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

Site Number	Location	Name	Hwy	km
SH006	HWY 33:14 C1 18.436	Klumph Creek Slide	33:14	Km 18.4
Legal Description:		**UTM Co-ordinates**		
1-33-70-9 W5		11U E 608450	N 6107166	

Current Monitoring:	20-June-2025	**Previous Monitoring**	21-May-2024
Instruments Read By:	Mr. Niraj Regmi, G.I.T., and Mr. Godfred Etiendem, Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): SI18-30 through SI18-35	**Pneumatic Piezometers (PN):** PN18-30 through PN18-35	**Vibrating Wire Piezometers (VW):** N/A	**Standpipe Piezometers (SP):** SP00-2, SP00-6A, and SP00-6B
Load Cell (LC): N/A	**Strain Gauges:** N/A	**SAAs:** N/A	**Others:**

Readout Equipment Used			
Slope Inclinometers: ST Digital Inclinometer probe with a 2 ft wheelbase and an RST Pocket PC readout	**Pneumatic Piezometers:** RST C108 pneumatic piezometer readout	**Vibrating Wire Piezometers:**	**Standpipe Piezometers:** DGSi Dipmeter
Load Cell:	**Strain Gauges:**	**SAAs:**	**Others:**
Note:			

Zones of New Movement:	None
Interpretation of Monitoring Results:	SI18-30, 32 and 34 are all located downslope of the highway along a cross section of the slide as shown on Dwg No. 32121-SH006. SI18-30, located near the head of the slide, showed a rate of movement of 2.0 mm/yr over 13.0 m to 14.8 m depth since spring of 2024 readings. SI18-32, located in the centre of the slide, showed a rate of movement of 0.2 mm/yr over 13.7 m to 17.3 m depth since the spring of 2024 readings. SI18-34, located on the toe berm, continued to show no discernible movement. SI18-31, 33 and 35 are located along second cross section of the slide. SI18-31 is located upslope of the highway; SI18-33 and 35 are located downslope of the highway. SI18-31 showed a rate of movement of 1.8 mm/yr over 12.3 m to 14.2 m depth since the spring of 2024 readings. SI18-33 in the middle of the slide, showed a rate of movement of 1.4 mm/yr over 15.5 m to 17.3 m depth since the spring of 2024 readings.

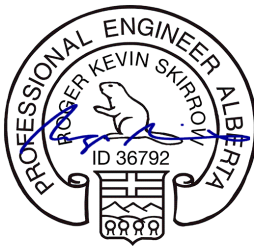
	SI18-35, located on the toe berm, showed no discernible movement of since the spring of 2024 readings. Overall, the SIs movements are consistent with those in the spring of 2024. The SIs at this site have historically shown a pattern of higher movement rates between the spring and fall readings cycles, with lower rates observed between the fall and spring readings cycles. The overall rates of movement have reduced since 2020 which appears to correspond with lowered groundwater levels since the fall of 2020. This is particularly evident at SI18-32, where the largest drop in groundwater level was observed at this location. Both cross sections showed similar movement patterns; the uppermost SIs moved the most, the middle SI moved slightly less, and the SIs in the toe berm showed little if any movement. This indicates the toe berm is still providing buttressing to the main slide area. Standpipe piezometers SP00-2, SP00-6A and SP00-6B showed increases in groundwater level of 0.34 m, 0.82 m and 0.16 m, respectively, since the spring of 2024 readings. The groundwater level measured in SP00-6A continues an upward trend, rising about 6 m over the past 25 years, and is now about 0.5 m below ground surface. The standpipe piezometer results are plotted in Figure SH006-1 in Appendix A. Pneumatic piezometers PN18-30, PN18-32, PN18-33 and PN18-35 showed a decrease in groundwater level of 0.09 m, 0.02 m, 0.06 m, and 0.38 m, respectively, since the spring of 2024 readings. PN18-35 has shown a trend of continually decreasing groundwater levels since the fall of 2019 and is currently showing the lowest groundwater level measured in the instrument. PN18-31 and PN18-34 showed increases to groundwater level of 0.03 m and 0.43 m, respectively, since the spring of 2024 readings. The pneumatic piezometer results are plotted in Figure SH006-2 in Appendix A.
Future Work:	Bears have been observed at this well vegetated, very large, remote site. A third-party wildlife escort will be used on subsequent visits to this site due to the high risk of a bear encounter. As such, it has been agreed with TEC that the reading frequency at this site will be reduced to once annually.
Instrumentation Repairs:	No instrumentation repairs are required at this time.
Additional Comments:	The access trails to several instruments located further off the highway have become quite overgrown and present safety and efficiency concerns. Consideration should be given to clearing some of the brush to more easily access these instruments. The clearing could be done by the maintenance contractor.

Attachments:	• Table SH006-1 Spring 2025 – HWY 33:14 Klumph Creek Slide, Slope Inclinometer Instrumentation Reading Summary • Table SH006-2 Spring 2025 – HWY 33:14 Klumph Creek Slide, Standpipe Piezometer Instrumentation Reading Summary • Table SH006-3 Spring 2025 – HWY 33:14 Klumph Creek Slide, Pneumatic Piezometer Instrumentation Reading Summary • Statement of Limitations and Conditions • APPENDIX A – SH006 SPRING 2025 o Field Inspector's report o Site Plan Showing Approximate Instrument Locations (Drawing No. 32121 SH006) o SI Reading Plots o Figure SH006-1 (Standpipe Piezometer Elevations o Figure SH006-2 (Pneumatic Piezometer Depths)

We trust this report meets your requirements at present. If you have any questions, please contact the undersigned at your convenience.

Yours very truly,
Thurber Engineering Ltd.
Roger Skirrow, M.Sc., P. Eng.
Senior Geotechnical Engineer

July 12, 2025



2025-07-14

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
RM SIGNATURE:
RM APEGA ID #: 51674
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 SH006-1 Spring 2025 – Hwy 33:14 Klumph Creek Slide Slope Inclinometer Instrumentation Reading Summary

Date Monitored: June 20, 2025

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AT NOTED DEPTH SINCE INITIAL READING (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS	DATE OF PREVIOUS READING	INCREMENTAL MOVEMENT SINCE PREVIOUS READING (mm)	CURRENT RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI10	*March 28, 1998*	*61.9 mm over 9.8 m to 11.7 m depth in 294° direction*	*15.3 mm/yr in September 2001*	*Sheared at 11.0 m (Spring 2021)*	*September 30, 2020*	*N/A*	*N/A*	*N/A*
SI11	*March 28, 1998*	*45 mm over 4.8 m to 6.6 m depth in 256° direction*	*19.3 mm/yr in May 2001*	*Damaged*	*September 18, 2011*	*N/A*	*N/A*	*N/A*
SI00-5	*March 24, 2000*	*108 mm over 8.1 m to 11.7 m depth in 267° direction* *103 mm over 9.9 m to 16.6 m depth in 267° direction*	*-* *-*	*Sheared at 11.0 m (Spring 2012)*	*September 18, 2011*	*N/A*	*N/A*	*N/A*
SI00-6	*March 24, 2000*	*42.1 mm over 14.7m to 16.5 m depth in 244° direction*	*17.6 mm/yr in October 2004*	*Blocked at 1.52 m (Spring 2008)*	*October 2, 2007*	*N/A*	*N/A*	*N/A*

Drawing 32121-SH006 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Table SH006-1 – Continued Spring 2025 – Hwy 33:14 Klumph Creek Slide Slope Inclinometer Instrumentation Reading Summary

Date Monitored: June 20, 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)
SI18-30	March 20, 2018	30.2 mm over 13.0 m to 14.8 m depth in 235° direction	14.8 on September 30, 2020	Operational	May 21, 2024	2.2	2.0	-0.1
SI18-31	March 20, 2018	29.3 mm over 12.3 m to 14.2 m depth in 237° direction	10.1 on September 30, 2020	Operational	May 21, 2024	1.9	1.8	-2.2
SI18-32	March 20, 2018	11.8 mm over 13.7 m to 17.3 m depth in 255° direction	12.0 on September 30, 2020	Operational	May 21, 2024	0.2	0.2	-0.1
SI18-33	March 20, 2018	24.5 mm over 15.5 m to 17.3 m depth in 250° direction	14.4 on September 30, 2020	Operational	May 21, 2024	1.5	1.4	-1.9
SI18-34	March 20, 2018	No discernible movement	N/A	Operational	May 21, 2024	N/A	N/A	N/A
SI18-35	March 20, 2018	4.8 mm over 4.5 m to 6.3 m depth in 245° direction	3.2 on June 2, 2020	Operational	May 21, 2024	No Discernible Movement	N/A	-0.1

Drawing 32121-SH006 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

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Table SH006-2 Spring 2025 – Hwy 33:14 Klumph Creek Slide Standpipe Piezometer Instrumentation Reading Summary

Date Monitored: June 20, 2025

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	MAXIMUM WATER ELEVATION (m)	MEASURED WATER ELEVATION (m)	PREVIOUS WATER ELEVATION (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
SP00-2	March 27, 2000	496.42	503.72	Operational	503.35 on July 5, 2021	502.65	502.31	0.34
SP00-5	*March 27, 2000*	*499.89*	*508.99*	*Assumed destroyed (Spring 2013)*	*507.0 m in September 2008*	*N/A*	*N/A*	*N/A*
SP00-6A	March 27, 2000	492.92	504.22	Operational	504.16 on June 20, 2024	504.16	503.34	0.82
SP00-6B	March 27, 2000	495.52	504.22	Operational	498.70 on June 9, 2022	497.91	497.75	0.16

Drawing 32121-SH006 in Appendix A provides a sketch of the approximate locations of the monitoring instrumentation for this site.

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Table SH006-3 Spring 2025 – Hwy 33:14 Klumph Creek Slide Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: June 20, 2025

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	CURRENT STATUS	MAXIMUM GROUNDWATER DEPTH (mBGS)	MEASURED PORE PRESSURE (kPa)	CURRENT GROUNDWATER DEPTH (mBGS)	PREVIOUS GROUNDWATER DEPTH (mBGS)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
PN18-30 (37804)	March 20, 2018	10.0	Operational	0.84 on June 2, 2020	81.3	1.71	1.62	-0.09
PN18-31 (37802)	March 20, 2018	10.5	Operational	0.53 on June 2, 2020	93.3	0.99	1.02	0.03
PN18-32 (37801)	March 20, 2018	12.0	Operational	1.11 on June 2, 2020	93.3	2.49	2.47	-0.02
PN18-33 (37803)	March 20, 2018	11.0	Operational	2.31 on Sep. 25, 2019	82.9	2.55	2.49	-0.06
PN18-34 (37800)	March 20, 2018	12.0	Operational	4.60 on Sep. 25, 2019	53.8	6.51	6.94	0.43
PN18-35 (37799)	March 20, 2018	12.5	Operational	4.61 on June 2, 2020	67.0	6.83	6.45	-0.38

Drawing 32121-SH006 in Appendix A provides a sketch of the approximate locations of the monitoring instrumentation for this site.

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STATEMENT FOR USE AND INTERPRETATION OF REPORT

1. STANDARD OF CARE

This Report has been prepared in a manner consistent with that degree of care and skill ordinarily exercised by members of the same profession currently practicing under similar circumstances at the same time and in the same or similar locality and in compliance with all applicable laws.

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment, including this Statement For Use and Interpretation of Report, are a part of the Report, which is of a summary nature and is not intended to stand alone without reference to the instructions given to Thurber by the Client, communications between Thurber and the Client, and any other reports, proposals or documents prepared by Thurber for the Client relative to the specific site described herein, all of which together constitute the Report.

IN ORDER TO PROPERLY UNDERSTAND THE SUGGESTIONS, RECOMMENDATIONS AND OPINIONS EXPRESSED HEREIN, REFERENCE MUST BE MADE TO THE WHOLE OF THE REPORT, AS DESCRIBED ABOVE. THURBER IS NOT RESPONSIBLE FOR USE BY ANY PARTY OF PORTIONS OF THE REPORT WITHOUT REFERENCE TOTHE WHOLE OF THE REPORT.

3. BASIS OF REPORT

The Report has been prepared for the specific site, development, design objectives, and purposes that were described to Thurber by the Client. The applicability and reliability of any of the findings, recommendations, suggestions, or opinions expressed in the Report, subject to the limitations provided herein, are only valid to the extent that the Report expressly addresses proposed development, design objectives and purposes, and then only to the extent that there has been no material alteration to or variation from any of the said descriptions provided to Thurber, unless Thurber is specifically requested by the Client to review and revise the Report in light of such alteration or variation.

4. USE OF THE REPORT

The information and opinions expressed in the Report, or any document forming part of the Report, are for the sole benefit of the Client for the development, design objectives, and/or purposes described to Thurber by the Client. **NO OTHER PARTY MAY USE OR RELY ON THE REPORT OR ANY PORTION THEREOF FOR OTHER THAN THE CLIENT'S BENEFIT IN CONNECTION WITH THE PURPOSES DESCRIBED IN THE REPORT**. Any use which a third party makes of the Report is the sole responsibility of such third party and is always subject to this Statement for Use and Interpretation of Report. Thurber accepts no liability or responsibility for damages suffered by any third party resulting from use of the Report for purposes outside the reasonable contemplation of Thurber at the time it was prepared or in any manner unintended by Thurber.

