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

Site Number	Location	Name	Hwy	km
SH024-12 SH024-12B* SH024-12A* SH024-12D**	Little Smoky River: East Valley Slope	Little Smoky River Valley, North Hill – Sites #12, #12B, #12A, and #12D	744:02	20.80-20.90 20.94-21.03 21.03-21.12 21.17-21.30

Legal Description	UTM Co-ordinates				
Site 12: NE21-76-22-W5M	11U	E	478,432	N	6,162,375
Site 12B: NE21-76-22-W5M	11U	E	478,472	N	6,162,492
Site 12A: NE21-76-22-W5M	11U	E	478,504	N	6,162,588
Site 12D: NE21- and SE28-76-22-W5M	11U	E	478,550	N	6,162,737

	Date	PF	CF	Total
Previous Inspection:	6-Jun-2023	10	3	30
Current Inspection:	27-May-2025	10	3	30
Road AADT:	290		**Year:**	2024
Inspected By:	Kristen Tappenden, TEC		Roger Skirrow, Thurber Mark Gallego, Thurber	
Report Attachments:	☒ Photographs	☒ Plans	☐ Maintenance Items	

Primary Site Issue:	The highway traverses slowly moving deep-seated, retrogressive landslides that move due partly to erosion at toe by the Little Smoky River and Peavine Creek resulting in cracking and sagging of the pavement surface at numerous locations. Approx. 4 km of the highway crosses this unstable north valley slope. These Sites are 55 m to 60 m above and 375 m to 475 m away from the Peavine Creek.
Dimensions:	Site 12: 85 m length of highway affected by cracking and guardrail distortion. Site 12B: 50 m length of highway with cracking. Site 12A: 90 m length of highway with cracking and slumping. * In 2016, a review of historical documentation for this Site determined that Site #12C should be #12B (south portion) and #12A (north portion). ** Site #12D not assessed since 2015.
Date of Remediation:	2002: Site #12A subexcavated and reconstructed with pitrun gravel with 2 m high toe berm, subdrain installation, and culvert extension. 2003: Site #12A: culvert lined with 762 mm smooth-wall steel pipe 2004: Site #12 subexcavated and replaced with pitrun gravel with clay toe berm and subdrain; west ditch erosion also repaired.
Maintenance:	Routine ACP crack sealing, milling, and patching, when required. 2017 (post-inspection): Overlay through Sites 13, 15, and 14 2021: Hwy upgrades on north valley slope including 50 mm overlay, new guardrails, line painting, and ditch improvements

Observations (Site 12):	Description	Worsened?
☒ Pavement Distress	Vertical distortions that develop are periodically removed with each pavement overlay. Cracks are continuing to reflect through since the most recent overlay. Cracks have extended into TR764 intersection towards the southwest ditch.	☒
☒ Slope Movement	Site is located on an active deep-seated landslide moving toward the Peavine Creek. There is short section of vertical distortion of the new guardrail.	☒
☐ Erosion		☐
☐ Seepage		☐
☒ Bridge/Culvert Distress	Minor rill development and ponding of water at both ends of approach culvert under TR764.	☐
☐ Other		☐
Observations (Site 12B):	**Description**	**Worsened?**
☒ Pavement Distress	The scarp crack has not yet reflected through 2021 overlay. Additional cracks continue to reflect through overlay.	☒
☒ Slope Movement	Site is located on an active deep-seated landslide moving toward the Peavine Creek.	☐
☐ Erosion		☐
☐ Seepage		☐
☐ Bridge/Culvert Distress		☐
☐ Other		☐
Observations (Site 12A):	**Description**	**Worsened?**
☒ Pavement Distress	Additional longitudinal and transverse cracking was reflected through; may not be related to slope movement.	☒
☒ Slope Movement	Site is located on an active deep-seated landslide moving toward the Peavine Creek. The toe berm appears to be functioning to stabilize the local embankment. New slump noted in 2022 in gravel placed on shoulder north of culvert. Some movement was observed during 2025 inspection.	☒
☒ Erosion	Minor erosion along grassed-lined channel at culvert outlet (km 21.081). Inlet end of ditch has been lined with erosion covering.	☐
☐ Seepage		☐
☒ Bridge/Culvert Distress	Culvert at km 21.081: inlet of SWSP liner is 1/3 silted in.	☒
☐ Other		☐
Instrumentation: None		

Assessment:

The overall valley slope is moving as several separate slide blocks in response to the toe erosion and downcutting of two different rivers resulting in numerous scarps, small to large scale sag ponds, and differential movement zones going in slightly different directions. The highway intersects the scarps of these blocks at several locations resulting in an uneven highway surface and cracking.

