

ALBERTA TRANSPORTATION AND
ECONOMIC CORRIDORS GRMP
PEACE REGION
(GRANDE PRAIRIE DISTRICT - NORTH)
INSTRUMENTATION MONITORING - FALL 2024



Site Number	Location	Name	Hwy	km
GP040	Hwy 2, 5 km North of Rycroft	Spirit River Bridge	2	5 km North of Rycroft
Legal Description:		UTM Co-ordinates		
16-4-77-5 W6		11U E 394305	N	6184771

Current Monitoring:	25-Sept-2024	Previous Monitoring	26-May-2024
Instruments Read By:	Mr. Neil McDonald and Mr. Nixson Mationg, of Thurber		

Instruments Read During This Site Visit			
Slope Inclonometers (SIs): SI17-3 and SI20-1	Pneumatic Piezometers (PN):	Vibration Wire Piezometers (VW): N/A	Standpipe Piezometers (SP):
Load Cell (LC):	Strain Gauges:	SAA's:	Others:

Readout Equipment Used			
Slope Inclonometers: RST Digital Inclonometer probe with a 2 ft. wheelbase and a RST Pocket PC readout	Pneumatic Piezometers:	Vibration Wire Piezometers:	Standpipe Piezometers:
Load Cell:	Strain Gauges:	SAA's:	Others:
Notes:			

Zones of New Movement:	None
Interpretation of Monitoring Results:	<p>Slope inclinometer SI17-3 was found to have been blocked or sheared at 3.27 m below the top of casing since June 22, 2020.</p> <p>SI20-1 is located within the pile wall on the east side of the south abutment. It showed a gentle tilt pattern of movement and a rate of movement of 1.4 mm/yr over 0.2 m to 14.2 m depth since the previous reading on May 26, 2024. This corresponds to an increase in rate of movement of 0.88 mm/yr since the previous reading. The readings are consistent with the cantilevered concrete pile wall performance expectations.</p> <p>All of the pneumatic piezometers on this site were previously damaged.</p>
Future Work:	Due to there being only one active instrument left on the site, we recommend reading this site once annually. The instruments should be read again in the fall of 2025.
Instrumentation Repairs:	No instrument repairs are required at this time.
Additional Comments:	

Attachments:	<ul style="list-style-type: none">• Table GP040-1 Fall 2024 – Hwy 2, 5 km North of Rycroft – Spirit River Head Slope Slide Slope Inclinometer Instrumentation Reading Summary• Table GP040-2 Fall 2024 – Hwy 2, 5 km North of Rycroft – Spirit River Head Slope Slide Pneumatic Piezometer Instrumentation Reading Summary• Statement of Limitations and Conditions • APPENDIX A – GP040-1 FALL 2024<ul style="list-style-type: none">○ Field Inspector’s report○ Site Plan Showing Approximate Instrument Locations (Drawing No. GP040-1)○ SI Reading Plots○ Figure GP040-1 (Piezometric Elevations)○ Figure GP040-2 (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 GP040-1: Fall 2024 – Hwy 2, 5 km North of Rycroft – Spirit River Head Slope Slide Slope Incliner Instrumentation Reading Summary

Date Monitored: September 25, 2024

INSTRUMENT #	DATE INITIALIZED	TOTAL CUMULATIVE RESULTANT MOVEMENT AT NOTED DEPTH SINCE INITIAL READING (mm)	MAXIMUM RATE OF MOVEMENT (mm/yr)	CURRENT STATUS	DATE OF PREVIOUS READING	INCREMENTAL MOVEMENT SINCE PREVIOUS READING (mm)	RATE OF MOVEMENT (mm/yr)	CHANGE IN RATE OF MOVEMENT SINCE PREVIOUS READING (mm/yr)
SI17-1	July 18, 2017	5.3 mm over 0.5 to 2.9 m depth in 316 ° direction	43.36 in August 2017	Sheared	September 6, 2017	N/A	31.8 mm/yr (September 2017)	N/A
		76.7 mm over 2.9 to 4.8 m depth in 316 ° direction	567.4 in August 2017				554.1 mm/yr (September 2017)	
SI17-2	July 18, 2017	84.2 over 1.8 m to 4.2 m depth in 34° direction	994.4 in July 2017	Sheared	August 18, 2017	N/A	994.4 mm/yr (August 2017)	N/A
SI17-3	July 18, 2017	37.9 over 0.2 m to 3.9 m depth in 341° direction	38.5 in January 2018	Sheared / Blocked at 3.27 m	June 22, 2020	N/A	19.4 mm/yr (June 2020)	N/A
SI20-1	October 22, 2020	23.8 over 0.2 m to 14.2 m depth in 250° direction	24.7 in April 2021	Operational	May 26, 2024	1.4	4.1	0.88

Drawing GP040-1 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.



