

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



| Site Number               | Location          | Name                    | Hwy   | km      |
|---------------------------|-------------------|-------------------------|-------|---------|
| NC106                     | HWY 63:08 km 27.9 | Pavement Distress       | 63:08 | 27.9    |
| <b>Legal Description:</b> |                   | <b>UTM Co-ordinates</b> |       |         |
| 7-16-83-24 W5             |                   | 11V E 455134            | N     | 6227955 |

|                             |                                                            |                            |             |
|-----------------------------|------------------------------------------------------------|----------------------------|-------------|
| <b>Current Monitoring:</b>  | 17-Sep-2025                                                | <b>Previous Monitoring</b> | 30-May-2025 |
| <b>Instruments Read By:</b> | Mr. Niraj Regmi, G.I.T and Mr. Angelo Castillo, of Thurber |                            |             |

| Instruments Read During This Site Visit  |                                           |                                                |                                                                                                                                                                                                                                                             |
|------------------------------------------|-------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Slope Inclinometers (SIs):</b><br>N/A | <b>Pneumatic Piezometers (PN):</b><br>N/A | <b>Vibration Wire Piezometers (VW):</b><br>N/A | <b>Standpipe Piezometers (SP):</b><br>N/A                                                                                                                                                                                                                   |
| <b>Load Cell (LC):</b><br>N/A            | <b>Strain Gauges:</b><br>N/A              | <b>SAA's:</b><br>N/A                           | <b>Others:</b><br><br><b>Extensometer strings:</b><br>EXT21-1 and EXT21-2<br><br><b>Thermistor arrays:</b><br>THERM21-2 and THERM21-3 (Cematrix test section)<br>THERM21-1 (Pavement Control)<br>THERM 21-4 (Grassed Control)<br><br><b>Weather Station</b> |

| Readout Equipment Used      |                               |                                    |                                                                                          |
|-----------------------------|-------------------------------|------------------------------------|------------------------------------------------------------------------------------------|
| <b>Slope Inclinometers:</b> | <b>Pneumatic Piezometers:</b> | <b>Vibration Wire Piezometers:</b> | <b>Standpipe Piezometers:</b>                                                            |
| <b>Load Cell:</b>           | <b>Strain Gauges:</b>         | <b>SAA's:</b>                      | <b>Others:</b><br>All readings were downloaded from a Campbell Scientific CR6 datalogger |
| <b>Notes:</b>               |                               |                                    |                                                                                          |

| Discussion                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Zones of New Movement:</b>                | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Interpretation of Monitoring Results:</b> | <p>The extensometer data is summarized in Table NC106-1 below and is plotted in Figures NC106-1 and NC106-2 in Appendix A. Extensometer EXT21-1, installed towards the southern end of the Cematrix repair section, shows a current total settlement of 3.1 mm. This is the same settlement since it was previously read on May 30, 2025. EXT21-2, installed towards the northern end of the Cematrix repair section, shows a current total settlement of 15.2 mm. This corresponds to an overall increase in settlement of 0.7 mm since it was previously read on May 30, 2025. At both locations, the majority of the settlement is occurring within the peat layer.</p> <p>The south extensometer (EXT21-1) has shown a pattern of about 3 mm of frost heave in the previous three winter seasons despite a constant amount of settlement during the spring and summer seasons which increased to just over 4 mm in the most-recent winter. The trend at the north extensometer (EXT21-2) is reversed as the heave amount has been steadily decreasing while the amount of summer settlement initially increased. At both extensometer locations, the settlement seems to have stabilized, despite the seasonal variability, and most of this settlement occurred about 13 months after construction.</p> <p>The thermistor results from the monitoring period are summarized in Table NC106-2 and the plots are presented in Figures NC106-3 to NC106-6. The near-surface temperature nodes from each of the thermistor arrays have been compared to the ambient temperature readings, and the results are plotted in Figure NC106-7. To compare the influence of the Cematrix on temperatures at depth, the 1.1 m to 1.3 m thermistor readings from all four locations are plotted in Figure NC106-8.</p> <p>The results indicate the following:</p> <ul style="list-style-type: none"> <li>(a) THERM21-1, installed south of the Cematrix repair zone, shows highly variable temperature readings within its shallowest thermistor nodes (above 1.1 m) reflecting changes in ambient air temperatures (Figure NC106-3). The thermistor nodes below 1.1 m have generally shown less fluctuations in temperatures. The nodes at 2.1 m and 3.1 m depth have recently shown significant scatter in the readings, possibly indicating issues with the sensors.</li> </ul> <p>A similar trend of fluctuating temperatures in response to changes in ambient temperature has been noted in the nodes above 1.3 m in THERM21-2 and THERM21-3, installed within the Cematrix repair section and in THERM21-4 installed within the grass covered area (Figures NC106-4 to NC106-6). The thermistor nodes below 1.3 m at all four locations has generally shown less fluctuations in temperatures.</p> <p>At THERM21-3, installed within the Cematrix repair section, the thermistors at 0.3 m, 1.3 m, 2.3 m, and 3.3 m depth, stopped functioning after March 24, 2025.</p> <ul style="list-style-type: none"> <li>(b) As expected, the ground temperature reduces with depth at all thermistor array locations (Figures NC106-3 to NC106-6).</li> <li>(c) The near-surface temperature nodes closely follow the trend of the ambient air temperatures. In addition, the shallow temperatures measured in the paved areas are significantly higher in the summer and colder in the winter compared to the grassed area (Figure NC106-7) as the grass and accumulated snow in the winter provide more insulation.</li> </ul> |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | (d) Figure NC106-8 shows that the thermistor nodes within the upper 1.3 m in the Cematrix section are less impacted by the changes in temperature when compared to the thermistor node within the upper 1.1 m of the pavement control section due to the insulating properties of the Cematrix. The results from THERM21-2 and THERM21-3 have also demonstrated that the insulating properties of the Cematrix reduced the temperatures below 1.3 m depth, and fluctuation in temperatures between the seasons in the treated section of the highway. |
| <b>Future Work:</b>             | As discussed in the June 11, 2025, meeting with TEC and Cematrix (who supplied the instrumentation), this site will be discontinued from the program as the repair is functioning as intended and the data collected has been sufficient to demonstrate the effectiveness of the repair method.                                                                                                                                                                                                                                                       |
| <b>Instrumentation Repairs:</b> | <p>The wires at the datalogger junction were confirmed to be installed correctly; therefore, the issue with noise and missing readings likely lies within the wires of the thermistors themselves.</p> <p>It is not economical to replace the thermistors as that would involve drilling and trenching through the highway surface. The functioning thermistors should continue to be monitored as long as they are functional or until the site is removed from the program.</p>                                                                     |
| <b>Additional Comments:</b>     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Attachments:</b> | <ul style="list-style-type: none"> <li>▪ Table NC106-1 Fall 2025 – HWY 63:08 km 27.9 Pavement Distress, Extensometer Instrumentation Reading Summary</li> <li>▪ Table NC106-2 Fall 2025 – HWY 63:08 km 27.9 Pavement Distress, Thermistor Array Instrumentation Reading Summary</li> <li>▪ Table NC106-3 Fall 2025 – HWY 63:08 km 27.9 Pavement Distress, Weather Station Instrumentation Reading Summary</li> <li>▪ Statement for Use and Interpretation of Report</li> <li>▪ APPENDIX A – NC106-1 FALL 2025 <ul style="list-style-type: none"> <li>□ Field Inspector's report</li> <li>□ Site Plan and Cross Sections Showing Approximate Instrument Locations (Drawings No. 32122-NC106-1 to 32122-NC106-3)</li> <li>□ Figures NC106-1 and NC106-2 (Extensometer Data Plots)</li> <li>□ Figures NC106-3 through NC106-6 (Individual Thermistor Array Plots)</li> <li>□ Figure NC106-7 (Composite Plot of Shallow Thermistor Array Nodes and Ambient Air Temperature)</li> <li>□ Figure NC106-8 (Composite Plot of 1.1 m – 1.3 m depth Thermistor Array Nodes and Ambient Air Temperature)</li> </ul> </li> </ul> |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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

