ALBERTA TRANSPORTATION AND ECONOMIC CORRIDORS
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION (PEACE RIVER DISTRICT)
2025 INSPECTION

Site Number	Location	Name	Hwy	km
PH072	Judah Hill	Sunshine Landslide	744:04	57.924
Legal Description		**UTM Co-ordinates (NAD 83)**		
SE¼ 20-083-21 W5M		11U E 483150	N 6230060	

	Date	PF	CF	Total
Previous Inspection:	May 17, 2023	5	5	25 (Highway)
		13	2	26 (Downslope)
Current Inspection:	May 15, 2025	5	5	25 (Highway)
		13	2	26 (Downslope)
Road WAADT:	630		**Year:**	2024
Inspected By:	Don Proudfoot, Tyler Clay (Thurber) Rocky Wang (TEC)			
Report Attachments:	☒ Photographs ☒ Plans ☒ Maintenance			

Primary Site Issue:	In May of 2013, a landslide developed that encompassed both lanes of the highway through a side hill fill that was located at the top of a high, steep valley slope. Another slide area developed west of the pullout area in the steep valley slope about 50 northwest of the first one.
Dimensions:	The 2013 landslide affected about 100 m of highway. The landslide was about 100 m by 140 m in plan size. The backscarp was partially located in the NBL ditch and in the backslope above the highway. Northwest slide area (first observed in 2019) approximately 50 m west of the pullout north of the pile wall: current active slide scarp approximately 15 m in width and 65 m in length in plan size.
Date of any remediation:	A cast-in place concrete pile wall supported with soil anchors was constructed to buttress the section of the road affected by the 2013 landslide; the highway embankment was rebuilt with expanded polystyrene light-weight fill and the roadway was reinstated to a gravel surface under AT Contract CON0015153 in 2014 and repaved in 2016.
Maintenance:	The PH072 site received a pavement overlay, and strong post W-beam guardrail was replaced in summer 2025 (after the current inspection) as part a larger paving project (CON0023098) of Hwy 744:04 between Peace River and the intersection with Hwy 683.

Observations:	**Description:**	**Worsened?**	
		Yes	**No**
☐ Pavement		☐	☐
☒ Slope Movement	The passive support bench downslope of the pile wall did not have major visible change from the 2023 condition (Photos 2 and 4). The drop from the top of the pile cap to the bases of the exposed portions of the piles varied between 3.3 m and 4.1 m. The cracking/ signs of visible movement in the passive soil bench below the pile wall is most prominent near	☒	☐

	the northern segment of the wall. Sliding in the lower slope appears active with fresh soil exposures (Photos 4 and 5). Slide area approximately 100 m northwest from the north end of the pile wall. 15 m wide scarp with tension cracks that are offset approximately 50 m from the west highway edge. Minor downslope movement noted. Main scarp crack is 1.3 m deep with some fresh soil exposures. Tension cracks upslope of the main scarp. A secondary scarp is forming at one of the tension crack locations. (Photos 6 and 7).		
☒ Erosion	An erosion gully (0.5 m wide, 0.4 m deep) approximately 30 m in length has developed parallel to the edge of the SBL ACP near the north end of the pile wall near KM 58.35 Ditch erosion present in NBL ditch beyond the north end of the pile wall. Scattered Class 1M riprap is present in the ditch bottom. (Photos 1 and 8)	☐	☐
☐Seepage		☐	☐
☐ Bridge/Culvert		☐	☐
☒ Other	The wall surface gutter drain periodically clogs with sediment and/or vegetation and needs to be cleaned on a regular basis. Most of the soil anchor protective caps are cracked and need to be replaced.	☒	☐

Instrumentation:
The instruments were read on June 10, 2025.

Slope Inclinometers Pile 34, Pile 59 and Pile 82
The three slope inclinometers were installed in retaining wall piles during construction. Since the end of construction in July 2015, the slope inclinometers have shown between 1 to 7 mm of downslope movement at the pile head. The movement rates recorded in Spring 2025 are small and range between approximately 0 to 1 mm/yr.

