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

THURBER

Site Number	Location	Name	Hwy	km
NC090	HWY 2:42 C1 17.72	Baptiste Creek	2:42	km 17.2
Legal Description: 5-6-67-23 W4		**UTM Co-ordinates**		
		12U E 338297	N 6071816	

Current Monitoring:	22-Sep-2025	**Previous Monitoring**	30-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): SI19-1	**Pneumatic Piezometers (PN):** N/A	**Vibration Wire Piezometers (VW):** VW19-1A and VW19-1B	**Standpipe Piezometers (SP):** N/A
Load Cell (LC): VC2130 to VC2136	**Strain Gauges:** three vibrating wire strain gauges	**SAAs:** N/A	**Others:**

Readout Equipment Used			
Slope Inclinometers: RST Digital Inclinometer probe with a 2 ft wheelbase and an RST Pocket PC readout	**Pneumatic Piezometers:**	**Vibration Wire Piezometers:** Campbell Scientific CR6 datalogger	**Standpipe Piezometers:**
Load Cell: Campbell Scientific CR6 datalogger	**Strain Gauges:** Campbell Scientific CR6 datalogger	**SAAs:**	**Others:**
Note:			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	Slope inclinometer SI19-1, installed upslope of the cantilever sheet pile wall, showed no discernable movement over 0.4 m to 1.7 m depth since the spring of 2025 readings. Vibrating wire piezometer VW19-1A showed a decrease in groundwater level of 1.39 m since the spring of 2025 reading. Vibrating wire piezometer VW19-1B showed an increase in groundwater level of 0.05 m since the spring of 2025 reading. Both vibrating wire piezometers have shown a pattern of seasonable variation in groundwater level, with the highest groundwater levels typically recorded between the months of April and June. The seasonal variation in groundwater level is more pronounced in VW19-1A, which is installed closer to the ground surface at 5 m depth. Load cells VC2131, VC2136, VC2134, VC2133, and VC2130 showed increases in measured load, ranging from 0.66 kN in load cell VC2136 to 4.08 kN in VC2134 since the spring of 2025 readings. Load cells VC2132 and VC2135 showed decreases in measured load of 0.01 kN and 1.82 kN, respectively, since the spring of 2025 readings. The load cells have generally shown a pattern of seasonal variation in

	loads, with the highest loads typically recorded during the winter months. VC2135, VC2131, and VC2136 are currently above their design load by 0.99 kN, 8.97 kN, and 1.81 kN, respectively. The upper, middle, and lower strain gauges showed increases in total micro-strain of 4.72 με, 8.69 με and 17.06 με, respectively, since the spring of 2025 readings. In general, the strain gauge readings continue to reflect minimal bending stresses in the tied-back sheet pile wall. The instrumentation readings indicate that the pile walls have performed well since construction completion.
Future Work:	The instruments should be read again in the spring of 2026.
Instrumentation Repairs:	No instrument repairs are required at this time.
Additional Comments:	

Attachments:	▪ Table NC090-1 Fall 2025 – HWY 2:42 Baptiste Creek Bridge NW Approach Fill Landslide (BF7055), Slope Inclinometer Instrumentation Reading Summary ▪ Table NC090-2 Fall 2025 – HWY 2:42 Baptiste Creek Bridge NW Approach Fill Landslide (BF7055), Vibrating Wire and Standpipe Piezometer Instrumentation Reading Summary ▪ Table NC090-3 Fall 2025 – HWY 2:42 Baptiste Creek Bridge NW Approach Fill Landslide (BF7055), Vibrating Wire Load Cell Instrumentation Reading Summary ▪ Table NC090-4 Fall 2025 – HWY 2:42 Baptiste Creek Bridge NW Approach Fill Landslide (BF7055), Vibrating Wire Strain Gauge Instrumentation Reading Summary ▪ Statement for Use and Interpretation of Report ▪ APPENDIX A – NC090-1 FALL 2025 □ Field Inspector's report □ Site Plan and Cross Section Showing Approximate Instrument Locations (Drawings Nos. 32122-NC090 1 and 32122-NC090-2) □ SI Reading Plots □ Figure NC090-1 (Piezometric Data Plot) □ Figure NC090-2 (Load Cell Data Plot) □ Figure NC090-3 (Strain Gauge Data Plot)

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

November 12, 2025

November 12 2025

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
RM SIGNATURE: _____
RM APEGA ID #: 91085
DATE: November 12, 2025
PERMIT NUMBER: P005186
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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

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Table NC090-1 Fall 2025 – Hwy 2:42 Baptiste Creek Bridge NW Approach Fill Landslide (BF7055) Slope Inclinometer 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)
SI19-1	August 21, 2019	21.2 mm over 0.4 to 1.7 m depth in 126° direction	365 on Sep. 14, 2019	Operational	May 30, 2025	N/A	N/A	-21.2

Drawings 32122-NC090-1 and NC090-2 in Appendix A show approximate locations of the monitoring instrumentation at this site.