Ken Froese, M.Eng., P. Eng.  
Senior Associate | Senior Geotechnical Engineer

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

**Table NC106-1: Fall 2025 – Hwy 63:08 Km 27.9 Pavement Distress Extensometer Instrumentation Reading Summary**

Date Monitored: September 17, 2025 (Monitoring period from May 30, 2025, to September 17, 2025)

| SETTLEMENT ZONE <sup>(1)</sup>                                       | DATE INITIALIZED | CURRENT STATUS | CURRENT SETTLEMENT (mm) | PREVIOUS SETTLEMENT (mm)<br>(Sept 17, 2024) | CHANGE IN SETTLEMENT (mm) <sup>(2)</sup> |
|----------------------------------------------------------------------|------------------|----------------|-------------------------|---------------------------------------------|------------------------------------------|
| EXT21-1                                                              |                  |                |                         |                                             |                                          |
| Total Settlement<br>(0 m to 5.83 m depth)                            | May 18, 2021     | Operational    | 3.1                     | 3.1                                         | 0                                        |
| Settlement in Clay Till<br>(4.83 m to 5.83 m depth)                  |                  |                | 0                       | 0.2                                         | -0.2                                     |
| Settlement in Peat<br>(1.33 m to 4.83 m depth)                       |                  |                | 2.3                     | 2.1                                         | 0.2                                      |
| Settlement in Cematrix,<br>Clay Cap and GBC<br>(0 m to 1.33 m depth) |                  |                | 0.8                     | 0.8                                         | 0                                        |
| EXT21-2                                                              |                  |                |                         |                                             |                                          |
| Total Settlement<br>(0 m to 5.76 m depth)                            | May 18, 2021     | Operational    | 15.2                    | 14.5                                        | 0.7                                      |
| Settlement in Clay Till<br>(4.76 m to 5.76 m depth)                  |                  |                | 0.8                     | 0.9                                         | -0.1                                     |
| Settlement in Peat<br>(1.26 m to 4.76 m depth)                       |                  |                | 10.6                    | 9.6                                         | 1.0                                      |
| Settlement in Cematrix,<br>Clay Cap and GBC<br>(0 to 1.26 m depth)   |                  |                | 3.8                     | 4.0                                         | -0.2                                     |

Drawings 32122-NC106-1 through 32122-NC106-3 in Appendix A provide sketches of the approximate locations and depths of the monitoring instrumentation for this site.

- Notes: (1) Depth measured from top of granular base coarse (GBC)  
 (2) Negative (-) change in relative settlement indicates upward movement (heave) and positive (+) change in settlement indicates downward movement (settlement)

**Table NC106-2: Fall 2025 – Hwy 63:08 Km 27.9 Pavement Distress Thermistor Array Instrumentation Reading Summary**

Date Monitored: September 17, 2025 (Monitoring period from May 30, 2025, to September 17, 2025)

| NODE DEPTH <sup>(1)</sup><br>(m) | DATE<br>INITIALIZED | CURRENT<br>STATUS | MAX TEMPERATURE<br>OVER MONITORING<br>PERIOD<br>(°C) | MIN TEMPERATURE<br>OVER MONITORING<br>PERIOD<br>(°C) | MEAN TEMPERATURE<br>DURING MONITORING<br>PERIOD<br>(°C) |
|----------------------------------|---------------------|-------------------|------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------|
| THERM21-1 (Pavement Control)     |                     |                   |                                                      |                                                      |                                                         |
| 0.1                              | June 6, 2021        | Operational       | 25.2 (Aug. 3, 2025)                                  | 13.7 (June 8, 2025)                                  | 19.8                                                    |
| 1.1                              |                     |                   | 20.6 (Sep. 2, 2025)                                  | 12.2 (May 30, 2025)                                  | 16.5                                                    |
| 2.1                              |                     |                   | 27.5 (Aug. 18, 2025)                                 | 6.8 (May 30, 2025)                                   | 16.3                                                    |
| 3.1                              |                     |                   | 29.7 (Aug. 19, 2025)                                 | 4.1 (May 30, 2025)                                   | 16.2                                                    |
| 4.1                              |                     |                   | 12.3 (Sep. 17, 2025)                                 | 2.6 (May 30, 2025)                                   | 6.9                                                     |
| 5.1                              |                     |                   | 8.5 (Sep. 17, 2025)                                  | 2.4 (May 30, 2025)                                   | 5.2                                                     |
| THERM21-2 (Cematrix section)     |                     |                   |                                                      |                                                      |                                                         |
| 0.1                              | June 6, 2021        | Operational       | 26.1 (Aug. 4, 2025)                                  | 16.0 (June 15, 2025)                                 | 20.7                                                    |
| 0.4                              |                     |                   | 26.3 (Aug. 4, 2025)                                  | 17.3 (June 15, 2025)                                 | 21.5                                                    |
| 0.8                              |                     |                   | 22.4 (Aug. 4, 2025)                                  | 14.6 (June 17, 2025)                                 | 18.2                                                    |
| 1.3                              |                     |                   | 12.1 (Aug. 3, 2025)                                  | 5.9 (May 30, 2025)                                   | 9.9                                                     |
| 2.3                              |                     |                   | 10.6 (Sep. 17, 2025)                                 | 4.6 (May 30, 2025)                                   | 8.1                                                     |
| 3.3                              |                     |                   | 8.4 (Sep. 15 to 17, 2025)                            | 3.3 (May 30, 2025)                                   | 6.1                                                     |

Drawings 32122-NC106-1 through 32122-NC106-3 in Appendix A provide sketches of the approximate locations and depths of the monitoring instrumentation for this site.

Notes: (1) Depth measured from top of granular base coarse (GBC)

**Table NC106-2 – Continued: Fall 2025 – Hwy 63:08 Km 27.9 Pavement Distress Thermistor Array Instrumentation Reading Summary**

Date Monitored: September 17, 2025 (Monitoring period from May 30, 2025, to September 17, 2025)

| Node Depth <sup>(1)</sup><br>(m) | Date<br>Initialized | Current<br>Status | Max Temperature Over<br>Monitoring Period<br>(°C) | Min Temperature<br>Over Monitoring<br>Period<br>(°C) | Mean Temperature<br>During Monitoring<br>Period<br>(°C) |
|----------------------------------|---------------------|-------------------|---------------------------------------------------|------------------------------------------------------|---------------------------------------------------------|
| THERM21-3 (Cematrix Section)     |                     |                   |                                                   |                                                      |                                                         |
| 0.3                              | June 6, 2021        | Damaged           | (N/A)                                             | (N/A)                                                | (N/A)                                                   |
| 1.3                              |                     | Damaged           | (N/A)                                             | (N/A)                                                | (N/A)                                                   |
| 2.3                              |                     | Damaged           | (N/A)                                             | (N/A)                                                | (N/A)                                                   |
| 3.3                              |                     | Damaged           | (N/A)                                             | (N/A)                                                | (N/A)                                                   |
| 4.3                              |                     | Operational       | 5.2 (Sep. 17, 2025)                               | 3.4 (Aug. 4, 2025)                                   | 4.6                                                     |
| 5.3                              |                     | Operational       | 4.8 (Sep. 17, 2025)                               | 4.2 (July 3, 2025)                                   | 4.4                                                     |
| THERM21-4 (Grassed Control)      |                     |                   |                                                   |                                                      |                                                         |
| 0.3                              | June 6, 2021        | Operational       | 14.4 (Aug. 31, 2025)                              | 0.9 (May 30, 2025)                                   | 10.8                                                    |
| 1.3                              |                     | Damaged           | (N/A)                                             | (N/A)                                                | (N/A)                                                   |
| 2.3                              |                     | Operational       | 5.8 (Sep 17, 2025)                                | 1.5 (Aug. 12, 2025)                                  | 4.1                                                     |
| 3.3                              |                     | Operational       | 4.5(Sep. 16, 2025)                                | -1.1 (Aug. 27, 2025)                                 | 3.9                                                     |
| 4.3                              |                     | Operational       | 4.8 (May 30, 2025)                                | 4.5 (July 25, 2025)                                  | 4.6                                                     |
| 5.3                              |                     | Operational       | 4.8 (May 30, 2025)                                | 4.5 (Aug. 6, 2025)                                   | 4.6                                                     |

Drawings 32122-NC106-1 through 32122-NC106-3 in Appendix A provide sketches of the approximate locations of the monitoring instrumentation for this site.

Notes: (1) Depth measured from top of GBC (THERM21-3), from ground surface (THERM21-4)

Maximum and minimum temperatures selected from measurements deemed reasonable and not the results of instrumentation error or fluctuations.