Table GP029-2: Fall 2024 – Hwy 2, 5 km North of Rycroft – Spirit River Head Slope Slide Pneumatic Piezometer Instrumentation Reading Summary

Date Monitored: Not Monitored

INSTRUMENT #	DATE INITIALIZED	TIP ELEV. (m)	GROUND ELEV. (m)	CURRENT STATUS	HIGHEST MEASURED WATER ELEVATION (m)	MEASURED PORE PRESSURE (kPa)	CURRENT WATER ELEVATION (m)	PREVIOUS WATER ELEVATION (m)	CHANGE IN WATER LEVEL SINCE PREVIOUS READING (m)
<i>PN17-1A</i>	<i>July 6, 2017</i>	<i>841.96</i>	<i>865.43</i>	<i>Damaged</i>	<i>863.05 in July 2017</i>	<i>N/A</i>	<i>N/A</i>	<i>857.78 (August 18, 2017)</i>	<i>N/A</i>
<i>PN17-1B</i>	<i>July 6, 2017</i>	<i>852.48</i>	<i>865.43</i>	<i>Damaged</i>	<i>864.92 in July 2017</i>	<i>N/A</i>	<i>N/A</i>	<i>861.83 (June 22, 2020)</i>	<i>N/A</i>
<i>PN17-2</i>	<i>July 5, 2017</i>	<i>856.89</i>	<i>865.89</i>	<i>Damaged</i>	<i>866.59 in July 2017</i>	<i>N/A</i>	<i>N/A</i>	<i>858.58 (June 22, 2020)</i>	<i>N/A</i>
<i>PN17-3</i>	<i>July 5, 2017</i>	<i>837.23</i>	<i>851.56</i>	<i>Damaged</i>	<i>843.14 in July 2017</i>	<i>N/A</i>	<i>N/A</i>	<i>838.64 (October 5, 2017)</i>	<i>N/A</i>

Drawing GP040-1 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.



STATEMENT OF LIMITATIONS AND CONDITIONS

1. STANDARD OF CARE

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

2. COMPLETE REPORT

All documents, records, data and files, whether electronic or otherwise, generated as part of this assignment 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.

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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. NO OTHER PARTY MAY USE OR RELY UPON THE REPORT OR ANY PORTION THEREOF WITHOUT THURBER'S WRITTEN CONSENT AND SUCH USE SHALL BE ON SUCH TERMS AND CONDITIONS AS THURBER MAY EXPRESSLY APPROVE. Ownership in and copyright for the contents of the Report belong to Thurber. Any use which a third party makes of the Report, is the sole responsibility of such third party. Thurber accepts no responsibility whatsoever for damages suffered by any third party resulting from use of the Report without Thurber's express written permission.

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 are judgmental in nature. 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 persons making use of such documents or records with our express written consent should 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 persons. Some conditions are subject to change over time and those making use of the Report should be aware of this possibility and understand that the Report only presents the conditions at the sampled points at the time of sampling. If special concerns exist, or the Client has special considerations or requirements, the Client should 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 on the basis of conditions in evidence at the time of site inspections and on the basis of information provided to Thurber. Thurber has relied in good faith upon representations, information and instructions provided by the Client and others concerning the site. Accordingly, Thurber does not accept responsibility for any deficiency, misstatement or inaccuracy contained in the Report as a result of misstatements, omissions, misrepresentations, or fraudulent acts of the Client or other persons providing information relied on by Thurber. Thurber is entitled to rely on such representations, information and instructions and is not required to carry out investigations to determine the truth or accuracy of such representations, information and instructions.
- 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 should 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 detailed in the contract documents should 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 in order to confirm and document that the site conditions do not materially differ from those interpreted 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. RELEASE OF POLLUTANTS OR HAZARDOUS SUBSTANCES

Geotechnical engineering and environmental consulting projects often have the potential to encounter pollutants or hazardous substances and the potential to cause the escape, release or dispersal of those substances. Thurber shall have no liability to the Client under any circumstances, for the escape, release or dispersal of pollutants or hazardous substances, unless such pollutants or hazardous substances have been specifically and accurately identified to Thurber by the Client prior to the commencement of Thurber's professional services.