Load Cells VC1802 to VC1806
All soil anchors were initially locked off to 162 kN (80% of the design SLS load of 192 kN). Since their final lock off, the anchors have exhibited a pattern of slightly increasing load over the winter months, which then relaxes in the summer months.

The latest load cell readings, as of June 10, 2025, show minor changes compared to the previous recorded load on May 23, 2024. The changes range from a decrease in 1.61 kN in VC1802 (anchor 60L) to an increase of 1.15 kN in VC1805 (anchor 34U). Load cells VC1803 (anchor 82U) recorded an all-time high measured load of 191.66 kN on February 5, 2025, while load cell VC1804 (anchor 82L) recorded an all time high measured load of 190.47 kN on March 20, 2025. Two load cells (VC1801/anchor 60U and VC1802/anchor 60L) are showing loads that are higher than the design service load, but these loads are still below the ULS factored design load. Overall, the load cells show a trend of relatively stable loads over the past several readings cycles.

Assessment (Refer to Drawing PH072-1)**:**

The reconstructed highway embankment and supporting pile wall appear to be performing well. The movement observed in the passive soil bench below the wall was anticipated and accounted for in the wall design.

The northwest slide area is expected to retrogress closer to the highway in the next 10 years. A new inspection site may eventually be required.

Recommendations:

Monitoring:

- The slide area northwest of the Sunshine pile wall should be monitored during the PH072 annual inspections or alternatively a new site should be created.
- The slope inclinometers should continue to be read manually twice per year and the datalogger installed at the site will continue to take readings of the load cells twice daily as part of the Geohazard Risk Assessment Program.

Maintenance:

- The erosion gully forming on the west edge of the road near the north end of the pile wall (km 58.35) should be backfilled with granular fill to provide support and minimize further undermining and damage to the ACP.
- The erosion in the NBL ditch north of the pile wall and reconstructed highway embankment should be addressed by placing additional Class 1M riprap over non-woven geotextile.
- A small ditch should be dug to drain the ponded water from the soil bench downslope of the wall. This will help slow down the movements in the bench area.
- The damaged anchor caps should be replaced and repacked with grease.

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.

Don Proudfoot, P.Eng.
Principal | Senior Geotechnical Engineer

PROFESSIONAL ENGINEER ALBERTA
TYLER T. CLAY
ID 120965
8 Oct. 2025

PROFESSIONAL ENGINEER ALBERTA
BRUCE W. NESTOR
ID 161284
October 3 2025

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
RM SIGNATURE: Don Proudfoot
RM APEGA ID #: 51674
DATE: October 6, 2025
PERMIT NUMBER: P005186
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

Tyler Clay, P.Eng.
Geological Engineer
Field Inspection

Bruce Nestor, P.Eng.
Geotechnical Engineer
Report Preparation

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.

