

ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS GRMP
NORTH CENTRAL (ATHABASCA AND FORT
McMURRAY DISTRICTS)
INSTRUMENTATION MONITORING - FALL 2025



Site Number	Location	Name	Hwy	km
NC071	HWY 663:04 C1 6.987	Little Pine Creek Slide	663:04	km 7.0
Legal Description: 4-14-65-22 W4		UTM Co-ordinates		
		12U E 355844	N	6054601

Current Monitoring:	22-Sep-2025	Previous Monitoring	31-May-2025
Instruments Read By:	Mr. Niraj Regmi, G.I.T and Mr. Angelo Castillo, of Thurber		

Instruments Read During This Site Visit			
Slope Inclinometers (SIs): SI12-1, SI12-2 and SI12-4	Pneumatic Piezometers (PN): PN12-1B, 12-2A, 12- 2B, 12-3B, 12-4A, 12- 4B, 12-6, and 12-8	Vibration Wire Piezometers (VW): N/A	Standpipe Piezometers (SP): SP1, SP2, SP12-10, and SP12-11
Load Cell (LC): N/A	Strain Gauges: N/A	SAA's: N/A	Others:

Readout Equipment Used			
Slope Inclinometers: RST Digital Inclinator probe with a 2 ft. wheelbase and a RST Pocket PC readout	Pneumatic Piezometers: RST C108 pneumatic piezometer reader	Vibration Wire Piezometers:	Standpipe Piezometers: DGS1 dipmeter
Load Cell:	Strain Gauges:	SAA's:	Others:
Notes:			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	Slope inclinometer SI12-4 has continued to show no discernible movement since initialization. SI12-1 showed a rate of movement of 4.8 mm/yr over 1.8 m to 5.5 m depth since the spring of 2025 readings. SI12-2 showed a rate of movement of 21.9 mm/yr over 9.8 m to 12.3 m depth since the spring of 2025 readings. The rate of movement increased in SI12-2 by 10 mm /yr. Pneumatic piezometer PN12-4B showed an increase in groundwater level of 0.08 m since the spring of 2025 readings. Pneumatic piezometers PN12-2A, PN12-2B, PN12-3B, PN12-4A, PN12-6, and PN12-8 showed decreases in groundwater levels of 0.06 m, 0.06 m, 0.22 m, 0.21 m, 0.08 m, and 0.77 m since the spring of 2025 readings. Standpipe piezometers SP1, SP-2, and SP12-10 showed decreases in groundwater levels of 0.64 m, 0.34 m, and 0.09 m since the spring of

	2025 readings. SP12-11 showed an increase in groundwater level of 0.34 m since the spring of 2025 reading. The groundwater levels measured in the pneumatic and standpipe piezometers are in line with historic groundwater readings at the site.
Future Work:	The instruments should be read again in the spring of 2026. SI12-9 was found sheared off during the fall 2024 monitoring event, and SI12-2 will likely get sheared off soon. Consideration should be given to replacing SI12-2 and SI12-9 in the near future to continue monitoring the landslide movement rates at this site.
Instrumentation Repairs:	No instrument repairs are required at this time.
Additional Comments:	

Attachments:	▪ Table NC071-1 Fall 2025 – HWY 663:04 Little Pine Creek, Slope Inclinator Instrumentation Reading Summary ▪ Table NC071-2 Fall 2025 – HWY 663:04 Little Pine Creek, Pneumatic Piezometer Instrumentation Reading Summary ▪ Table NC071-3 Fall 2025 – HWY 663:04 Little Pine Creek, Standpipe Piezometer Instrumentation Reading Summary ▪ Statement for Use and Interpretation of Report ▪ APPENDIX A – NC071-1 FALL 2025 □ Field Inspector's report □ Site Plan Showing Approximate Instrument Locations (Drawing No. 32122-NC071) □ SI Reading Plots □ Figure NC071-1 (Piezometric Depths)
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We trust this report meets your requirements at present. If you have any questions, please contact the undersigned at your convenience.