Site 12:

Portions of the main slide scarp crack at the Township Road 764 (TR764) intersection are continuing to reflect through the 2021 overlay. Cracks have extended into TR764 intersection towards the southwest ditch. There is a slight vertical sag observed in the middle section of the guardrail across from the TR764 intersection (installed in 2021) during the 2022, 2023 and 2025 inspections. This appears to be in the same location where the previous guardrail was also deformed. Overall, the toe berm appears to be functioning to stabilize the highway fill embankment; however, it is not conclusive if the pavement cracking and guardrail deformation are related to the local or global slope movements.

Site 12B:
This site, an area of additional cracking between the two toe berms at Site #12 and Site #12A, was discontinued from the Geohazard Assessment program in 2007. At the time of the 2016 inspection, there appeared to be a long crack roughly parallel to the highway that may be associated with slope movement and the width and extents of cracking have increased slightly each year following. In 2022, only minor transverse cracks had re-appeared through the 2021 overlay and a few more cracks were noted in 2023 and 2025. More time will be required to determine if the full crack pattern will become established and if it suggests potential slope instability.

Site 12A:
Additional longitudinal cracking has reflected through the 2021 overlay; and some of the previous transverse cracking has appeared. Although these cracks on the highway are above the toe berm, they do not appear to be related slope movement (at this time). During the 2021 grading work, gravel was loosely placed on the east side of the highway embankment just north of the culvert. This material was placed too steeply and had started to slump at the time of the 2022 inspection. Although the scarp at the edge of the highway appeared unchanged, the toe roll observed at the bottom of the slope is more defined. It is possible that the slumping is occurring only within the loose gravel; however, it should be regraded at a flatter slope, spread out along more of the embankment, or removed out of the valley to prevent destabilizing the highway embankment itself. Some movement was observed at the slump and the toe roll during the 2025 inspection.

Recommendations:

Short-Term:
- Road maintenance should continue as necessary to maintain a safe roadway surface and may consist of milling, patching, and crack sealing of the ACP.
- The loose gravel fill at Site 12A should be graded and track-packed into a flatter downslope configuration and monitored for any additional movement.

Long-Term:
A functional planning study was commissioned (lead by CIMA+) to look at realignment of Hwy 744 on both sides of the valley. However, given the high cost of this option and the low volume of traffic, it is unlikely that a large scale realignment that would avoid all the slide issues along Hwy 744, will be undertaken in the near future. Consideration could be given to a shorter realignment, as previously proposed by Thurber, which would include Site #12 and potentially a portion of Site #12B. Site #12A would not be included in this shorter realignment option.

Ongoing Investigation/Inspection:

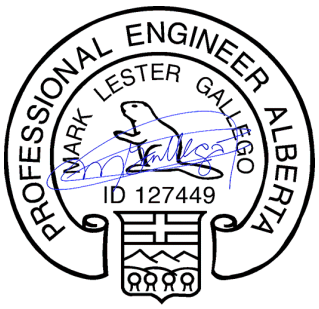
The frequency of Geohazard inspection was increased to annual following the 2022 year-end meeting.

If a drill rig is in the area on other projects, installation of inclinometers through the toe berms at Site 12 and 12A would be useful to determine the presence, depth, and movement rate of potential deeper-seated failure surfaces that could have long-term implications for the highway. The LiDAR information gathered for the functional planning study could be repeated periodically to help assess the pattern and rate of movements within the Little Smoky Valley that affect the highway.

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.