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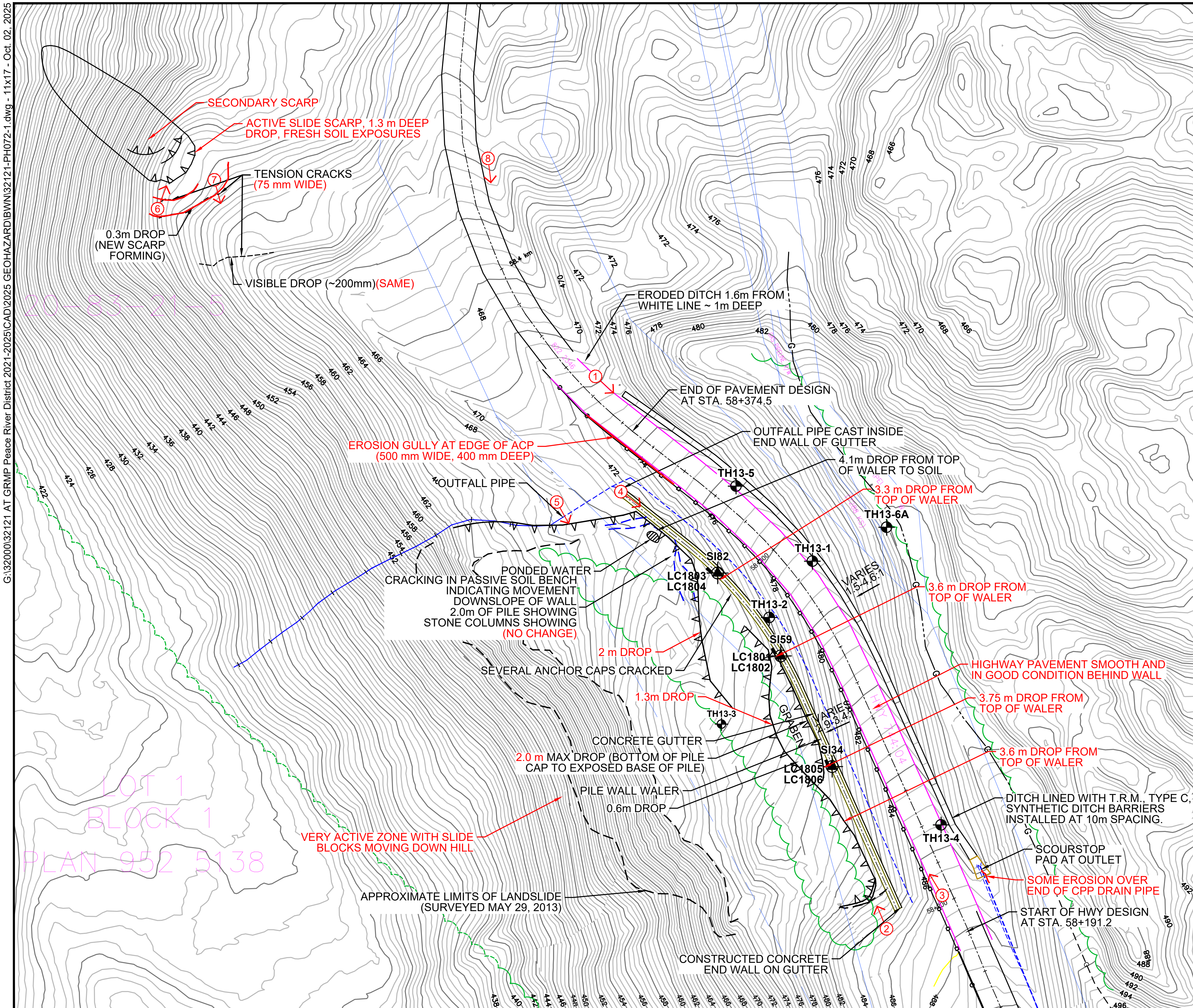


SECONDARY SCARP
ACTIVE SLIDE SCARP, 1.3 m DEEP DROP, FRESH SOIL EXPOSURES
TENSION CRACKS (75 mm WIDE)
0.3m DROP (NEW SCARP FORMING)
VISIBLE DROP (~200mm)(SAME)
20-83-21-5
ERODED DITCH 1.6m FROM WHITE LINE ~ 1m DEEP
END OF PAVEMENT DESIGN AT STA. 58+374.5
EROSION GULLY AT EDGE OF ACP (500 mm WIDE, 400 mm DEEP)
OUTFALL PIPE CAST INSIDE END WALL OF GUTTER
4.1m DROP FROM TOP OF WALER TO SOIL
OUTFALL PIPE
3.3 m DROP FROM TOP OF WALER
TH13-5
TH13-6A
TH13-1
SI82
LC1803
LC1804
PONDED WATER
CRACKING IN PASSIVE SOIL BENCH INDICATING MOVEMENT DOWNSLOPE OF WALL
2.0m OF PILE SHOWING
STONE COLUMNS SHOWING
(NO CHANGE)
VARIES 1.5-4.6:1
