ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP
PEACE REGION
(GRANDE PRAIRIE DISTRICT - NORTH)
INSTRUMENTATION MONITORING - SPRING 2025

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
Legal Description: 8-14-86-8 W6		**UTM Co-ordinates**		
		11U E 368433	N 6258811	

Current Monitoring:	15-June-2025	**Previous Monitoring**	27-May-2024
Instruments Read By:	Mr. Neil McDonald and Mr. Godfred Etiendem, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): 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)	**Pneumatic Piezometers (PN):** PN11-3	**Vibrating Wire Piezometers (VW):** VW11-7	**Standpipe Piezometers (SP):**
Load Cell (LC): VC1759(50U), VC1760(50L), VC1761(76L), VC1762(77U), VC1763(26L) and VC1764(27U) (All Site 3 upper wall)	**Strain Gauges:**	**SAAs:**	**Others:**

Readout Equipment Used			
Slope Inclinometers: Two RST Digital Inclinometer probes with 2 ft. wheelbases and RST Pocket PC readouts	**Pneumatic Piezometers:** RST C108 pneumatic piezometer readout	**Vibrating Wire Piezometers:** Geokon GK 404 vibrating wire readout	**Standpipe Piezometers:**
Load Cell: RST Multichannel DTLink software	**Strain Gauges:**	**SAAs:**	**Others:**
Notes: Significant noise in the reading was detected near the top of SI12-P9L.			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	**Slope Indicators** Slope inclinometer SI11-3 showed a rate of movement of 0.8 mm/yr over 0.5 m to 3.5 m depth since the fall of 2024 readings. Since 2013 the rate of movement has fluctuated and shows an overall rate of about 2.5 mm per year. SI11-4 shows subtle indefinite movement zones. Slope inclinometers SI12-P9U, SI12-P17U, SI12-P26U were installed in the upper wall. All three SIs showed similar deflection profiles

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 no discernible movement over the length of the pile and waler from 2.7 m to 29.5 m depth and over the length of the pile from 5.1 m to 29.0 5 m depth, since the fall 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 16.0 mm in the upslope direction of which about 2 mm of movement has occurred since 2014.

SI12-P17U showed no discernible movement over the length of the pile and waler from 2.8 m to 29.0 m depth and over the length of the pile from 5.2 m to 29.0 m depth, since the fall 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 21.9 mm in the upslope direction of which about 5 mm of movement has occurred since 2014.

SI12-P26U showed no discernible movement over the length of the pile and waler from 2.5 m to 26.3 m depth and a rate of movement of 0.5 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 since the fall of 2023 have shown a general trend reversal of about 0.5 mm/yr (or in the downhill direction), whichmay be attributed to the 2023 construction measures that occurred in this area. The total pile head movement to date has been 18.4 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 14.0 mm towards the river since installation, with no discernible movement over 0.1 m to 19.6 m since the fall of 2024 readings. SI12-P9L has shown a total pile head movement of 3.6 mm in the downslope direction since installation, with no discernible movement over the length of the pile since the fall of 2024 readings. Significant noise was detected in the current and previous readings of SI12-P9L, so the movement rate should be reevaluated during the next readings. SI12-P14L has shown a total pile head movement of 4.1 mm in the downslope direction since installation, with a rate of movement of 1.2 mm/yr (downhill) since the fall 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 two years in SI12-9L have shown a trend change to about -6 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 fall of 2024, the groundwater level in pneumatic piezometer PN11-3 decreased by 0.22 m. Vibrating wire piezometer VW11-7 showed a decrease in groundwater level of 0.04 m since the fall of 2024 readings. Over the longer term, since about 2014, both of these piezometers have shown a slight decreasing trend in groundwater levels

Load Cells

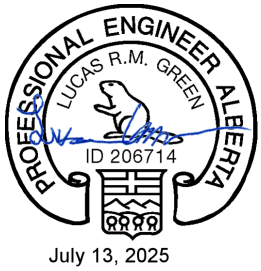
Anchors 26L and 27U are installed at pile P9 towards the north end of the pile wall. Anchors G50U and G50L are installed at pile P17 in the

	central portion of the wall. Anchors G76L and G77U are installed at P26 towards the south end of the wall. Since the fall of 2024, the load cells showed minor increases in measured load ranging from an increase of 0.15 kN in VC1762 (anchor 77U) to an increase of 1.57 kN in VC1761 (anchor 76L). The current readings on the load cells varied from 172.94 kN in VC1762 (anchor 77U) to 228.94 kN in VC1764 (anchor 27U). The anchor design load was 300 kN and the anchors were locked off at 240 kN. 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 load 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. The instrument readings at this site indicate that the landslide repairs at this site have been successful in stabilizing the slope movements.
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 PH026-1 Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Slope Inclinometer Instrumentation Reading Summary • Table PH026-2 Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Pneumatic Piezometer Instrumentation Reading Summary • Table PH026-3 Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Vibrating Wire Piezometer Instrumentation Reading Summary • Table PH026-4 Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Standpipe Piezometer Instrumentation Reading Summary • Table PH026-5 Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 and 6), Load Cells Instrumentation Reading Summary (Upper Pile Wall) • Statement Statement for Use and Interpretation of Report • APPENDIX A - PH026-1 SPRING 2025 o Field Inspector's report o Site Plan Showing Approximate Instrument Locations (Drawings No. 32123 PH026 1 and 32123-PH026-2) o SI Reading Plots o Figure PH026-1 (Piezometric Elevations) o Figure PH026-2 (Piezometric Depths) o Figure PH026-3 (Load Cell Readings) o Figure PH026-4 (Load Cell Temperatures)

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.
Renato Clementino, Ph.D., P. Eng.
Principal | Senior Geotechnical Engineer



July 13, 2025

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
RM SIGNATURE: _____
RM APEGA ID #: 72376
DATE: July 14, 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 PH026-1: Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: June 16, 2025

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	49.0 mm over 0.5 m to 3.5 m depth in 232° direction	42.3 mm/yr in October 2012	Active	September 24, 2024	0.6	0.8	2.3
SI11-4	March 27, 2011	No discernible movement	N/A	Active	September 24, 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…Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 And 6)Slope Inclinometer Instrumentation Reading Summary

Date Monitored: June 16, 2025

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*
UPPER WALL								
SI12-P9U	October 2, 2012	-29.3 mm over 2.7 m to 29.5 m depth in 292° direction	-1040.4 mm/yr on August 8, 2013 *	Active	September 24, 2024	No discernible movement	N/A	-6.6
		-16.0 mm over 5.1 m to 29.5 m depth in 292° direction	-668.8 mm/yr on August 8, 2013 *			No discernible movement	N/A	-5.2
SI12-P17U	October 2, 2012	19.0 mm over 2.8 m to 29.0 m depth in 278° direction	-1920.7 mm/yr on August 10, 2013 *	Active	September 24, 2024	No discernible movement	N/A	-10.2
		-21.9 mm over 5.2 m to 29.0 m depth in 278° direction	-1189.1 mm/yr on August 10, 2013 *			No discernible movement	N/A	-6.5

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…Spring 2025 – Hwy 726:02 Eureka River (Sites 3, 5 And 6) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: June 16, 2025

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)
UPPER WALL								
SI12-P26U	October 2, 2012	-7.6 mm over 2.5 m to 26.3 m depth in 37° direction	-679.6 mm/yr on August 12, 2013 *	Active	September 24, 2024	No discernible movement	N/A	-2.7
		-18.4 mm over 4.9 m to 26.3 m depth in 37° direction	-465.6 mm/yr on August 12, 2013			0.3	0.5	-0.6
LOWER WALL								
SI12-P3L	September 20, 2012	14.0 mm over 0.1 m to 19.6 m depth in 204° direction	10.6 mm/yr on September 20, 2014	Active	September 24, 2024	No discernible movement	N/A	-5.6
SI12-P9L	September 20, 2012	3.6 mm over 1.6 m to 19.9 m depth in 229° direction	85.1 mm/yr on August 14, 2013	Active	September 24, 2024	No discernible movement	N/A	-1.8
SI12-P14L	September 20, 2012	4.1 mm over 0.7 m to 20.2 m depth in 255° direction	4.8 mm/yr on October 22, 2021	Active	September 24, 2024	0.9	1.2	6.5

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

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Table PH026-2: Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: June 16, 2025

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	99.5	13.35	13.13	-0.22
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.

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Table PH026-3: Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Vibrating Wire Piezometer Instrumentation Reading Summary

Date Monitored: June 16, 2025

INSTRUMENT	DATE INITIALIZED	TIP ELEV. (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER LEVEL BGS (m)	CURRENT GROUNDWATER DEPTH (mBGS)	PREVIOUS GROUNDWATER DEPTH (mBGS)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
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	16.04	16.00	-0.04

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

Table PH026-4: Spring 2025 – 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)

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Table PH026-5: Spring 2025 – HWY 726:02 Eureka River (Sites 3, 5 And 6) Load Cells Instrumentation Reading Summary (Upper Pile Wall)

Date Monitored: June 16, 2025

ANCHOR NUMBER/ROW	PILE # AND POSITION	SERIAL #	DESIGN LOAD / LOCK-OFF LOAD (kN)	MAXIMUM RECORDED LOAD (kN)	MEASURED LOAD[1] (June 16, 2025) (kN)	PREVIOUS RECORDED LOAD[1] (Sep. 24, 2024) (kN)	CHANGE IN LOAD SINCE PREVIOUS READING (kN)
26L	P9/center	VC1763	300 / 240	255.06 on August 24, 2013	212.62	211.21	1.41
27U	P9/south	VC1764	300 / 240	258.68 on August 28, 2013	228.94	227.67	1.27
50U	P17/center	VC1759	300 / 240	250.13 on August 28, 2013	208.57	207.14	1.43
50L	P17/center	VC1760	300 / 240	252.88 on August 28, 2013	186.43	185.66	0.77
76L	P26/north	VC1761	300 / 240	264.72 on August 15, 2013	184.72	183.15	1.57
77U	P26/center	VC1762	300 / 240	261.41 on August 16, 2013	172.94[2]	172.79[2]	0.15

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.

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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 (CON0022165)
PEACE REGION (GRANDE PRAIRIE DISTRICT – NORTH)
INSTRUMENTATION MONITORING RESULTS

SPRING 2025

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)
SPRING 2025

Location:	North Eureka River Slide (HWY 726:02 C1 9.911)	**Readout:**	RST PN C108 Unit 8/ GK 404, SN 364
File Number:	32123	**Casing size:**	2.75
Probe:	RST SET 5R and 8R	**Temp:**	20
Cable:	RST SET 5R and 8R	**Read by:**	NKR/GE

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	16-Jun-25	1.05	88 to 2	218	1633	-1616	-770	770	8R/8R	2.75	
SI11-4	368446.63	6258834.32	16-Jun-25	0.85	98 to 2	198	259	-246	1981	-1981	8R/8R	2.75	
Upper Wall													
SI12-P9U	368400.67	6258635.59	16-Jun-25	0.7	2 to 98	250	122	-113	-306	289	5R/5R	2.75	No extension
SI12-P17U	368400.98	6258605.62	16-Jun-25	1.2	2 to 98	286	-552	560	345	-375	5R/5R	2.75	
SI12-P26U	368401.31	6258572.75	16-Jun-25	0.85	2 to 90	10	-408	413	-50	28	5R/5R	2.75	
SI12-P3L	368360	6258629	16-Jun-25	1.42	2 to 68	204	498	-487	264	-261	8R/8R	2.75	
SI12-P9L	368371.87	6258609.86	16-Jun-25	-0.4	2 to 63	200	429	-412	-214	213	8R/8R	2.75	*
SI12-P14L	368371.25	6258589.95	16-Jun-25	0.8	2 to 68	268	105	-93	-727	699	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	16-Jun-25	99.5	33812

VIBRATING WIRE PIEZOMETER (VW) READINGS

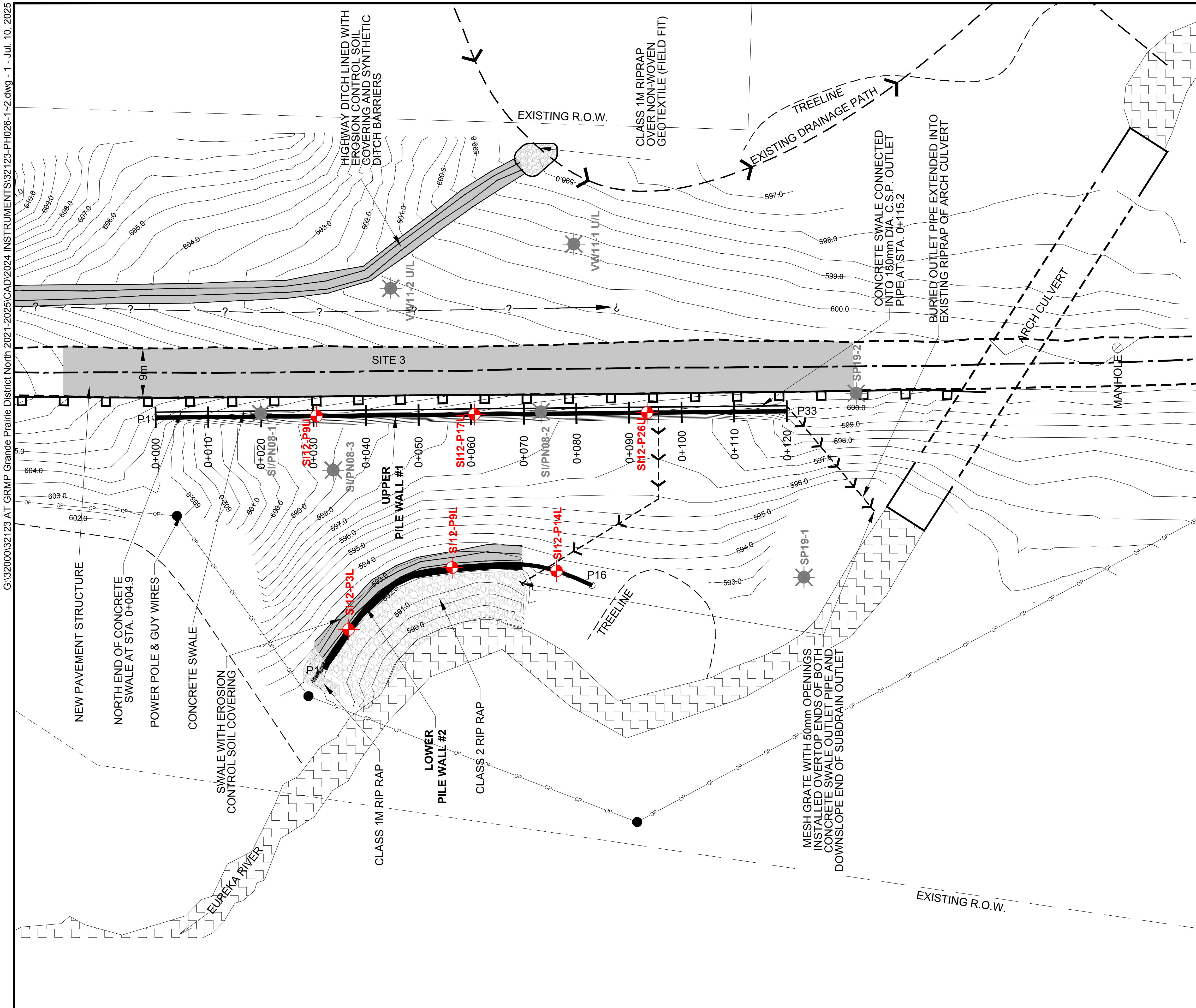
VW #	GPS Location (UTM 11)		Date	Reading ($Dg/^0C$)	Identification Number
	Easting (m)	Northing (m)			
VW11-7	368402.00	6258729.78	16-Jun-25	8285.7/4.2	16449

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	16-Jun-25	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 -.0.40m from ground surface inside Metal box


HIGHWAY DITCH LINED WITH EROSION CONTROL SOIL COVERING AND SYNTHETIC DITCH BARRIERS
EXISTING R.O.W.
CLASS 1M RIPRAP OVER NON-WOVEN GEOTEXTILE (FIELD FIT)
TREELINE
EXISTING DRAINAGE PATH
CONCRETE SWALE CONNECTED INTO 150mm DIA. C.S.P. OUTLET PIPE AT STA. 0+115.2
BURIED OUTLET PIPE EXTENDED INTO EXISTING RIPRAP OF ARCH CULVERT
ARCH CULVERT
MANHOLE
VW11-2 U/L
VW11-1 U/L
SITE 3
9m
SP19-2
P1
P33
0+000
0+010
0+020
SI/PN08-1
SI12-P9U
0+030
SI/PN08-3
0+040
0+050
SI12-P17U
0+060
0+070
SI/PN08-2
0+080
0+090
SI12-P26U
0+100
0+110
0+120
UPPER PILE WALL #1
SI12-P9L
SI12-P14L
SI12-P3L
P16
SP19-1
TREELINE
NEW PAVEMENT STRUCTURE
NORTH END OF CONCRETE SWALE AT STA. 0+004.9
POWER POLE & GUY WIRES
CONCRETE SWALE
SWALE WITH EROSION CONTROL SOIL COVERING
CLASS 1M RIP RAP
LOWER PILE WALL #2
CLASS 2 RIP RAP
MESH GRATE WITH 50mm OPENINGS INSTALLED OVERTOP ENDS OF BOTH CONCRETE SWALE OUTLET PIPE AND DOWNSLOPE END OF SUBDRAIN OUTLET
EUREKA RIVER
EXISTING R.O.W.

