

Site Number	Location	Name	Hwy	km
PH032	HWY 744:04 C1 58.0	Makeout Slide- Judah Hill	744:04	Km 58.0
Legal Description: 9-20-83-21 W5		UTM Co-ordinates		
		11U E 483237	N	6229841

Current Monitoring:	23-May-2024	Previous Monitoring	9-Oct-2023
Instruments Read By:	Mr. Niraj Regmi, G.I.T and Mr. Nixson Mationg, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): PK15, PK36, PK54 and PK80 (at KM 58 pile wall) PM12 and PM24 (at Makeout pile wall)	Pneumatic Piezometers (PN): PN13-32-1S and PN13 32 1D	Vibrating Wire Piezometers (VW):	Standpipe Piezometers (SP):
Load Cell (LC): VC1850, VC1853, VC1855, VC1856, VC1857, VC1858, VC1859, VC1860, VC1861 and VC1862 (on selected anchors at KM 58 pile wall) VC1848, VC1849, VC1851, VC1852 and VC1854 (on selected anchors at Makeout pile wall)	Strain Gauges: N/A	SAAs:	Others:

Readout Equipment Used			
Slope Inclinometers: RST Digital Inclinomater probe with 2 ft wheelbase and RST Pocket PC readout	Pneumatic Piezometers: RST C108 pneumatic piezometer readout	Vibrating Wire Piezometers:	Standpipe Piezometers:
Load Cell: RST DT2040 datalogger (Load cell datalogger files were uploaded to a laptop using RST Multichannel DTLINK software)	Strain Gauges:	SAAs:	Others:

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	<p>At the KM 58 pile wall, PK15 showed a rate of movement of less than 0.1 mm/yr the length of the pile and a rate of movement of 0.1 mm/yr over the combined length of the pile and waler since the fall of 2023 readings. Since the completion of construction, PK15 has shown a total cumulative deflection of 3.0 mm over the length of the pile in the downslope direction and a total cumulative movement of 3.4 mm in the downslope direction over the combined length of the pile and waler.</p> <p>PK36 showed a rate of movement of 0.5 mm/yr over the length of the pile and a rate of movement of 1.9 mm/yr over the combined length of the pile and waler. Since the completion of construction, PK36 has shown total cumulative deflections of 5.3 mm in the downslope direction over the length of the pile and 5.1 mm in the downslope direction over the combined length of the pile and waler.</p>

PK54 showed a rate of movement of 1.8 mm/yr over the length of the pile and a rate of movement of 1.2 mm/yr over the combined length of the pile and waler. Since the completion of construction, PK54 has shown total cumulative movements of 12.9 mm in the downslope direction over the length of the pile and 10.9 mm in the downslope direction over the combined length of the pile and waler.

PK80 showed a rate of movement of 0.7 mm/yr over the length of the pile and no discernible movement over the combined length of the pile and waler. Since the completion of construction, PK80 has shown total cumulative movements of 9.3 mm in the downslope direction over the length of the pile and 7.9 mm in the downslope direction over the combined length of the pile and waler.

The SIs at the KM 58 wall location show a current overall trend of slow downslope movement.

At the Makeout pile wall location, PM12 showed a rate of movement of 2.6 mm/yr over the length of the pile and a rate of movement of 5.8 mm/yr over the combined length of the pile and waler. Since the completion of construction, PM12 has shown total cumulative deflections of 2.7 mm in the downslope direction over the length of the pile and 1.5 mm in the upslope direction over the combined length of the pile and waler.

PM24 showed a rate of movement of 1.0 mm/yr over the length of the pile and a rate of movement of 0.7 mm/yr over the combined length of the pile and waler. Since the completion of construction, PM24 has shown total cumulative movements of 3.0 mm in the downslope direction over the length of the pile and 1.3 mm in the downslope direction over the combined length of the pile and waler.

After being pulled into the slope during the initial lock off of the anchors, the SIs at the Makeout wall location have show an overall trend of slow downslope movement since the end of construction. There have been minor seasonal changes in the wall displacement.

PN13-32-1S showed an increase in groundwater level of 0.07 m since it was last read in the spring of 2023 readings. PN13-32-1D showed a decrease in groundwater level of 0.05 m since the fall of 2023 readings. Pneumatic piezometer results are plotted in Figures PH032-1 (by elevation) and PH032-2 (by depth below ground surface) in Appendix A.

The load cells are connected to two dataloggers that are programmed to take two readings per day. Since the fall of 2023 readings, the load cells at the KM 58 wall showed minor changes in measured load ranging from a decrease of 1.18 kN in VC1853 (anchor K54L) to an increase of 6.79 kN in VC1862 (anchor K15M). Load cells VC1862 (K15M), VC1858 (K15L), VC1856 (K36M), VC1857 (K54M), VC1860 (K79M) and VC1861 (K80L) registered all time high measured loads between January 28 to 30, 2024. The anchors at the KM 58 wall show an overall trend of slowly increasing load, mainly with seasonally higher loads during the winter months. It should also be noted that load cells VC1862 (K15M) and VC1858 (K15L) show current loads that are 4.7 percent and 7.9 percent, respectively, above their SLS design loads.

At the Makeout wall, the load cells showed increases in measured load ranging from 0.21 kN in VC1848 (anchor M12L) to 5.01 kN in VC1854 (anchor M12U). The load cells at the Makeout wall have also shown an overall trend of slowly increasing loads since the end of construction, with seasonally higher loads during the winter months. However, none of the measured loads are over the SLS design loads.

The load cell average loads and temperatures are plotted for the KM 58 and Makeout walls on Figures PH032-3 and PH032-4, respectively, in Appendix A. The design and lock-off loads for each anchor are shown in the legends of the figures.

	Overall, the SI and load cell data indicates that the pile walls have been effective at mitigating the landslide movements at this site and the measured deflections and anchor loads are within expected ranges. However, since the instruments at the KM 58 pile wall are showing a trend of downslope movement, combined with gradually increasing anchor loads, the instruments here should be monitored closely to ensure that the downslope movement doesn't begin to accelerate.
Future Work:	The instruments should be read again in the fall of 2024.
Instrumentation Repairs:	Pneumatic Piezometer PN13-32-1S was malfunctioning during the fall of 2023 readings, however it was found to be functioning during the current readings, although the readings were slow to stabilize.
Additional Comments:	
Attachments:	<ul style="list-style-type: none"> • Table PH032-1: Spring 2024 – HWY 744:04 Judah Hill (Makeout Slide) Slope Incliner Instrumentation Reading Summary • Table PH032-2: Spring 2024 – HWY 744:04 Judah Hill (Makeout Slide) Pneumatic Piezometer Instrumentation Reading Summary • Table PH032-3: Spring 2024 – HWY 744:04 Judah Hill (Makeout Slide) Load Cell Instrumentation Reading Summary • Statement of Limitations and Conditions • Appendix A <ul style="list-style-type: none"> ○ Field Inspector's report ○ Site Plan Showing Approximate Instrument Locations (Drawings No. 32121-PH032-1, 32121-PH032-2, and 32121-PH032-3) ○ Pile Wall General Layout drawings ○ SI Reading Plots ○ Figure PH032-1 (Piezometric Elevations) ○ Figure PH032-2 (Piezometric Depths) ○ Figure PH032-3 (Load Cell Data for Km 58 Pile Wall) ○ Figure PH032-4 (Load Cell Data for Makeout Pile Wall)

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.
Don Proudfoot, M.Eng., P. Eng.
Partner | Senior Geotechnical Engineer

Bruce Nestor, P.Eng.
Geotechnical Engineer



Table PH032-1: Spring 2024 – HWY 744:04 Judah Hill (Makeout Slide) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: May 23, 2024

INSTRUMENT #	DATE INITIALIZED (AFTER CONSTRUCTION)	TOTAL CUMULATIVE RESULTANT MOVEMENT AT NOTED DEPTH SINCE INITIAL READING (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS	DATE OF PREVIOUS READING	INCREMENTAL MOVEMENT SINCE PREVIOUS READING (mm)	RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
KM 58 WALL								
PK15	July 2, 2015	3.0 over 2.1 m to 13.7 m depth in 274° direction	17.3 in July 2015	Operational	October 9, 2023	<0.1	<0.1	-2.6
		3.4 over 0.3 m to 13.7 m depth in 274° direction	29.1 in July 2015			0.1	0.1	-0.4
PK36	July 2, 2015	5.3 over 2.6 m to 16.6 m depth in 318° direction	3.4 in October 2020	Operational	October 9, 2023	0.3	0.5	-0.2
		5.1 over 0.1 to 16.6 m depth in 318° direction	8.0 in September 2016			1.2	1.9	10.3
PK54	July 2, 2015	12.9 over 2.8 m to 20.4 m depth in 313° direction	12.0 in October 2020	Operational	October 9, 2023	1.1	1.8	-0.1
		10.9 over 0.3 m to 20.4 m depth in 313° direction	13.3 in October 2020			0.7	1.2	-0.4

Drawings 32121-PH032-1~3 in Appendix A provide a sketch of the approximate location of the monitoring instrumentation for this site.

Table PH032-1 – Continued...Spring 2024 – HWY 744:04 Judah Hill (Makeout Slide) Slope Inclinometer Instrumentation Reading Summary

Date Monitored: May 23, 2024

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AT NOTED DEPTH SINCE INITIAL READING (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS	DATE OF PREVIOUS READING	INCREMENTAL MOVEMENT SINCE PREVIOUS READING (mm)	RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
PK80	July 2, 2015	9.3 over 2.4 m to 20.0 m depth in 262° direction	-20.2 in July 2015	Operational	October 9, 2023	0.4	0.7	-1.4
		7.9 over 0.5 m to 20.0 m depth in 262° direction	-26.4 in July 2015			No discernible movement	N/A	-6.6
MAKEOUT WALL								
PM12	July 3, 2015	2.7 over 2.2 m to 19.2 m depth in 316° direction	-41.3 in July 2015	Operational	October 9, 2023	1.6	2.6	4.1
		1.5 over 0.3 m to 19.2 m depth in 316° direction	-52.8 in July 2015			3.6	5.8	11.4
PM24	July 3, 2015	3.0 over 2.1 m to 19.2 m depth in 298° direction	-27.4 in July 2015	Operational	October 9, 2023	0.9	1.0	0.1
		1.3 over 0.3 m to 19.2 m depth in 298° direction	-33.4 in July 2015			0.6	0.7	0.1

Drawings 32121-PH032-1~3 in Appendix A provide a sketch of the approximate location of the monitoring instrumentation for this site.



Table PH032-2: Spring 2024 – HWY 744:04 Judah Hill (Makeout Slide) Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: May 23, 2024

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER LEVEL (m)	MEASURED PORE PRESSURE (kPa)	CURRENT GROUNDWATER ELEVATION (m)	PREVIOUS GROUNDWATER ELEVATION October 9, 2023 (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
PN13-32-1S	November 30, 2013	9.14	499.84	Operational	493.56 in September 2022	23.6	493.10	493.03*	0.07
PN13-32-1D	November 30, 2013	18.29	499.84	Operational	482.46 in December 2013	4.6	482.02	482.07	-0.05

Drawings 32121-PH032-1~3 in Appendix A provide a sketch of the approximate location of the monitoring instrumentation for this site. PN 13-32-1S was not functioning properly in fall 2023 so the previous reading presented was taken on June 16, 2023



Table PH032-3: Spring 2024 – HWY 744:04 Judah Hill (Makeout Slide) Load Cell Instrumentation Reading Summary

Date Monitored: May 23, 2024

ANCHOR NUMBER	LOAD CELL SERIAL #	DESIGN LOAD / LOCK-OFF LOAD (kN)	MAXIMUM RECORDED LOAD (kN)	RECORDED LOAD ⁽¹⁾ (MAY 23, 2024) (kN)	PREVIOUS RECORDED LOAD ⁽¹⁾ (OCT. 9, 2023) (kN)	CHANGE IN LOAD SINCE PREVIOUS READING (kN)
KM 58 WALL						
K15M	VC1862	178/177	194.23 on January 30, 2024	186.31	179.52	6.79
K15L	VC1858	239/231	264.90 on January 28, 2024	257.87	255.96	1.91
K36M	VC1856	233/199	214.91 on January 30, 2024	200.06	195.11	4.95
K45L	VC1855	292/248	248.50 on April 20, 2015	222.31	222.44	-0.13
K54M	VC1857	231/215	198.10 on January 30, 2024	194.49	193.52	0.97
K54L	VC1853	292/248	240.57 on August 14, 2023	236.67	237.85	-1.18
K55U	VC1850	274/272	275.28 on April 17, 2015	245.24	241.45	3.79
K79U	VC1859	274/272	250.27 on April 16, 2015	217.06	216.93	0.13
K79M	VC1860	231/215	217.55 on January 30, 2024	205.10	202.80	2.30
K80L	VC1861	292/248	264.09 on January 28, 2024	257.42	256.82	0.60

Drawings 32121-PH032-1~3 in Appendix A provide a sketch of the approximate location of the monitoring instrumentation for this site.

(1) Load cell data is recorded twice daily with datalogger on site. Dataloggers' data are uploaded twice annually during instrumentation readings. See Figure PH032-3 for combined historical instrument readings.



Table PH032-3 – Continued...Spring 2024 – HWY 744:04 Judah Hill (Makeout Slide) Load Cells Instrumentation Reading Summary

Date Monitored: May 23, 2024

ANCHOR NUMBER	LOAD CELL SERIAL #	DESIGN LOAD / LOCK-OFF LOAD (kN)	MAXIMUM RECORDED LOAD (kN)	RECORDED LOAD ⁽¹⁾ (MAY 23, 2024) (kN)	PREVIOUS RECORDED LOAD ⁽¹⁾ (OCT. 9, 2023) (kN)	CHANGE IN LOAD SINCE PREVIOUS READING (kN)
MAKEOUT WALL						
M12U	VC1854	274/272	277.02 on March 18, 2022	253.91	248.90	5.01
M12M	VC1849	231/215	213.90 on March 25, 2015	200.74	199.19	1.55
M12L	VC1848	292/248	253.28 on March 22, 2023	244.15	243.94	0.21
M24U	VC1851	274/272	271.81 on March 25, 2015	248.71	244.75	3.96
M24M	VC1852	231/215	217.10 on March 25, 2015	185.60	182.48	3.12

Drawings 32121-PH032-1~3 in Appendix A provide a sketch of the approximate location of the monitoring instrumentation for this site.

(1) Load cell data is recorded twice daily with datalogger on site. Dataloggers data are uploaded twice annually during instrumentation readings. See Figure PH032-4 for combined historical instrument readings.



STATEMENT OF LIMITATIONS AND CONDITIONS

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This Report has been prepared in accordance with generally accepted engineering or environmental consulting practices in the applicable jurisdiction. No other warranty, expressed or implied, is intended or made.

2. COMPLETE REPORT

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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.

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- 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.
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THURBER ENGINEERING LTD.

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

SPRING 2024

**APPENDIX A
DATA PRESENTATION**

SITE PH032: HWY 744:04, JUDAH HILL (MAKEOUT SLIDE)

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
PEACE REGION (PEACE RIVER DISTRICT)
INSTRUMENTATION MONITORING FIELD SUMMARY (PH032)
SPRING 2024**

Location: Makeout Slide - Judah Hill (HWY 744:04 C1 57.924)	Readout: RST PN C108 Unit 4
File Number: 32121	Casing: 2.75
Probe: RST SET 5R	Temp: 17
Cable: RST SET 5R	Read by: NKR/NRM

SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 11)		Date	Stickup (m)	Depth from top of Casing (ft)	Magn. North A+ Groove	Current Bottom Depth Readings				Probe/ Reel #	Size (")	Remarks
	Easting (m)	Northing (m)					A+	A-	B+	B-			
PK15	483237	6229841	23-May-24	1.21	48 to 2	245	382	-373	545	-549	5R/5R	2.75	
PK36	483225	6229863	23-May-24	0.8	56 to 2	310	-202	213	-39	23	5R/5R	2.75	
PK54	483214	6229882	23-May-24	1.2	70 to 2	300	705	-696	-159	146	5R/5R	2.75	
PK80	483199	6229909	23-May-24	0.99	68 to 2	225	-411	421	218	-238	5R/5R	2.75	
PM12	483157	6229989	23-May-24	1.18	66 to 2	275	-849	856	832	-854	5R/5R	2.75	
PM24	483151	6230002	23-May-24	1.22	66 to 2	260	498	-487	504	-523	5R/5R	2.75	

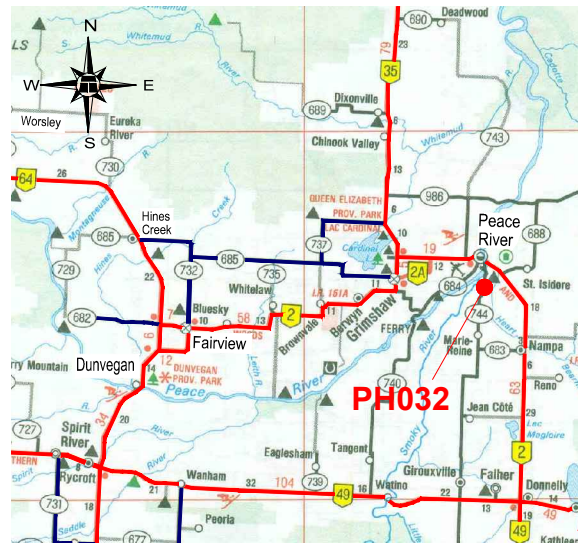
PN#	GPS Location (NAD83)		Date	Reading (kPa)	Identification Number
	Easting (m)	Northing (m)			
PN13-32-1S	483205	6229901	23-May-24	23.6	35485
PN13-32-1D	483205	6229901	23-May-24	4.6	35497

VIBRATING WIRE LOAD CELL (VC) READINGS

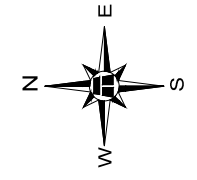
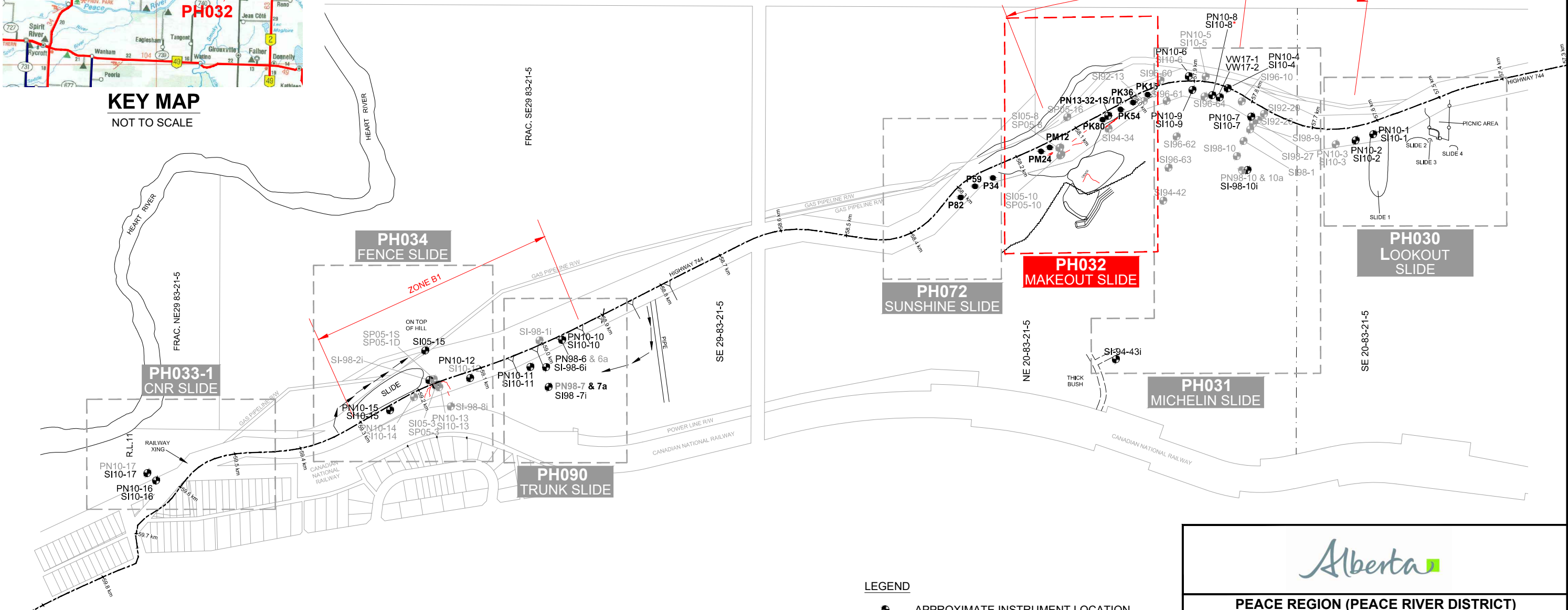
VC #	GPS Location (UTM 11)		Datalogger Serial #	Date	Comment
	Easting (m)	Northing (m)			
VC1850			RST 2034	23-May-24	Downloaded
VC1853					Downloaded
VC1855					Downloaded
VC1856					Downloaded
VC1857					Downloaded
VC1858					Downloaded
VC1859					Downloaded
VC1860					Downloaded
VC1861					Downloaded
VC1862					Downloaded
VC1848			RST 2036		Downloaded
VC1849					Downloaded
VC1851					Downloaded
VC1852					Downloaded
VC1854					Downloaded

INSPECTOR REPORT

PN 13-32-1S Reading takes a long time to stabilize



KEY MAP
NOT TO SCALE



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



PEACE REGION (PEACE RIVER DISTRICT)

