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

THURBER

Site Number	Location	Name	Hwy	km
NC096	HWY 63:04 R1 2.845	Wandering River Bridge	63:04	km 2.8
Legal Description: 11-12-73-17 W4		**UTM Co-ordinates**		
		12U E 405804	N 6130385	

Current Monitoring:	17-Sep-2025	**Previous Monitoring**	25-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): N/A	**Pneumatic Piezometers (PN):** N/A	**Vibration Wire Piezometers (VW):** VW20 1A, VW20-1B, VW20-3A and VW20-3B	**Standpipe Piezometers (SP):** SP20-2 and SP20-4
Load Cell (LC): N/A	**Strain Gauges:** N/A	**SAAs:** N/A	**Others:**

Readout Equipment Used			
Slope Inclinometers:	**Pneumatic Piezometers:**	**Vibration Wire Piezometers:** RST VW2106 Unit 1 Vibrating Wire Readout	**Standpipe Piezometers:** DGSI dipmeter
Load Cell:	**Strain Gauges:**	**SAAs:**	**Others:**
Notes:			

Discussion	
Zones of New Movement:	None
Interpretation of Monitoring Results:	Standpipe piezometers SP20-2 and SP20-4 showed increases in groundwater level of 0.50 m and 0.09 m, respectively, since the spring of 2025 readings. Vibrating wire piezometers VW20-1A and VW20-1B showed increases in groundwater level of 0.34 m and 0.32 m, respectively, since the spring of 2025 readings. VW20-3A and VW20-3B showed decreases in groundwater level of 0.27 m and 0.04 m, respectively, since the spring of 2025 readings. VW20-3B shows an above-ground (artesian) groundwater level of 3.17 m.
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 NC096-1 Fall 2025 – HWY 63:04 Wandering River Bridge South Approach Fill Landslides (BF7573IN), Inclinometer Instrumentation Reading Summary ▪ Table NC096-2 Fall 2025 – HWY 63:04 Wandering River Bridge South Approach Fill Landslides (BF7573IN), Standpipe Piezometer Instrumentation Reading Summary ▪ Table NC096-3 Fall 2025 – HWY 63:04 Wandering River Bridge South Approach Fill Landslides (BF7573IN), Vibrating Wire Piezometer Instrumentation Reading Summary ▪ Statement for Use and Interpretation of Report ▪ APPENDIX A – NC096-1 FALL 2025 □ Field Inspector's report □ Site Plan Showing Approximate Instrument Locations (Drawing No. 32122-NC096) □ Figure NC096-1 (Piezometric Depths)

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

PROFESSIONAL ENGINEER ALBERTA
TAREK ABDELAZIZ
ID 91085
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

Table NC096-1: Fall 2025 – Hwy 63:04 Wandering River Bridge South Approach Fill Landslides (BF75731N) Inclinometer Instrumentation Reading Summary

Date Monitored: Not monitored

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)
SI20-1	*December 6, 1996*	*100.9 over 0.1 m to 1.9 m depth in 348° direction*	*292.0 in June 25, 2021*	*Sheared off at 2.4 m below top of casing*	*June 25, 2021*	*N/A*	*N/A*	*N/A*
SI20-3	*December 21, 2021*	*20.2 over 0.7 m to 2.5 m depth in 51° direction*	*103.1 in February 2021*	*Sheared off at 3.0 m below top of casing*	*March 9, 2021*	*N/A*	*N/A*	*N/A*

Drawing 32122-NC096 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

THURBER

Table NC096-2: Fall 2025 – Hwy 63:04 Wandering River Bridge South Approach Fill Landslides (BF75731N) Standpipe Piezometer Instrumentation Reading Summary

Date Monitored: September 17, 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)
SP20-2	November 29, 2020	14.78	-	Operational	1.47 on October 1, 2023	1.79	2.29	0.50
SP20-4	December 1, 2020	14.70	-	Operational	3.28 on June 25, 2021	4.00	4.09	0.09

Drawing 32122-NC096 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.

