentation Reading Summary</li> <li>• Table PH026-4 Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Standpipe Piezometer Instrumentation Reading Summary</li> <li>• Table PH026-5 Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Load Cells Instrumentation Reading Summary (Upper Pile Wall)</li> <li>• Statement of Limitations and Conditions</li> <li>• APPENDIX A - PH026-1 FALL 2024 <ul style="list-style-type: none"> <li>○ Field Inspector's report</li> <li>○ Site Plan Showing Approximate Instrument Locations (Drawings No. 32123 PH026 1 and 32123-PH026-2)</li> <li>○ SI Reading Plots</li> <li>○ Figure PH026-1 (Piezometric Elevations)</li> <li>○ Figure PH026-2 (Piezometric Depths)</li> <li>○ Figure PH026-3 (Load Cell Readings)</li> <li>○ Figure PH026-4 (Load Cell Temperatures)</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 PH026-1: Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Slope Inclinometer Instrumentation Reading Summary**

Date Monitored: September 24, 2024

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AND DEPTH OF MOVEMENT TO DATE (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS OF SI	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)
SI08-1	Jan. 20, 2008	51.4 mm over 3.9 m to 5.1 m depth in 219° direction	102.6 mm/yr between May and Oct. 2008	Sheared off at 4.9 m	May 27, 2008	N/A	N/A	N/A
		22.8 mm over 5.1 m to 8.1 m depth in 219° direction	42.4 mm/yr between May and Oct. 2008			N/A	N/A	N/A
SI08-2	Jan. 20, 2008	7.4 mm over 8.1 m to 10.0 m depth in 270° direction	28.2 mm/yr between Jan and Feb. 2008	Sheared off at 9.8 m	Jan. 20, 2008	N/A	N/A	N/A
		17.7 mm over 11.8 m to 13.6 m depth in 270° direction	65.4 mm/yr between Jan. and Feb. 2008			N/A	N/A	N/A
SI08-3	Jan. 20, 2008	70.0 mm over 6.9 m to 10.0 m depth in 230° direction	142.5 mm/yr between May and Oct. 2008	Sheared off at 7.9 m	May 27, 2008	N/A	N/A	N/A
		43.7 mm over 8.1 m to 10.0 m depth in 260° direction	74.8 mm/yr between May and Oct. 2008			N/A	N/A	N/A
SI11-3	March 28, 2011	48.5 mm over 0.5 m to 3.5 m depth in 232° direction	42.3 mm/yr in October 2012	Active	May 27, 2024	No discernible movement	N/A	-4.1
SI11-4	March 27, 2011	No discernible movement	N/A	Active	May 27, 2024	N/A	N/A	N/A

Drawing 32123-PH026-1~2 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site



**Table PH026-1 – Continued...Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Slope Inclinometer Instrumentation Reading Summary**

Date Monitored: September 24, 2024

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AND DEPTH OF MOVEMENT TO DATE (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS OF SI	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)
SI11-5	March 27, 2011	40.4 mm over 8.2 m to 10.1 m depth in 216° direction	21.8 mm/yr in October 2012	Sheared at 8.7 m depth	September 25, 2013	N/A	N/A	N/A
SI11-6	March 25, 2011	48.3 mm over 16.2 m to 18.6 m depth in 256° direction	25.3 mm/yr In April 2011	Sheared at 17.1 m depth	September 25, 2013	N/A	N/A	N/A
SI11-7	March 24, 2011	35.9 mm over 17.4 m to 18.6 m depth in 246° direction	23.5 mm/yr In October 2012	Sheared off at 16.7 m	June 2, 2013	N/A	N/A	N/A
<b>UPPER WALL</b>								
SI12-P9U	October 2, 2012	-27.8 mm over 2.7 m to 29.5 m depth in 292° direction	-1040.4 mm/yr on August 8, 2013 *	Active	May 27, 2024	1.5	4.5	7.1
		-14.8 mm over 5.1 m to 29.5 m depth in 292° direction	-668.8 mm/yr on August 8, 2013 *			1.1	3.4	5.4
SI12-P17U	October 2, 2012	20.8 mm over 2.8 m to 29.0 m depth in 278° direction	-1920.7 mm/yr on August 10, 2013 *	Active	May 27, 2024	2.5	7.7	14.9
		-21.7 mm over 5.2 m to 29.0 m depth in 278° direction	-1189.1 mm/yr on August 10, 2013 *			2.0	6.2	11.3

Drawing 32123-PH026-1~2 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site

**Table PH026-1 – Continued...Fall 2024 – Hwy 726:02 Eureka River (Sites 3, 5 And 6) Slope Inclinator Instrumentation Reading Summary**  
 Date Monitored: September 24, 2024

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AND DEPTH OF MOVEMENT TO DATE (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS OF SI	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)
<b>UPPER WALL</b>								
SI12-P26U	October 2, 2012	-7.1 mm over 2.5 m to 26.3 m depth in 37° direction	-679.6 mm/yr on August 12, 2013 *	Active	May 27, 2024	0.7	2.0	1.3
		-18.7 mm over 4.9 m to 26.3 m depth in 37° direction	-465.6 mm/yr on August 12, 2013			0.4	1.1	0.1
<b>LOWER WALL</b>								
SI12-P3L	September 20, 2012	14.8 mm over 0.1 m to 19.6 m depth in 204° direction	10.6 mm/yr on September 20, 2014	Active	May 27, 2024	1.4	4.4	6.8
SI12-P9L	September 20, 2012	10.9 mm over 1.6 m to 19.9 m depth in 229° direction	85.1 mm/yr on August 14, 2013	Active	May 27, 2024	No discernible movement	N/A	-5.3
SI12-P14L	September 20, 2012	3.2 mm over 0.7 m to 20.2 m depth in 255° direction	4.8 mm/yr on October 22, 2021	Active	May 27, 2024	No discernible movement	N/A	-3.7

Drawing 32123-PH026-1~2 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site

**Table PH026-2: Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Pneumatic Piezometer Instrumentation Reading Summary**

Date Monitored: September 24, 2024

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED GROUNDWATER LEVEL BGS (m)	MEASURED PORE PRESSURE (kPa)	CURRENT GROUNDWATER LEVEL BGS (m)	PREVIOUS GROUNDWATER LEVEL BGS (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
PN08-1	January 20, 2008	10.0	N/A	Removed	9.71 on Oct. 13, 2008	N/A	N/A	9.79 (Sep 24, 2011)	N/A
PN08-2	January 20, 2008	10.0	N/A	Removed	9.31 on Oct. 13, 2008	N/A	N/A	9.55 (Sep 24, 2011)	N/A
PN08-3	January 20, 2008	10.2	N/A	Removed	9.84 on Oct. 13, 2008	N/A	N/A	10.02 (Sep 24, 2011)	N/A
PN11-3	March 27, 2011	23.5	N/A	Active	6.97 on March 28, 2011	101.7	13.13	13.45	0.32
PN11-4	March 26, 2011	24.1	N/A	Damaged	12.15 on March 28, 2011	N/A	N/A	16.36 (Oct 2, 2012)	N/A
PN11-6	March 25, 2011	18.8	N/A	Damaged	10.83 on Sept. 25, 2013	N/A	N/A	12.41 (Oct 3, 2017)	N/A

Drawing 32123-PH026-1 & -2 in Appendix A provide sketches of the approximate locations of the monitoring instrumentation for this site

Notes:

PN - pneumatic piezometer.

BGS- below ground surface.



**Table PH026-3: Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Vibrating Wire Piezometer Instrumentation Reading Summary**

Date Monitored: September 24, 2024

<b>INSTRUMENT</b>	<b>DATE INITIALIZED</b>	<b>TIP ELEV. (m)</b>	<b>GROUND ELEV. (m)</b>	<b>CURRENT STATUS</b>	<b>HIGHEST MEASURED WATER LEVEL BGS (m)</b>	<b>CURRENT GROUNDWATER DEPTH (mBGS)</b>	<b>PREVIOUS GROUNDWATER DEPTH (mBGS)</b>	<b>CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)</b>
VW11-1U	March 28, 2011	N/A	N/A	Removed	5.23 mBGS on September 24, 2011	N/A	5.23 (Sep 24, 2011)	N/A
VW11-1L	March 28, 2011	N/A	N/A	Removed	8.98 mBGS on March 28, 2011	N/A	10.62 (Sep 24, 2011)	N/A
VW11-2U	March 27, 2011	N/A	N/A	Destroyed	6.34 mBGS on June 4, 2011	N/A	8.38 (Oct. 2, 2012)	N/A
VW11-2L	March 27, 2011	N/A	N/A	Damaged	12.14 mBGS on March 27, 2011	N/A	13.68 (June 13, 2012)	N/A
VW11-5	March 25, 2011	N/A	N/A	Removed	10.63 mBGS on March 25, 2011	N/A	19.61 (October 2, 2018)	N/A
VW11-7	March 25, 2011	N/A	N/A	Active	14.93 mBGS on June 3, 2014	16.00	16.05	0.05

Drawing 32123-PH026-1 & -2 in Appendix A provide sketches of the approximate locations of the monitoring instrumentation for this site

**Table PH026-4: Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Standpipe Piezometer Instrumentation Reading Summary**

Date Monitored: Not Monitored

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV.* (m)	CURRENT STATUS	MAXIMUM MEASURED WATER LEVEL BGS (m)	MEASURED WATER LEVEL BGS (m)	PREVIOUS READING BGS (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
SP19-1	March 26, 2019	8.8	604.30	Removed during Construction	1.72 on June 22, 2022	N/A	2.93 (Oct. 2, 2022)	N/A
SP19-2	March 26, 2019	19.1	613.30	Removed during Construction	10.37 on June 19, 2020	N/A	11.48 (Oct. 2, 2022)	N/A

Drawing 32123-PH026-1& -2 in Appendix A provide sketches of the approximate locations of the monitoring instrumentation for this site.

SP19-1 and 19-2 were removed in the summer of 2023 during slide repair construction.

\*Note: Elevations obtained from ARA in 2019. A different survey datum was used (~12.5 m higher than the previous datum)

**Table PH026-5: Fall 2024 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Load Cells Instrumentation Reading Summary (Upper Pile Wall)**

Date Monitored: September 24, 2024

ANCHOR NUMBER/ROW	PILE # AND POSITION	SERIAL #	DESIGN LOAD / LOCK-OFF LOAD (kN)	MAXIMUM RECORDED LOAD (kN)	MEASURED LOAD <sup>(1)</sup> (Sep. 24, 2024) (kN)	PREVIOUS RECORDED LOAD <sup>(1)</sup> (May 27, 2024) (kN)	CHANGE IN LOAD SINCE PREVIOUS READING (kN)
26L	P9/center	VC1763	300 / 240	255.06 on August 24, 2013	211.21	209.32	1.89
27U	P9/south	VC1764	300 / 240	258.68 on August 28, 2013	227.67	223.85	3.82
50U	P17/center	VC1759	300 / 240	250.13 on August 28, 2013	207.14	205.61	1.53
50L	P17/center	VC1760	300 / 240	252.88 on August 28, 2013	185.66	187.13	-1.47
76L	P26/north	VC1761	300 / 240	264.72 on August 15, 2013	183.15	182.40	0.75
77U	P26/center	VC1762	300 / 240	261.41 on August 16, 2013	171.10 <sup>(2)</sup>	172.79 <sup>(2)</sup>	-1.69

Drawing 32123-PH026-1& -2 in Appendix A provides sketches of the approximate locations of the monitoring instrumentation for this site

Notes:

1. Load cell data is recorded twice daily with dataloggers on site. Dataloggers are downloaded twice annually during instrumentation readings. See Figures PH026-3 and PH026-4 Appendix A for complete historical instrument readings.
2. As of October 16, 2013, at 9:59 one of the vibrating wires in VC1762 (anchor 77U) has stopped working. The measured force is an average of two vibrating wires instead of three
3. The battery for the datalogger for load cells VC1759 and VC1760 was dead between September 18, 2019 and June 19, 2020. No data was collected between those dates.
4. U designates upper row anchors. L designates lower row anchors.



## STATEMENT OF LIMITATIONS AND CONDITIONS

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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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### 7. 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 others 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.



**THURBER** ENGINEERING LTD.

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP (CON0022165)  
PEACE REGION (GRANDE PRAIRIE DISTRICT – NORTH)  
INSTRUMENTATION MONITORING RESULTS**

**FALL 2024**

**APPENDIX A  
DATA PRESENTATION**

**SITE PH026: HWY 726:02, EUREKA RIVER (SITES 3, 5 AND 6)**

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS  
PEACE REGION (GRANDE PRAIRIE - NORTH DISTRICT)  
INSTRUMENTATION MONITORING FIELD SUMMARY (PH026)  
FALL 2024**

<b>Location:</b> North Eureka River Slide (HWY 726:02 C1 9.911)	<b>Readout:</b> RST PN C108 Unit 4, VW GIC 404, S/N 364
<b>File Number:</b> 32123	<b>Casing size:</b> 2.75
<b>Probe:</b> RST SI Set 5R & 8R	<b>Temp:</b> 15C
<b>Cable:</b> RST SI Set 5R & 8R	<b>Read by:</b> NNM/NRM

**SLOPE INCLINOMETER (SI) READINGS**

SI#	GPS Location (UTM 11)		Date	Stickup (m)	Depth from top of casing (ft)	Azimuth of A+ Groove	Current Bottom Depth Readings				Probe/ Reel #	Size (")	Remarks
	Easting (m)	Northing (m)					A+	A-	B+	B-			
SI11-3	368433	6258811	24-Sep-24	1.05	88 to 2	218	1633	-1618	-770	773	8R/8R	2.75	
SI11-4	368446.63	6258834.32	24-Sep-24	0.85	98 to 2	198	267	-245	1983	-1984	8R/8R	2.75	
<b>Upper Wall</b>													
SI12-P9U	368400.67	6258635.59	24-Sep-24	0.7	2 to 98	250	127	-114	-307	296	5R/5R	2.75	No extension
SI12-P17U	368400.98	6258605.62	24-Sep-24	1.2	2 to 98	286	-554	564	361	-382	5R/5R	2.75	
SI12-P26U	368401.31	6258572.75	24-Sep-24	0.85	2 to 90	10	-415	421	-50	32	5R/5R	2.75	
SI12-P3L	368360	6258629	24-Sep-24	1.42	2 to 68	204	500	-488	255	-273	5R/5R	2.75	
SI12-P9L	368371.87	6258609.86	24-Sep-24	-0.4	2 to 63	200	418	-404	-187	221	5R/5R	2.75	
SI12-P14L	368371.25	6258589.95	24-Sep-24	0.8	2 to 68	268	110	-98	-721	703	5R/5R	2.75	

**PNEUMATIC PIEZOMETER READINGS**

PN#	GPS Location (UTM 11)		Date	Reading (kPa)	Identification Number
	Easting (m)	Northing (m)			
PN11-3	368433.82	6258811.21	24-Sep-24	101.7	33812

**VIBRATING WIRE PIEZOMETER (VW) READINGS**

VW #	GPS Location (UTM 11)		Date	Reading (Dg/°C)	Identification Number
	Easting (m)	Northing (m)			
VW11-7	368402.00	6258729.78	24-Sep-24	8282.4 / 4.2	16449

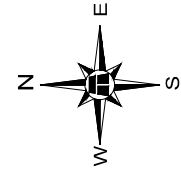
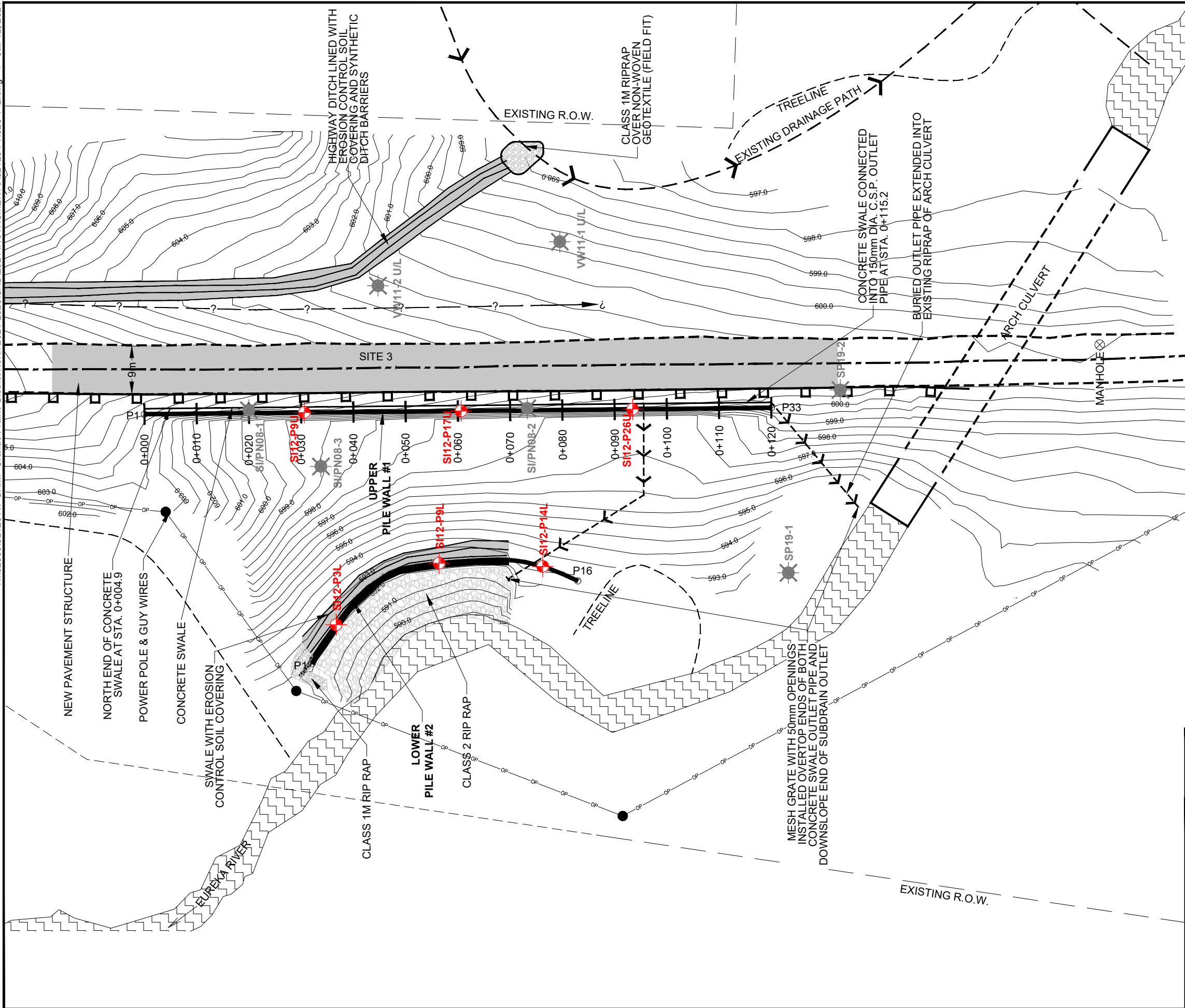
**VIBRATING WIRE LOAD CELL (VC) READINGS**

ANCHOR #	VC #	GPS Location (UTM 11)		Datalogger Serial #	Date	PILE NUMBER AND POSITION	Comment
		Easting (m)	Northing (m)				
50U	VC1759	368400.99	6228605.61	RST 2699	24-Sep-24	P17 CENTER	Downloaded
50L	VC1760	368400.99	6228605.61				Downloaded
76L	VC1761	368401.32	6258573.83	RST 2700		P26 NORTH	Downloaded
77U	VC1762	368401.32	6258572.76			P26 CENTER	Downloaded
26L	VC1763	368400.68	6258635.61	RST 2701		P9 CENTER	Downloaded
27U	VC1764	368400.68	6258634.54			P9 SOUTH	Downloaded