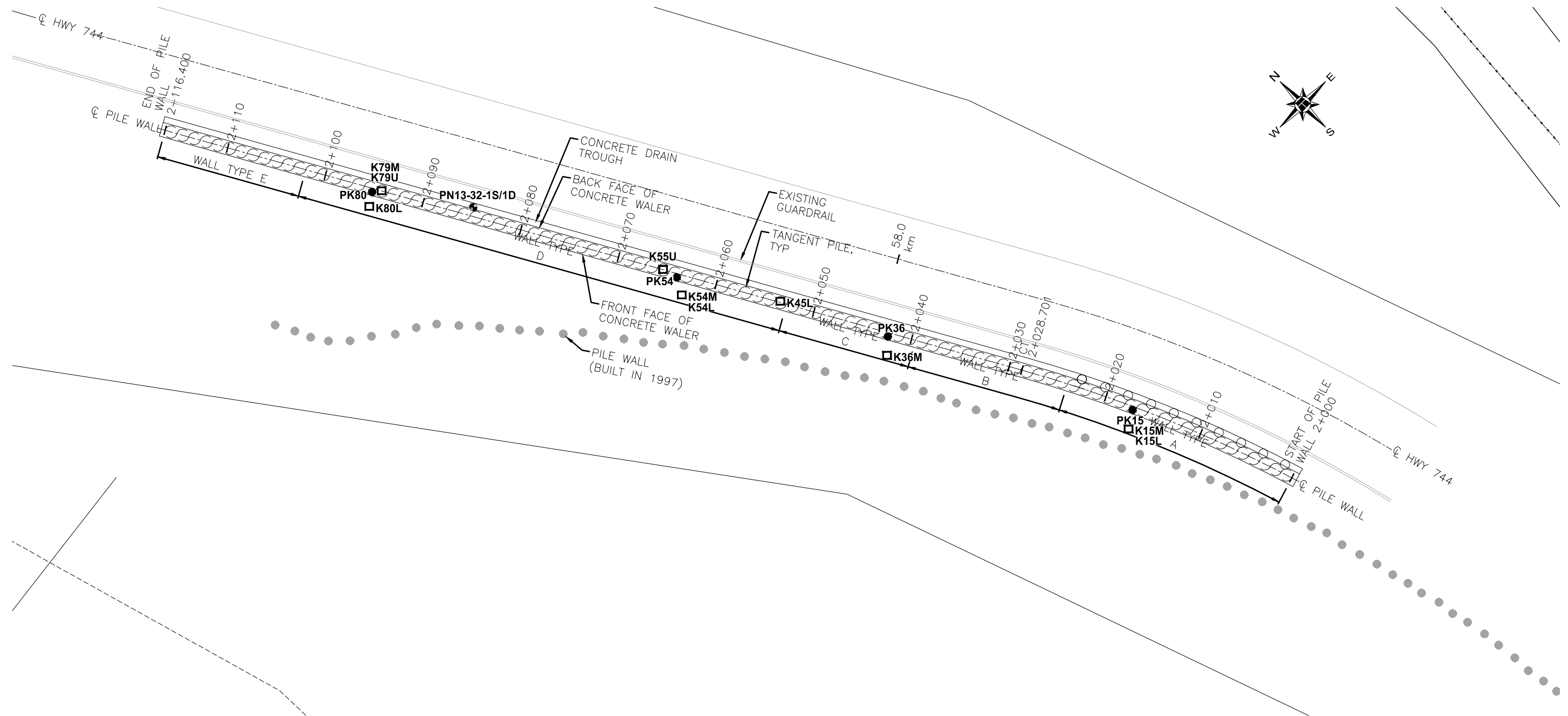
**PH032: HWY 744:04 - JUDAH HILL
(MAKEOUT SLIDE)
INSTRUMENT LOCATIONS**

DWG No. 32121-PH032-1

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	DWP
SCALE	APPROX. 1:6000
DATE	SEPTEMBER 2021
FILE No.	32121



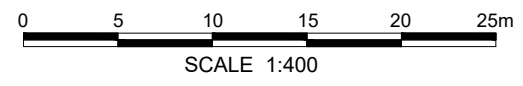
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LEGEND

- APPROXIMATE PILE LOCATION (2016)
- ⊙ APPROX. PNEUMATIC PIEZOMETER LOCATION
- APPROX. LOAD CELL LOCATION
- APPROXIMATE PILE LOCATION (1997)

PILE NO.	NORTHING (m)	EASTING (m)
PK15	6229841.349	483237.014
PK36	6229863.530	483225.073
PK54	6229882.353	483214.478
PK80	6229909.542	483199.175






PEACE REGION (PEACE RIVER DISTRICT)

PH032: HWY 744: 04 - JUDAH HILL (MAKEOUT SLIDE)
km 58 PILE WALL
INSTRUMENT LOCATIONS

DWG No. 32121-PH032-2

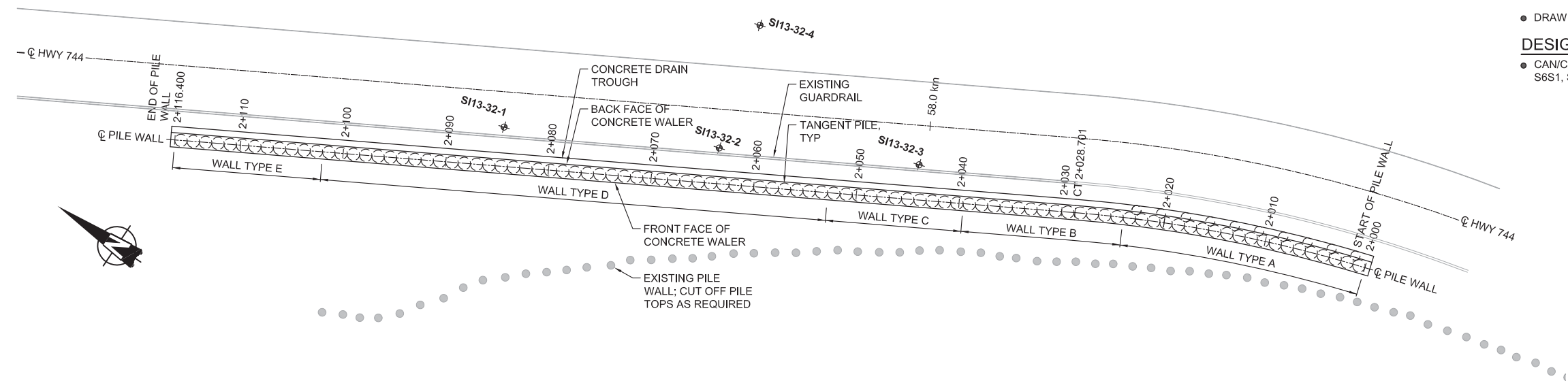
DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	DWP
SCALE	1:400
DATE	SEPTEMBER 2021
FILE No.	32121



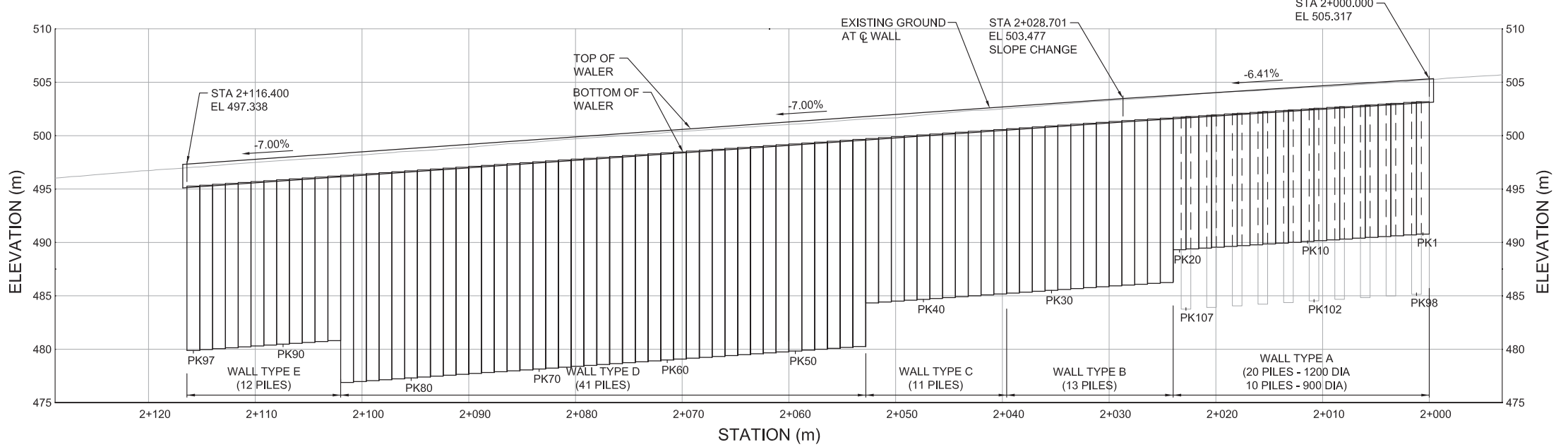
THURBER ENGINEERING LTD.

PLAN DESCRIPTION KM 58 LANDSLIDE PILE RETAINING WALL GENERAL LAYOUT		BAR CODE		RD-19071-C		15153		PH72	
CONTRACT No.		SITE No.		CONTRACT No.		SITE No.		CONTRACT No.	
PHOTO No.		TITLE SEARCH DATE		GRAPHICS FILE		DATE		BY	
MAR 2014		MAR 2014		DEC 2016		DATE		BY	
SLB		NSR		MT/SLB		DATE		BY	
SURVEYED		DESIGNED		CHECKED		DRAWN		DATE	
2016-12-16		2016-12-16		2016-12-16		2016-12-16		2016-12-16	
REVISION		RECORD DRAWING		REVISION		RECORD DRAWING		REVISION	
15153		PH72		RD-19071-C		15153		PH72	

- GENERAL NOTES**
- ALL DIMENSIONS SHOWN ON THE PILE WALL GENERAL LAYOUT ARE GIVEN IN METRES. ALL OTHER PILE WALL DRAWINGS ARE DIMENSIONED IN MILLIMETRES EXCEPT FOR STATIONS AND ELEVATIONS WHICH ARE GIVEN IN METRES.
 - DRAWING SCALES ARE BASED ON PLOTTING FULL SIZE (22"x34")
- DESIGN**
- CAN/CSA S6-06 CANADIAN HIGHWAY BRIDGE DESIGN CODE + SUPPLEMENTS S6S1, S6S2, AND S6S3



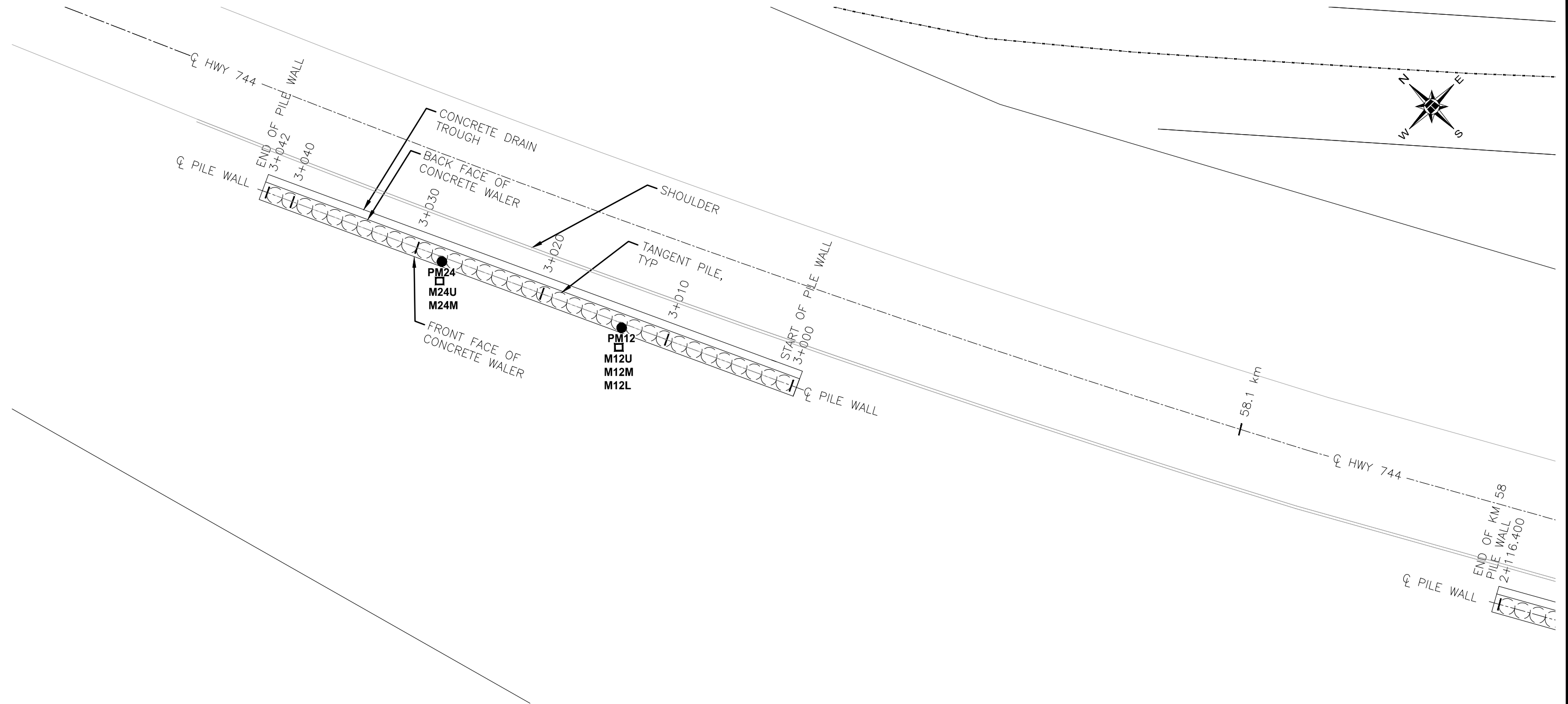
SITE PLAN
1:250



ELEVATION - PILE WALL
SHOWN ALONG PILE WALL CENTRELINE 1:250

THIS RECORD DRAWING INDICATES THAT THE CONSTRUCTED PROJECT SUBSTANTIALLY COMPLIES WITH THE DESIGN DRAWINGS AND ALL APPROPRIATE CONTRACT PLANS AND SPECIFICATIONS.

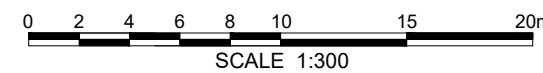
CONSULTANT JOB No. 15-16-288 PLAN No. RD-19071-C THURBER ENGINEERING LTD. DIALOG		PERMIT TO PRACTICE PERMIT TO PRACTICE DIALOG ALBERTA ARCHITECTURE ENGINEERING INTERIOR DESIGN PLANNING INC. ORIGINAL SIGNED AND STAMPED By: N. S. ROBSON On: DEC 16, 2016 PERMIT NUMBER: P 10020 The Association of Professional Engineers, Geologists and Geophysicists of Alberta	DESIGNER ORIGINAL DOCUMENT STAMPED AND SIGNED BY: S. L. BROWN ON: MAR 7, 2014	FIELD REVIEW ENGINEER ORIGINAL DOCUMENT STAMPED AND SIGNED BY: S. L. BROWN ON: DEC 16, 2016	<p align="center">KM 58 LANDSLIDE PILE RETAINING WALL GENERAL LAYOUT</p> <table border="1"> <tr> <td>REGION</td> <td>SITE No.</td> <td>PLAN No.</td> <td>PROJECT</td> <td>CONTRACT No.</td> <td>SHEET</td> </tr> <tr> <td>PEACE</td> <td>PH72</td> <td>RD-19071-C</td> <td>744:04</td> <td>15153</td> <td>38 of 48</td> </tr> </table>		REGION	SITE No.	PLAN No.	PROJECT	CONTRACT No.	SHEET	PEACE	PH72	RD-19071-C	744:04	15153	38 of 48	
REGION	SITE No.	PLAN No.	PROJECT	CONTRACT No.	SHEET														
PEACE	PH72	RD-19071-C	744:04	15153	38 of 48														



LEGEND

- APPROXIMATE PILE LOCATION
- APPROX. LOAD CELL LOCATION

PILE NO.	NORTHING (m)	EASTING (m)
PM12	6229989.636	483157.061
PM24	6230002.710	483151.024



PEACE REGION (PEACE RIVER DISTRICT)

**PH032: HWY 744: 04 - JUDAH HILL (MAKEOUT SLIDE)
MAKEOUT PILE WALL
INSTRUMENT LOCATIONS**

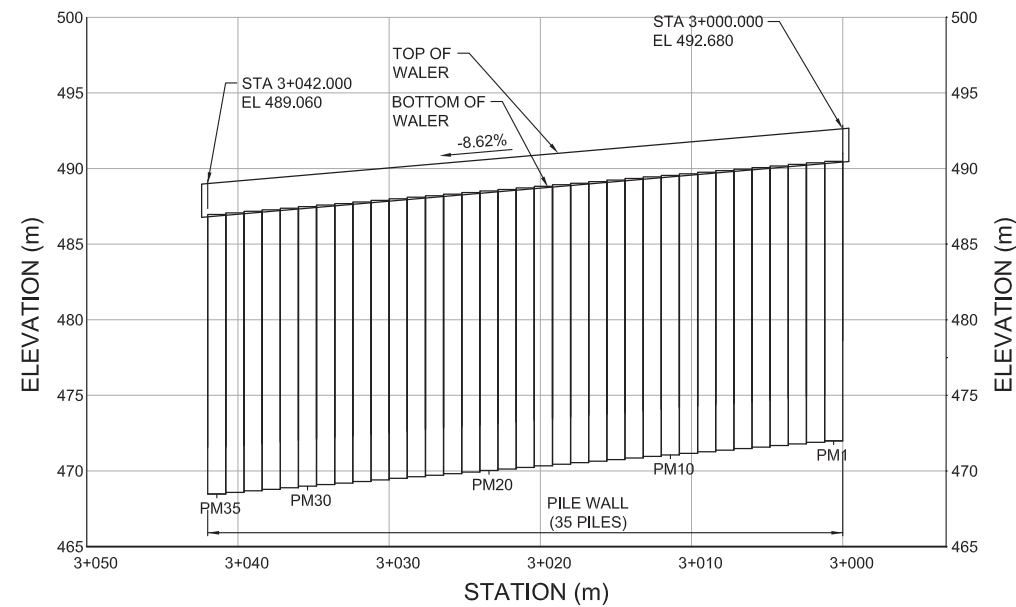
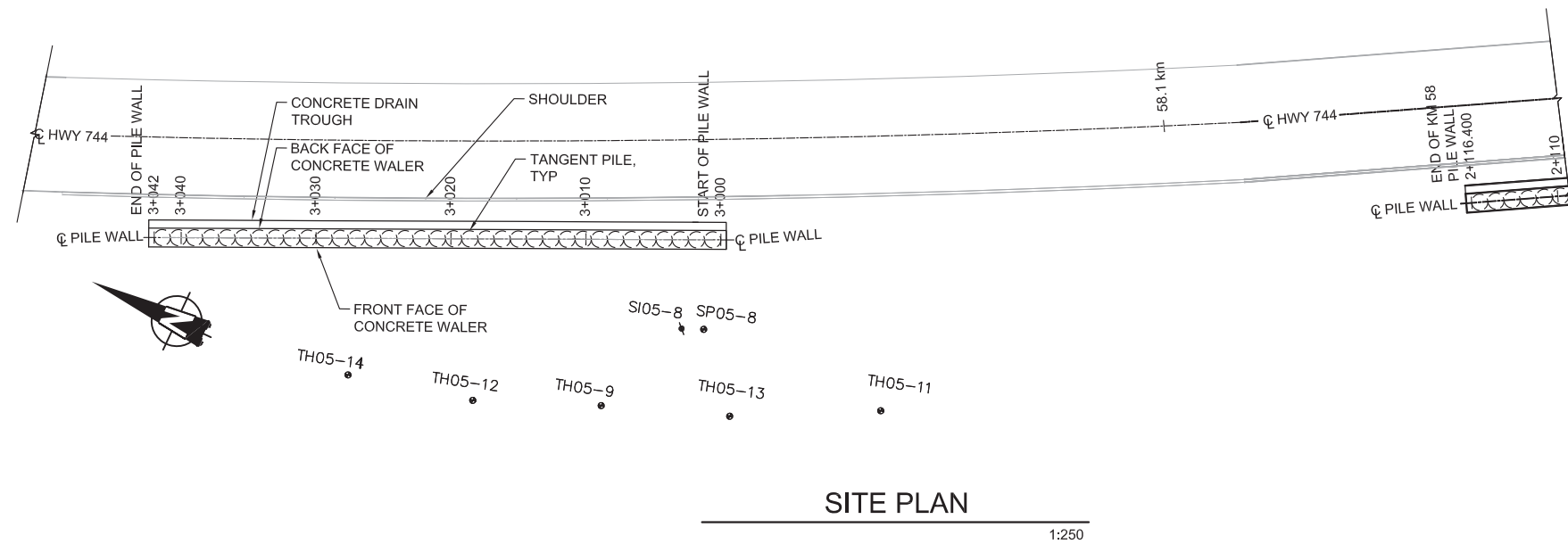
DWG No. 32121-PH032-3

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	DWP
SCALE	1:300
DATE	SEPTEMBER 2021
FILE No.	32121



THURBER ENGINEERING LTD.

PLAN DESCRIPTION MAKEOUT LANDSLIDE PILE RETAINING WALL GENERAL LAYOUT		BAR CODE		RD-19078-C		15153		PH72	
PLAN No.	CONTRACT No.	PHOTO No.	TITLE SEARCH DATE	GRAPHICS FILE	DATE	BY	DESIGNED	CHECKED	DRAWN
			MAR 2014	MAR 2014	MAR 2014	SLB	NSR	MT/SLB	
REVISION	RECORD DRAWING	DATE	BY	DESIGNED	CHECKED	DRAWN			
		2016-12-16	SLB						



ELEVATION - PILE WALL
SHOWN ALONG PILE WALL CENTRELINE 1:250

THIS RECORD DRAWING INDICATES THAT THE CONSTRUCTED PROJECT SUBSTANTIALLY COMPLIES WITH THE DESIGN DRAWINGS AND ALL APPROPRIATE CONTRACT PLANS AND SPECIFICATIONS.