5. INTERPRETATION OF THE REPORT

a) **Nature and Exactness of Soil and Contaminant Description:** Classification and identification of soils, rocks, geological units, contaminant materials and quantities have been based on investigations performed in accordance with the standards set out in Paragraph 1. Classification and identification of these factors is inherently judgement-based. Comprehensive sampling and testing programs implemented with the appropriate equipment by experienced personnel may fail to locate some conditions. All investigations utilizing the standards of Paragraph 1 will involve an inherent risk that some conditions will not be detected and all documents or records summarizing such investigations will be based on assumptions of what exists between the actual points sampled. Actual conditions may vary significantly between the points investigated and the Client and all other parties making use of such documents or records with or without our express written consent need to be aware of this risk and the Report is delivered subject to the express condition that such risk is accepted by the Client and such other parties. Some conditions are subject to change over time and those making use of the Report need to be aware of this possibility and understand that the Report only presents the interpreted conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client must disclose them so that additional or special investigations may be undertaken which would not otherwise be within the scope of investigations made for the purposes of the Report.

b) **Reliance on Provided Information:** The evaluation and conclusions contained in the Report have been prepared based on conditions in evidence at the time of site inspections and based on information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report resulting from misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other parties providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.

c) **Design Services:** The Report may form part of design and construction documents for information purposes even though it may have been issued prior to final design being completed. Thurber is recommended to be retained to review final design, project plans and related documents prior to construction to confirm that they are consistent with the intent of the Report. Any differences that may exist between the Report's recommendations and the final design need to be reported to Thurber immediately so that Thurber can address potential conflicts.

d) **Construction Services:** During construction Thurber should be retained to provide field reviews. Field reviews consist of performing sufficient and timely observations of encountered conditions to confirm and document that the site conditions do not materially differ from those conditions considered in the preparation of the report. Adequate field reviews are necessary for Thurber to provide letters of assurance, in accordance with the requirements of many regulatory authorities.

6. INDEPENDENT JUDGEMENTS OF CLIENT

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

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

SPRING 2025

APPENDIX A
DATA PRESENTATION

SITE SH006: HWY 33:14 (KLUMPH CREEK SLIDE)

ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (SH006)
SPRING 2025

Location:	Klumph Creek Slide (HWY 33:14 C1 18.436)	**Readout:**	
File Number:	32121	**Extension:**	2.75"
Probe:	RST SET 8R	**Temp:**	17
Cable:	RST SET 8R	**Read by:**	NKR/GE

SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 11)		Date	Stickup (m)	Depth from top of casing (ft)	Mag North Azimuth of A+	Current Bottom Depth Readings				Probe/ Reel #	Size (")	Remarks
	Easting	Northing					A+	A-	B+	B-			
SI18-30	608450	6107166	20-Jun-25	0.76	98 to 2	200	208	-196	-168	169	8R	2.75	
SI18-31	608518	6107038	20-Jun-25	0.76	98 to 2	200	31	-28	-380	383	8R	2.75	
SI18-32	608361	6107128	20-Jun-25	0.67	98 to 2	250	1	14	-162	161	8R	2.75	
SI18-33	608462	6106977	20-Jun-25	0.69	98to 2	240	426	-412	375	-374	8R	2.75	
SI18-34	608257	6107079	20-Jun-25	0.66	100 to 2	270	193	-178	181	-180	8R	2.75	
SI18-35	608380	6106890	20-Jun-25	0.73	98 to 2	230	130	-113	-121	123	8R	2.75	

PNEUMATIC PIEZOMETER (PN) READINGS

PN#	GPS Location (UTM 11)		Date	Reading (kPa)	Identification Number
	Easting	Northing			
PN18-30	608450	6107166	20-Jun-25	81.3	37804
PN18-31	608518	6107038	20-Jun-25	93.3	37802
PN18-32	608361	6107128	20-Jun-25	97.5	37801
PN18-33	608462	6106977	20-Jun-25	82.9	37803
PN18-34	608257	6107079	20-Jun-25	53.8	37800
PN18-35	608380	6106890	20-Jun-25	67	37799

STANDPIPE PIEZOMETER READINGS

SP#	GPS Location (UTM 11)		Date	Stick-up (m)	Reading below top of pipe (m)	Bottom Pipe Depth (below ground (m))
	Easting	Northing				
SP00-2	608534	6106814	20-Jun-25	1.03	2.1	8.12
SP00-6A	608438	6107044	20-Jun-25	0.87	0.93	11.50
SP00-6B	608438	6107044	20-Jun-25	0.88	7.19	8.80

INSPECTOR REPORT

SP00-6A and 6B nested standpipe in same hole

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DESIGN CRESTLINE OF CUT FOR 4H:1V

SLOPE OFFLOADING AREA

MINIMUM CREST OF CUT FOR BACKSLOPE OF 5H:1V

ROCK LINED DITCH

SEVERE TRANSVERSE CRACK WITH 50mm VERTIAL DROP (2015)

MINIMUM CREST OF CUT FOR BACKSLOPE OF 4H:1V

ADDITIONAL CUT AREA (BORROW)

TOE OF BERM

LOCATIONS OF ROCK WEIRS FOR EROSION PROTECTION (6 IN TOTAL)

WET/SOFT AREAS (2015)

SLIGHT TO MODERATE TRANSVERSE CRACKING AND SLIGHT DISTORTION ALONG ENTIRE LENGTH OF ROAD (2015)

GRANULAR DRAINAGE MATERIAL

SLIDE CROSS SECTION 1

CATCHWATER DITCH

CREST OF BERM

EDGE OF BERM

GRAVEL LINED SWALE

ARMOURED DITCH SECTION

SYNTHETIC DITCH CHECKS AT 8m SPACING ALONG HIGHWAY DITCH

SLIDE CROSS SECTION 2

1200mm Ø CULVERT OUTLET: 1m DEEP, 3m WIDE, 6m LONG SCOUR BOWL (2016)

SINKHOLE APPROXIMATELY 15m EAST OF CULVERT, 2m DIAMETER (2013, 2016)

RIP RAP OVER STEEP DITCH SECTION AND AROUND CULVERT INLETS

EXISTING CULVERTS (1200 Ø N, 900mm Ø S)

SI/PN18-30
SI/PN18-32
SI/PN18-34
SI/PN18-31
SI/PN18-33
SI/PN18-35

TH00-1 (SP)
SI 20
TH00-3A (SP)
TH00-3 (SP)
SI 4
TH00-4 SI
TH00-4A&B (SP)
SI 5
SI 21
TH00-5 SI
TH00-5A (SP)
(BLOCKED AT 1.5m) TH00-6 SI
TH00-6C
TH00-6A&B (SP)
TH00-2 (SP)
SI 3B
SI 13
SI 15
SI 11
SI 2
SI 10
SHEARED AT 11.0m
SI 1
SI 12

HWY 33:14

LATERAL PIPE #1
LATERAL PIPE #2
LATERAL PIPE #3
DITCH
OH

N
W E
S

LEGEND

- APPROXIMATE TEST HOLE LOCATION
- APPROXIMATE SLOPE INCLINOMETER LOCATION
- SP STANDPIPE PIEZOMETER
- PN PNEUMATIC PIEZOMETER
- SI SLOPE INCLINOMETER
- MAJOR SCARP (CHECKED IN FIELD) (2000)
- MINOR SCARP (ESTIMATED FROM AIR PHOTOS) (2000)
- DITCH
- SUBDRAIN
- OH OVERHEAD POWER LINE

NOTES
1. FEATURE LOCATIONS ARE APPROXIMATE.
2. PREVIOUS OBSERVATIONS SHOWN IN BLACK (2013-2015 FROM AMEC FIGURE 1, PROJECT EG10030, PROVIDED BY ALBERTA TRANSPORTATION).
3. INSTRUMENTS SHOWN IN RED ARE ACTIVE.

REFERENCES
1. 2008 LIDAR PROVIDED BY ALBERTA TRANSPORTATION. SHADED BY SLOPE ANGLE FROM WHITE AT 0° TO BLACK AT ≥30°.
2. BASE PLAN DRAWN BY THURBER ENGINEERING LTD. DRAWING NO. 15-76-9-1C.

0 50 100 150 200 250m
SCALE 1:4000

Alberta Transportation

PEACE REGION (PEACE RIVER DISTRICT)

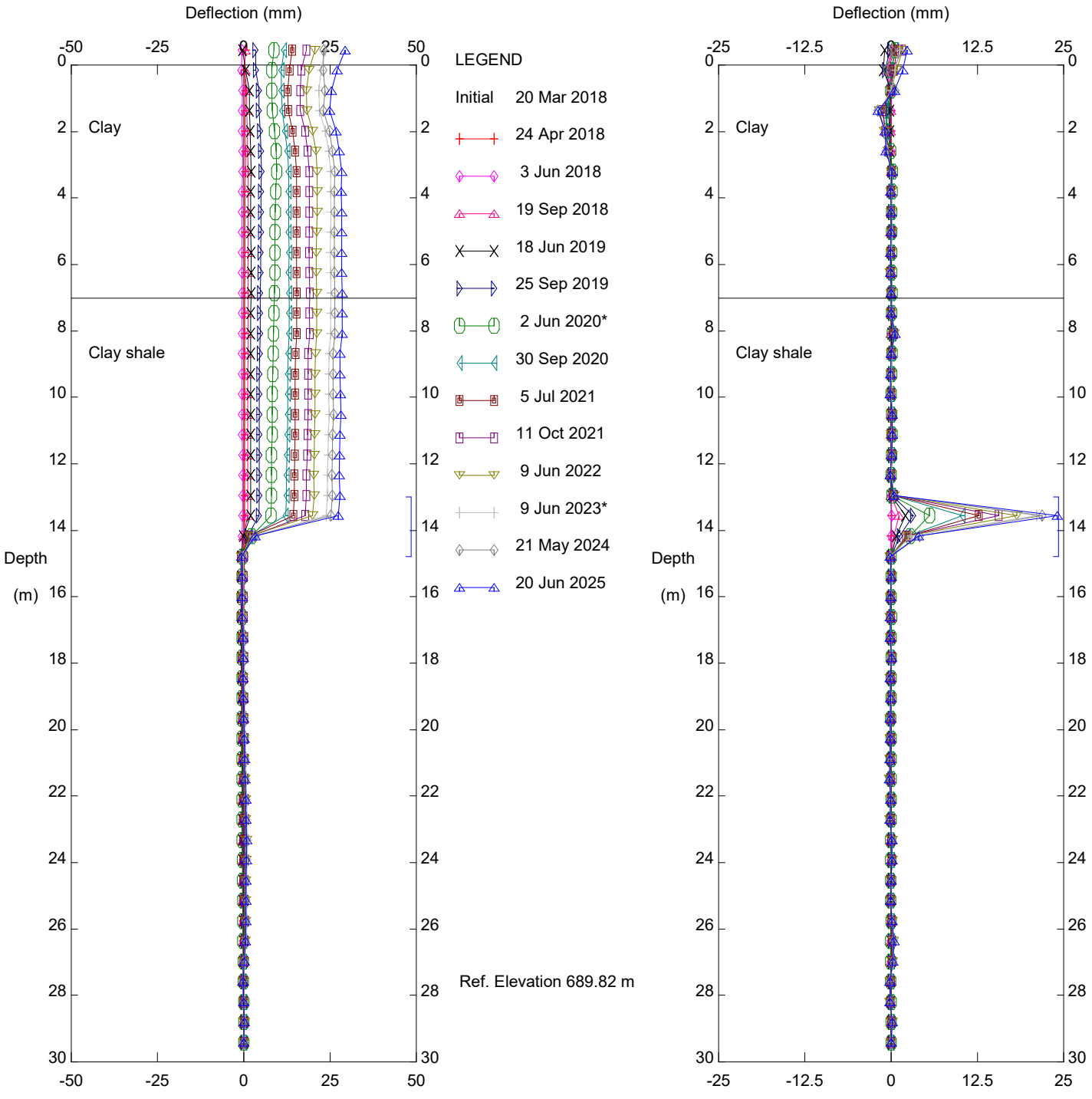
SH006: HWY 33:14 - KLUMPH CREEK SLIDE SITE PLAN SHOWING APPROXIMATE INSTRUMENT LOCATIONS