**INSPECTOR REPORT**

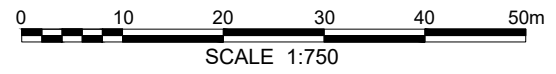
* SI12-P9L is -.040m from ground surface inside Metal box
**SP19-2 is flushmounted in southbound highway lane


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**LEGEND**

-  INSTRUMENTS LOCATED IN THE PILE WALLS
-  INSTRUMENT NOT IN USE






**PEACE REGION  
(GRANDE PRAIRIE DISTRICT NORTH)**

**PH026: HWY 726:02 S. OF WORSLEY, SITE #3  
SITE PLAN SHOWING INSTRUMENT LOCATIONS**

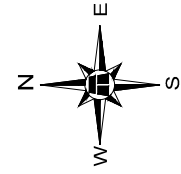
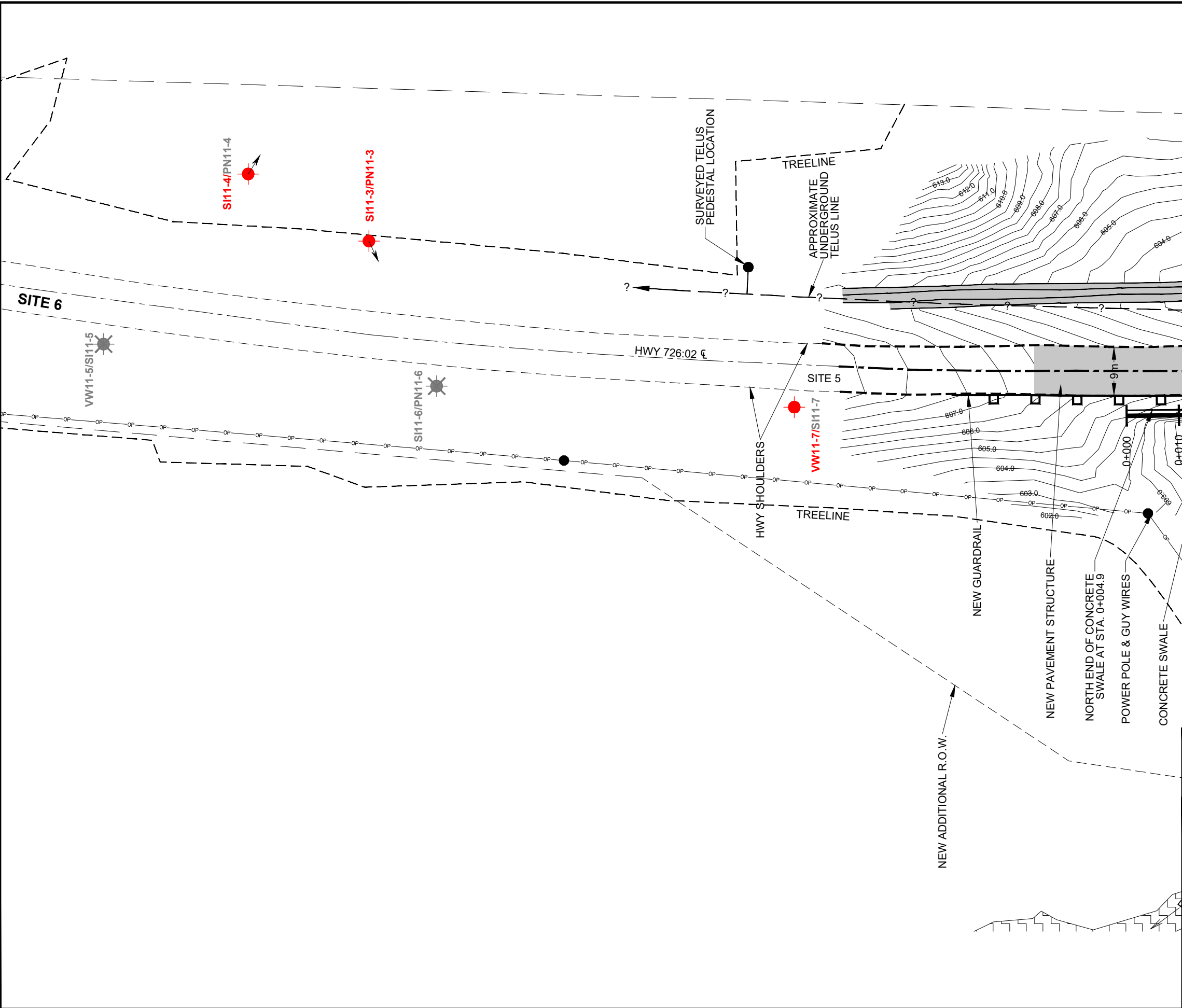
DWG No. 32123-PH026-1

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	DWP
SCALE	1:750
DATE	JULY 2024
FILE No.	32123






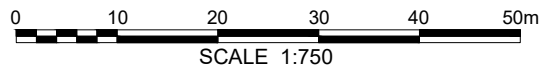
**THURBER ENGINEERING LTD.**


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**LEGEND**

-  INSTRUMENT LOCATIONS (NOT SURVEYED)
-  DIRECTION OF MOVEMENT IN SLOPE INCLINOMETER
-  INSTRUMENT NOT IN USE






**PEACE REGION  
(GRANDE PRAIRIE DISTRICT NORTH)**

**PH026: HWY 726:02 S. OF WORSLEY, SITES #5 & #6  
SITE PLAN SHOWING INSTRUMENT LOCATIONS**

DWG No. 32123-PH026-2

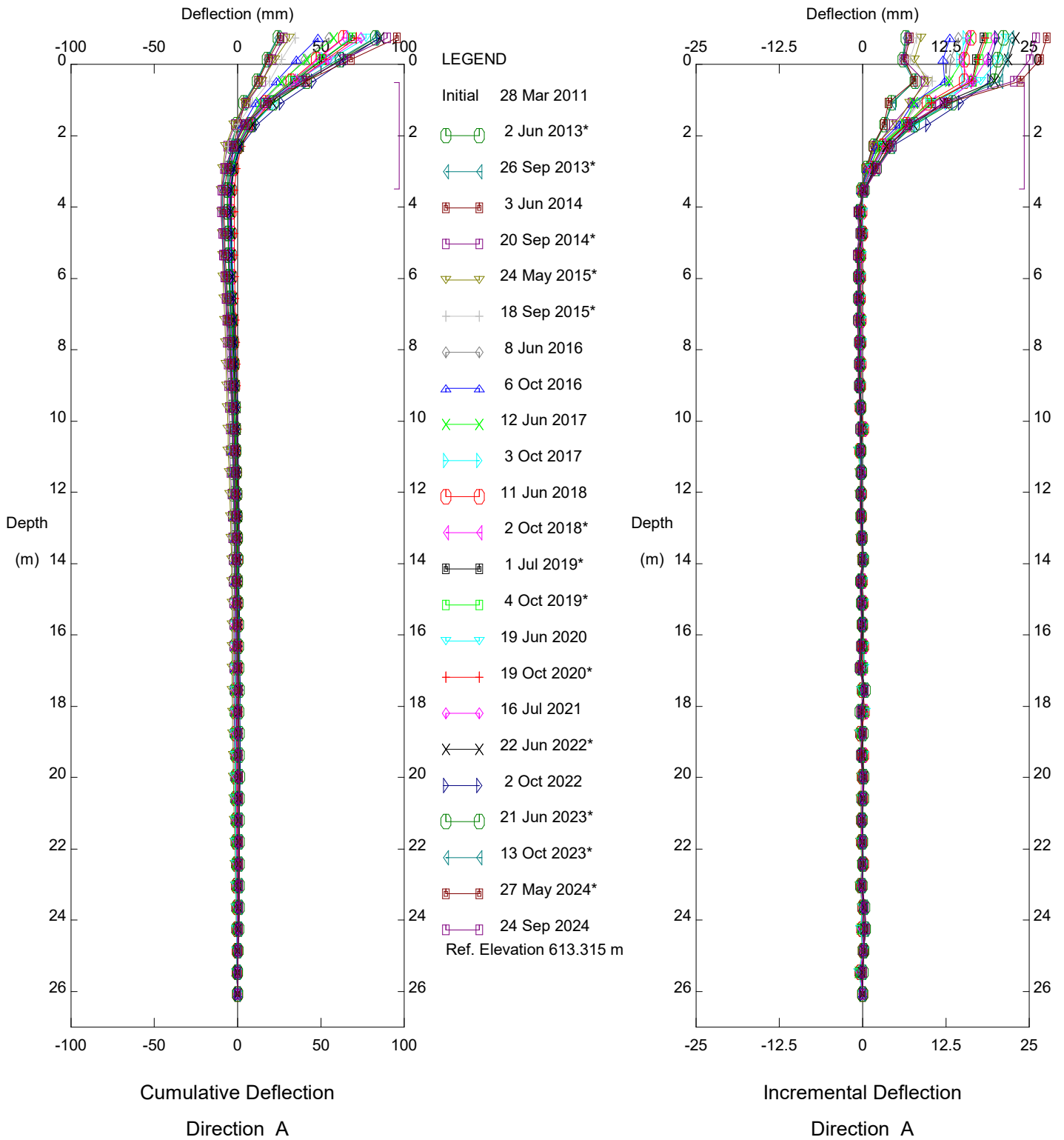
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DESIGNED BY	BWN
APPROVED BY	DWP
SCALE	1:750
DATE	JULY 2024
FILE No.	32123



**THURBER ENGINEERING LTD.**



Thurber Engineering Ltd.

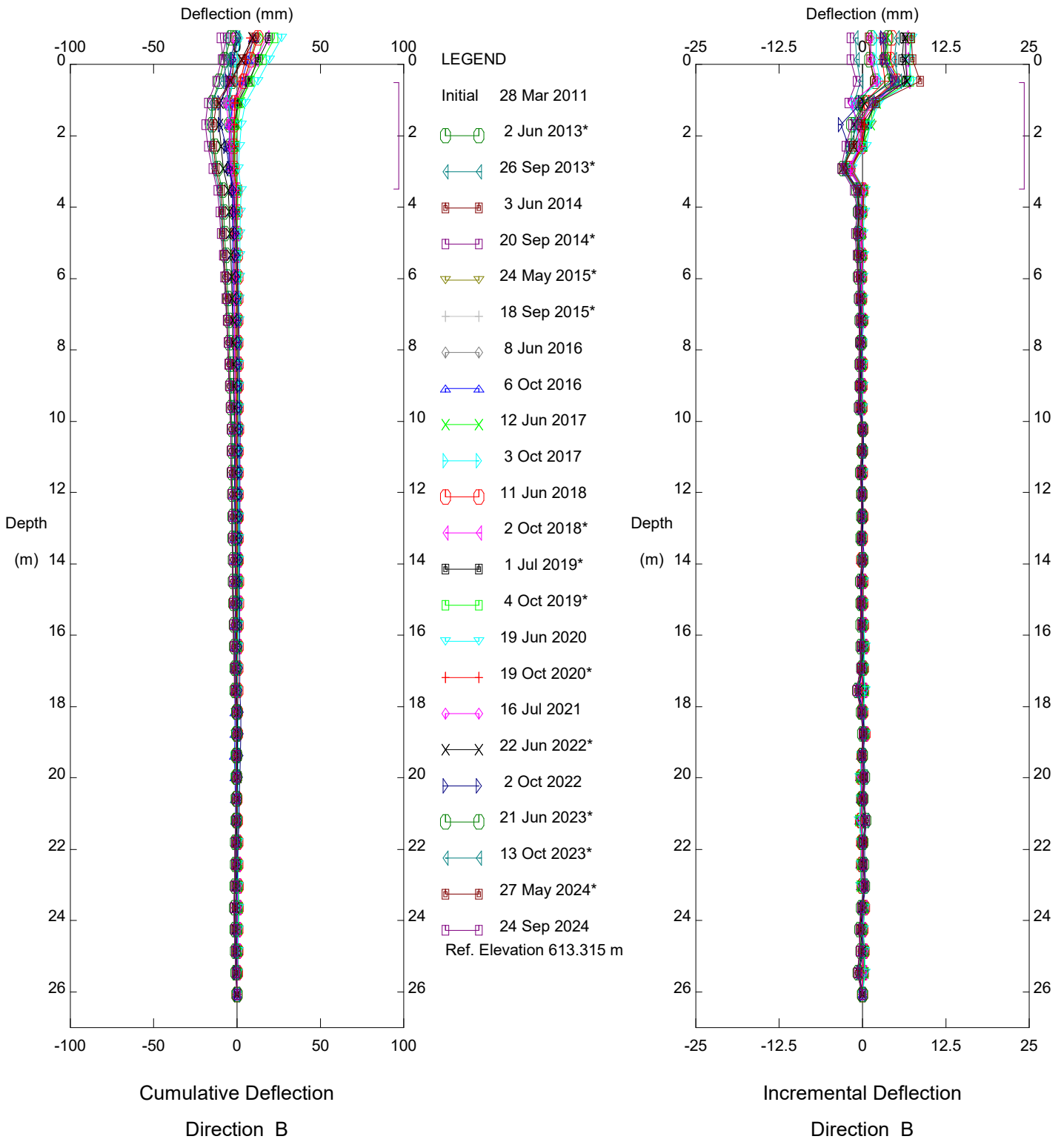


Hwy 726:02 Eureka River, PH026, Inclinometer SI11-3

Alberta Transportation

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

Thurber Engineering Ltd.

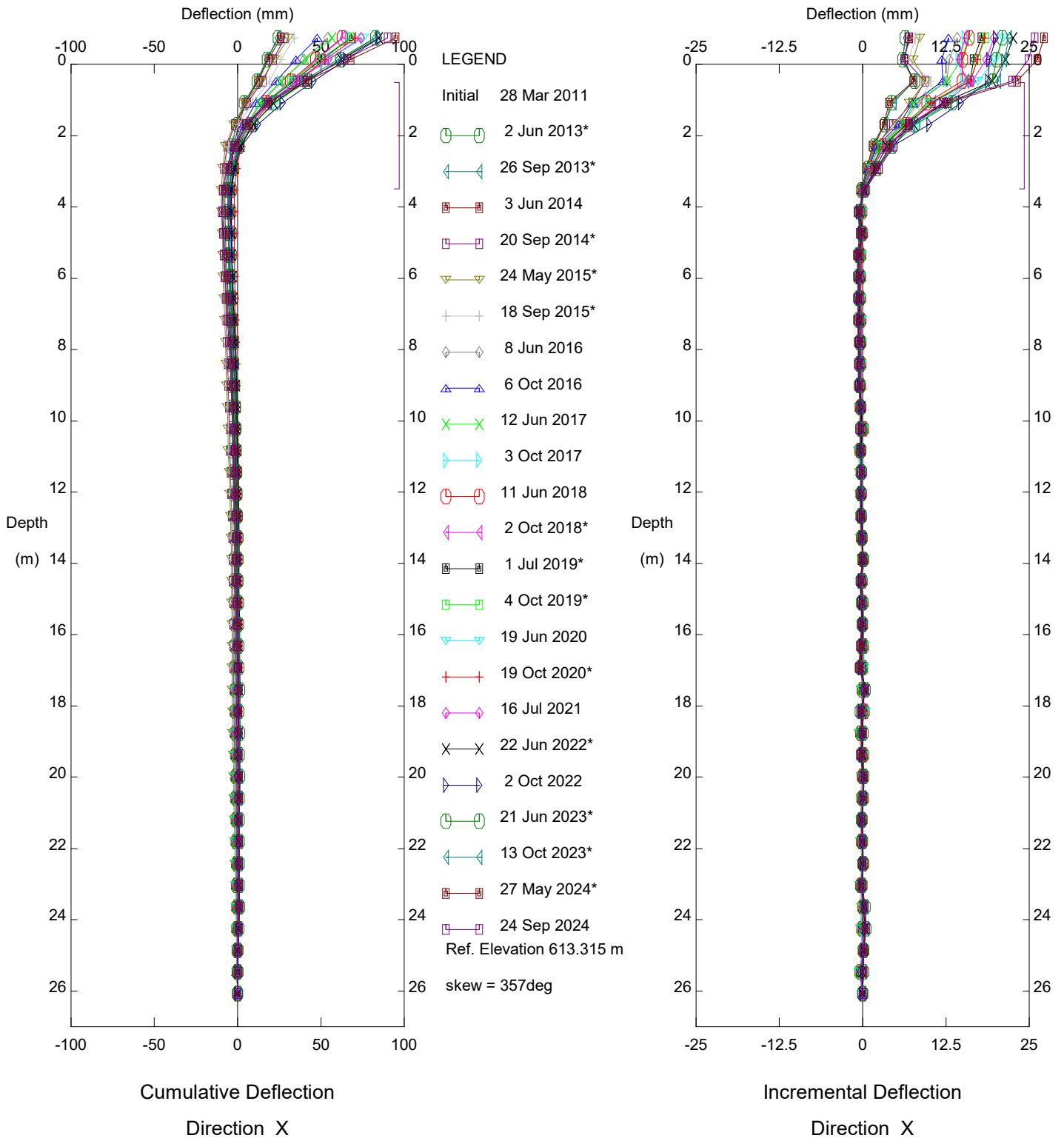


Hwy 726:02 Eureka River, PH026, Inclinometer SI11-3

Alberta Transportation

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Thurber Engineering Ltd.

