

**ALBERTA TRANSPORTATION
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – PEACE RIVER/HIGH LEVEL
2018 INSPECTION**



Site Number	Location	Name	Hwy	km
PH22	13 km W. Cleardale	Clear River East Hill-Site 6	64:02	22.8-23.1
Legal Description		UTM Co-ordinates (NAD 83)		
S28-84-11-W6		11 N 6243933	E 334702	

	Date	PF	CF	Total
Previous Inspection:	June 1, 2017	10	3	30
Current Inspection:	May 18, 2018	10	3	30
Road AADT:	420		Year:	2017
Inspected By:	Barry Meays, Don Proudfoot (Thurber); Ed Szmata, Ken Szmata, Roger Skirrow (AT).			
Report Attachments:	<input checked="" type="checkbox"/> Photographs		<input checked="" type="checkbox"/> Plans	<input type="checkbox"/> Maintenance Items

Primary Site Issue:	Slide cutting across highway, potentially at 2 locations		
Dimensions:	West dip about 25 m wide (located ~200m west of an east dip)		
Date of any remediation:	7 Horizontal Drains in 1987		
Maintenance:	Asphalt overlay in August 2008. Intermittent patches. Chip seal in Fall, 2017.	Worsened?	
Observations:	Description	Yes	No
<input checked="" type="checkbox"/> Pavement Distress	Elongated cracks are beginning to reflect through the fall, 2017 chip seal at the east dip. This chip seal has masked the cracks and patches placed in the area of the west dip.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	At the east dip, the south shoulder is sunken, and the subdued slump located downslope of hwy at this location is more apparent.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Build-up of sanding gravel on the EB shoulder about 50 mm high blocks and channelizes runoff.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	Trace in OWP of WB lane east of east dip.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Bridge/Culvert Distress	Culvert at west edge of east dip.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>	<input type="checkbox"/>

Instrumentation:
None operational. Previous Movements in SI-58 was 10 mm/yr at 21 m to 26 m deep.

Assessment (Refer to Figure PH22-1):
It was concluded in 2011 that the drains mentioned in the old road files 50 m downslope of hwy may not have been installed, since they could not be located. Movements that were previously monitored in SI58 appear to be ongoing (but slow) based on a kink in the south guardrail and bow in the fence on the south embankment at this location. There is a possibility that a large slide scarp circles north of highway and joins the two observed dips spaced 200 m apart along the highway.

The west dip appears to be enlarging westwards, based on cracks first found in 2013 a distance of 15 m west of the west dip and which were observed to extend about 50 m west in 2017, and also a more apparent dip in the embankment in 2018. Previous cracks through the patch in the west dip were congregated in the wheel paths and did not cross, suggesting pavement fatigue, however with time the crack pattern appears to be angling semi-continuously across the highway. The cracks and the fact that the east dip was again patched in 2015, and the new/enlarged cracks and sunken shoulder at the east dip, suggests some on-going creep (which was previously reflecting through the 2008 overlay). Seepage traces in the pavement in previous years indicates a high water table.

Recommendations:

Inspection: It was previously recommended by AT in 2011 that this site should be inspected every second year from now on.

Maintenance: Clean the accumulated sand from the east highway shoulder and from underneath the guardrail for safety and to prevent formation of surface water concentration rilling. If necessary, place pitrun gravel in the runoff channel on the embankment below the guardrail.

Short Term: Clean the culvert outlet (located on the north side of the highway at the east highway dip) of mud/debris that is partially blocking the culvert to promote unrestricted flow.

Obtain LiDAR for this site (currently no coverage in AT's database), and review to see if a circular slide plane that joins both dip areas can be delineated. Perform a geotechnical Investigation to define the slide plane, consisting of 3 test holes containing Sl's and Piezometers (as shown on Figure PH22-1) to depths of 35 m.