LEGEND

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

0 10 20 30 40 50m
SCALE 1:750

Alberta Transportation

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 2025
FILE No.	32123

THURBER

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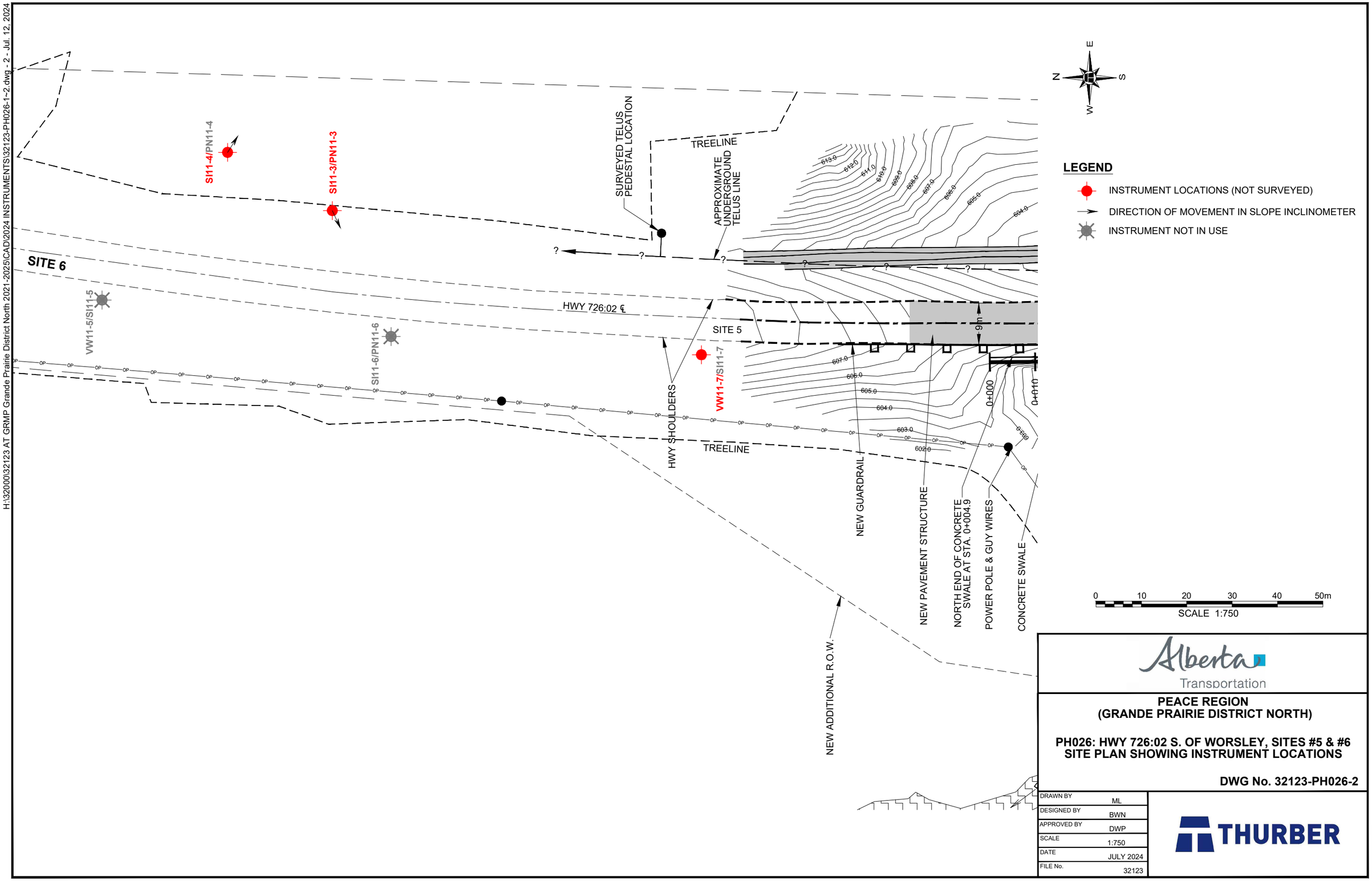


N E S W

LEGEND

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

0 10 20 30 40 50m

SCALE 1:750

Alberta Transportation

PEACE REGION
(GRANDE PRAIRIE DISTRICT NORTH)

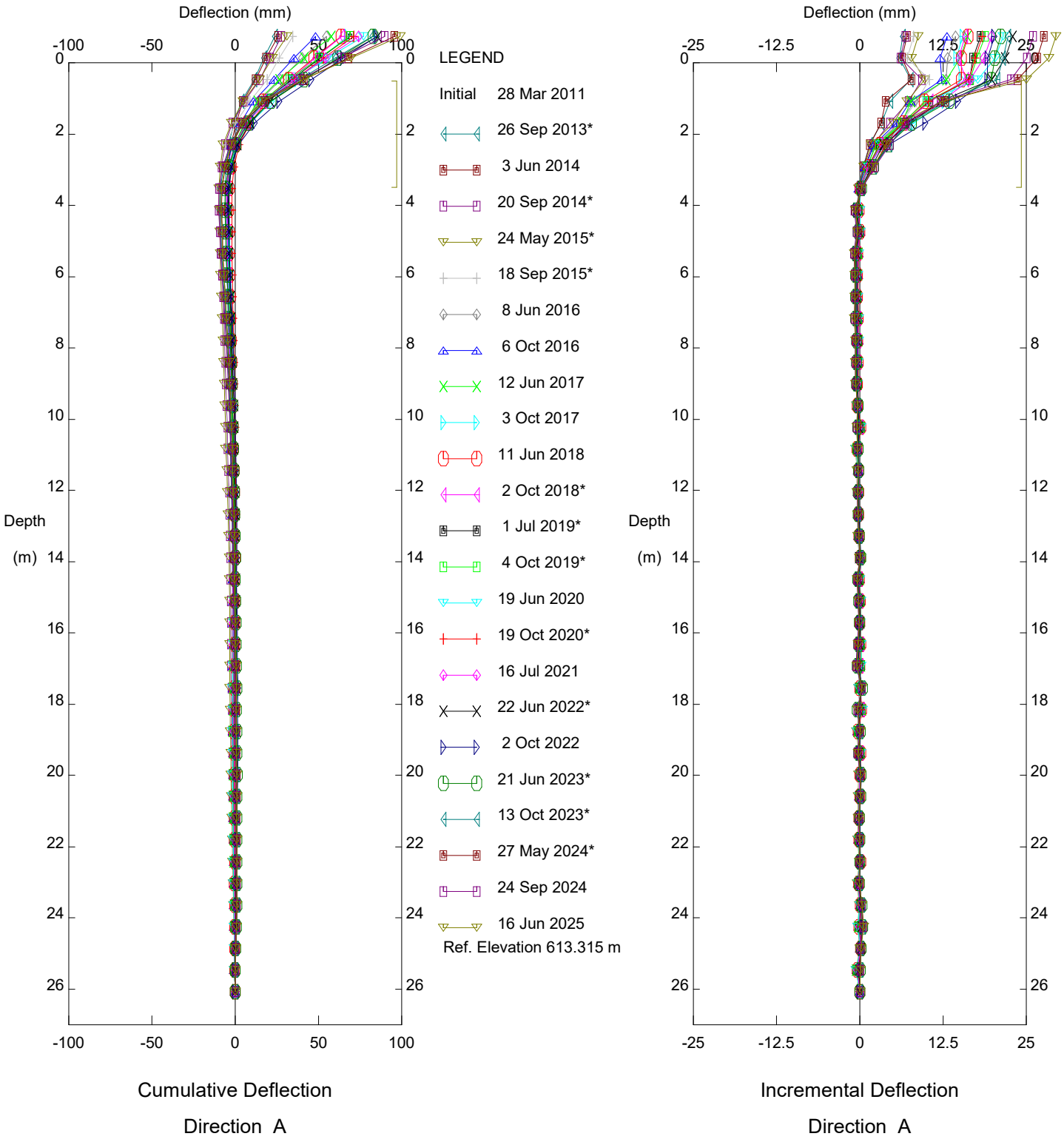
PH026: HWY 726:02 S. OF WORSLEY, SITES #5 & #6
SITE PLAN SHOWING INSTRUMENT LOCATIONS

DWG No. 32123-PH026-2

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

THURBER

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

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

Alberta Transportation

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

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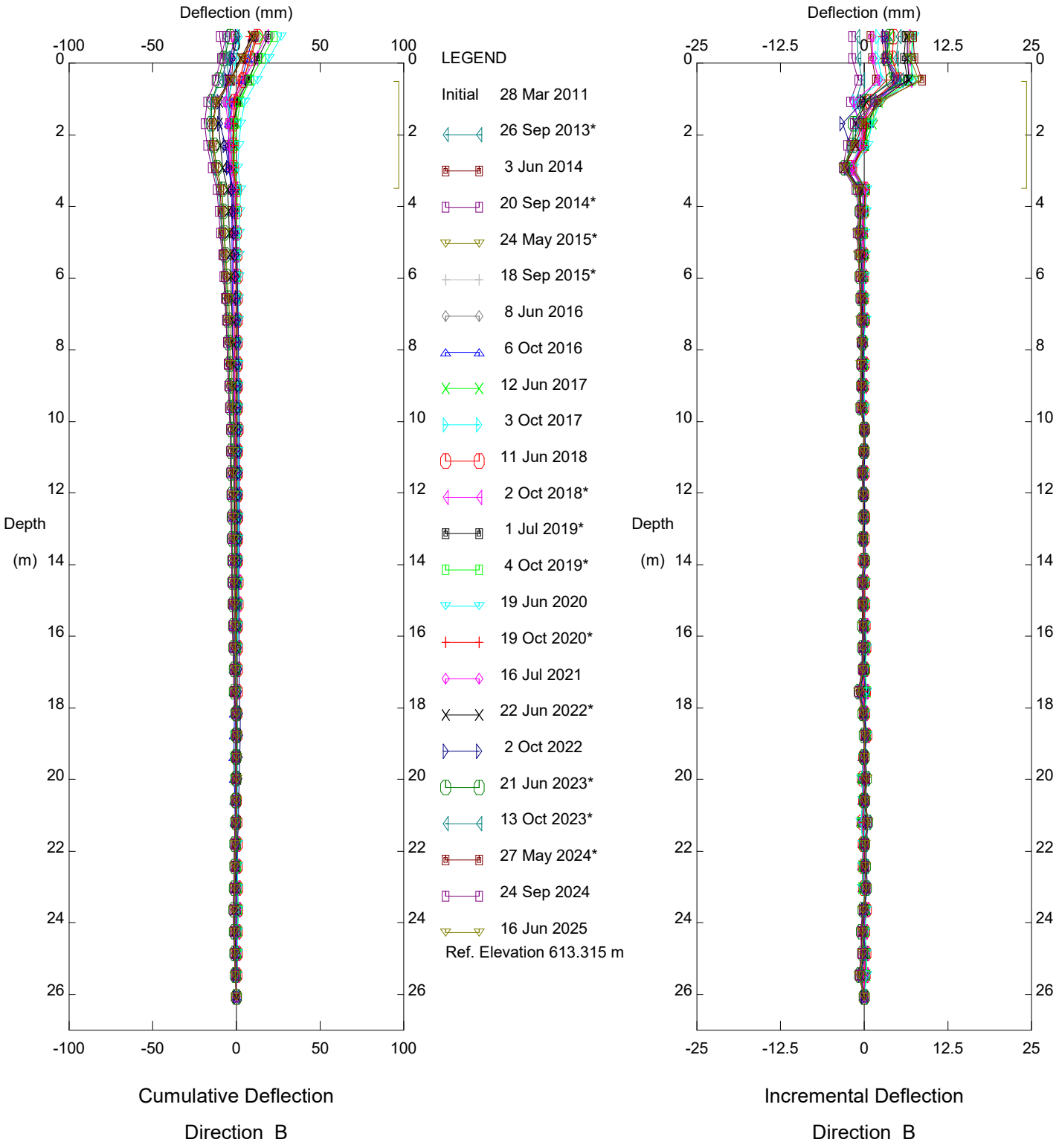

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

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

Alberta Transportation

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

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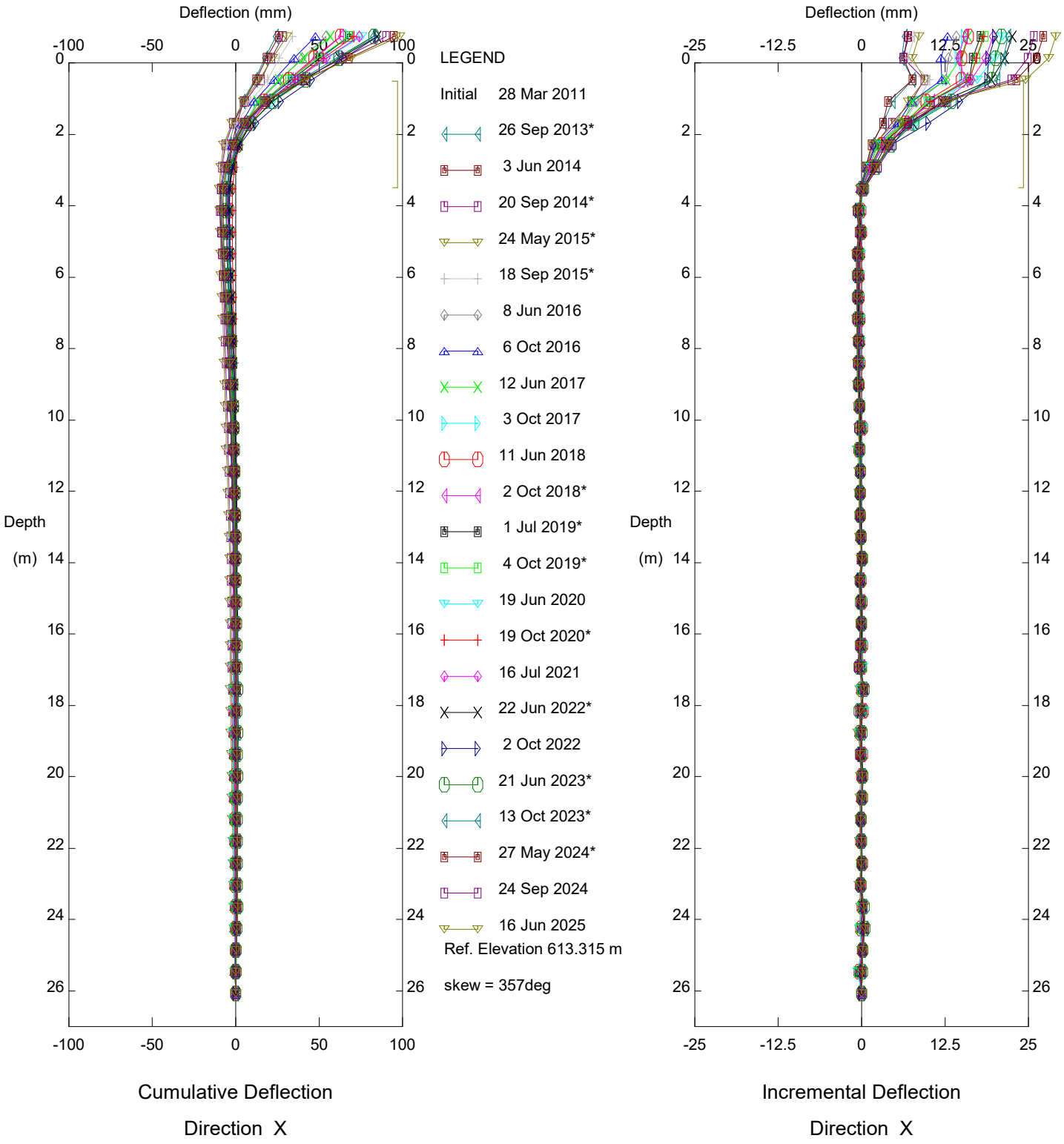

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

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

Alberta Transportation

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

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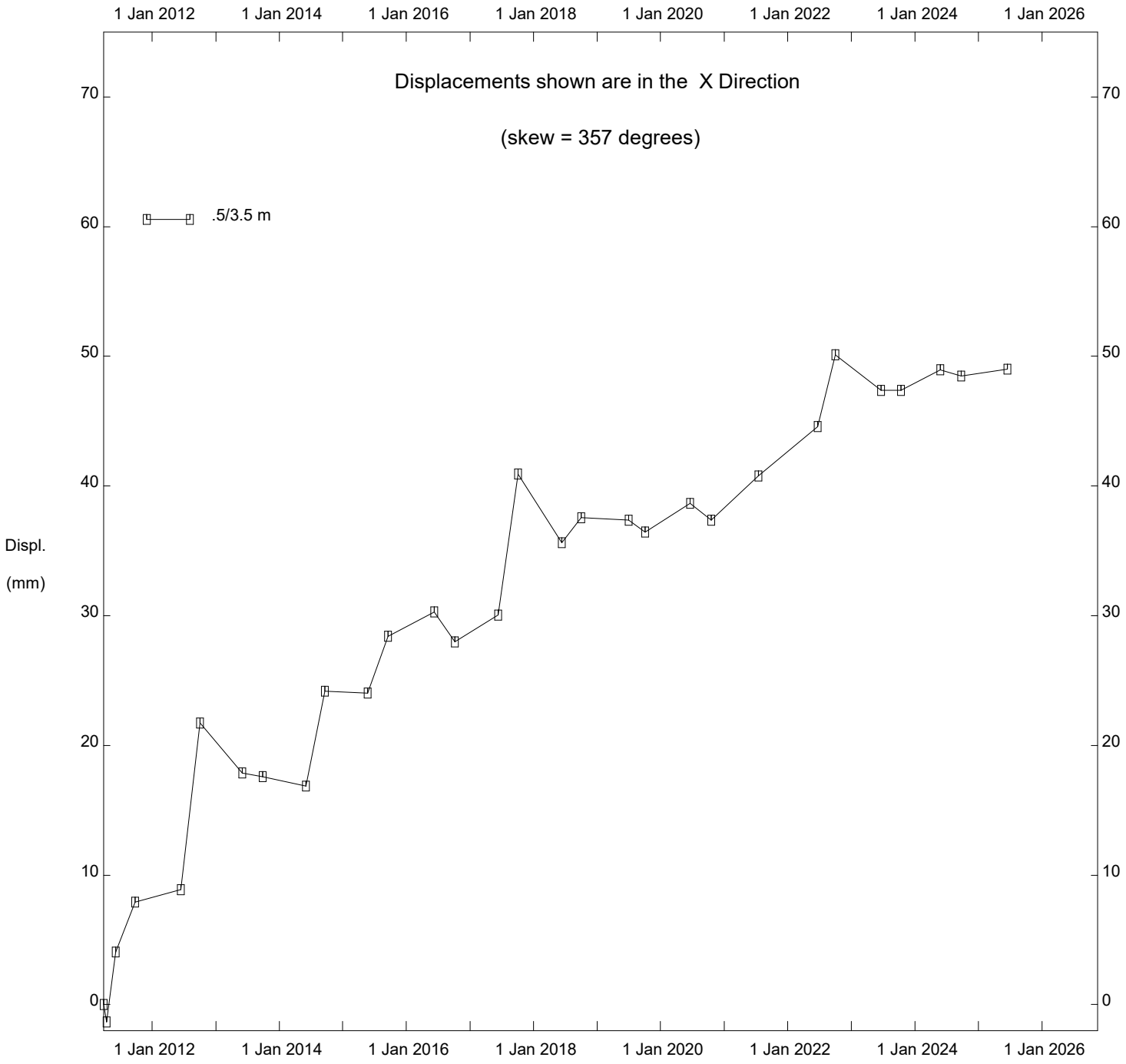
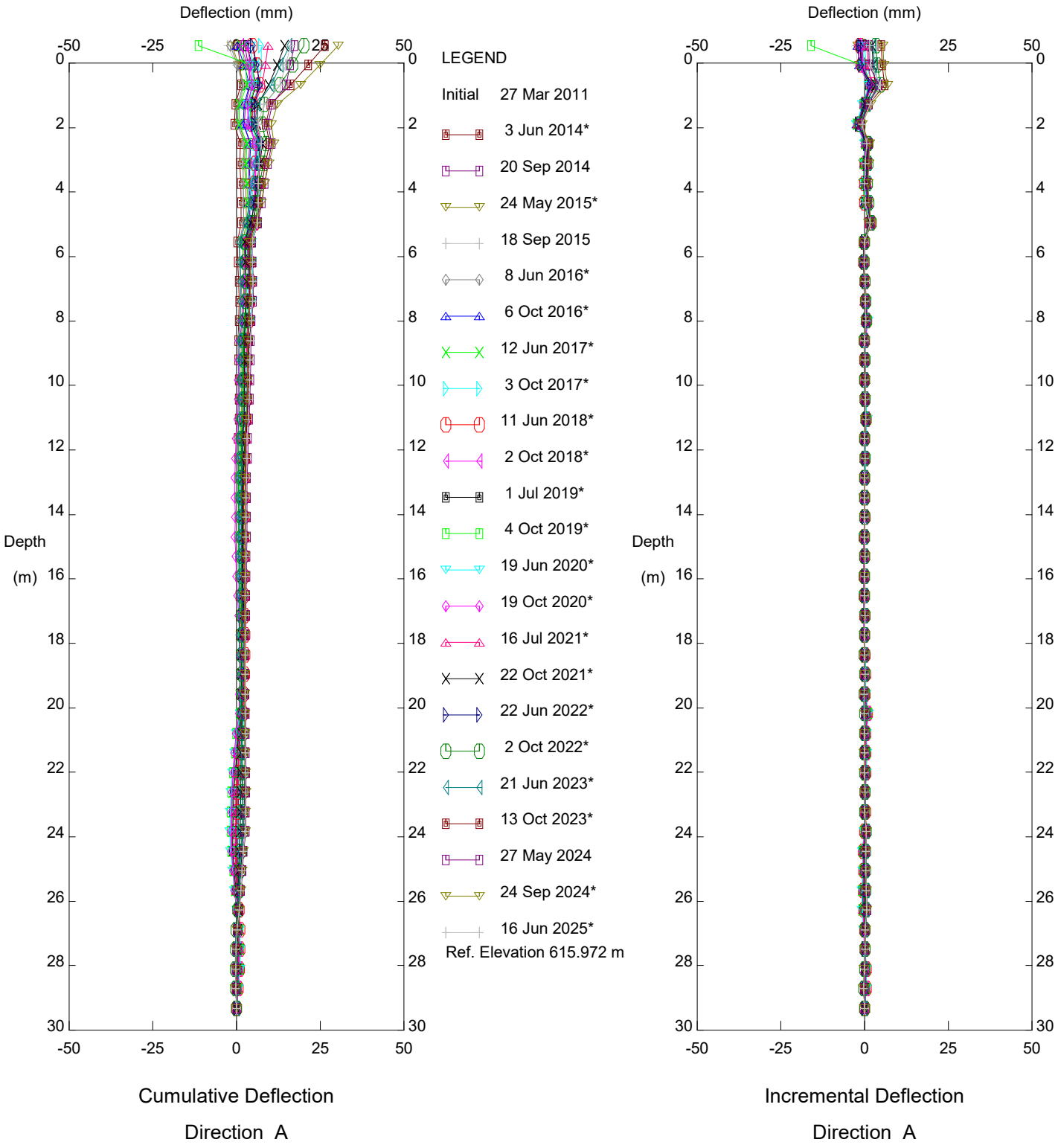