Table NC090-2: Fall 2025 – Hwy 2:42 Baptiste Creek Bridge NW Approach Fill Landslide (BF7055) Vibrating Wire Piezometer Instrumentation Reading Summary

Date Monitored: September 22, 2025

INSTRUMENT #	DATE INITIALIZED	TIP DEPTH (m)	CURRENT STATUS	MAXIMUM GROUNDWATER DEPTH (m)	CURRENT GROUNDWATER DEPTH (m)	PREVIOUS GROUNDWATER DEPTH (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
VW19-1A(1) (4060)	August 21, 2019	5.0	Operational	1.98 on September 10, 2019	4.51	3.12	-1.39
VW19-1B(1) (4061)	August 21, 2019	10.0	Operational	1.00 on June 18, 2020	2.09	2.14	0.05

Drawings 32122-NC090-1 and NC090-2 in Appendix A show approximate locations of the monitoring instrumentation at this site.

Notes:

(1) Vibrating wire piezometer data is recorded daily through on-site datalogger and is downloaded twice annually during the instrumentation readings.

Table NC090-3: Fall 2025 – Hwy 2:42 Baptiste Creek Bridge NW Approach Fill Landslide (BF7055) Vibrating Wire Load Cell Instrumentation Reading Summary

Date Monitored: September 22, 2025

LOAD CELL SERIAL #	ANCHOR NUMBER	DESIGN LOAD / LOCK-OFF LOAD (kN)	MAXIMUM RECORDED LOAD (kN)	RECORDED LOAD [1] (SEPTEMBER 22, 2025) (kN)	PREVIOUS RECORDED LOAD [1] (MAY 30, 2025) (kN)	CHANGE IN LOAD SINCE PREVIOUS READING (kN)
VC2135	8	140/140	170.98 on February 25, 2025	140.99	142.81	-1.82
VC2132	12	210/210	223.76 on January 30, 2025	192.54	192.55	-0.01
VC2131	13	140/140	160.03 on February 23, 2025	148.97	147.40	1.57
VC2136	19	140/140	154.16 on February 21, 2025	141.81	141.15	0.66
VC2134	24	210/210	231.75 on March 5, 2023	194.81	190.73	4.08
VC2133	29	140/140	132.80 on February 22, 2025	119.24	117.97	1.27
VC2130	34	210/210	193.84 on January 14, 2024	178.77	177.60	1.17

Drawings 32122-NC090-1 and NC090-2 in Appendix A show approximate locations of the monitoring instrumentation at this site.

Notes:

1) Load cell data is recorded daily through existing datalogger on site. Datalogger data is downloaded twice annually during instrumentation readings.

Table NC090-4: Fall 2025 – Hwy 2:42 Baptiste Creek Bridge NW Approach Fill Landslide (BF7055) Vibrating Wire Strain Gauge Instrumentation Reading Summary

Date Monitored: September 22, 2025

STRAIN GAUGE	ELEVATION	TOTAL MICROSTRAIN (1) (SEPTEMBER 22, 2025) (με)	PREVIOUS TOTAL MICROSTRAIN (1) (May 30, 2025) (με)	CHANGE IN MICROSTRAIN SINCE PREVIOUS READING (με)
Upper	585.5	36.98	32.26	4.72
Middle	584.0	55.30	46.61	8.69
Lower	582.5	65.64	48.58	17.06

Drawings 32122-NC090-1 and NC090-2 in Appendix A show approximate locations of the monitoring instrumentation at this site.

Notes:

(1) Strain Gauge data is recorded daily through existing datalogger on site. Datalogger data is downloaded twice annually during instrumentation readings.

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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.

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ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP (CON0022163)
NORTH CENTRAL (ATHABASCA AND FORT McMURRAY DISTRICTS)
INSTRUMENTATION MONITORING RESULTS

FALL 2025

APPENDIX A
DATA PRESENTATION AND DRAWINGS

SITE NC090: HWY 2:42 BAPTISTE CREEK BRIDGE
NW APPROACH FILL LANDSLIDE (BF7055)

ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
NORTH CENTRAL REGION - ATHABASCA AND FORT McMURRAY DISTRICTS
INSTRUMENTATION MONITORING FIELD SUMMARY (NC090)
FALL 2025

Location:	Baptiste Creek (HWY 2:42 C1 17.723)	**Readout:**	
File Number:	32122	**Casing Diameter:**	2.75"
Probe:	RST SET 8R	**Temp:**	16
Cable:	RST SET 8R	**Read by:**	AFC/NKR

SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (UTM 12)		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-			
SI19-1	338297	6071816	22-Sep-25	1.09	52 to 2	107	-2	16	76	-67	8R/8R	2.75	

VIBRATING WIRE LOAD CELL (VC) READINGS

VC#	Datalogger GPS Location (UTM 12)		Datalogger Serial #	Date	Comment
	Easting (m)	Northing (m)			
VC2130 to VC2136	338298	6071815	Campbell Scientific 10671	22-Sep-25	Downloaded

VIBRATING WIRE STRAIN GAUGE (SG) READINGS

SG #	Datalogger GPS Location (UTM 12)		Datalogger Serial #	Date	Comment
	Easting (m)	Northing (m)			
3 RST strain gauges	338298	6071815	Campbell Scientific 10671	22-Sep-25	Downloaded