Yours very truly,
Thurber Engineering Ltd.
Tarek Abdelaziz, Ph.D., P. Eng.
Partner | Senior Geotechnical Engineer

Yasir Khan, E.I.T.
Geotechnical Engineer-In-Training

Table NC071-1 Fall 2025 – Hwy 663:04 Little Pine Creek Slope Inclinator Instrumentation Reading Summary

Date Monitored: September 22, 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)
SI12-1	December 8, 2012	65.0 over 1.8 m to 5.5 m depth in 230° direction	26.0 in September 2015	Operational	May 31, 2025	1.5	4.8	-2.7
SI12-2	December 8, 2012	138.8 over 9.8 m to 12.3 m depth in 203° direction	31.0 in October 10, 2021	Operational	May 31, 2025	6.8	21.9	10.0
SI12-4	December 12, 2012	No discernible movement	N/A	Operational	May 31, 2025	N/A	N/A	N/A

Drawing 32122-NC071 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Table NC071-2 Fall 2025 – Hwy 663:04 Little Pine Creek Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: September 22, 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)
PN12-1A	December 12, 2012	15.0	589.4	Malfunctioning	4.12 in February 2013	N/A	N/A	4.12 (February 2013)	N/A
PN12-1B	December 12, 2012	25.0	589.4	Non-Operational	14.42 in September 2018	N/A	N/A	14.49 (June 3, 2023)	N/A
PN12-2A	December 7, 2012	15.9	583.3	Active	6.74 in June 2024	89.3	6.81	6.75	-0.06
PN12-2B	December 7, 2012	19.9	583.3	Active	10.48 in June 2022	90.1	10.74	10.68	-0.06
PN12-3A	December 12, 2012	11.0	573.9	Malfunctioning	2.06 in February 2013	N/A	N/A	3.19 (May 2017)	N/A
PN12-3B	December 12, 2012	15.3	573.9	Active	0.92 in June 2022	135.2	1.46	1.24	-0.22

Drawing 32122-NC071 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

Table NC071-2 Continued... Fall 2025 – Hwy 663:04 Little Pine Creek Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: September 22, 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)
PN12-4A	December 12, 2012	9.4	565.1	Active	2.84 in May 2013	59.4	3.32	3.11	-0.21
PN12-4B	December 12, 2012	20.6	565.1	Active	4.76 in June 2020	151.1	5.17	5.25	0.08
PN12-5	December 5, 2012	20.0	590.5	Malfunctioning	13.32 in December 2012	N/A	N/A	19.93 (September 2018)	N/A
PN12-6	December 5, 2012	12.0	585.6	Active	7.50 in May 2016	31.3	8.81	8.73	-0.08
PN12-8	December 2, 2012	5.3	588.9	Active	-0.53 in June 2024	47.5	0.49	-0.28*	-0.77
PN12-9	December 7, 2012	18.3	582.3	Malfunctioning	1.58 in February 2013	N/A	N/A	3.05 (September 2018)	N/A

Drawing 32122-NC071 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

* Negative value represents artesian, above ground water level

Table NC071-3 Fall 2025 – Hwy 663:04 Little Pine Creek Standpipe Piezometer Instrumentation Reading Summary

Date Monitored: September 22, 2025

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED GROUNDWATER LEVEL BGS (m)	CURRENT GROUNDWATER DEPTH BGS (m)	PREVIOUS GROUNDWATER DEPTH BGS (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
SP1	December 1979	12.3	587.0	Operational	6.49 on June 29, 2021	7.83	7.19	-0.64
SP2	December 1979	11.3	576.5	Operational	1.84 on May 31, 2025	2.18	1.84	-0.34
SP12-7	December 8, 2012	19.8	578.3	Blocked at 1 m depth	4.95 on September 28, 2020	N/A	N/A	N/A
SP12-10	December 12, 2012	19.8	571.6	Operational	0.70 on September 16, 2024	0.82	0.73	-0.09
SP12-11	December 12, 2012	15.2	556.2	Operational	7.58 on June 4, 2022	7.68	8.02	0.34