3.6 m DROP FROM TOP OF WALER
TH13-2
SI59
2 m DROP
LC1801
LC1802
SEVERAL ANCHOR CAPS CRACKED
HIGHWAY PAVEMENT SMOOTH AND IN GOOD CONDITION BEHIND WALL
1.3m DROP
TH13-3
GRABEN
HWY 744:04
3.75 m DROP FROM TOP OF WALER
CONCRETE GUTTER
2.0 m MAX DROP (BOTTOM OF PILE CAP TO EXPOSED BASE OF PILE)
SI34
LC1805
LC1806
3.6 m DROP FROM TOP OF WALER
PILE WALL WALER
0.6m DROP
LOT 1
BLOCK 1
PLAN 952 5138
DITCH LINED WITH T.R.M., TYPE C, SYNTHETIC DITCH BARRIERS INSTALLED AT 10m SPACING.
TH13-4
VERY ACTIVE ZONE WITH SLIDE BLOCKS MOVING DOWN HILL
SCOURSTOP PAD AT OUTLET
SOME EROSION OVER END OF CPP DRAIN PIPE
APPROXIMATE LIMITS OF LANDSLIDE (SURVEYED MAY 29, 2013)
START OF HWY DESIGN AT STA. 58+191.2
CONSTRUCTED CONCRETE END WALL ON GUTTER
58.4 km

