

**ALBERTA TRANSPORTATION
GEOHAZARD ASSESSMENT PROGRAM
PEACE REGION – HIGH LEVEL
2020 CALLOUT**



Site Number	Location	Name	Hwy	km
PH075-2	North of Town of Peace River	Whitemud River (km 44.8)	743:02	44.8
Legal Description		UTM Co-ordinates		
NE02-88-21-W5		11V N 6273979	E 486113	

	Date	PF	CF	Total RISK LEVEL
Previous Inspection:				
Current Inspection:	4-August-2020	9	6	54
Road AADT:	110	Year:	2019	
Inspected By:	Ed Szmata, TRANS		Don Proudfoot, Thurber	
Report Attachments:	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input type="checkbox"/> Maintenance Items			

Primary Site Issue:	A landslide scarp has developed in the surface of a two laned gravelled road.		
Dimensions:	55 m wide along the shoulder, approx. 275 m wide at the creek and 160 m long from the highway to the creek.		
Date of any remediation:			
Maintenance:	Highway officially closed on July 13, 2020 due to landslide movements at other sites.	Worsened?	
Observations:	Description	Yes	No
<input checked="" type="checkbox"/> Pavement Distress	Cracks and dip in gravel road surface.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	Cracks and dip across roadway indicate slope movement. LiDAR indicates historical scarps on slope above and below roadway.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Erosion occurring in east ditch sporadically over 200 m length between Km 44.3 to 44.1 south of PH075-1 (photo 4 and 5)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	A zone of steady seepage was observed at Site PH038 (approx. km 45.4) in the uphill shoulder of the highway, making the road surface soft at that location (photo 1).	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Culvert Distress		<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>	<input type="checkbox"/>
Instrumentation:	None.		

Assessment:

The slide at PH075-2 was first noticed during a callout inspection of other sites on Hwy 743 on August 4, 2020.

The site is located on Highway 743:02 on a sidehill alignment ascending the valley slope of a tributary to the Whitemud River. LiDAR provided by Alberta Transportation (Figure 1) shows that the valley slope has been affected by historic landslide movements. It is considered that recent higher groundwater levels have re-activated a large slide block which is now affecting about 55 m of the road surface. At the centre of the disturbance the highway is located about 25 m above the creek. The valley slope surface, as shown by the cross-section on Dwg. No.13351-PH075-2, is hummocky, indicating the presence of several retrogressive slide blocks between the creek and the road.

There is a zone of steady seepage at PH038, at about Km 45.4 (see Figure 1), that has been noted during previous visits to that site. The amount of water seeping out of the ground at that locations was higher this year than previous years and had created a soft yielding surface in the shoulder area under traffic loading repetitions.

Ditch erosion occurred downstream of a centreline culvert this spring between km 44.3 and 44.1. The grader operator from LaPrairie indicated that the culvert might have been frozen and that higher than usual meltwater runoff by-passed the inlet and carried on down to the river creating patches of erosion through the grass covered ditch. The LiDAR shows a gully in the riverbank at the end of the erosion section suggesting that this may have also happened before in the past.

Recommendations:Landslide Movements:

The most practical solutions available at the PH075-2 landslide site involve monitoring and re-aligning the highway away from the current slide cracks.

Short-Term (<3 months):

- The cracks and slumping at this site are still limited in extent such that the road can still be used at this location with care and at slow speeds. Slide warning signs and a 30 km/hr speed limit are recommended. Frequent visits by the AT Maintenance Contractor are also recommended to ensure that the roadway remains safe for the travelling public as this slide could continue to move and further damage the road, especially following heavy periods of precipitation and the coming spring thaw when groundwater levels could be higher.