GENERAL NOTES

- ALL DIMENSIONS SHOWN ON THE PILE WALL GENERAL LAYOUT ARE GIVEN IN METRES. ALL OTHER PILE WALL DRAWINGS ARE DIMENSIONED IN MILLIMETRES EXCEPT FOR STATIONS AND ELEVATIONS WHICH ARE GIVEN IN METRES.
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- DESIGN**
- CAN/CSA S6-06 CANADIAN HIGHWAY BRIDGE DESIGN CODE + SUPPLEMENTS S6S1, S6S2, AND S6S3

ITEM	UNIT	TOT EST	AS CONST	
REINFORCING STEEL	PLAIN	kg	87 570	-
CONCRETE - CLASS C		m ³	100	-
CONCRETE - CLASS PILE		m ³	730	-
DRILLED CONCRETE PILES	DRILL RIG SET-UP	PILE	35	-
	PILE INSTALLATION	m	644	-
QUANTITY ESTIMATE				

CONSULTANT

JOB No. 15-16-288 PLAN No. RD-19078-C

PERMIT TO PRACTICE

PERMIT TO PRACTICE
DIALOG ALBERTA ARCHITECTURE ENGINEERING
INTERIOR DESIGN PLANNING INC.
ORIGINAL SIGNED AND STAMPED
By: N. S. ROBSON
On: DEC 16, 2016
PERMIT NUMBER: P 10020
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

DESIGNER

ORIGINAL DOCUMENT
STAMPED AND
SIGNED BY:
S. L. BROWN
ON: MAR 25, 2014

FIELD REVIEW ENGINEER

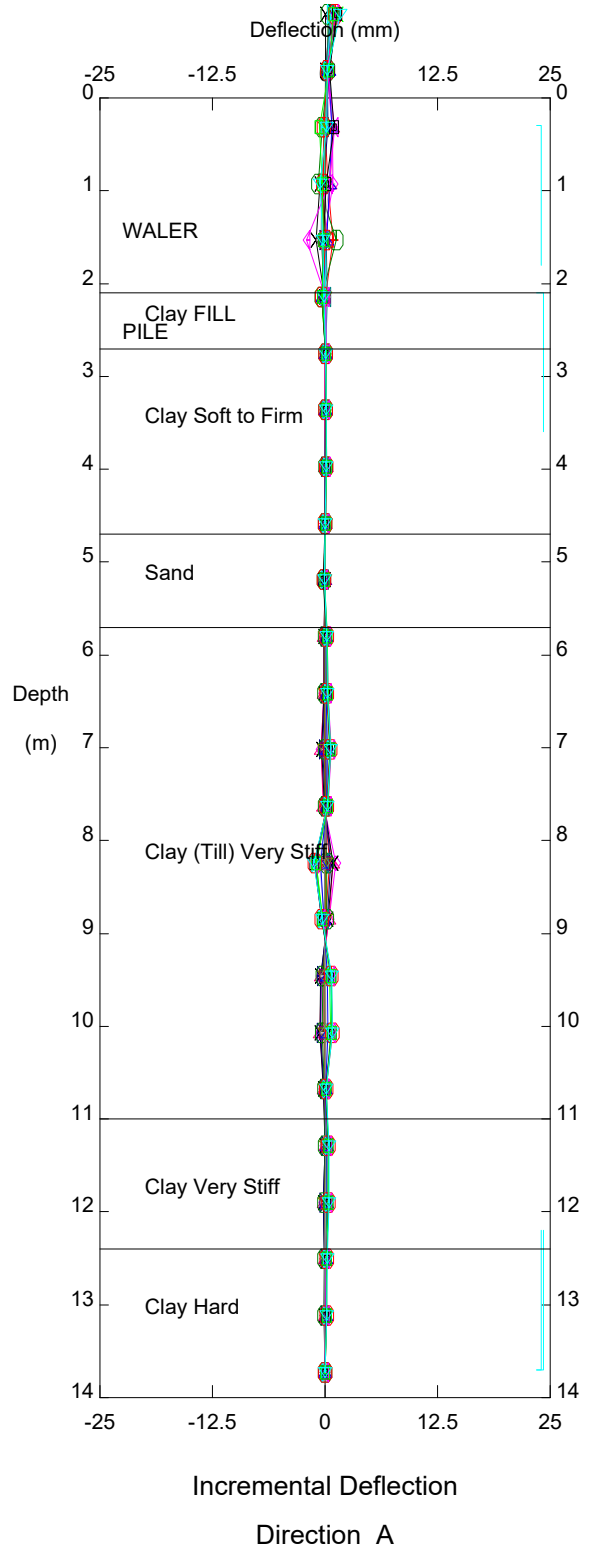
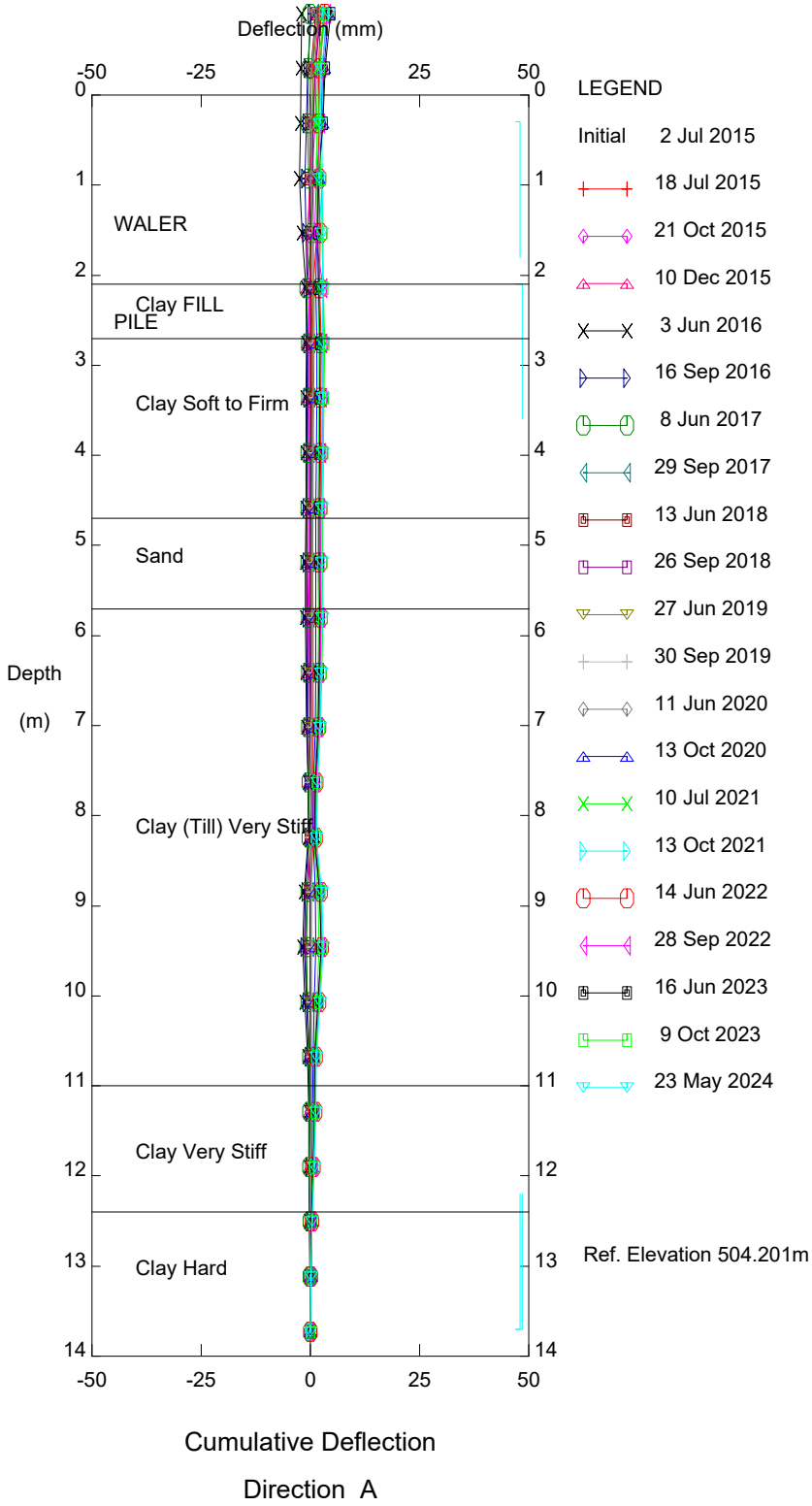
ORIGINAL DOCUMENT
STAMPED AND
SIGNED BY:
S. L. BROWN
ON: DEC 16, 2016

**MAKEOUT LANDSLIDE
PILE RETAINING WALL
GENERAL LAYOUT**

REGION	SITE No.	PLAN No.	PROJECT	CONTRACT No.	SHEET
PEACE	PH72	RD-19078-C	744204	15153	45 of 48

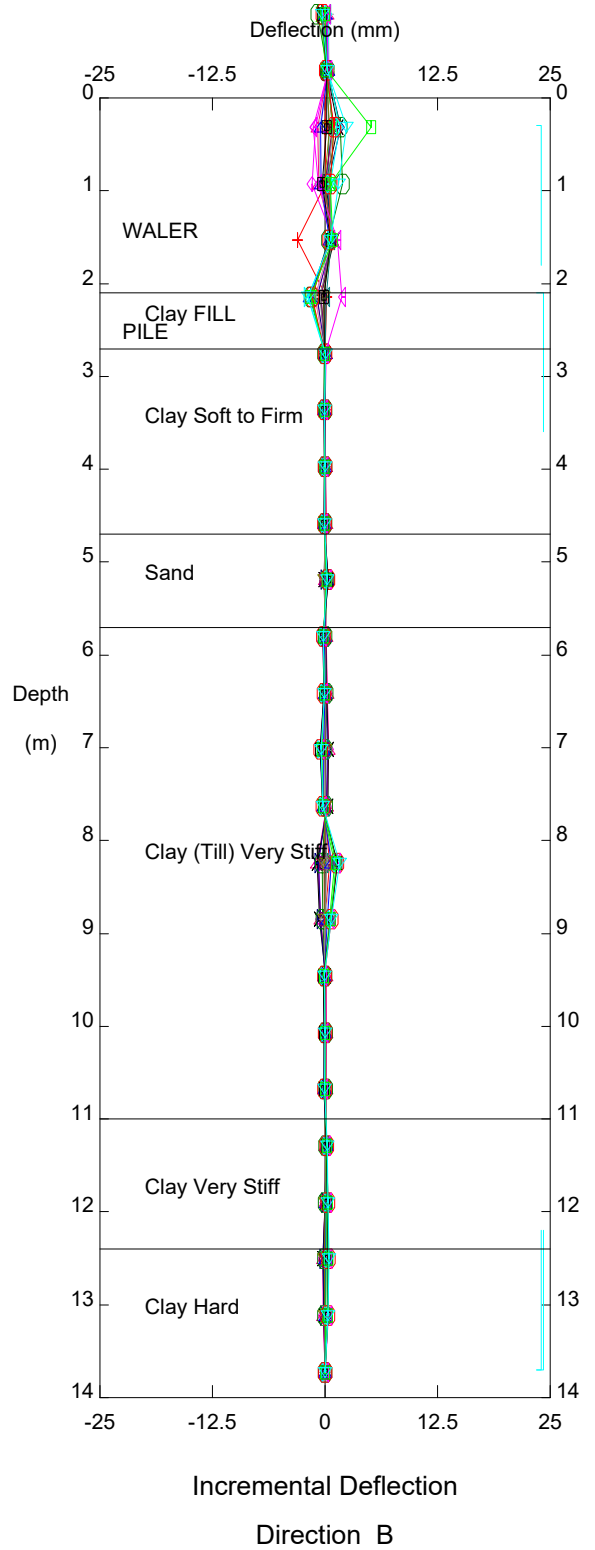
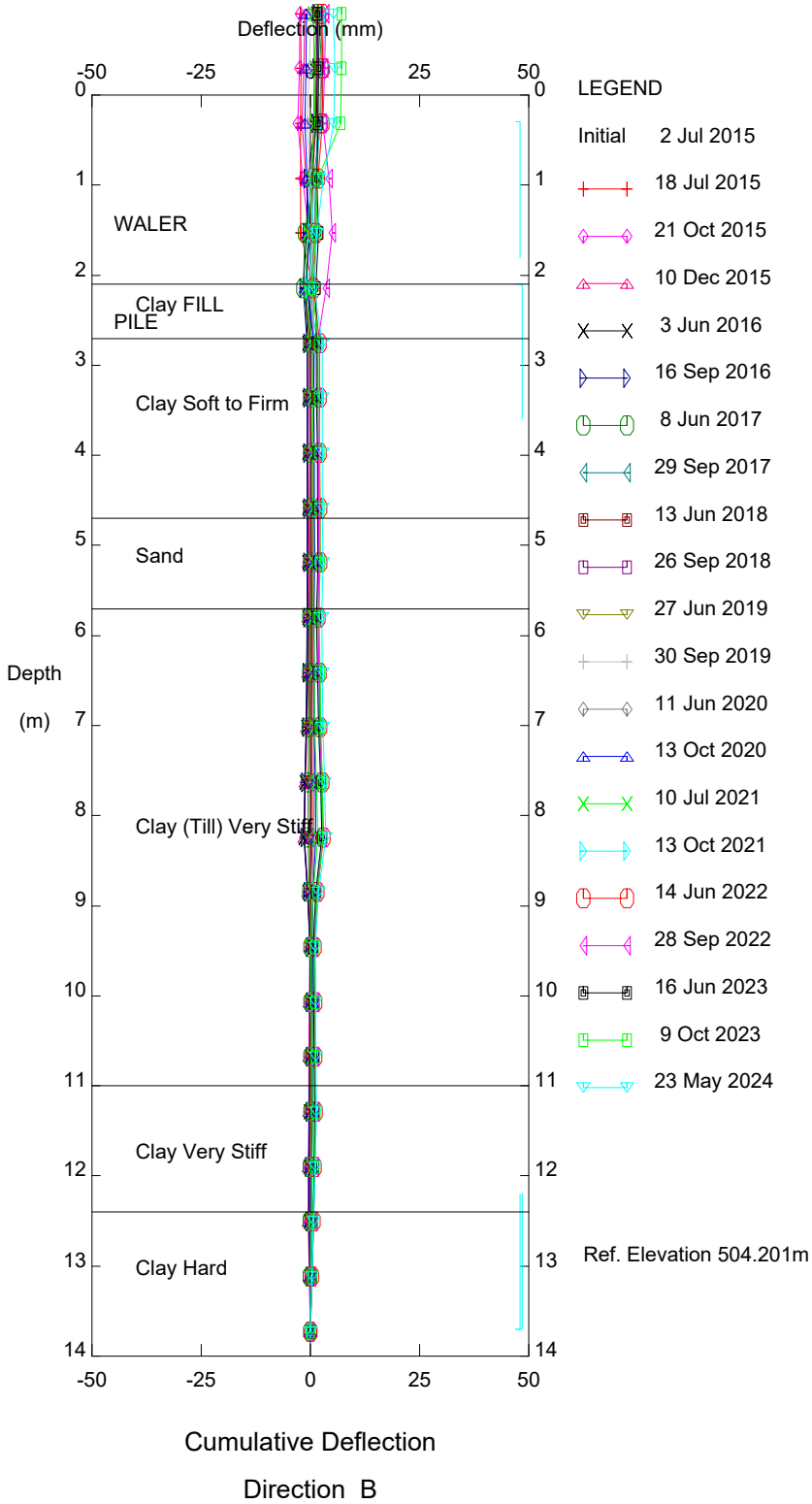
2.5 0 2.5 HORIZONTAL
2.5 0 2.5 VERTICAL

Thurber Engineering Ltd



PH032 KM 58 (Post Construction), Inclinator PK15

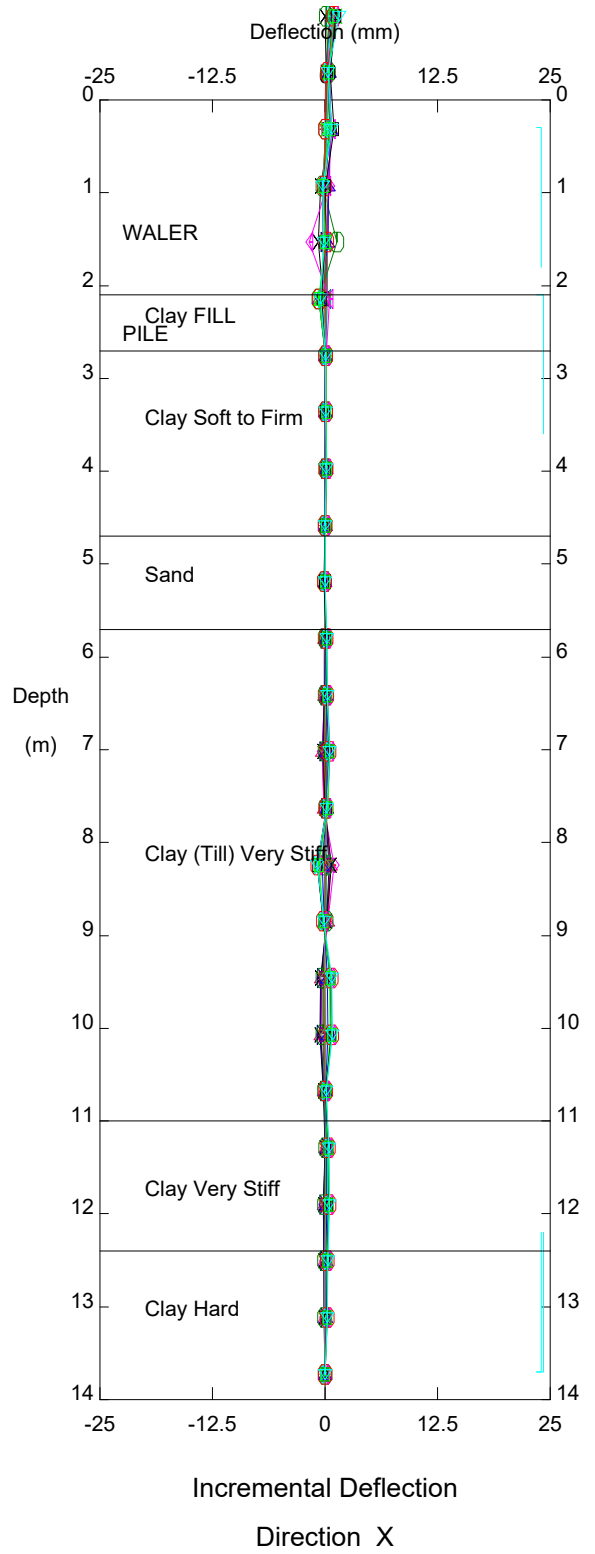
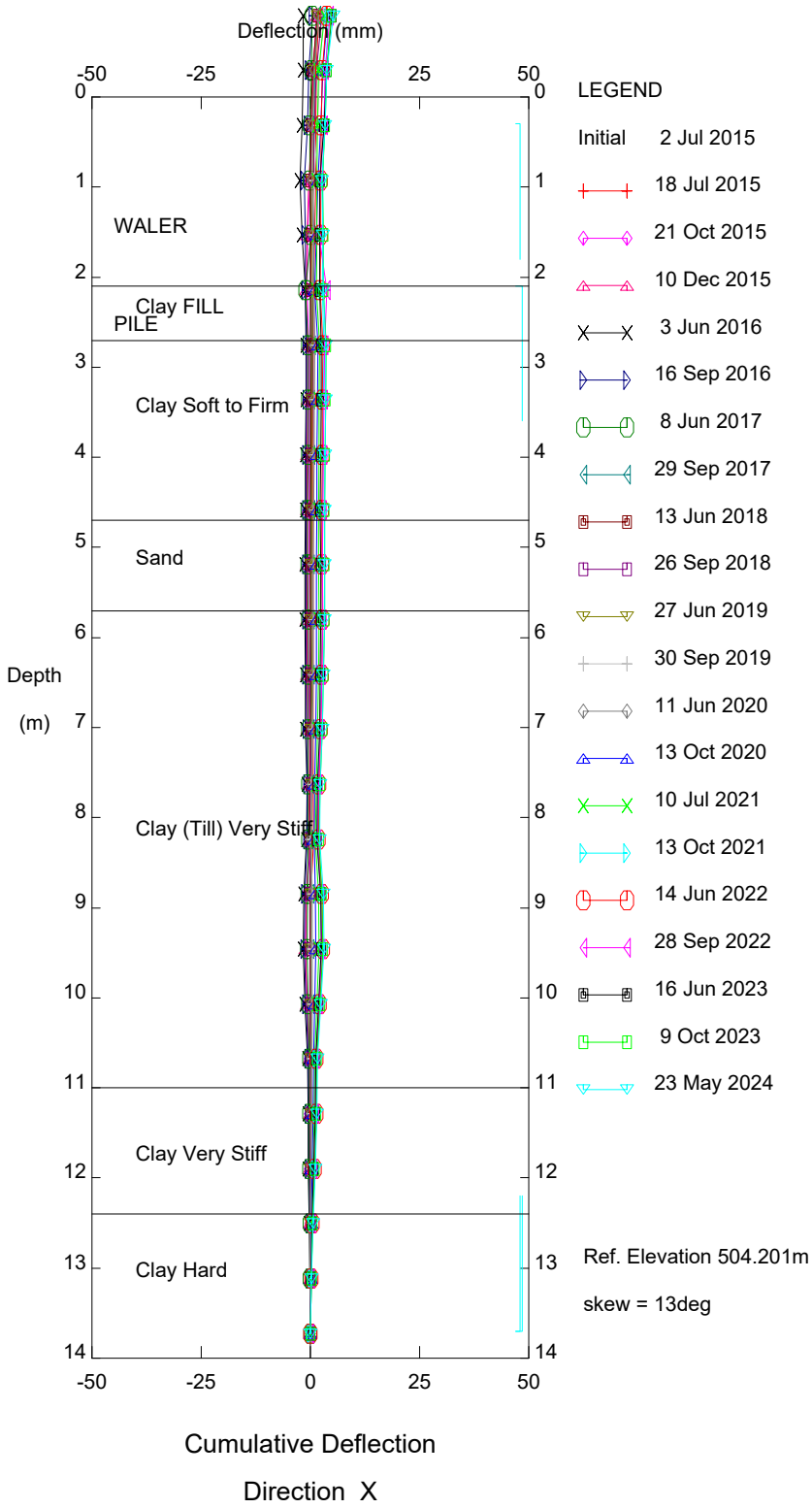
Alberta Transportation