DWG No. 32121-SH006

DRAWN BY	ML
DESIGNED BY	NFR
APPROVED BY	DWP
SCALE	1:4000
LAST UPDATED	JULY 2025
FILE No.	32121

THURBER

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

SH006, Klumph Creek Slide, Inclinometer SI18-30

Alberta Transportation

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

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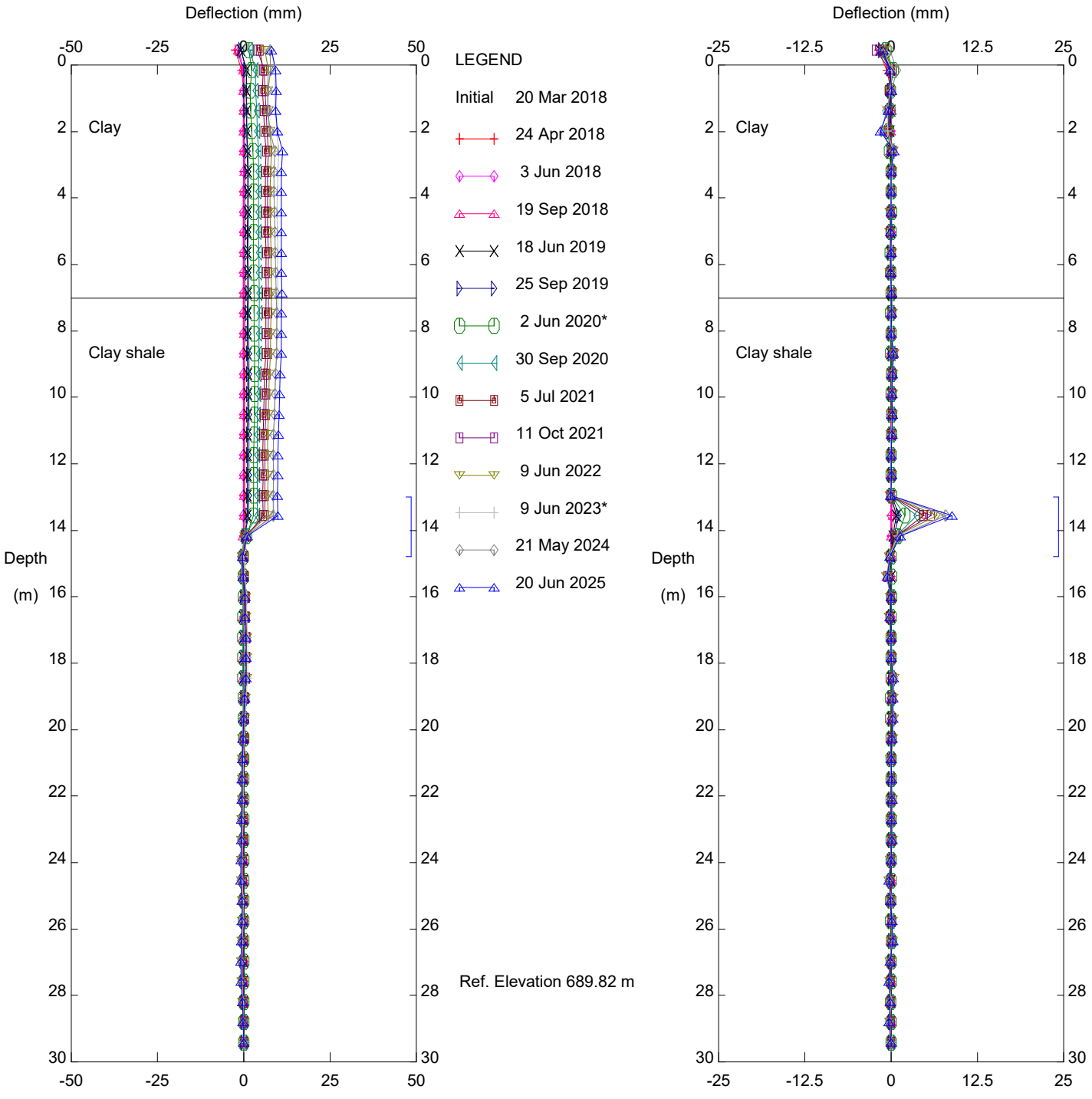

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

SH006, Klumph Creek Slide, Inclinometer SI18-30

Alberta Transportation

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

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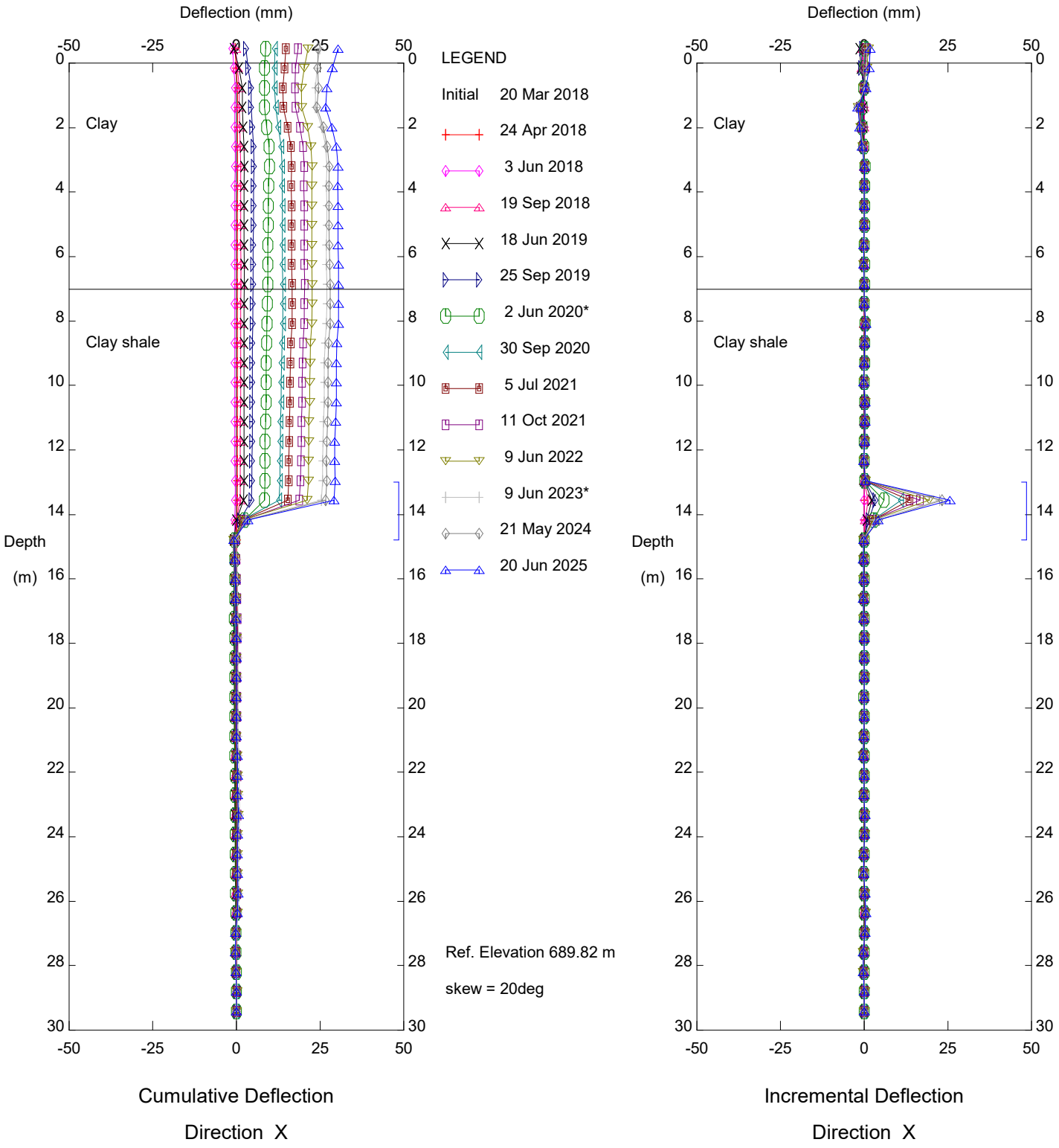
Thurber Engineering Ltd.



Cumulative Deflection

Direction X

Incremental Deflection

Direction X

SH006, Klumph Creek Slide, Inclinometer SI18-30

Alberta Transportation

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

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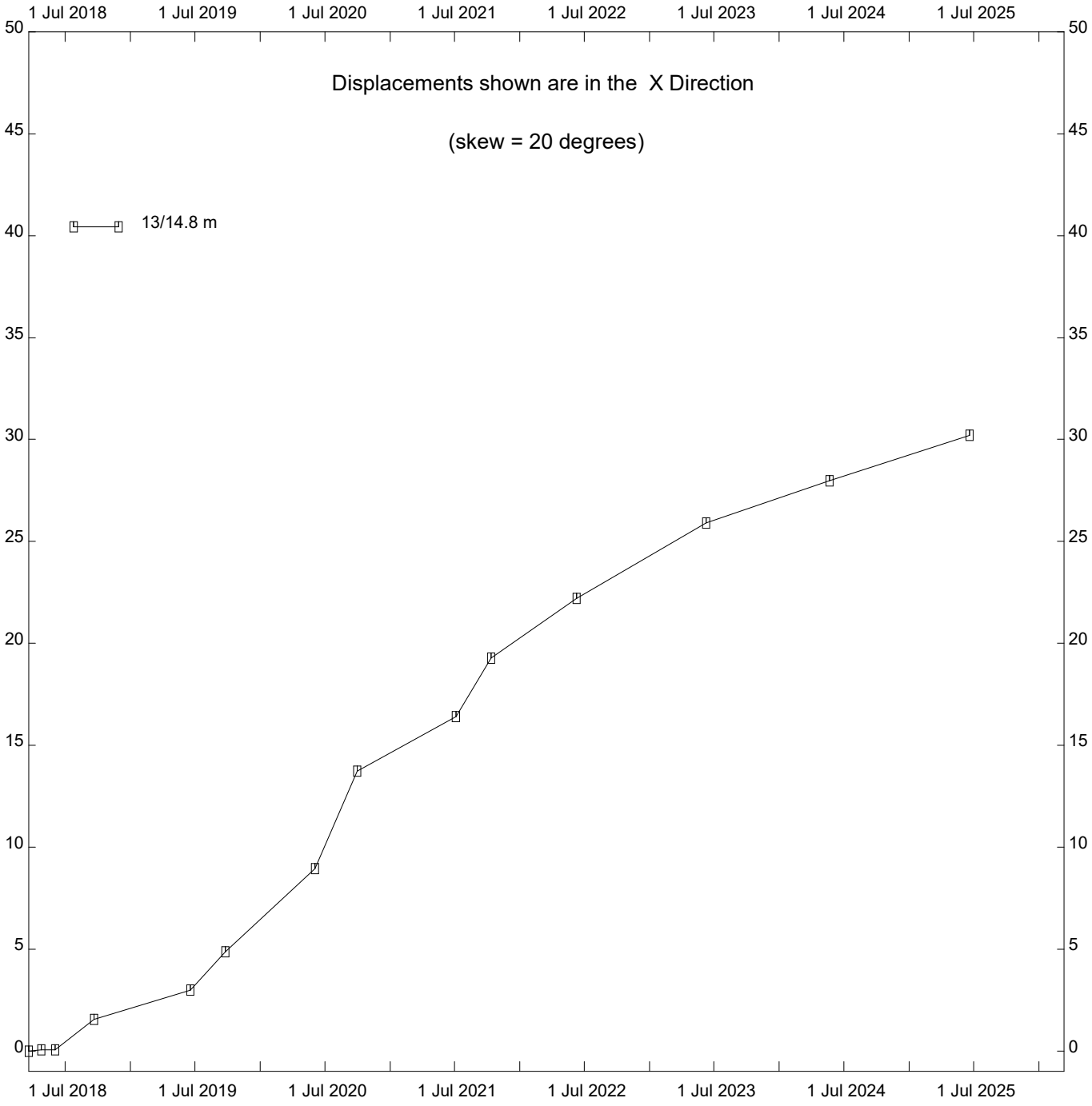
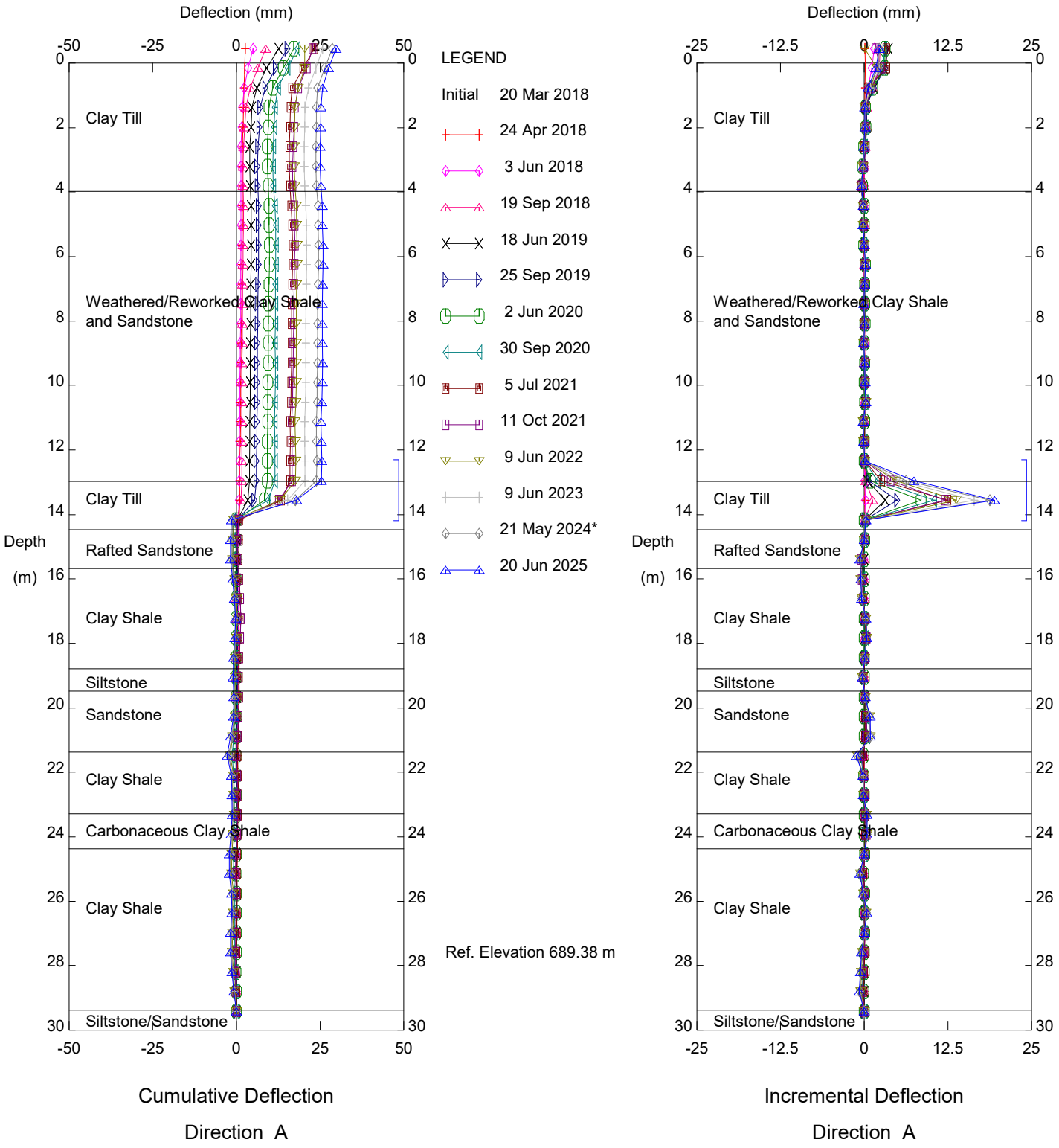
Thurber Engineering Ltd.