THURBER

Table NC096-3: Fall 2025 – Hwy 63:04 Wandering River Bridge South Approach Fill Landslides (BF75731N) Vibrating Wire Piezometer Instrumentation Reading Summary

Date Monitored: September 17, 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)
VW20-1A (70924)	December 21, 2020	5.03	-	Operational	1.08 on June 25, 2021	1.45	1.79	0.34
VW20-1B (70925)	December 21, 2020	12.04	-	Operational	0.53 on June 25, 2021	0.88	1.20	0.32
VW20-3A (70923)	December 21, 2020	5.03	-	Operational	0.81 on December 21, 2020	1.42	1.15	-0.27
VW20-3B (70926)	December 21, 2020	12.04	-	Operational	-3.27 on June 8, 2024	-3.17	-3.21	-0.04

Drawing 32122-NC096 in Appendix A provides a sketch of the approximate location of the monitoring instrumentation for this site.
Note: Negative (-) groundwater level indicates above-ground (artesian) groundwater condition.

THURBER

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.

THURBER

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 NC096: HWY 63:04 WANDERING RIVER BRIDGE SOUTH APPROACH FILL LANDSLIDES (BF75731N)

ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
NORTH CENTRAL REGION - ATHABASCA AND FORT McMURRAY DISTRICTS
INSTRUMENTATION MONITORING FIELD SUMMARY (NC096)
FALL 2025

Location: Wandering River Bridge (Hwy 63:04 R1 2.845)
File Number: 32122
Readout: RST VW2106 Unit 1/ DGSI Dipmeter
Casing Diameter: 2.75"
Temp: 20
Read by: NKR/AFC

STANDPIPE PIEZOMETER (SP) READINGS

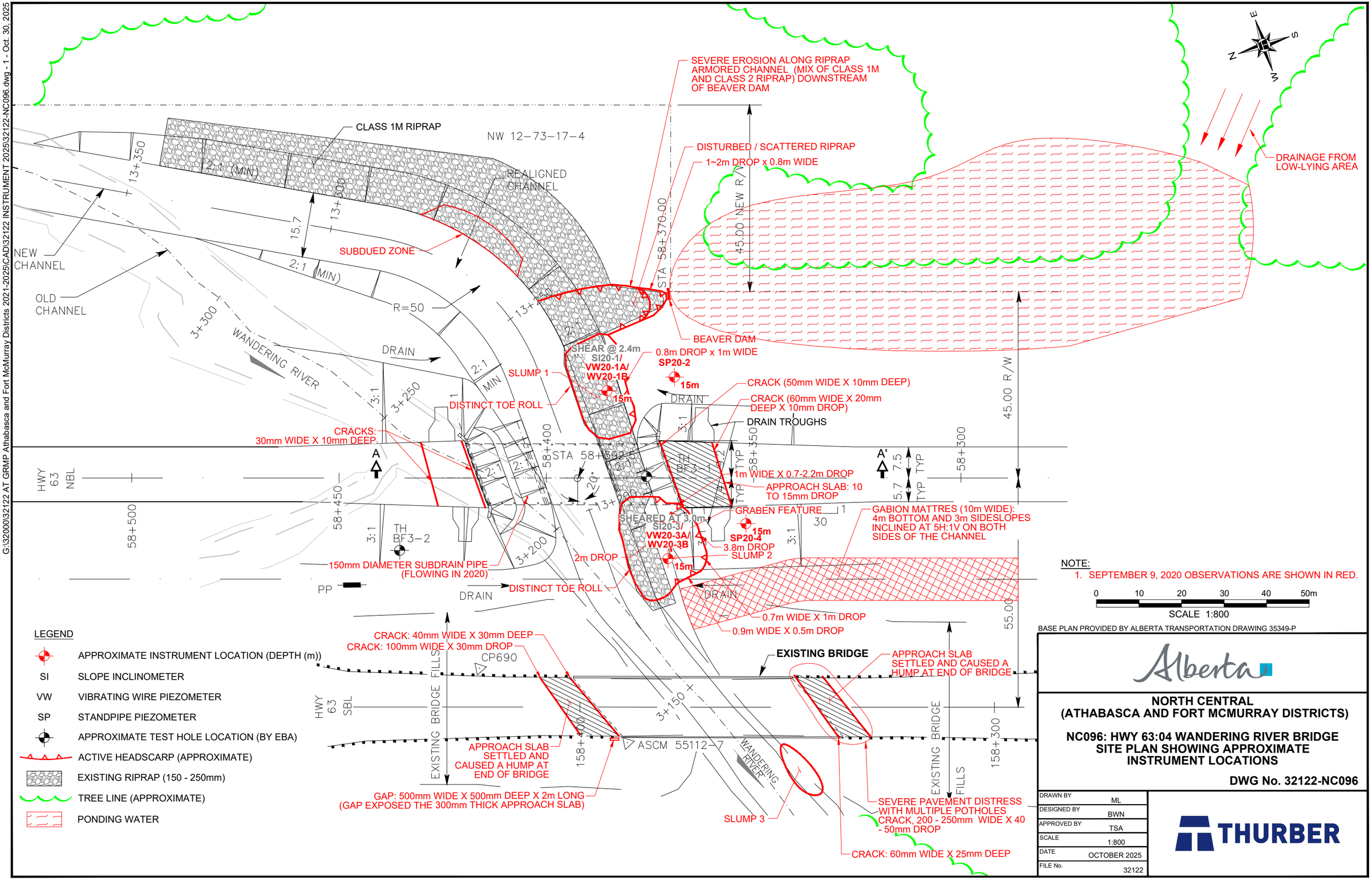
SP#	GPS Location (UTM 12)		Date	Stick-up (m)	Reading below top of casing (m)	Bottom Pipe Depth (below top of casing (m)
	Northing	Easting				
SP20-2	6130385	405804	17-Sep-25	0.96	2.75	4.51
SP20-4	6130380	405766	17-Sep-25	0.99	4.99	15.67