Roger Skirrow, P.Eng.
Senior Geotechnical Engineer



October 9, 2025

Mark Gallego, P.Eng.
Geotechnical Engineer

PERMIT TO PRACTICE
THURBER ENGINEERING LTD.
RM SIGNATURE: _____
RM APEGA ID #: 51674
DATE: October 10, 2025
PERMIT NUMBER: P005186
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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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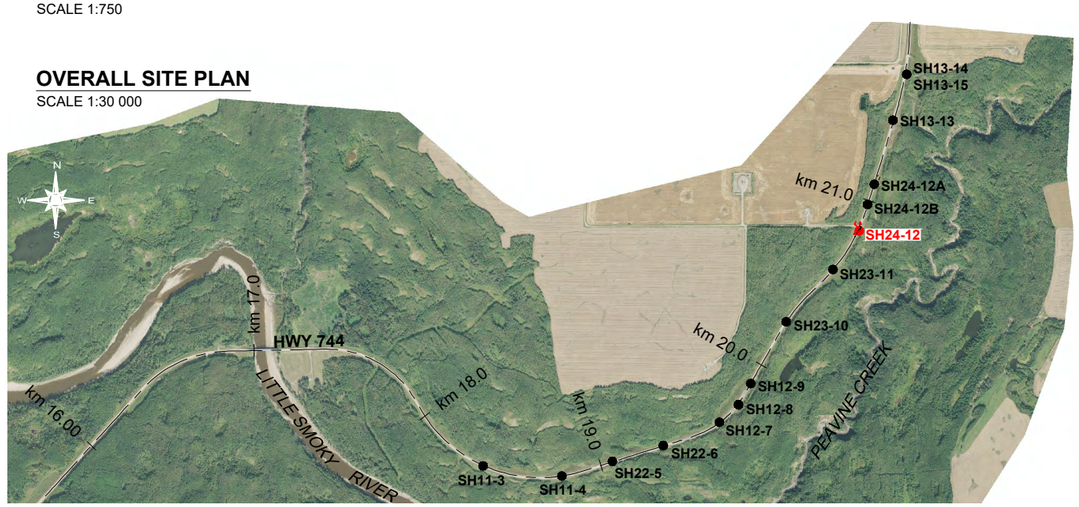
PONDED WATER (2023)
CLASS 1M RIPRAP (300 mm THICK OVER NON-WOVEN GEOTEXTILE)
GROWTH OVER RIPRAP
EROSION RILLS
200mm WIDE, 200mm DEEP
RUTS
CRACKS
10mm WIDE
20mm WIDE
10mm DIFF
10mm WIDE
10mm WIDE
CULVERT
CATTAILS
PONDED WATER
40mm WIDE
10mm WIDE
<15mm WIDE
VERTICAL DIP IN GUARDRAIL
<10mm WIDE
INACTIVE SCARP
km 20.8
km 20.9
PH024-12B
PH024-12
POSSIBLE SCARP (2019)
NOT OBVIOUS (2020)
15m
3.25H:1V
3%
3%
4H:1V
4H:1V
4H:1V
TOE BERM
EXTENT OF GRAVEL WEDGE
BURIED SUBDRAIN OUTLET
SWALE LINED WITH
HIGH-FLOW SOIL COVERING

DETAILED SITE PLAN
SCALE 1:750

OVERALL SITE PLAN
SCALE 1:30 000



LEGEND
- CULVERT
- GUARDRAIL
- ① DIRECTION AND NUMBER OF PHOTO

NOTES
1. FEATURE LOCATIONS ARE APPROXIMATE.
2. PREVIOUS OBSERVATIONS SHOWN IN BLACK (2013-2015 FROM AMEC FIGURE 1, PROJECT EG10030, PROVIDED BY ALBERTA TRANSPORTATION).
3. MAY 2025 OBSERVATIONS SHOWN IN RED.
4. CRACK AND PATCH PATTERNS RESET USING 2022 UAV IMAGERY AS HWY 744 WAS OVERLAID IN SUMMER 2021.
5. GUARDRAIL AND CULVERT LOCATIONS TAKEN FROM MCINTOSH PERRY AS-BUILT DRONE SURVEY (JULY 2021).

0 10 20 30 40 50m
SCALE 1:750

SATELLITE IMAGE FROM VALTUS IMAGERY (DATED 2014)

Alberta

PEACE REGION (PEACE RIVER DISTRICT)