Hwy 726:02 Eureka River, PH026, Inclinometer SI11-3

Alberta Transportation

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

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

Alberta Transportation

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

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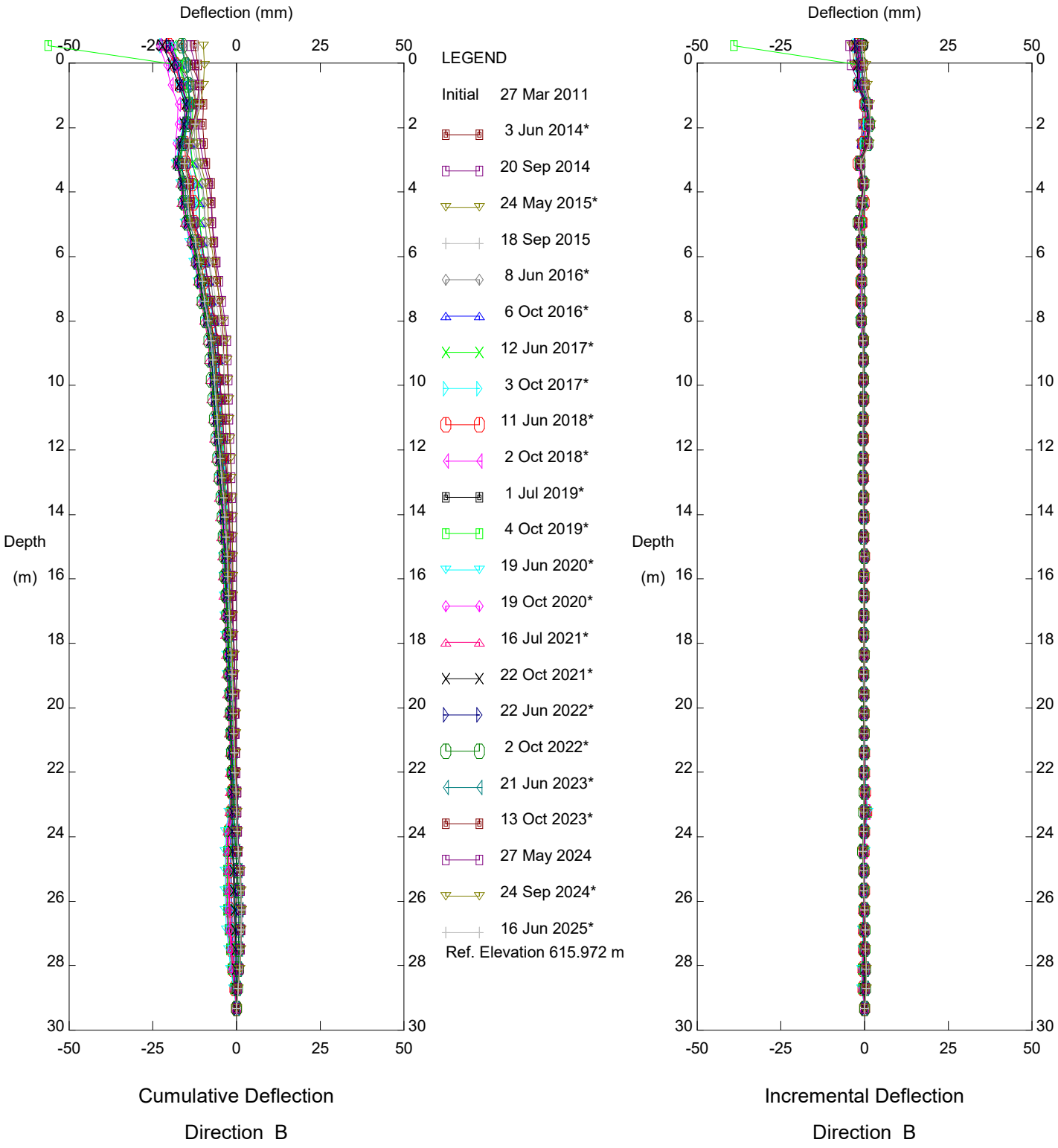

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

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

Alberta Transportation

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

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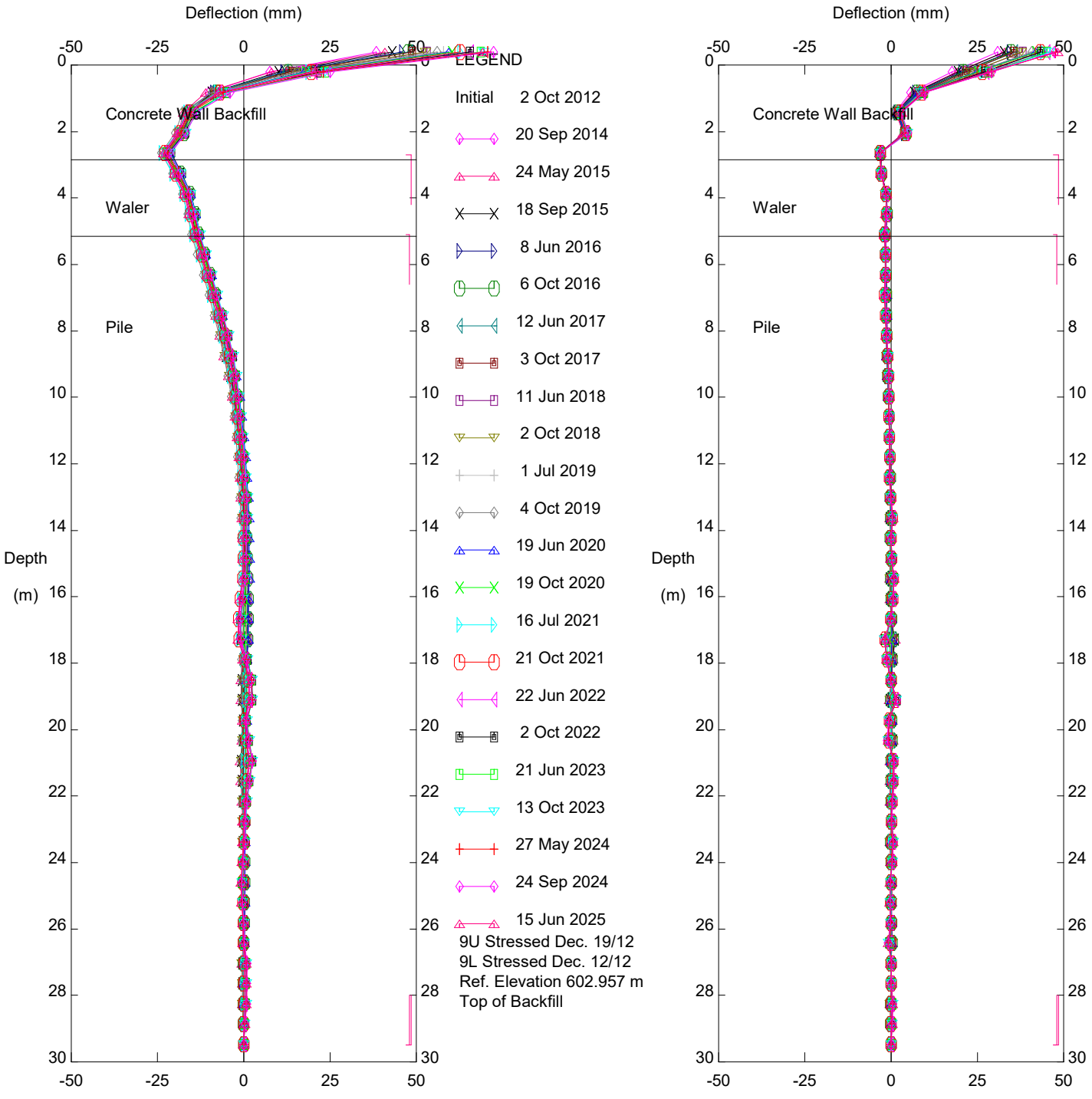

Cumulative Deflection

Direction A

Incremental Deflection

Direction A

PH026 Eureka River Upper Wall, Inclinometer SI12-P9U

Alberta Transportation

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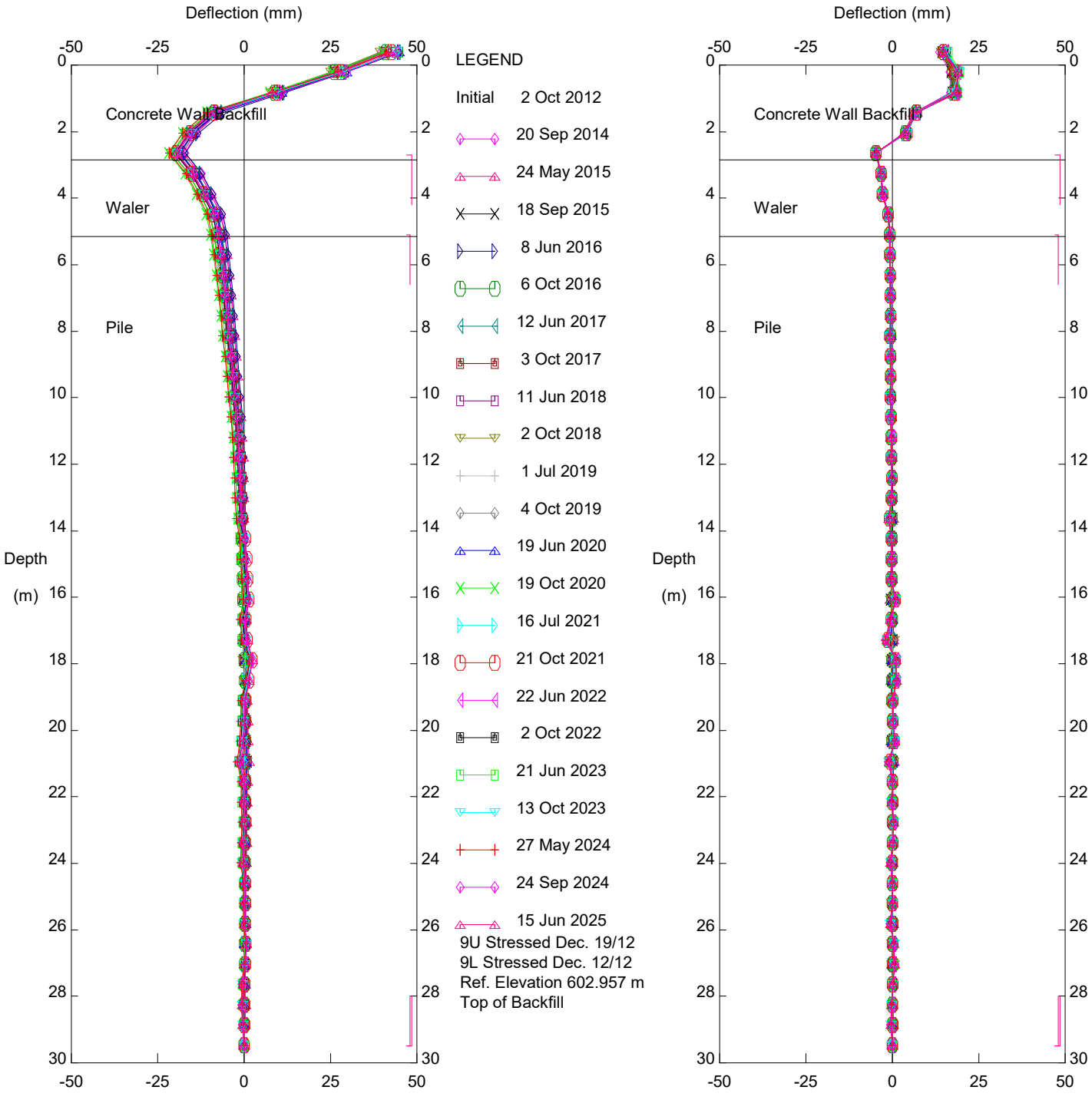

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

PH026 Eureka River Upper Wall, Inclinometer SI12-P9U

Alberta Transportation

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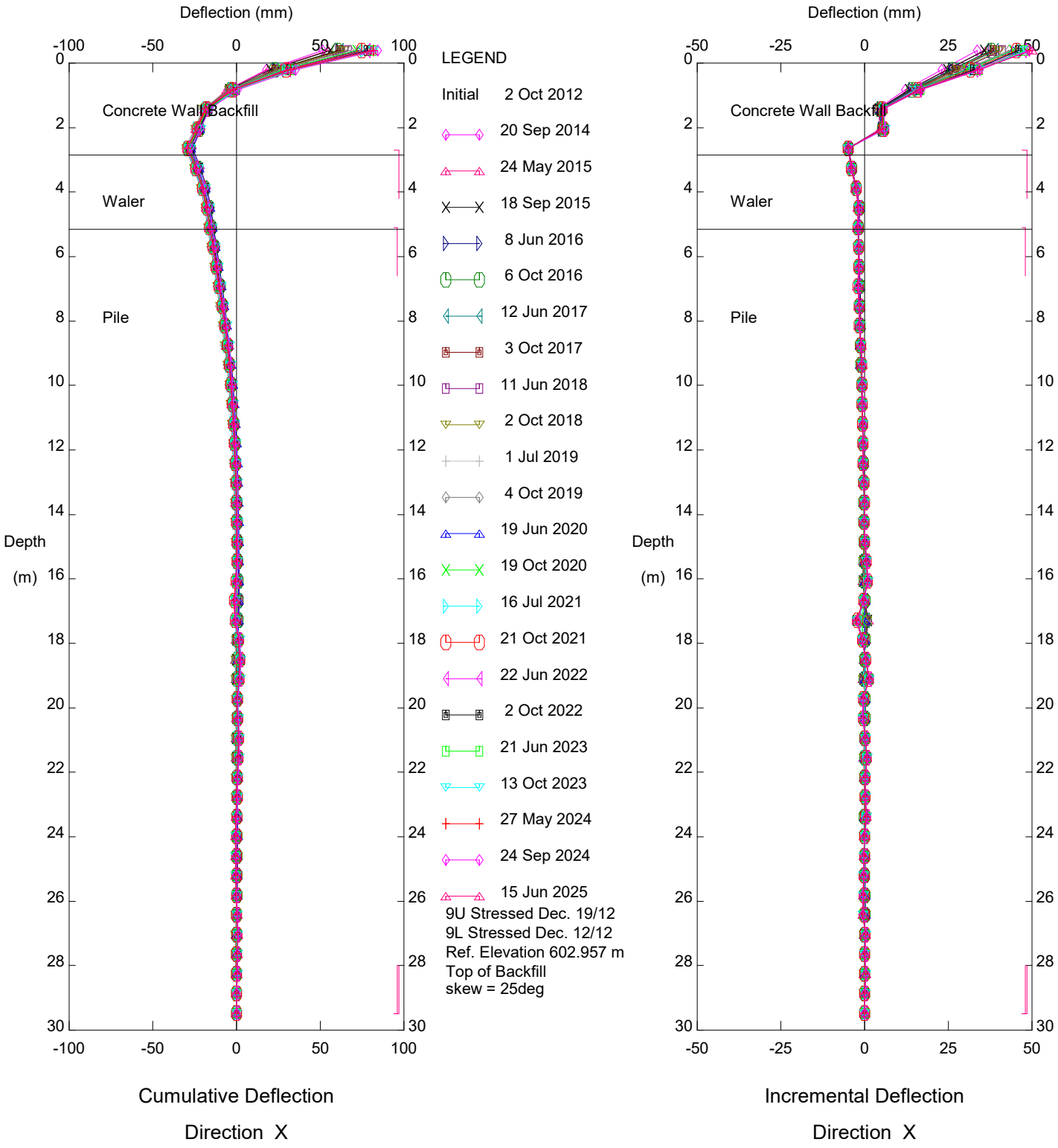