**Table NC106-3: Fall 2025 – Hwy 63:08 Km 27.9 Pavement Distress Weather Station Instrumentation Reading Summary**

Date Monitored: September 17, 2025 (Monitoring period from May 30, 2025, to September 17, 2025)

| MONITORING PERIOD                   | MAX TEMPERATURE (°C)  | MIN TEMPERATURE (°C) | MEAN TEMPERATURE (°C) | TOTAL PRECIPITATION (mm) | MAX HOURLY WIND SPEED (m/s) | MEAN HOURLY WIND SPEED (m/s) | MEAN BAROMETRIC PRESSURE (mbar) | MEAN RELATIVE HUMIDITY (%) |
|-------------------------------------|-----------------------|----------------------|-----------------------|--------------------------|-----------------------------|------------------------------|---------------------------------|----------------------------|
| May 30, 2025, to September 17, 2025 | 30.2<br>Aug. 28, 2025 | 3.1<br>June 8, 2025  | 15.6                  | 70                       | 17.8<br>June 7, 2025        | 5.2                          | 936.9                           | 75.5                       |

Drawings 32122-NC106-1 through 32122-NC106-2 in Appendix A provide sketches of the approximate locations 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 DRAWINGS**

**SITE NC106: HWY 63:08 km 27.9 PAVEMENT DISTRESS**

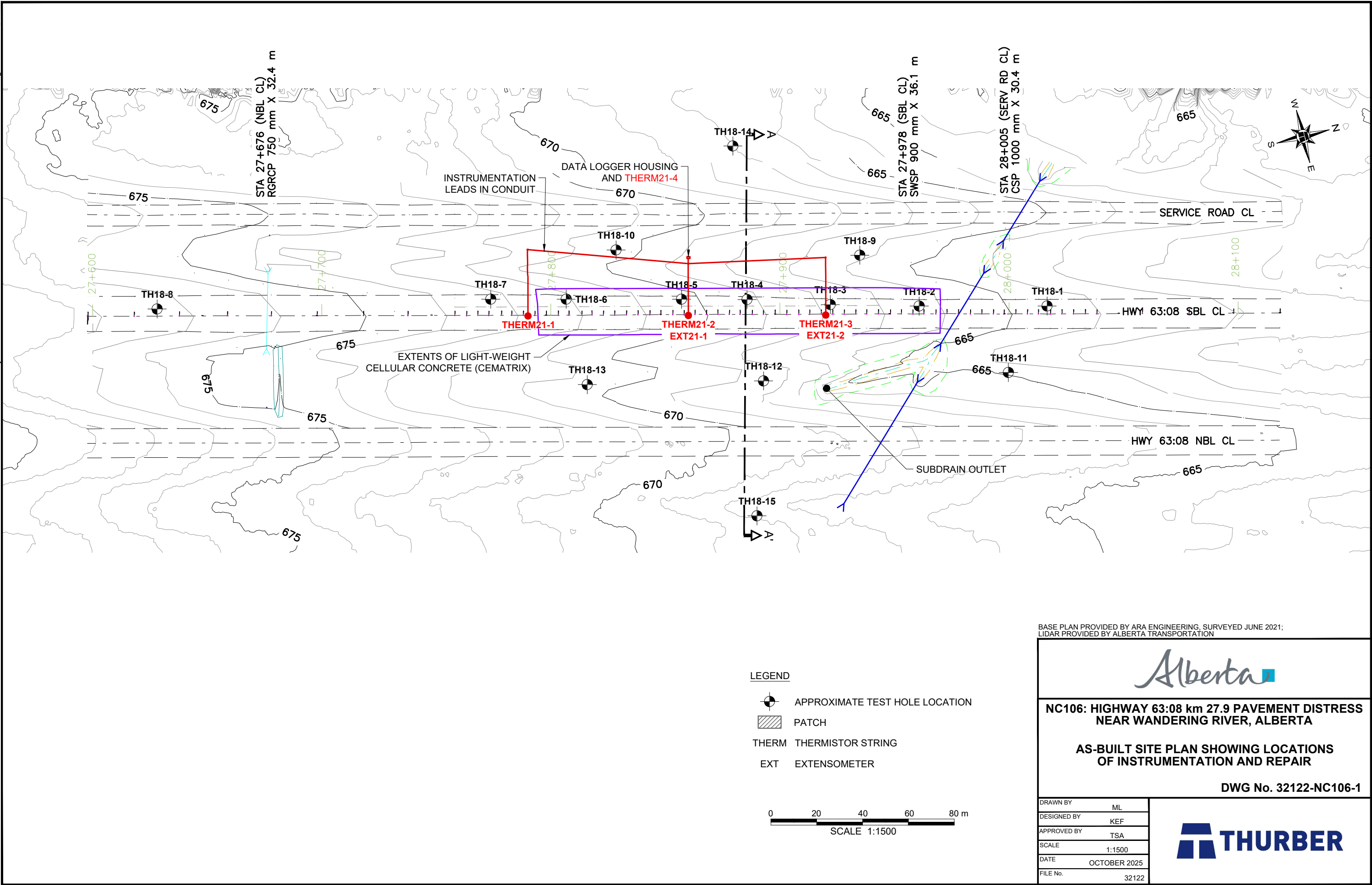
**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS  
NORTH CENTRAL REGION - ATHABASCA AND FORT McMURRAY DISTRICTS  
INSTRUMENTATION MONITORING FIELD SUMMARY (NC106)  
FALL 2025**

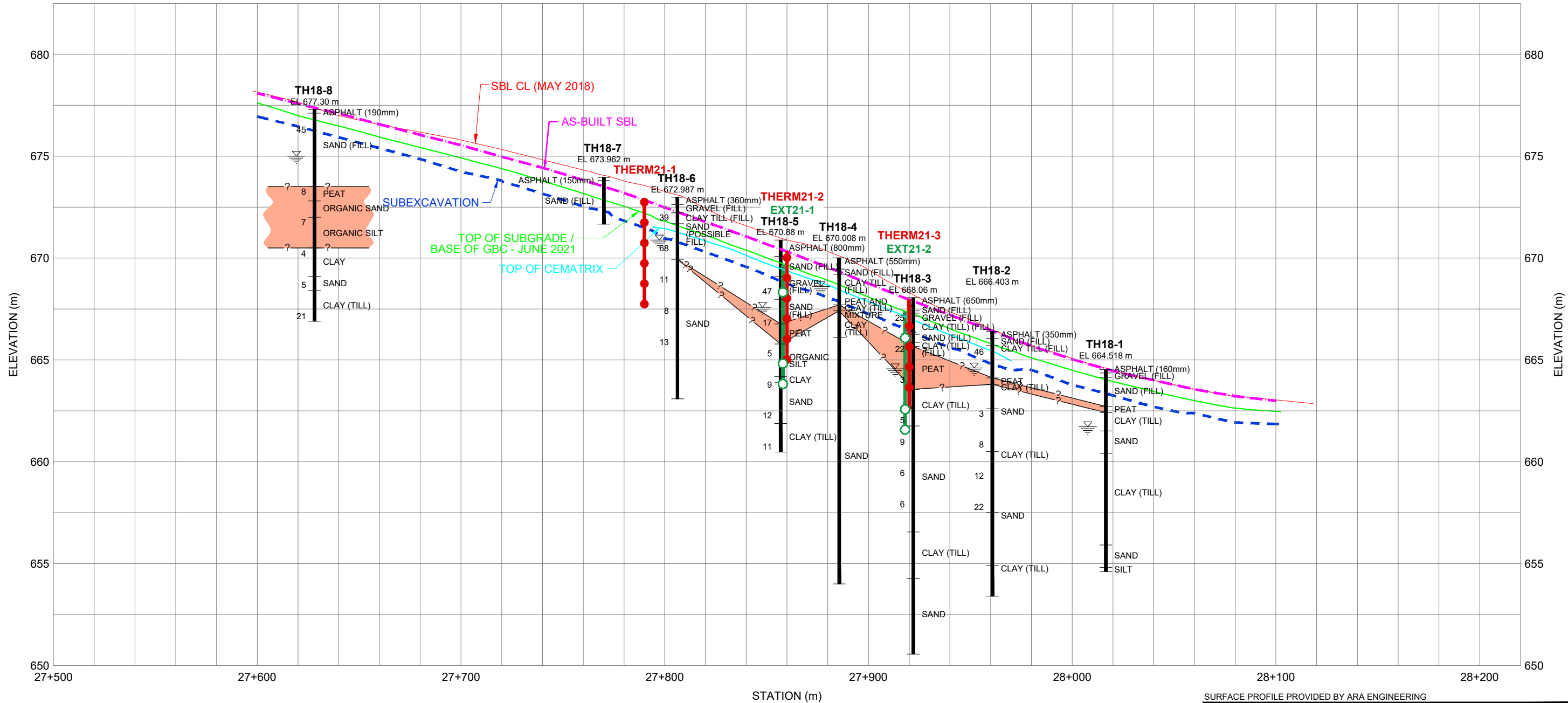
|                                                      |                         |
|------------------------------------------------------|-------------------------|
| <b>Location:</b> Hwy 63:08 km 27.9 Pavement Distress | <b>Temp (deg C):</b> 24 |
| <b>File Number:</b> 32122                            | <b>Read by:</b> NKR/AFC |

**DATALOGGER STATION READINGS**

| Instruments                                          | GPS Location<br>(UTM 12) |              | Datalogger Serial # | Date      | Remarks         |
|------------------------------------------------------|--------------------------|--------------|---------------------|-----------|-----------------|
|                                                      | Easting (m)              | Northing (m) |                     |           |                 |
| Extensimeters,<br>thermistors and<br>weather station | 455134.00                | 6227955.00   | CR6 15875           | 17-Sep-25 | Data downloaded |

|                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------|
| Confirm that recent dates have been downloaded for all DAT files prior to leaving site. Use "collect now" option in loggernet. |
| Download data from CR6 logger - need unique key to unlock logger enclosure                                                     |
| Site is between km marker 174 and 176 on southbound lane of Hwy 63                                                             |
| New Program uploaded during readings                                                                                           |





LEGEND

- SPT N VALUE
- WATER LEVEL IN HOLE AT END OF DRILLING
- THERMISTOR (THERM) NODE
- EXTENSOMETER (EXT) ANCHORS

NOTE

DATA CONCERNING THE VARIOUS STRATA HAVE BEEN OBTAINED AT THE TEST HOLE LOCATIONS ONLY. THE SOIL STRATIGRAPHY BETWEEN TEST HOLES HAS BEEN INFERRED FROM GEOLOGICAL EVIDENCE AND SO MAY VARY FROM THAT SHOWN.