SH024-12: HWY 744:02 LITTLE SMOKY RIVER VALLEY 2025 SITE INSPECTION PLAN

DWG No. 32121-SH024-12

DRAWN BY	ML
DESIGNED BY	MG
APPROVED BY	RKS
SCALE	AS SHOWN
DATE	OCTOBER 2025
FILE No.	32121

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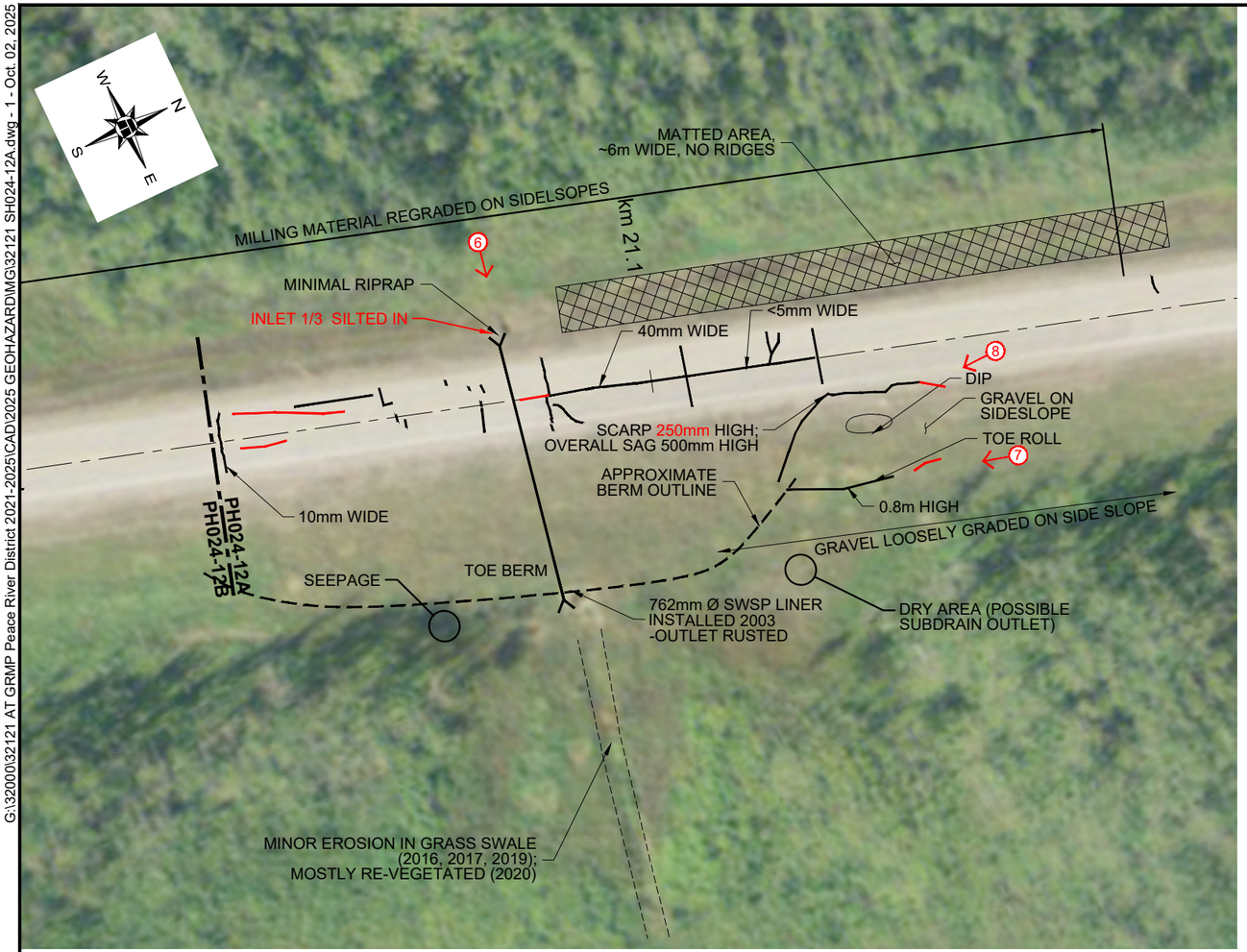
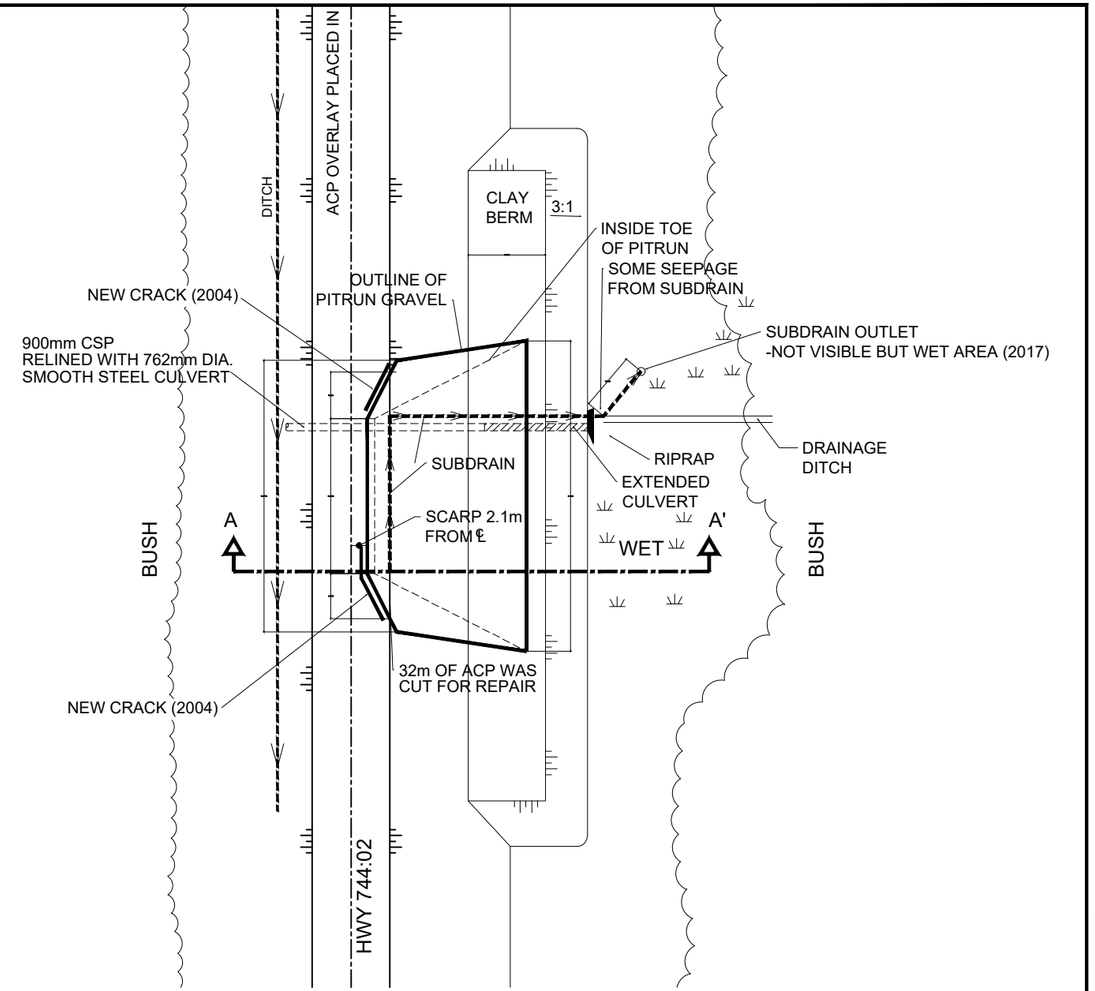
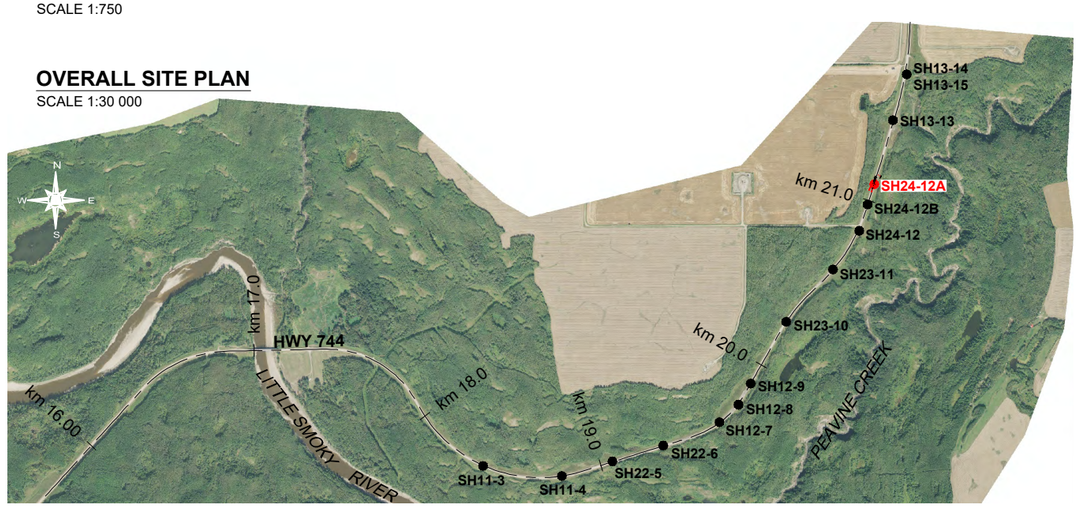