Drawing 32122-NC071 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

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 TO THE 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 (CON0022163)
NORTH CENTRAL (ATHABASCA AND FORT McMURRAY DISTRICTS)
INSTRUMENTATION MONITORING RESULTS**

FALL 2025

**APPENDIX A
DATA PRESENTATION AND SITE PLANS**

SITE NC071: HWY 663:04 LITTLE PINE CREEK

**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
NORTH CENTRAL REGION - ATHABASCA AND FORT McMURRAY DISTRICTS
INSTRUMENTATION MONITORING FIELD SUMMARY (NC088)
FALL 2025**

Location: HWY 63:06 (R1 11.570) - km 108 Settlement	Readout: RST PN C108 Unit 8
File Number: 32122	Casing Diameter: 2.75"
Probe: RST SET 8R	Temp (deg C): 22
Cable: RST SET 8R	Read by: NKR/AFC

SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 12)		Date	Stickup (m)	Readings Depth from top of casing (ft)	Azimuth of A+ Groove degree	Current Bottom Depth Readings				Probe/ Reel #	Size (")	Remarks
	Northing	Easting					A+	A-	B+	B-			
SI18-4	6172648	426558	17-Sep-25	0.66	58 to 2	270	729	-719	-40	48	8R/8R	2.75	West Side

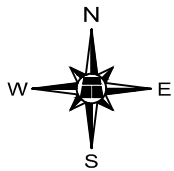
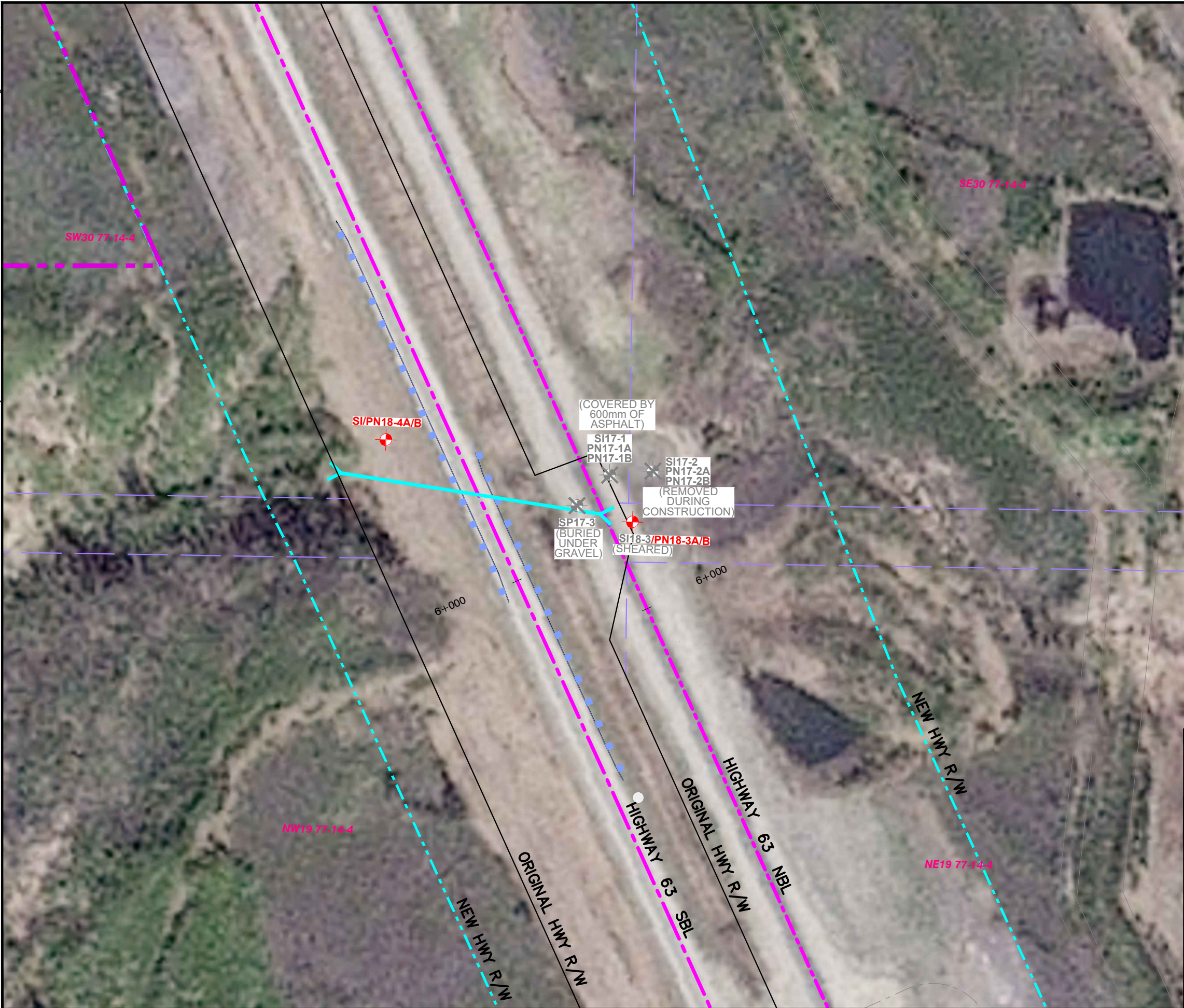
PNEUMATIC PIEZOMETER (PN) READINGS