SURFACE PROFILE PROVIDED BY ARA ENGINEERING



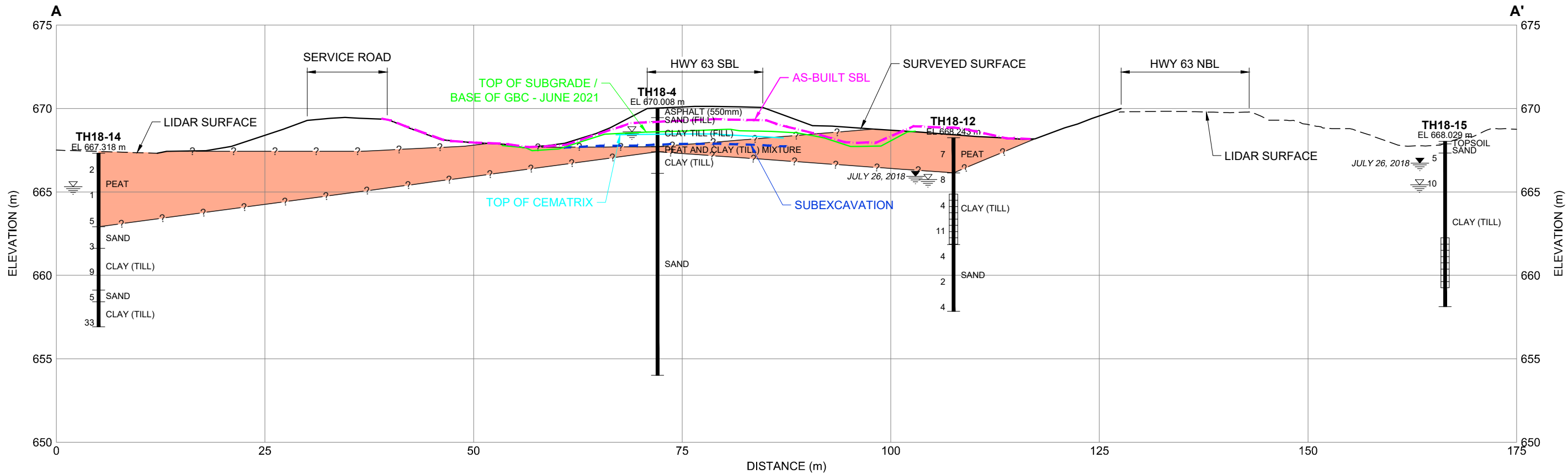
NC106: HIGHWAY 63:08 km 27.9 PAVEMENT DISTRESS  
NEAR WANDERING RIVER, ALBERTA

AS-BUILT PROFILE ALONG ROAD

DWG No. 32122-NC106-2

|             |                  |
|-------------|------------------|
| DRAWN BY    | ML               |
| DESIGNED BY | KEF              |
| APPROVED BY | TSA              |
| SCALE       | H 1:2000 V 1:200 |
| DATE        | OCTOBER 2025     |
| FILE No.    | 32122            |





LEGEND

- 15 SPT N VALUE
- WATER LEVEL IN HOLE AT END OF DRILLING
- WATER LEVEL IN PIEZOMETER
- STANDPIPE PIEZOMETER SCREENED INTERVAL

NOTES

1. INSTRUMENTATION NOT SHOWN FOR CLARITY
2. DATA CONCERNING THE VARIOUS STRATA HAVE BEEN OBTAINED AT THE TEST HOLE LOCATIONS ONLY. THE SOIL STRATIGRAPHY BETWEEN TEST HOLES HAS BEEN INFERRED FROM GEOLOGICAL EVIDENCE AND SO MAY VARY FROM THAT SHOWN.

BASE PLAN PROVIDED BY ARA ENGINEERING



NC106: HIGHWAY 63:08 km 27.9 PAVEMENT DISTRESS  
NEAR WANDERING RIVER, ALBERTA

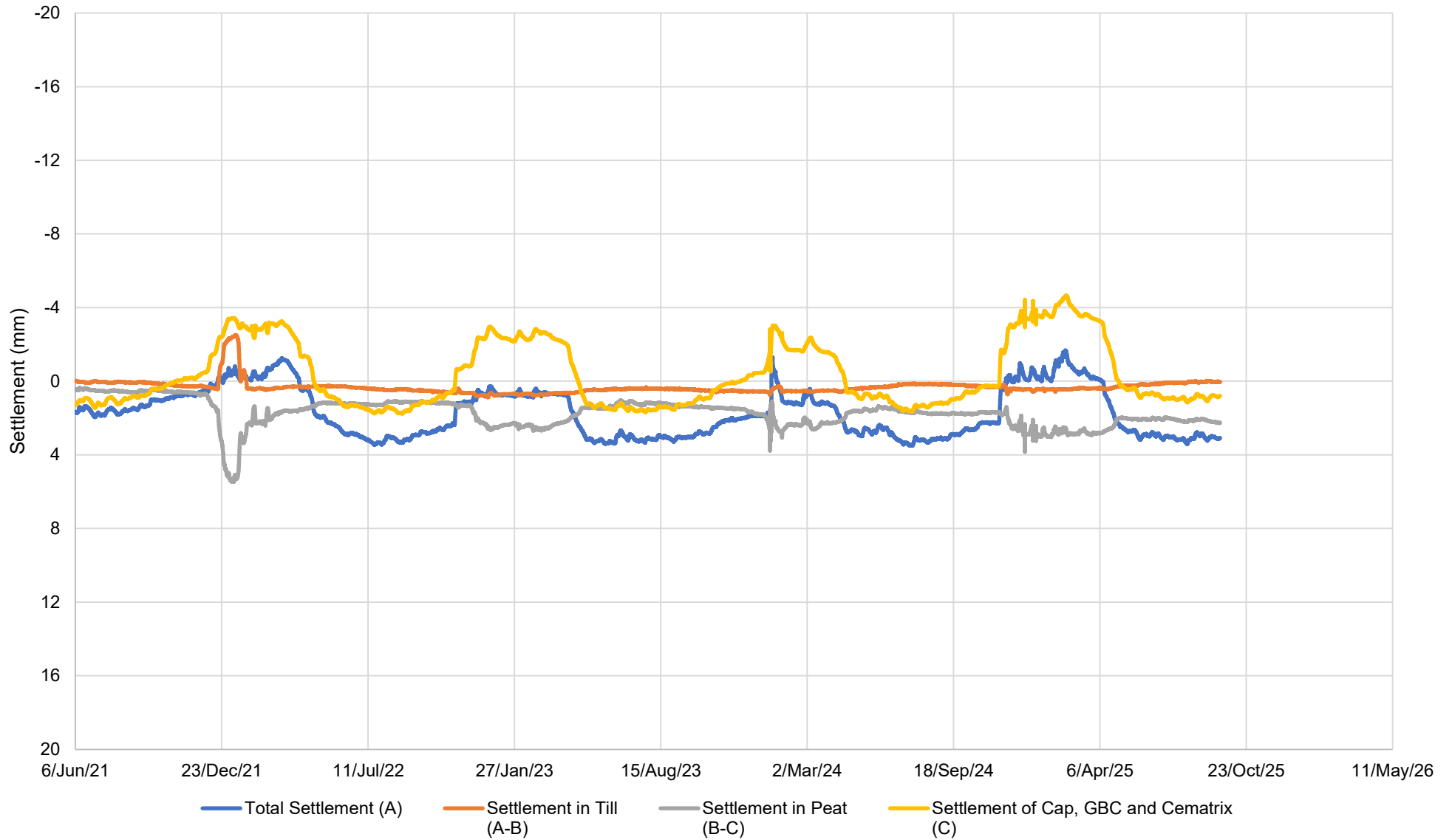
AS-BUILT CROSS-SECTION A-A'

