

**ALBERTA TRANSPORTATION
AND ECONOMIC CORRIDORS
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – GRANDE PRAIRIE DISTRICT - NORTH
2025 INSPECTION**



Site Number	Location	Name	Hwy	km
GP040	4.7 km's N. of Rycroft	Spirit River Bridge (BF75106)	2:68	4.7
Legal Description		UTM Co-ordinates		
SE¼ 34-078-5 W6M		11U E 394291	N 6184727	

	Date	PF	CF	Total
Previous Inspection:	29-May-2023	12	2	24
Current Inspection:	5-May-2025	8	2	16
Road AADT:	3,160		Year:	2024
Inspected By:	Robert Senior, TEC Chris Newman, TEC		Nicole Wilder, Thurber Don Proudfoot, Thurber	
Report Prepared By:	Nicole Wilder, Don Proudfoot (Review)			
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

Primary Site Issue:	<p>In 2013, a landslide developed in the west side of the south abutment headslope and sideslope of the Spirit River Bridge (BF75106). It appeared that there was also a second localized slide below the bridge south abutment which extended towards the east where a previous tension crack existed and had developed into a 1 m high scarp.</p> <p>Erosion was also observed at the toe of the south abutment headslope beneath the bridge.</p>	
Dimensions:	<p>The upper portion of the old landslide located close to the south abutment was about 20 m in width across the backscarp and extended down to the river bank. The lower portion of the landslide located on the river terrace was about 35 m in width across the backscarp. The second slide to the east was approximately 30 m in width.</p>	
Date of any Remediation:	<p>The highway was stabilized with the construction of two concrete tangent pile walls and soil nails under the south headslope between July 2020 and August 2021.</p>	
Maintenance:		
Observations:	Description	Worsened?
<input type="checkbox"/> Pavement Distress	No new pavement cracks were observed since the repair.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	The slope downslope of both pile walls appeared to have settled between 0.54 m on the west wall and about 2.1 m on the east wall.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Erosion was observed within the area that was previously repaired east of the bridge. The erosion gully was about 1100 mm wide and 900 mm deep which has expanded since 2024.	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	The erosion gully was slightly wet.	<input checked="" type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>

<input checked="" type="checkbox"/> Other	There was a large beaver dam upstream of the bridge completely blocking off water above the riprap. Consideration should be given to dismantling this.	<input checked="" type="checkbox"/>
<p>Instrumentation June 17, 2025: Inclinometers SI20-1 = Installed in the west pile wall showed a gentle tilt pattern of movement of 0.5 mm and a rate of movement of 0.7 mm/yr over 0.2 m to 14.2 m depth since the previous reading on September 25, 2024. This corresponds to a decrease in rate of movement of 3.4 mm/yr since the previous reading. The total pile head deflection to date has been 24.3 mm. The readings are consistent with the cantilevered concrete pile wall performance expectations. SI17-1 = Sheared off at 4.6 m depth prior to the October 5, 2017 readings; SI17-2 = Sheared off at 4.3 m depth prior to the October 5, 2017 readings; SI17-3 = This SI was last read June 22, 2020 and showed movement between 0.2 m to 3.9 m depth and a rate of 19.4 mm/yr and has since sheared off at a depth of 3.27 m.</p> <p>Piezometers were last read June 22, 2020, none read in 2025 PN17-1A = not functioning; PN17-1B = 3.6 m BGS; PN17-2 = 7.3 m BGS; PN17-3 = not functioning.</p>		
<p>Assessment:</p> <p>In 2013, as a result of heavy rains, the water level in the Spirit River rose and shifted toward the south. The raised river level caused erosion at the toe of the south bridge abutment headslope and sideslope, resulting in the occurrence of the landslide in the south abutment fill. The slip surface appeared to be based in high plastic clay and clay till, toeing out at the river.</p> <p>The site was repaired between 2020 and 2021 by constructing two concrete tangent pile walls and soil nails below the south headslope. However, during the 2023 inspection the slope below the pile walls had settled and dropped between 0.51 m and 2.1 m below the top of the pile walls. The magnitude of the drop was reviewed with the design team and it is understood that the wall can accommodate this amount of loss of passive support. However, this may become a concern if the slide mass settles even further in front of the wall. It was mentioned that this should be monitored going forward. During the 2025 inspection these settlement depths remained mainly the same; hence no significant settlement has occurred in the two years since the last inspection and this may have equalized. There was an erosion gully that formed on the east side of the bridge which should be filled in by the maintenance contractor before it enlarges and poses a risk to the bridge as it has enlarged quite a bit compared to in 2023. A large beaver dam was also observed upstream of the bridge just before the riprap channel. Consideration should be given to dismantling this dam to prevent it from breaking and large amounts of water rushing through the site potentially disturbing the repair.</p>		
Recommendations:		Cost
<p>Regularly monitor the site for activity, settlement and erosion.</p> <p>It is recommended to keep this site on the annual geohazard monitoring program at least for a few more years to confirm that there is no further settlement of the soil downslope of the walls. Additionally, the erosion gully on the east side of the south abutment should be repaired by:</p> <ol style="list-style-type: none"> 1) Remove all loose fill by excavation down to the base of the erosion gully 2) Re-build the bottom of the ditch by compacting the excavated clay back into the erosion channel in thin lifts then topsoiling, seeding then placing TRM ECB overtop. Riprap over non-woven geotextile could also be used for a more robust fix. <p>As mentioned above, the beaver dam should also be removed.</p>		Maintenance

CLOSURE

It is a condition of this letter report that Thurber's performance of its professional services will be subject to the attached Statement for Use and Interpretation of Report.

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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 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.



Photo 1. Looking north along the southbound lane of the highway.



Photo 2. Looking northeast at the concrete drain trough above the west pile wall.



Photo 3. Looking southeast at riprap that appeared to have settled on the downslope side of the pile wall.



Photo 4. Looking east at the corner of the pile wall and settled riprap.



Photo 5. Looking south at the south abutment and head slope.



Photo 6. Looking south at erosion gully that has formed east of the south side of the bridge.



Photo 7. Looking southeast at riprap that settled below the east pile wall.



Photo 8. Looking south towards the east pile wall and riprap.



Photo 9. Looking northwest at the pier and riprap.



Photo 10. Looking northeast at debris that has accumulated in the pile weirs.



Photo 11. Looking west at the south headslope and east pile wall.



Photo 12. Looking northwest at the beaver dam upstream of the placed riprap.