PN #	Serial	GPS Location (UTM 12)		Location	Date	Reading (kPa)	Comments
		Northing	Easting				
PN18-3A	38153	6172605	426683	Attached to SI18-3	17-Sep-25	26.6	East Side
PN18-3B	38150	6172605	426683	Attached to SI18-3	17-Sep-25	45.2	East Side
PN18-4A	38152	6172648	426558	Attached to SI18-4	17-Sep-25	2.1	West Side
PN18-4B	38151	6172648	426558	Attached to SI18-4	17-Sep-25	64.4	West Side

INSPECTOR REPORT

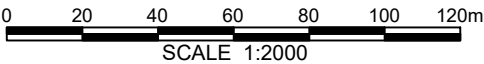
Site is at 108 Km marker on Hwy 63 Northbound lane - SI 18-3
Site is at 108 Km marker on Hwy 63 Southbound lane - SI 18-4

G:\32000\32122 AT GRMP Athabasca and Fort McMurray Districts 2021-2025\CAD\32122 INSTRUMENT 2025\32122-NC088.dwg - 1N - Oct. 30, 2025



LEGEND

- APPROXIMATE THURBER TEST HOLE LOCATION
- SLOPE INCLINOMETER
- PNEUMATIC PIEZOMETER
- STANDPIPE PIEZOMETER
- ORIGINAL 1200mm Ø CULVERT
- NON-OPERATIONAL INSTRUMENT