7. INDEPENDENT JUDGEMENTS OF CLIENT

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**ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS GRMP (CON0022165)
PEACE REGION (GRANDE PRAIRIE DISTRICT – NORTH)
INSTRUMENTATION MONITORING RESULTS**

FALL 2024

**APPENDIX A
DATA PRESENTATION**

SITE GP040: HWY 2, 5 km NORTH OF RYCROFT – SPIRIT RIVER HEAD SLOPE SLIDE

ALBERTA TRANSPORTATION
 PEACE REGION - GRANDE PRAIRIE AREA
 SLOPE INCLINOMETER MONITORING FIELD SUMMARY
 SPRING 2020

Location: Spirit River Bridge 5KM North of Rycroft File Number: 17104 Probe: RST Set 8R / 10 Cable: RST Set 8R / 10	Readout: RST PN C108 Unit 7 Casing Size: 2.75 Temp: 15 Read by: NNM/NRM
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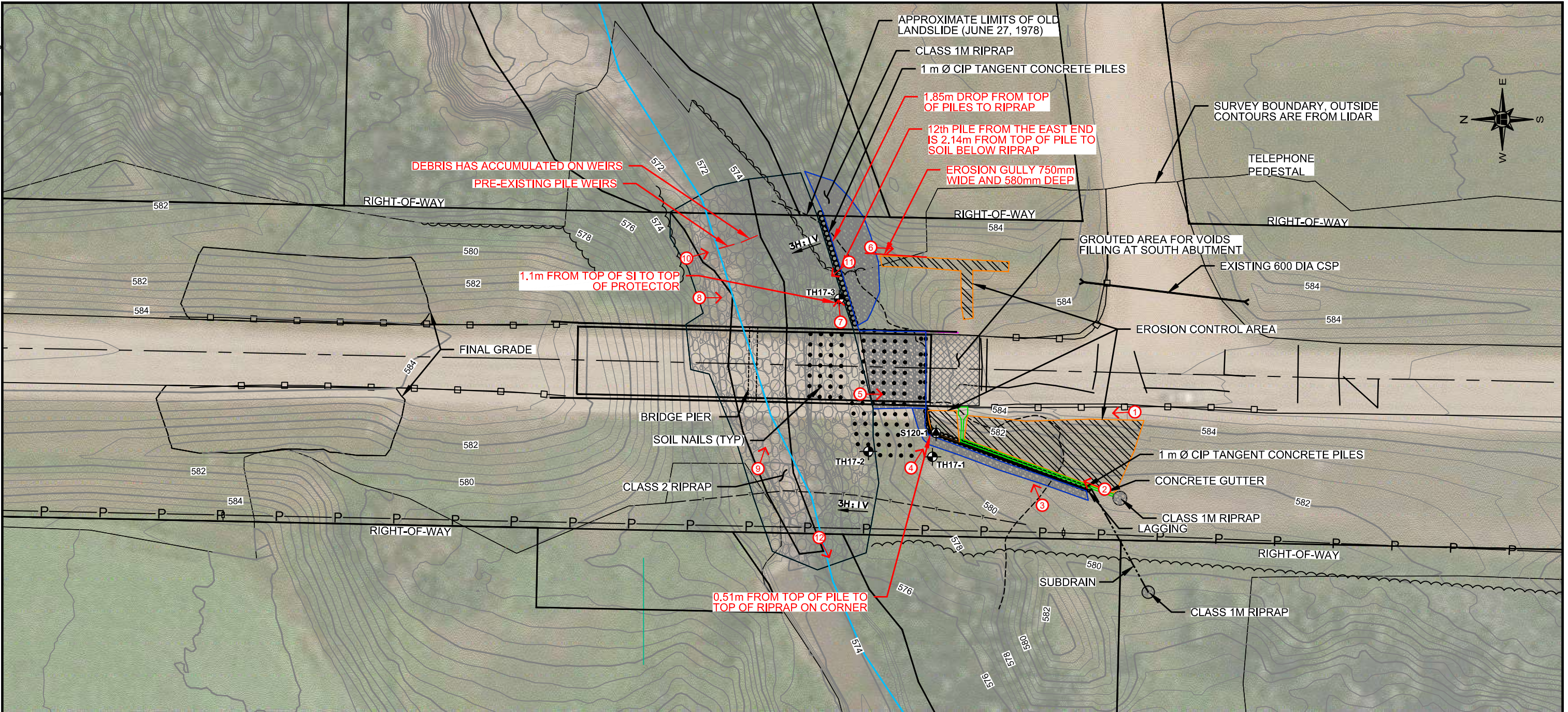
SLOPE INCLINOMETER (SI) READINGS