DWG No. 32122-NC106-3

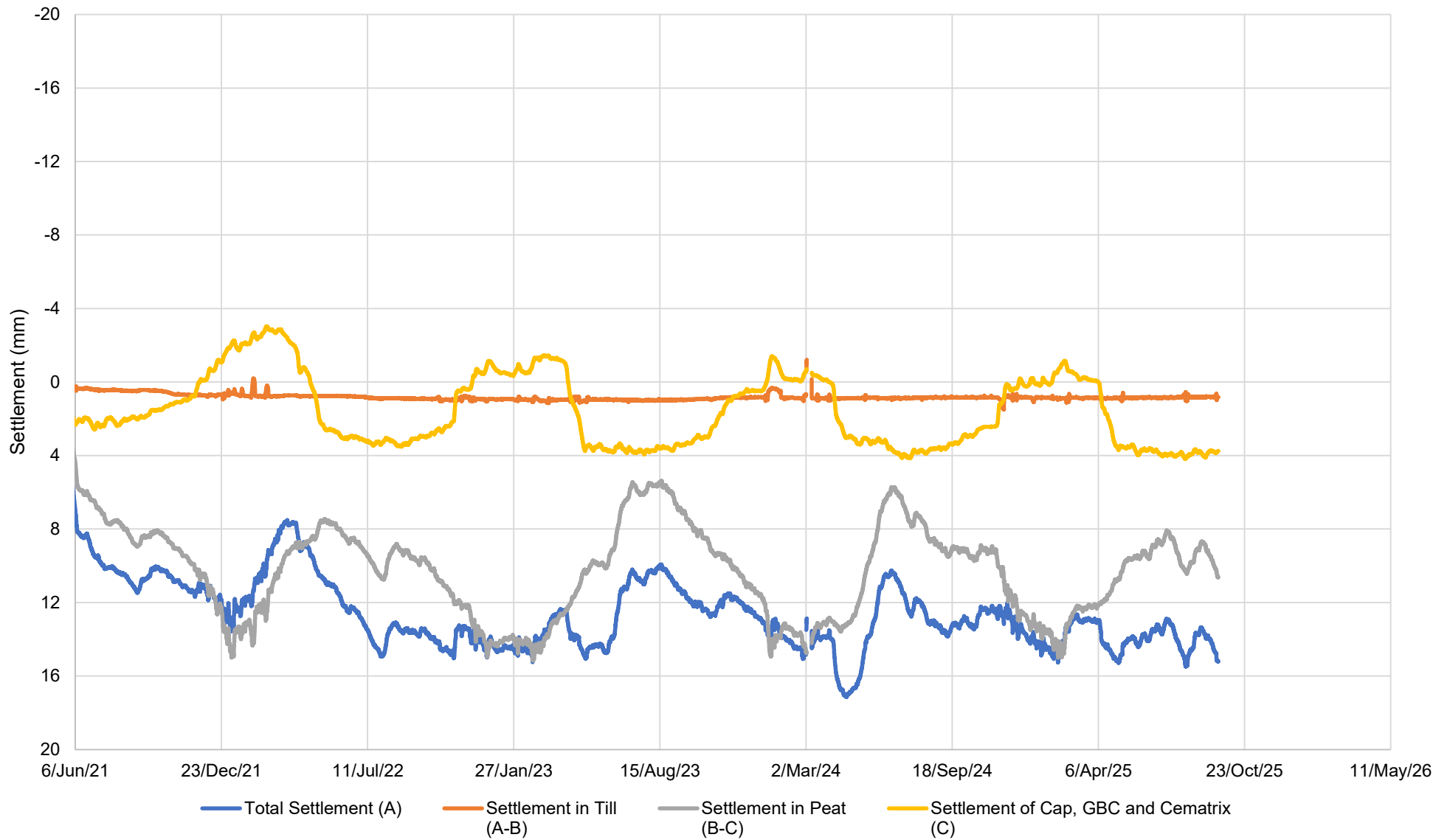
|             |                 |
|-------------|-----------------|
| DRAWN BY    | ML              |
| DESIGNED BY | KEF             |
| APPROVED BY | TSA             |
| SCALE       | H 1:500 V 1:250 |
| DATE        | OCTOBER 2025    |
| FILE No.    | 32122           |



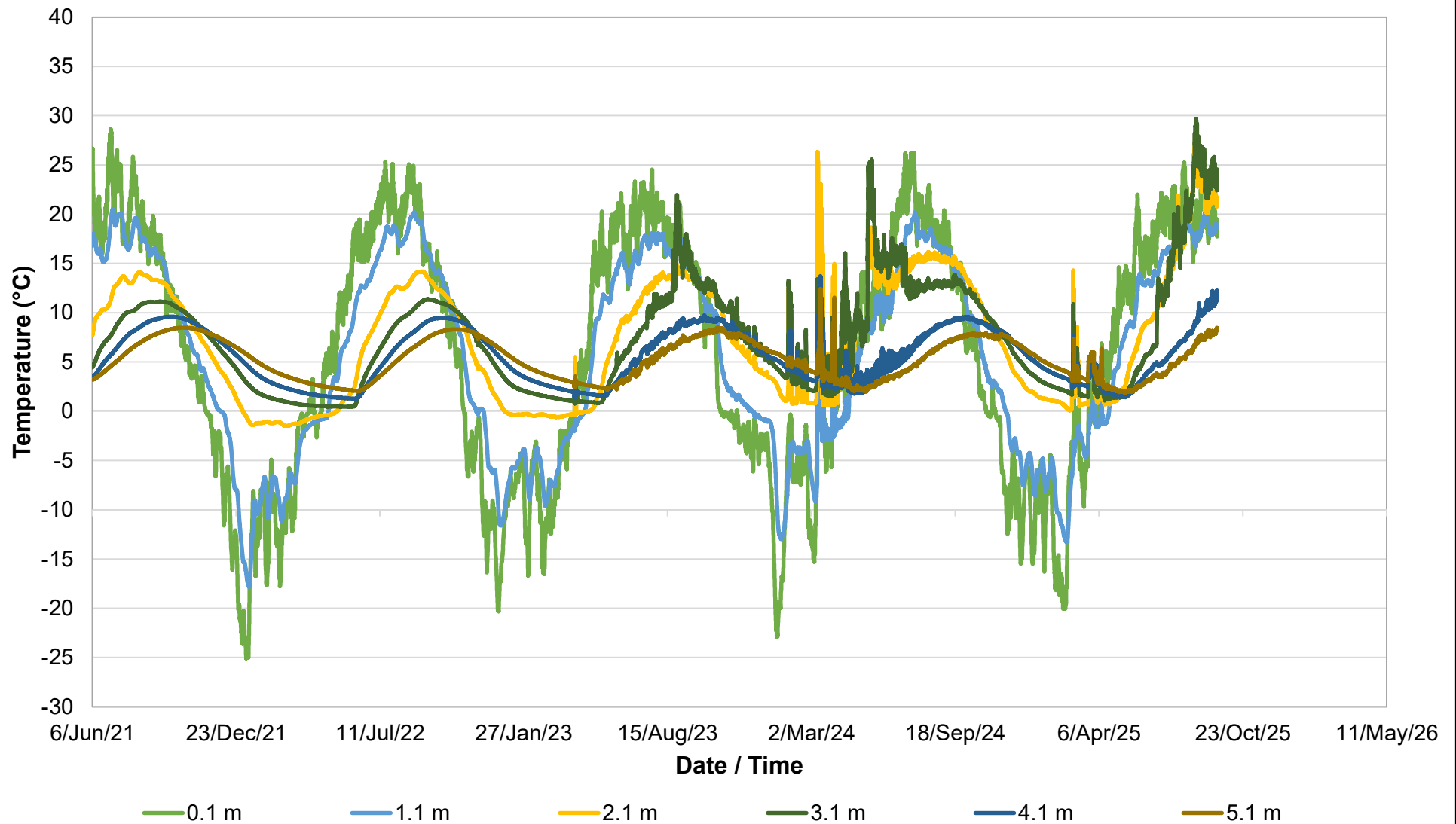
**Figure NC106-1**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**EXT21-1 - Displacement**