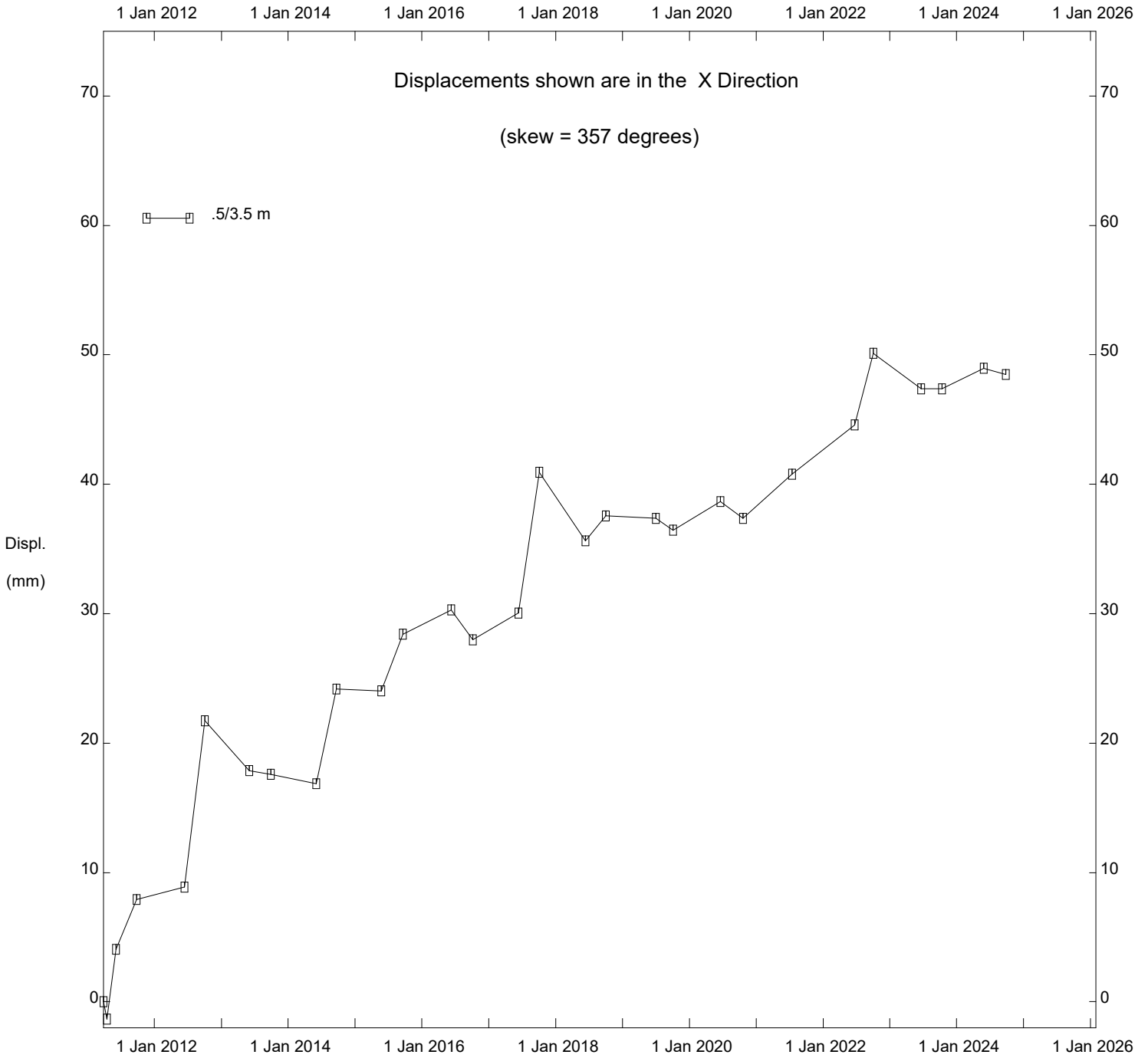


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Alberta Transportation

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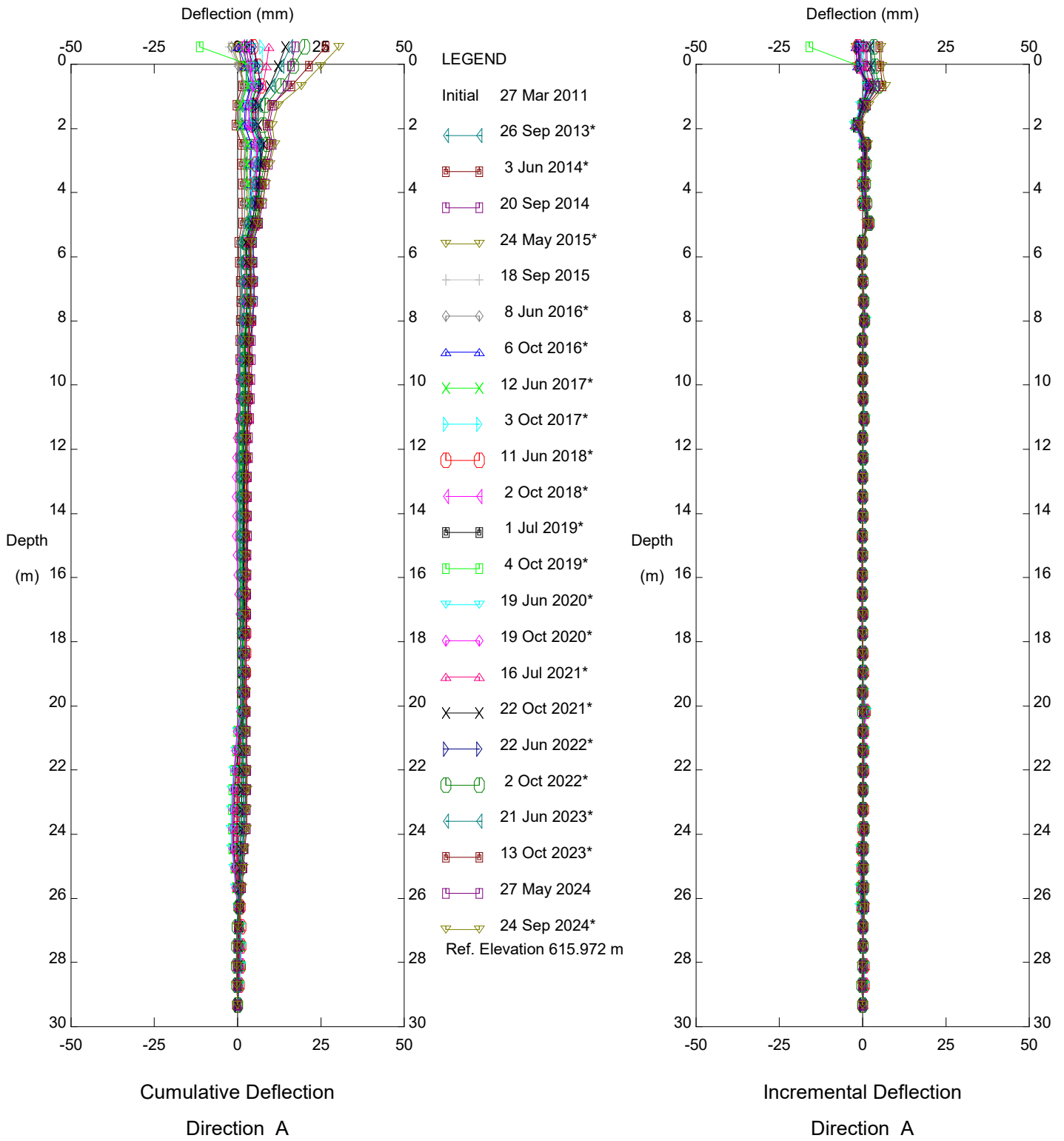
Thurber Engineering Ltd.



Hwy 726:02 Eureka River, PH026, Inclinator SI11-3

Alberta Transportation

Thurber Engineering Ltd.

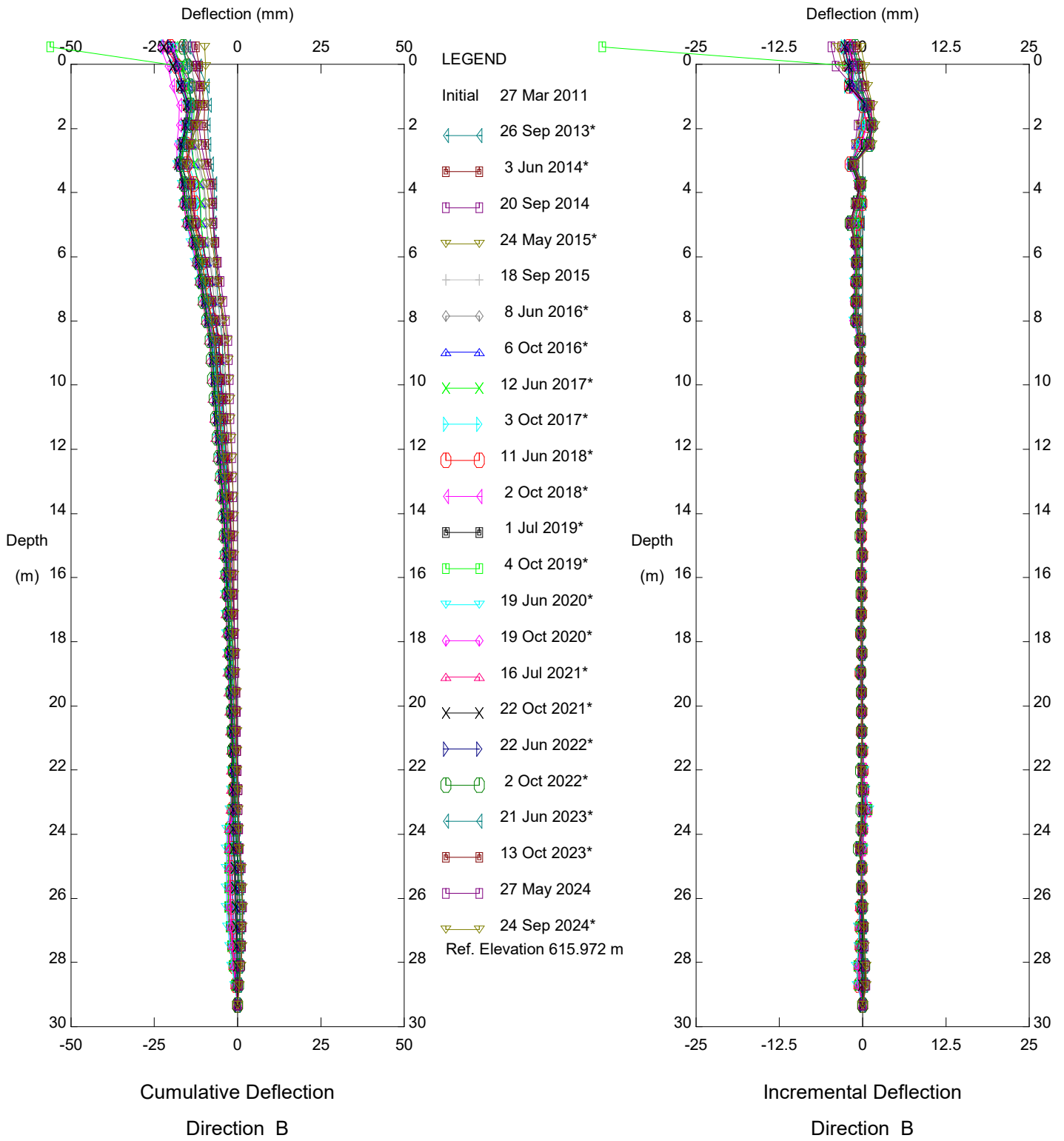


Hwy 726:02 Eureka River, PH026, Inclinometer SI11-4

Alberta Transportation

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

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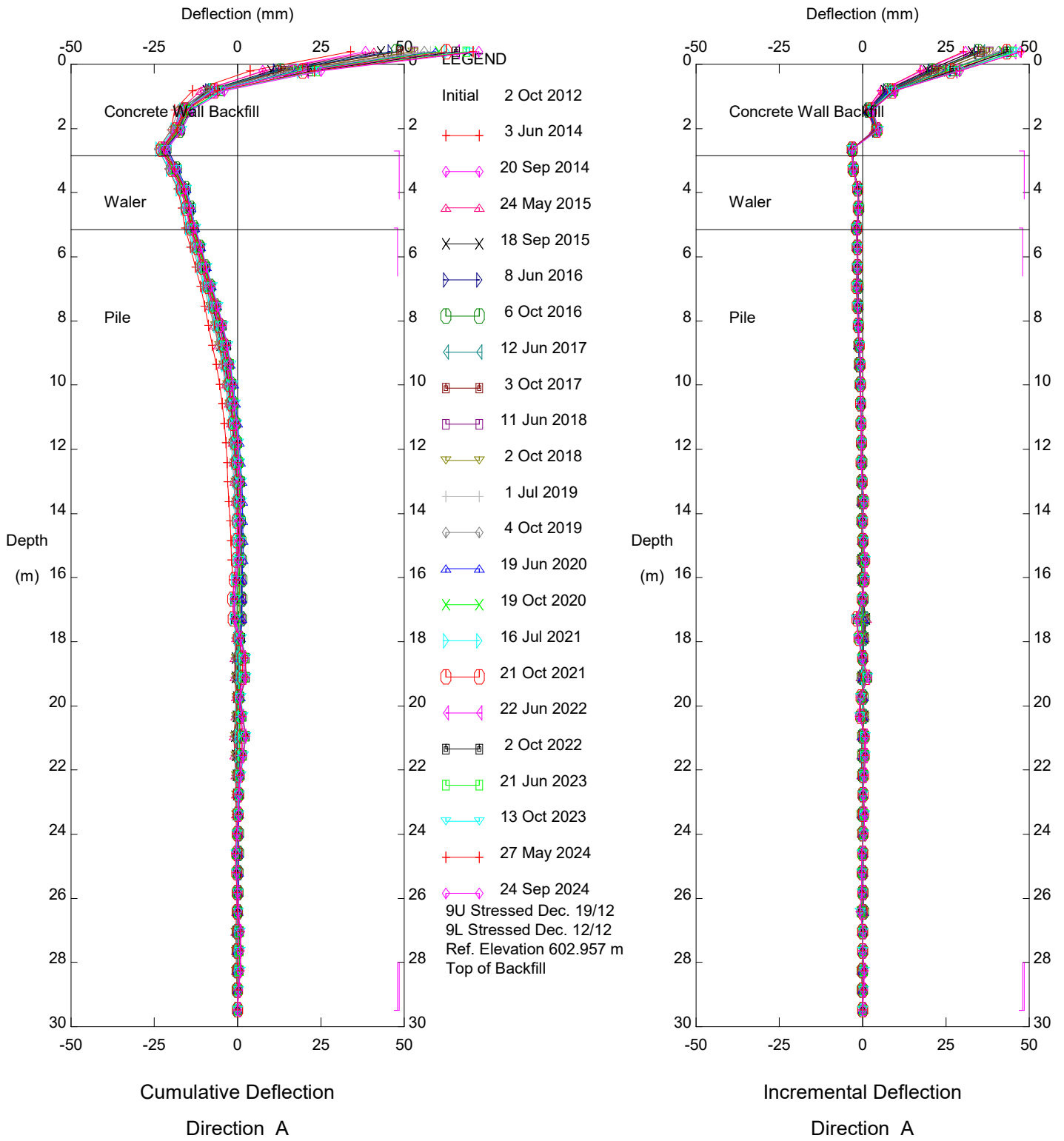


Hwy 726:02 Eureka River, PH026, Inclinometer SI11-4

Alberta Transportation

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

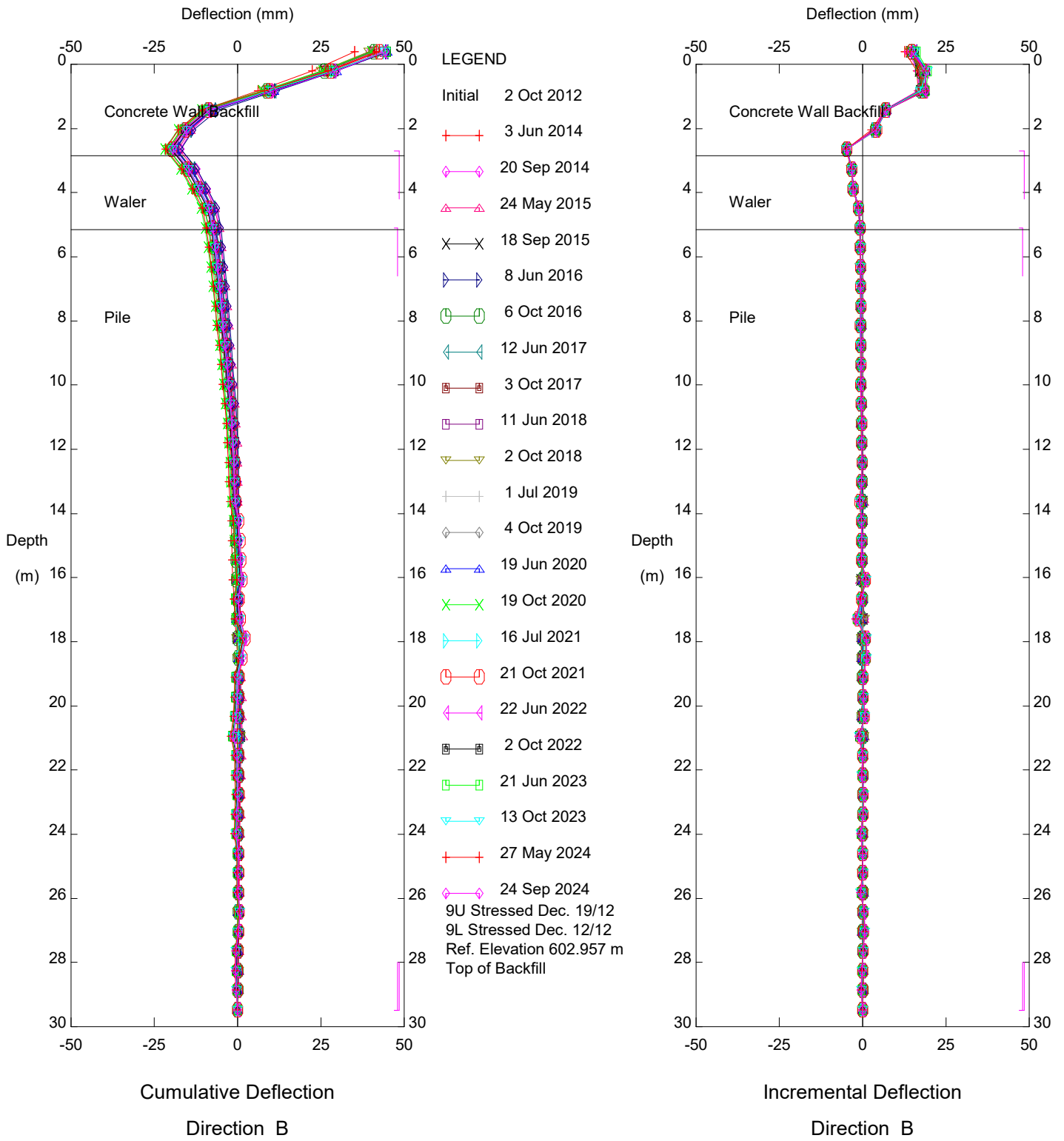
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PH026 Eureka River Upper Wall, Inclinometer SI12-P9U

Alberta Transportation

Thurber Engineering Ltd.