N
W E
S

LEGEND

- SURVEYED GAS LINE
- ESTIMATED CURRENT ALIGNMENT OF ATCO PIPELINE
- TREE LINE
- TREE LINE (ESTIMATED)
- APPROXIMATE LIMITS OF LANDSLIDE (SURVEYED MAY 29, 2013)
- NEW STRONG POST GUARD RAIL (2015)
- GUARD RAIL
- DIRECTION AND PHOTO NUMBER
- SLOPE INCLINOMETER
- TEST HOLE
- LOAD CELL

NOTE:

1. MAY 15, 2025 OBSERVATIONS SHOWN IN RED.

0 10 20 30 40 50 60m

SCALE 1:1000

Alberta

PEACE REGION (PEACE RIVER DISTRICT)

PH072-1 SUNSHINE SLIDE
2025 SITE INSPECTION PLAN

DWG No. 32121-PH072-1

DRAWN BY	DLA
DESIGNED BY	BWN / TTC
APPROVED BY	TSA
SCALE	1:1000
DATE	SEPTEMBER 2025
FILE No.	32121

THURBER

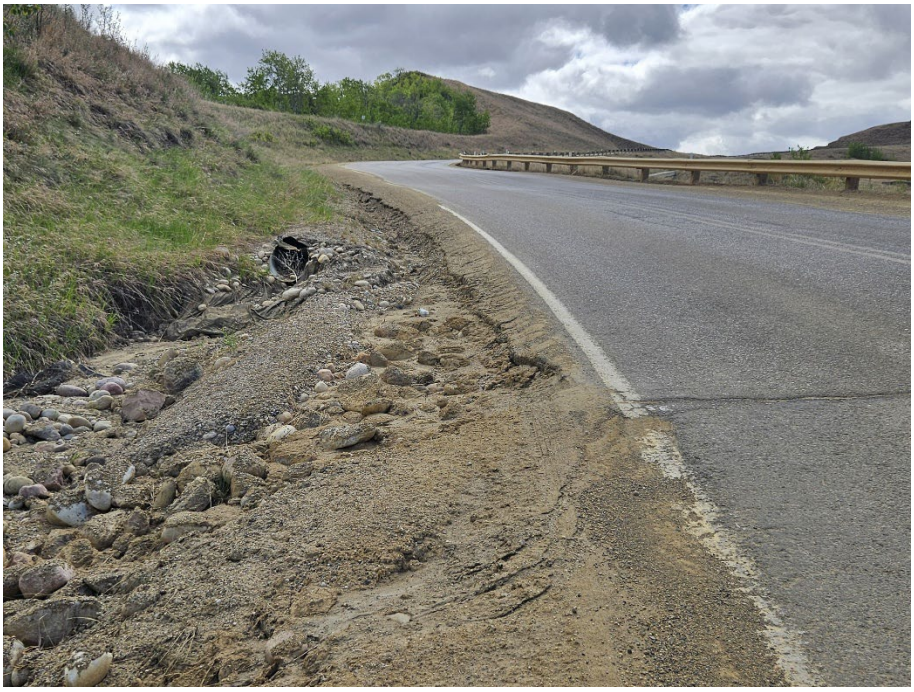


Photo 1.