VIBRATING WIRE PIEZOMETER (VW) READINGS

VW #	Serial #	GPS Location (UTM 12)		Datalogger Serial #	Date	Comment
		Easting (m)	Northing (m)			
VW19-1A	4060	338298	6071815	CS 10671	22-Sep-25	Downloaded
VW19-1B	4061					Downloaded

INSPECTOR REPORT

7 load cells, 3 VW strain gauges and 2 VW Piezometers are wired to a Campbell Scientific CR6 datalogger mounted on the west face of the sheet pile wall

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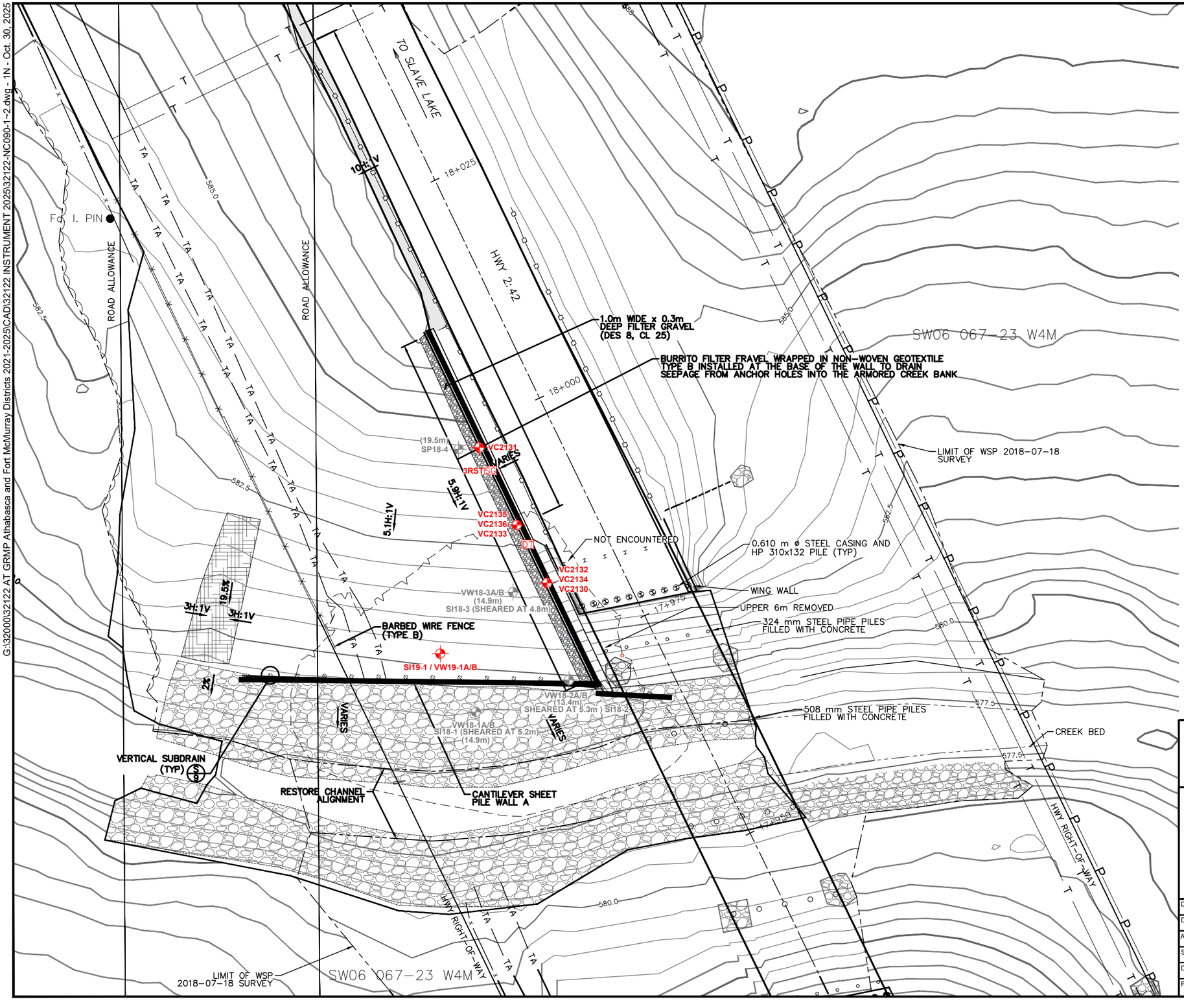

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W E
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LEGEND

- NEW INSTRUMENT LOCATION
- INSTRUMENT LOCATION (SHEARED OFF/DAMAGED DURING CONSTRUCTION)
- CP CONTROL POINT
- VERTICAL DRAIN
- DT DATA LOGGER
- SG STRAIN GAUGE
- STABILIZED LANDSLIDE AREA
- EXISTING CLASS 1M RIPRAP
- DESIGN GRADING LIMITS
- CLASS 1 RIPRAP
- TRM TYPE C
- —T— TELUS LINE (APPROXIMATE)
- —TA— ABANDONED TELUS LINE
- —X— BARBED WIRE FENCE
- —x— NEW TYPE B FENCE
- —P— OVERHEAD POWER LINE (APPROXIMATE)
- TREELINE
- GUARD RAIL
- 582 GROUND SURFACE CONTOUR
- Fd. I. PIN FOUND IRON PIN