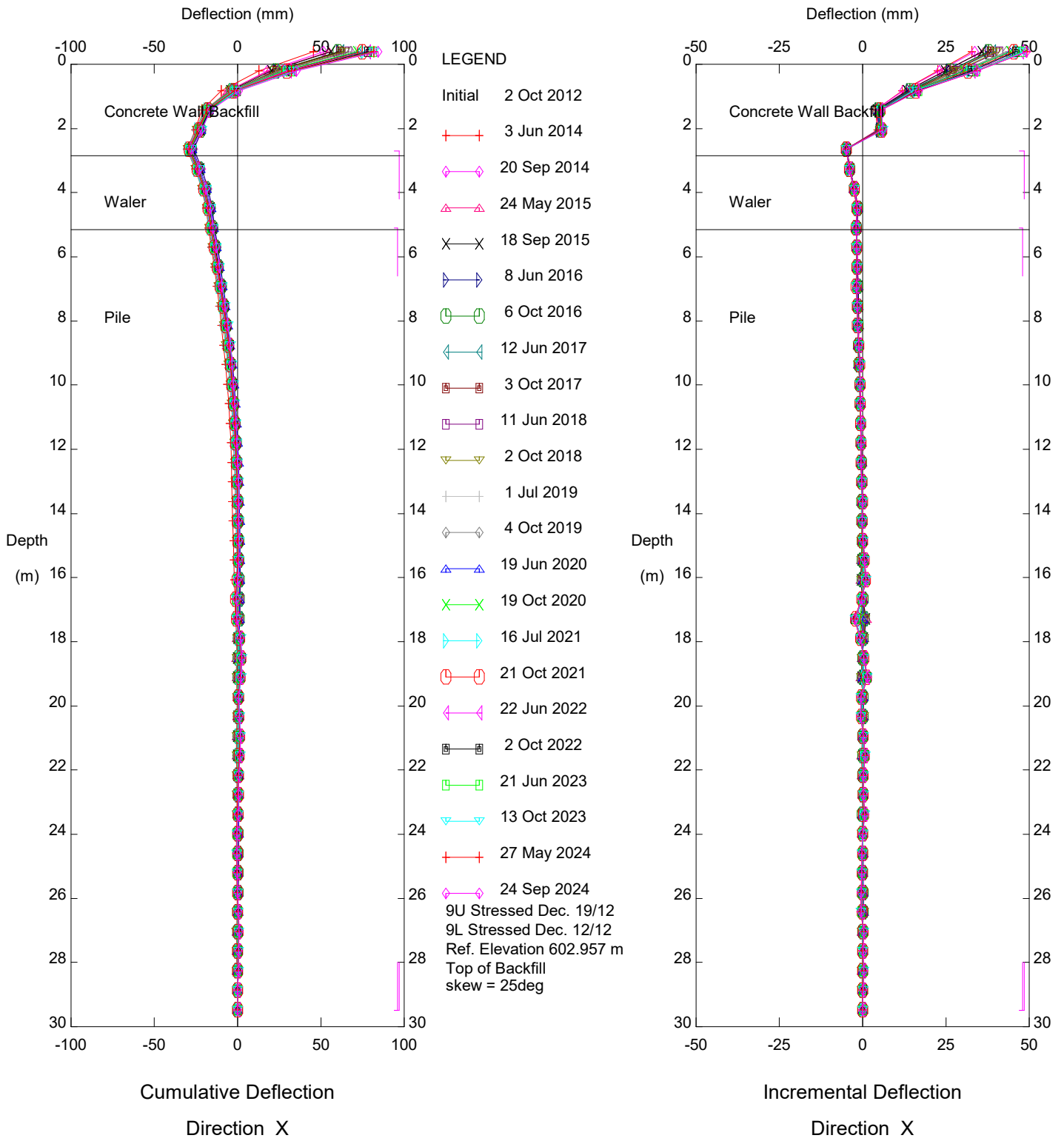


PH026 Eureka River Upper Wall, Inclinometer SI12-P9U

Alberta Transportation



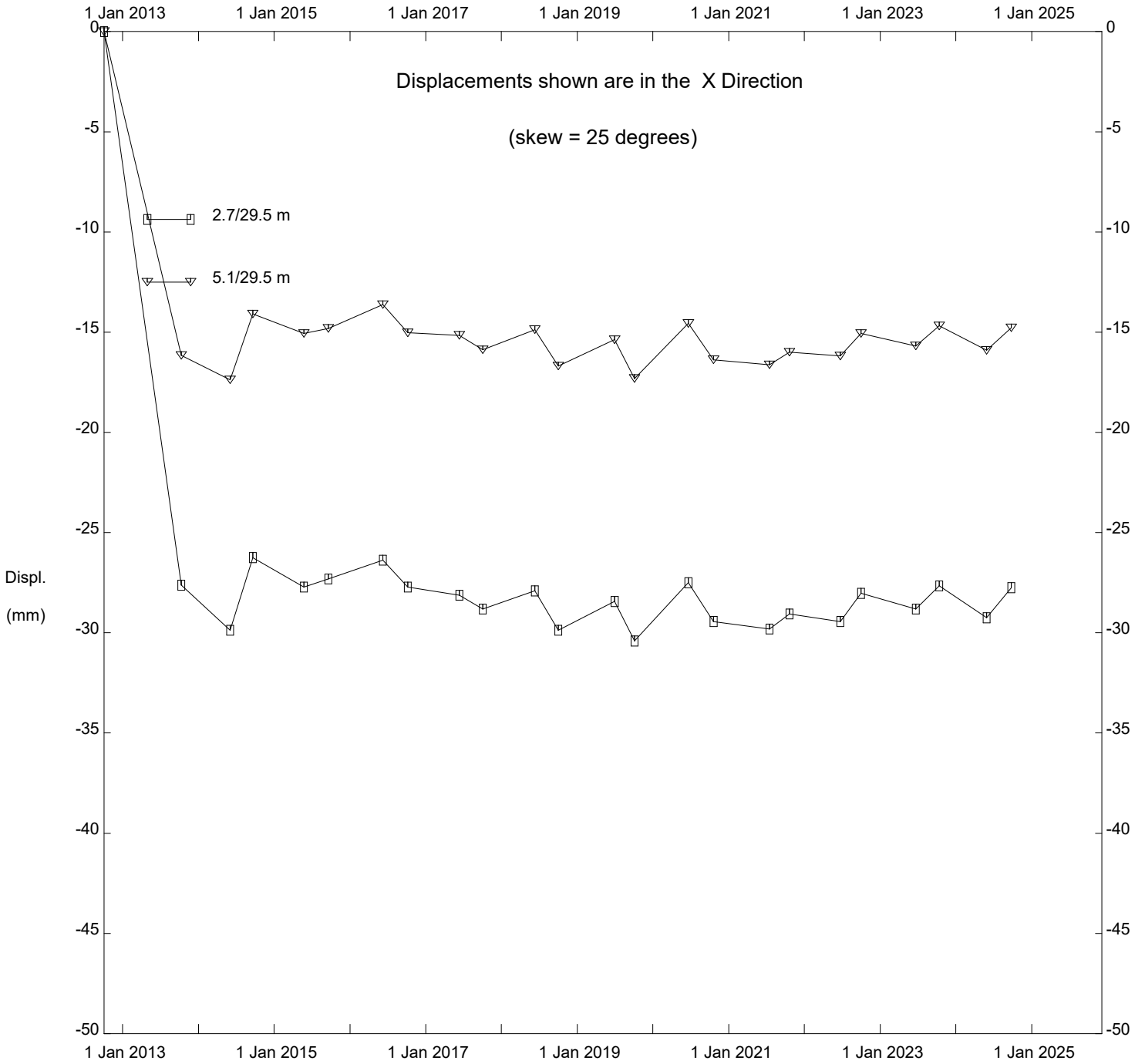
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PH026 Eureka River Upper Wall, Inclinometer SI12-P9U

Alberta Transportation

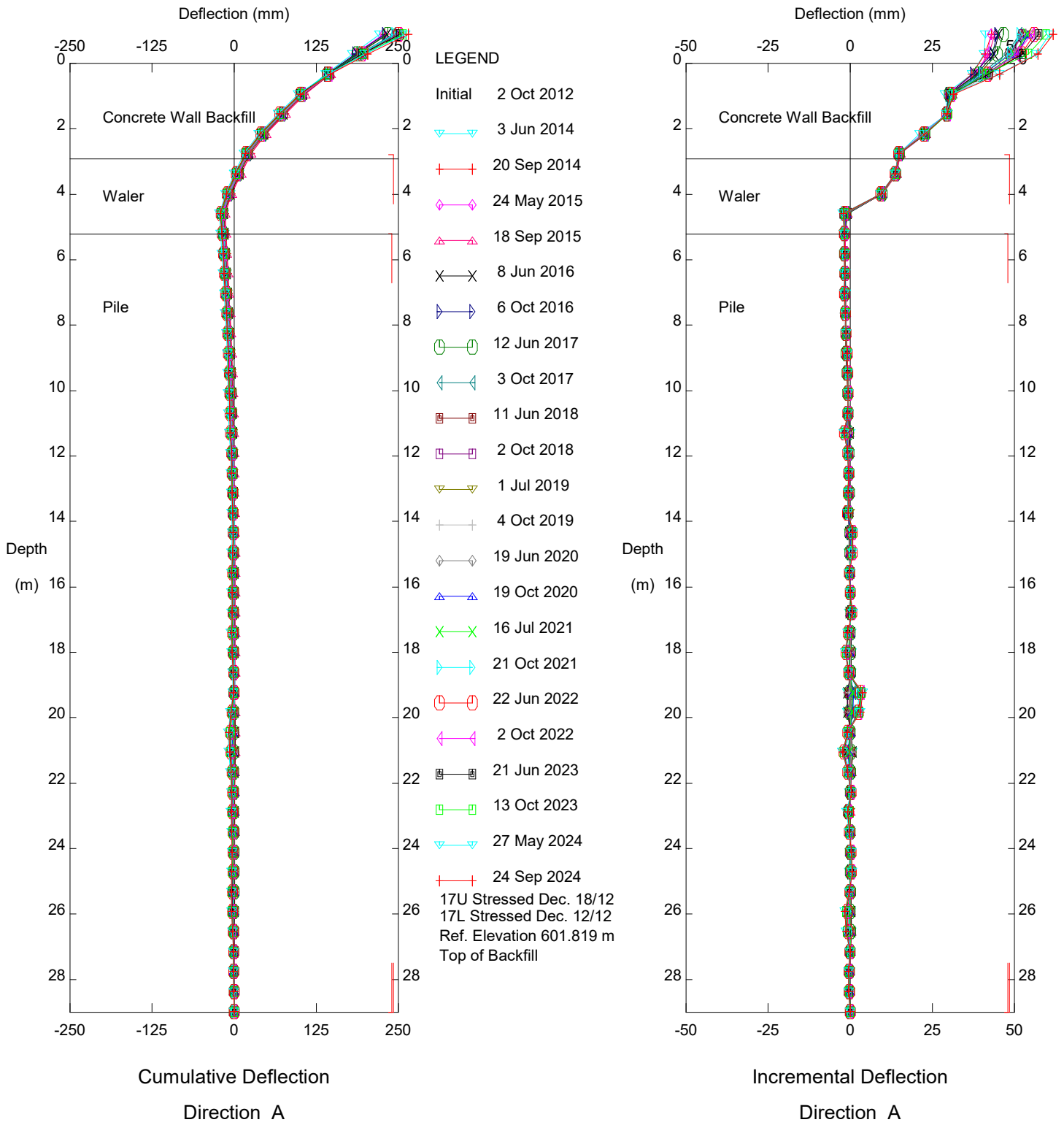
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Alberta Transportation

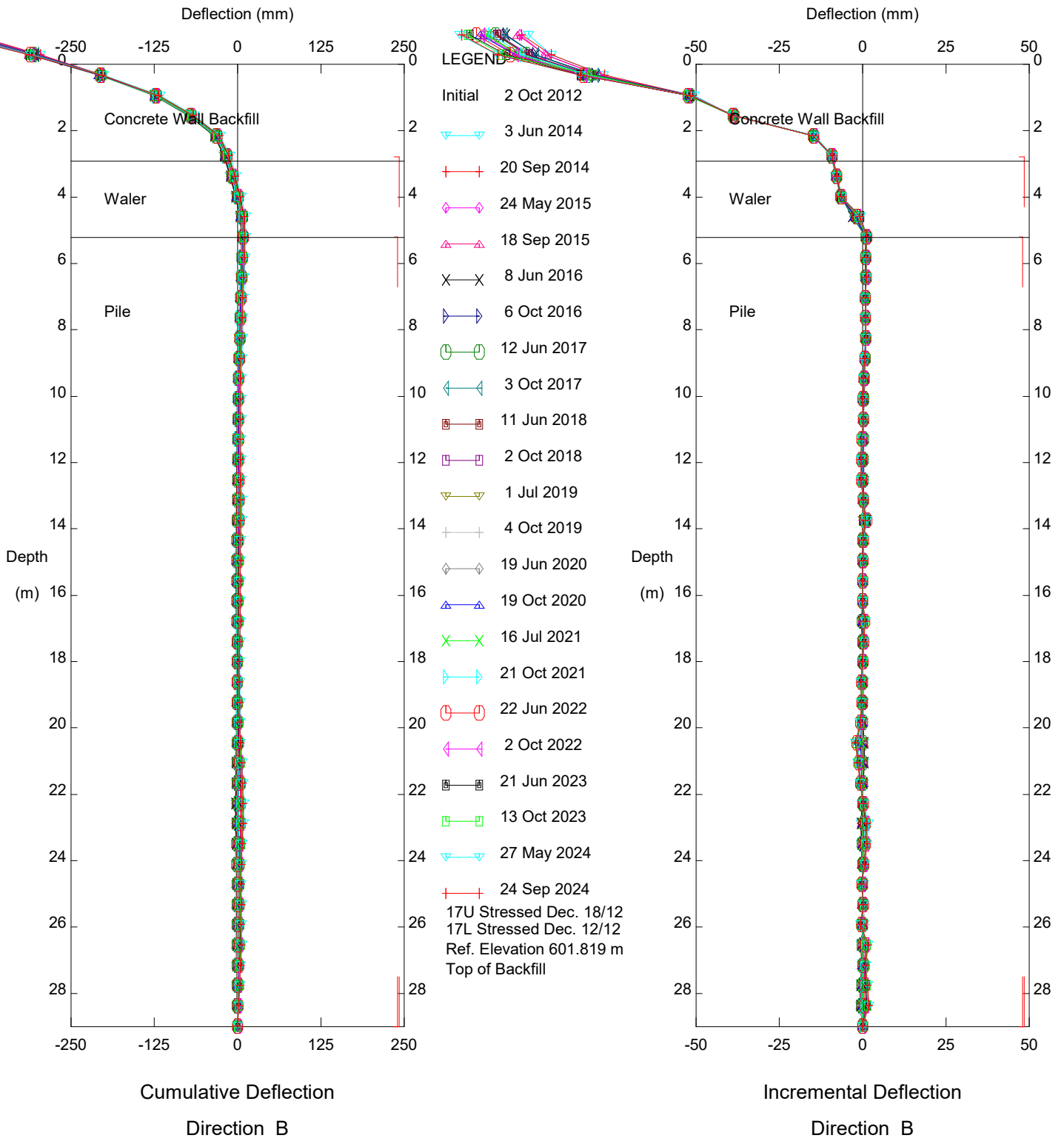
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Alberta Transportation

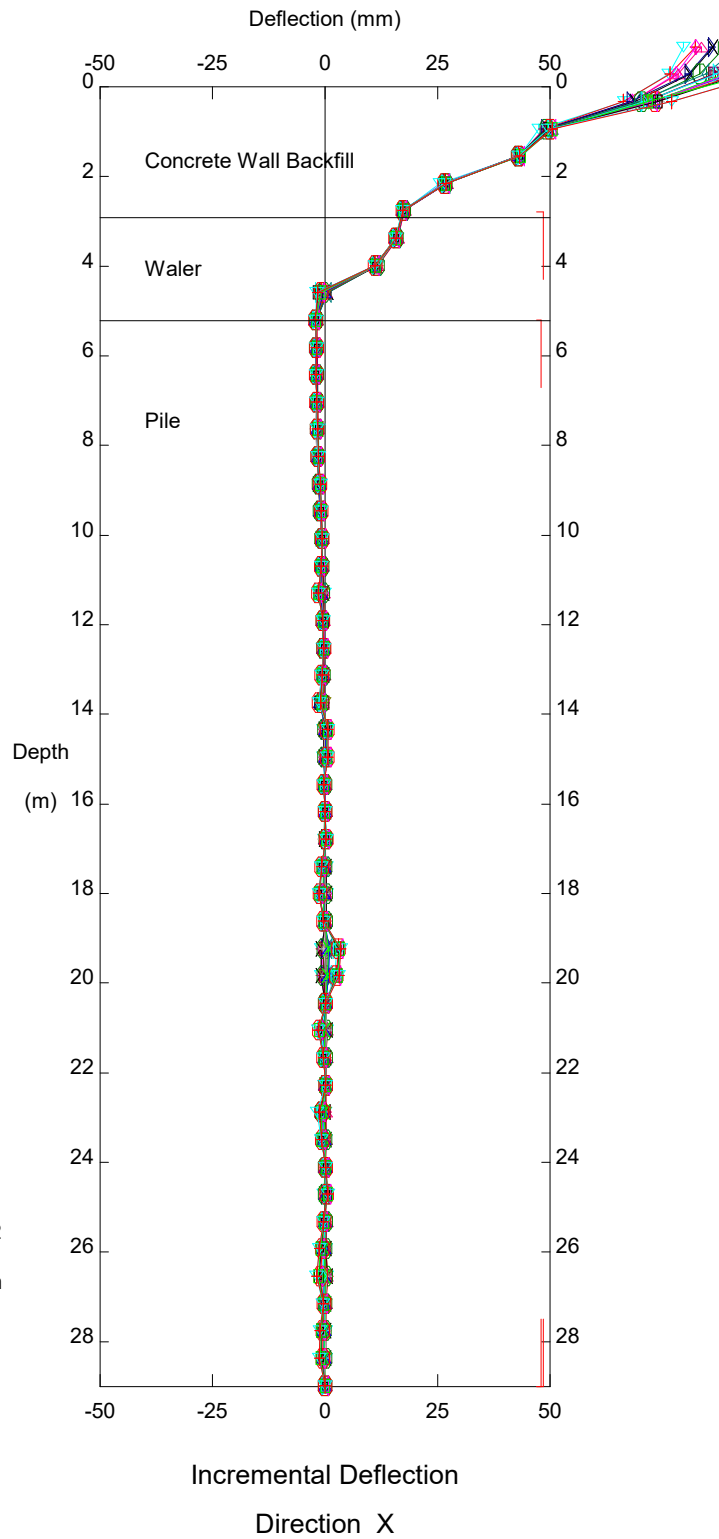
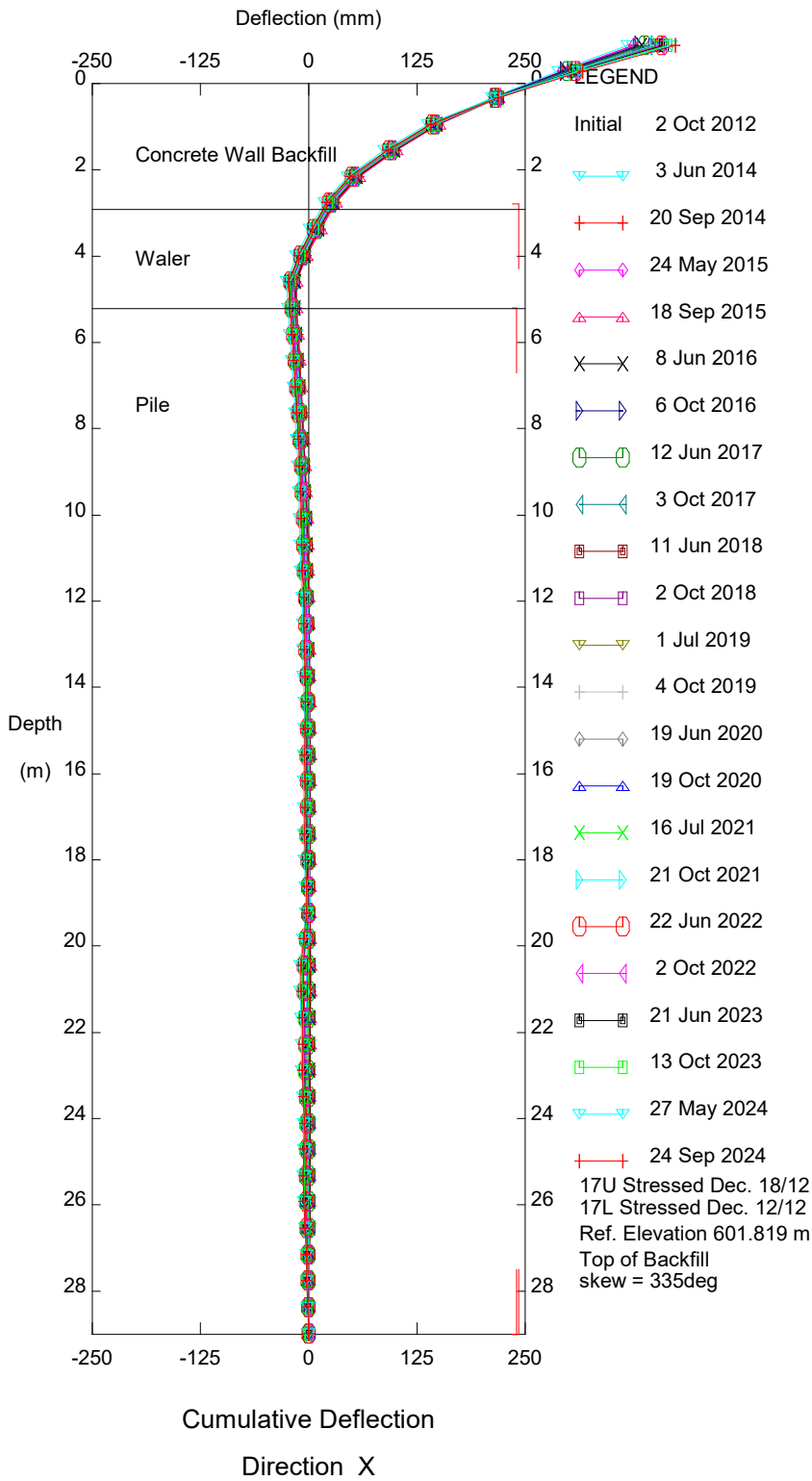
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Alberta Transportation