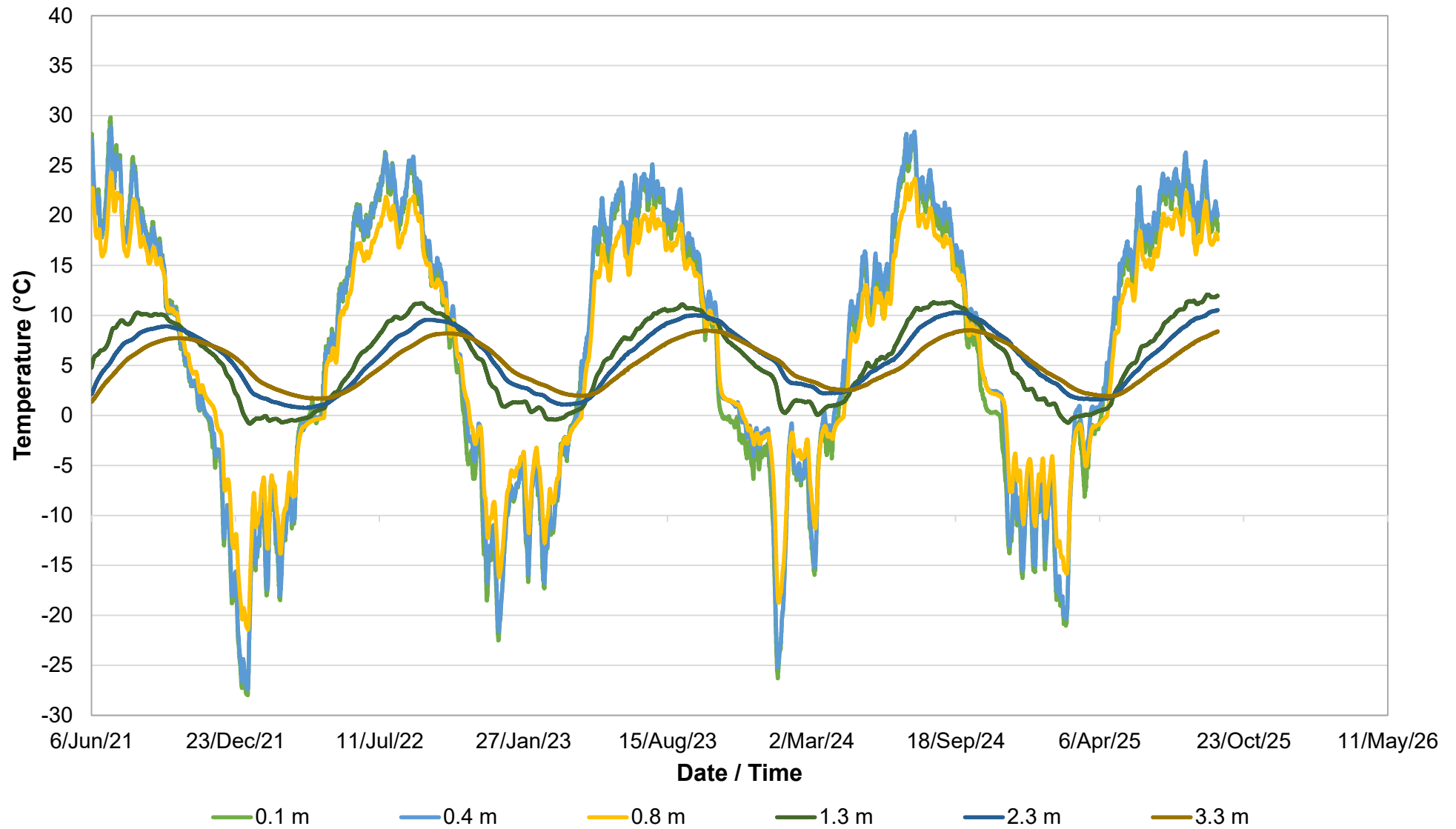
**Figure NC106-2**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**EXT21-2 - Displacement**



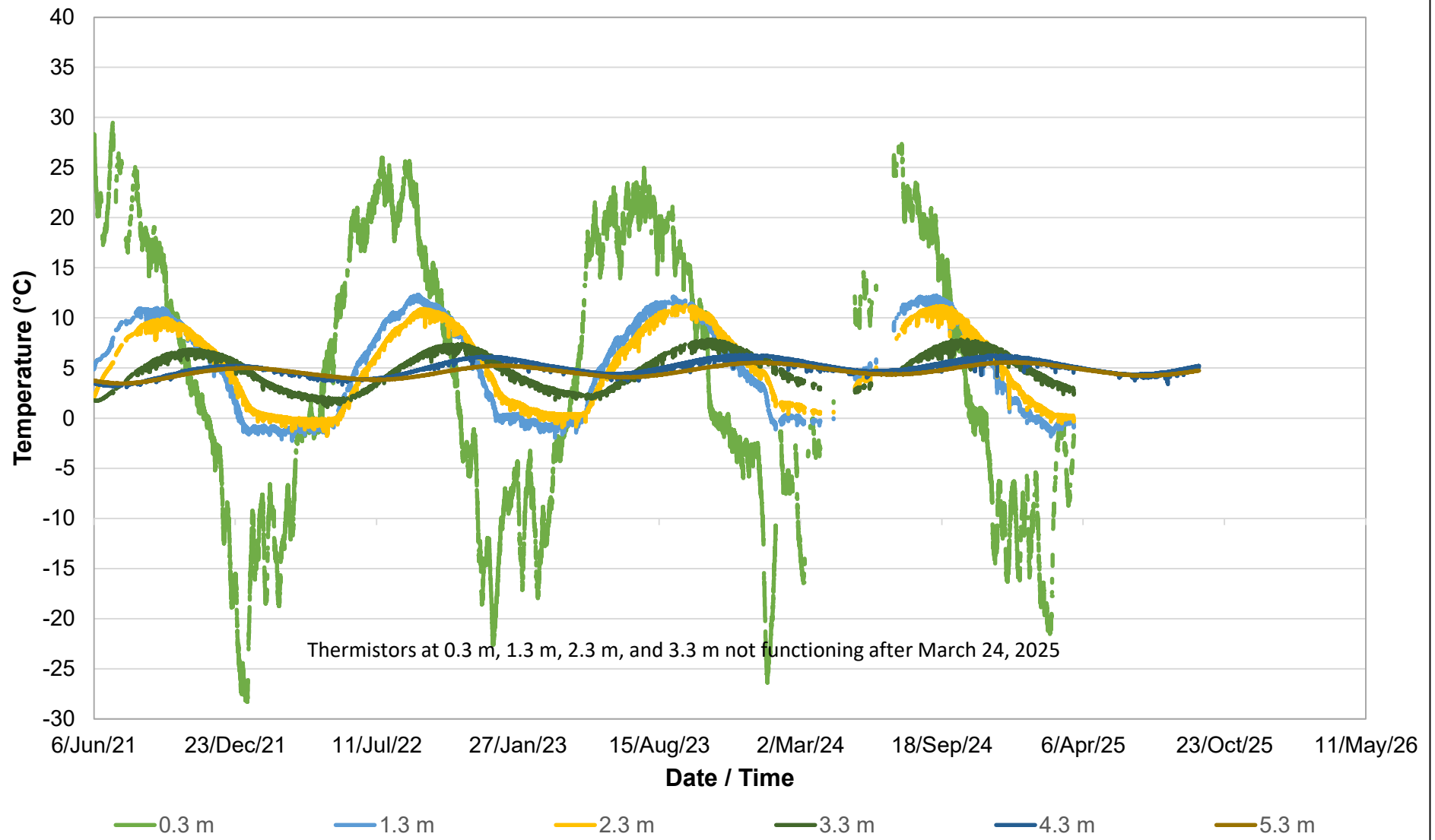
**Figure NC106-3**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**THERM21-1 (Pavement Control)**



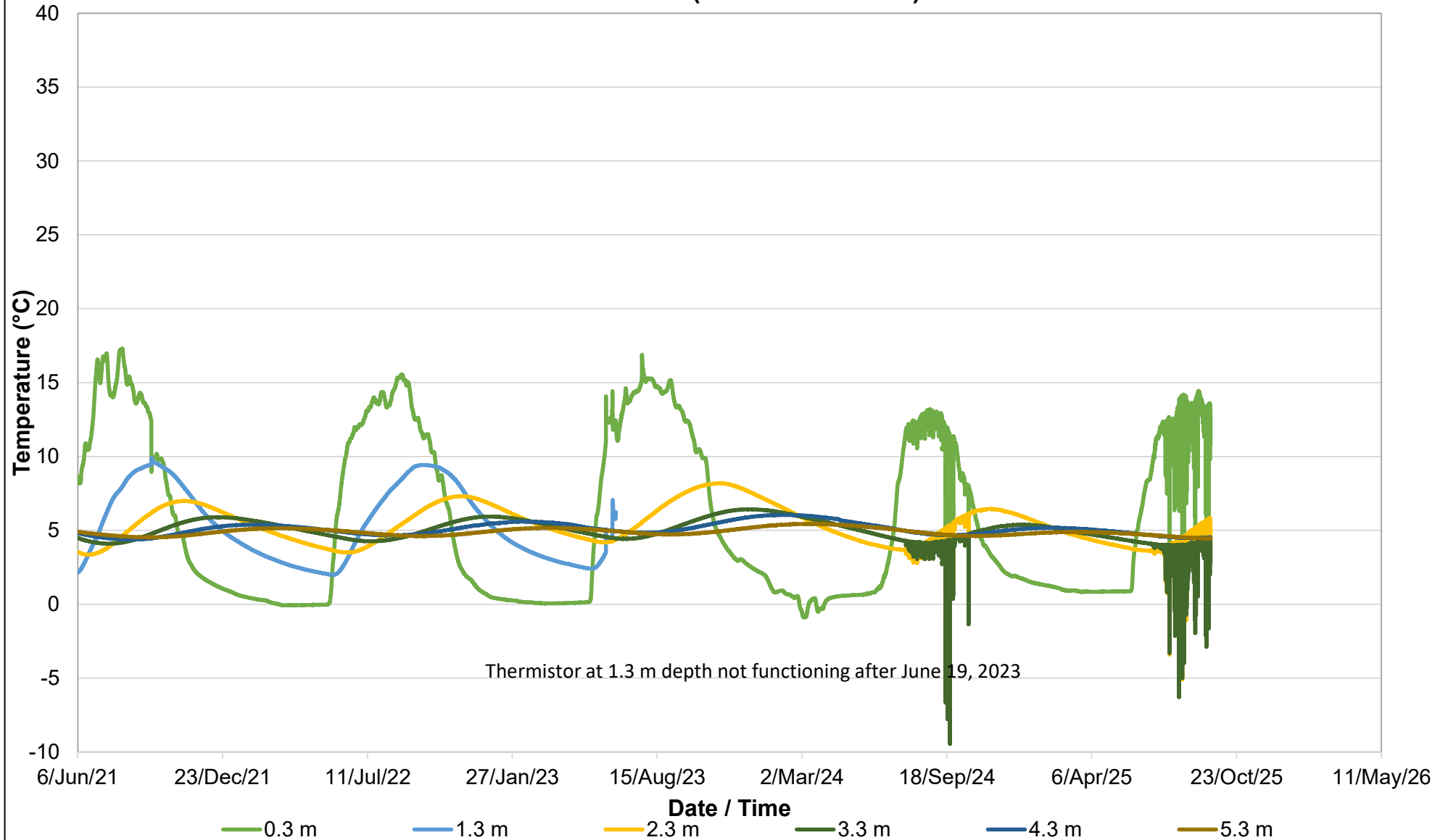
**Figure NC106-4**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**THERM21-2 (Pavement Test)**