0 5 10 15 20 25m

SCALE 1:400

Alberta

NORTH CENTRAL
(ATHABASCA AND FORT MCMURRAY DISTRICTS)

NC090: HWY 2:42 BAPTISTE CREEK BRIDGE (BF7055)
SITE PLAN SHOWING APPROXIMATE INSTRUMENT LOCATIONS

DWG No. 32122-NC090-1

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	TSA
SCALE	1:400
DATE	OCTOBER 2025
FILE No.	32122

THURBER

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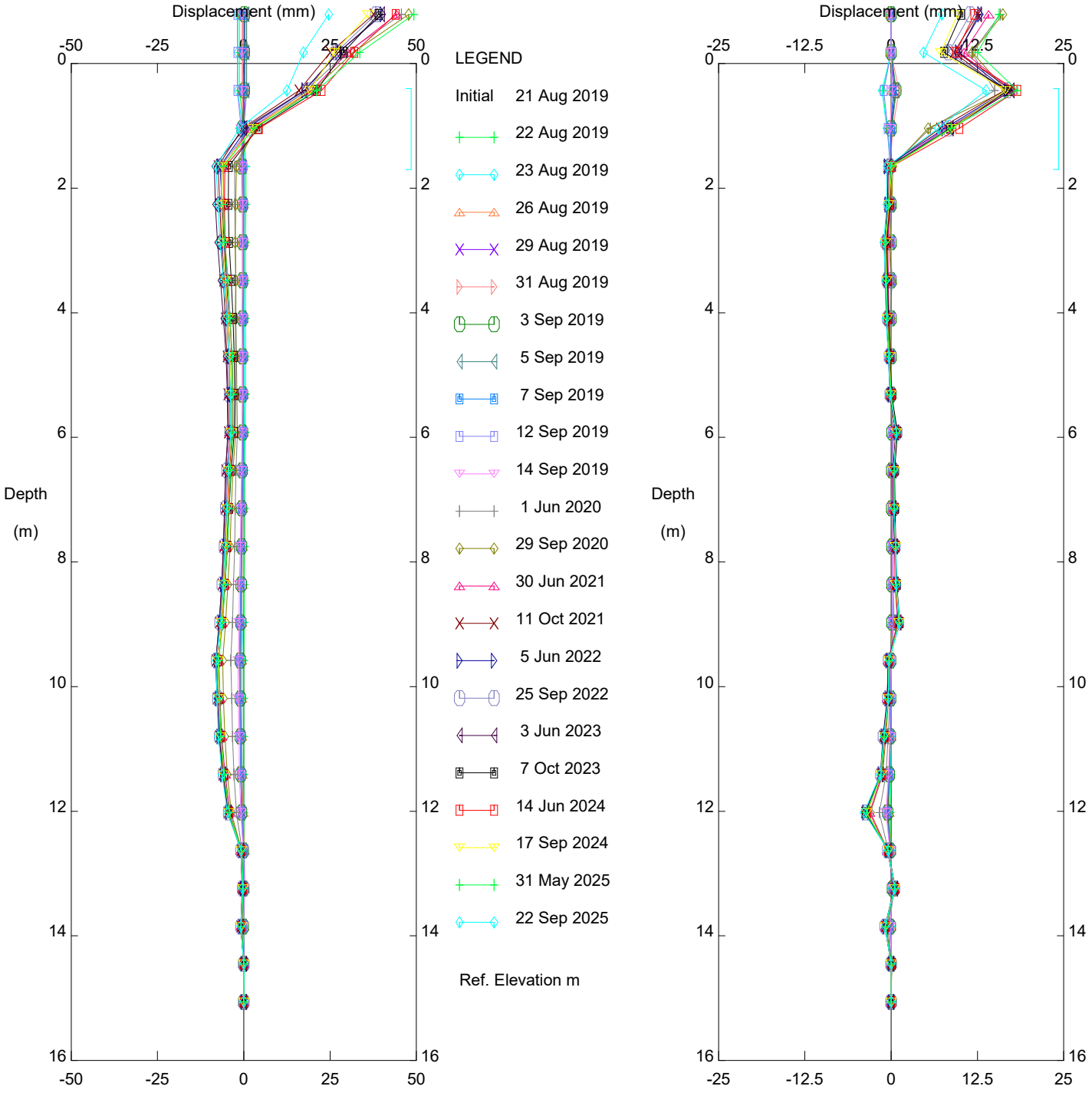