DETAILED SITE PLAN
SCALE 1:750



SCHEMATIC AS-BUILT PLAN
NTS

OVERALL SITE PLAN
SCALE 1:30 000



LEGEND

CULVERT

1 DIRECTION AND NUMBER OF PHOTO

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5. GUARDRAIL AND CULVERT LOCATIONS TAKEN FROM MCINTOSH PERRY AS-BUILT DRONE SURVEY (JULY 2021).

0 10 20 30 40 50m
SCALE 1:750

SATELLITE IMAGE FROM VALTUS IMAGERY (DATED 2014)

Alberta

PEACE REGION (PEACE RIVER DISTRICT)

SH024-12A: HWY 744:02 LITTLE SMOKY RIVER VALLEY 2025 SITE INSPECTION PLAN

DWG No. 32121-SH024-12A

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DESIGNED BY	MG
APPROVED BY	RKS
SCALE	AS SHOWN
DATE	OCTOBER 2025
FILE No.	32121

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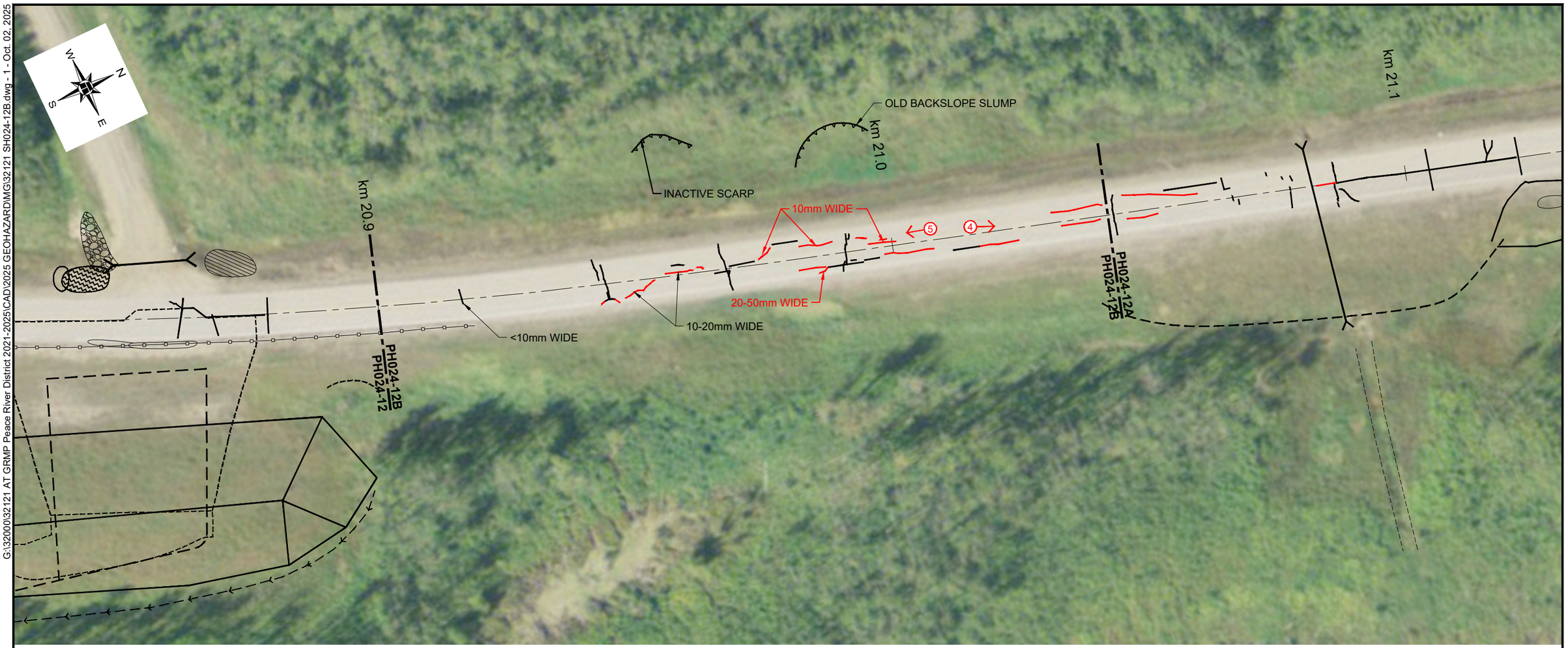
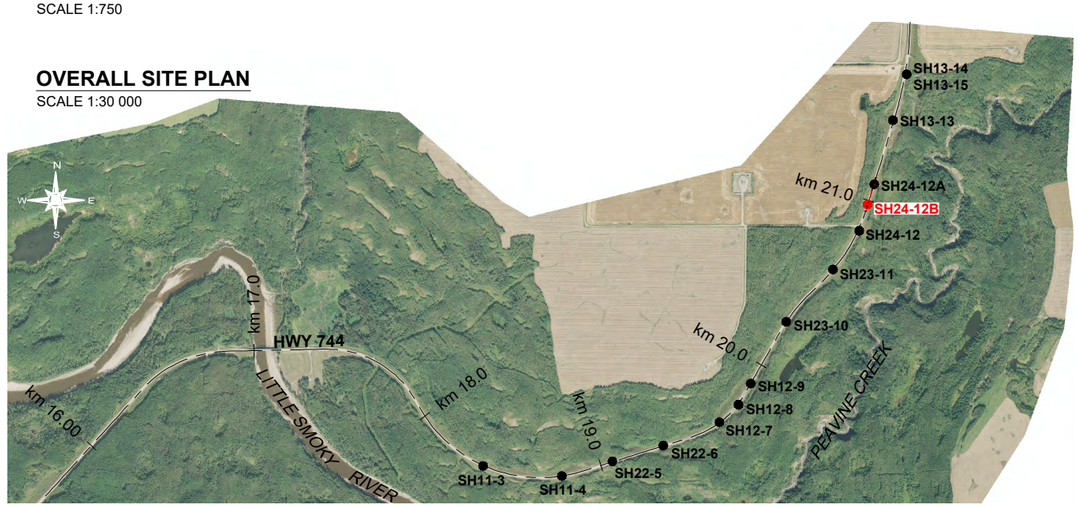