SI#	GPS Location (NAD83 UTM)		Date	Stickup (m)	Depth from top of CASING (ft)	Azimuth of A+ Groove	Current Bottom Depth Readings				Probe/ Reel #	Size (")	Remarks
	(N)	(E)					A+	A-	B+	B-			
SI17-3	6184771	394305		0.69	48 to 2	330	290	-275	-754	758	8R/8R		Blocked or sheared at 3.3 m
SI20-1	6184691	394281	25-Sep-24	0.76	48 to 2	219	-568	577	284	-278	10/10		

INSPECTOR REPORT

*water return. Purged water and took readings.
PN Piezometers on site are damaged

H:\32000\32123 AT GRMP Grande Prairie District North 2021-2025\CAD\2023\NPW\32123-GP040-1.dwg - 1N - Aug. 24, 2023



LEGEND

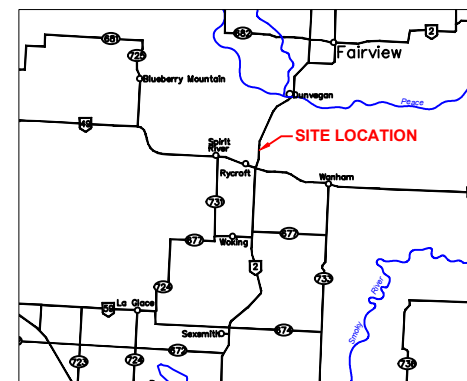
- APPROXIMATE TEST HOLE LOCATION(2017)
- APPROXIMATE SLOPE INCLINOMETER LOCATION (2020)
- TELUS CABLE
- OVERHEAD POWER LINE
- GUARD RAIL
- TREE LINE
- SOIL NAIL
- SUBDRAIN
- CONTROL POINT
- DIRECTION AND NUMBER OF PHOTO

NOTES:

1. MAY 29, 2023 FEATURES SHOWN IN RED
2. BASE PLAN PROVIDED BY WSP, SITE SURVEYED ON SEPTEMBER 5, 2017.
3. CONTOURS OUTSIDE SURVEY LIMIT ARE FROM 2015 LIDAR DATA.
4. NAD83 UTM 11 COORDINATE SYSTEM.
5. CONTOUR INTERVALS 0.5m.



AIR PHOTO FROM ESRI WORLD IMAGERY EXPORTED ON AUGUST 23, 2023



KEY PLAN
SCALE: 1:2 000 000



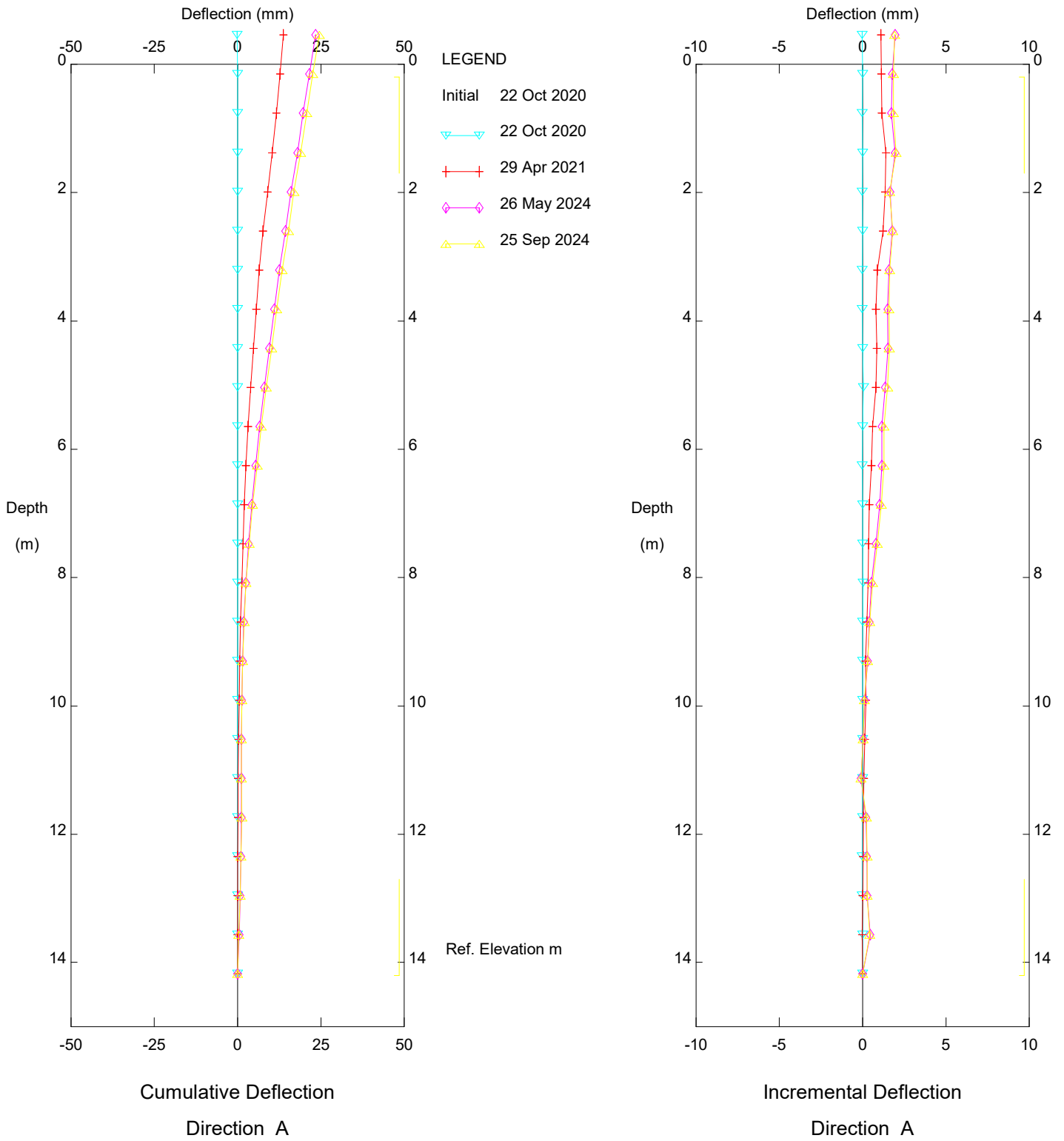
PEACE REGION (GRANDE PRAIRIE)