BASE PLAN PROVIDED BY ALBERTA TRANSPORTATION; AIR PHOTO PROVIDED BY VALTUS

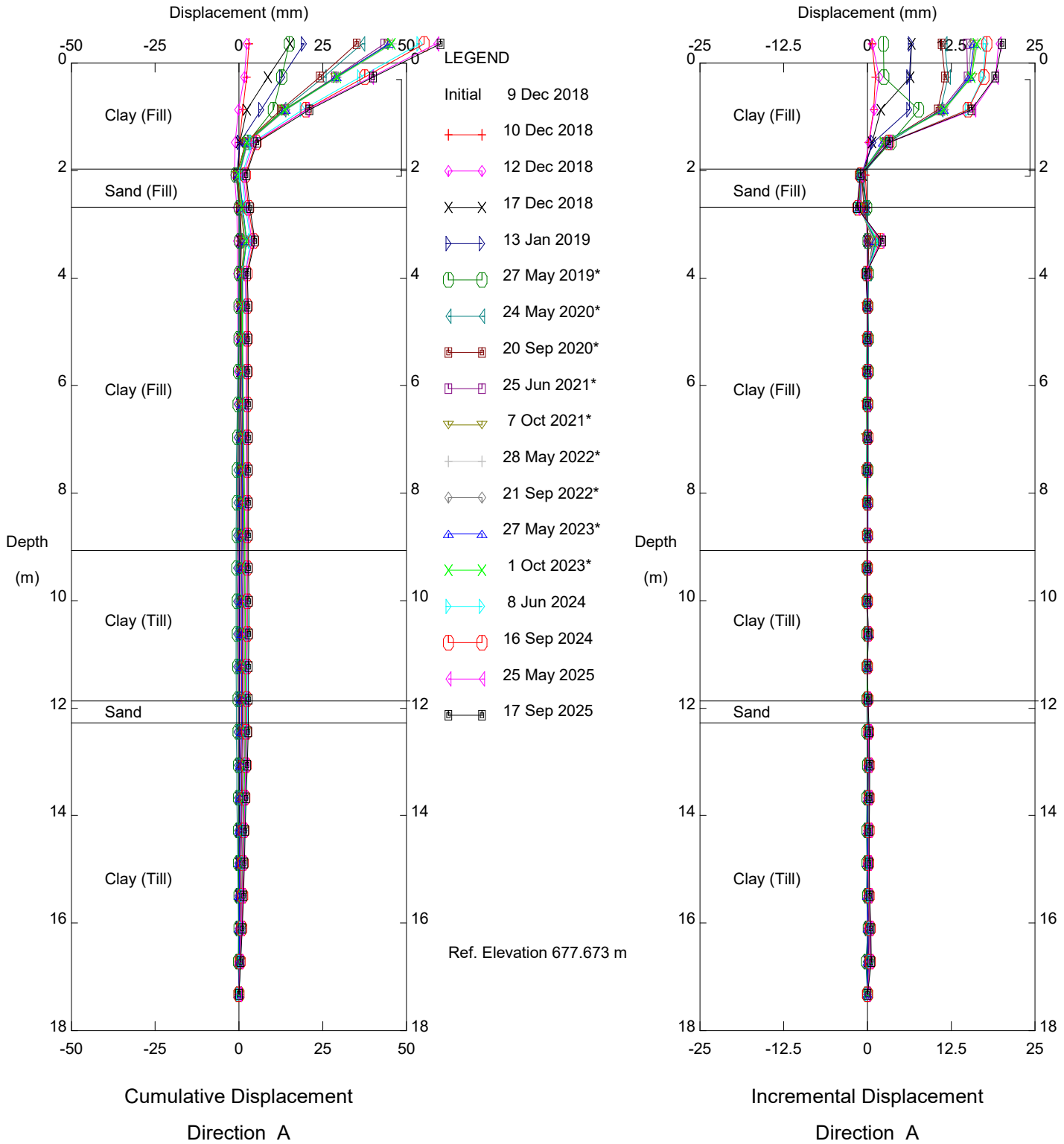


**NORTH CENTRAL
(ATHABASCA AND FORT MCMURRAY DISTRICTS)**
**NC088: HWY 63:06 EAST AND WEST
EMBANKMENT FAILURES (km 4.9)**
**SITE PLAN SHOWING APPROXIMATE
INSTRUMENT LOCATIONS**
DWG No. 32122-NC088

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	TSA
SCALE	1:2000
DATE	OCTOBER 2025
FILE No.	32122