PH032 KM 58 (Post Construction), Inclinator PK15

Alberta Transportation

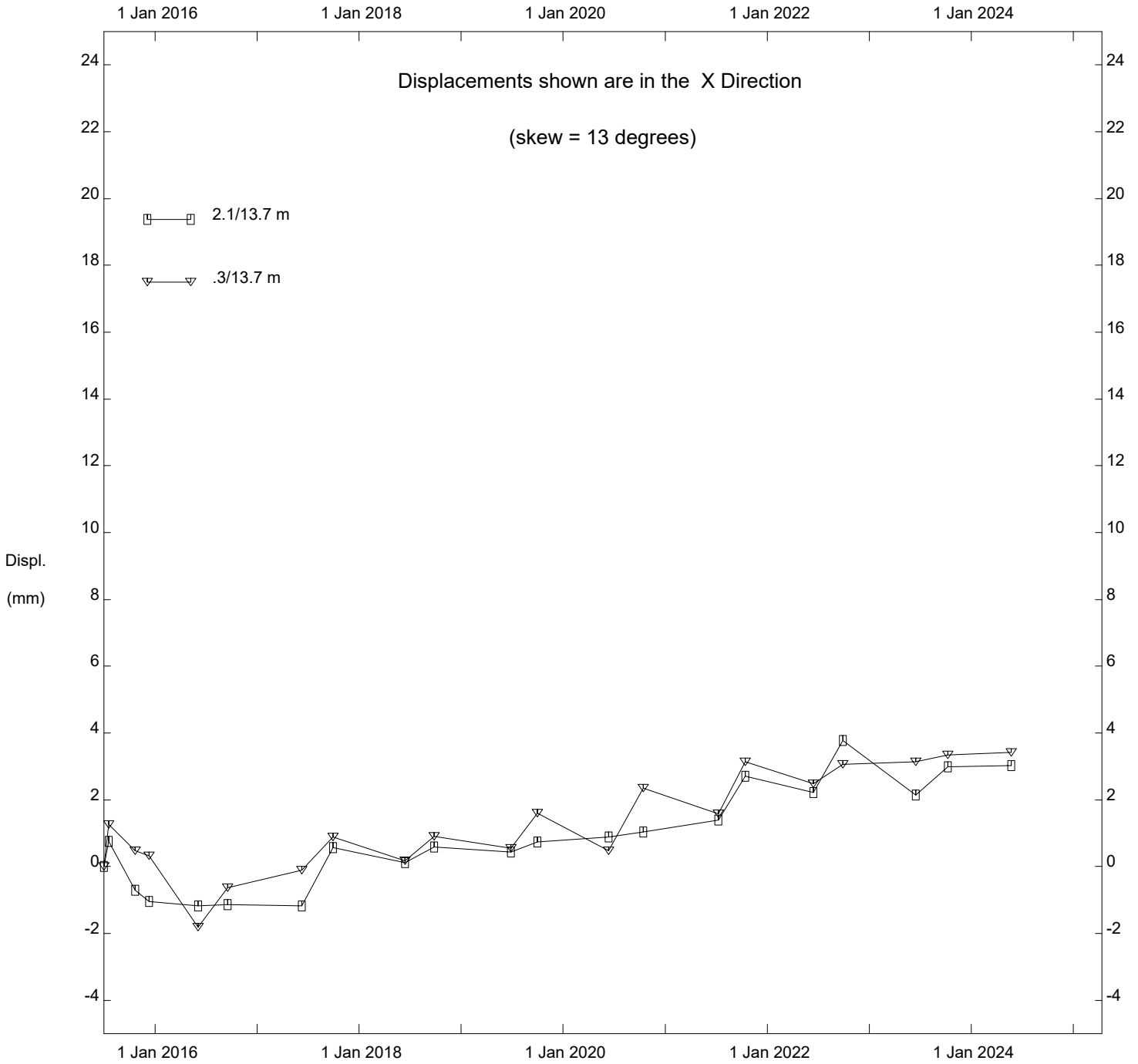
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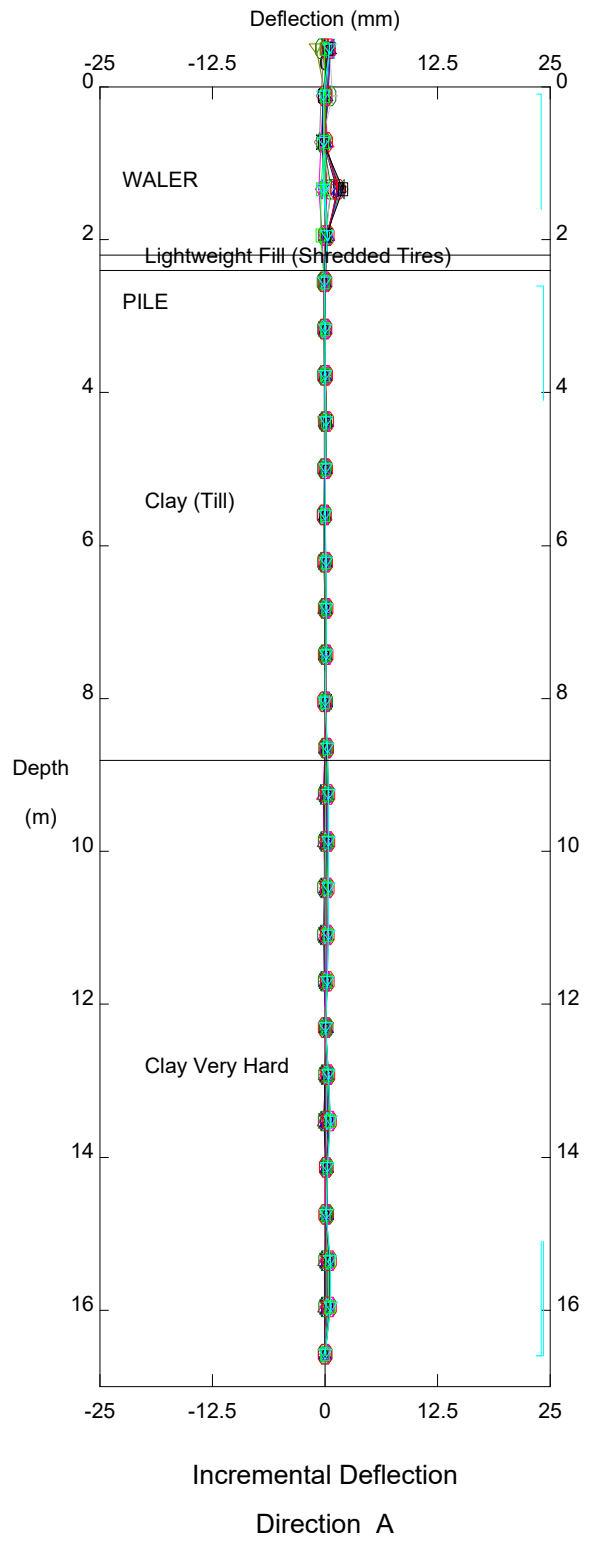
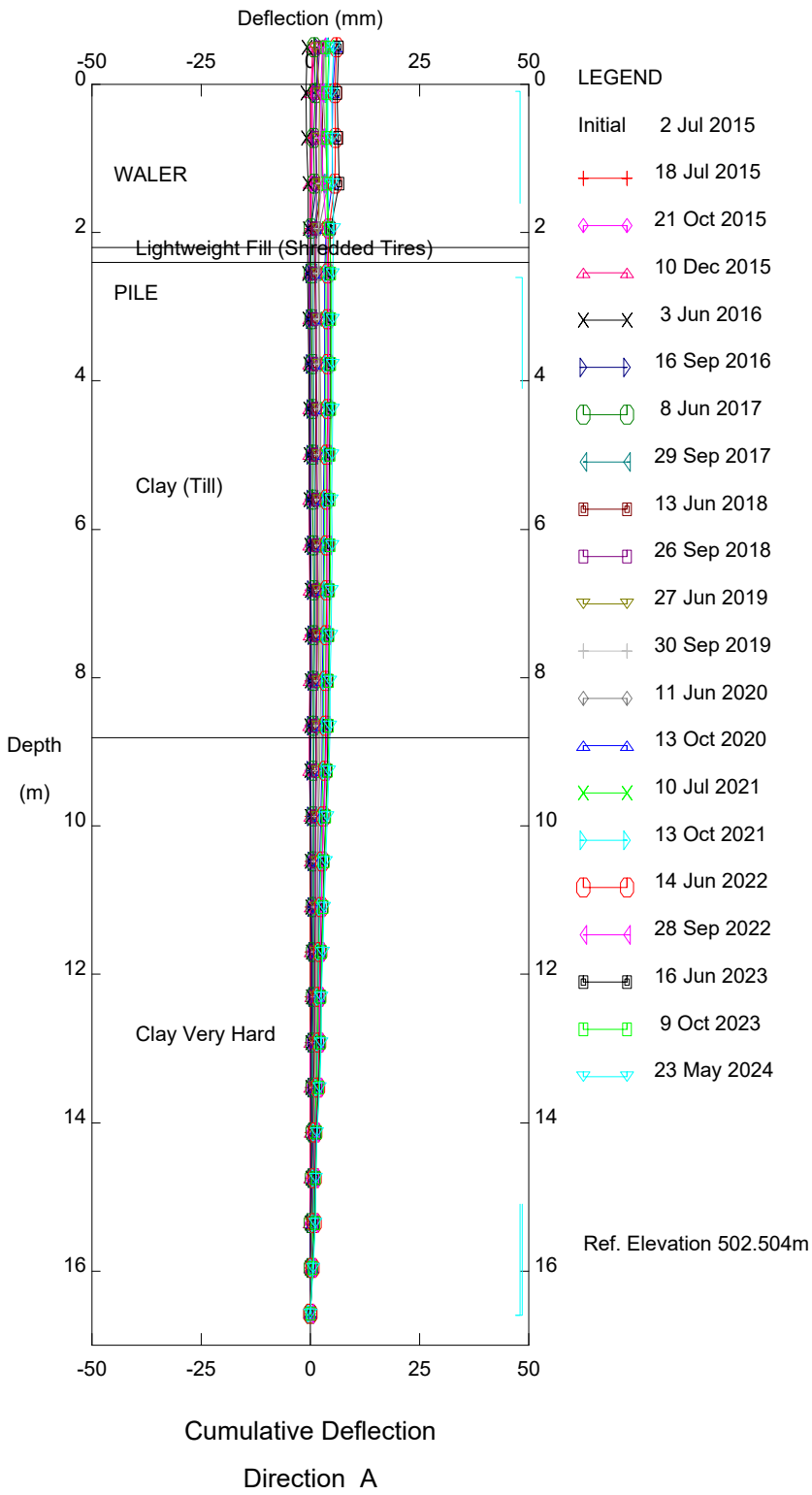
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Alberta Transportation

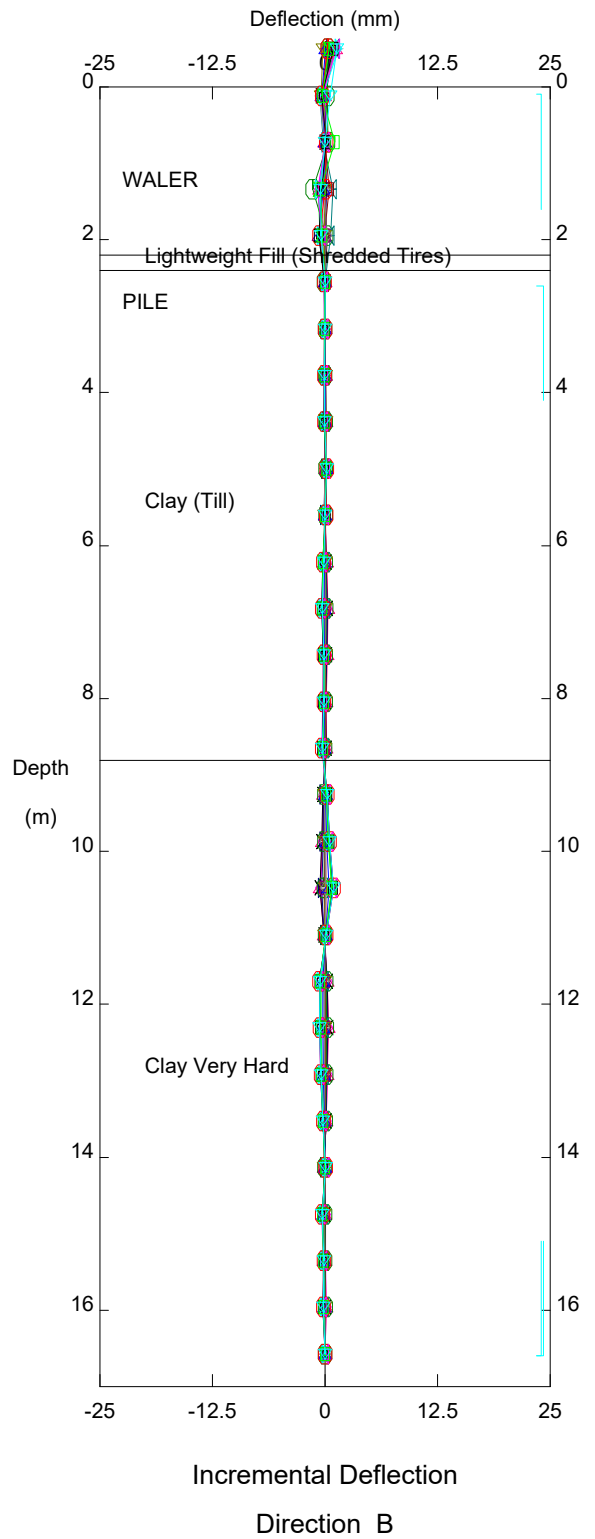
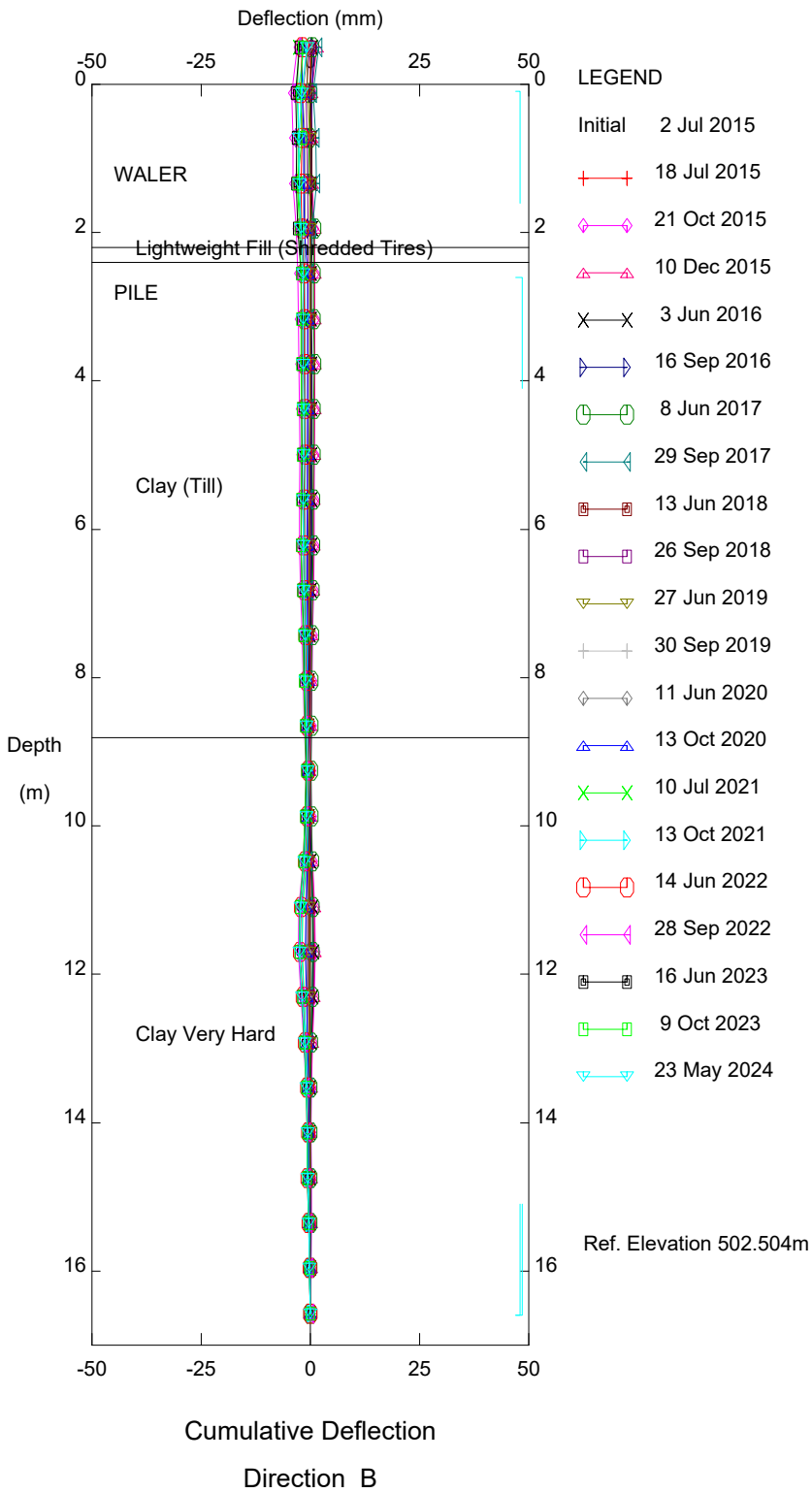
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Alberta Transportation