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

PH026 Eureka River Upper Wall, Inclinometer SI12-P9U

Alberta Transportation

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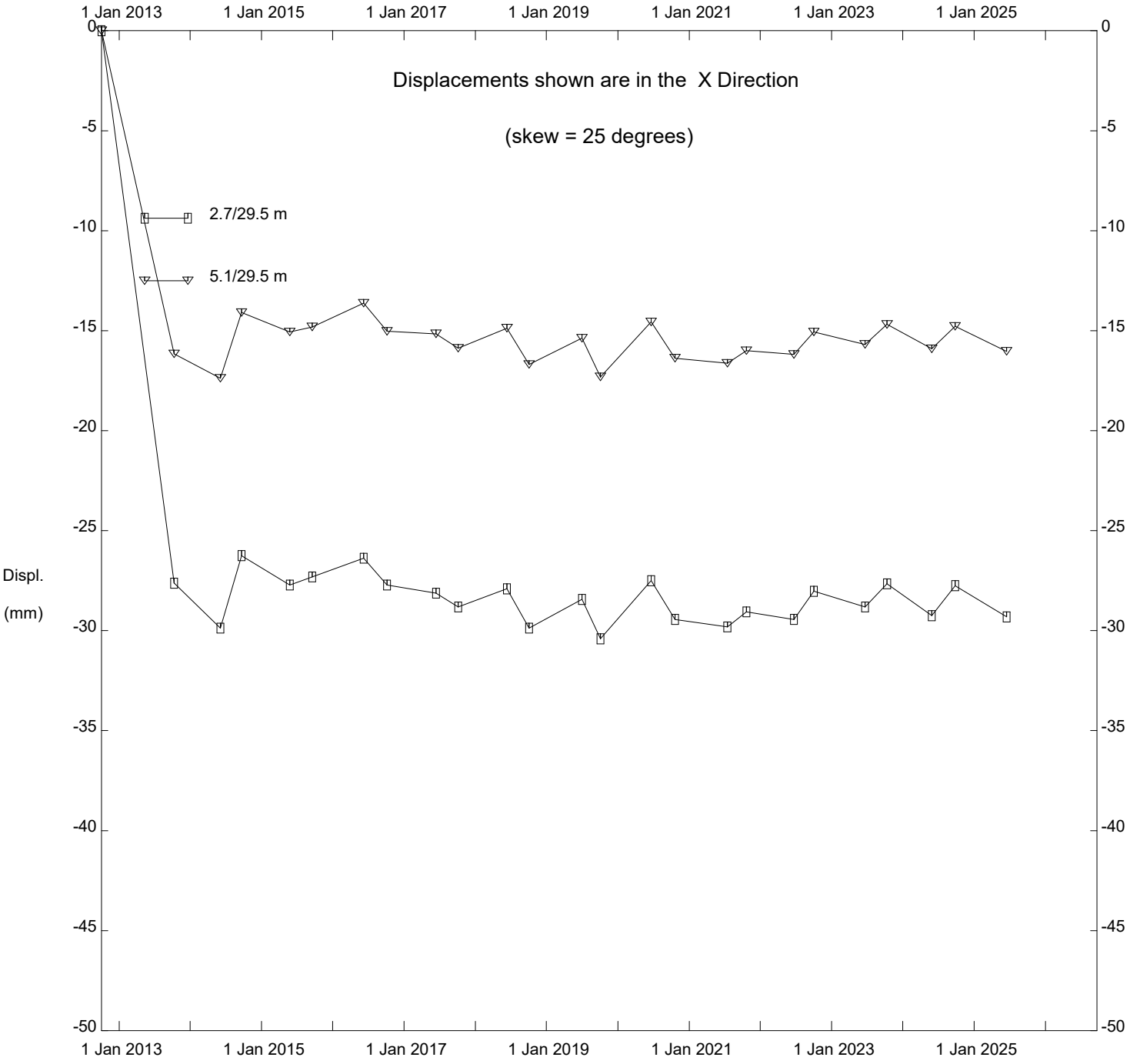

PH026 Eureka River Upper Wall, Inclinometer SI12-P9U

Alberta Transportation

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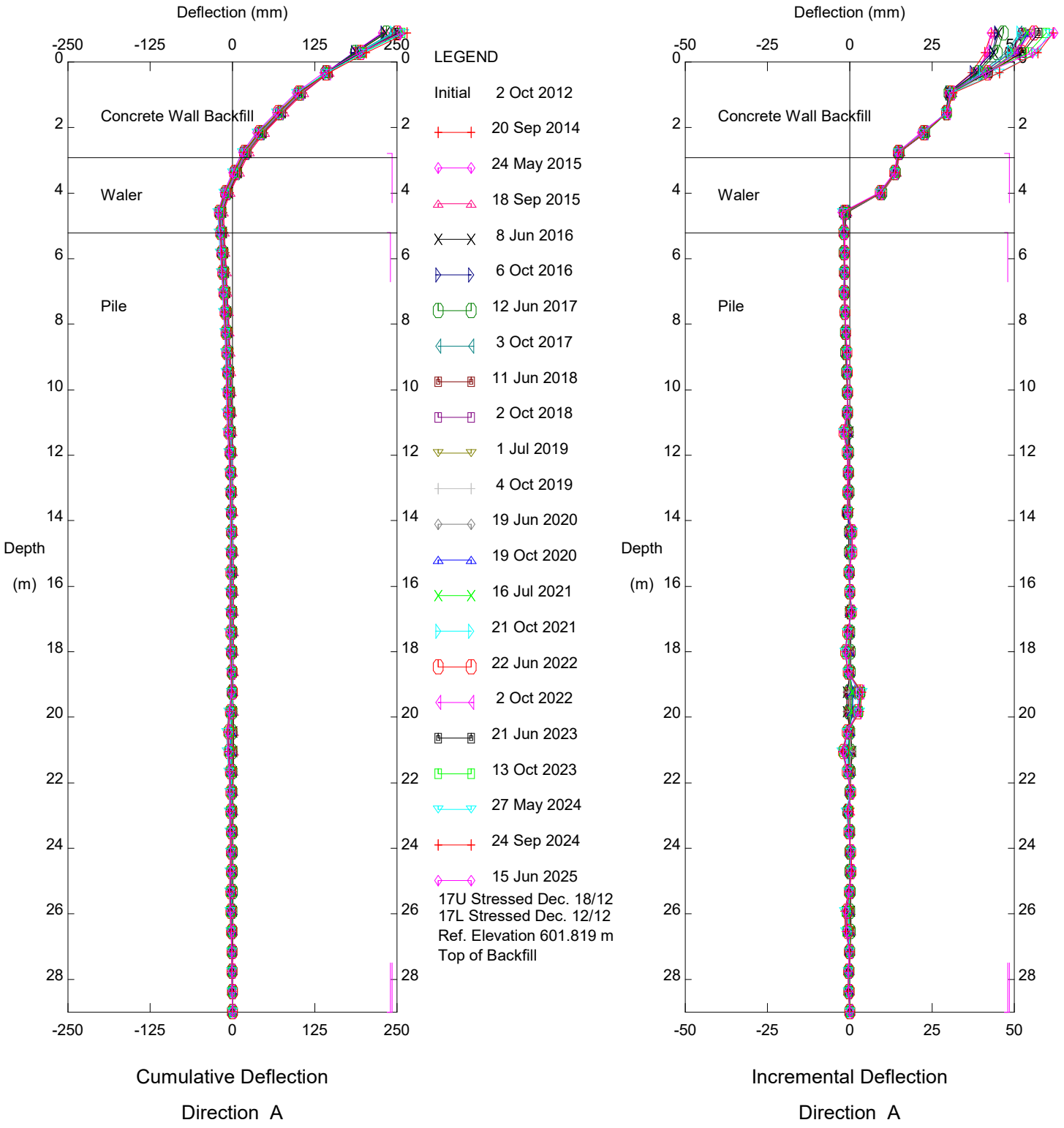

Cumulative Deflection

Direction A

Incremental Deflection

Direction A

PH026 Eureka River Upper Wall, Inclinometer SI12-P17U

Alberta Transportation

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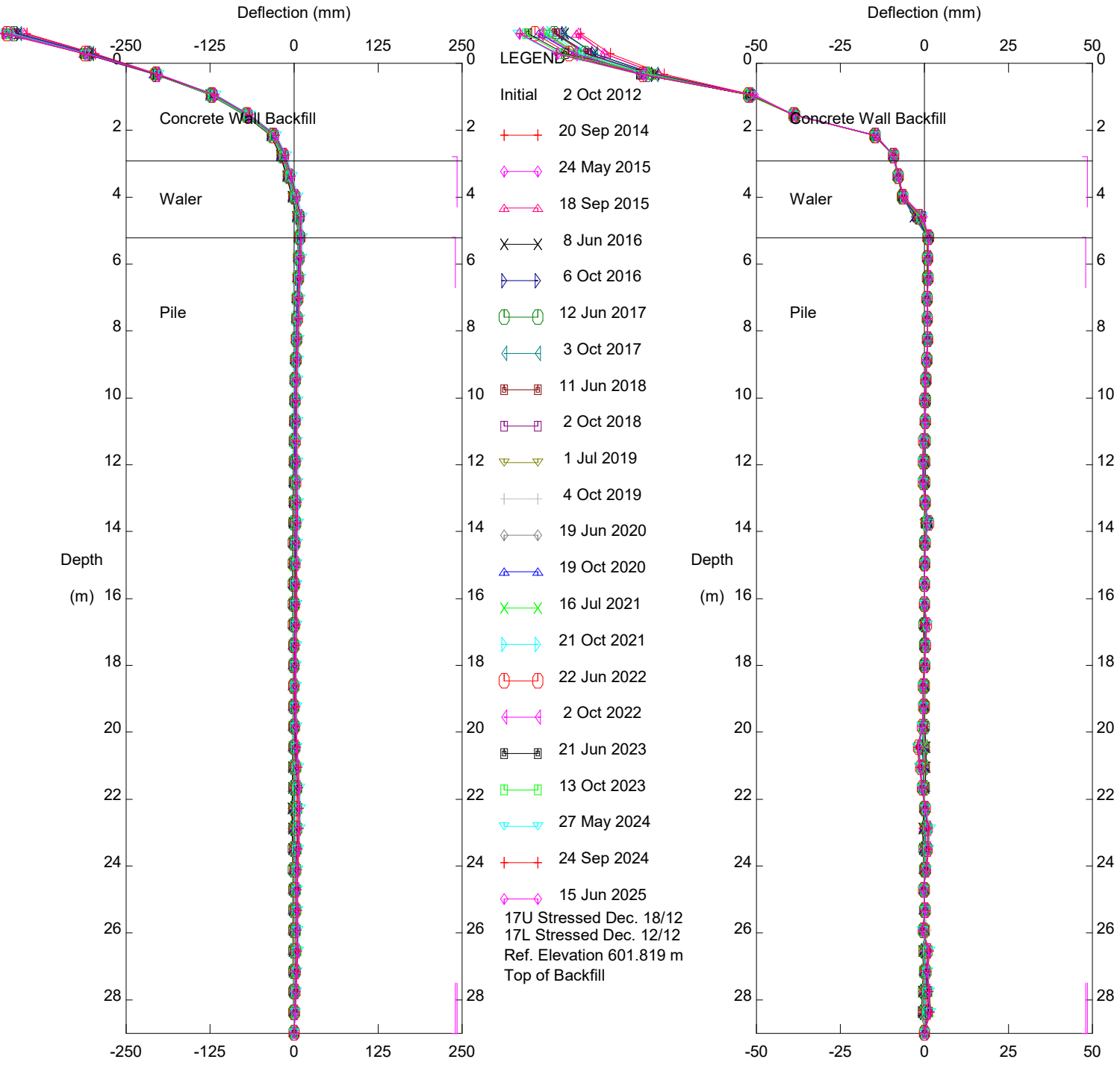

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

PH026 Eureka River Upper Wall, Inclinometer SI12-P17U

Alberta Transportation

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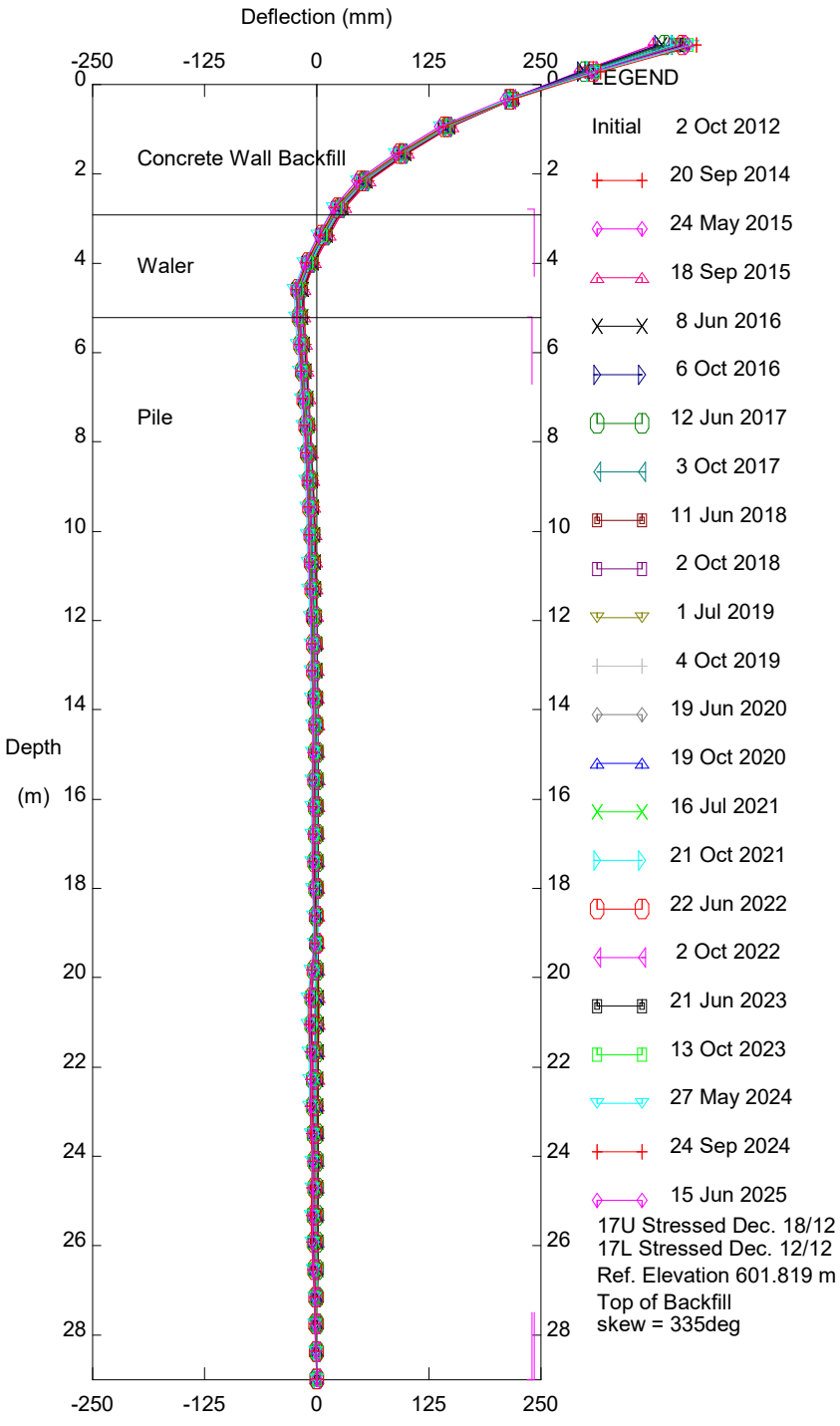
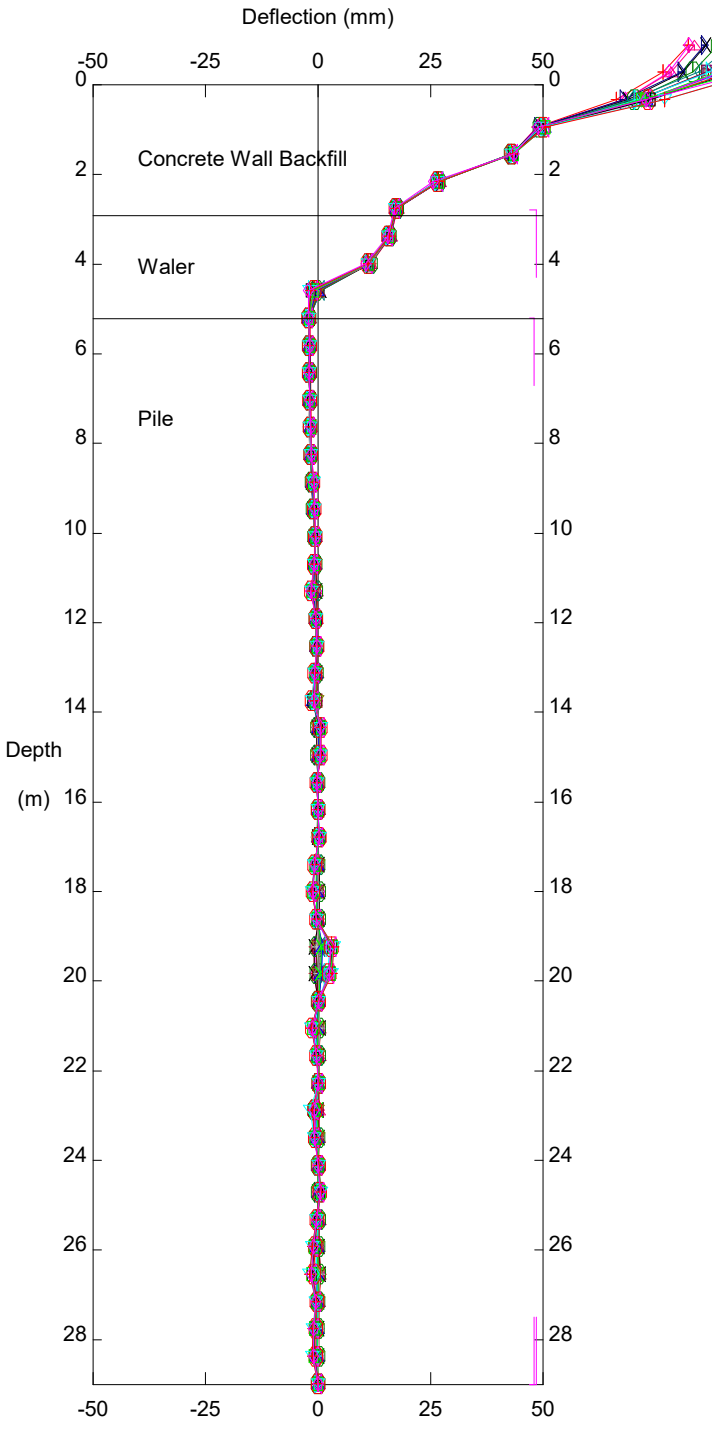