Looking southeast at northbound lane ditch erosion near the north end of the Sunshine pile wall. Outlet of ditch CSP culvert is visible in the middle left of the photo.

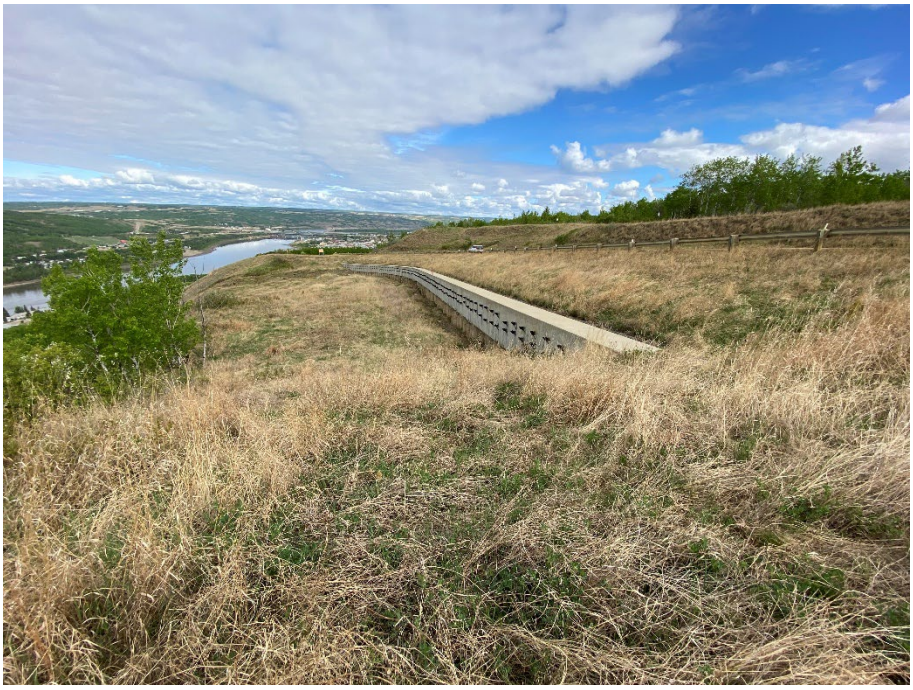
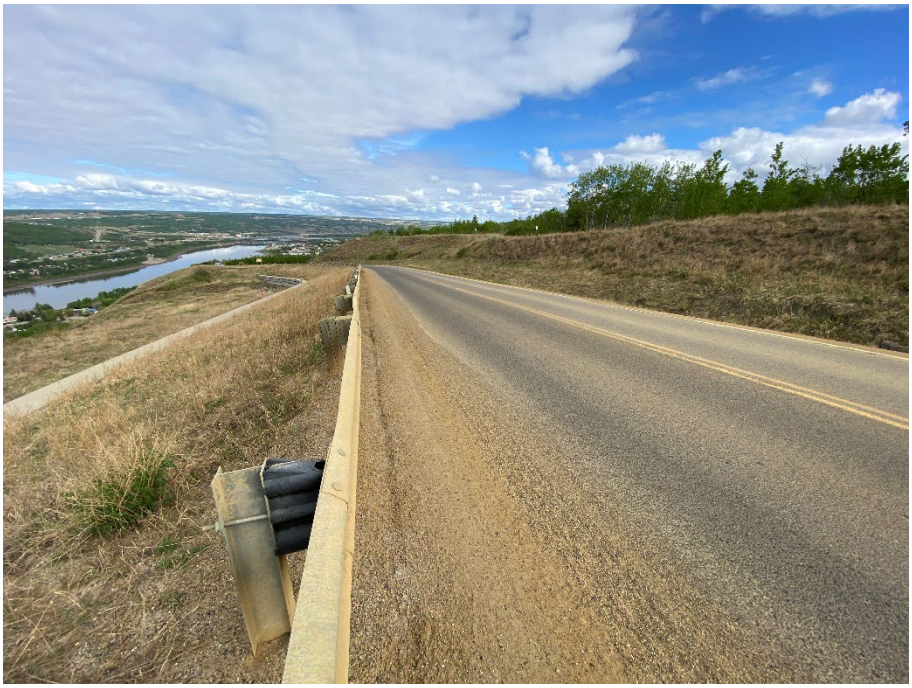
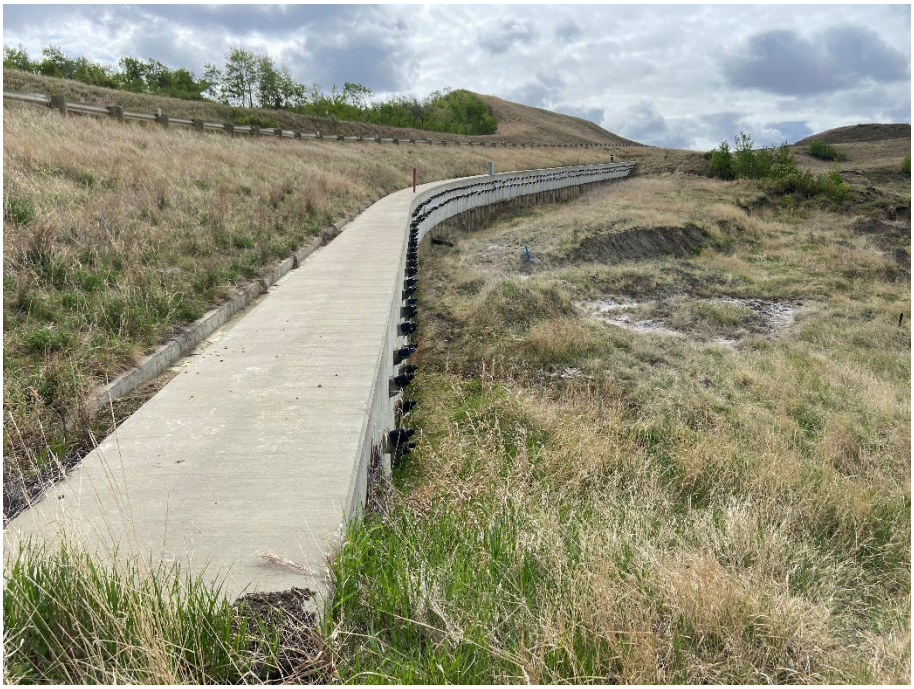