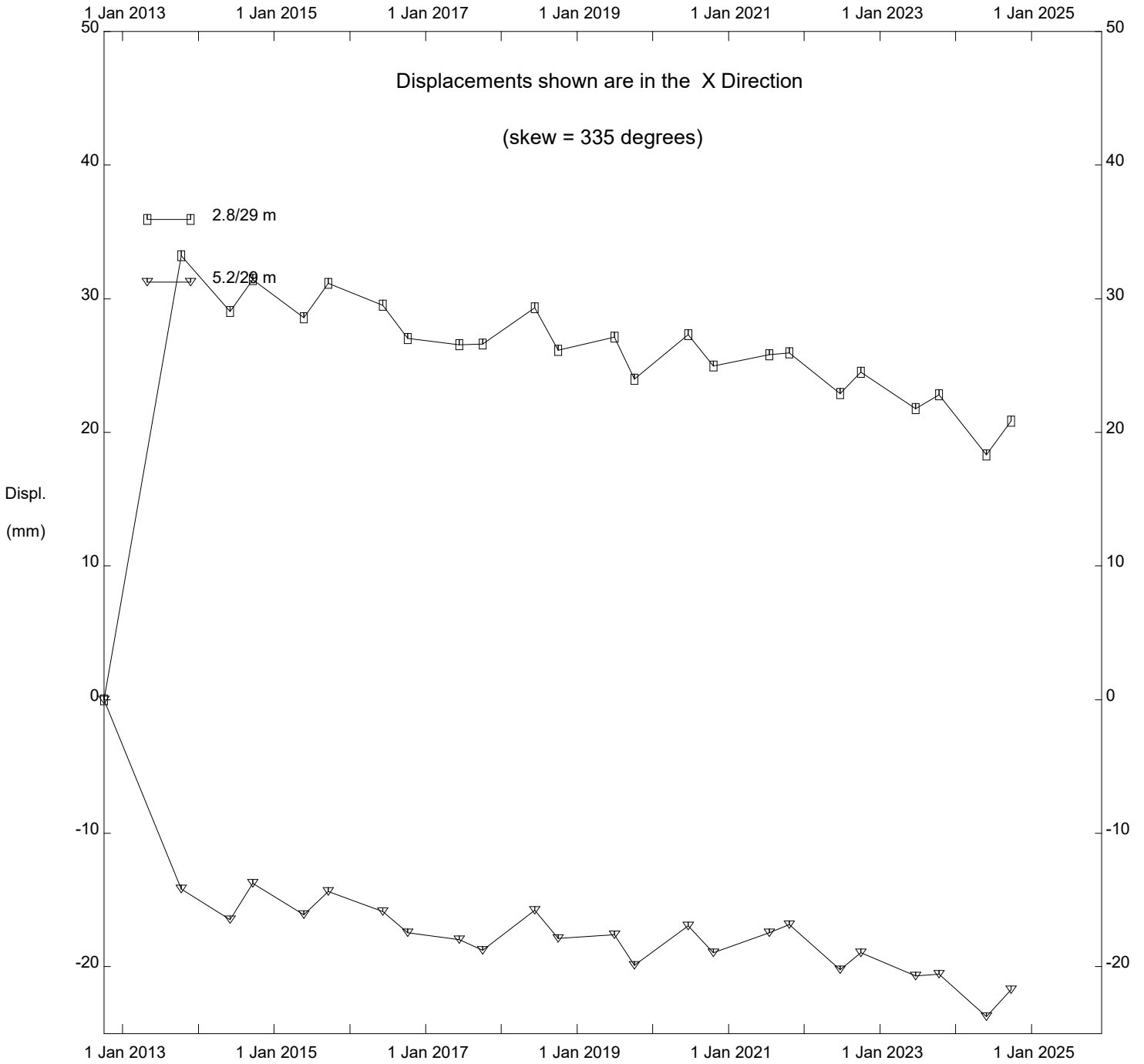
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Alberta Transportation

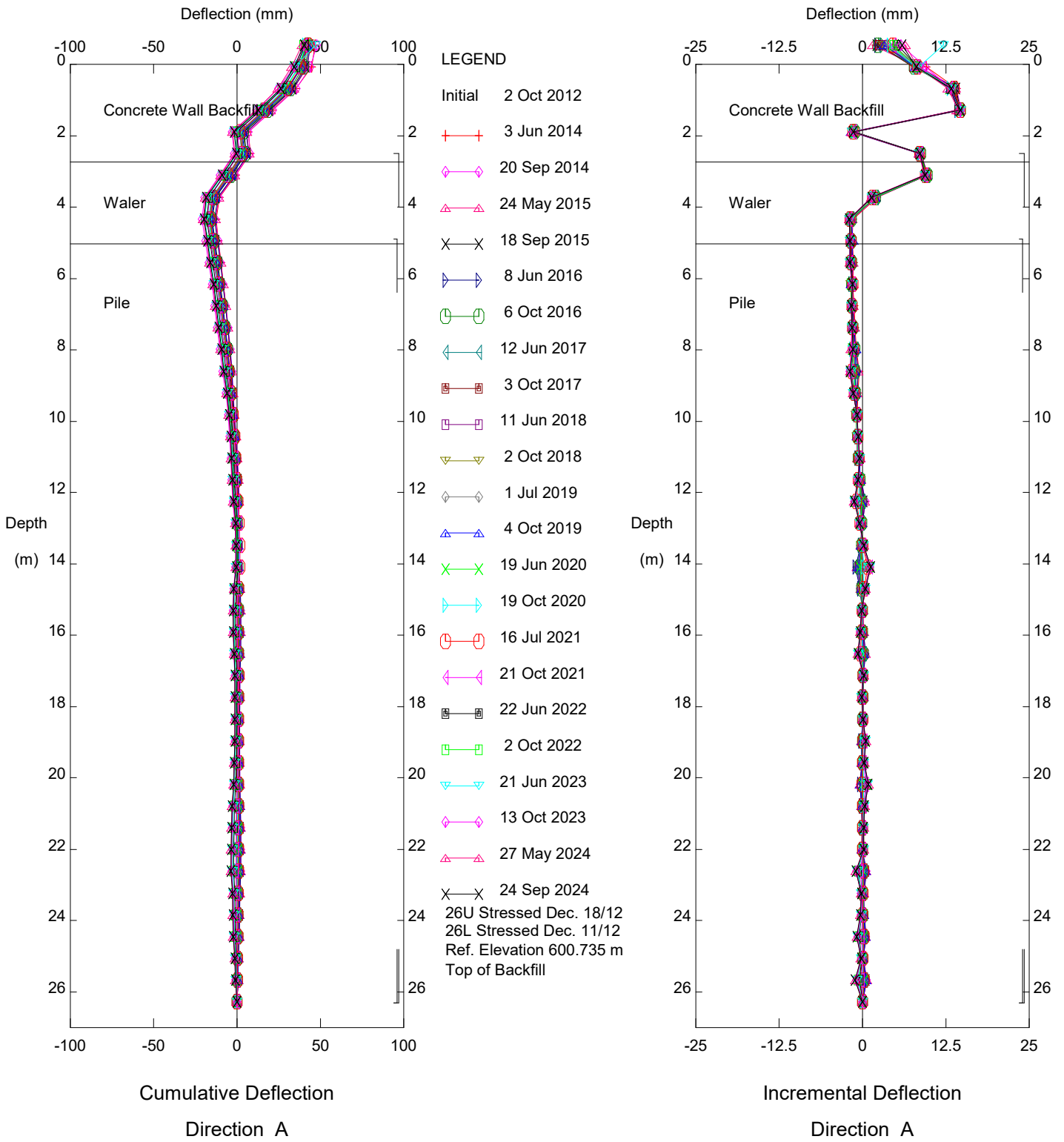
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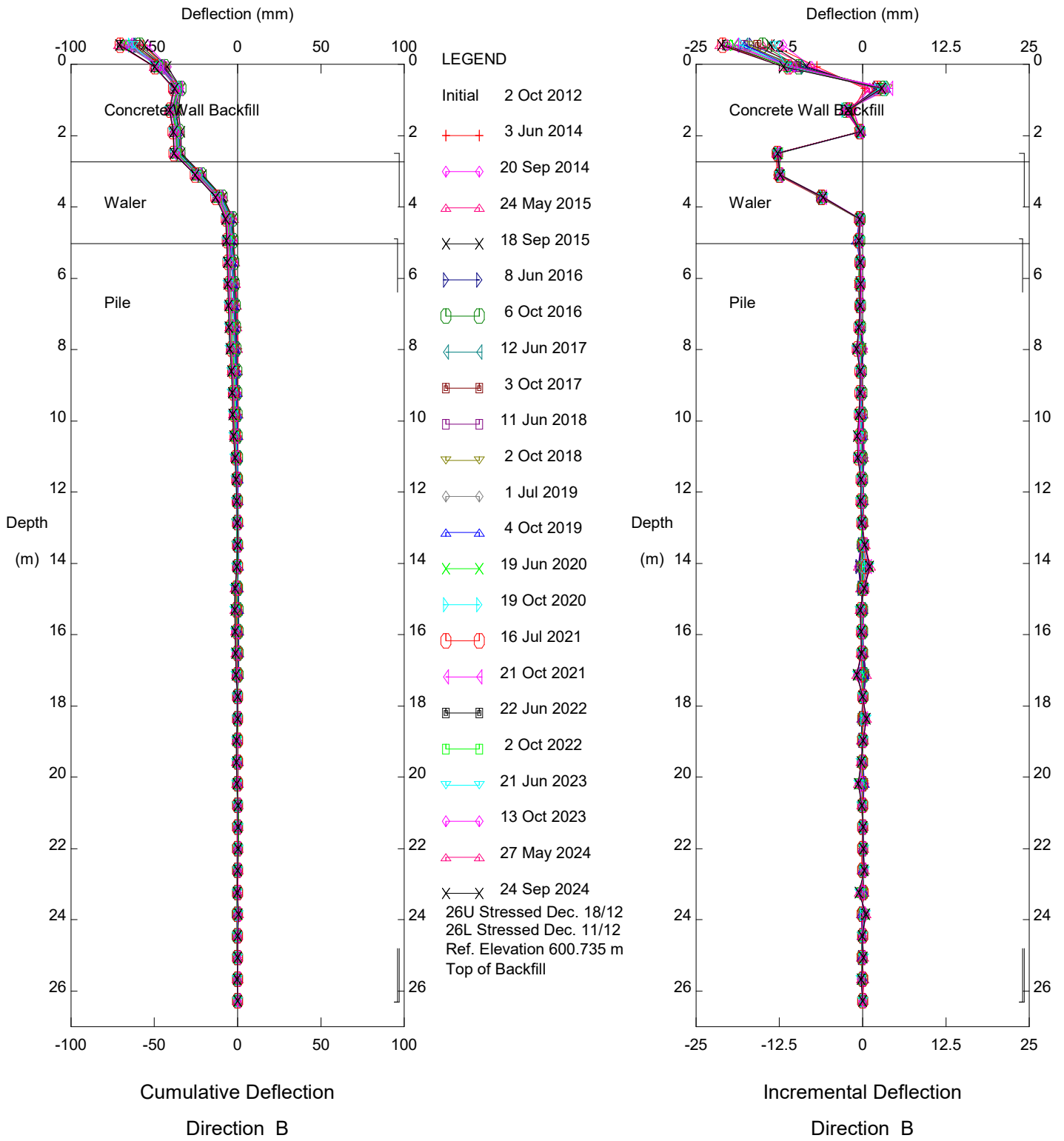
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Alberta Transportation

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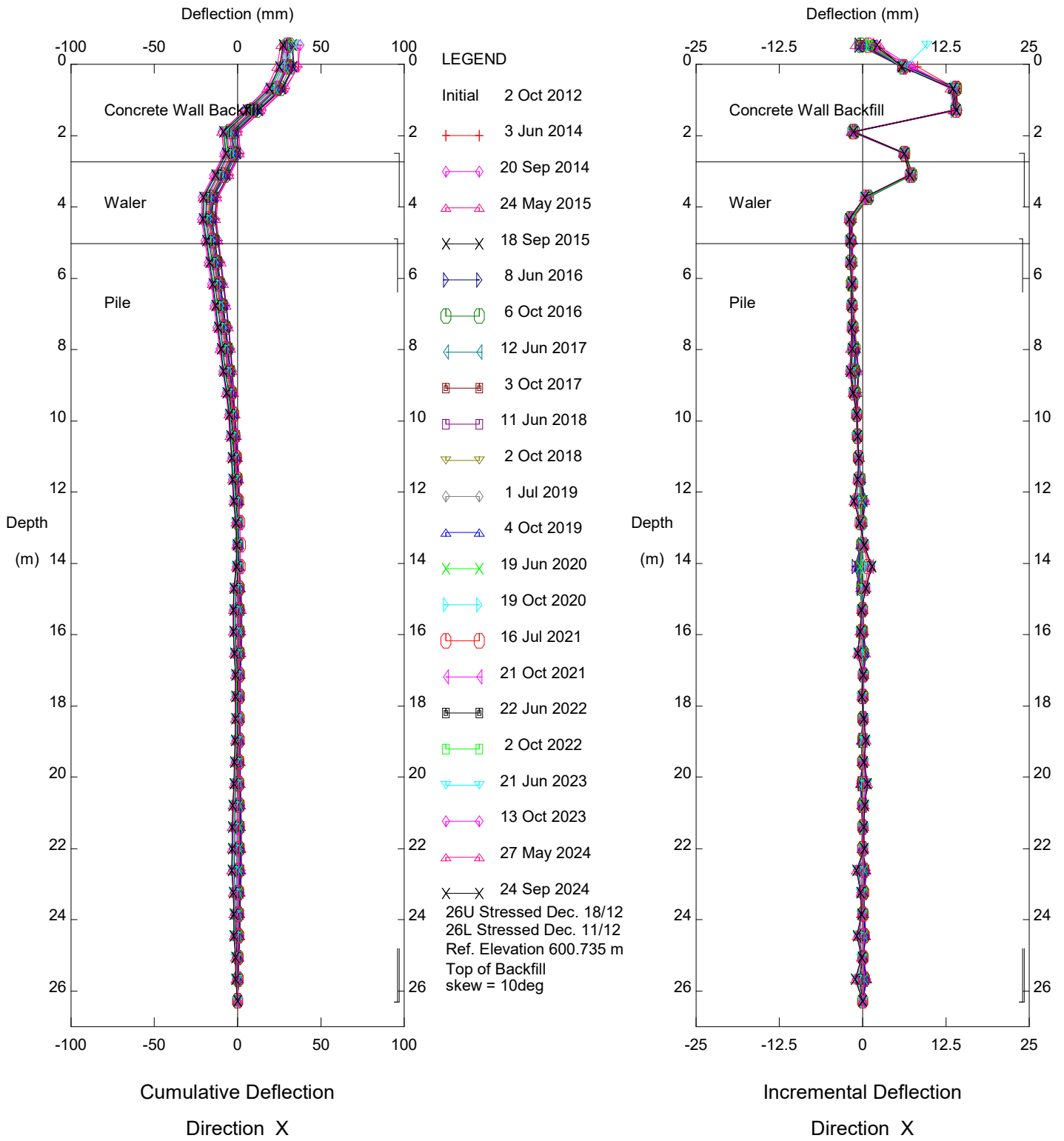