Cumulative Deflection

Direction X



Incremental Deflection

Direction X

PH026 Eureka River Upper Wall, Inclinometer SI12-P17U

Alberta Transportation

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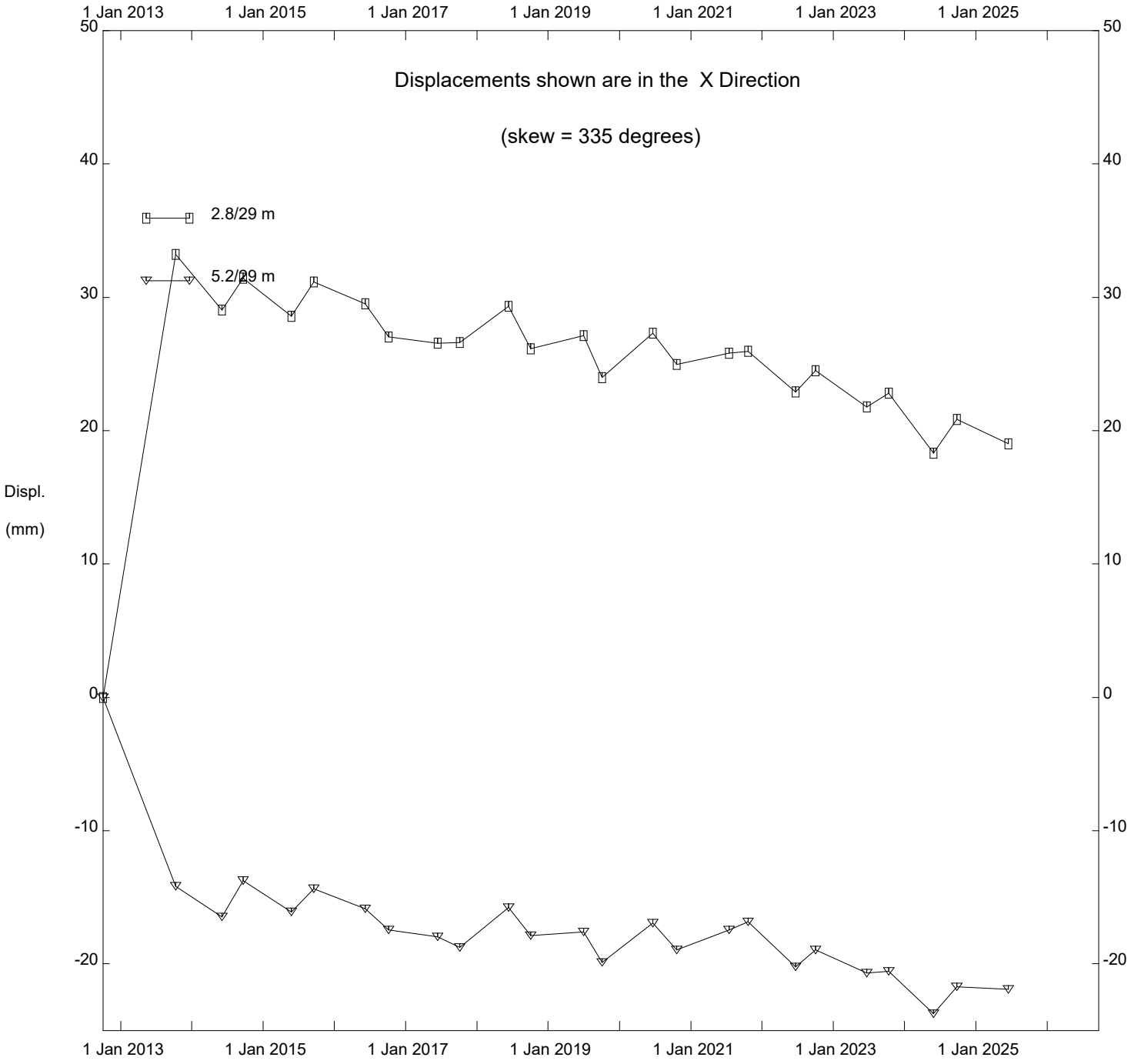
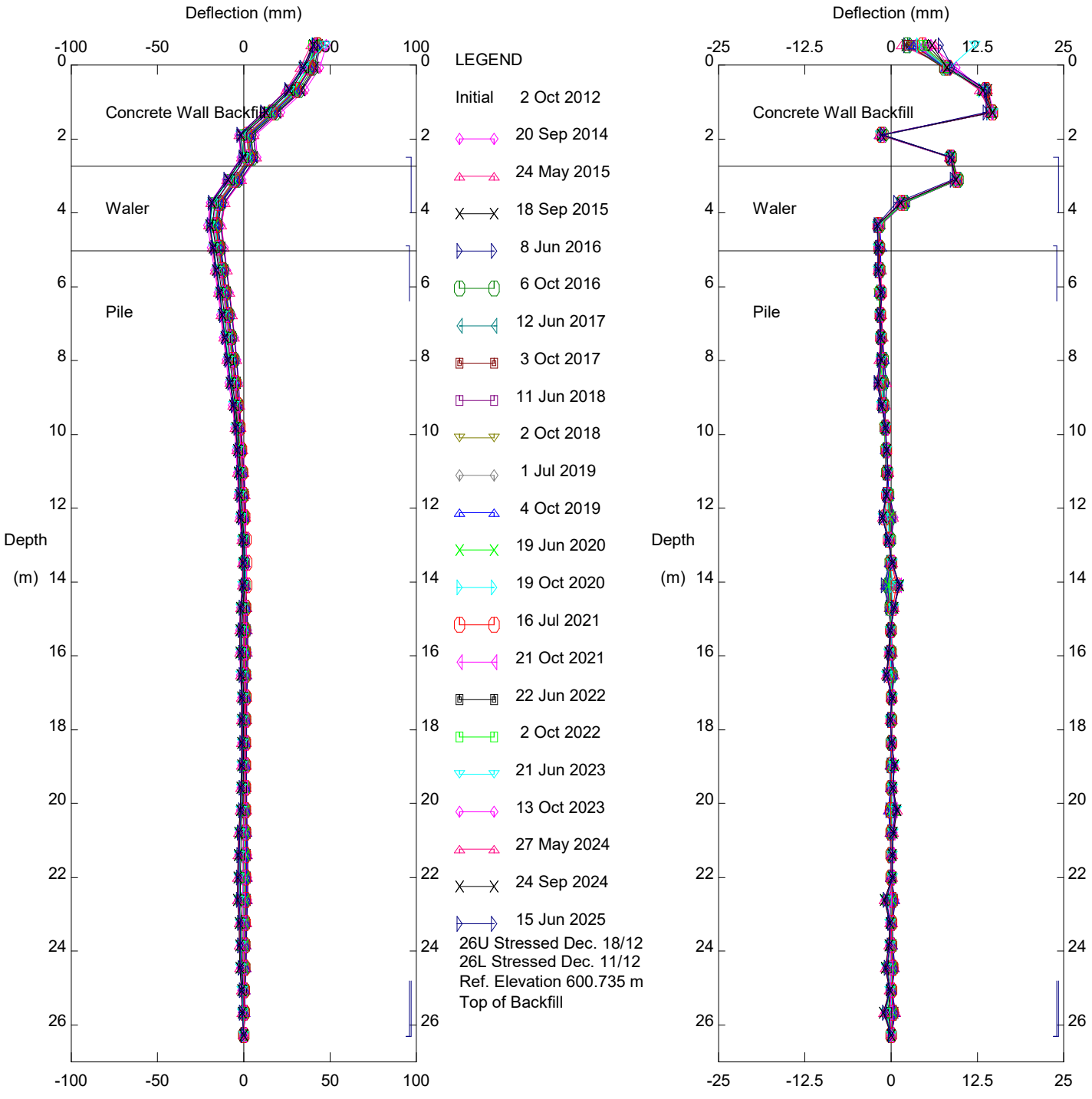


PH026 Eureka River Upper Wall, Inclinometer SI12-P17U

Alberta Transportation

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

PH026 Eureka River Upper Wall, Inclinometer SI12-P26U

Alberta Transportation

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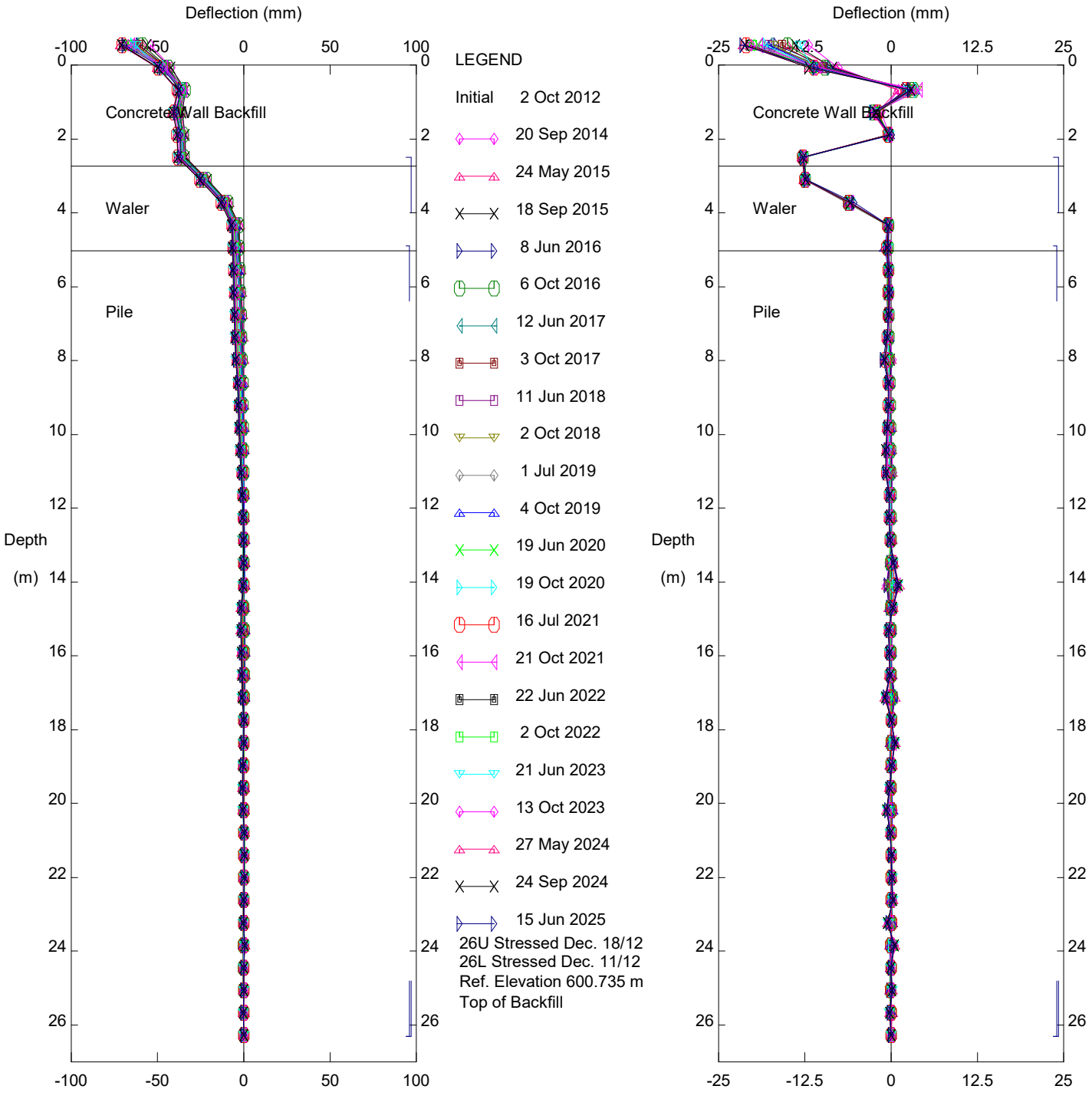

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

PH026 Eureka River Upper Wall, Inclinometer SI12-P26U

Alberta Transportation

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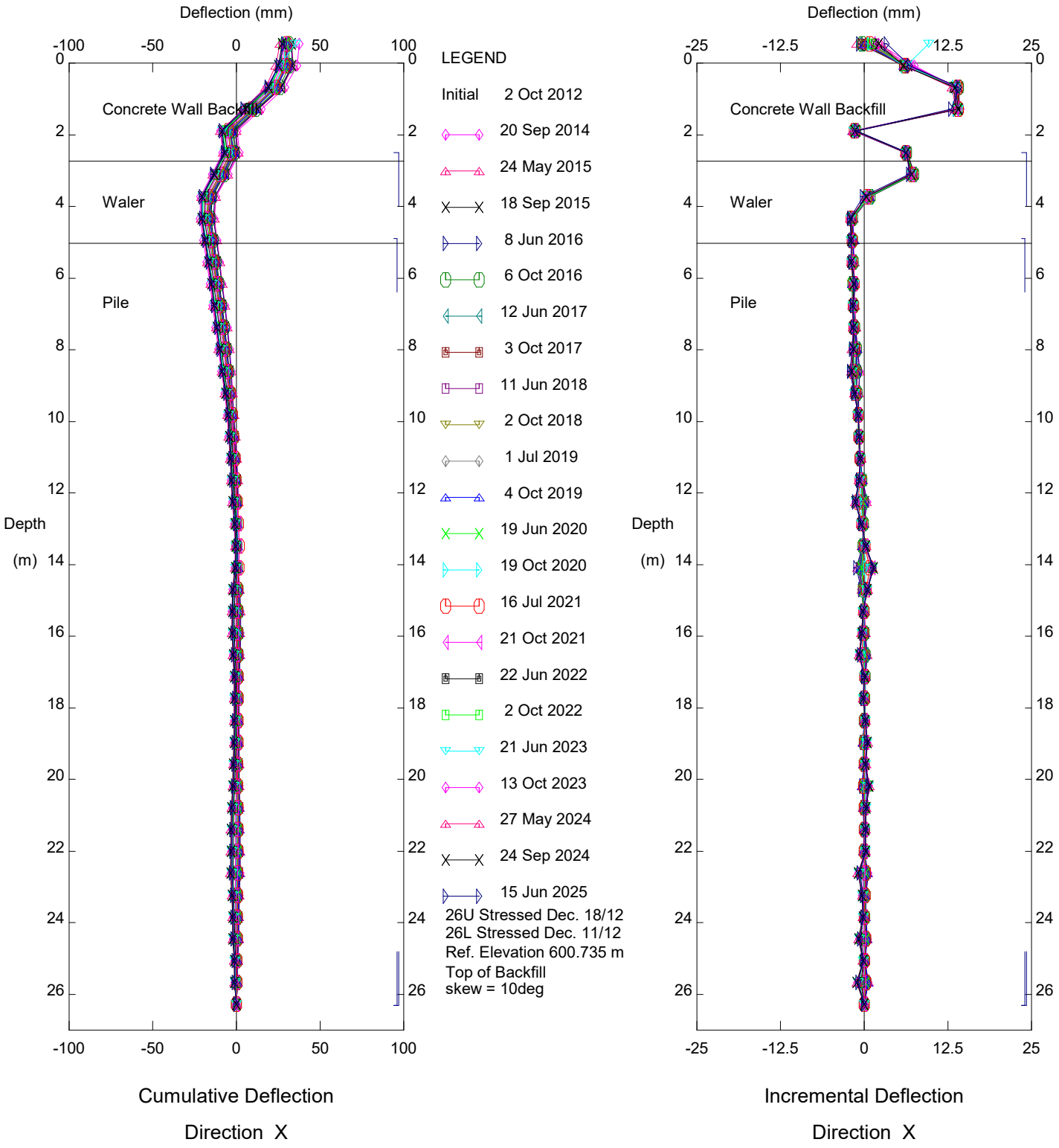

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

PH026 Eureka River Upper Wall, Inclinometer SI12-P26U

Alberta Transportation

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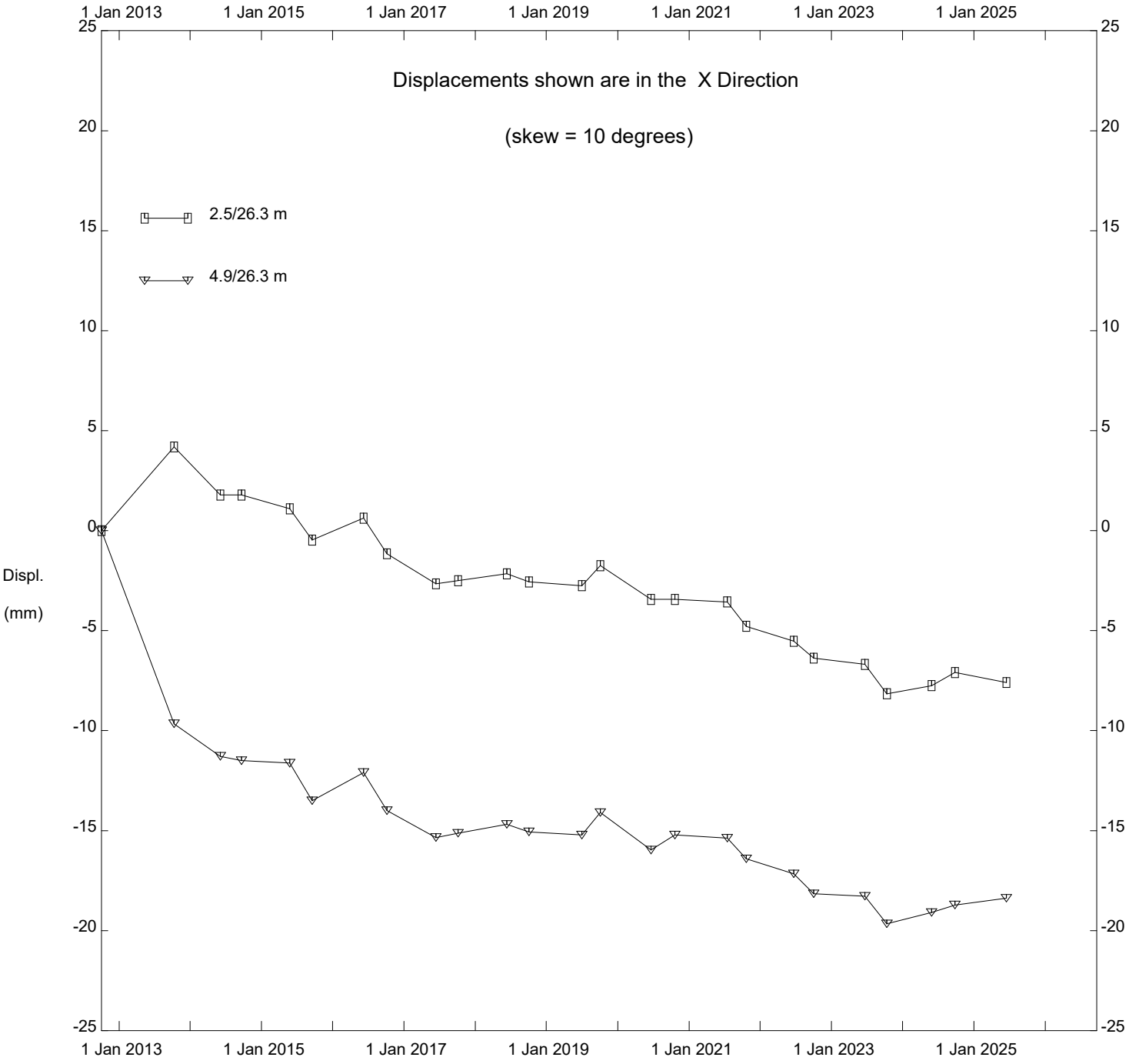