Photo 2.

Looking northwest from the south end of the Sunshine pile wall at km 58.20. No major visible changes from the 2023 condition.

	**Photo 3.** Looking northwest from south end of the Sunshine pile wall at km 58.20 along the highway. No distress to the ACP surface was observed.
	**Photo 4.** Looking southeast along the pile wall at km 58.33. Head scarp cracks downslope of the wall showed a 2.0 m drop.

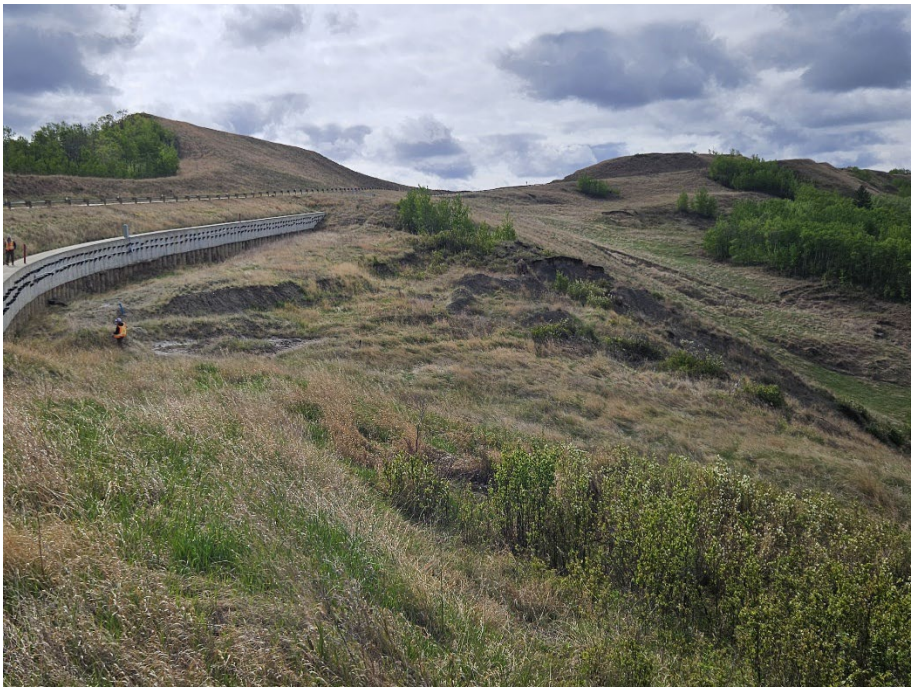


Photo 5.

Looking southeast at the lower slide area below the wall. Active ongoing slide movement within the lower slope.

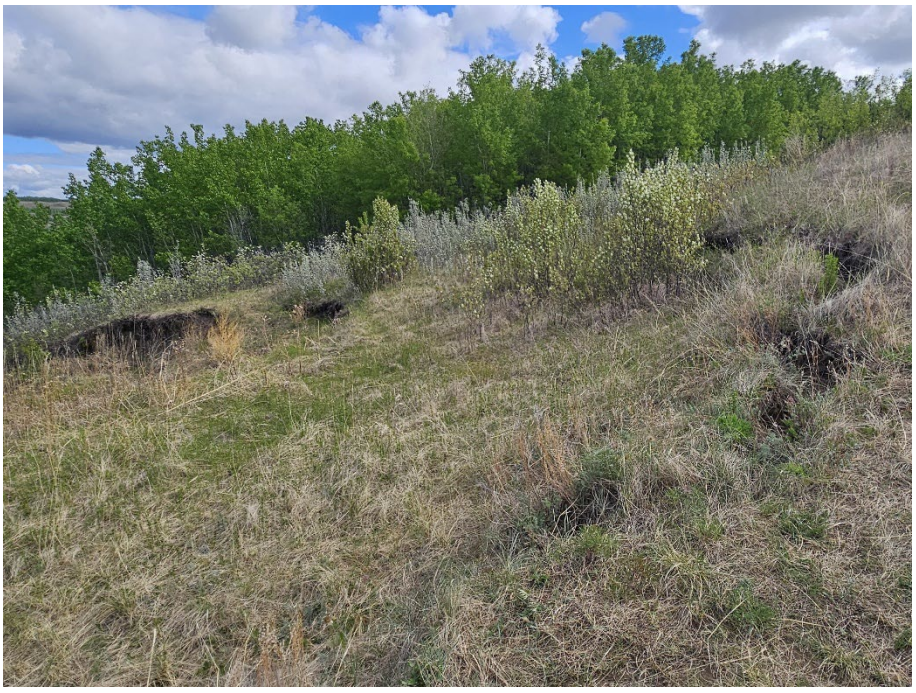


Photo 6.

Slide area (first observed in 2019) approximately 120 m NW of the north end of the pile wall. Slide is active with fresh soil exposures in 2025.