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Alberta Transportation

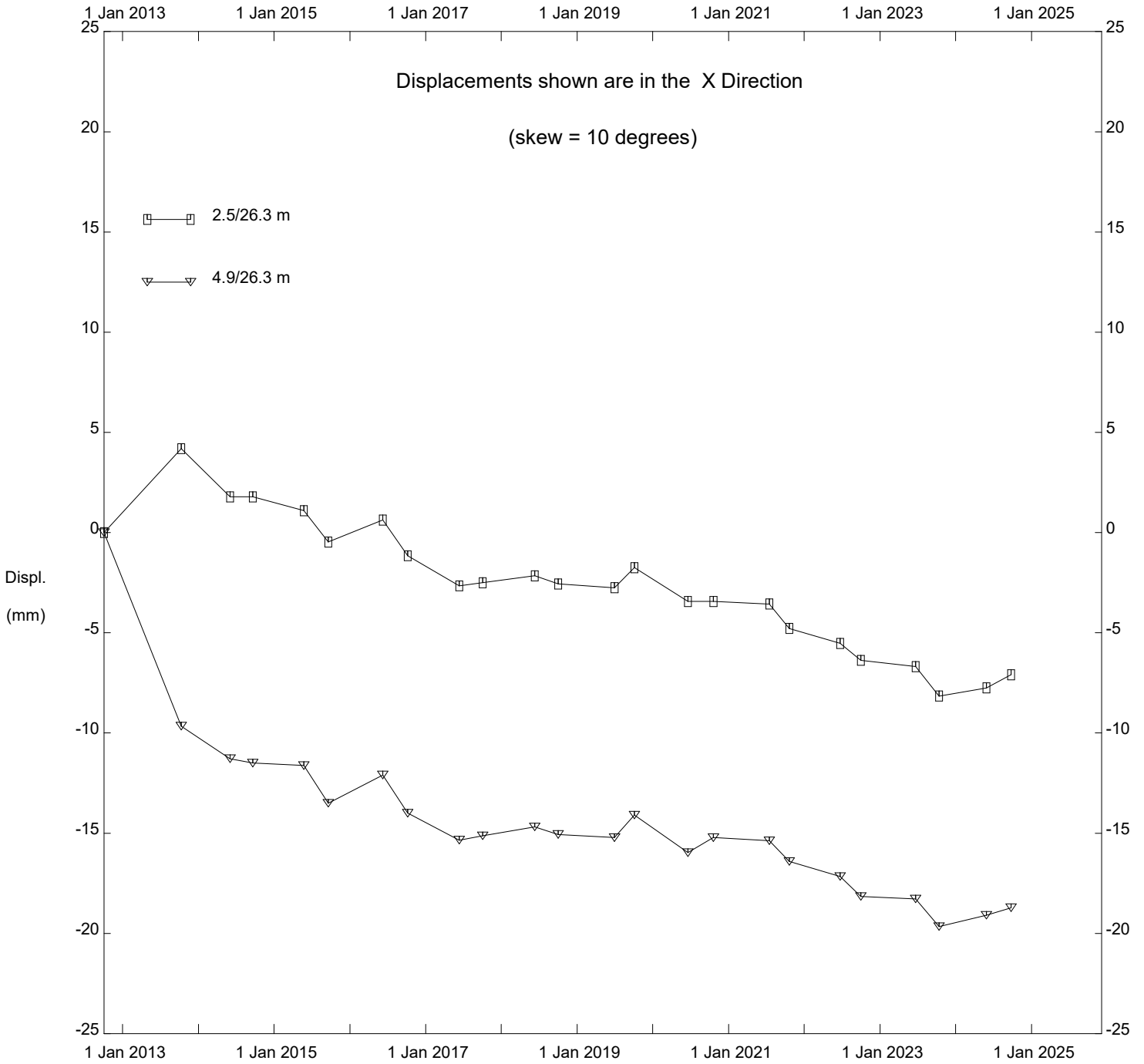


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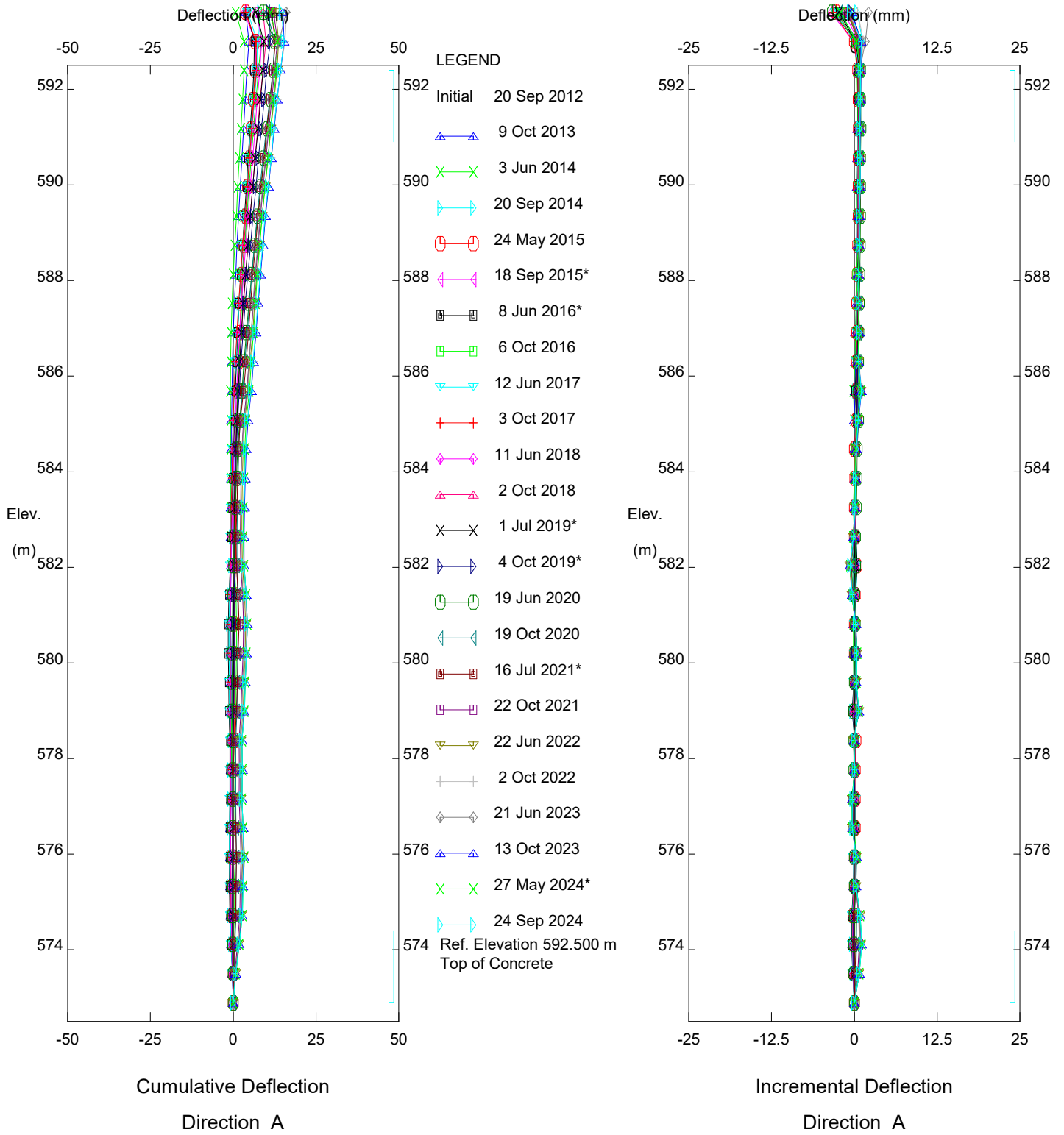
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Alberta Transportation



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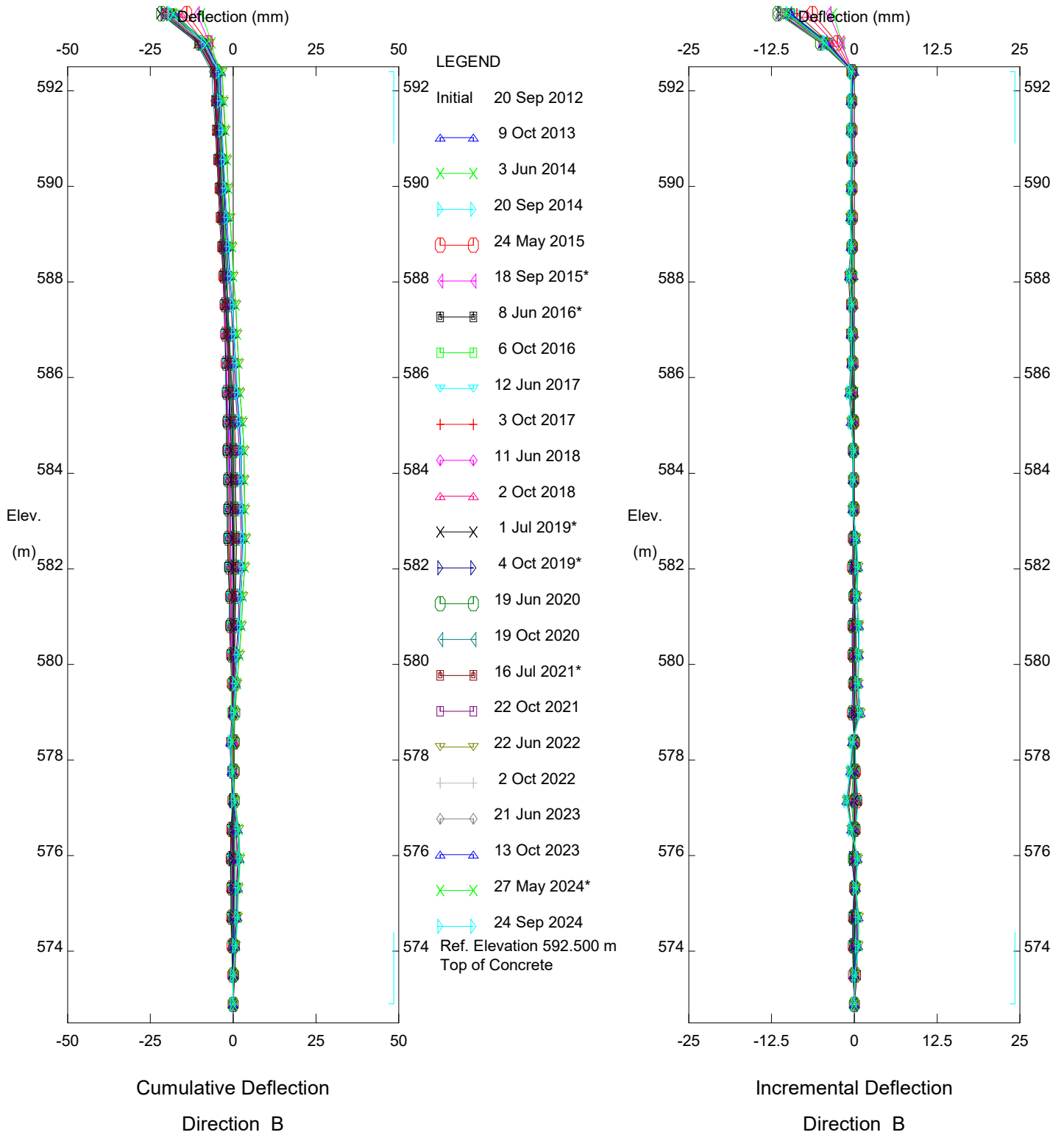
Alberta Transportation



PH026 Eureka River Lower Wall, Inclinometer SI12-P3L

Alberta Transportation

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

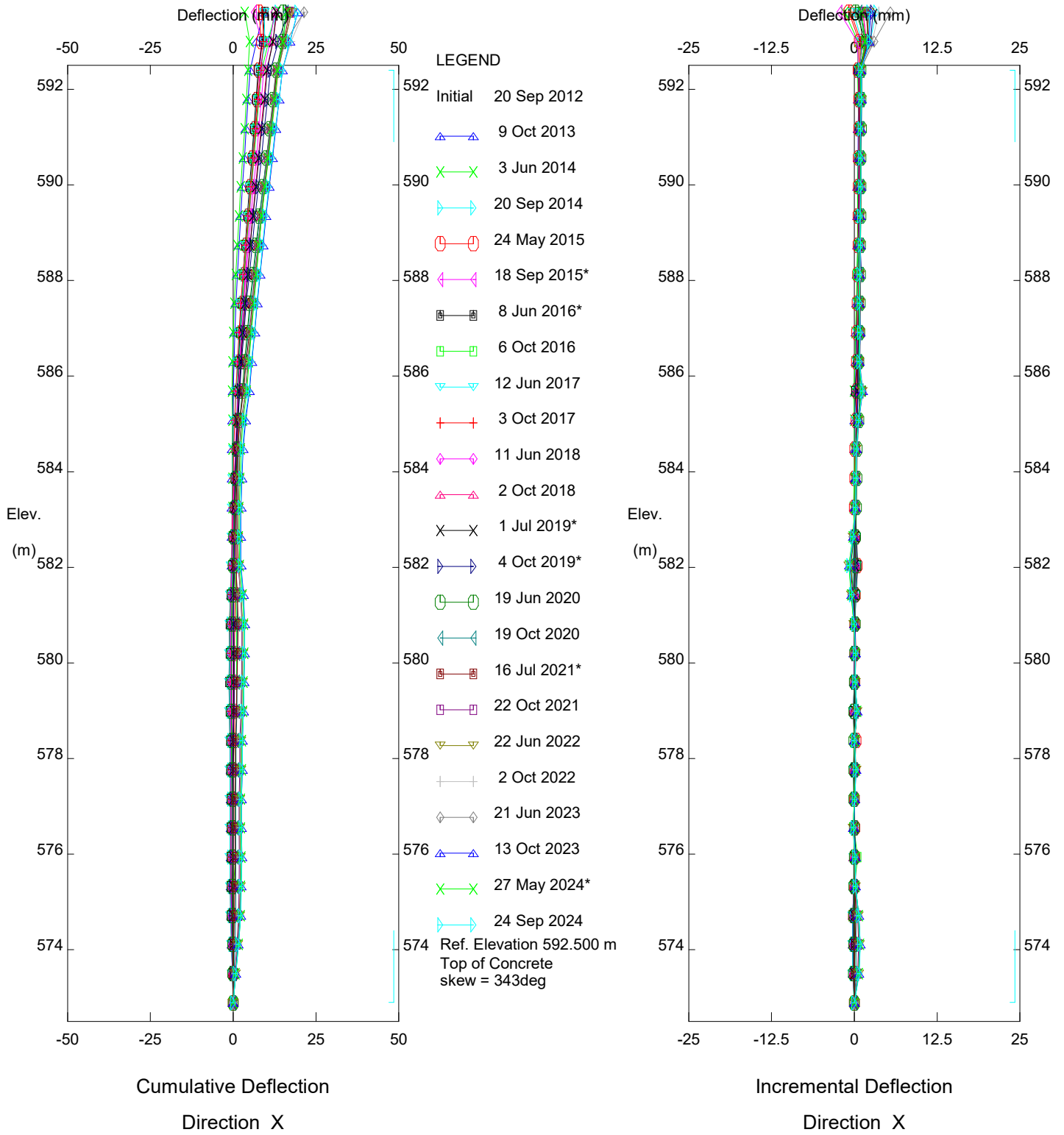


PH026 Eureka River Lower Wall, Inclinometer SI12-P3L

Alberta Transportation

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Thurber Engineering Ltd.

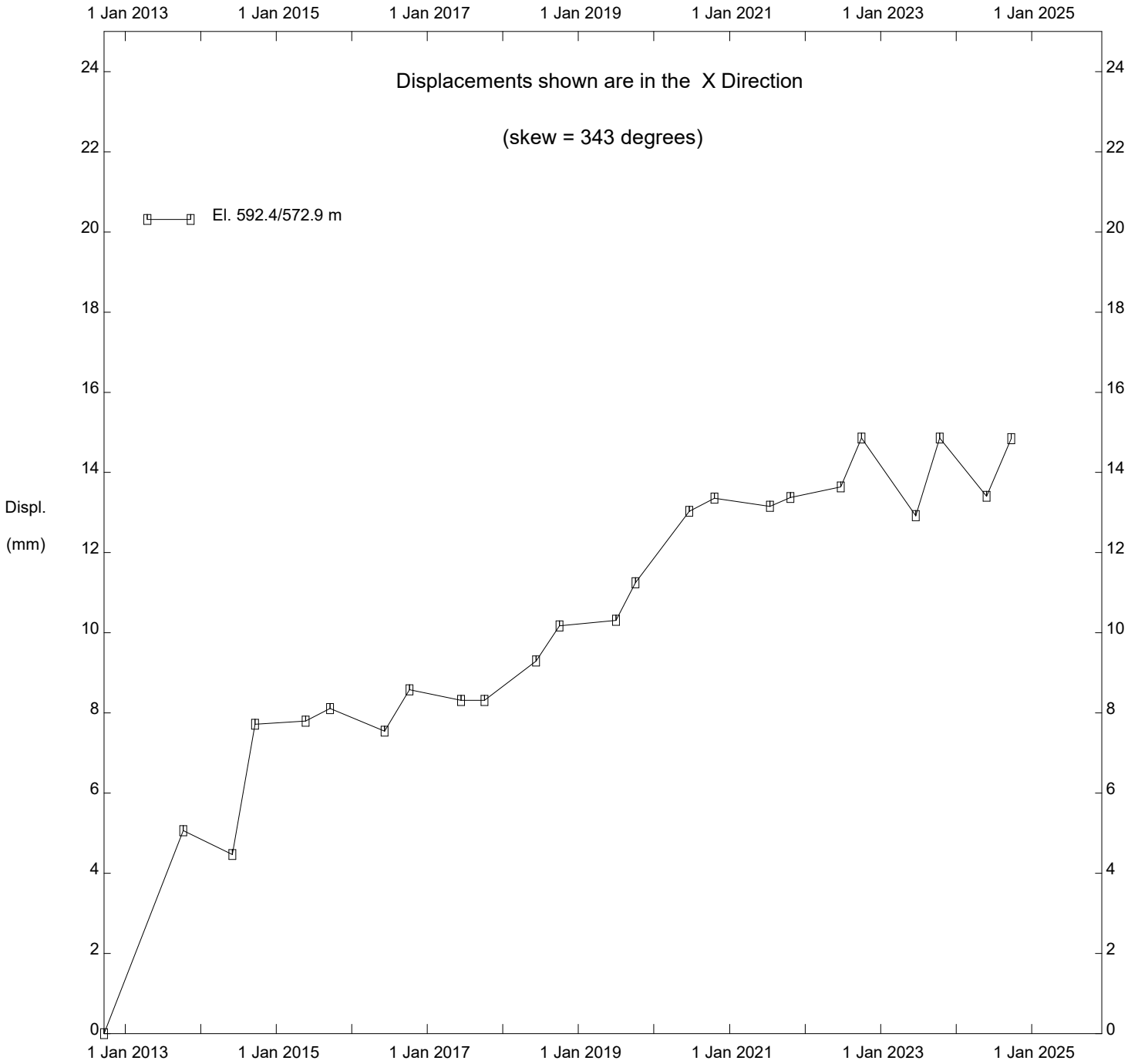


PH026 Eureka River Lower Wall, Inclinometer SI12-P3L

Alberta Transportation

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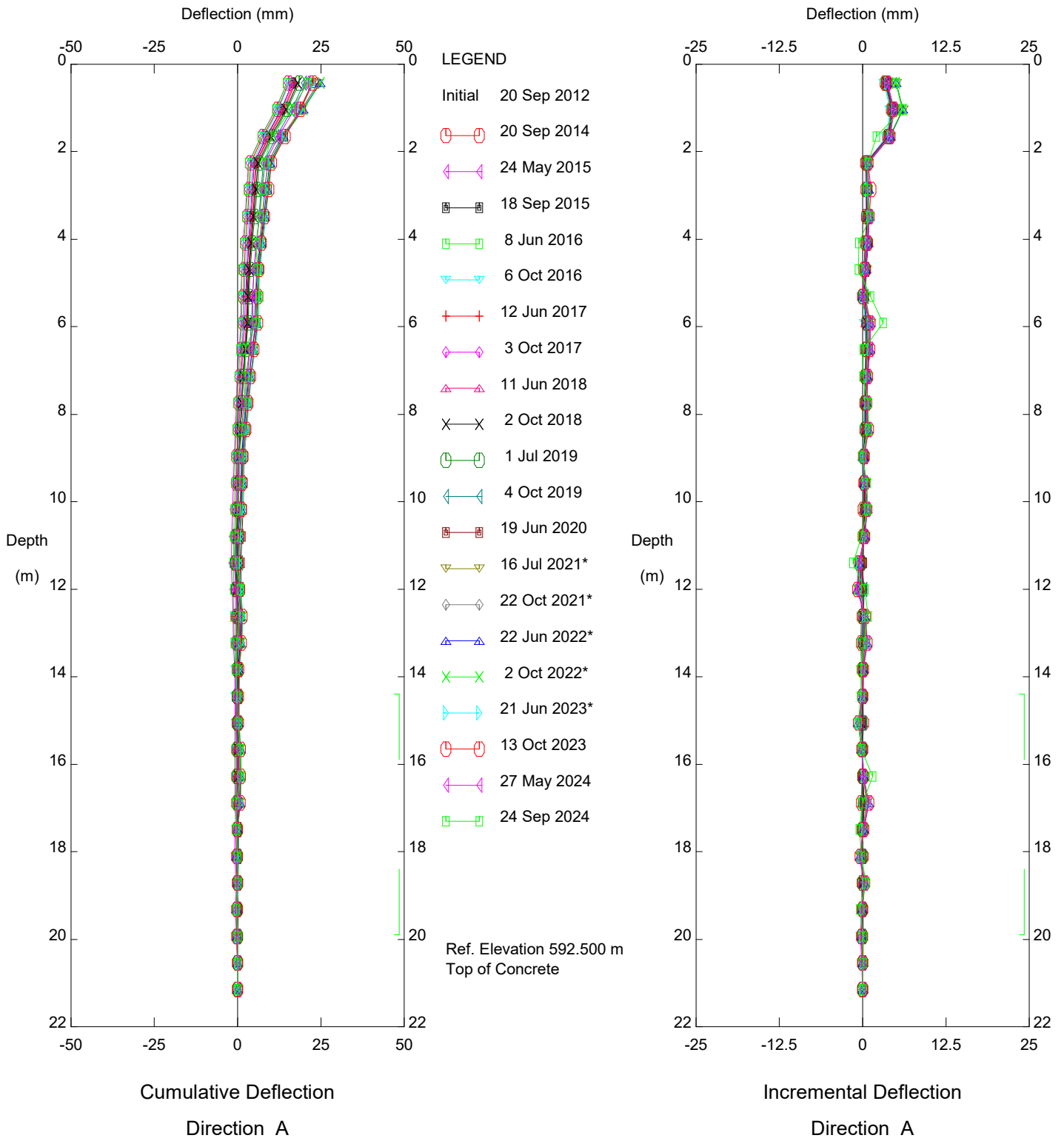
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Alberta Transportation