VIBRATING WIRE READINGS

VW	Serial	GPS Location		Date	Reading B(units)	Temp degree C
		Northing	Easting			
VW20-1A	70924	6130401	405806	17-Sep-25	8655.9	4
VW20-1B	70925	6130401	405806	17-Sep-25	7943.9	4
VW20-3A	70923	6130400	405764	17-Sep-25	8623.7	4.5
VW20-3B	70926	6130400	405764	17-Sep-25	7251.8	4.2

INSPECTOR REPORT

Site is km marker 57 on Hwy 63 NBL



LEGEND

- APPROXIMATE INSTRUMENT LOCATION (DEPTH (m))
- SI — SLOPE INCLINOMETER
- VW — VIBRATING WIRE PIEZOMETER
- SP — STANDPIPE PIEZOMETER
- APPROXIMATE TEST HOLE LOCATION (BY EBA)
- ACTIVE HEADSCARP (APPROXIMATE)
- EXISTING RIPRAP (150 - 250mm)
- TREE LINE (APPROXIMATE)
- PONDING WATER

NOTE:

1. SEPTEMBER 9, 2020 OBSERVATIONS ARE SHOWN IN RED.

0 10 20 30 40 50m

SCALE 1:800

BASE PLAN PROVIDED BY ALBERTA TRANSPORTATION DRAWING 35349-P

Alberta

NORTH CENTRAL
(ATHABASCA AND FORT MCMURRAY DISTRICTS)

NC096: HWY 63:04 WANDERING RIVER BRIDGE
SITE PLAN SHOWING APPROXIMATE INSTRUMENT LOCATIONS

DWG No. 32122-NC096

DRAWN BY	ML
DESIGNED BY	BWN
APPROVED BY	TSA
SCALE	1:800
DATE	OCTOBER 2025
FILE No.	32122

THURBER

FIGURE NC096-1
NC96: HWY 63:04 WANDERING RIVER BRIDGE (BF75731N)
VIBRATING WIRE AND STANDPIPE PIEZOMETER DATA