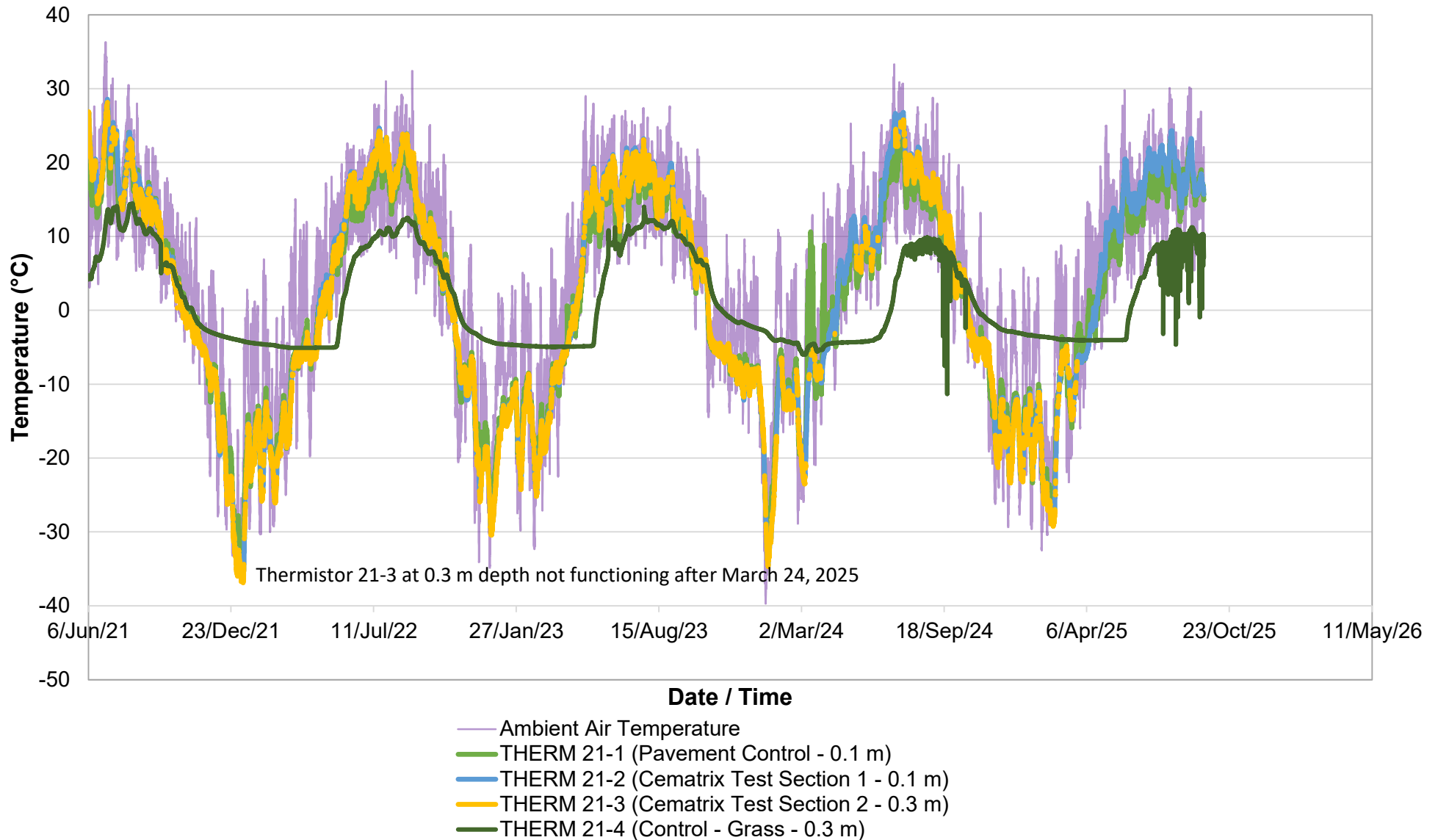
**Figure NC106-5**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**THERM21-3 (Pavement Test)**



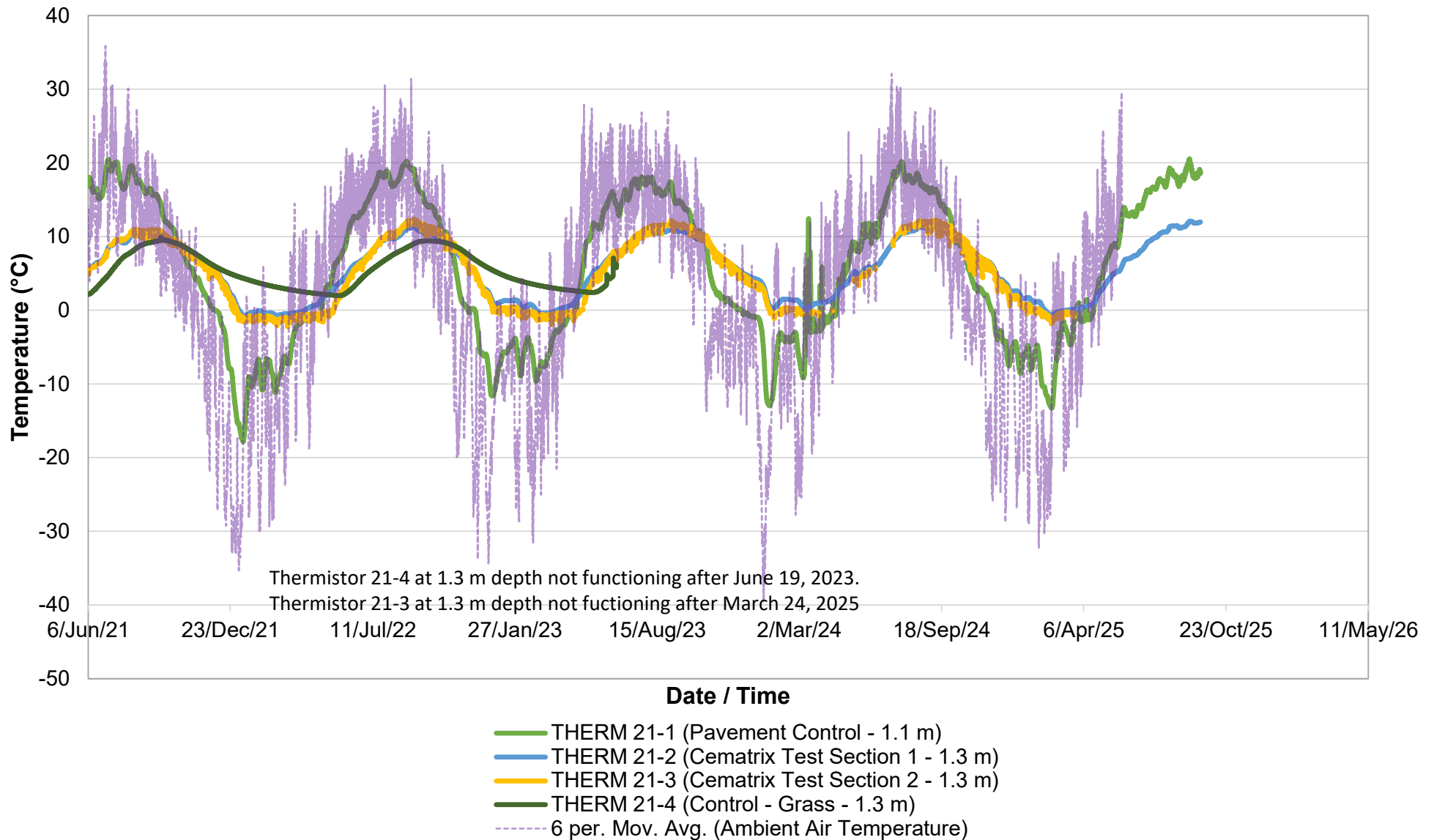
**Figure NC106-6**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**THERM21-4 (Control Grassed)**