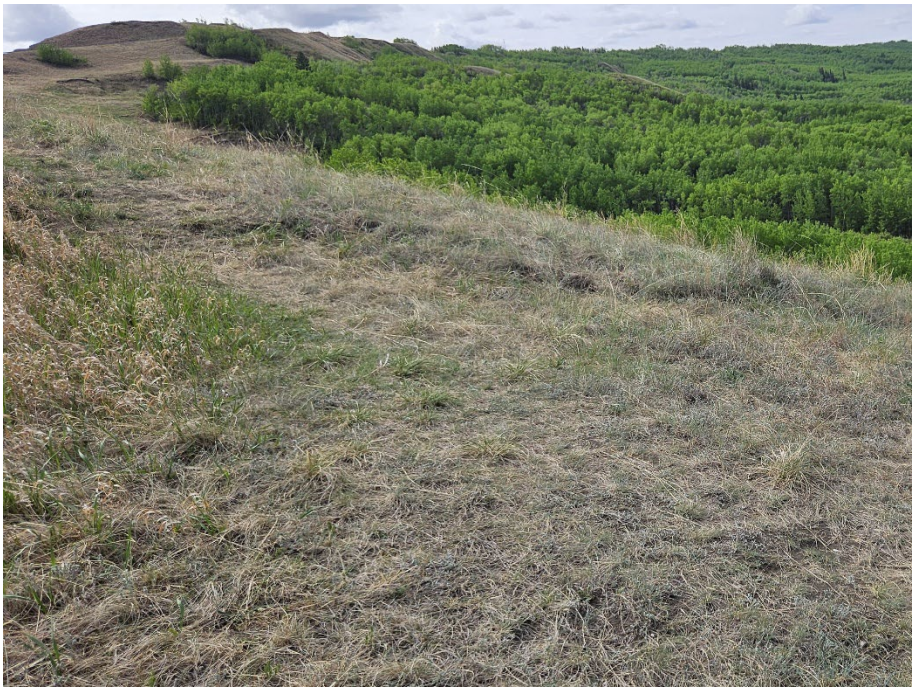


Photo 7.

Looking southeast at the uppermost tension crack observed upslope from the slide scarp in Photo 6. Cracks are up to 75 mm wide.

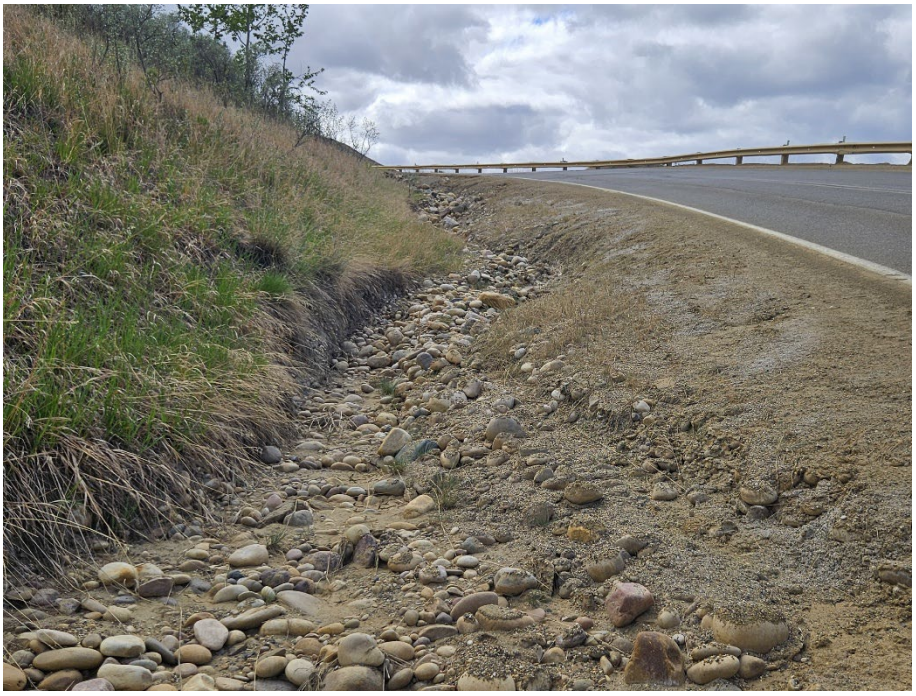


Photo 8.

Looking south at erosion in NBL ditch at km 58.43. Scattered 1M riprap visible in ditch bottom.