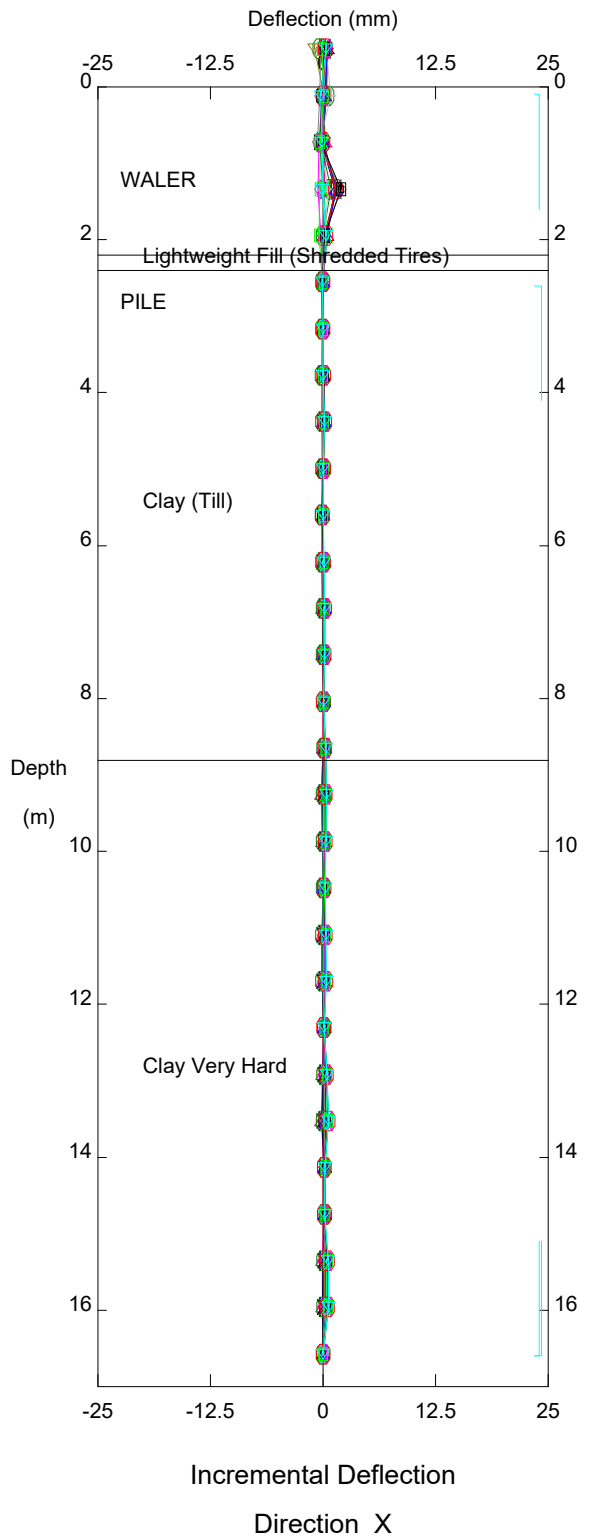
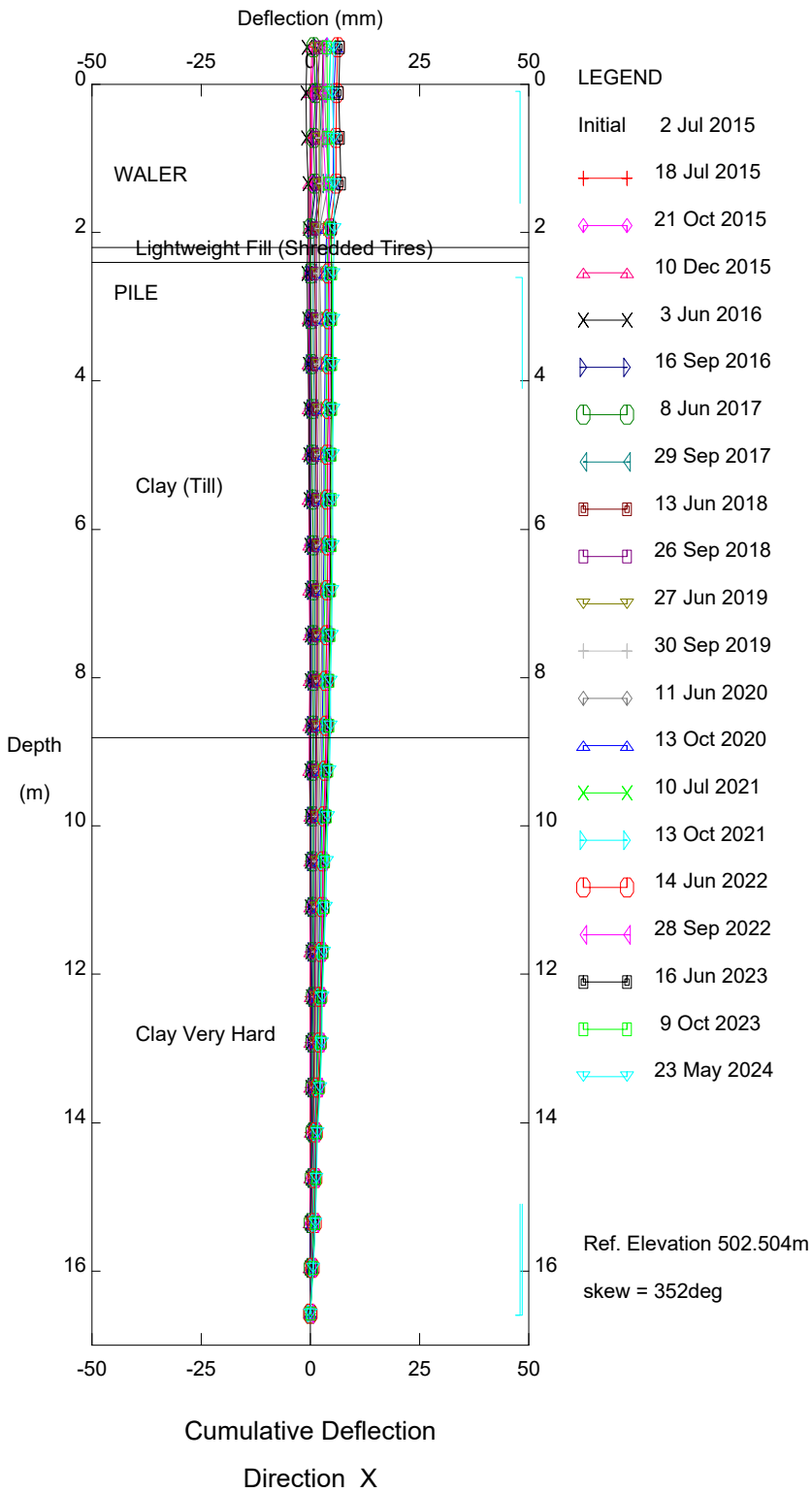
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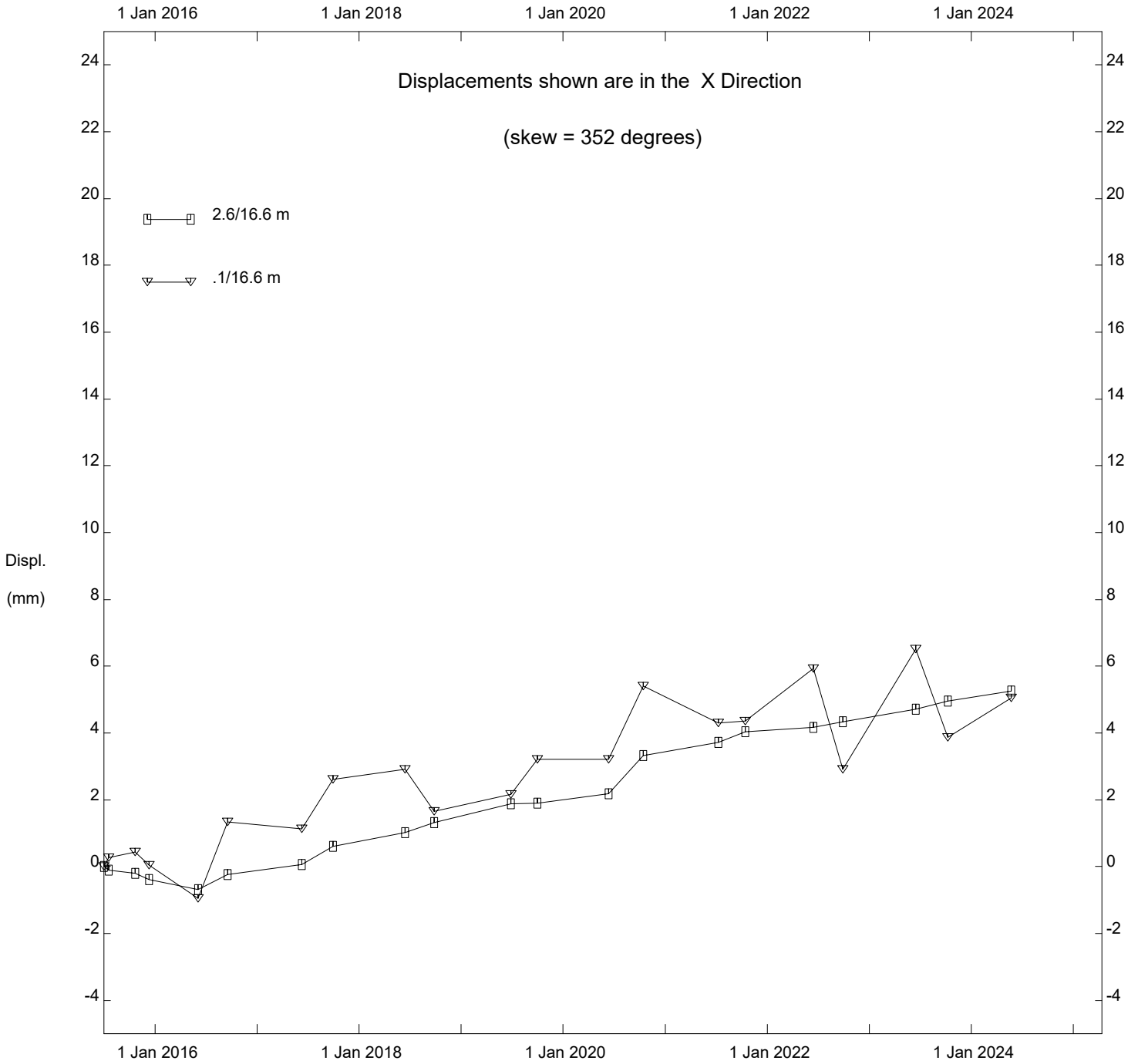
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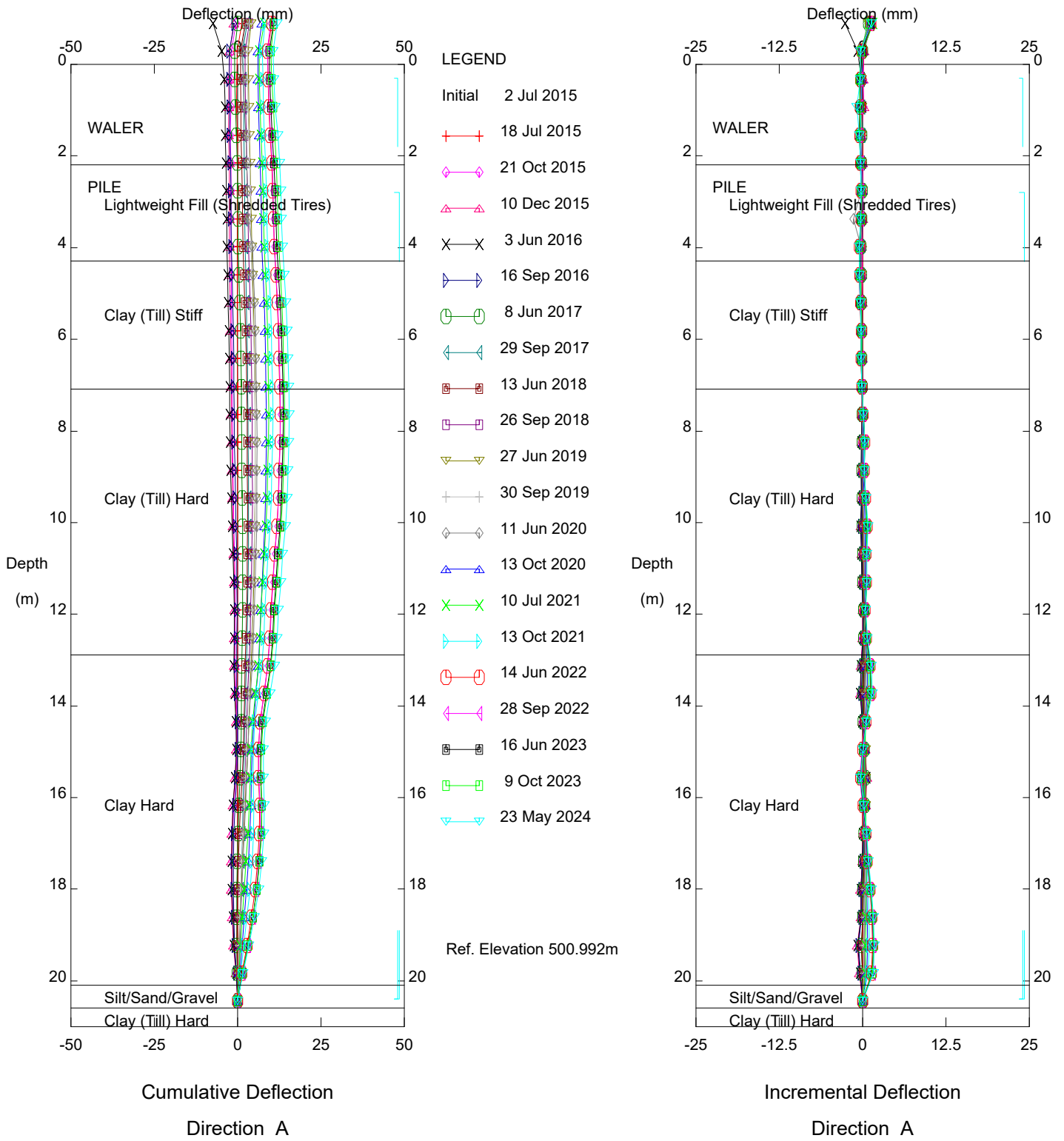
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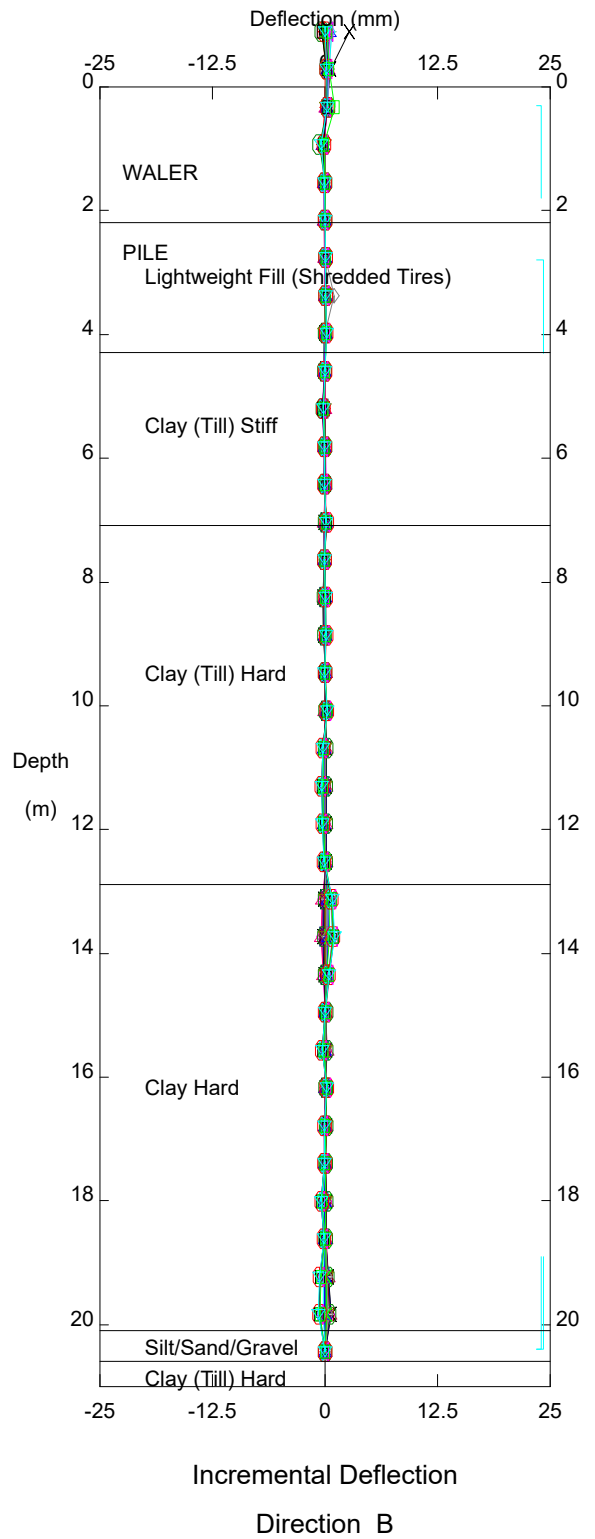
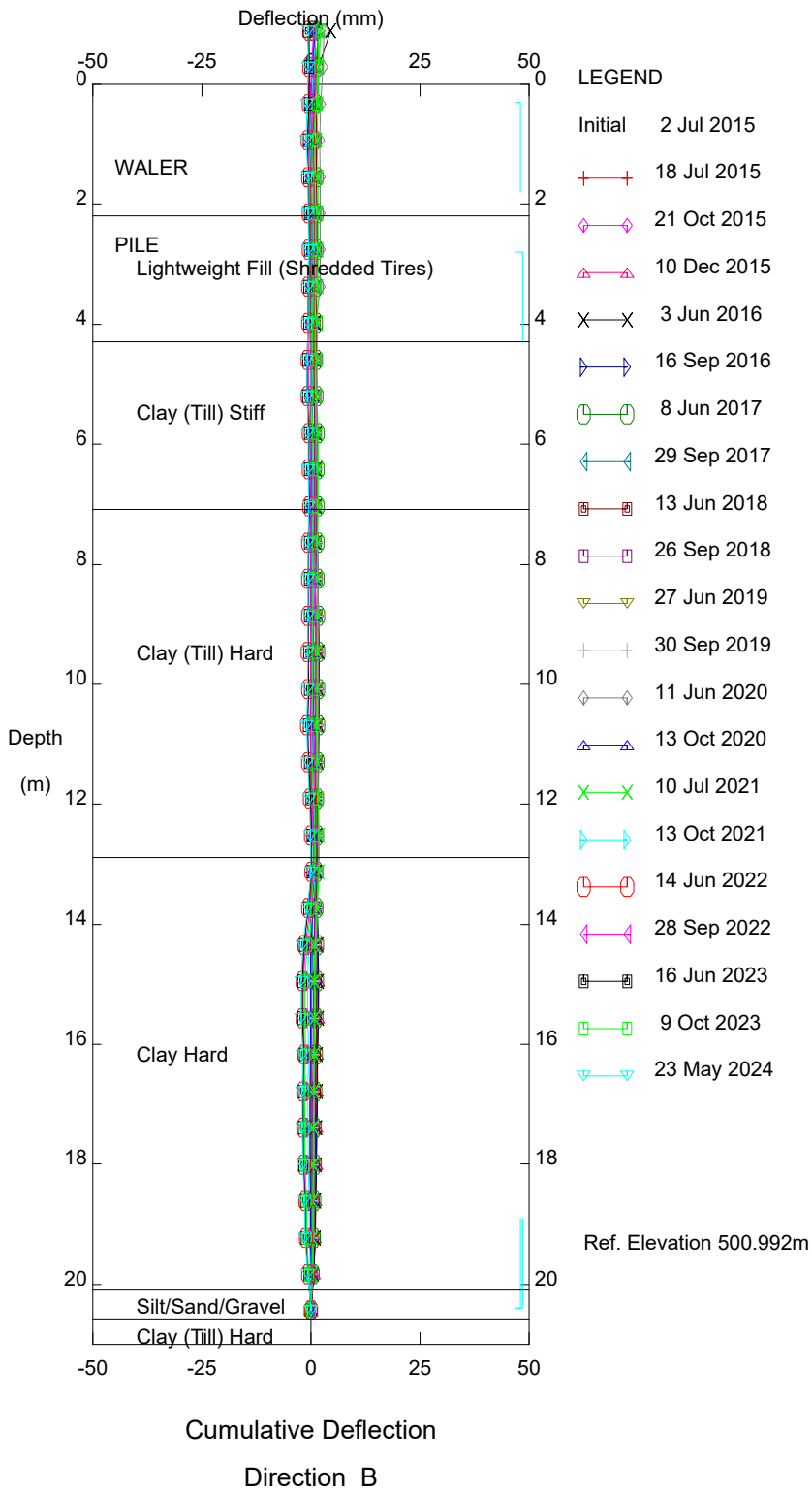
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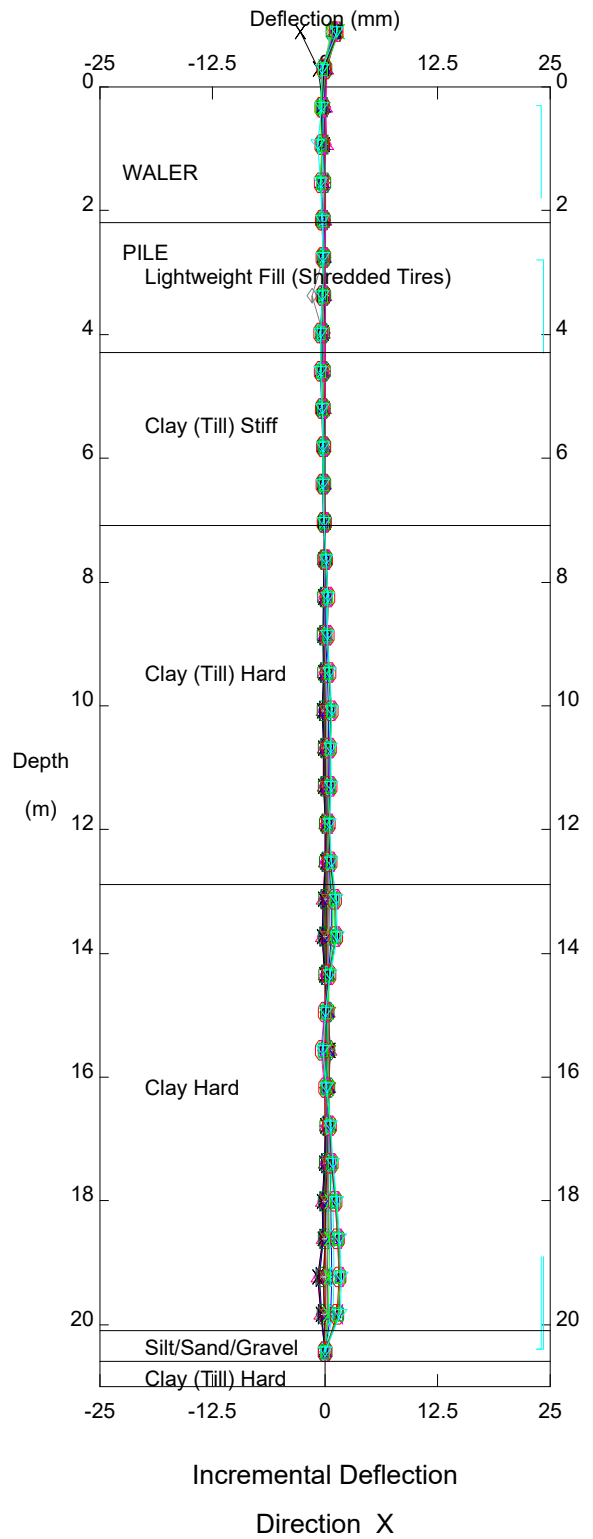
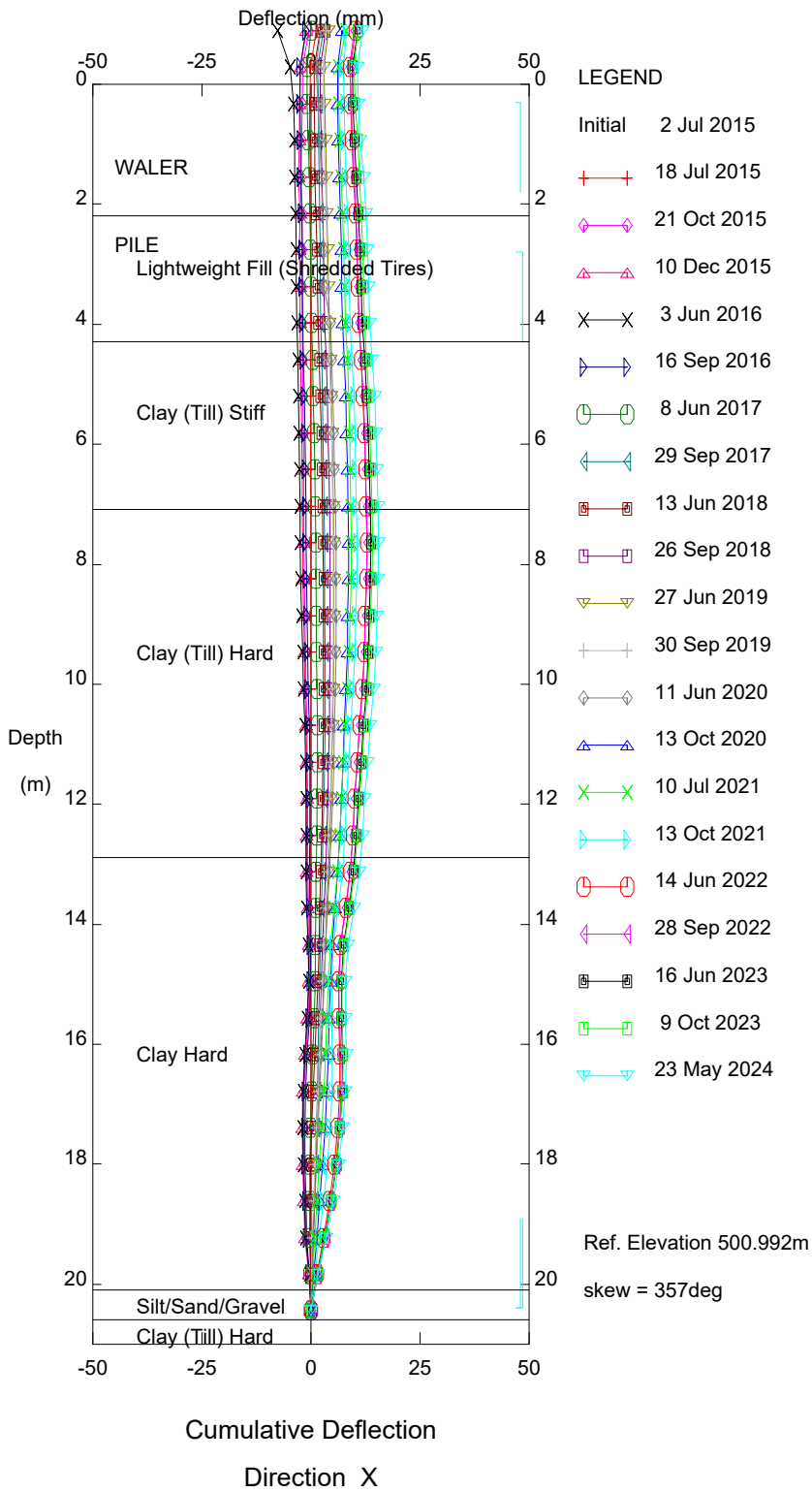
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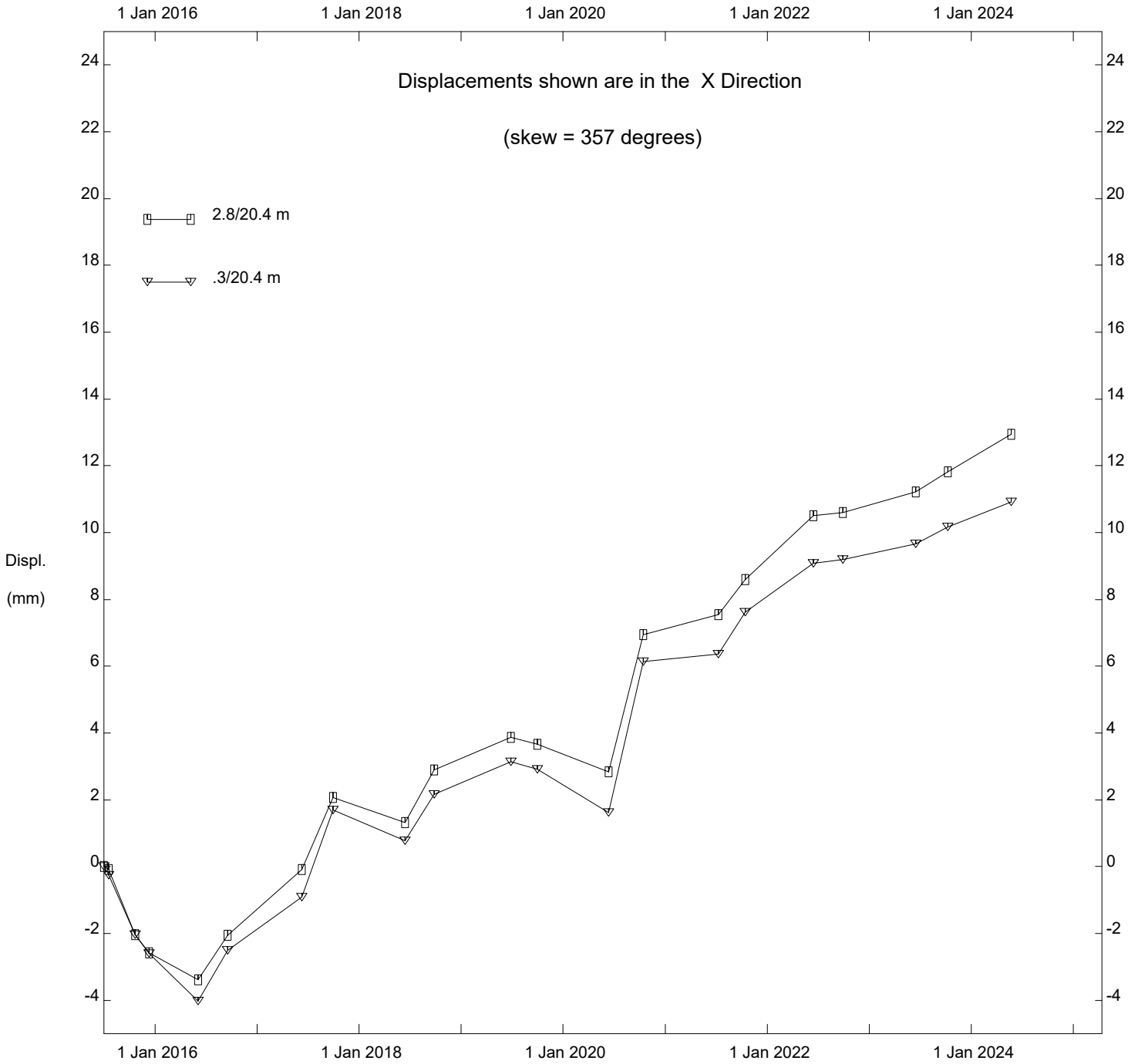
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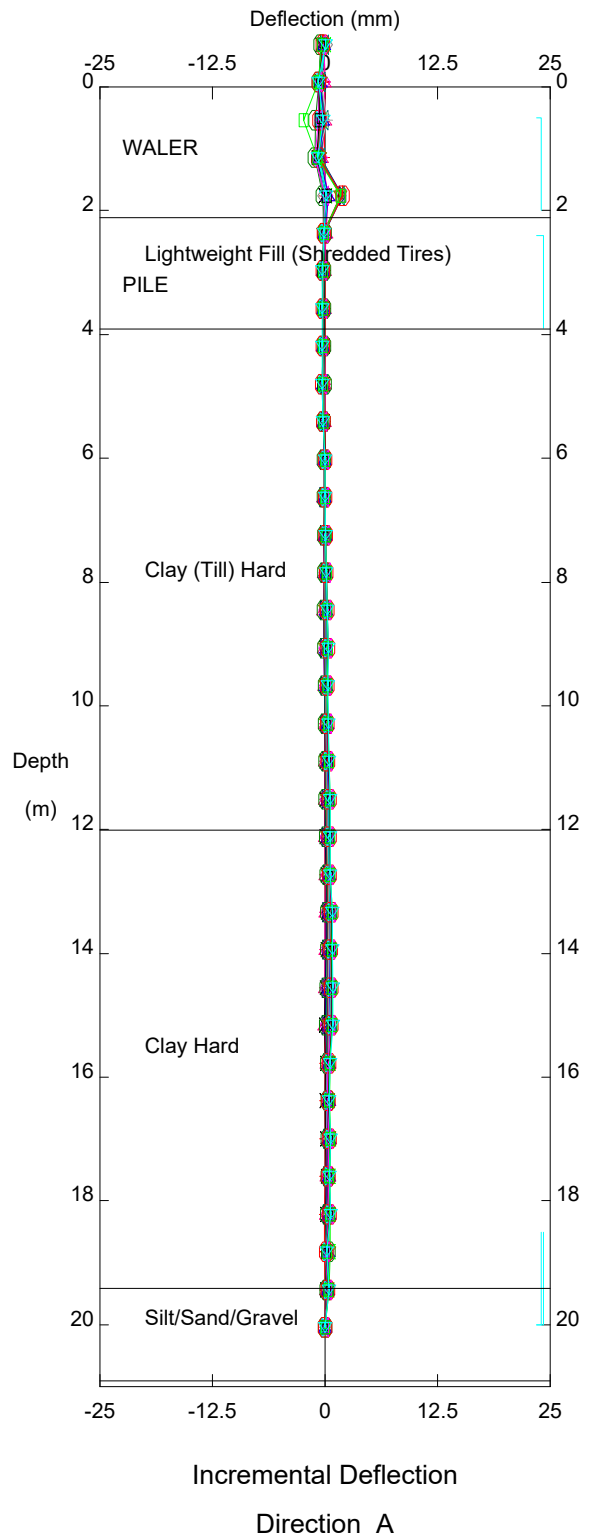
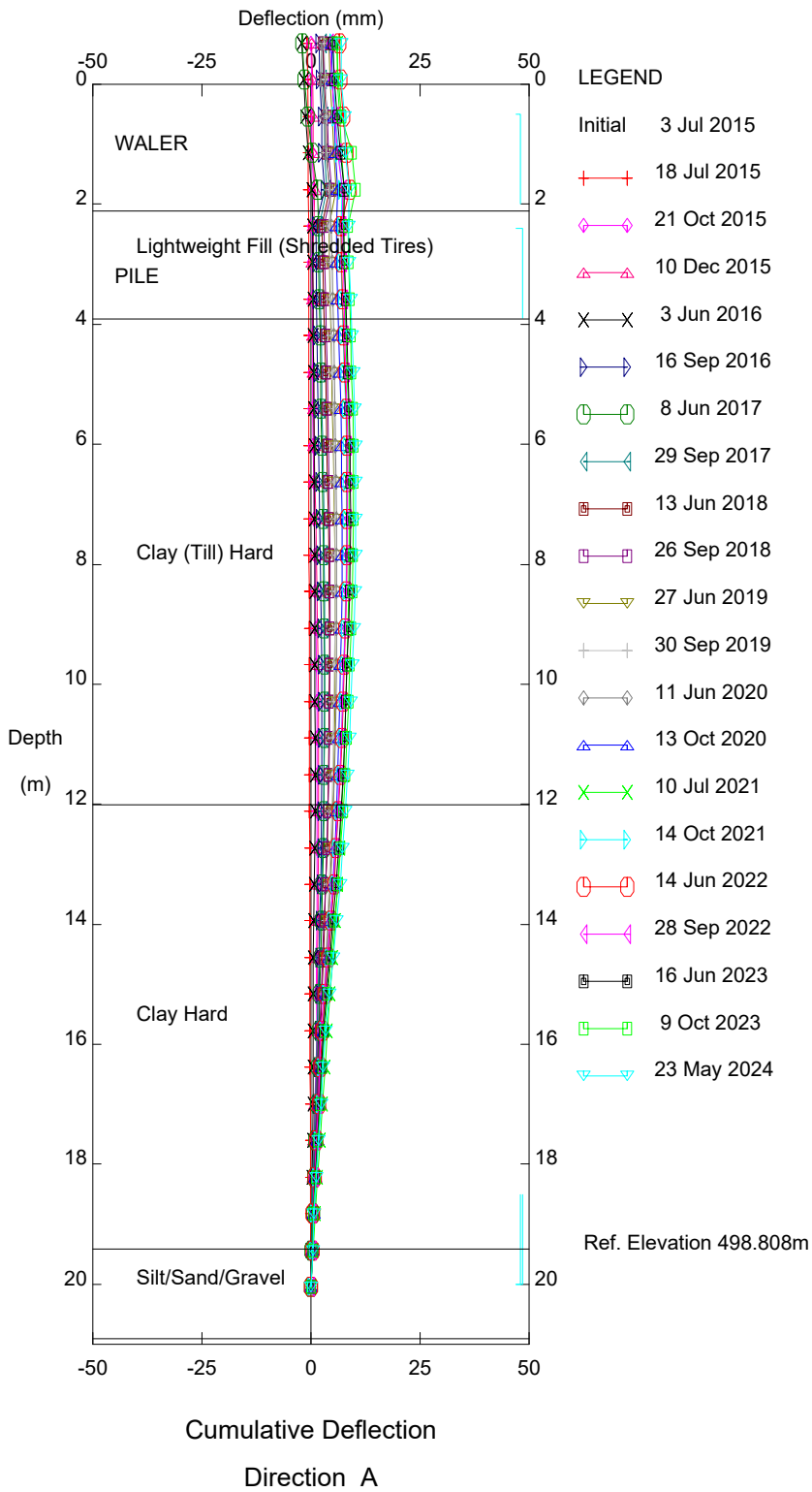
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Alberta Transportation