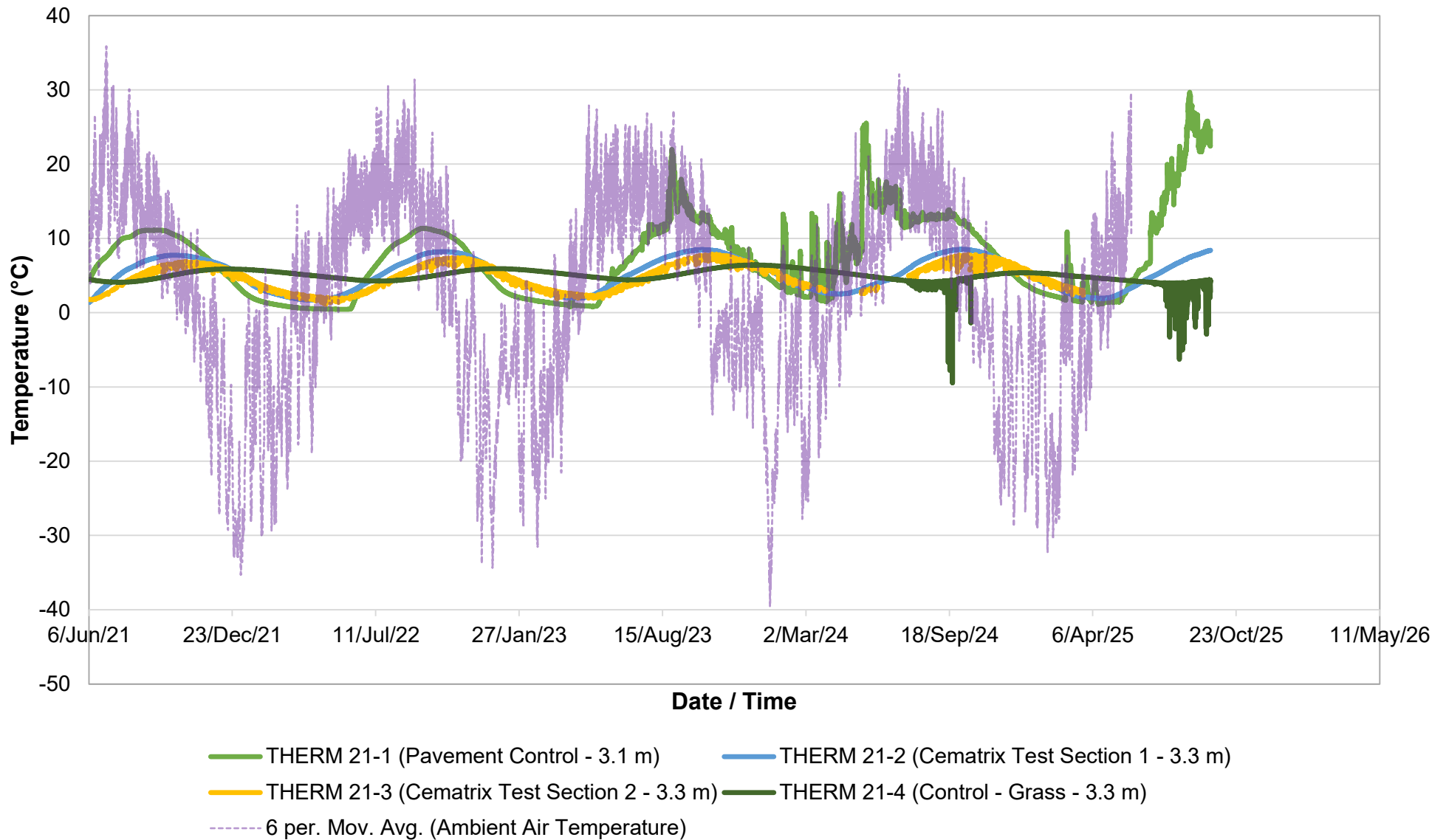
**Figure NC106-7**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**Surface Thermistors and Weather Data**



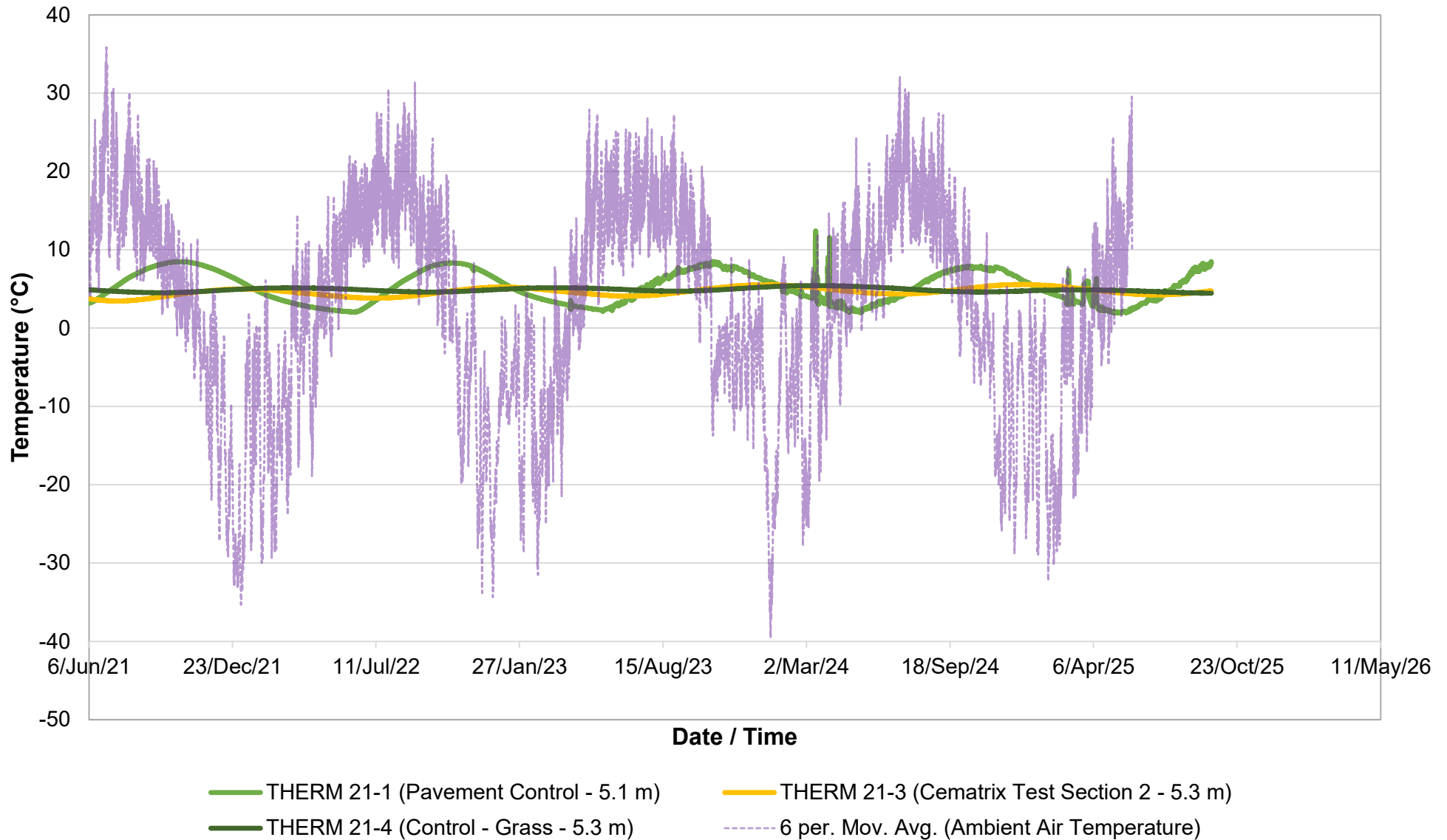
**Figure NC106-8**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**1.1 m - 1.3 m Depth Thermistors and Weather Data**



**Figure NC106-8**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**3.1 m to 3.3 m Depth Thermistors and Weather Data**



**Figure NC106-8**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**5.1 m to 5.3 m Depth Thermistors and Weather Data**



**Figure NC106-9**  
**Highway 63:08 km 27.9 Pavement Distress Near Wandering River, Alberta**  
**Hourly and Cumulative Precipitation**