DETAILED SITE PLAN

SCALE 1:750

OVERALL SITE PLAN

SCALE 1:30 000



LEGEND

- CULVERT
- GUARDRAIL
- RED TEMPORARY HAZARD SIGN
- ① DIRECTION AND NUMBER OF PHOTO

NOTES

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5. GUARDRAIL AND CULVERT LOCATIONS TAKEN FROM MCINTOSH PERRY AS-BUILT DRONE SURVEY (JULY 2021).

0 10 20 30 40 50m

SCALE 1:750

SATELLITE IMAGE FROM VALTUS IMAGERY (DATED 2014)

Alberta

PEACE REGION (PEACE RIVER DISTRICT)

SH024-12B: HWY 744:02 LITTLE SMOKY RIVER VALLEY 2025 SITE INSPECTION PLAN

DWG No. 32121-SH024-12B

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SCALE	AS SHOWN
DATE	OCTOBER 2025
FILE No.	32121

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Photo 1, Site 12 – Looking northeast at the highway surface upslope of the toe berm location. There is a noticeable dip in the at the middle section of the guardrail.

Photo 2, Site 12 – Looking northeast from the TR764 intersection at where the main scarp crack was located. The previous crack pattern is continuing to reflect through the 2021 overlay.

Photo 3, Site 12 – Looking southwest at the TR764 intersection where cracks have extended from the road surface towards the southwest ditch.

Photo 4, Site 12B: Looking north at cracks extending towards Site 12A.

Photo 5, Site 12B – Looking south at cracks continuing to reflect through the 2021 overlay.

Photo 6, Site 12A – Looking east at culvert inlet location.

Photo 7, Site 12A – Looking south at toe roll downslope of where excess gravel appears to have been wasted on the sideslope. There appears to be some movement observed since the last inspection.

Photo 8, Site 12A – Looking south at the downslope shoulder, where a scarp had previously developed near the highway due to excess gravel placement.