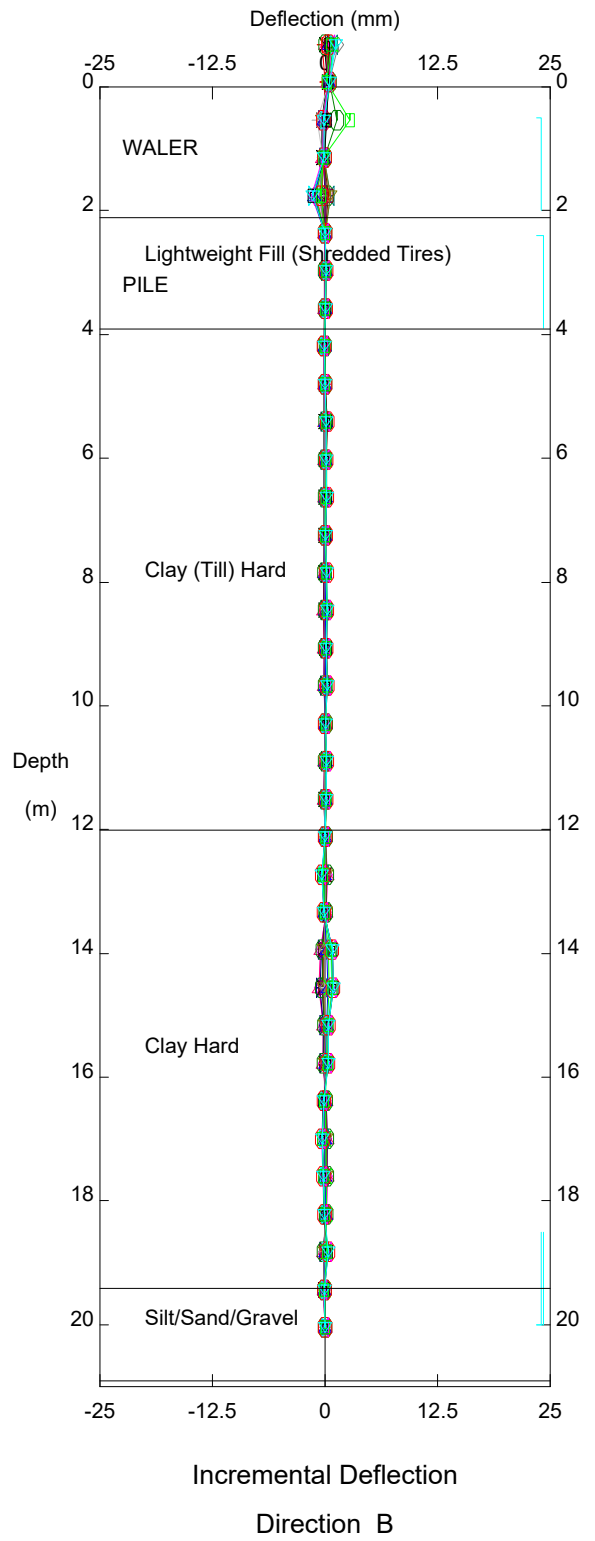
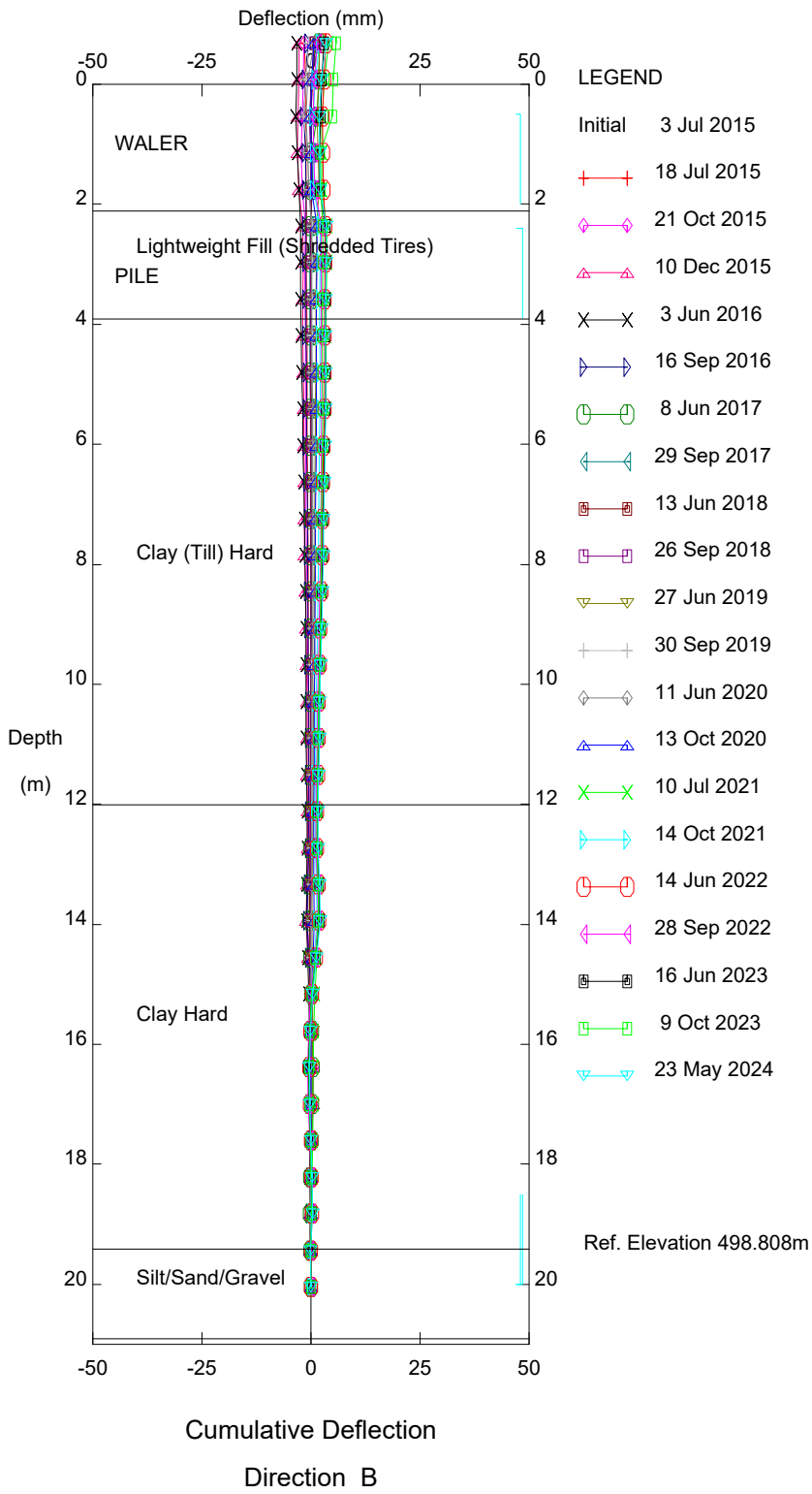
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Alberta Transportation

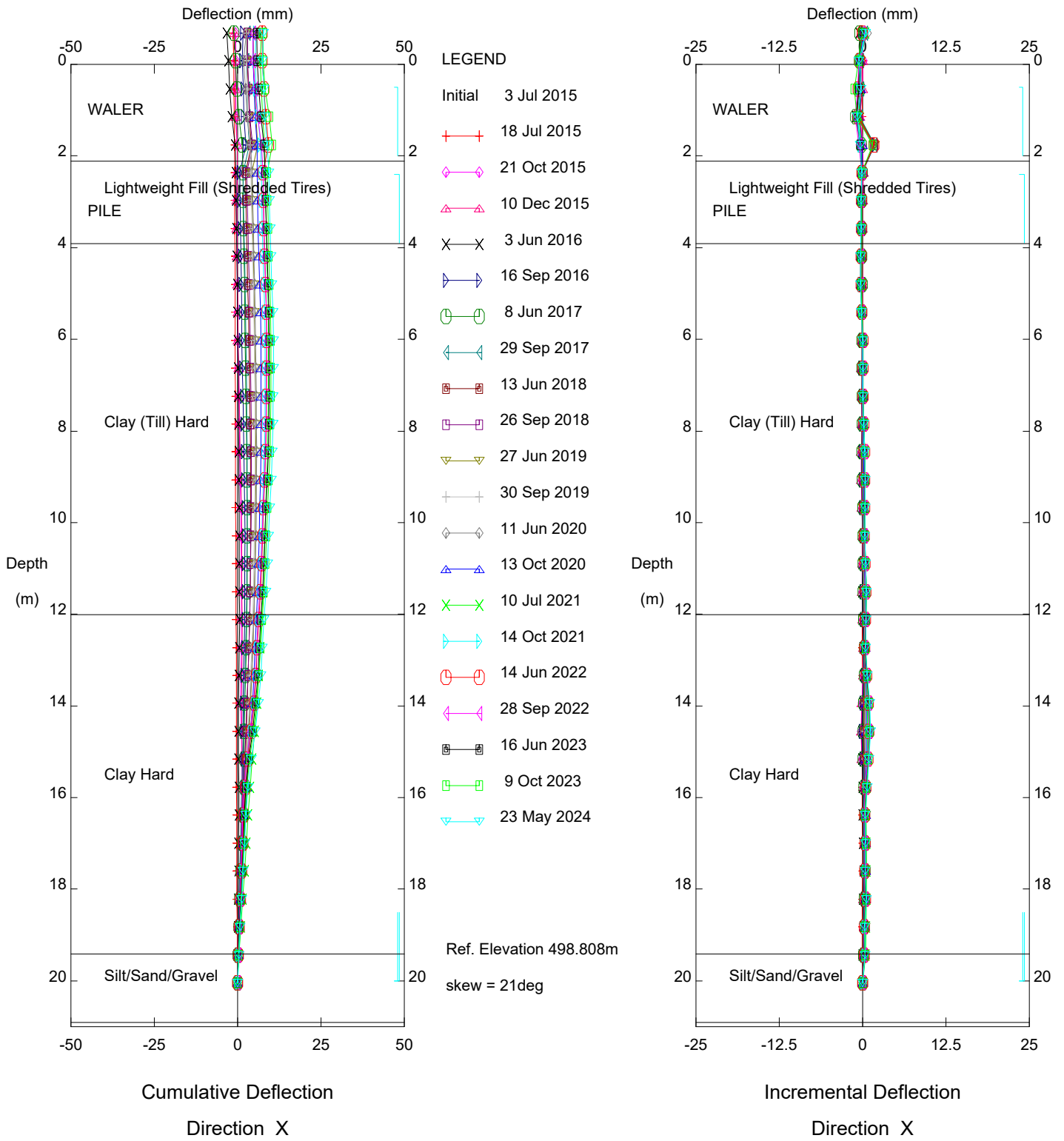
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Alberta Transportation

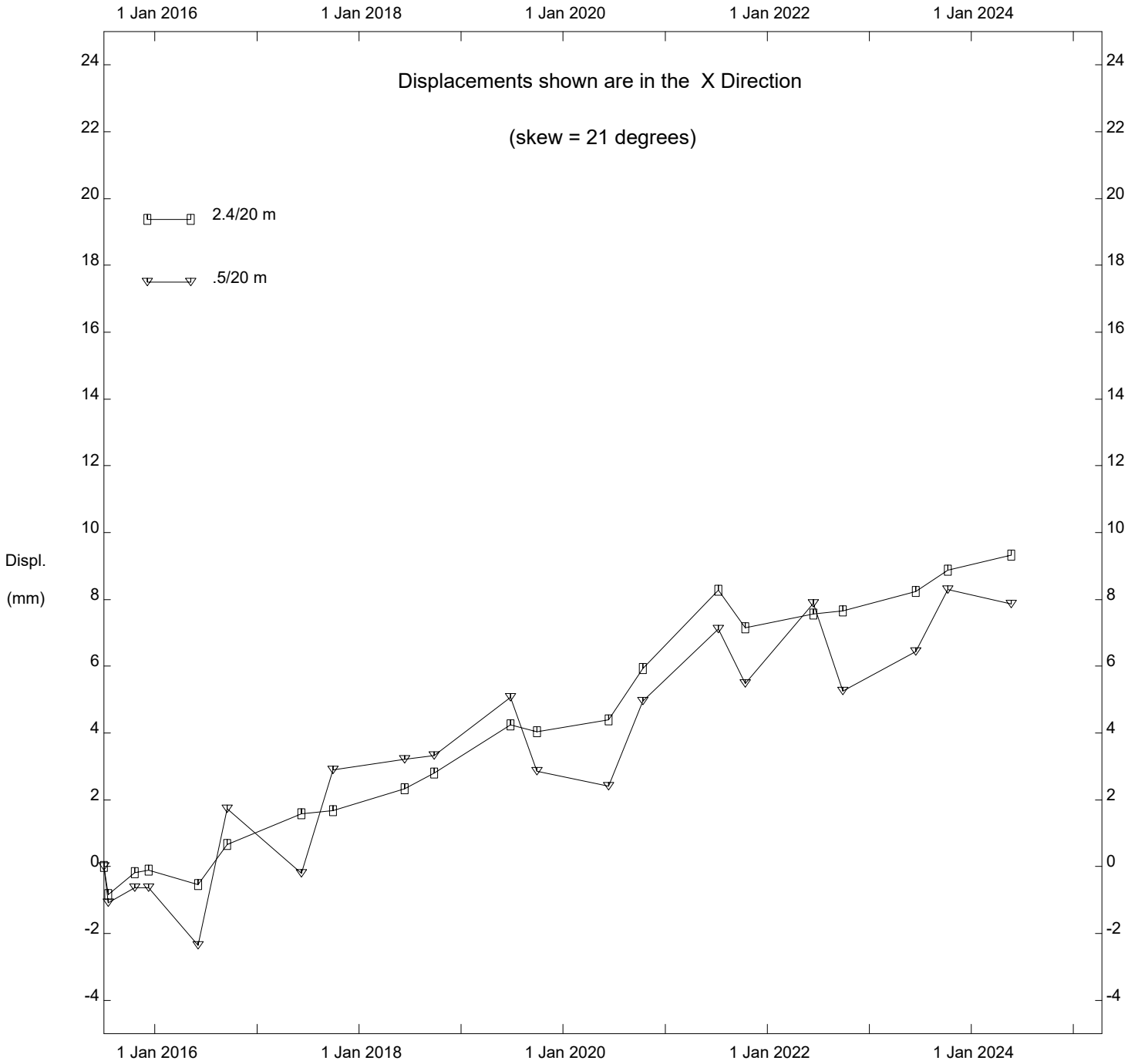
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Alberta Transportation