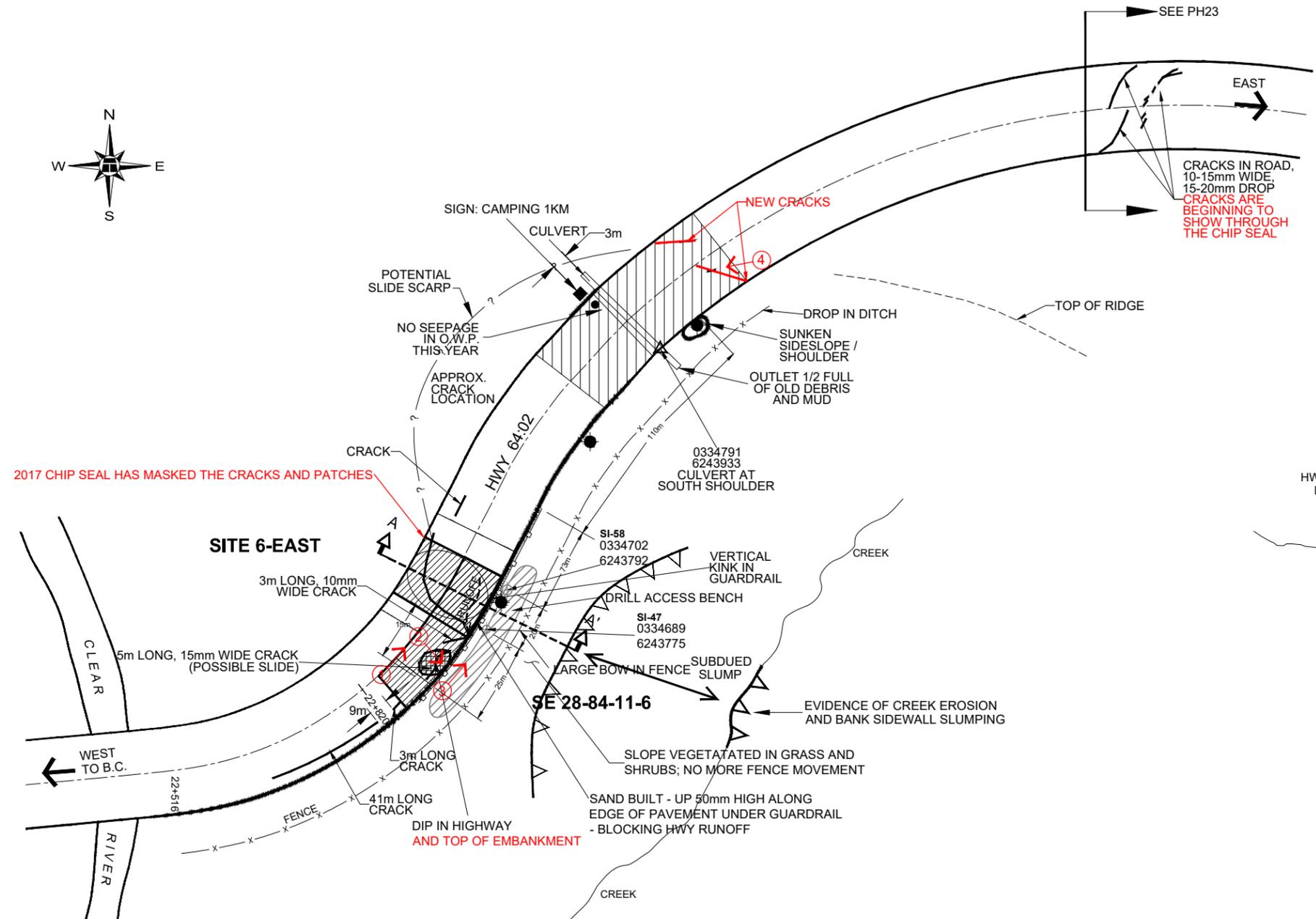
Estimated Cost \$100,000

Long Term:

Install horizontal drains;

OR Reroute the highway further upslope around the slide, in combination with some material unloading at the current highway position;

OR Install a pile wall with tie backs.



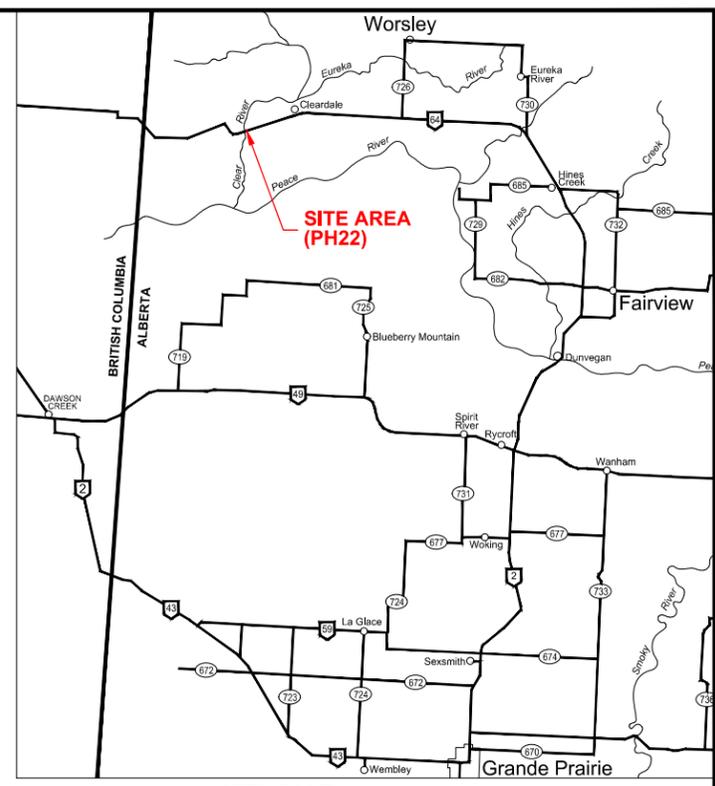
LAYOUT PLAN OF PH22-SITE #6 NOT TO SCALE
(SW1/4-28-84-11-6)