SH006, Klumph Creek Slide, Inclinometer SI18-30

Alberta Transportation

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

SH006, Klumph Creek Slide, Inclinometer SI18-31

Alberta Transportation

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

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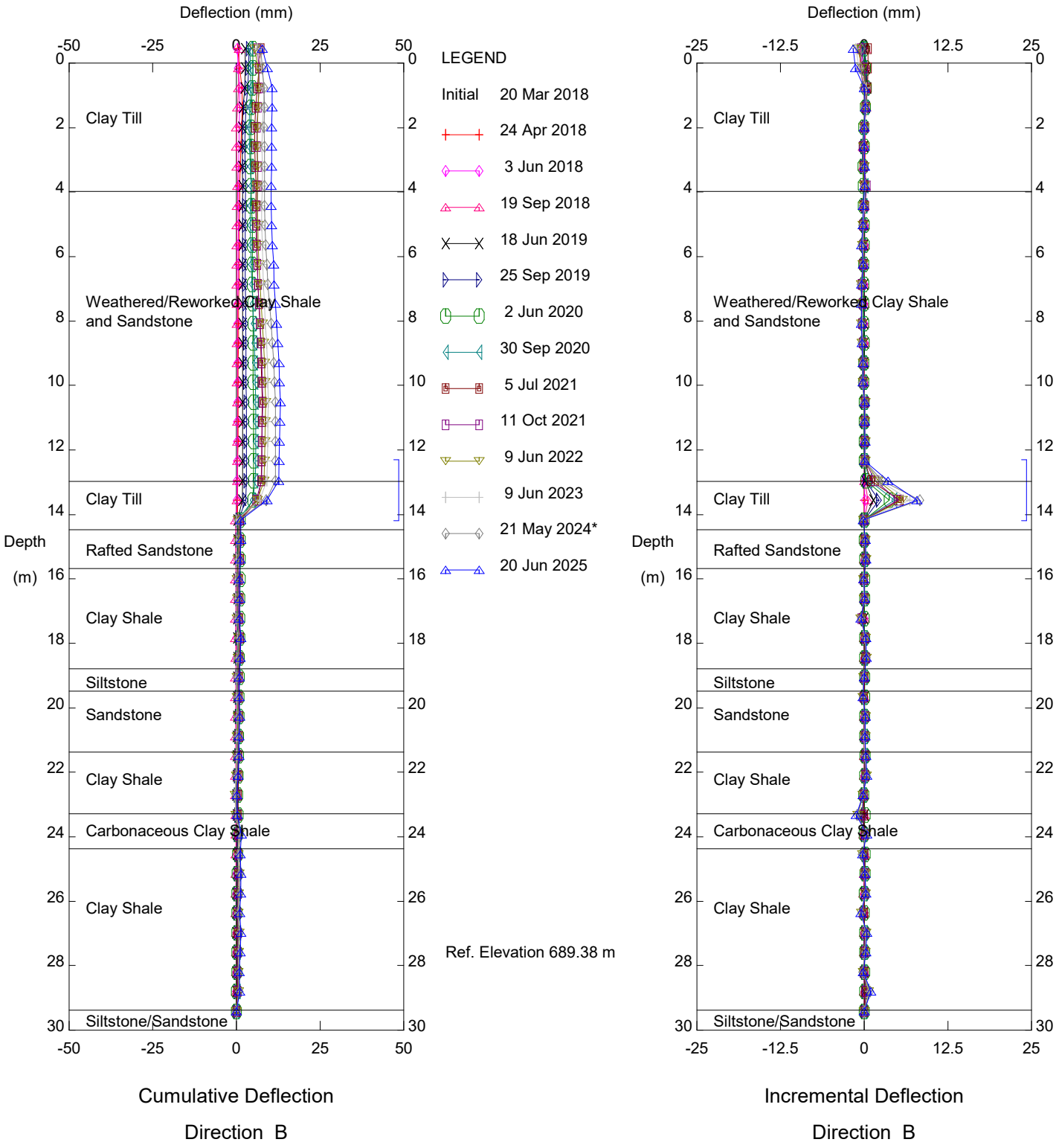
Thurber Engineering Ltd.



Cumulative Deflection

Direction B

Incremental Deflection

Direction B

SH006, Klumph Creek Slide, Inclinometer SI18-31

Alberta Transportation

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

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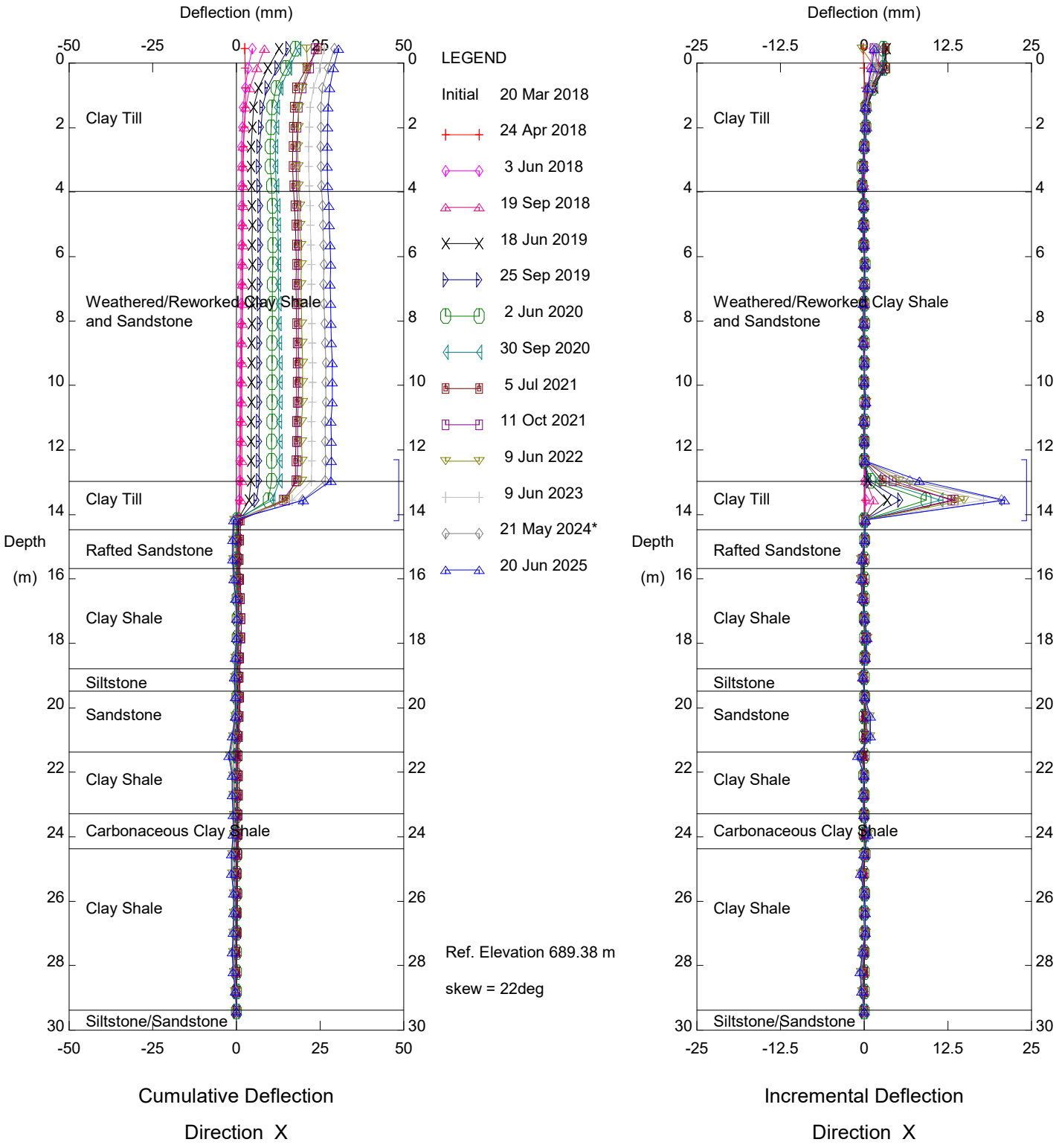
Thurber Engineering Ltd.



Cumulative Deflection

Direction X

Incremental Deflection

Direction X

SH006, Klumph Creek Slide, Inclinometer SI18-31

Alberta Transportation

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

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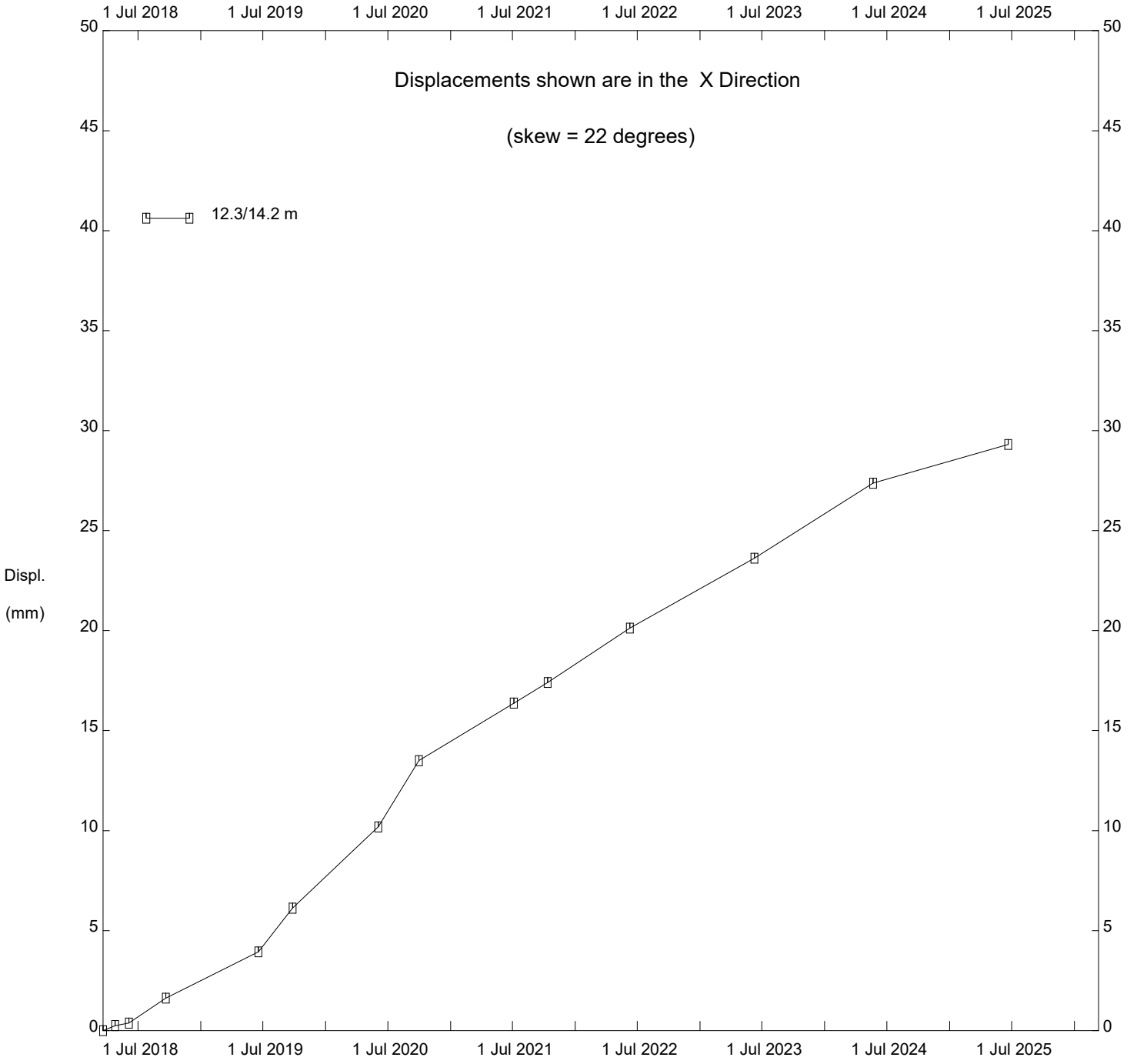
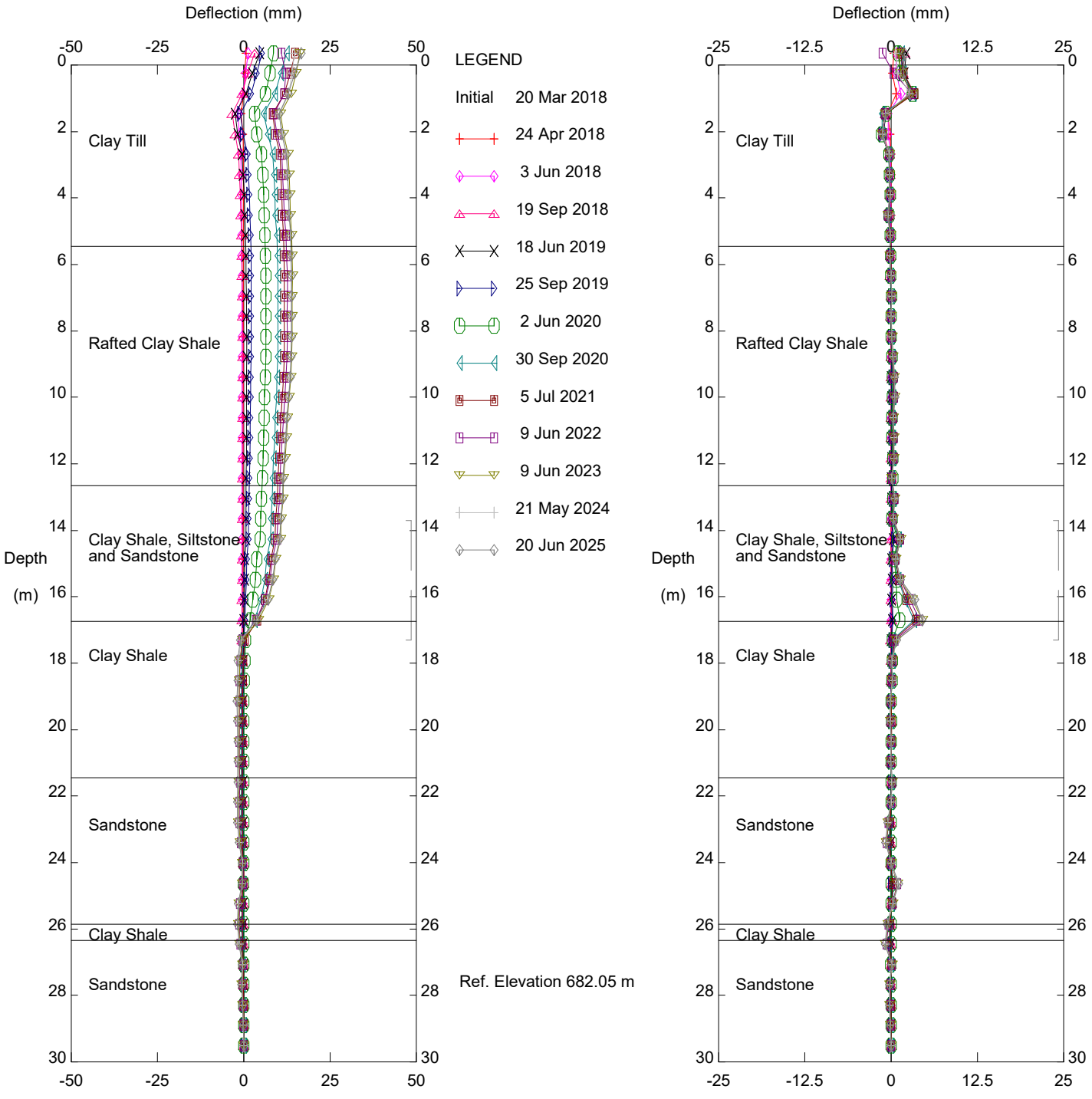
Thurber Engineering Ltd.