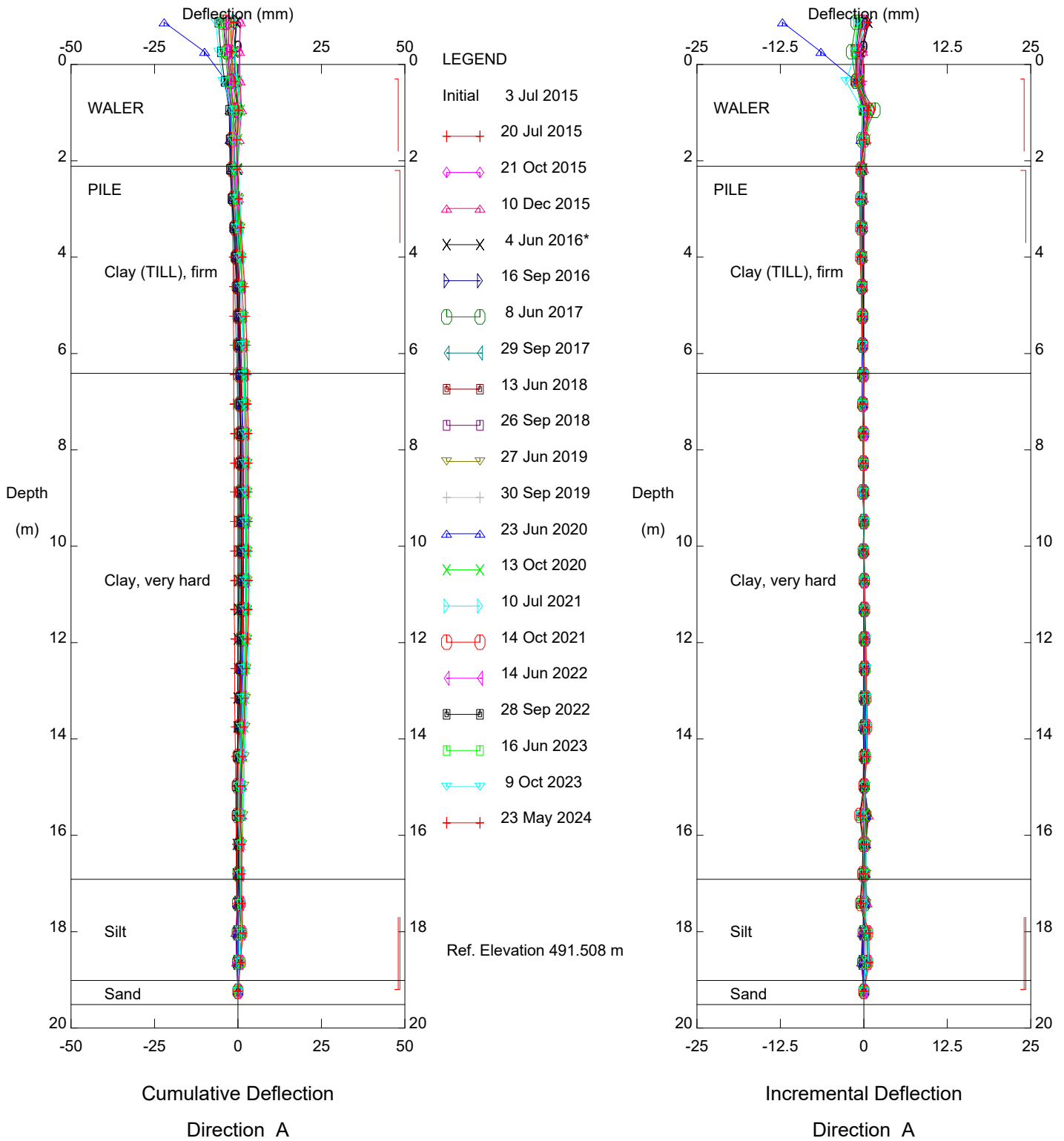
Thurber Engineering Ltd



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Alberta Transportation

Thurber Engineering Ltd

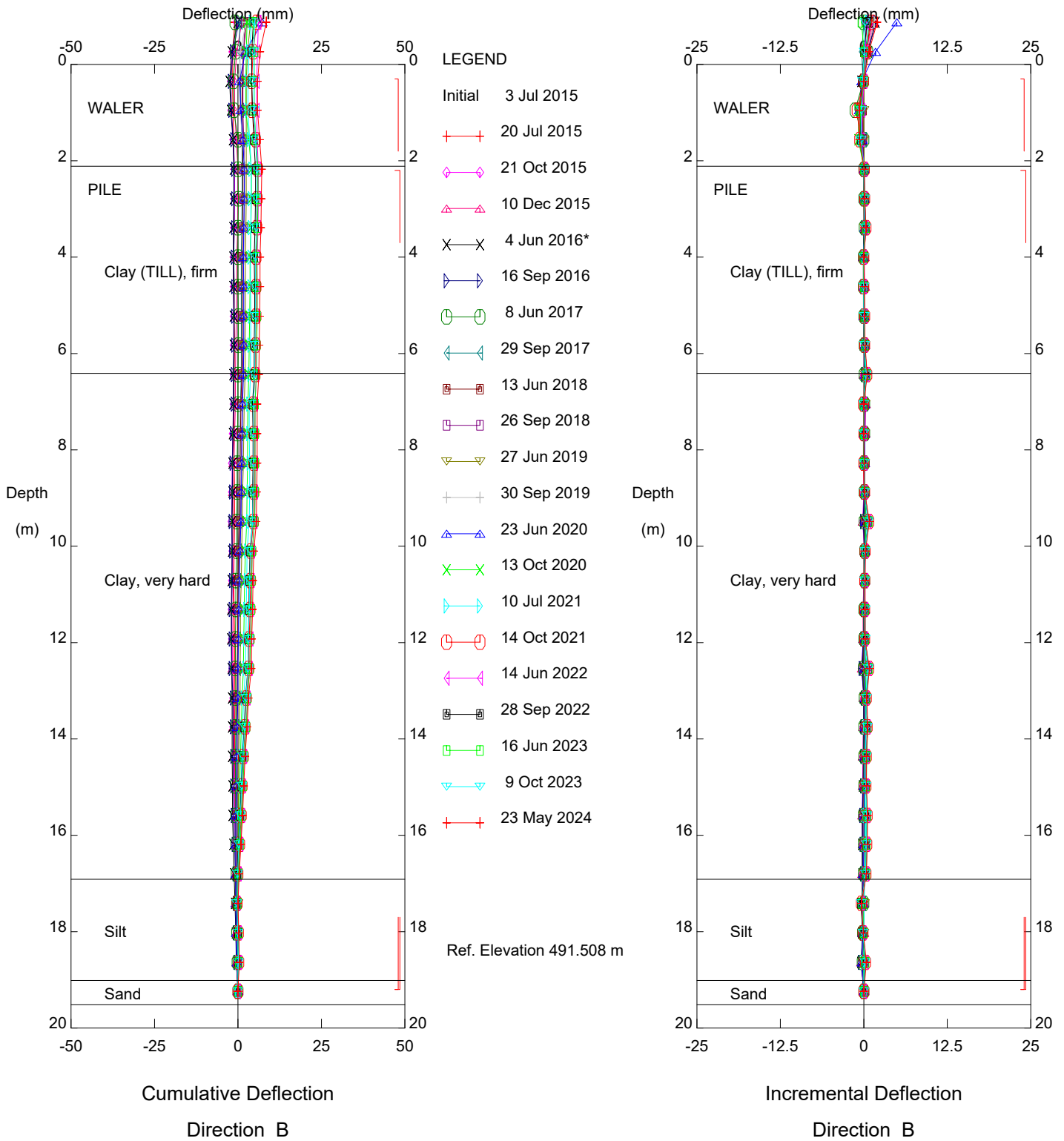


PH032 Makeout (Post Construction), Inclinometer PM12

Alberta Transportation

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

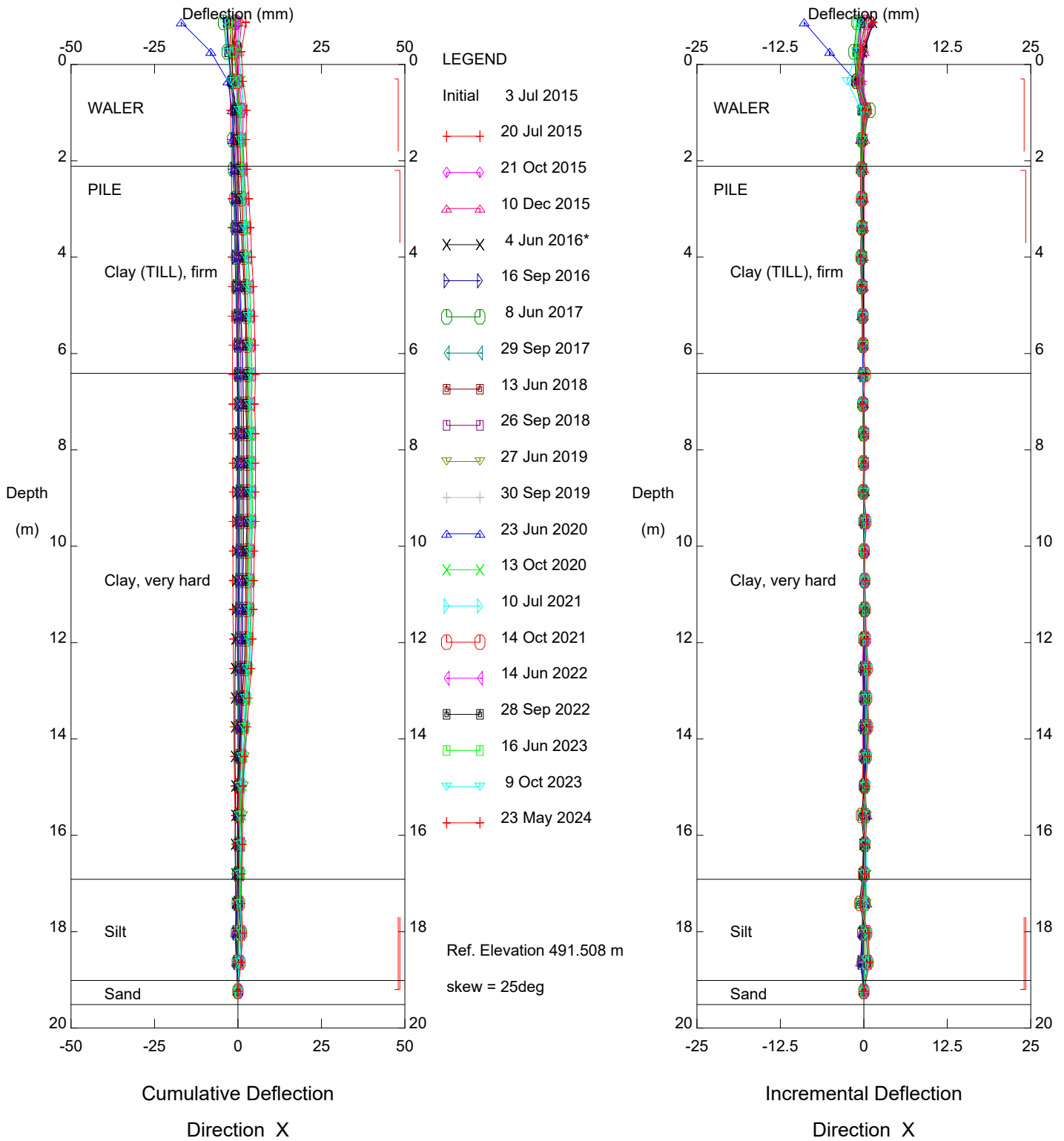
Thurber Engineering Ltd



PH032 Makeout (Post Construction), Inclinometer PM12

Alberta Transportation

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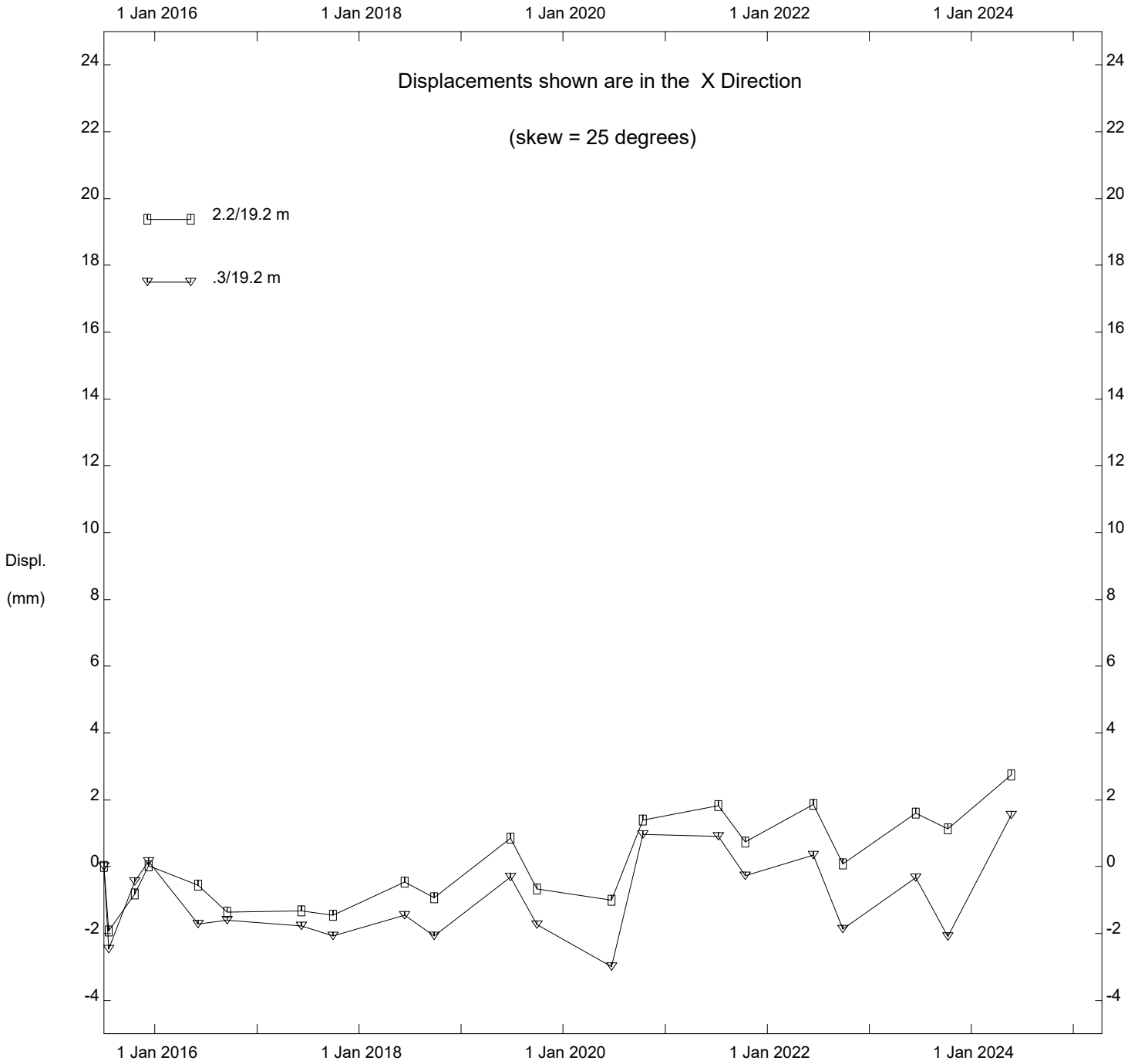


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Alberta Transportation

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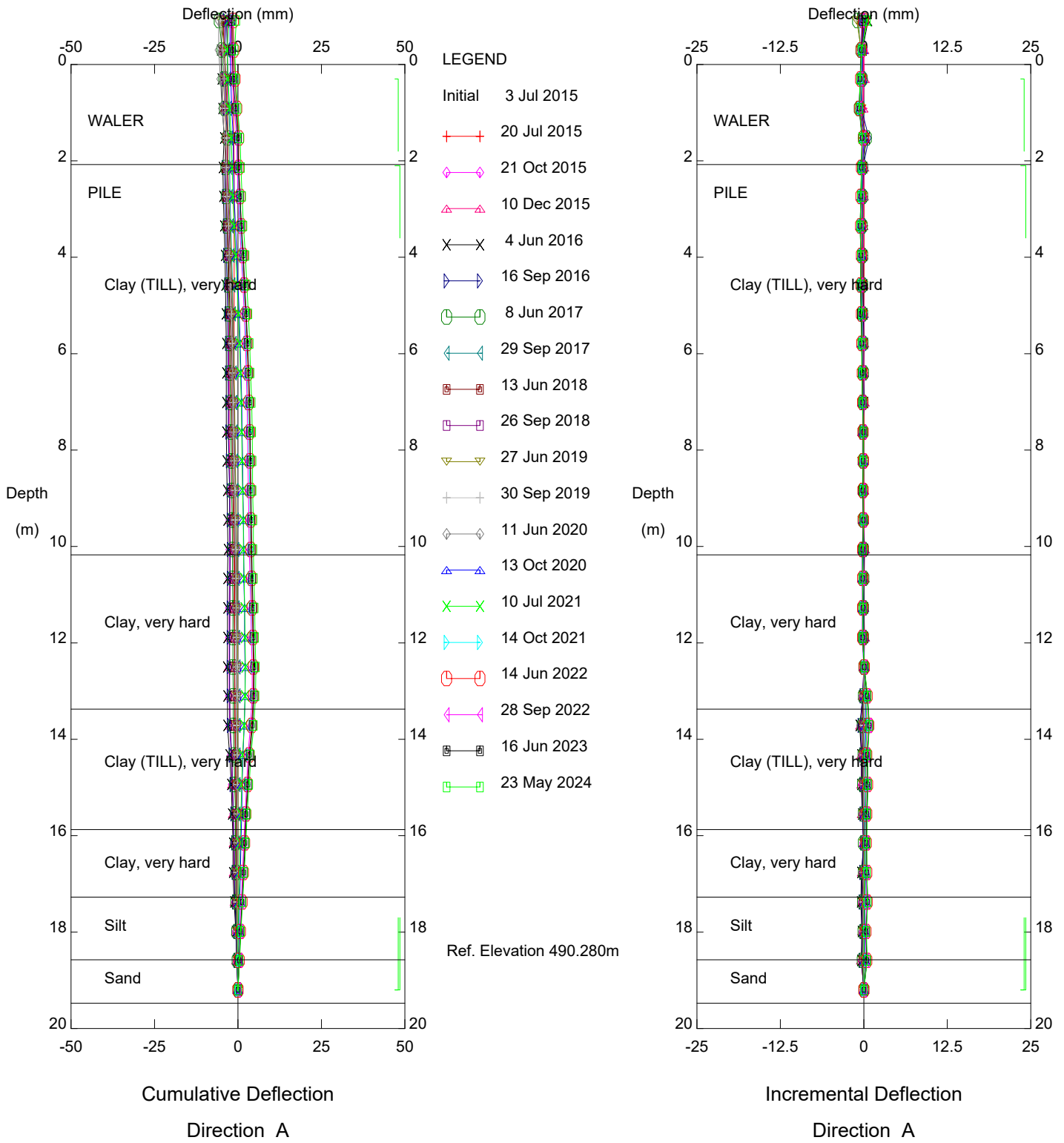
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Alberta Transportation

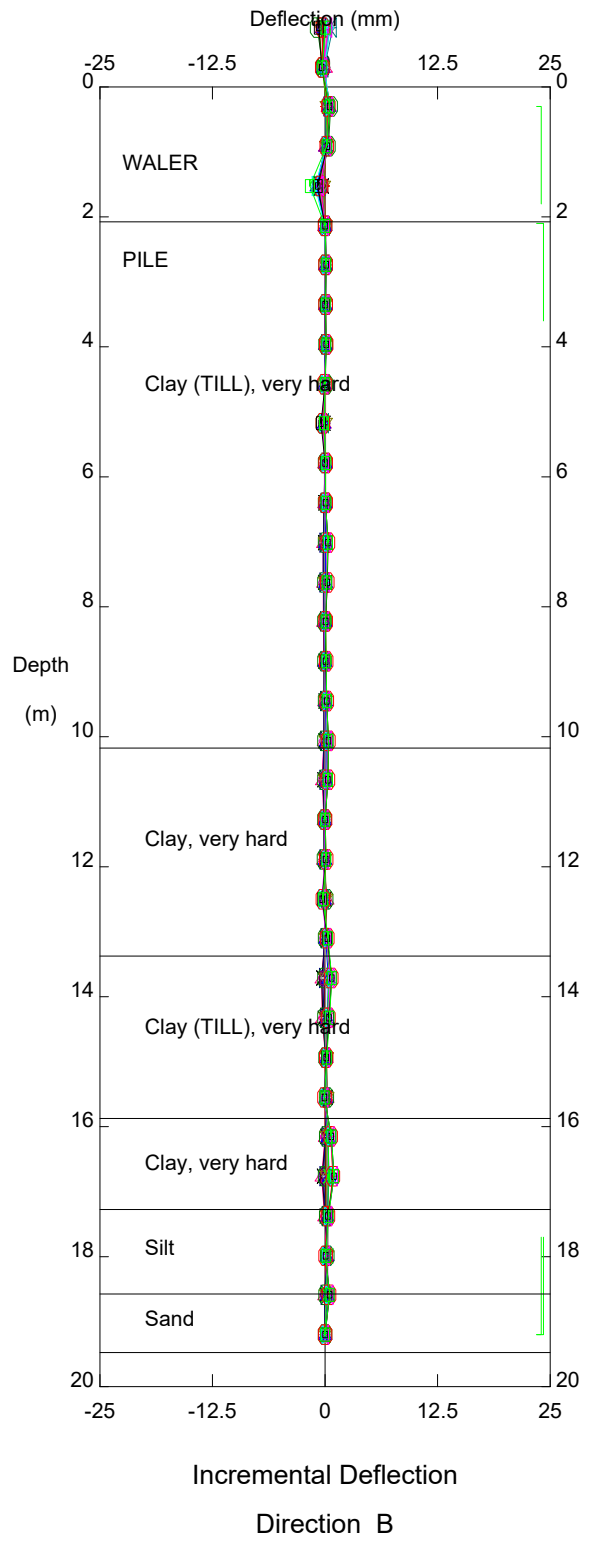
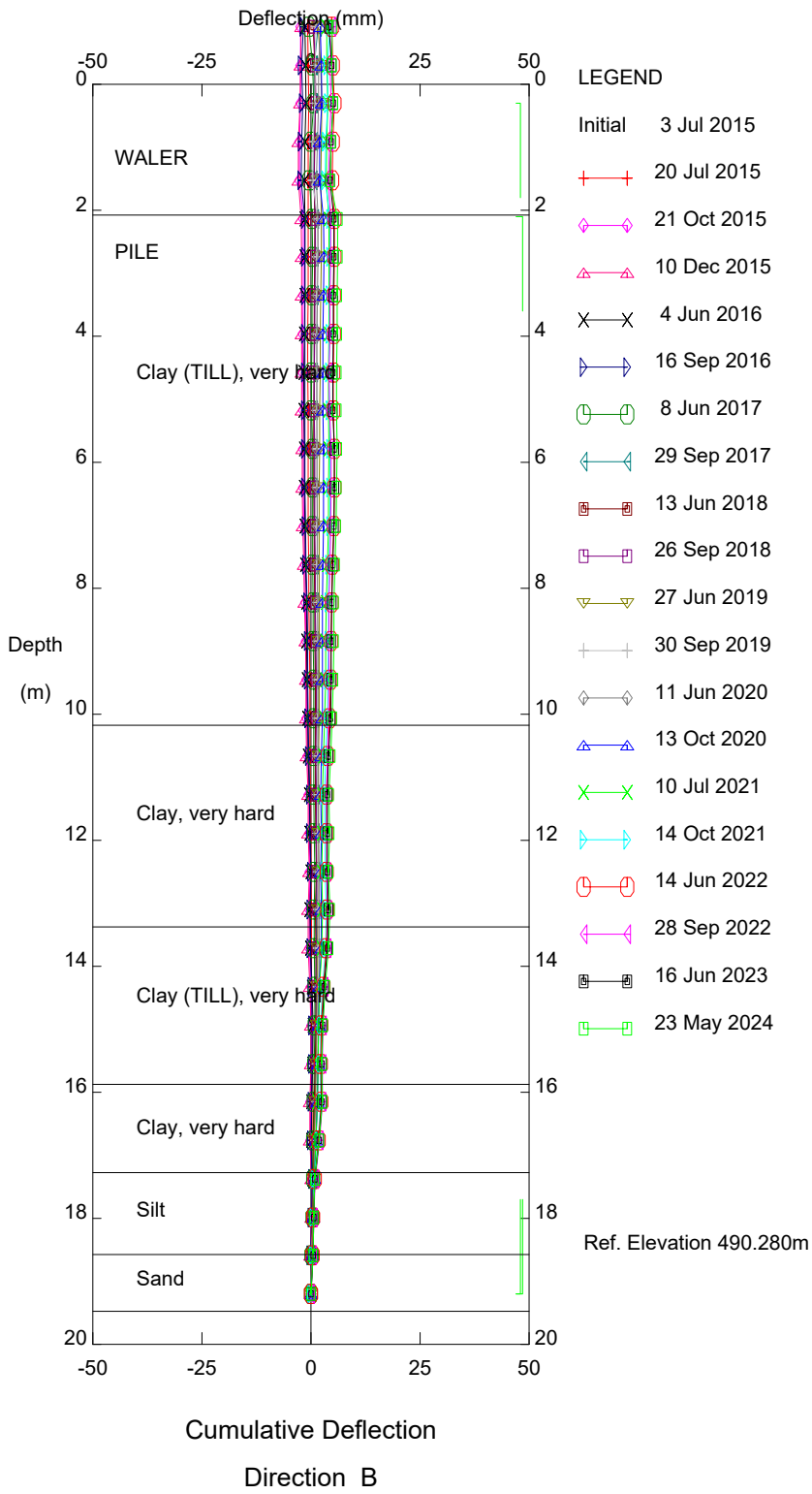
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PH032 Makeout (Post Construction), Inclinometer PM24