Cumulative Displacement

Direction A

Incremental Displacement

Direction A

Hwy 2:42 Baptiste Creek Bridge, Inclinometer SI19-1

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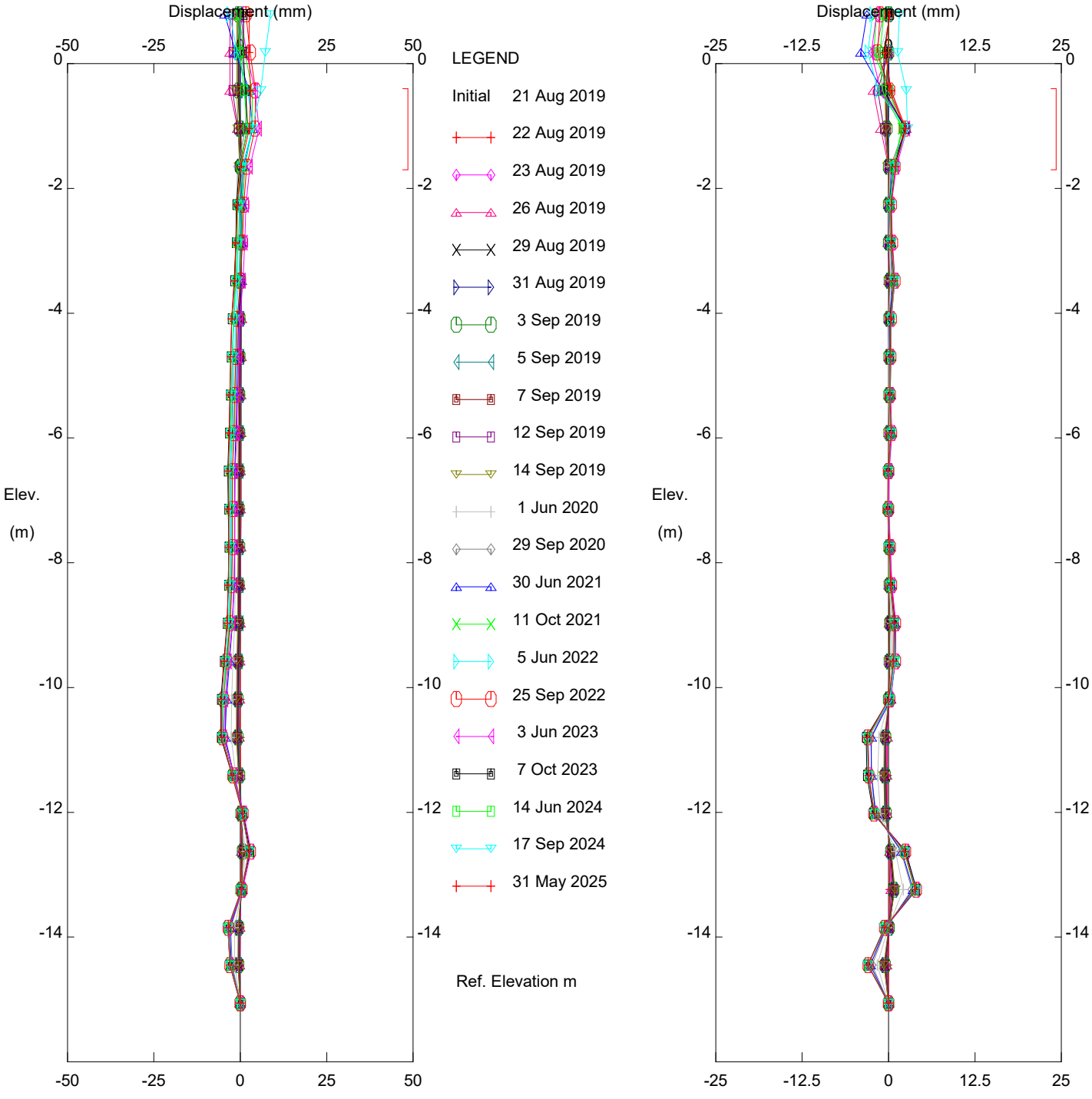