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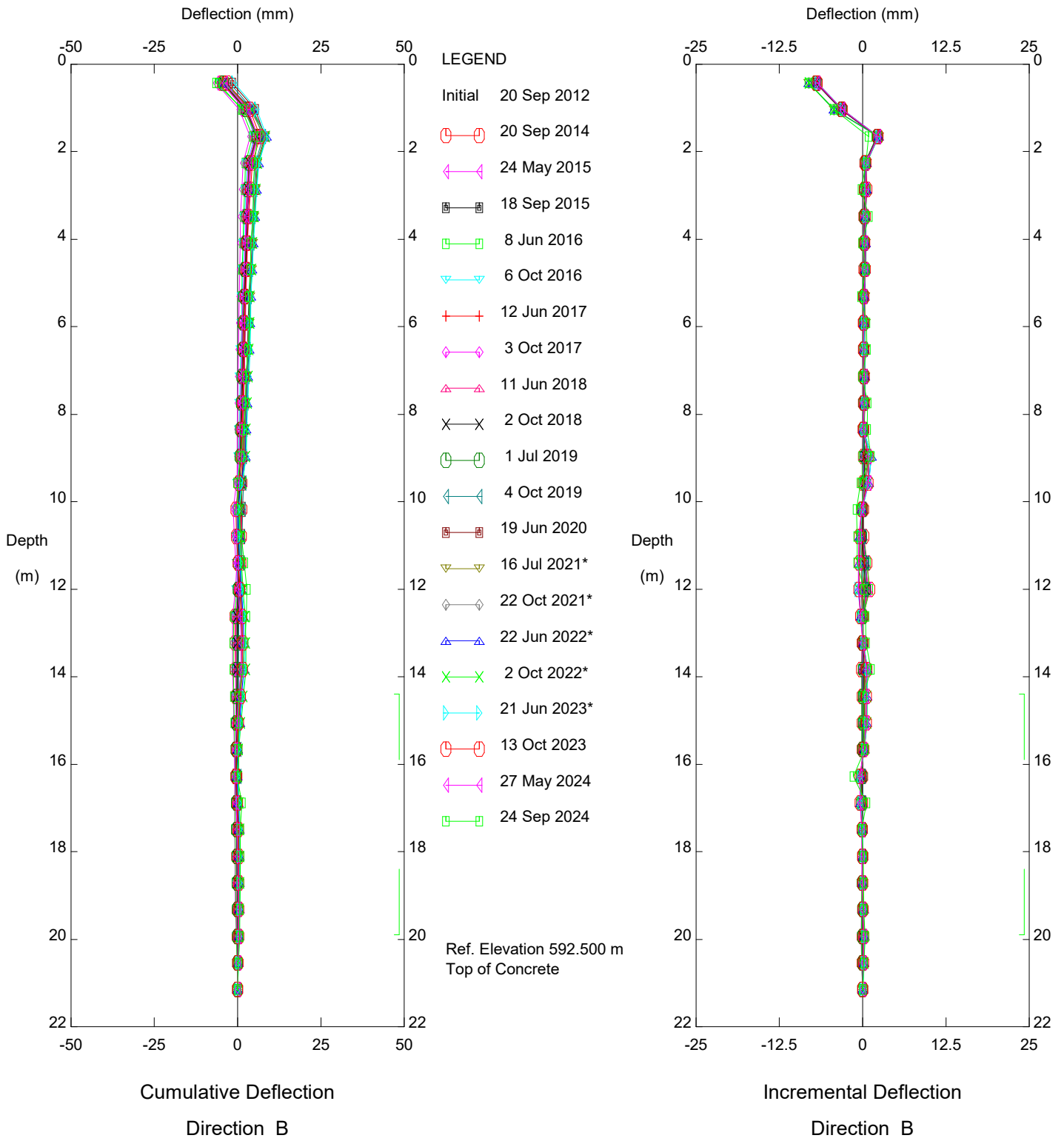


PH026 Eureka River Lower Wall, Inclinometer SI12-P9L

Alberta Transportation

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

Thurber Engineering Ltd.



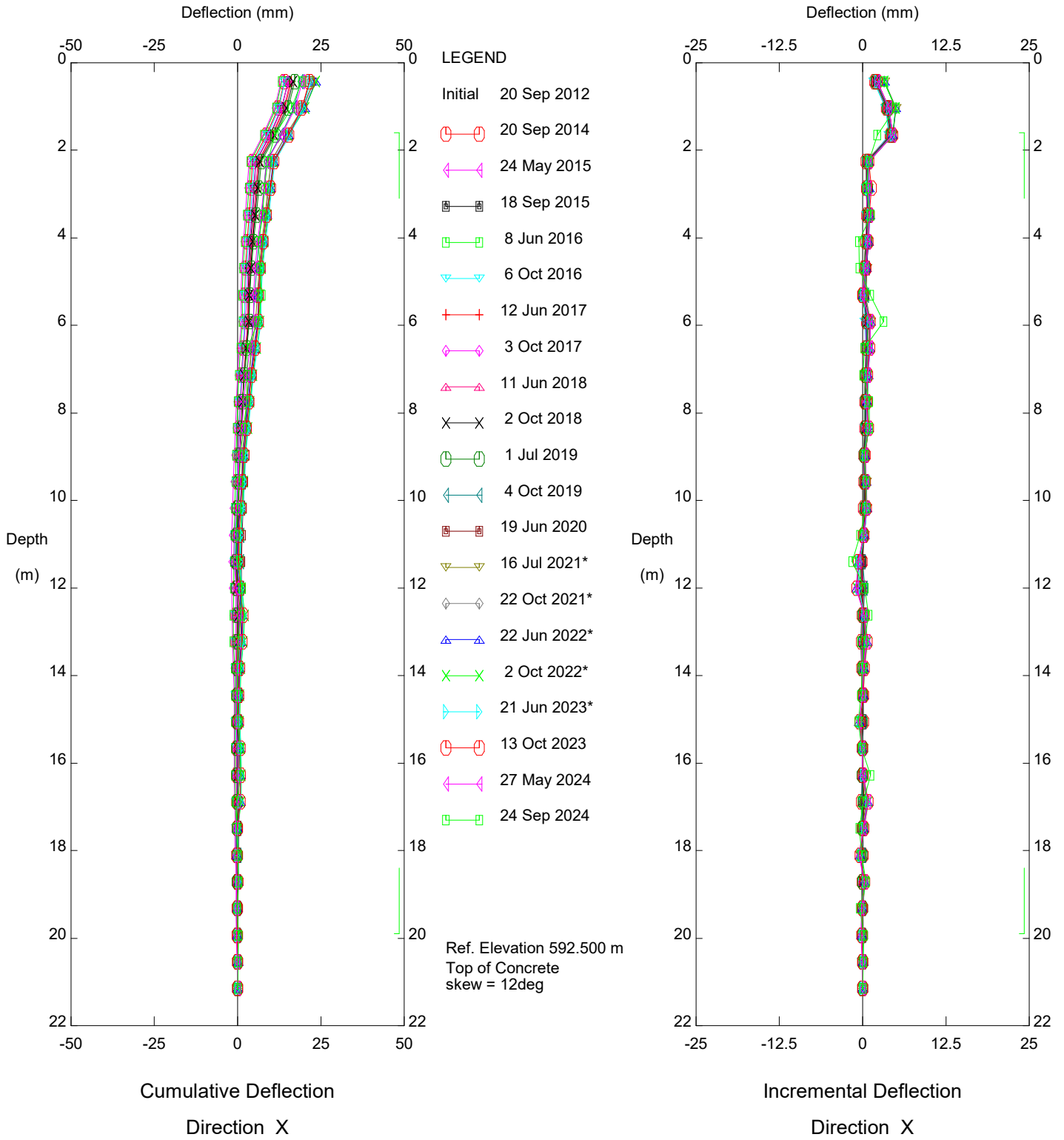
PH026 Eureka River Lower Wall, Inclinometer SI12-P9L

Alberta Transportation

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



Thurber Engineering Ltd.

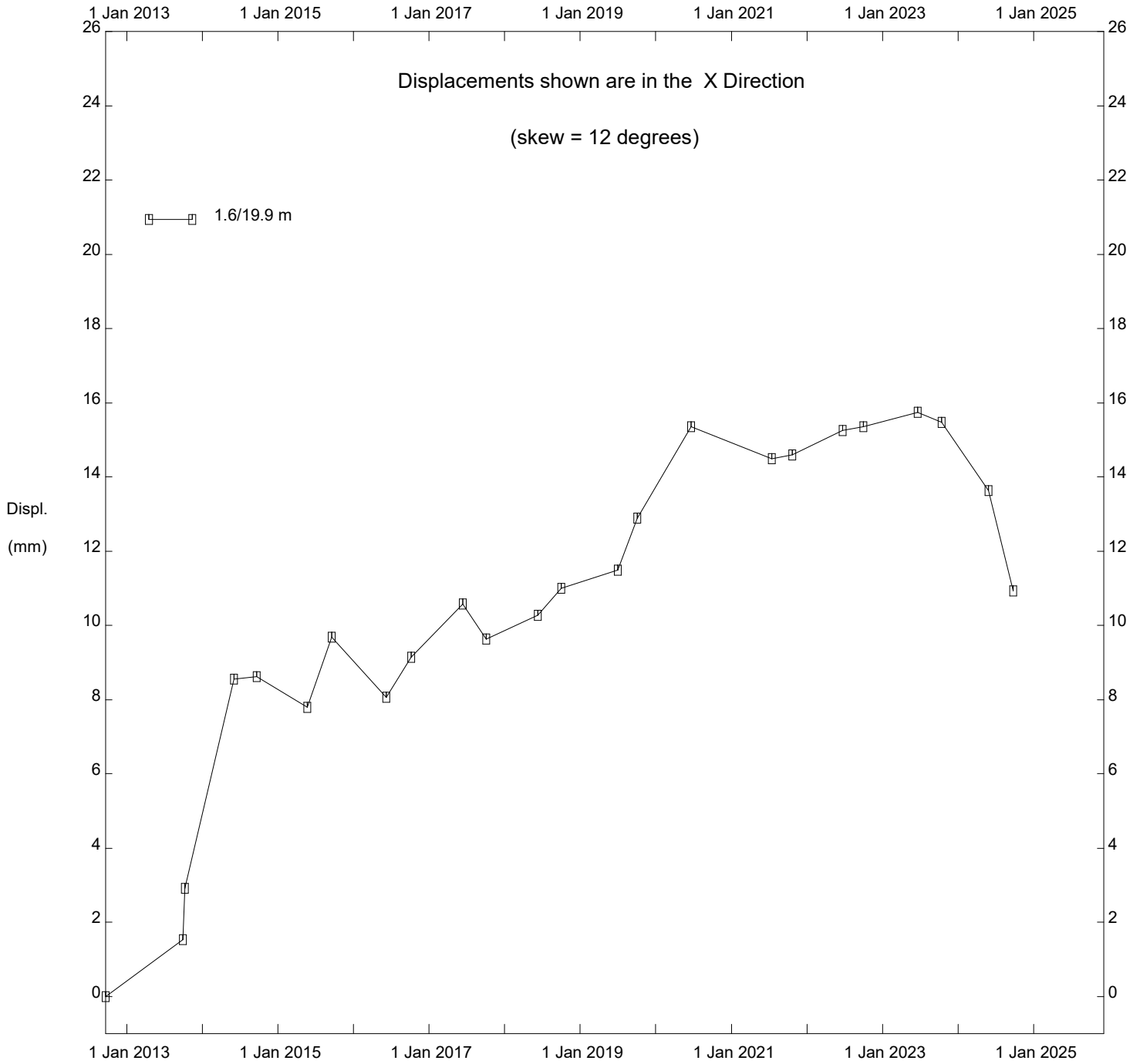


PH026 Eureka River Lower Wall, Inclinometer SI12-P9L

Alberta Transportation

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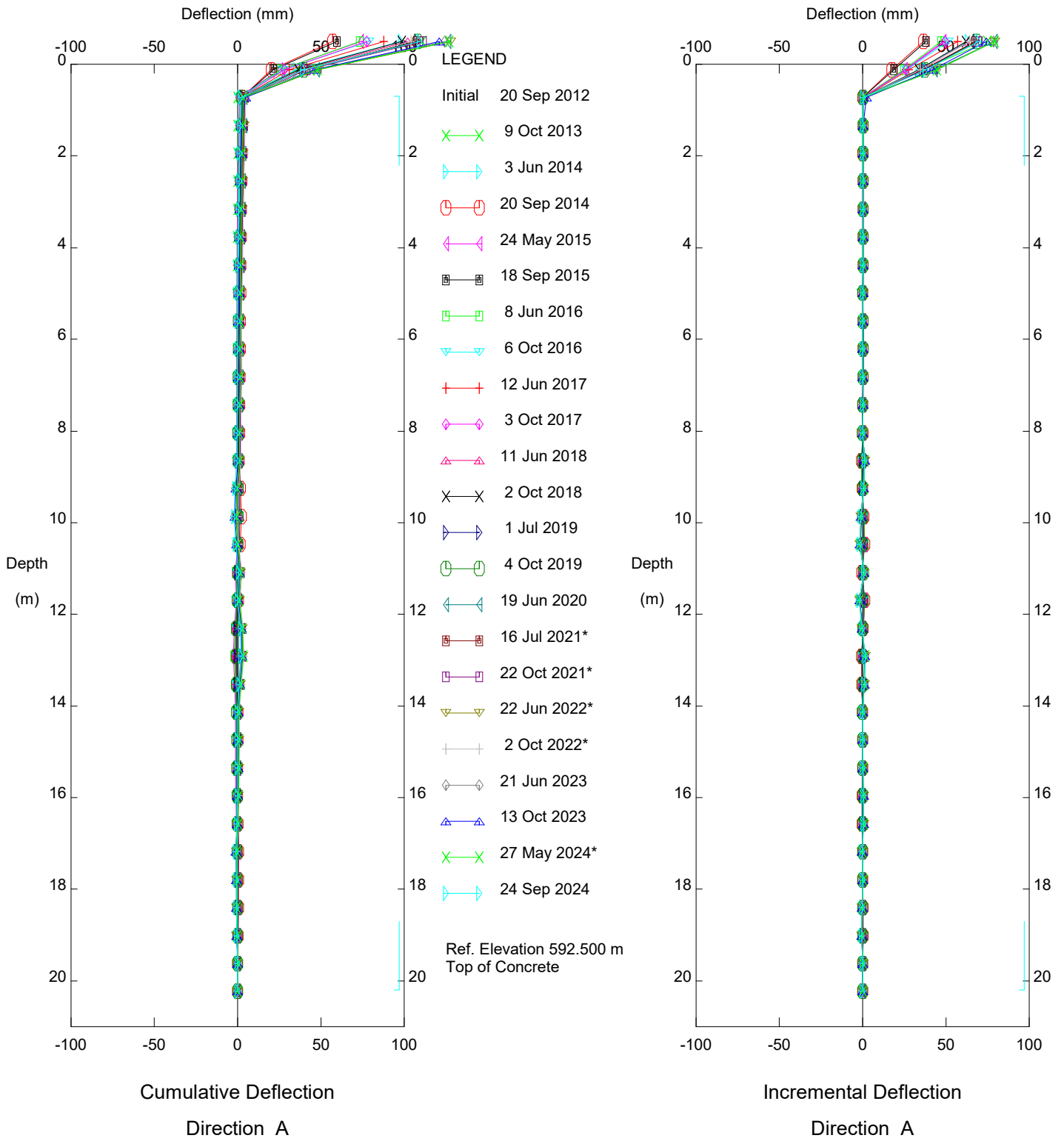
Thurber Engineering Ltd.



PH026 Eureka River Lower Wall, Inclinator SI12-P9L

Alberta Transportation

Thurber Engineering Ltd.

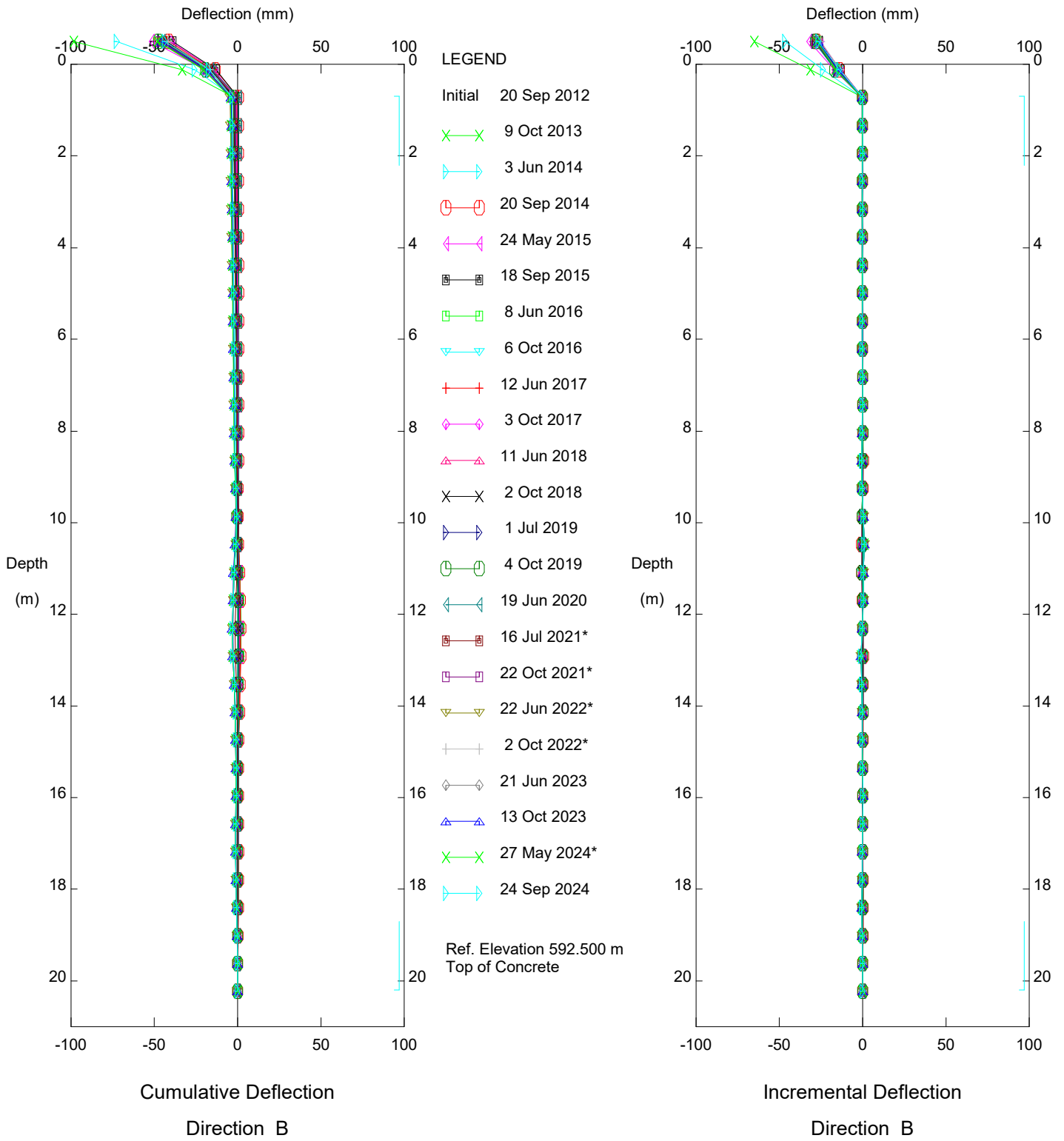


PH026 Eureka River Lower Wall, Inclinator SI12-P14L

Alberta Transportation

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

Thurber Engineering Ltd.