PH026 Eureka River Upper Wall, Inclinometer SI12-P26U

Alberta Transportation

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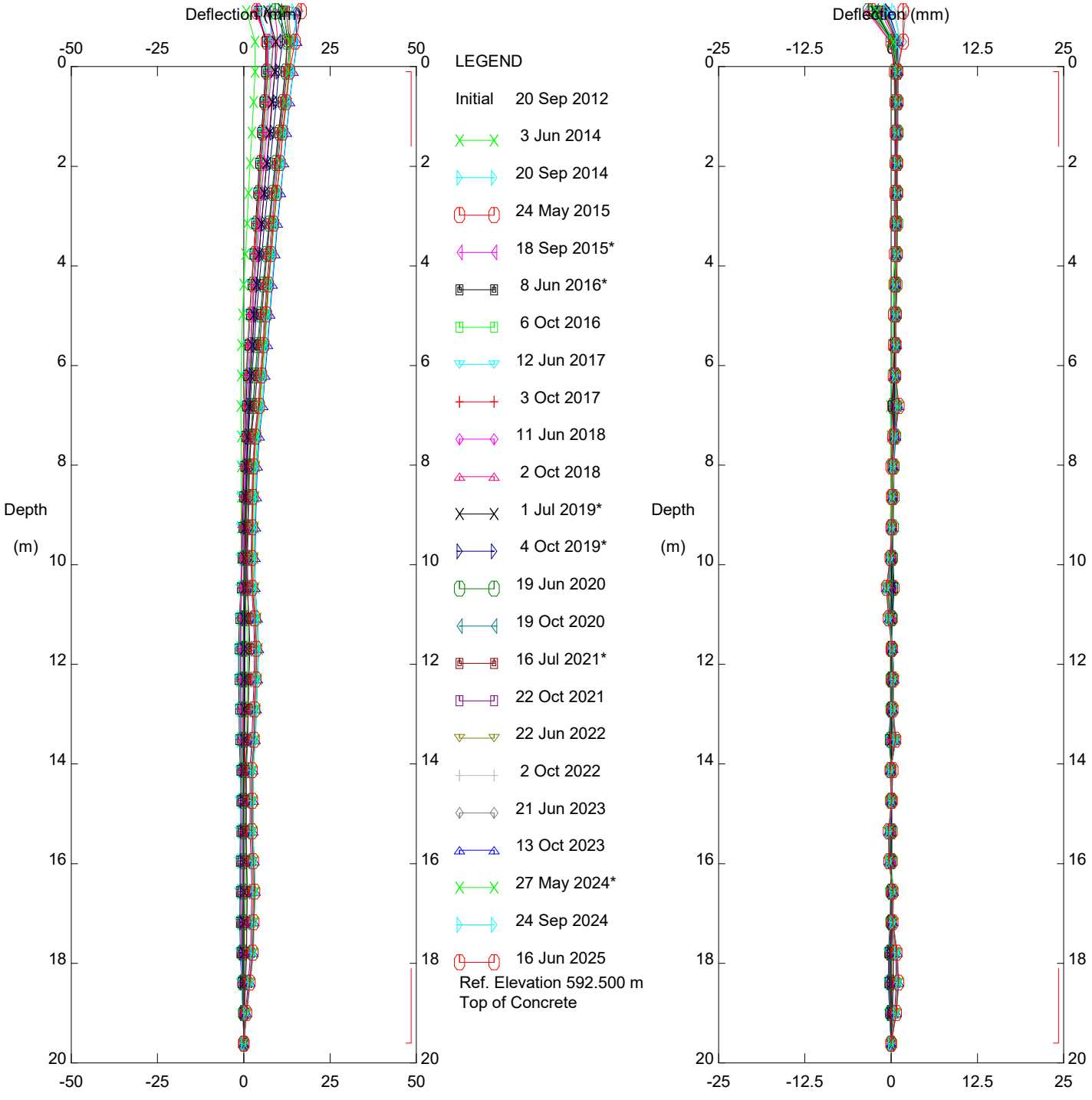


Cumulative Deflection

Direction A

Incremental Deflection

Direction A

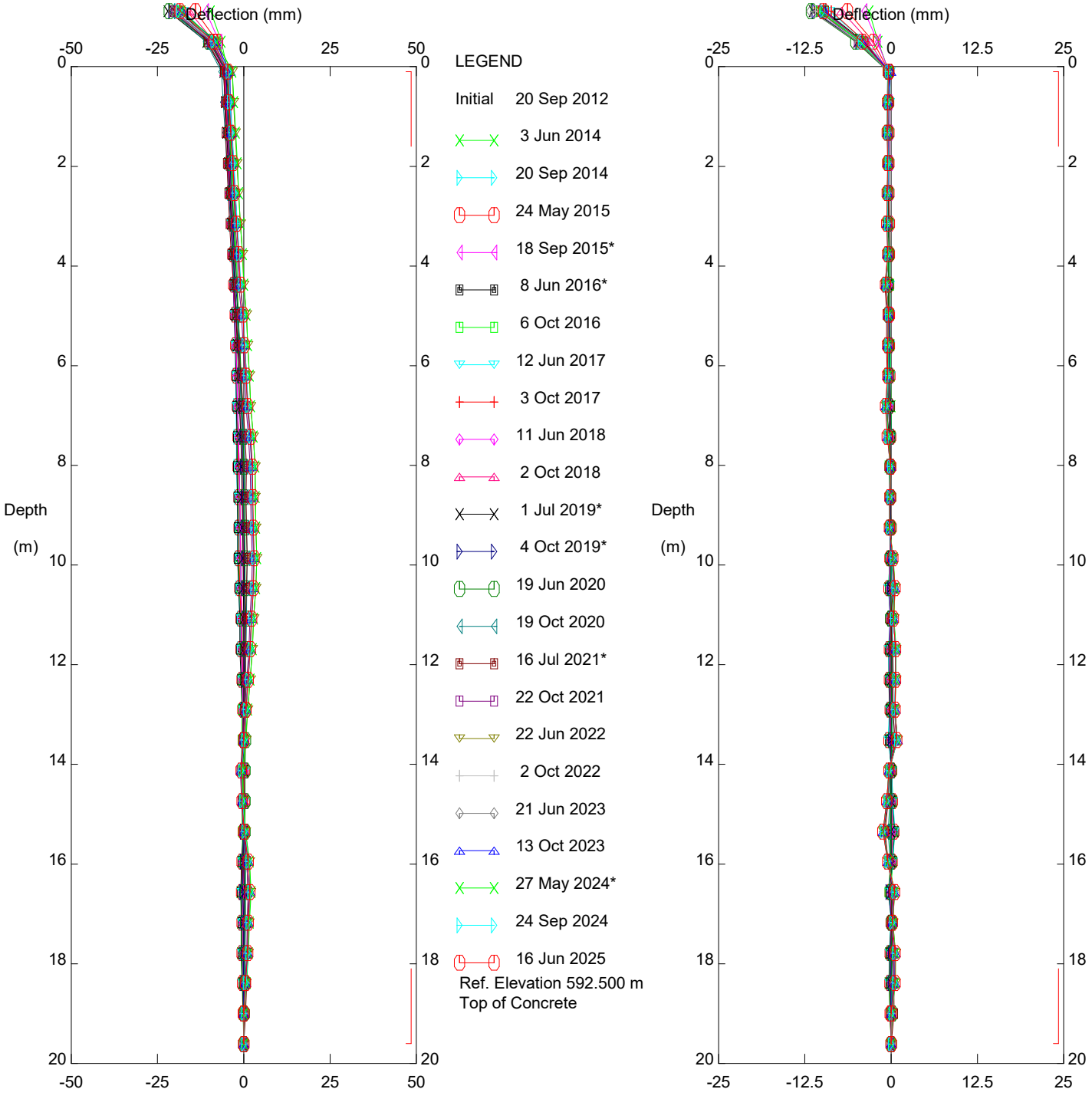
PH026 Eureka River Lower Wall, Inclinometer SI12-P3L

Alberta Transportation

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

G:\32000\32123 AT GRMP Grande Prairie District North 2021-2025\Section C\2025A-Spring\SI Readings\PH026\SI12-P3 L.gtl

Thurber Engineering Ltd.



Cumulative Deflection

Direction B

Incremental Deflection

Direction B

PH026 Eureka River Lower Wall, Inclinometer SI12-P3L

Alberta Transportation

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

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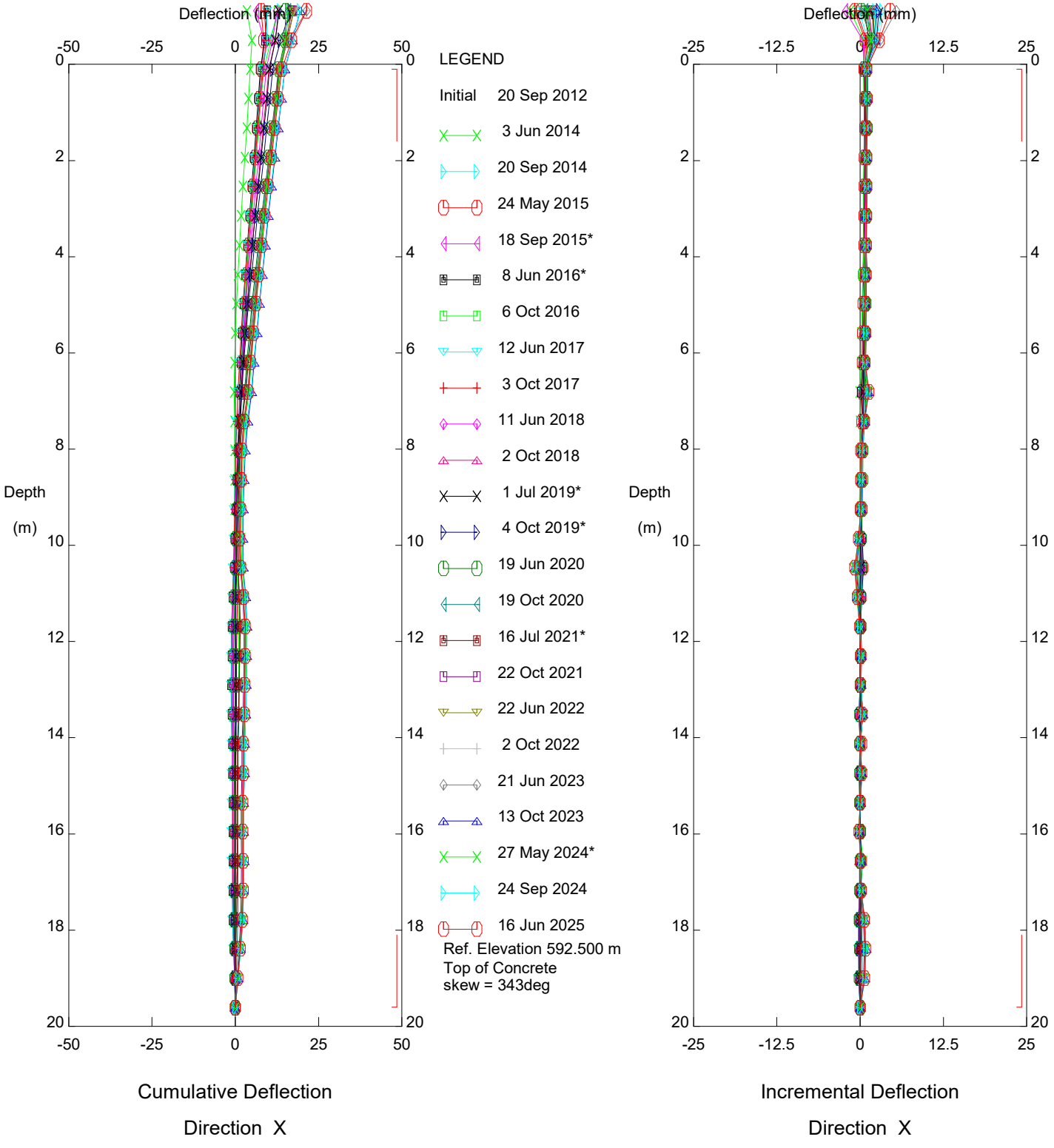

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

PH026 Eureka River Lower Wall, Inclinometer SI12-P3L

Alberta Transportation

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

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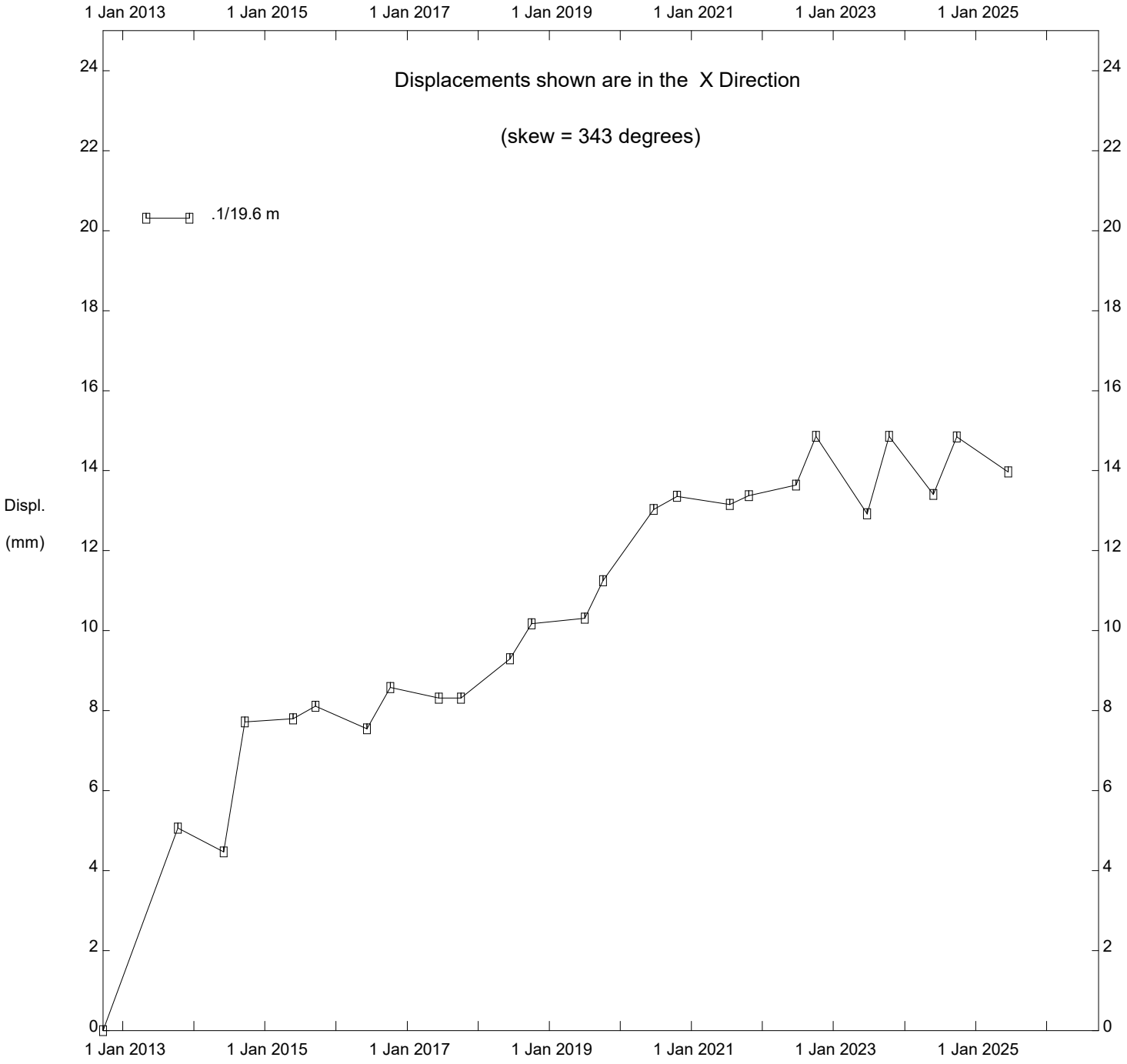
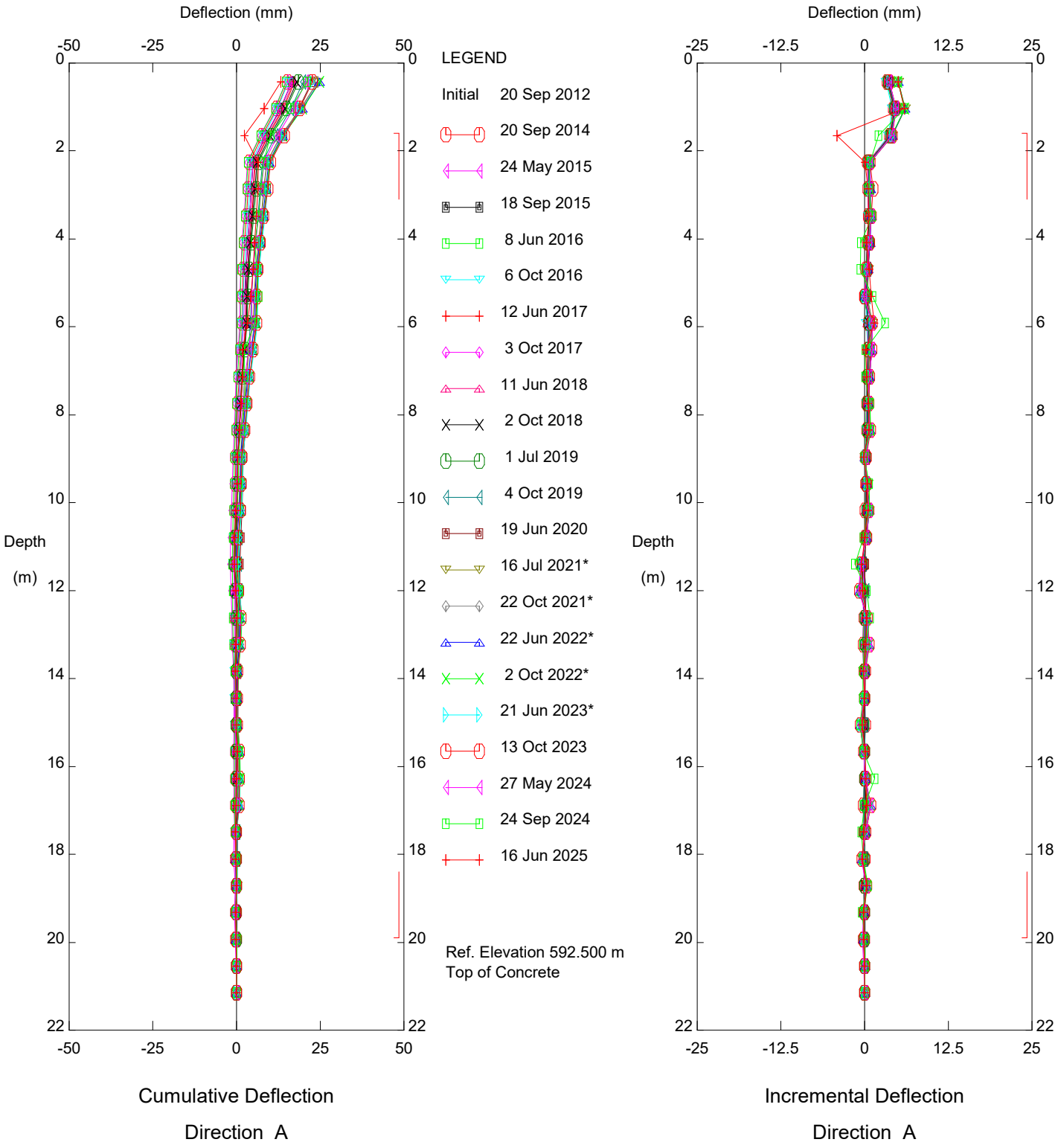
Thurber Engineering Ltd.