Cumulative Displacement

Direction B

Incremental Displacement

Direction B

Hwy 2:42 Baptiste Creek Bridge, Inclinometer SI19-1

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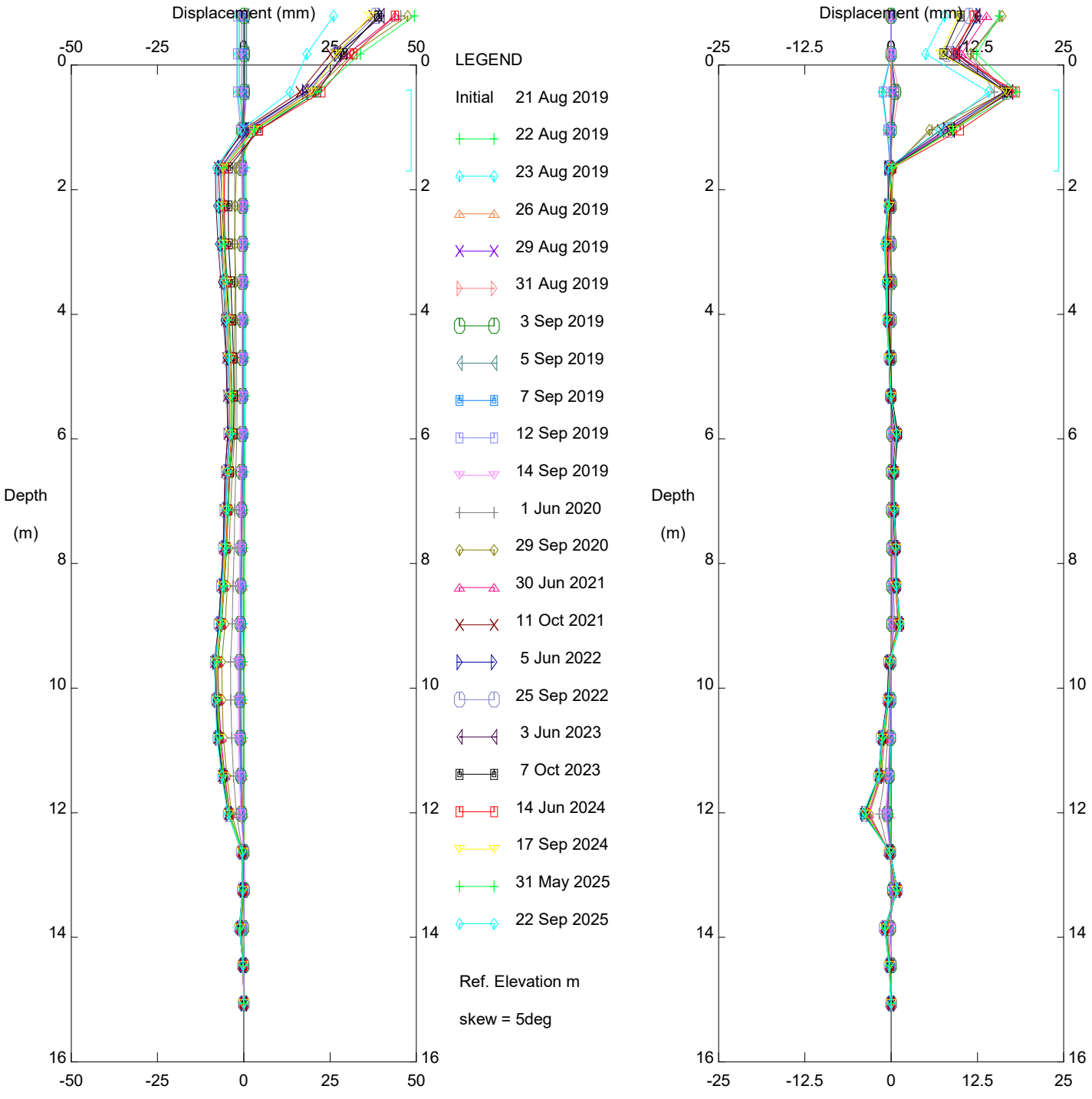

Cumulative Displacement

Direction X

Incremental Displacement

Direction X

Hwy 2:42 Baptiste Creek Bridge, Inclinometer SI19-1

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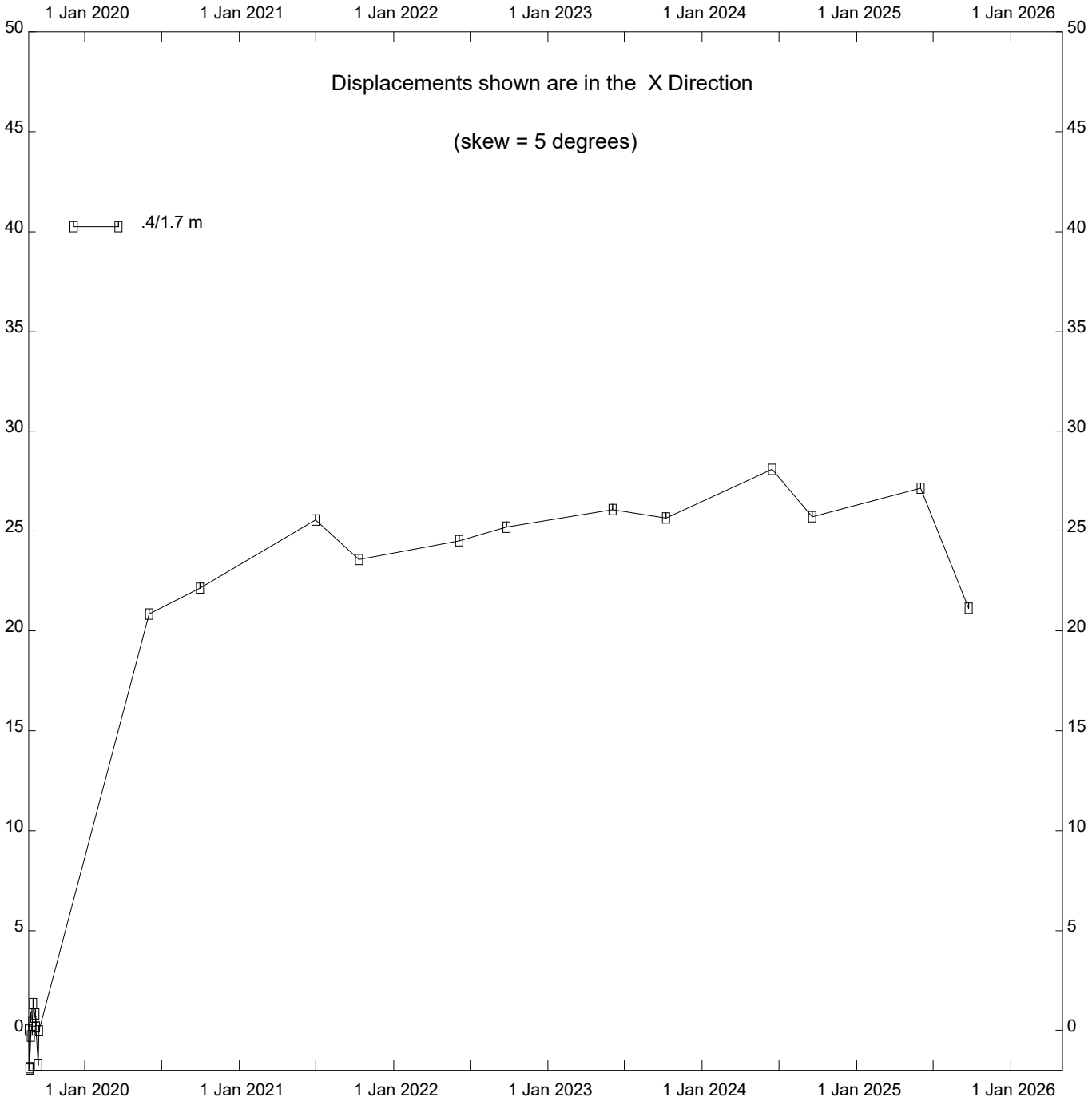