SH006, Klumph Creek Slide, Inclinometer SI18-31

Alberta Transportation

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

SH006, Klumph Creek Slide, Inclinometer SI18-32

Alberta Transportation

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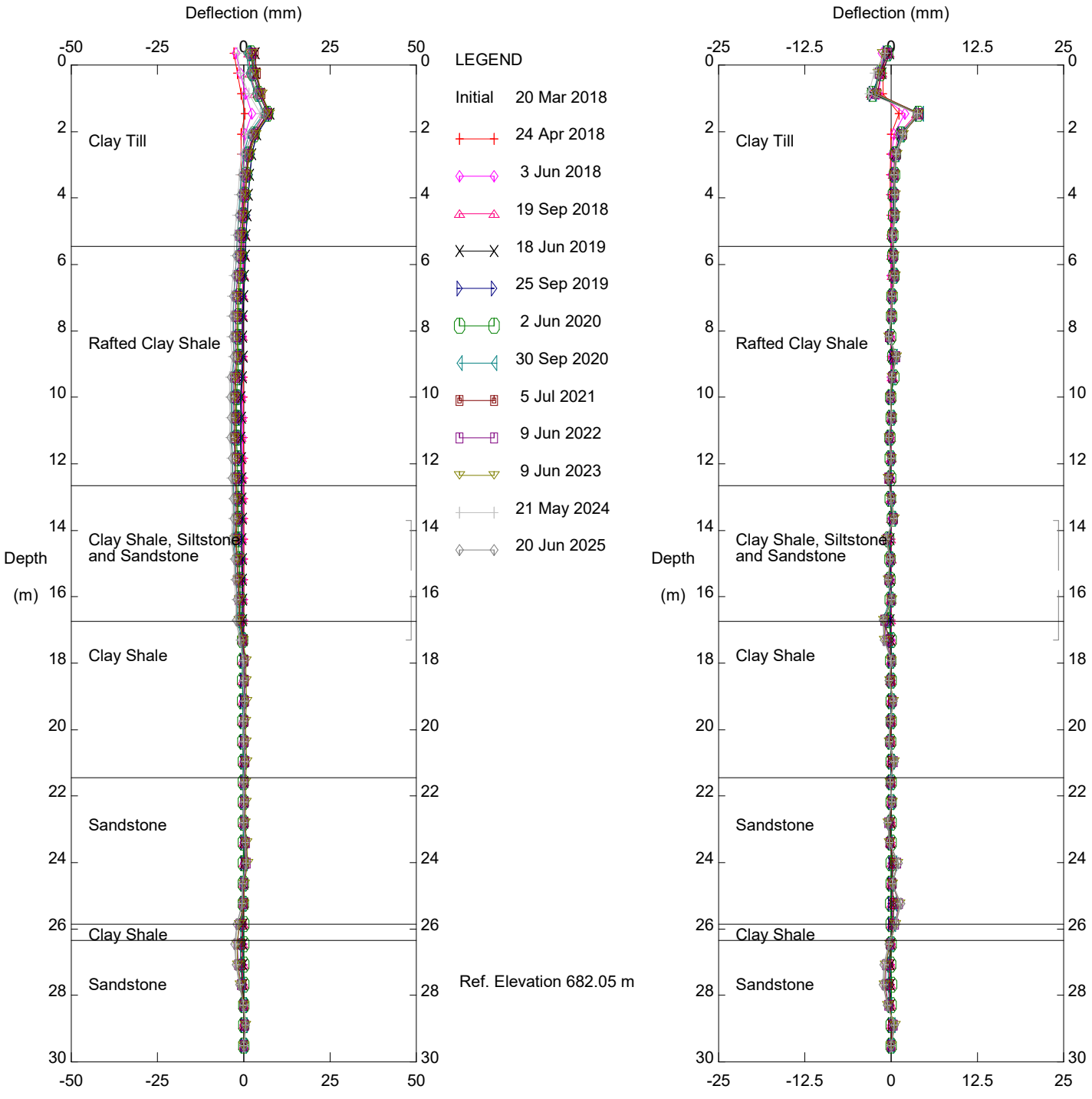

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

SH006, Klumph Creek Slide, Inclinometer SI18-32

Alberta Transportation

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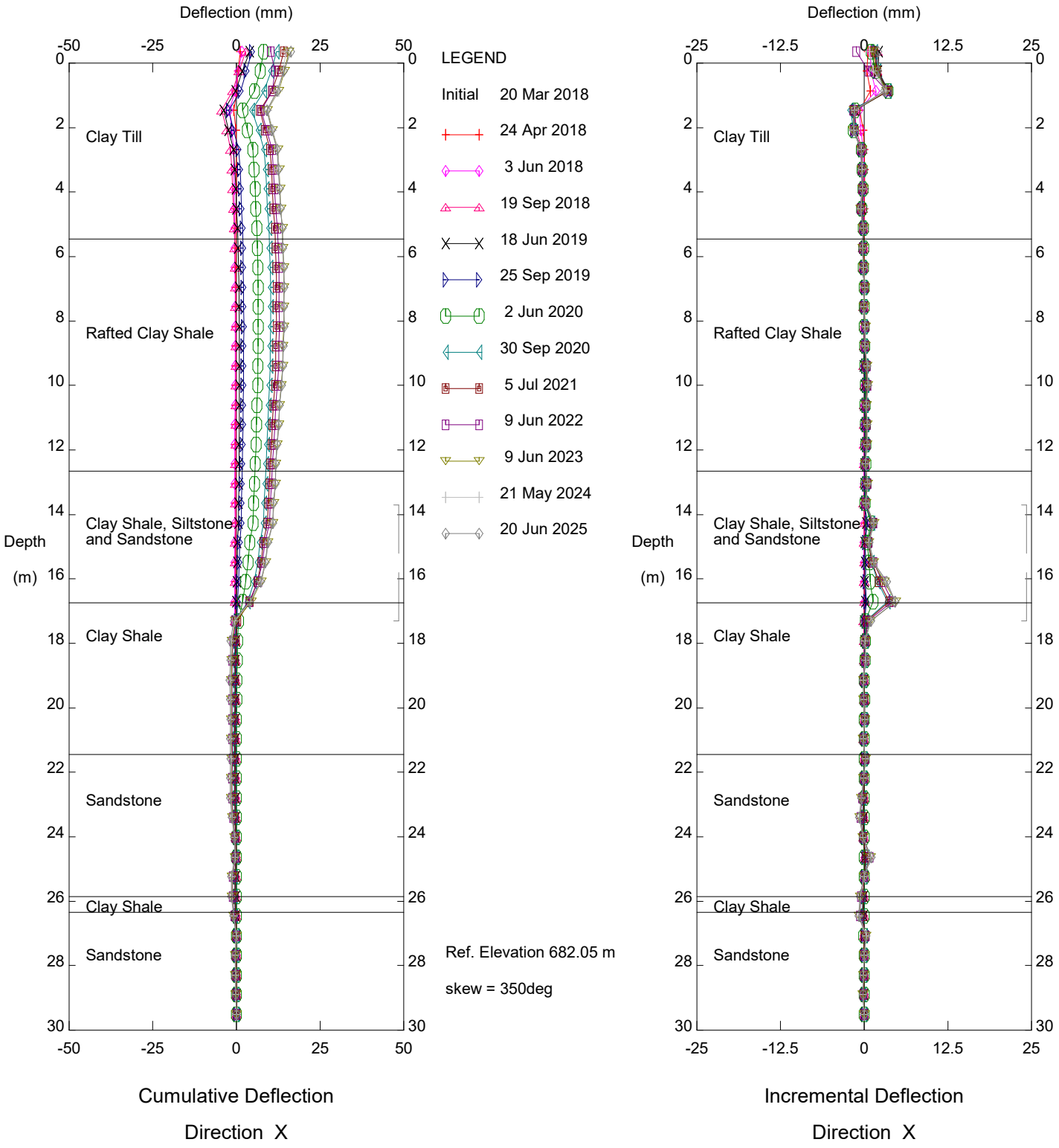

Cumulative Deflection

Direction X

Incremental Deflection

Direction X

SH006, Klumph Creek Slide, Inclinometer SI18-32

Alberta Transportation

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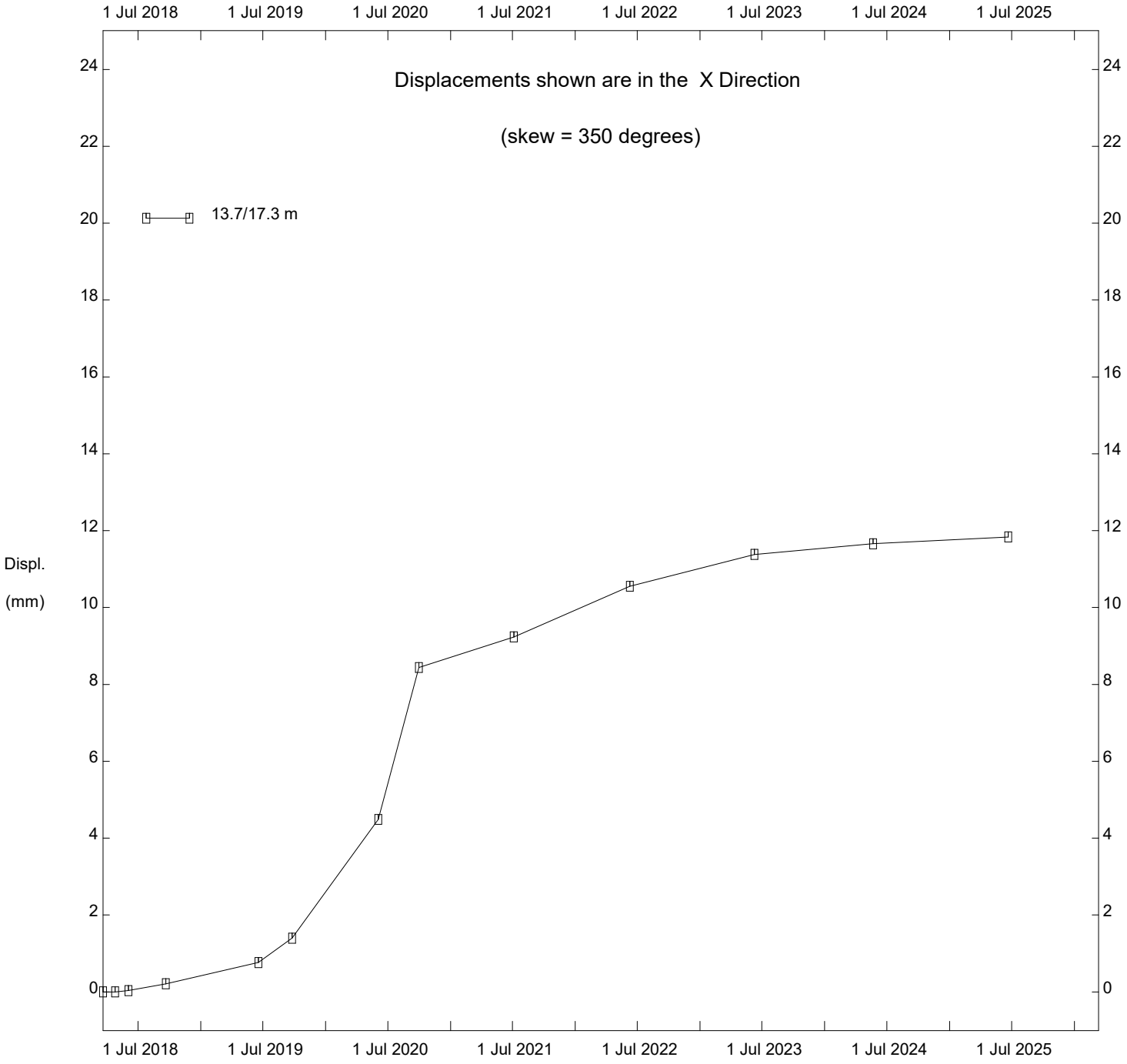