Thurber Engineering - Edmonton

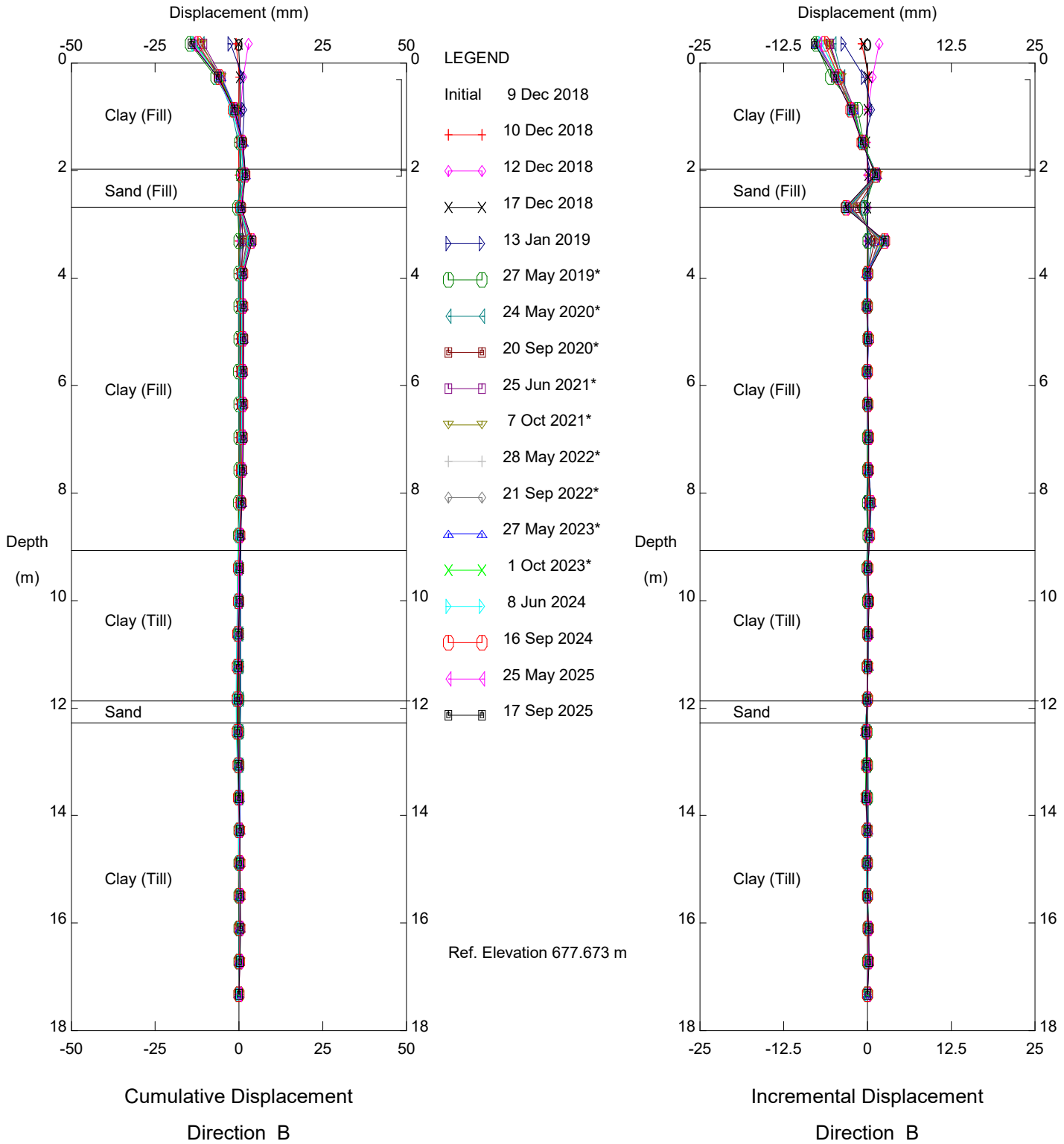


NC088 - West Embankment, Inclinometer SI18-4

Alberta Transportation

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

Thurber Engineering - Edmonton

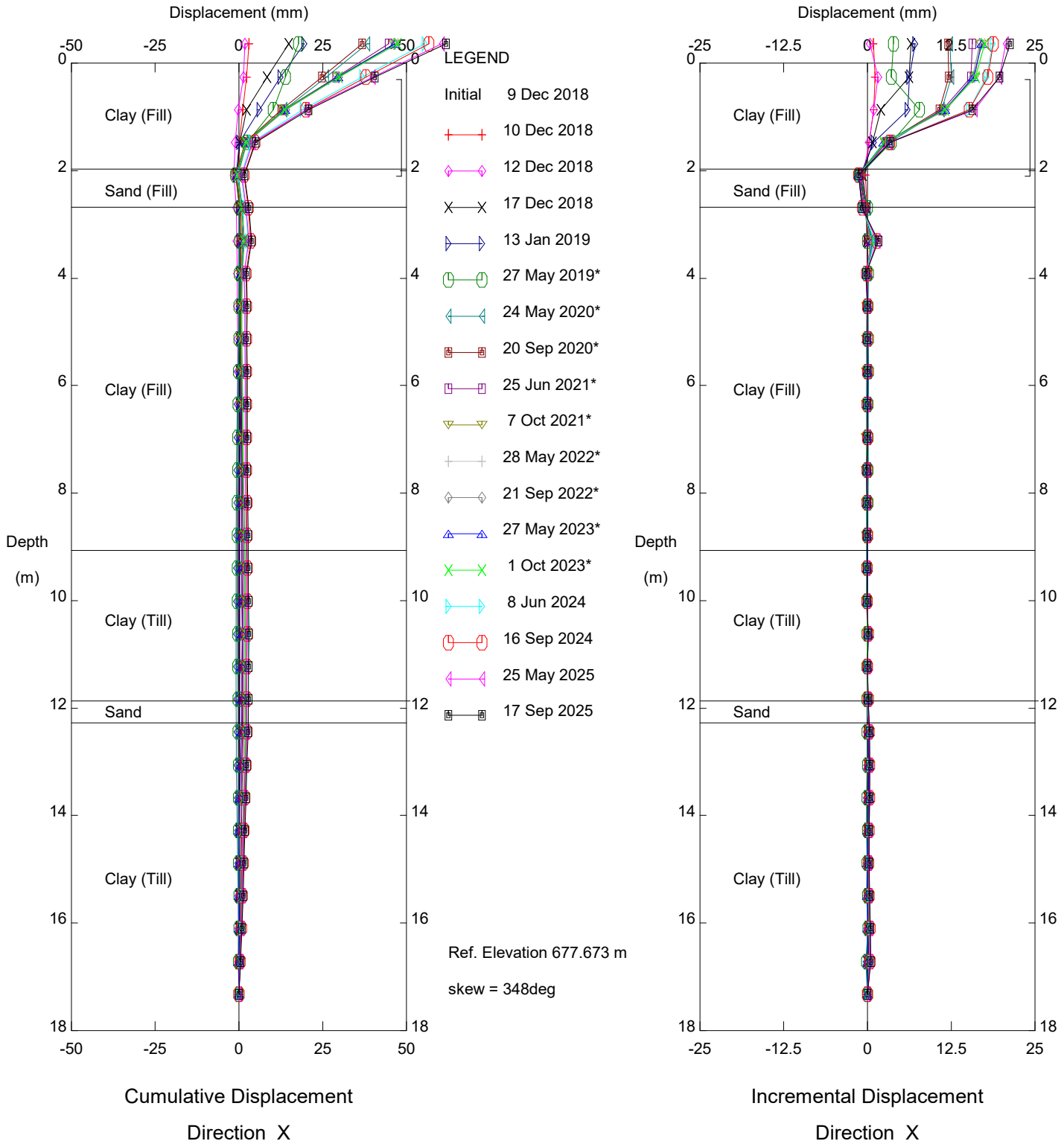