Hwy 2:42 Baptiste Creek Bridge, Inclinometer SI19-1

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FIGURE NC090-1
PIEZOMETER DATA FOR HWY 2:42 BAPTISTE CREEK

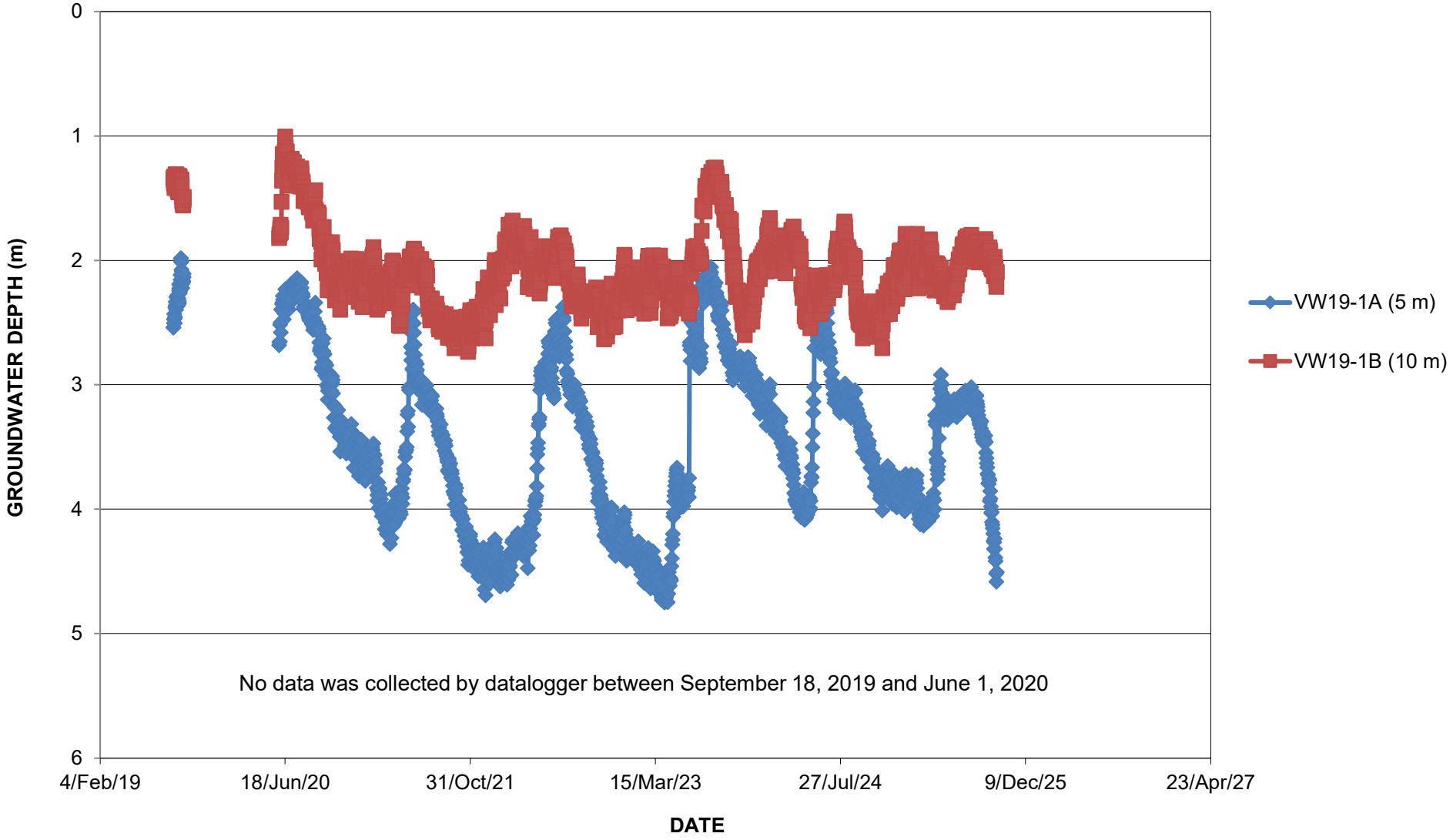

FIGURE NC090-2
LOAD CELL DATA FOR HWY 2:42 BAPTISTE CREEK

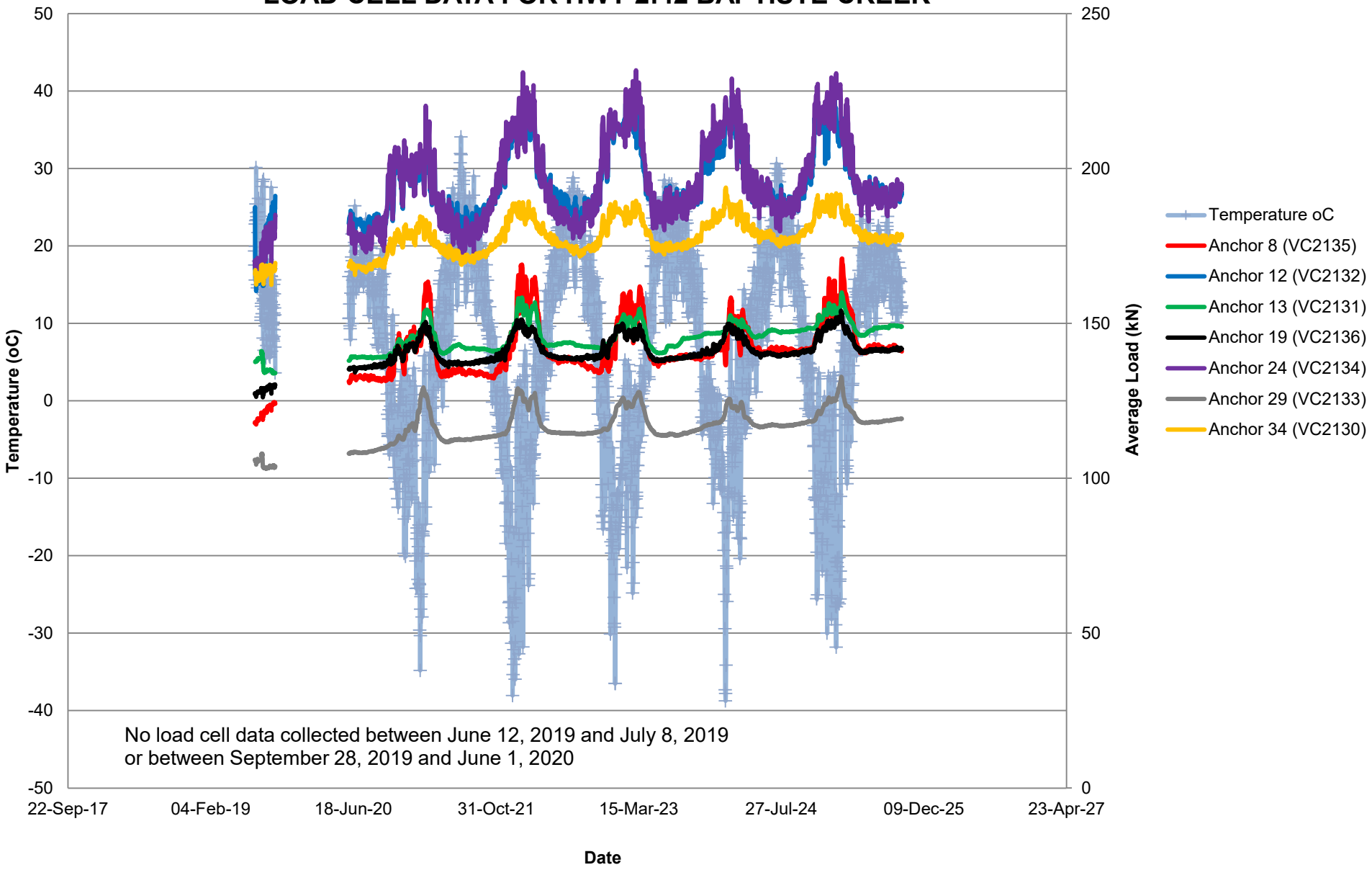

FIGURE NC090-3
STRAIN GAUGE DATA FOR HWY 2:42 BAPTISTE CREEK