SH006, Klumph Creek Slide, Inclinometer SI18-32

Alberta Transportation

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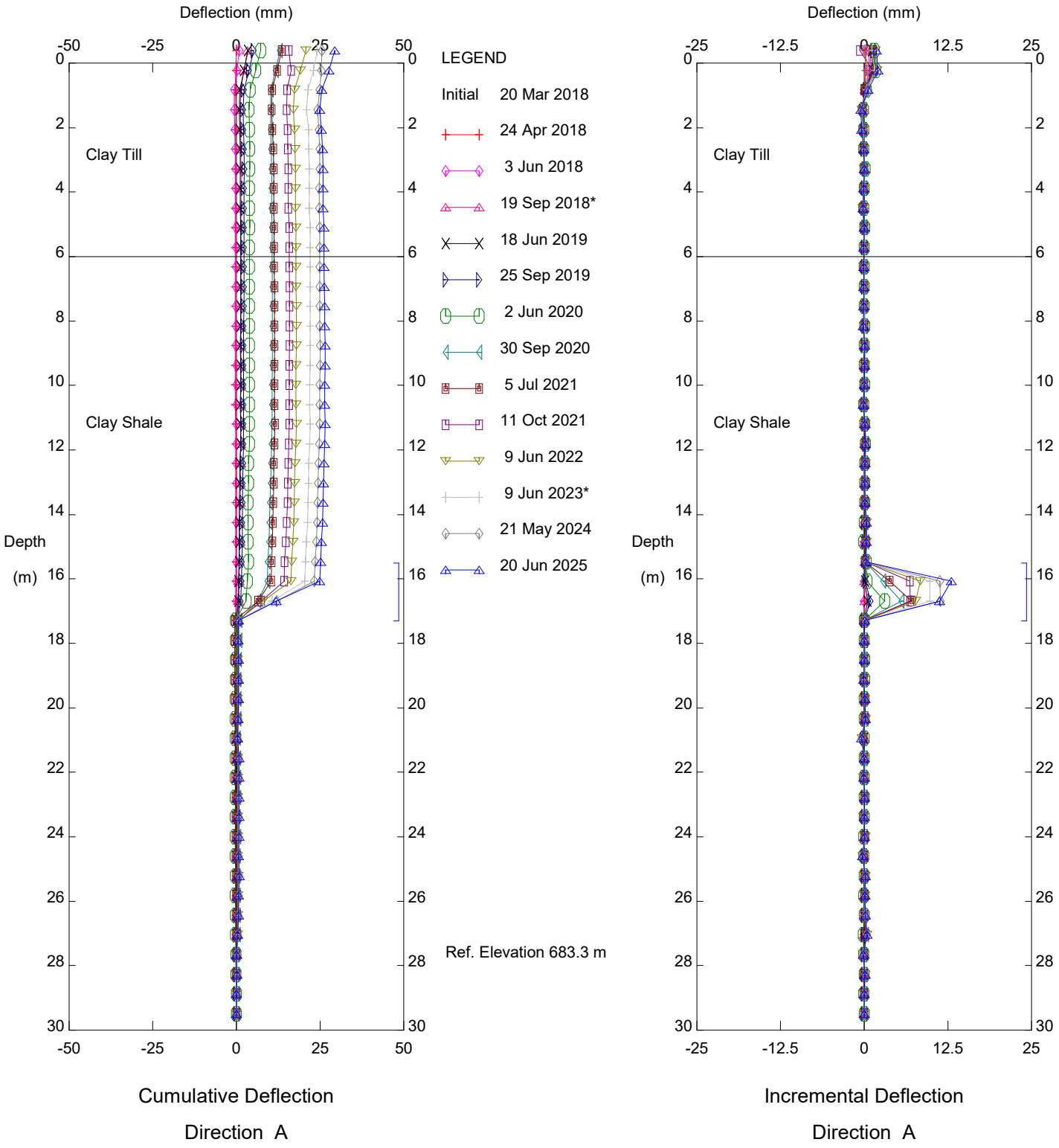

Cumulative Deflection

Direction A

Incremental Deflection

Direction A

SH006, Klumph Creek Slide, Inclinometer SI18-33

Alberta Transportation

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

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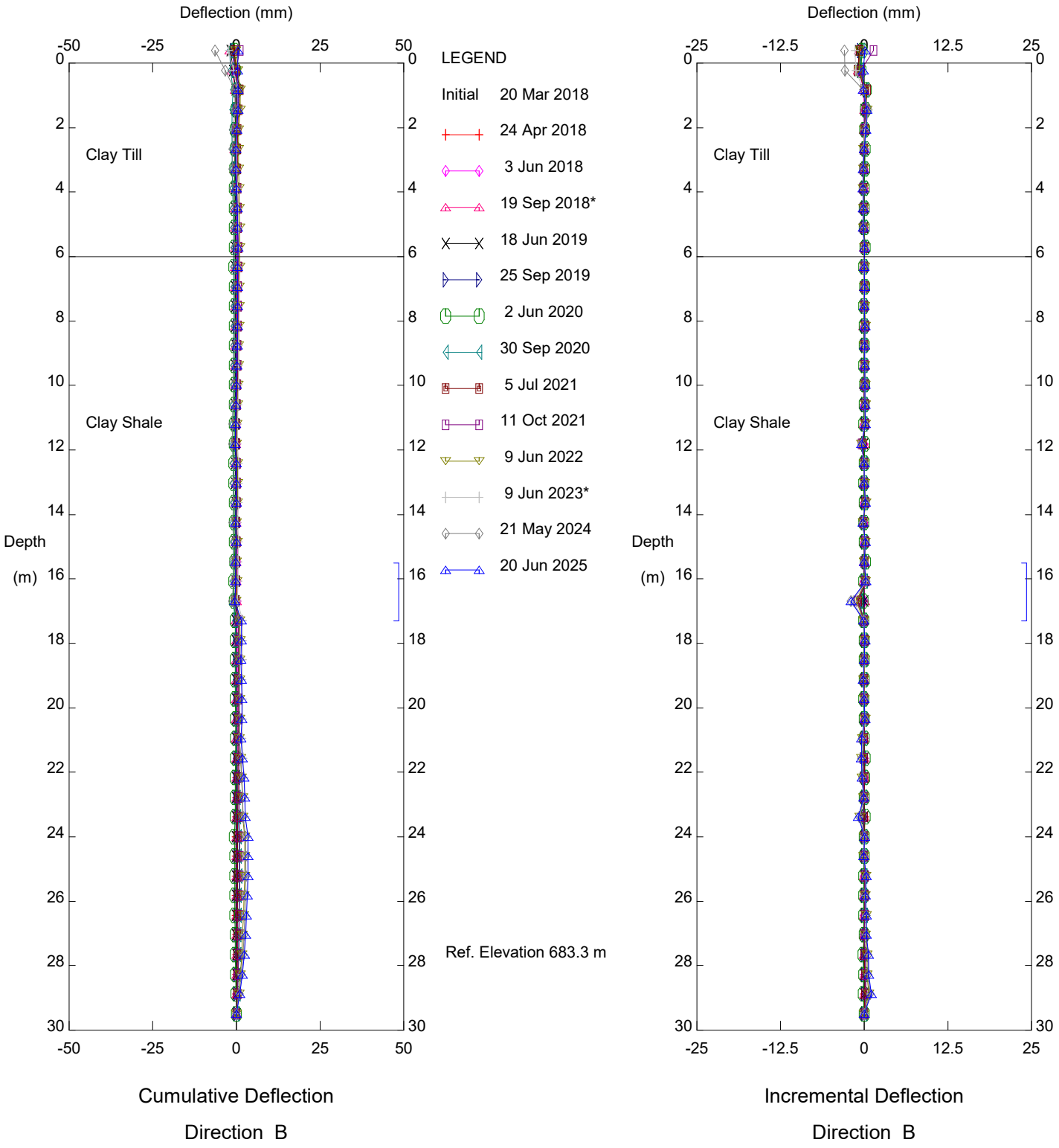
Thurber Engineering Ltd.



Cumulative Deflection

Direction B

Incremental Deflection

Direction B

SH006, Klumph Creek Slide, Inclinometer SI18-33

Alberta Transportation

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

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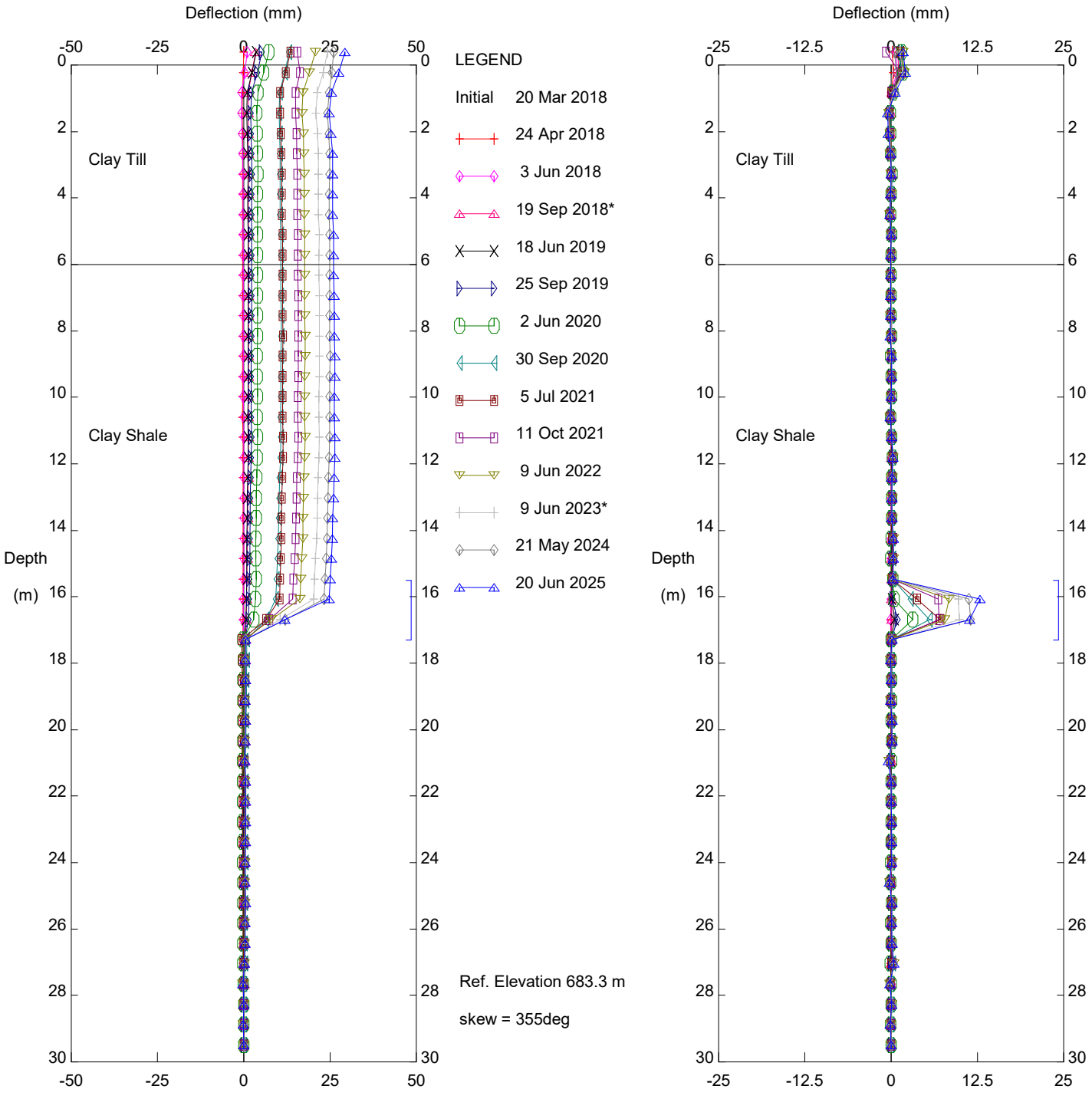
Thurber Engineering Ltd.