**GP040-1: HWY 2:68 - SPIRIT RIVER BRIDGE (BF75106)
2023 INSPECTION PLAN**

DWG No. 32123-GP040-1

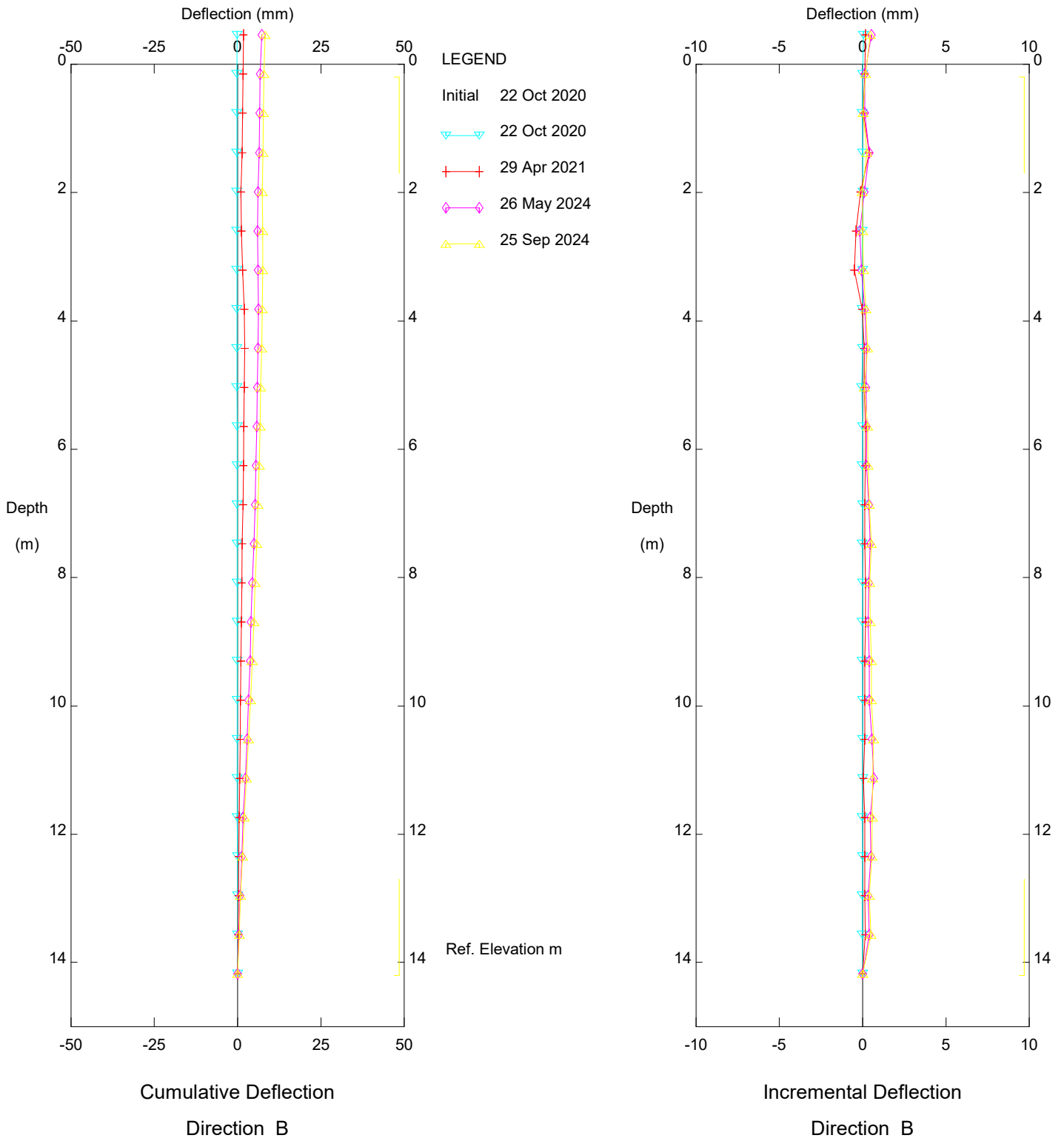
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DESIGNED BY	NPW
APPROVED BY	DWP
SCALE	1:750
DATE	AUGUST 2023
FILE No.	32123