PH026 Eureka River Lower Wall, Inclinometer SI12-P3L

Alberta Transportation

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

PH026 Eureka River Lower Wall, Inclinometer SI12-P9L

Alberta Transportation

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

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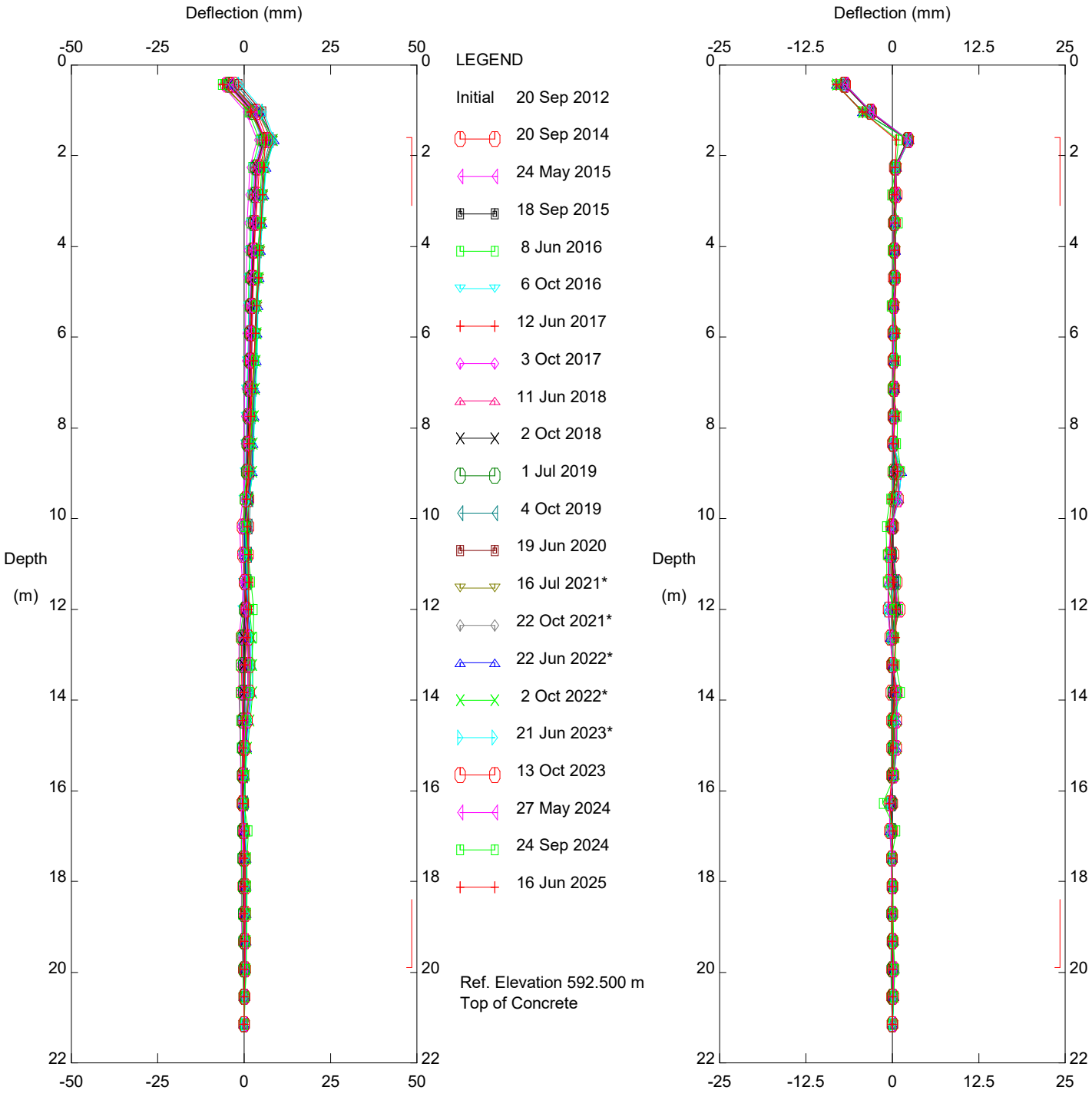

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

PH026 Eureka River Lower Wall, Inclinometer SI12-P9L

Alberta Transportation

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

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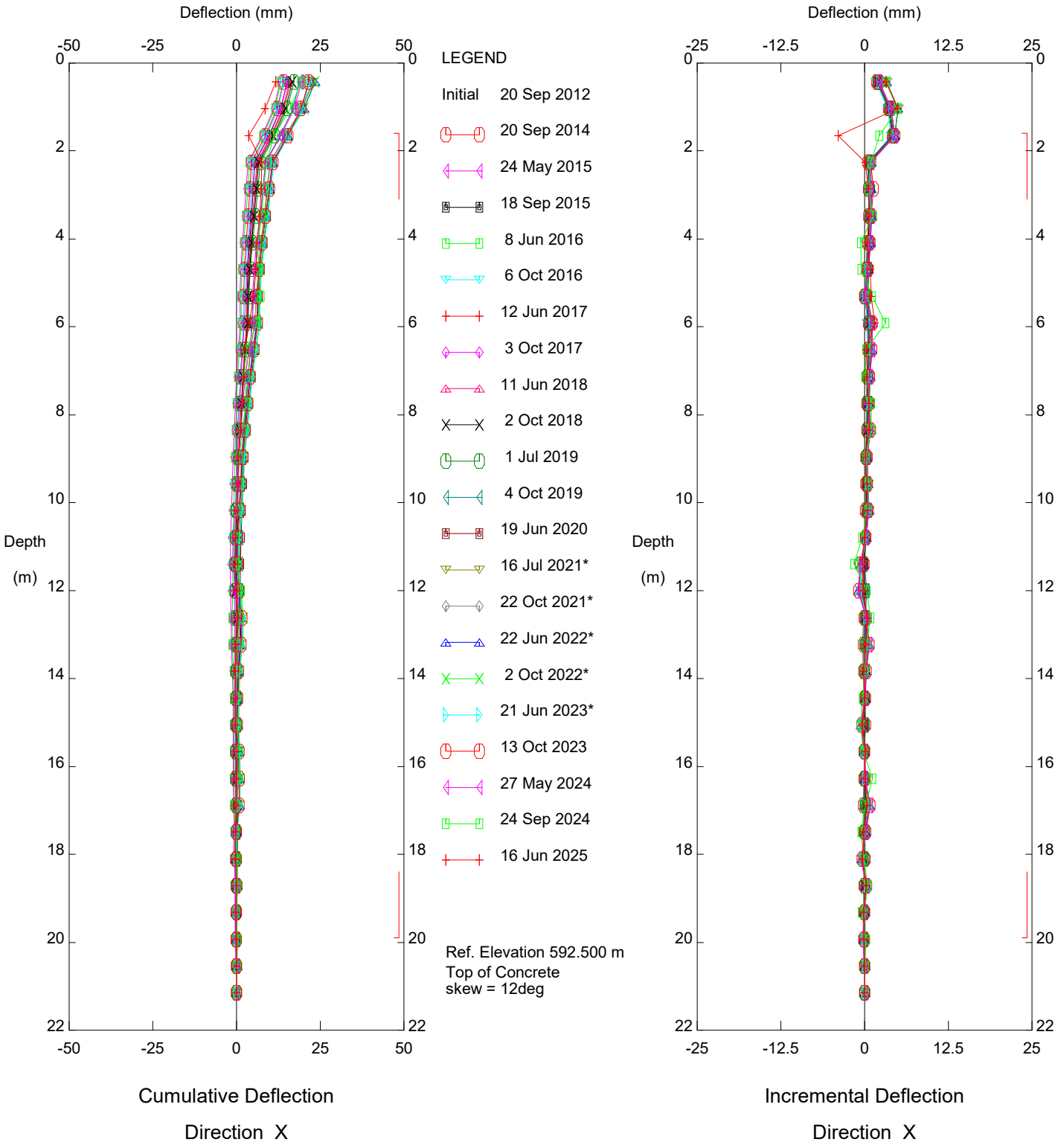

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

PH026 Eureka River Lower Wall, Inclinometer SI12-P9L

Alberta Transportation

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

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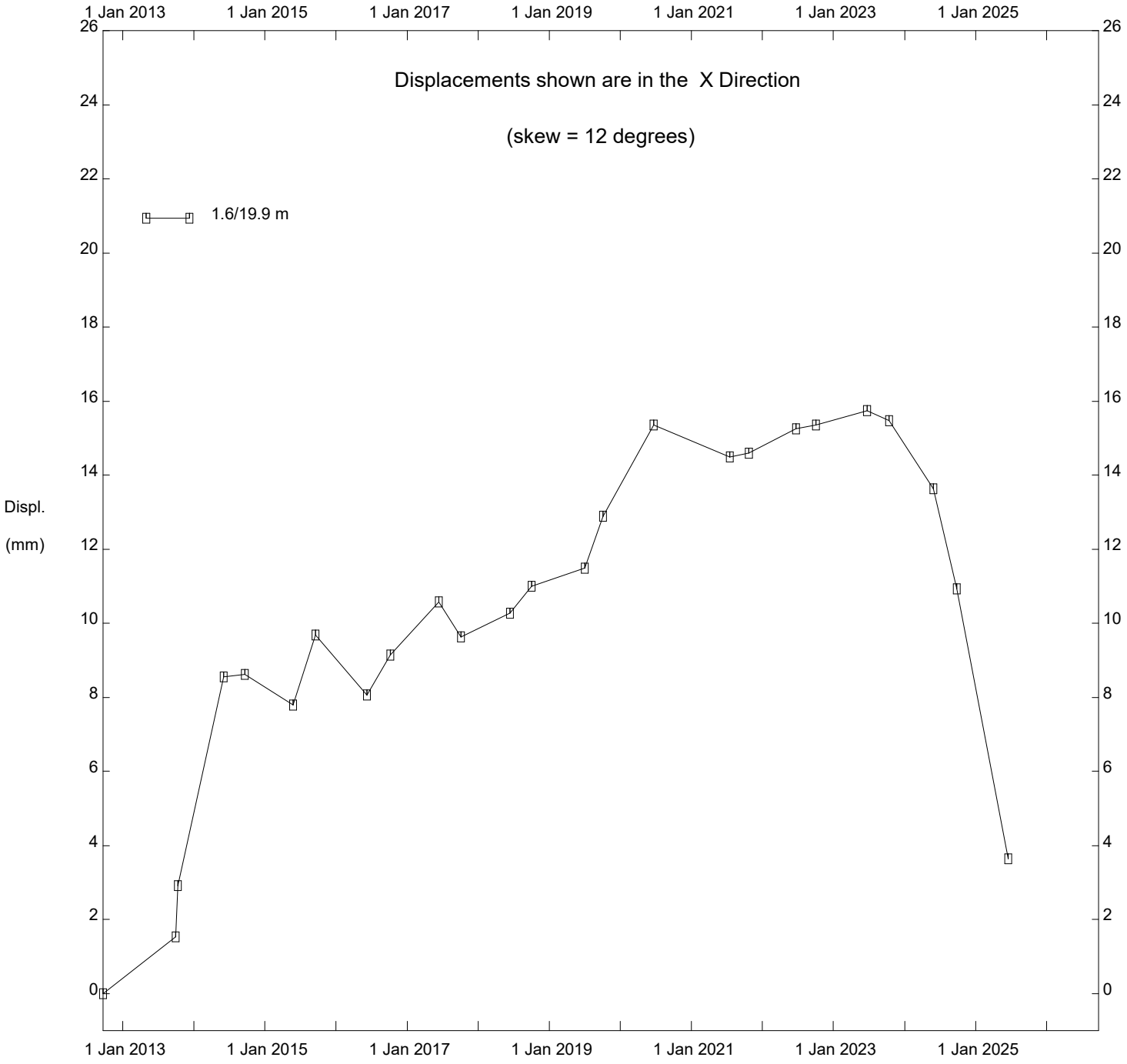
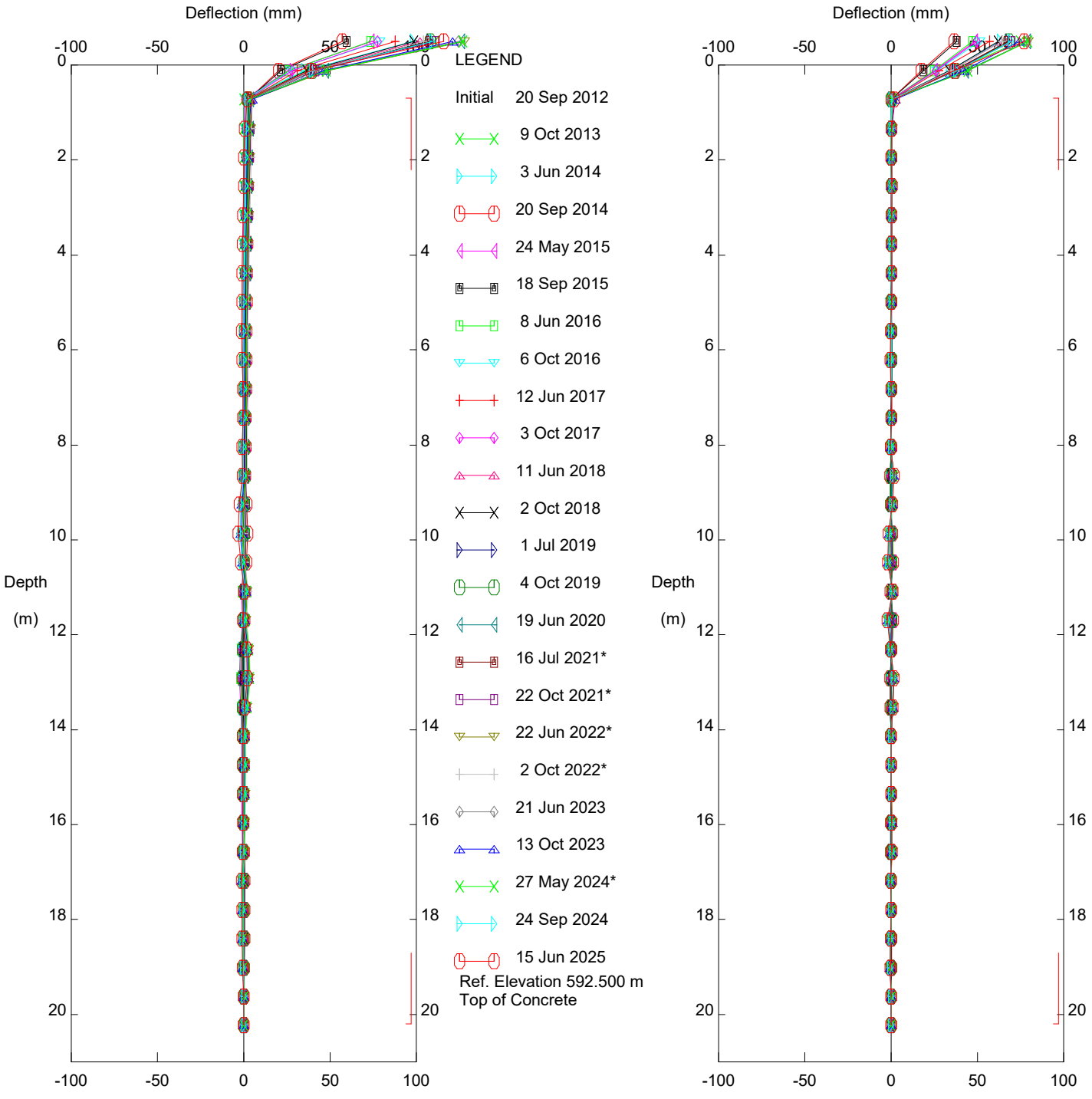
Thurber Engineering Ltd.



PH026 Eureka River Lower Wall, Inclinometer SI12-P9L

Alberta Transportation

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

PH026 Eureka River Lower Wall, Inclinometer SI12-P14L

Alberta Transportation

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

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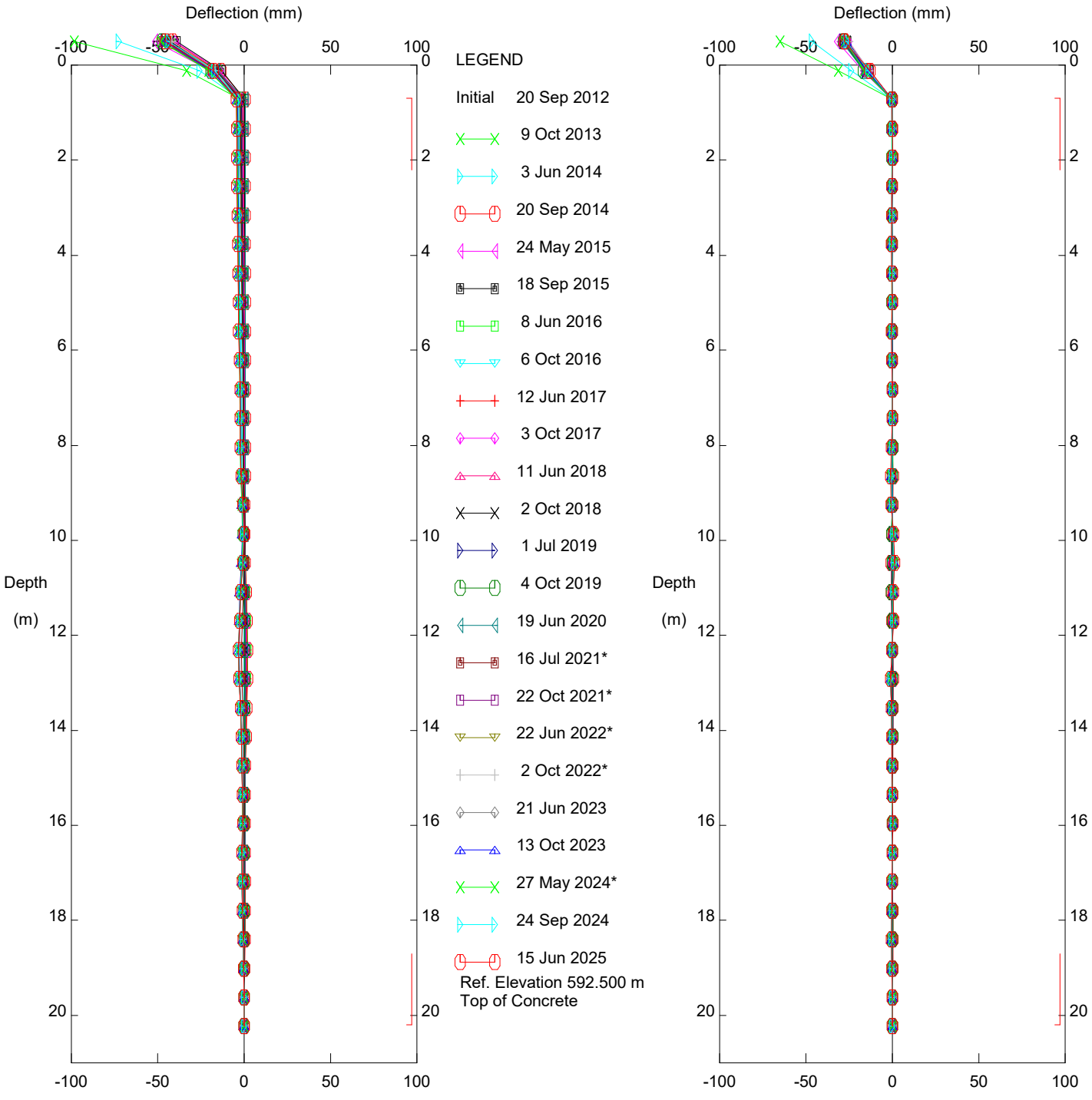