Cumulative Deflection

Direction X

Incremental Deflection

Direction X

SH006, Klumph Creek Slide, Inclinometer SI18-33

Alberta Transportation

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

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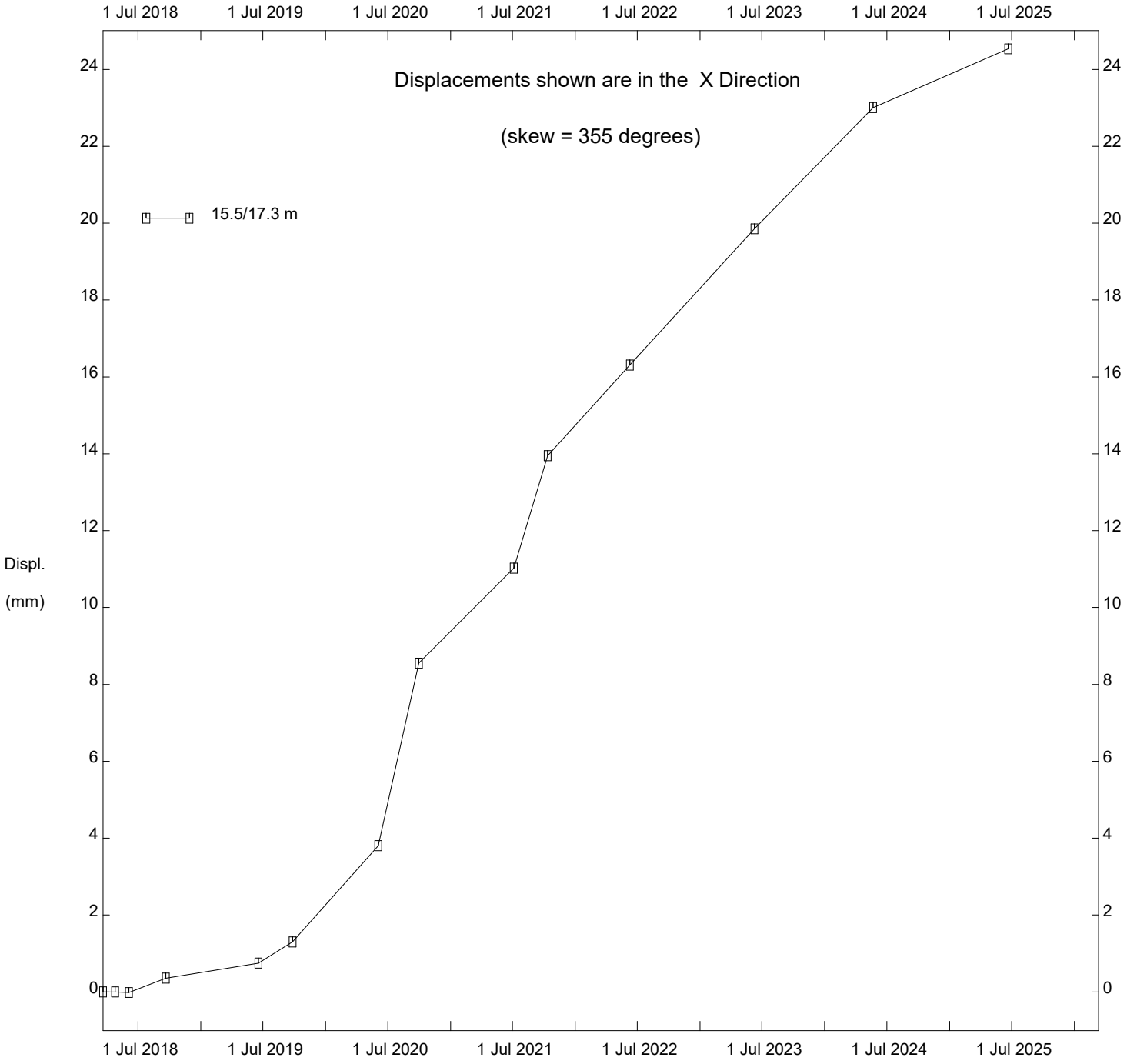
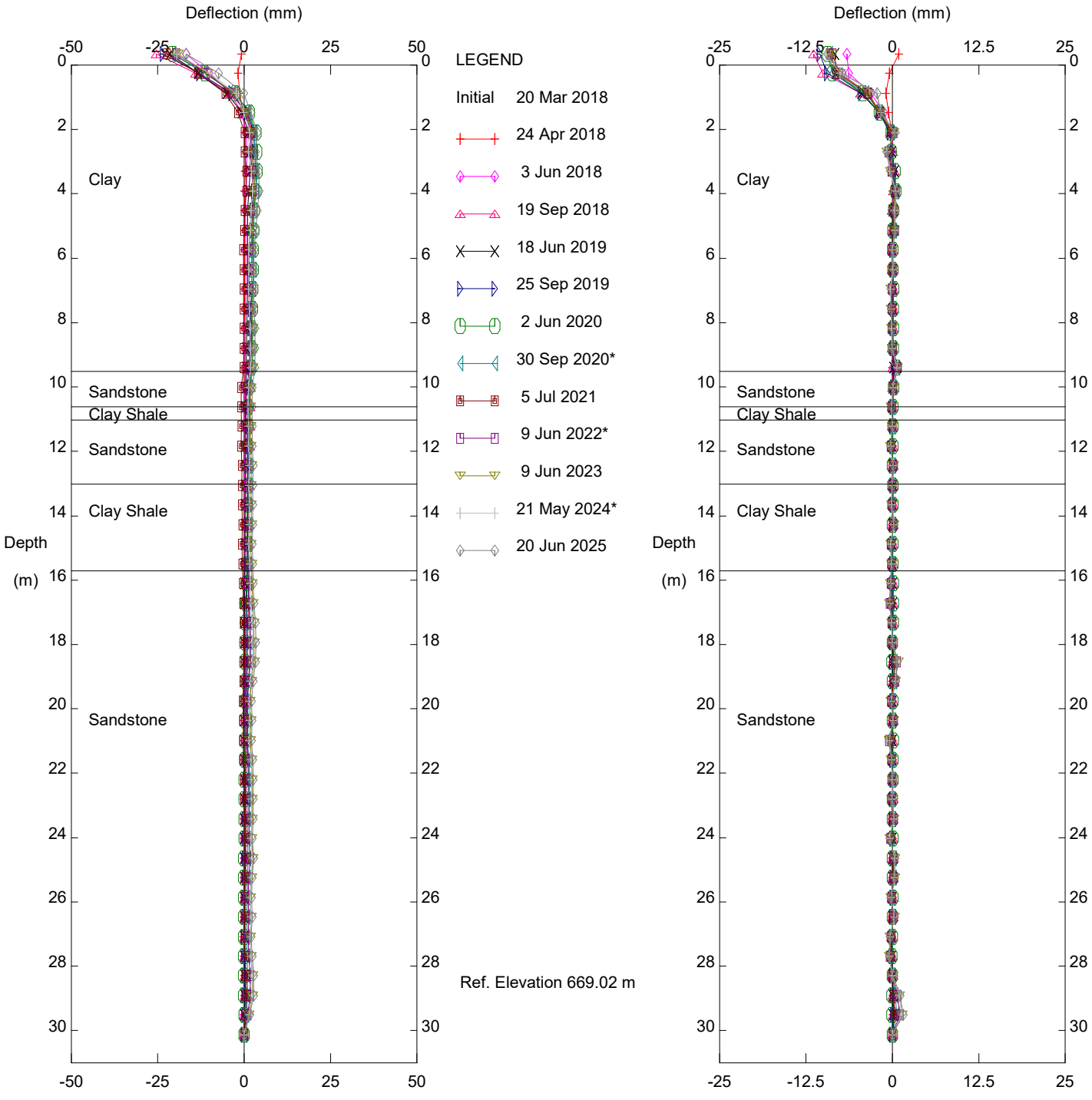


SH006, Klumph Creek Slide, Inclinometer SI18-33

Alberta Transportation

Thurber Engineering Ltd.



Cumulative Deflection

Direction A

Incremental Deflection

Direction A

SH006, Klumph Creek Slide, Inclinometer SI18-34

Alberta Transportation

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

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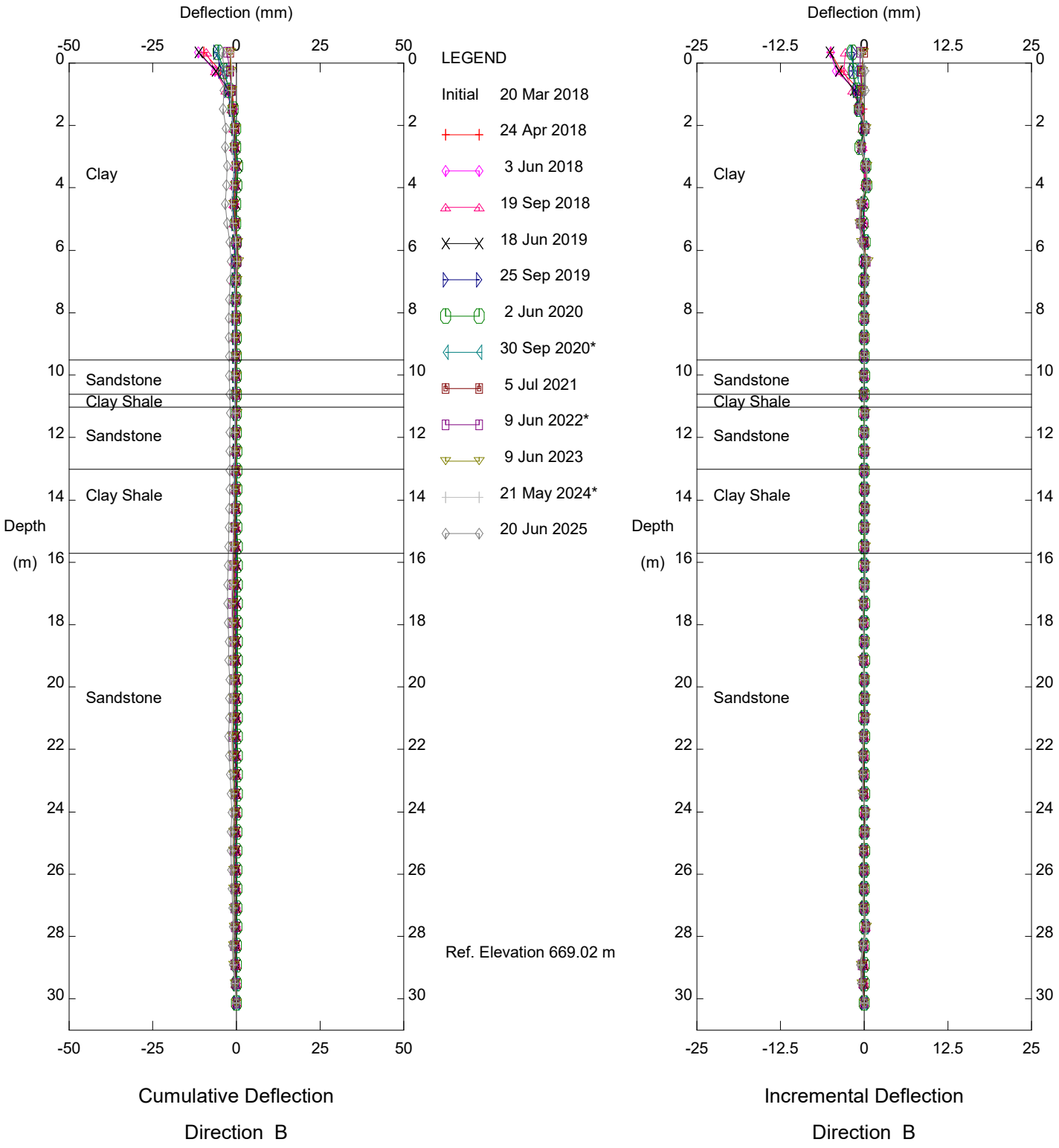

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

SH006, Klumph Creek Slide, Inclinometer SI18-34

Alberta Transportation

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

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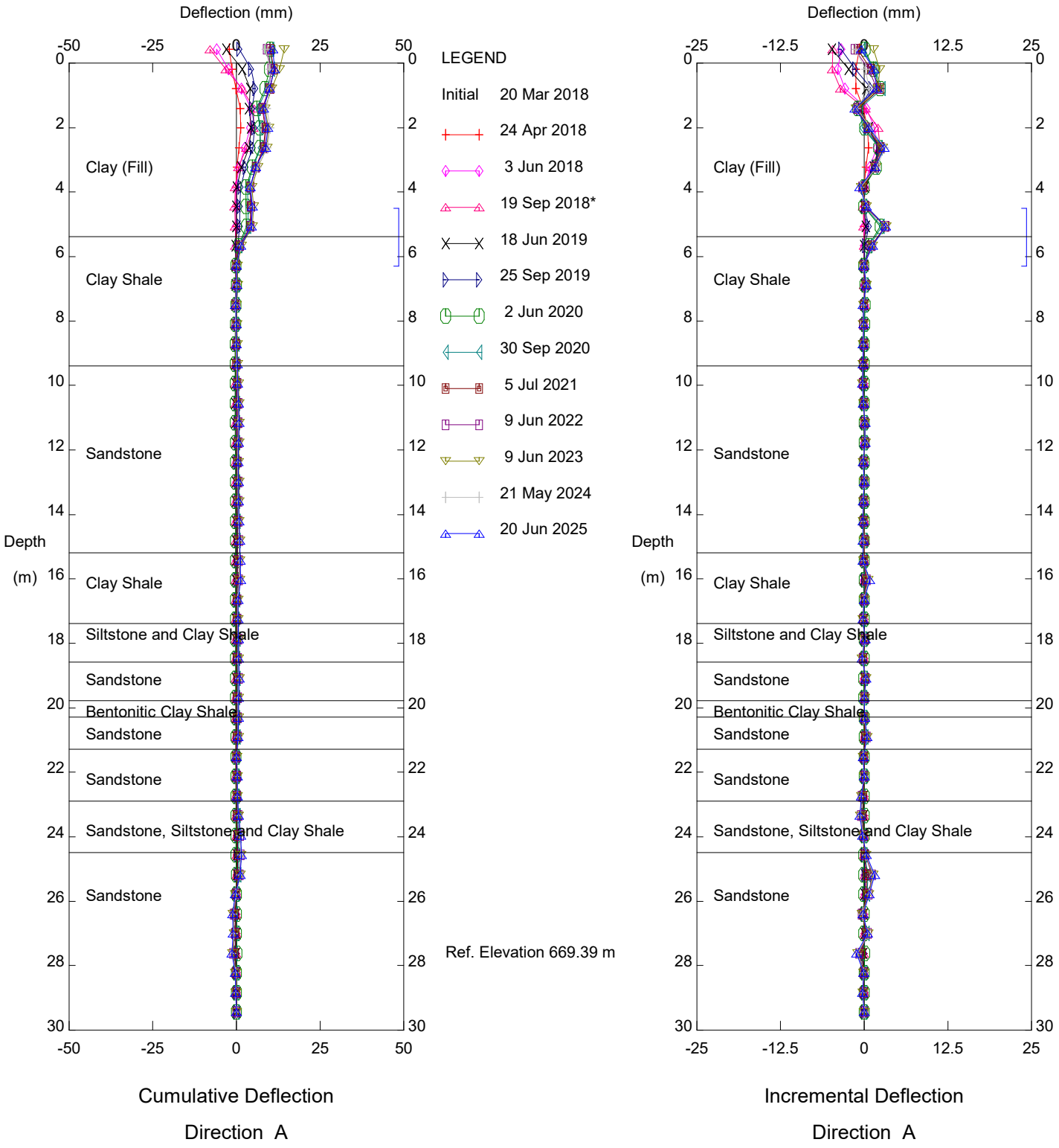