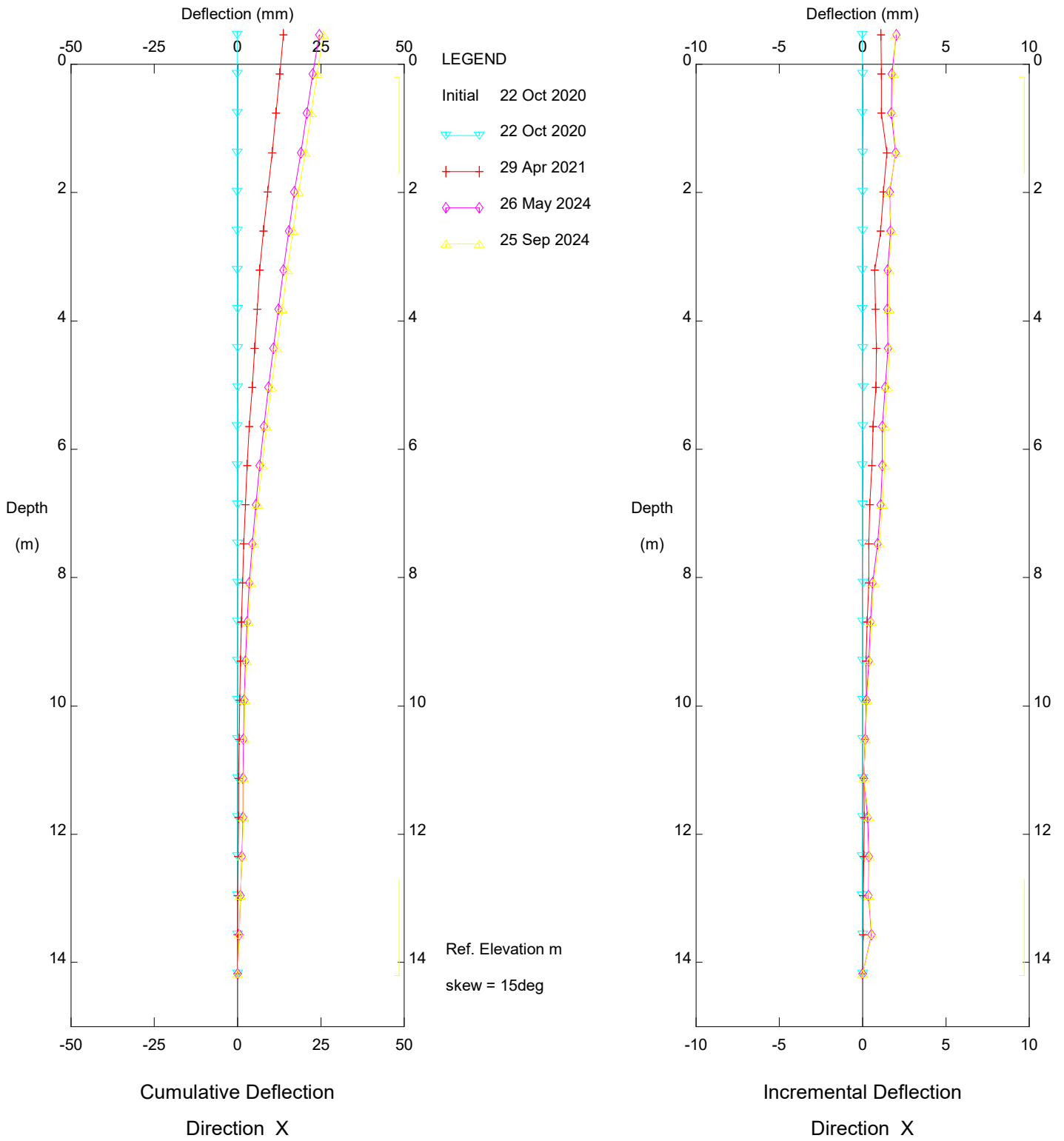
Spirit River Bridge, Inclinometer SI20-1