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

PH026 Eureka River Lower Wall, Inclinometer SI12-P14L

Alberta Transportation

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

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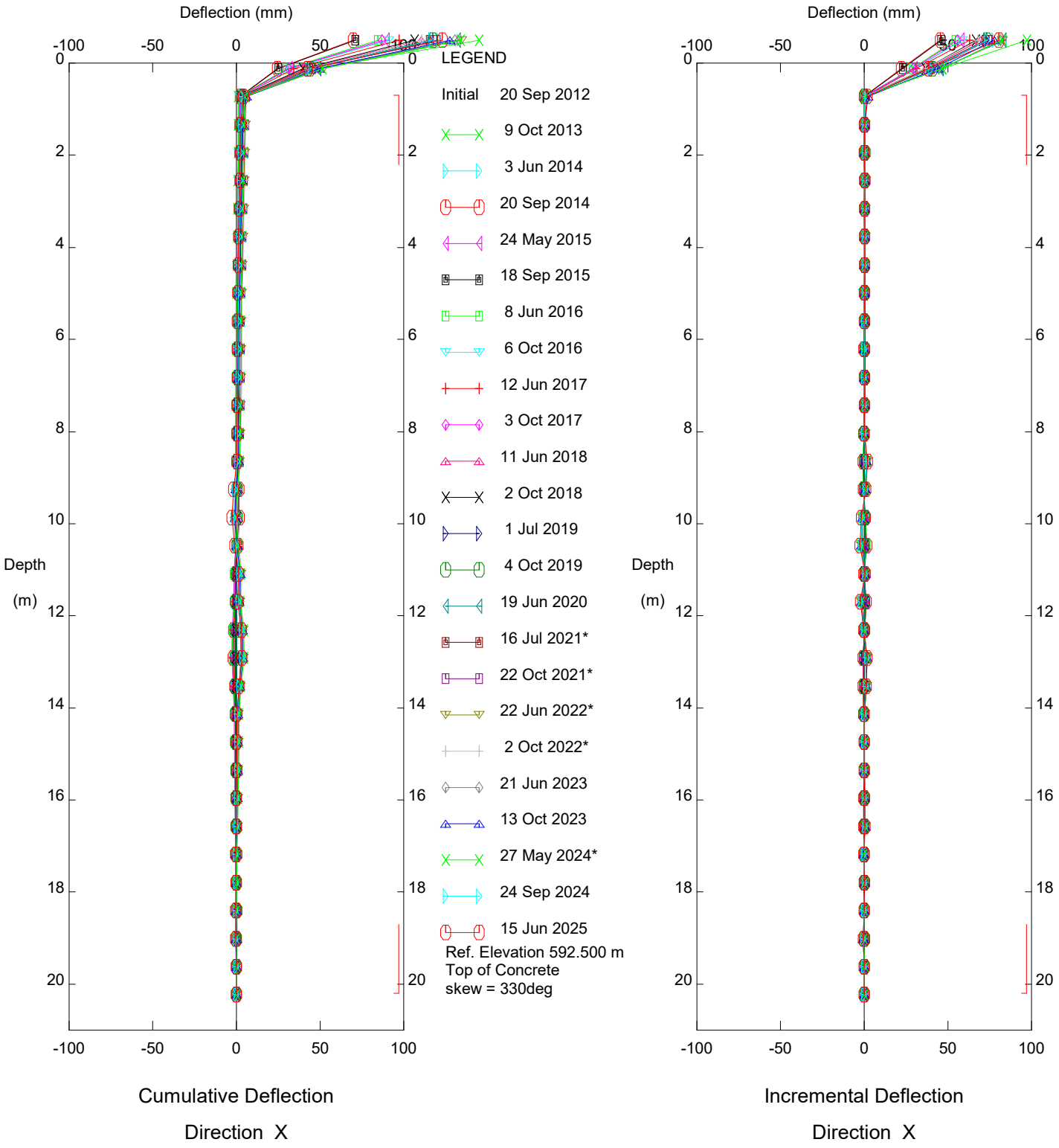

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

PH026 Eureka River Lower Wall, Inclinometer SI12-P14L

Alberta Transportation

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

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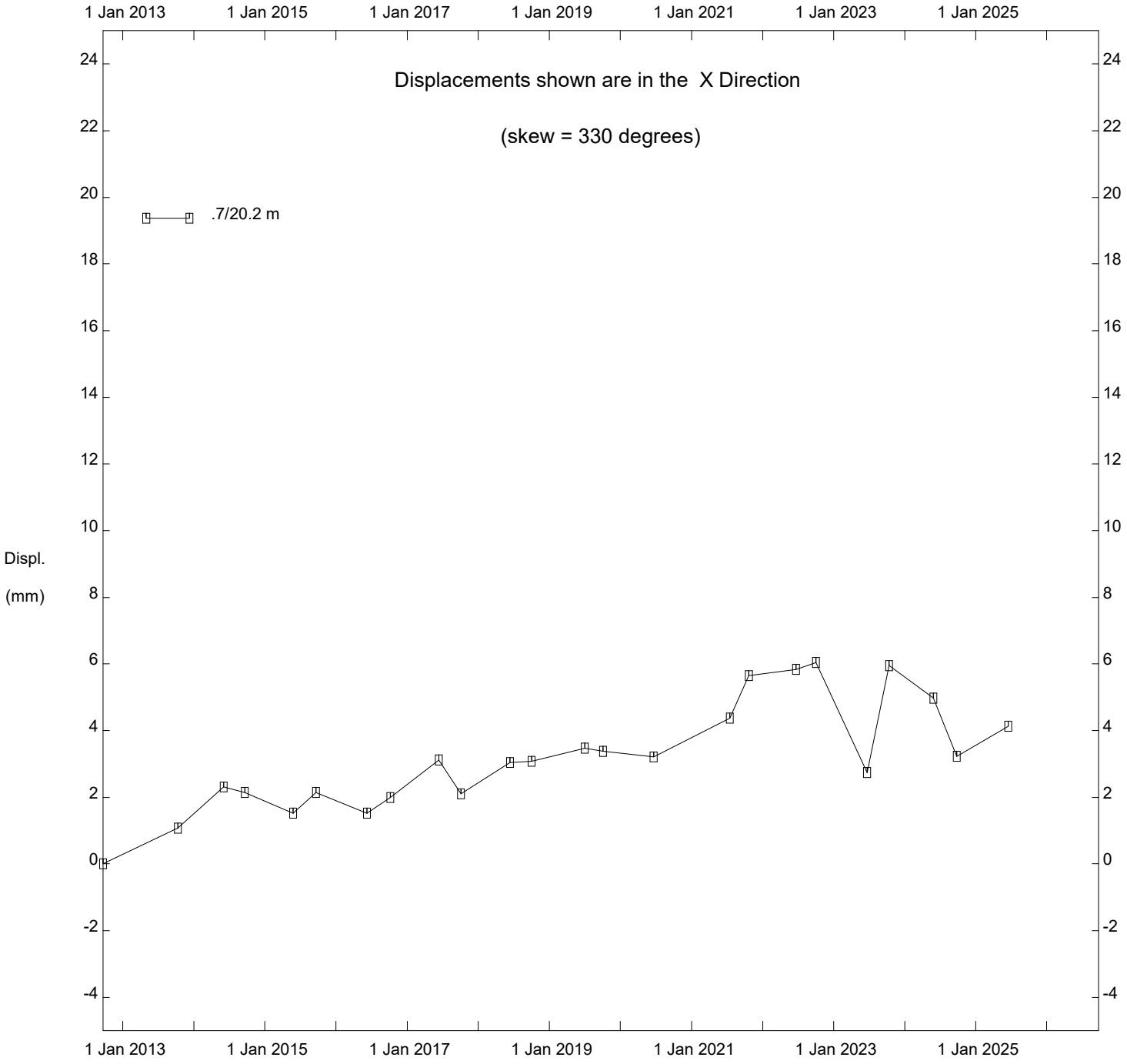
Thurber Engineering Ltd.



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)

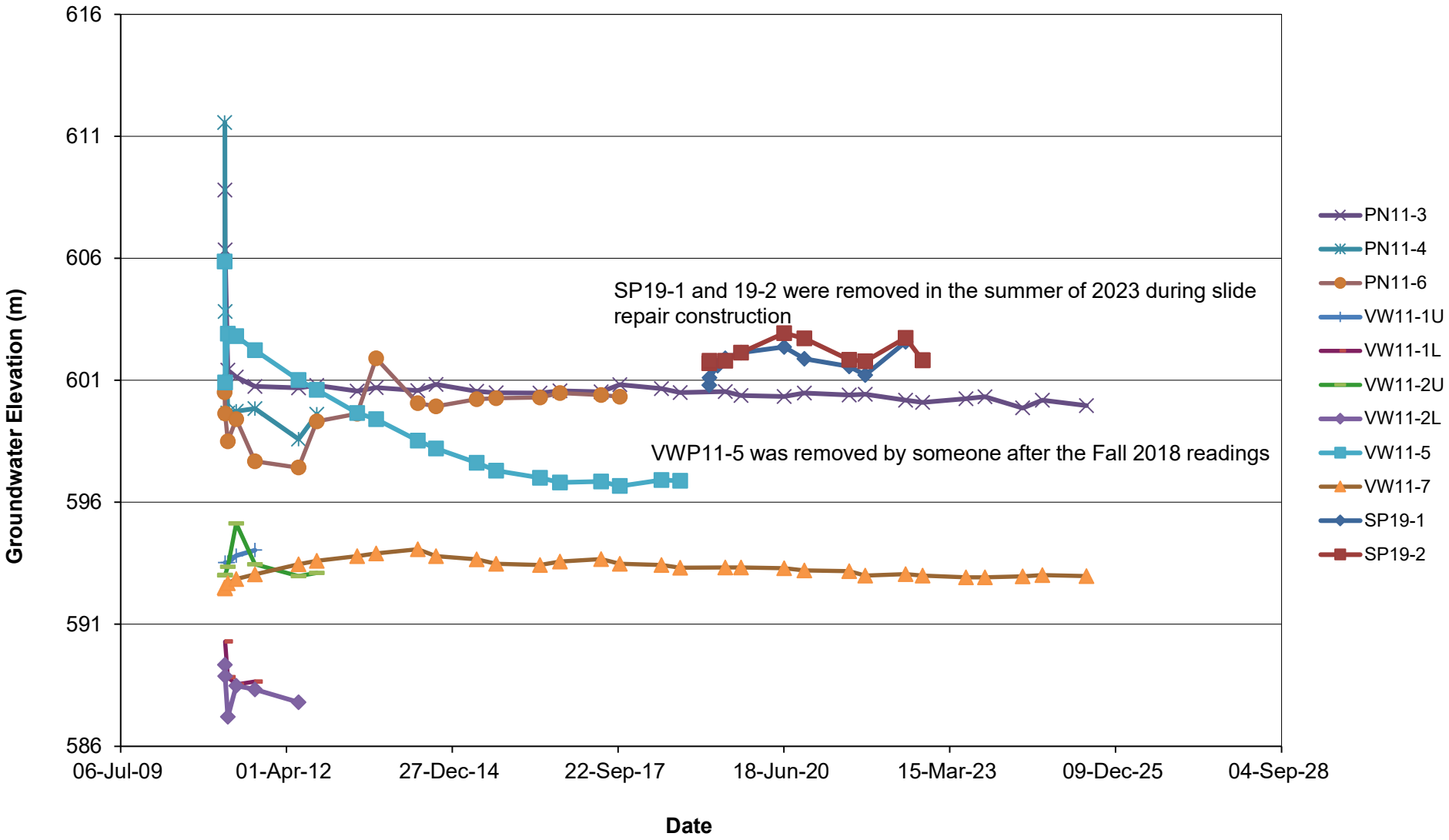


FIGURE PH026-2
PIEZOMETRIC DEPTHS FOR HWY 726:02 EUREKA RIVER (SITE 3, 5 AND 6)

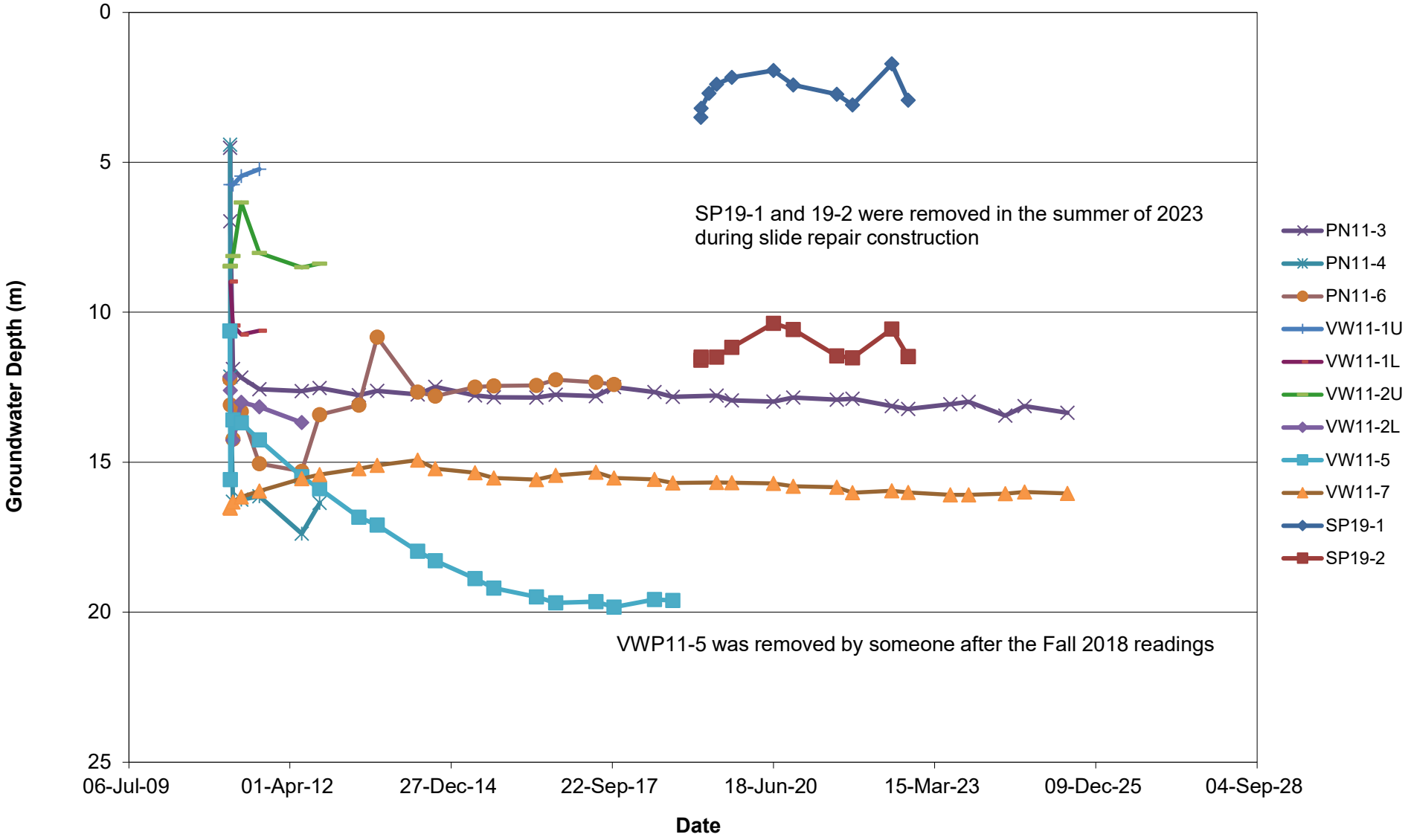


FIGURE PH026-3
LOAD CELL DATA FOR HWY 726:02 UPPER PILE WALL ANCHORS

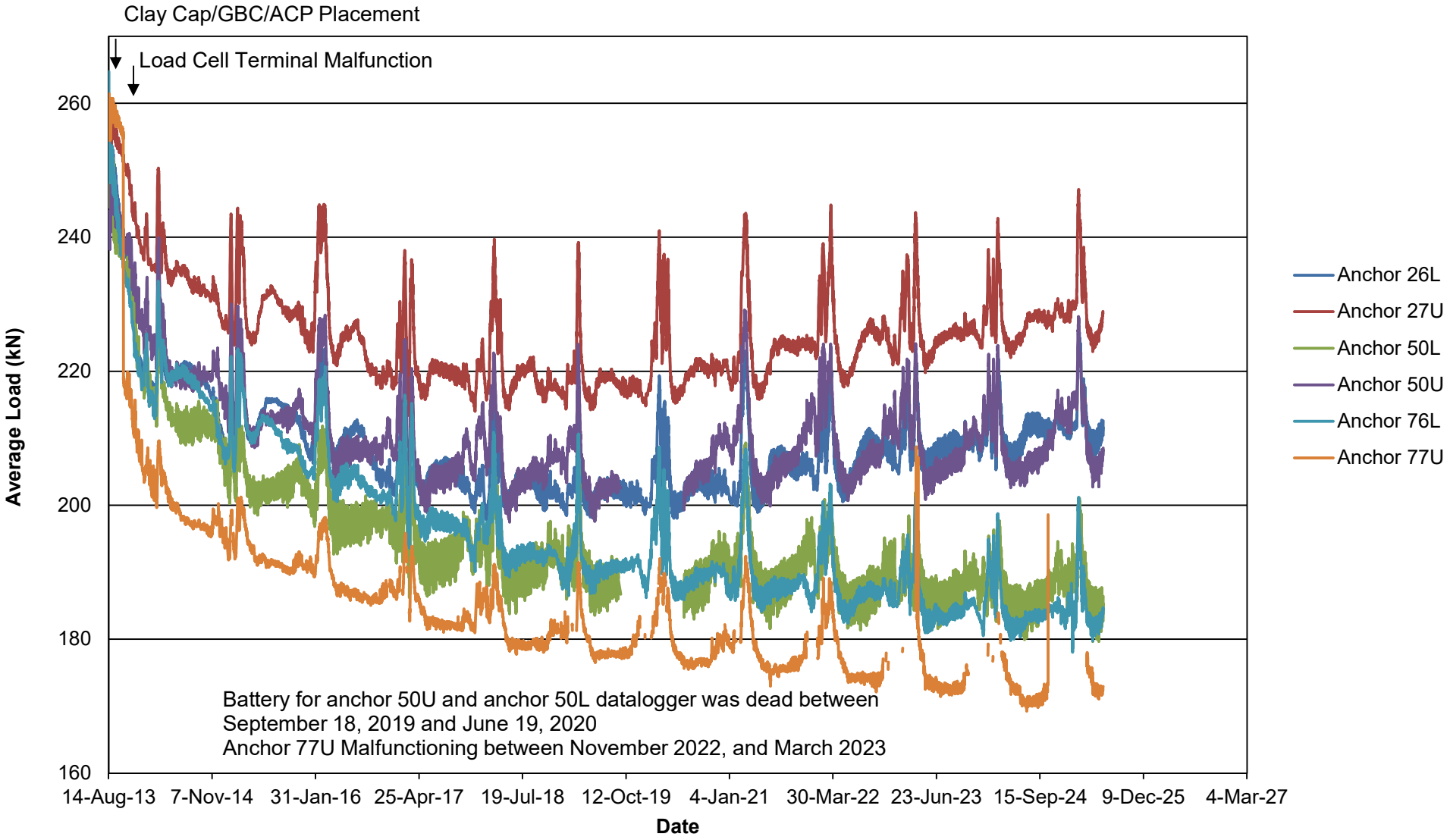


FIGURE PH026-4
LOAD CELL TEMPERATURES FOR HWY 726:02 UPPER PILE WALL ANCHORS