Alberta Transportation

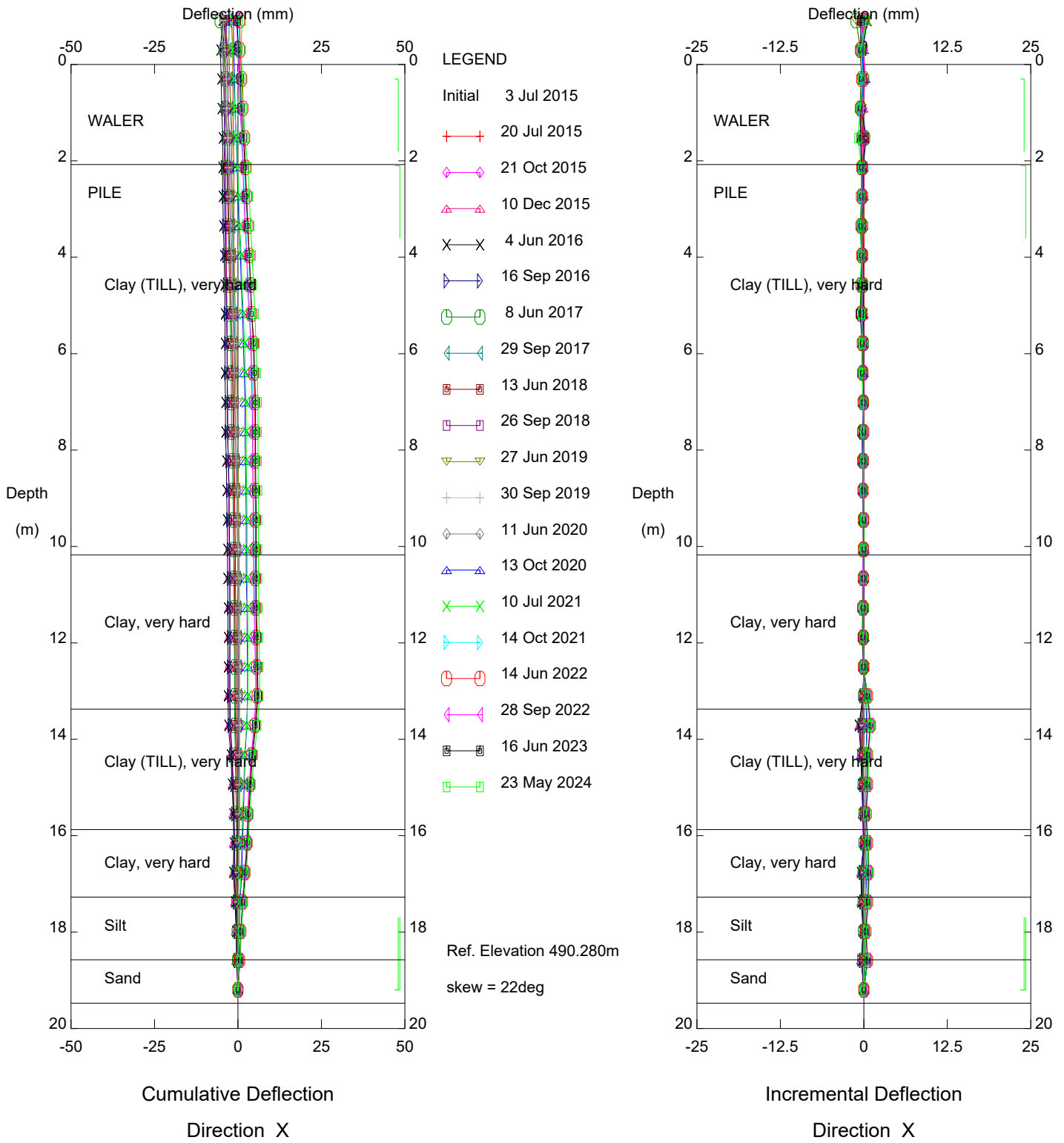
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Alberta Transportation

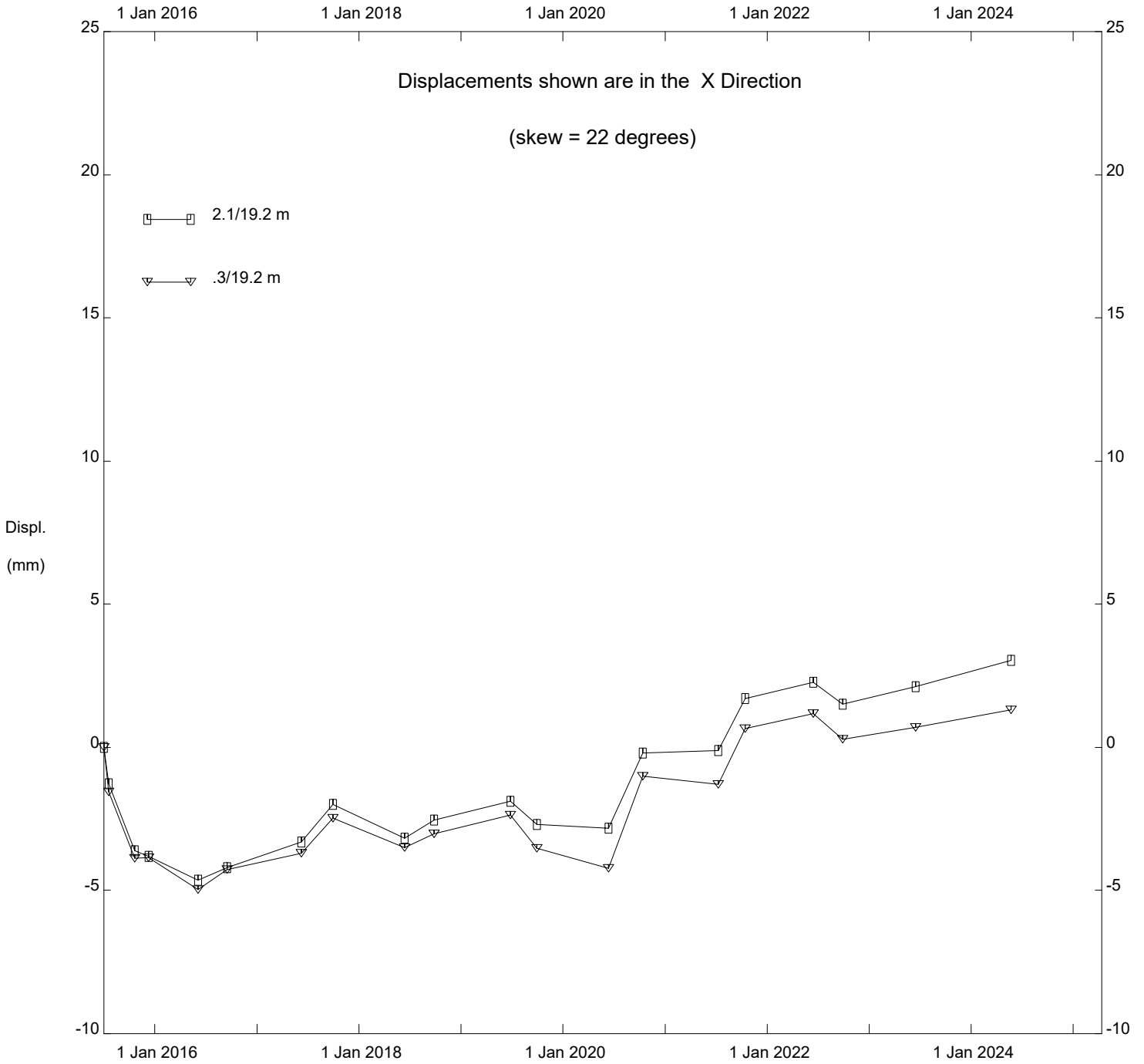
Thurber Engineering Ltd



PH032 Makeout (Post Construction), Inclinometer PM24

Alberta Transportation

Thurber Engineering Ltd



PH032 Makeout (Post Construction), Inclinator PM24

Alberta Transportation

**FIGURE PH032-1
PIEZOMETRIC ELEVATIONS FOR HWY 744:04, JUDAH HILL MAKEOUT SLIDE**

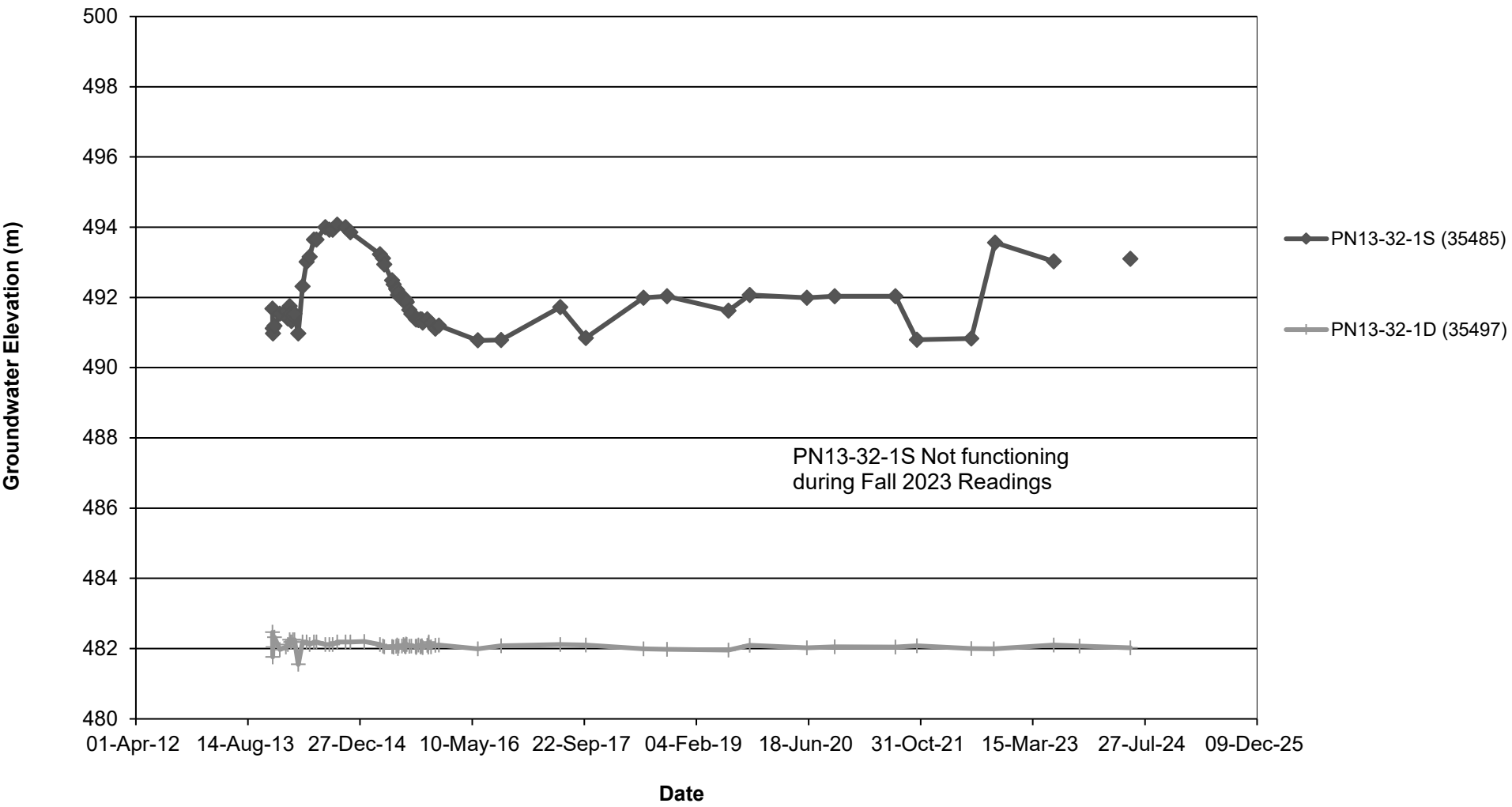
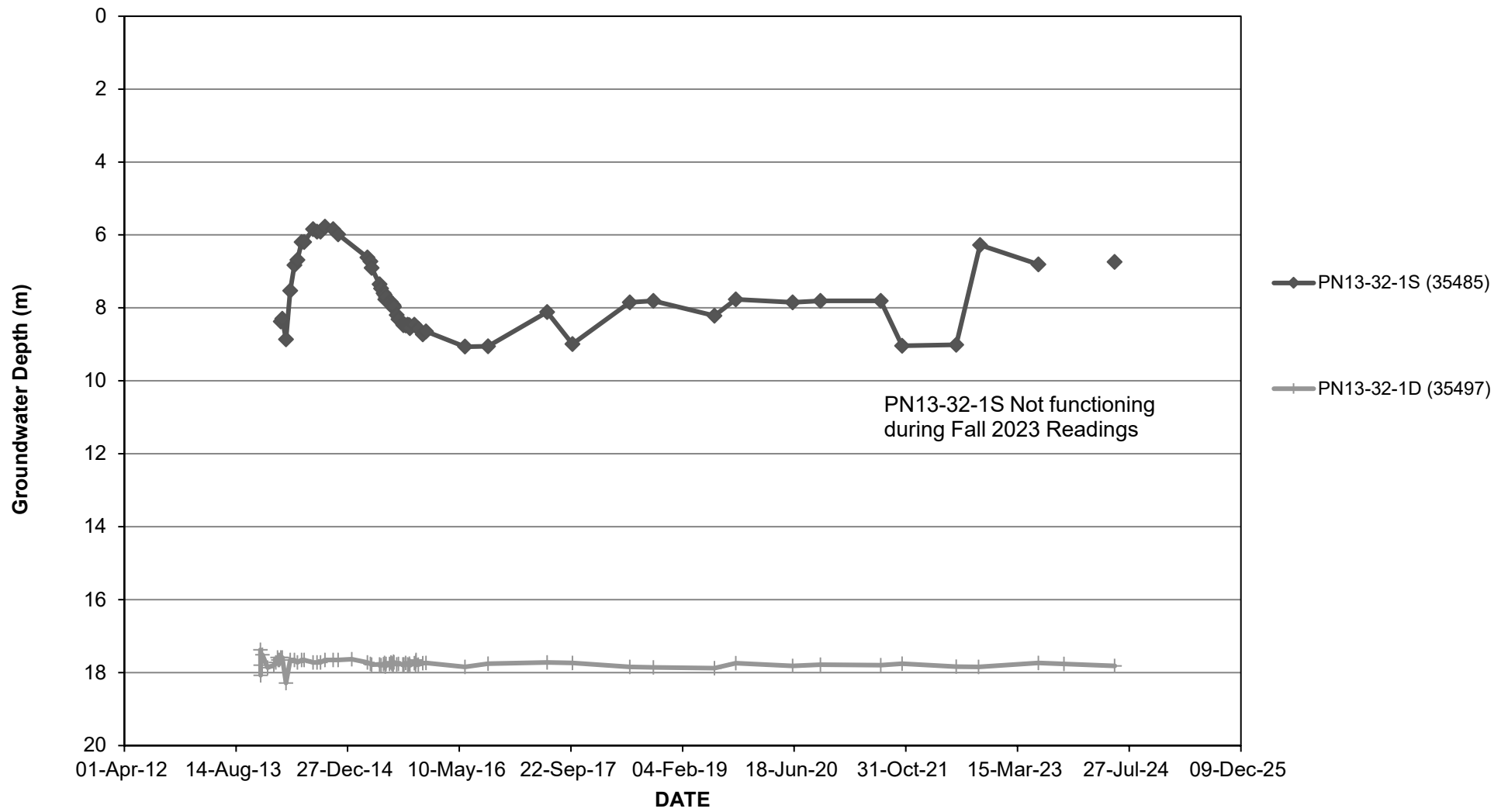
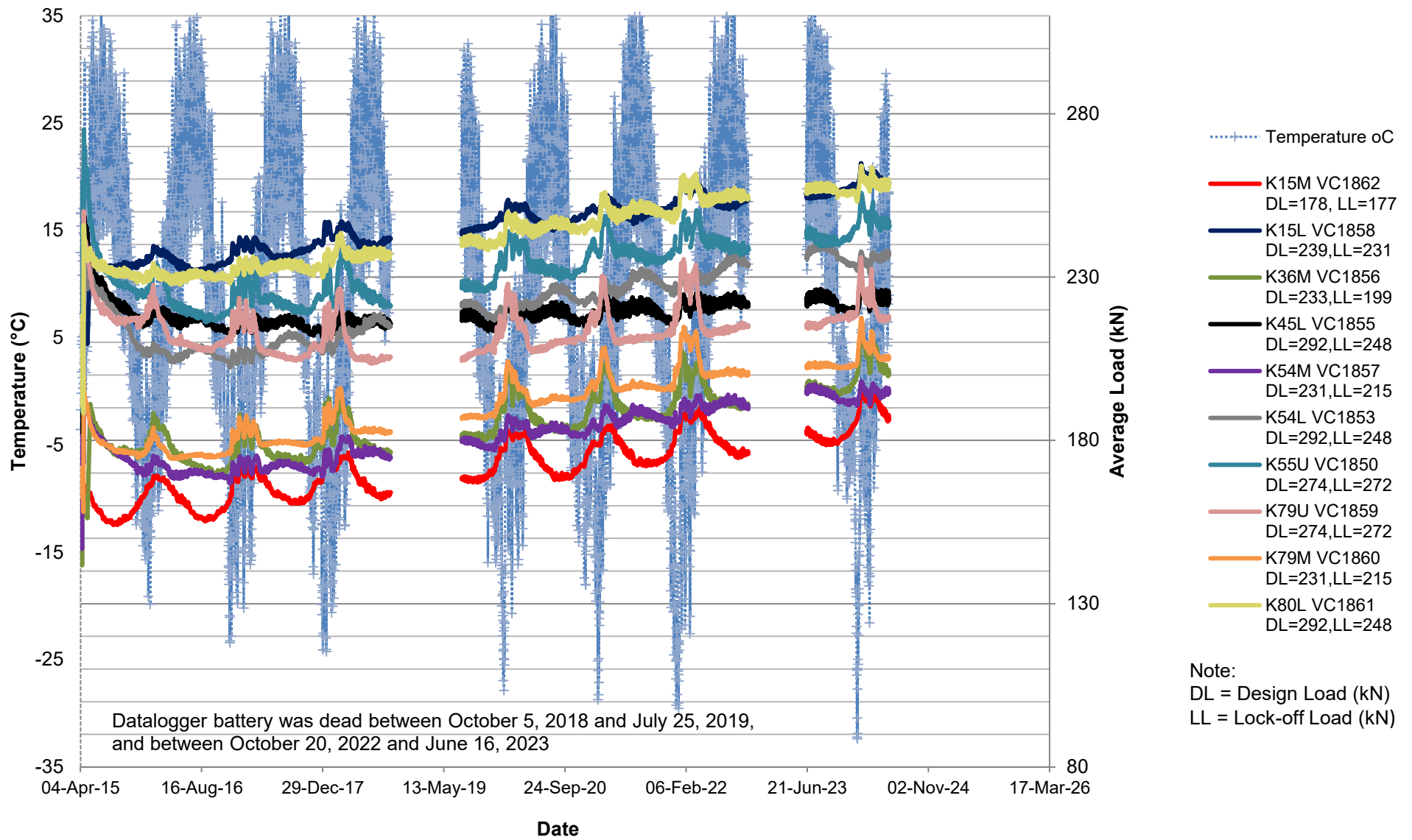


FIGURE PH032-2
PIEZOMETRIC DEPTHS FOR PH032-1: JUDAH HILL MAKEOUT SLIDE



**FIGURE PH032-3
LOAD CELL DATA FOR KM 58 PILE WALL**



**FIGURE PH032-4
LOAD CELL DATA FOR MAKEOUT PILE WALL**