Alberta Transportation



Spirit River Bridge, Inclinometer SI20-1

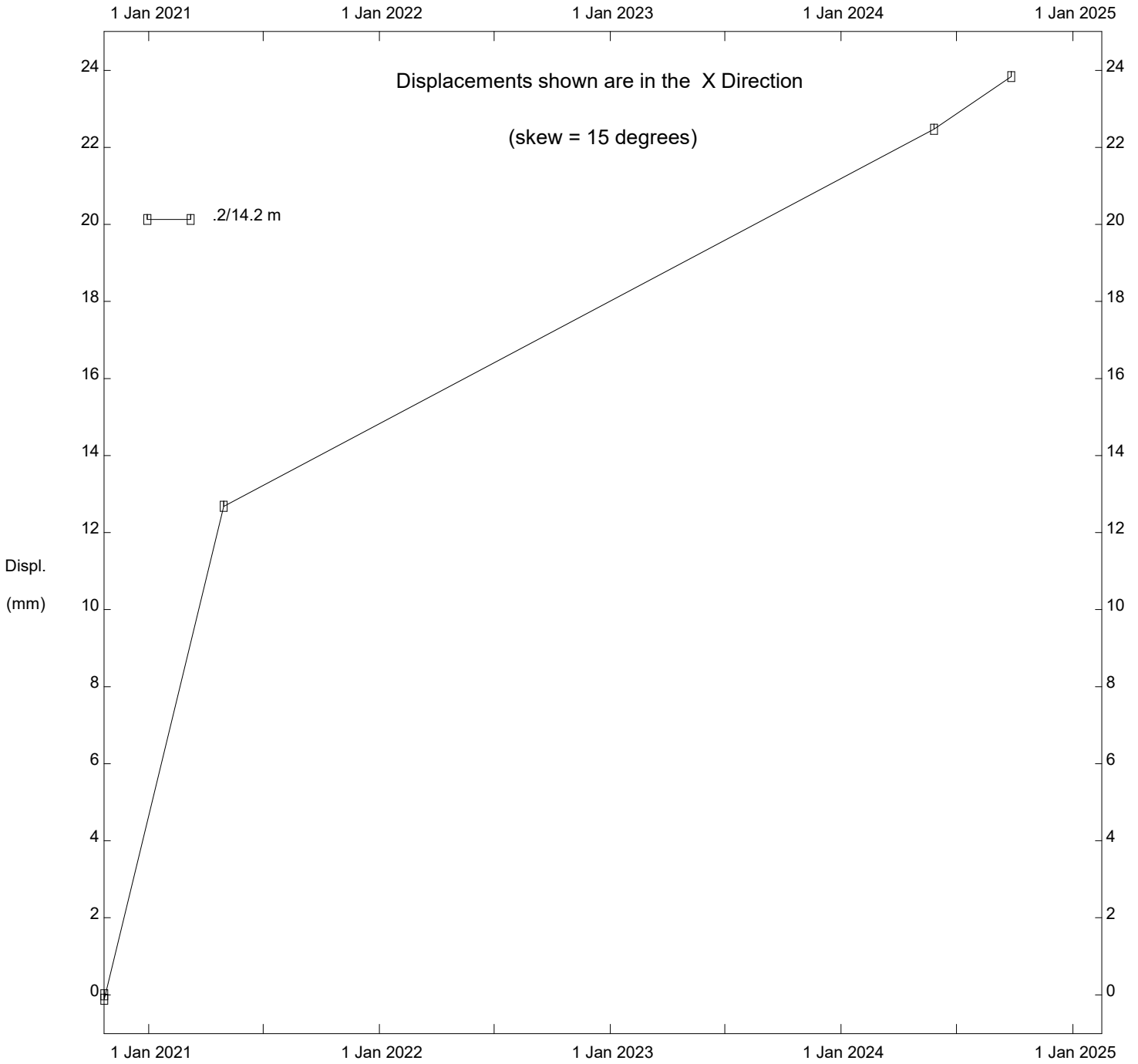
Alberta Transportation



Spirit River Bridge, Inclinator SI20-1

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Spirit River Bridge, Inclinator SI20-1