LEGEND :

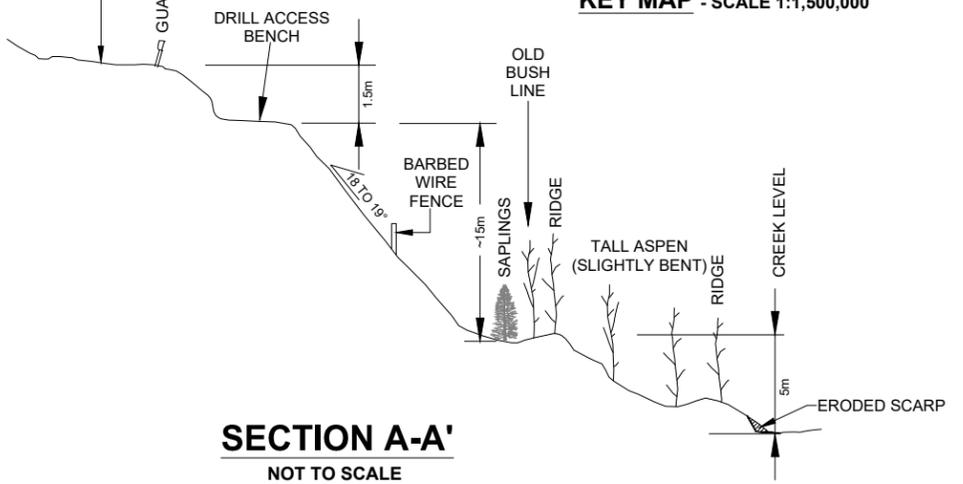
- SLOPE INCLINOMETER (not in use)
- PHOTO & DIRECTION
- SLUMP SCARP
- FENCE
- GUARDRAIL
- A.C. PATCH
- HAND HELD GPS CO-ORDINATES
- PROPOSED 35m DEEP SI WITH 2-10m AND 1-25m DEEP STANDPIPE PIEZOMETER

NOTES :

1. BASE PLAN COPIED FROM "GAEA ENGINEERING" DRAWING
2. FEATURE LOCATIONS ARE APPROXIMATE.
3. PREVIOUS OBSERVATIONS SHOWN IN BLACK
4. MAY 18, 2018 OBSERVATIONS SHOWN IN RED
5. CHIP SEAL PLACED IN FALL, 2017



KEY MAP - SCALE 1:1,500,000



SECTION A-A'
NOT TO SCALE

**PEACE REGION (PEACE RIVER/HIGH LEVEL)
PH22 HWY 64:02 - CLEAR RIVER EAST HILL REGION**

2018 PH22 INSPECTION PLAN

FIGURE PH22, SITE #6

DRAWN BY	ML
DESIGNED BY	BDM
APPROVED BY	DWP
SCALE	N.T.S.
DATE	MAY 18, 2018
FILE No.	13351

THURBER ENGINEERING LTD.



Photo 1 – Looking east along the highway from the far west end of the site. The fall, 2017 chip seal has camouflaged the cracks. Note the west dip in the road/guardrail in the background.



Photo 2 - Looking south at the guardrail at the west highway dip. Note the accumulated sand/gravel on the EB shoulder (~50 mm high), that channelizes runoff from the highway.



Photo 3 - Looking east along the south highway embankment, at a dip beginning to form in the embankment. Note the well grassed/vegetated sideslope. There is also a bow in the fence (not visible in the photo).



Photo 4 - Looking west at the old cracks reflecting through the chip seal, and a dip/sunken eastbound shoulder of the highway located at the east end of the site.