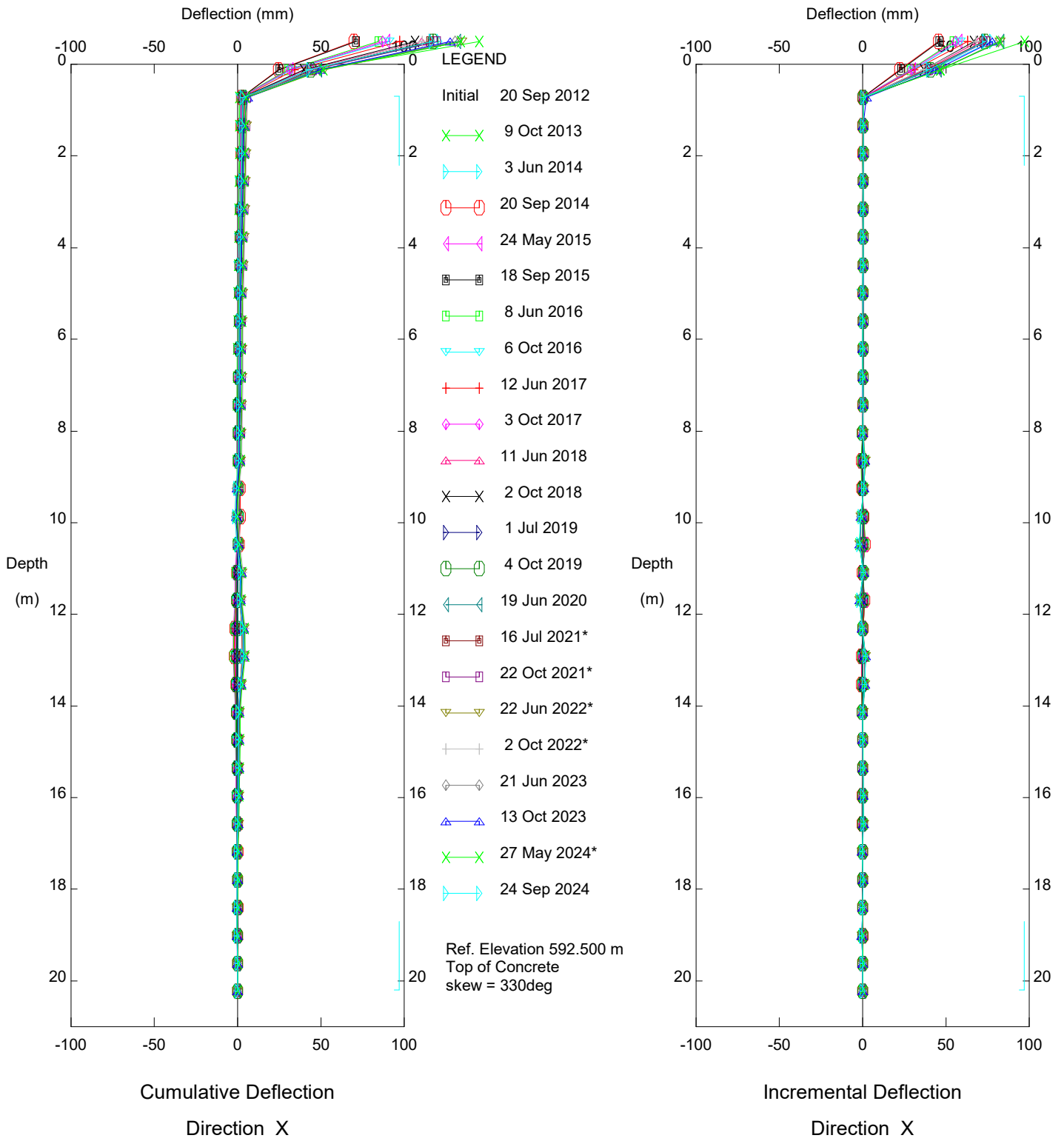


PH026 Eureka River Lower Wall, Inclinator SI12-P14L

Alberta Transportation

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Thurber Engineering Ltd.

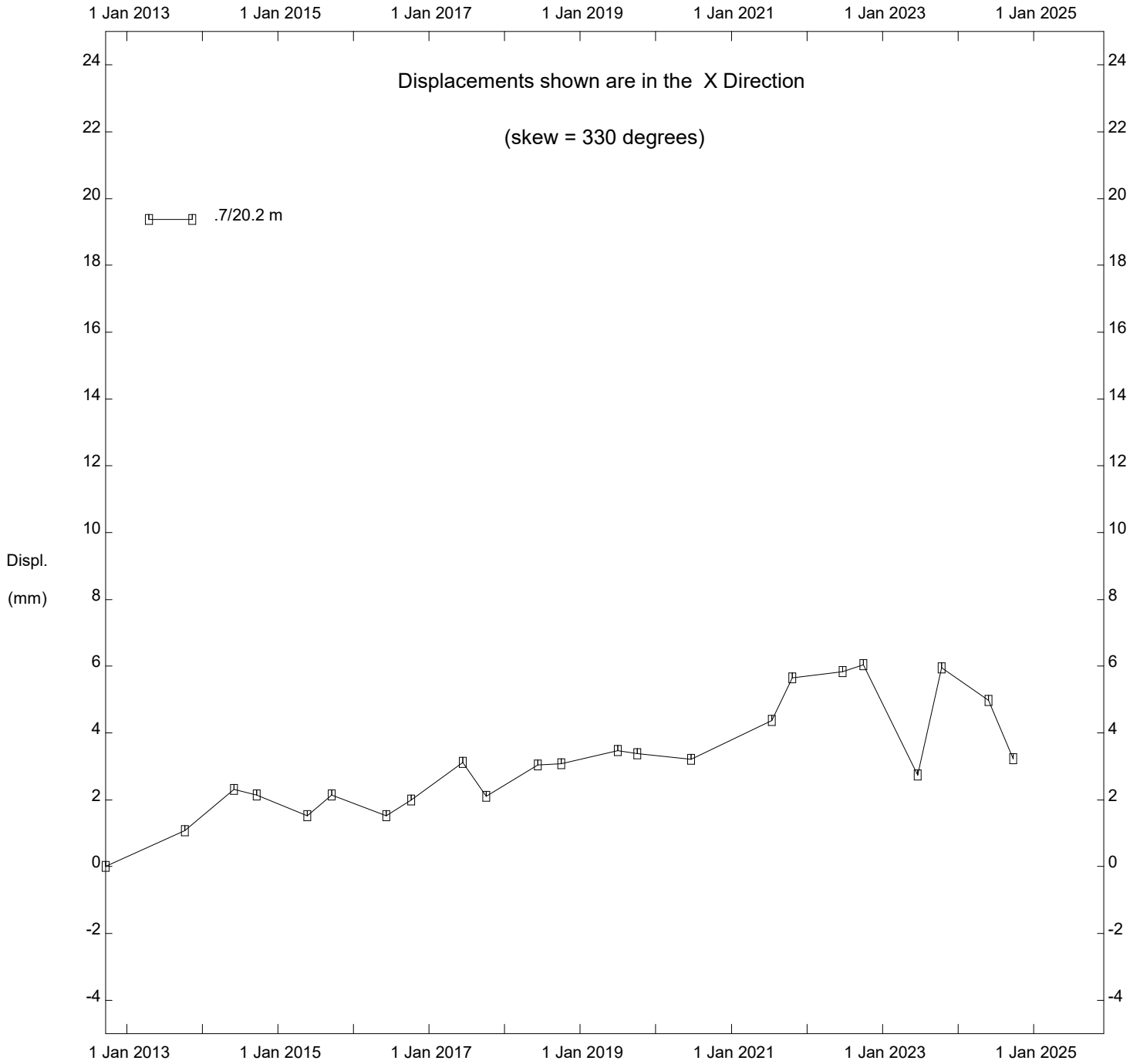


PH026 Eureka River Lower Wall, Inclinator SI12-P14L

Alberta Transportation

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

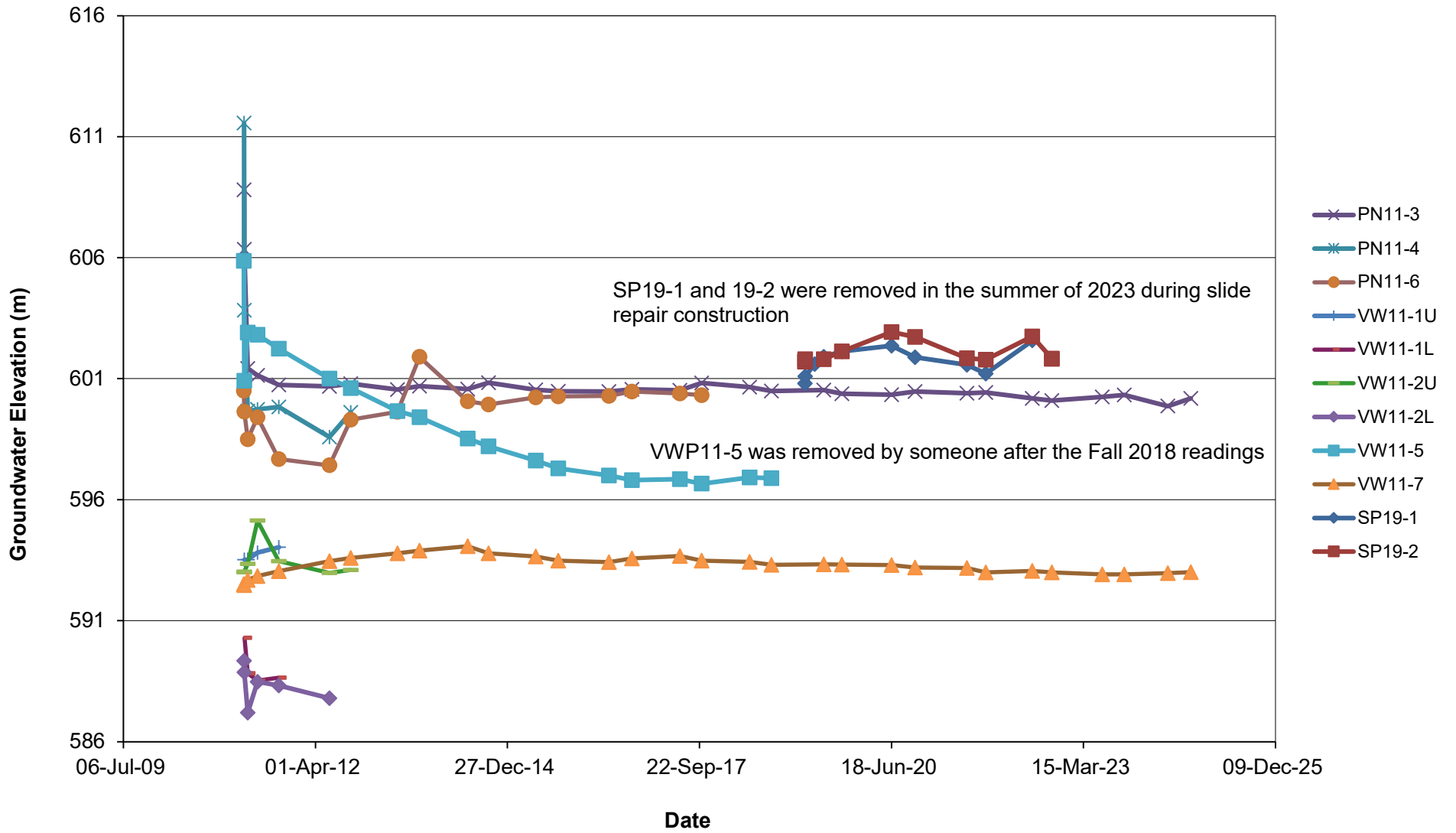
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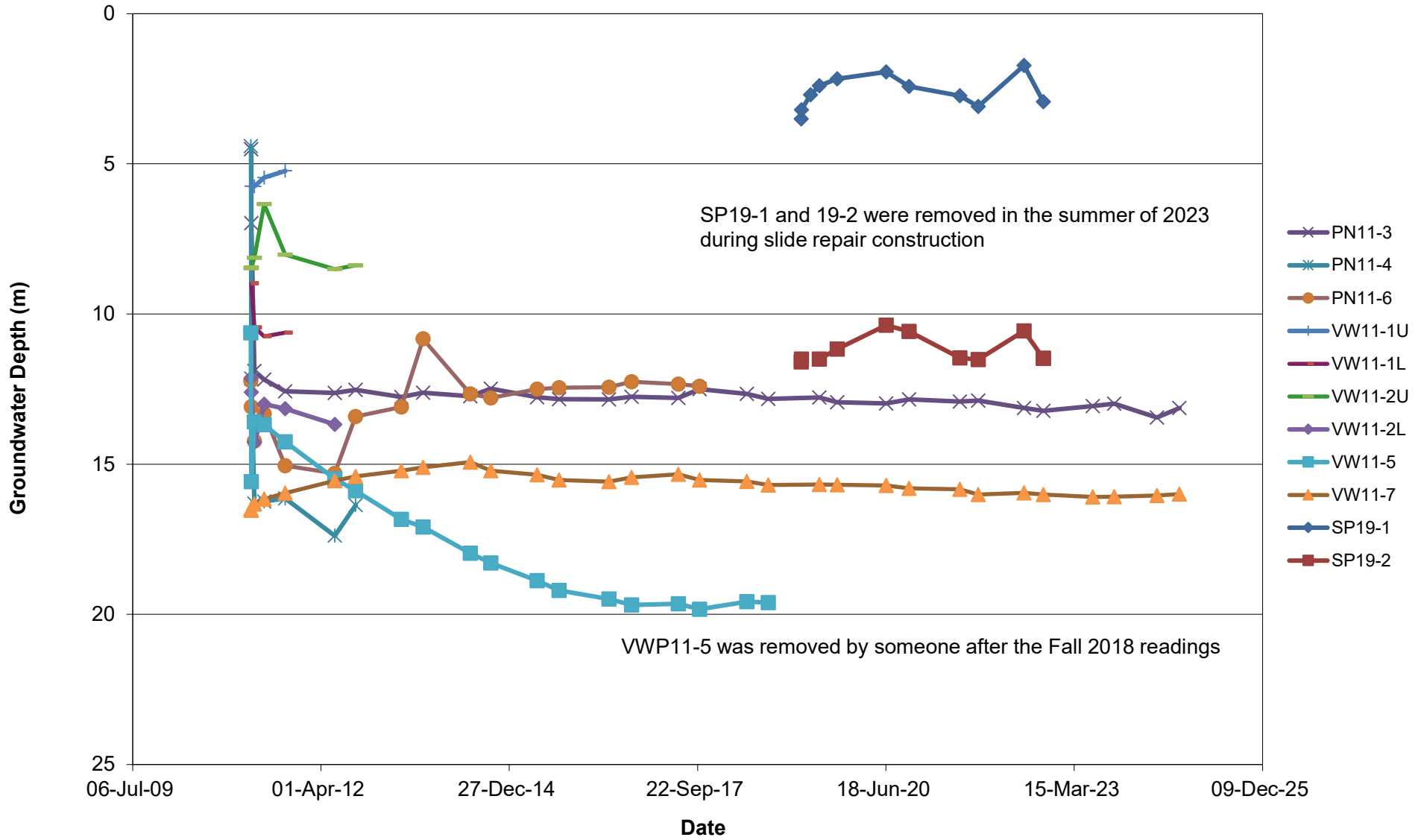
PH026 Eureka River Lower Wall, Inclinometer SI12-P14L

Alberta Transportation

**FIGURE PH026-1**  
**PIEZOMETRIC ELEVATIONS FOR HWY 726:02 EUREKA RIVER (SITE 3, 5 AND 6)**

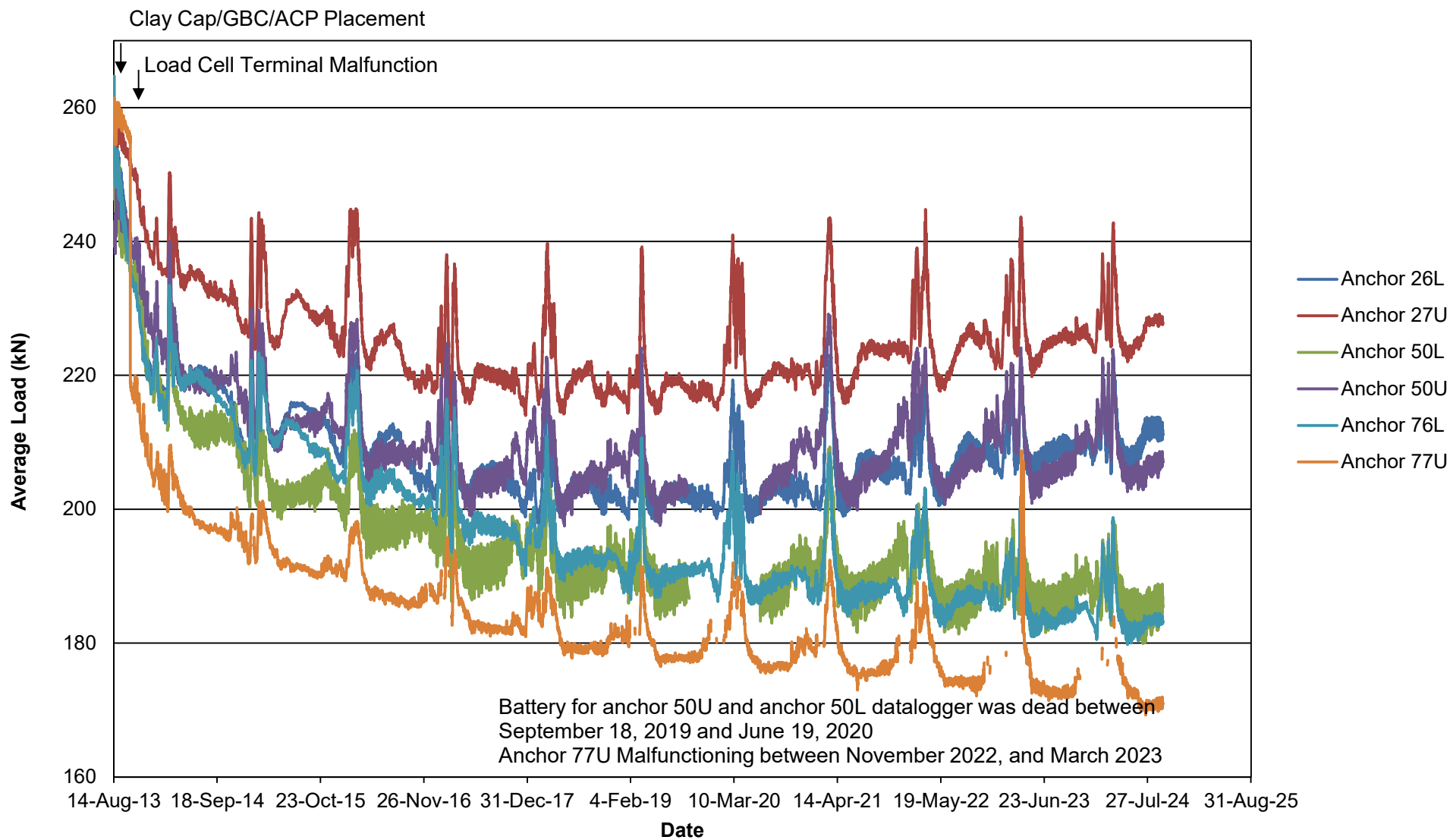


**FIGURE PH026-2**  
**PIEZOMETRIC DEPTHS FOR HWY 726:02 EUREKA RIVER (SITE 3, 5 AND 6)**





**FIGURE PH026-3**  
**LOAD CELL DATA FOR HWY 726:02 UPPER PILE WALL ANCHORS**



**FIGURE PH026-4**  
**LOAD CELL TEMPERATURES FOR HWY 726:02 UPPER PILE WALL ANCHORS**