Cumulative Deflection

Direction A

Incremental Deflection

Direction A

SH006, Klumph Creek Slide, Inclinometer SI18-35

Alberta Transportation

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

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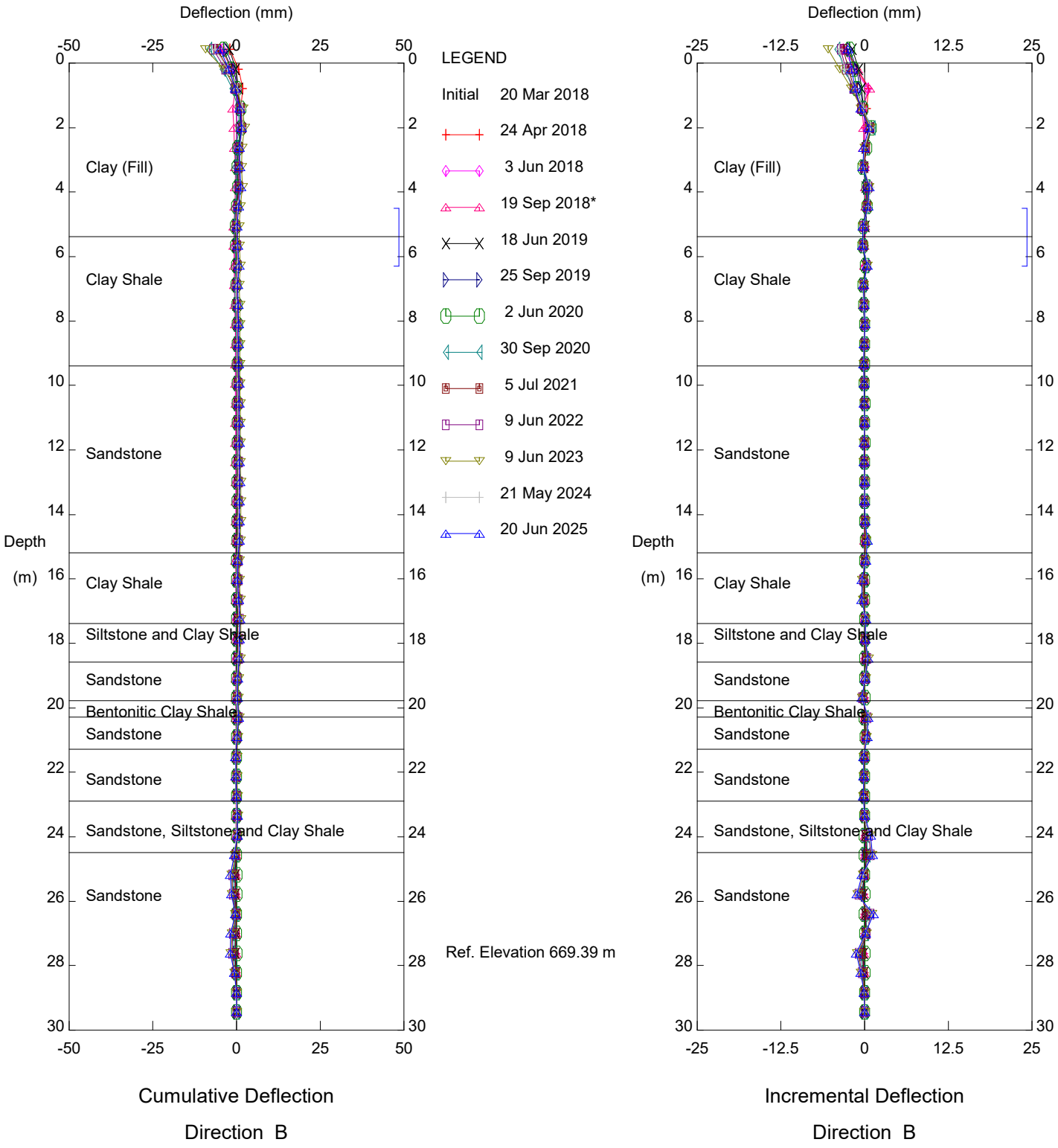

Cumulative Deflection

Direction B

Incremental Deflection

Direction B

SH006, Klumph Creek Slide, Inclinometer SI18-35

Alberta Transportation

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

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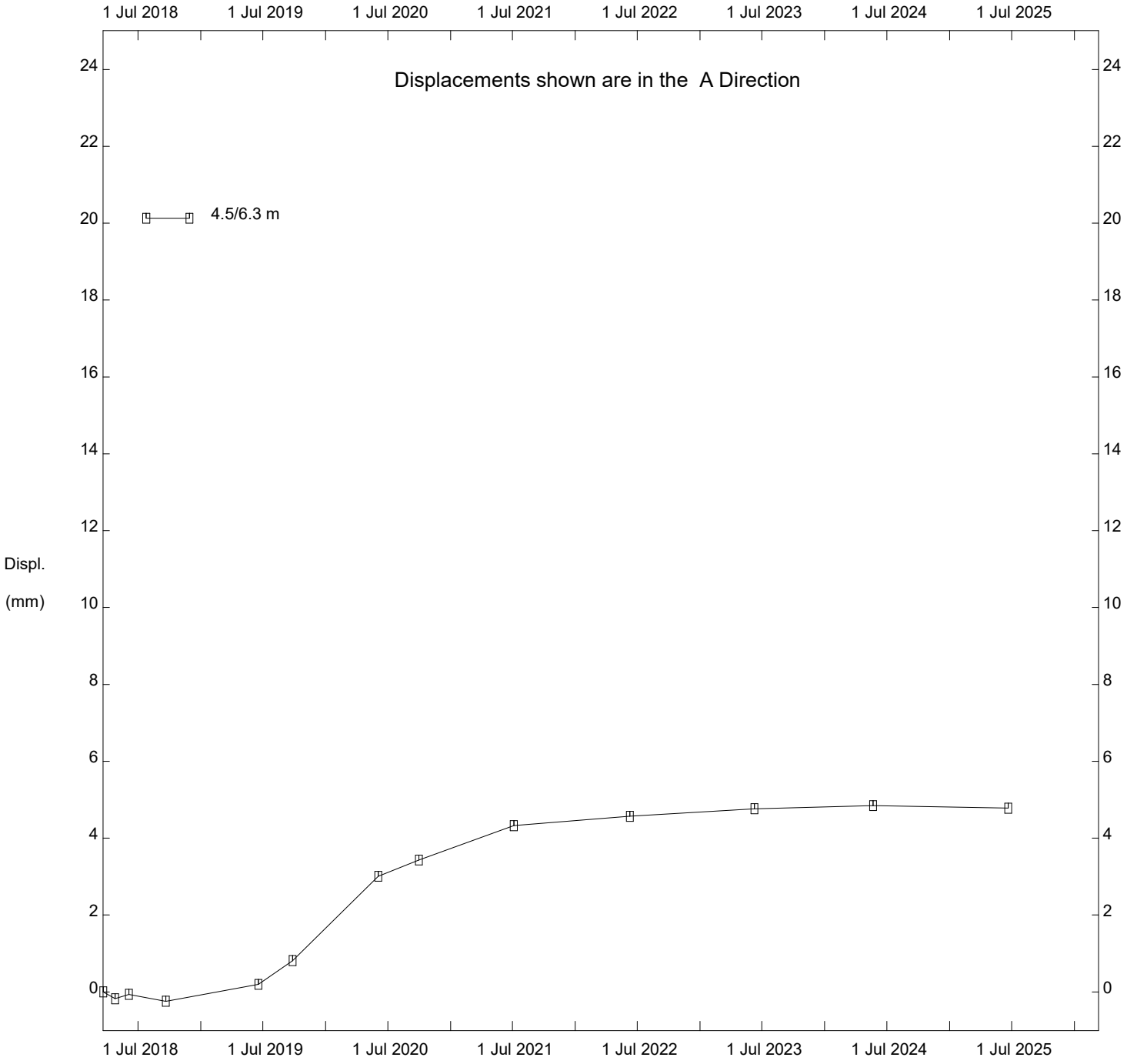

SH006, Klumph Creek Slide, Inclinometer SI18-35

Alberta Transportation

FIGURE SH006-1
KLUMPH CREEK STANDPIPE PIEZOMETER DATA

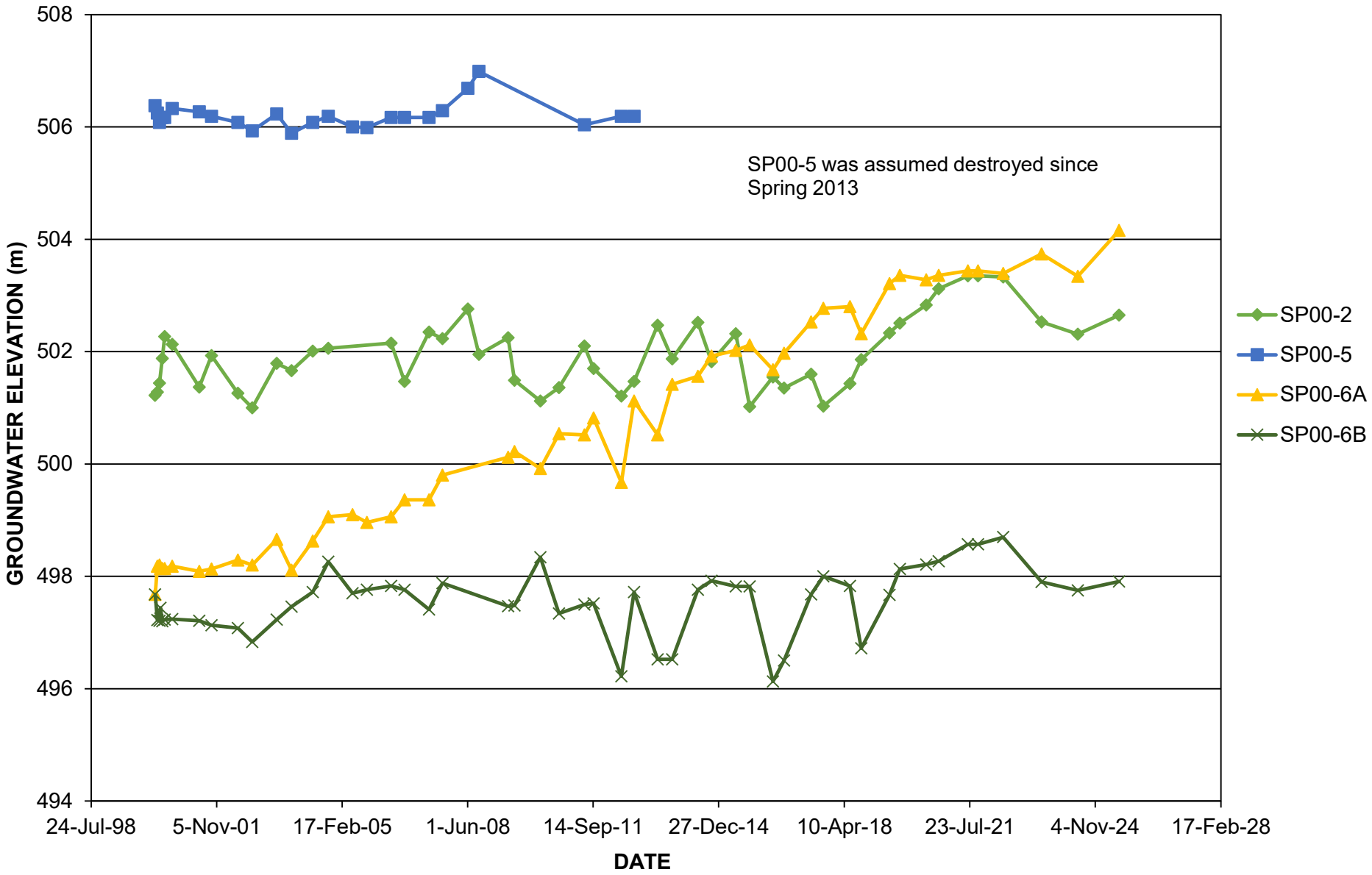

FIGURE SH006-2
KLUMPH CREEK PNEUMATIC PIEZOMETER DATA (2018 INSTRUMENTS)