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FIGURE GP040-1
PIEZOMETRIC ELEVATIONS FOR HWY 2:68 4.7 km NORTH OF RYCROFT

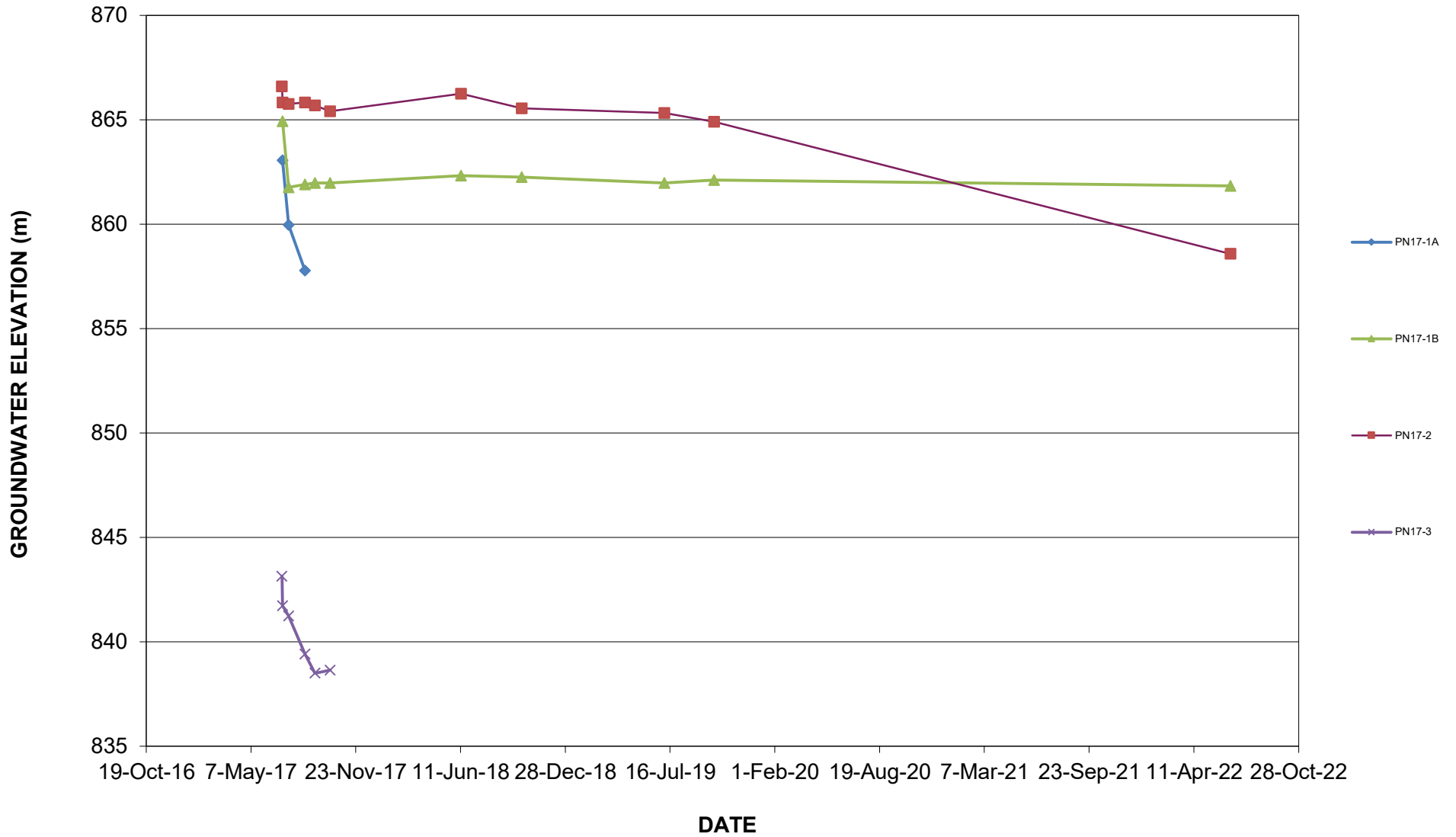


FIGURE GP040-2
PIEZOMETRIC DEPTHS FOR HWY 2:68 4.7 km NORTH OF RYCROFT