NC088 - West Embankment, Inclinator SI18-4

Alberta Transportation

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

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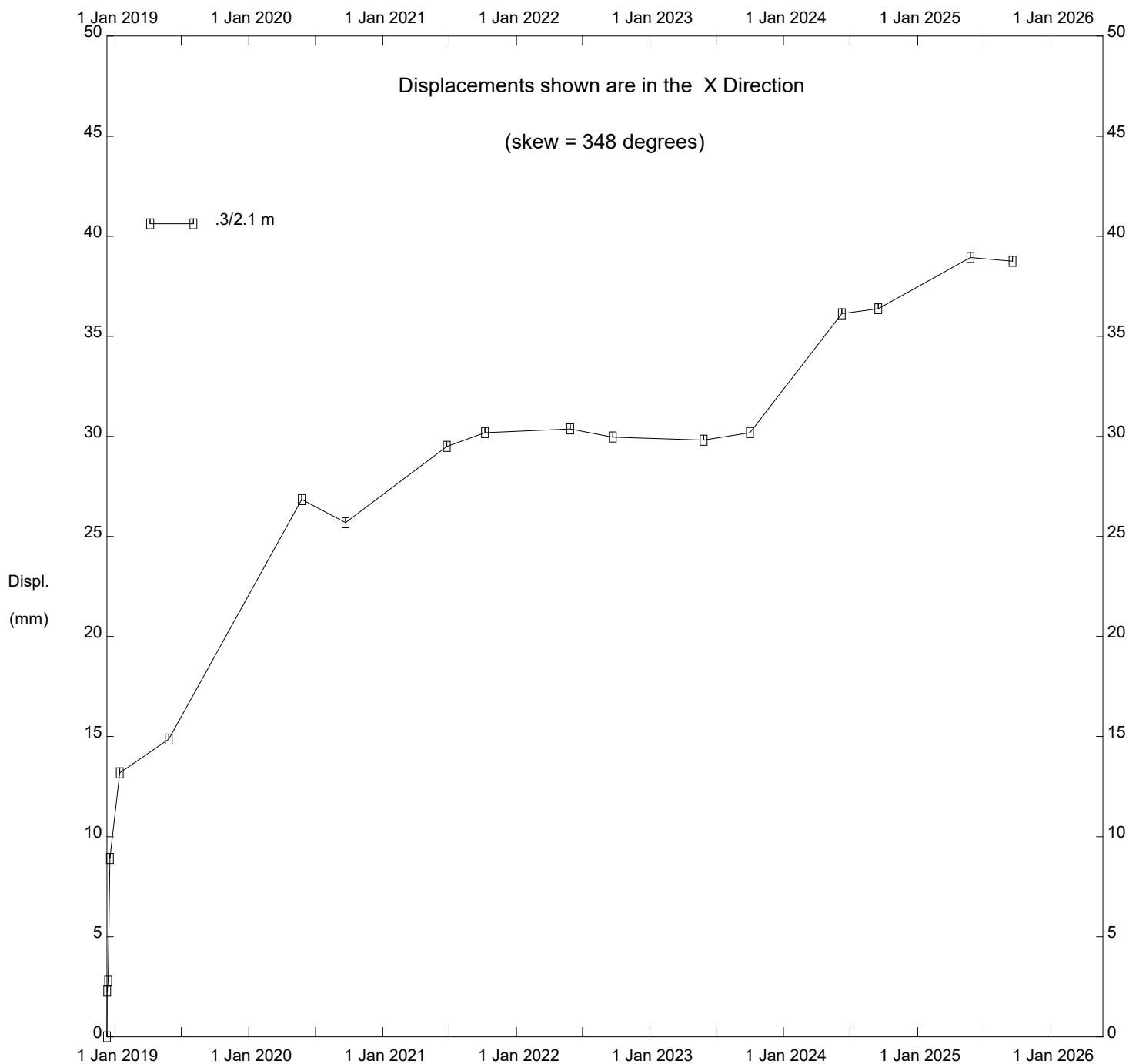


NC088 - West Embankment, Inclinator SI18-4

Alberta Transportation

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

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NC088 - West Embankment, Inclinator SI18-4

Alberta Transportation

FIGURE NC088-1
PIEZOMETER DATA FOR HWY 63:06 EAST AND WEST EMBANKMENT
FAILURES (km 4.90)