Medium-Term:

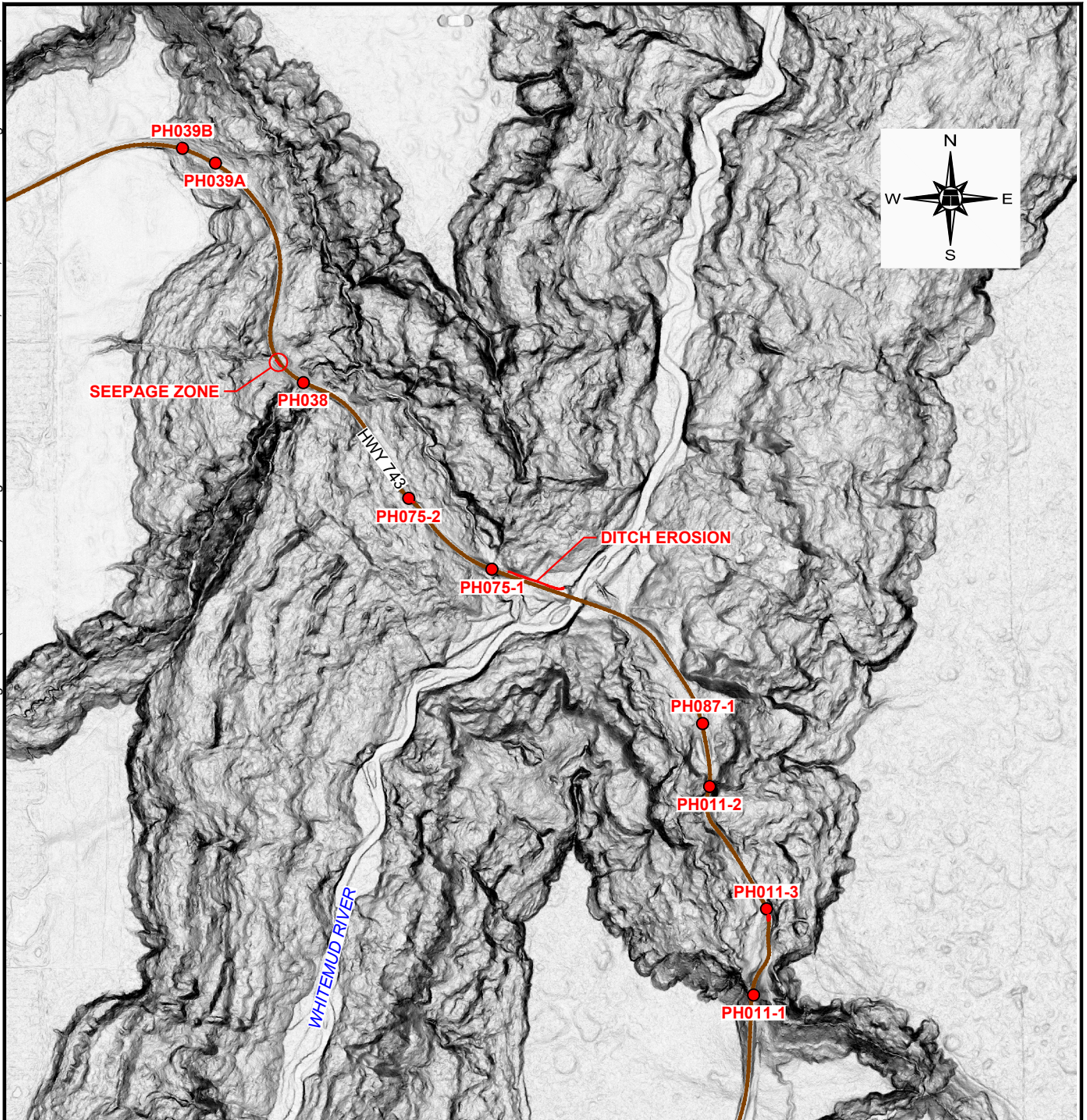
- A localized realignment of the roadway around the slide could be carried out if the road condition worsens.
- A local driven steel pile wall might also be considered to provide temporary support to the road but might become distorted and fall out of service over time if the larger slide blocks move again.

Seepage at PH038:

A subdrain should be installed below the ditch to intercept and drain away groundwater to the inlet of the bridge file pipe at PH038. The subdrain would need to be about 150 m in length and located deep enough to place it below the frost penetration depth (say about 3 m). The road surface should also be excavated down about 1 m, underlain by a wicking geogrid (frost-wick layer) that drains into the subdrain, and then backfilled with free draining gravel.

Erosion south of PH075-1:

Spring steaming of the culvert might prevent a reoccurrence of the bypass flow. The eroded ditch areas should be backfilled with gravel, covered with seeded topsoil, and TRM.



2008 LIDAR PROVIDED BY ALBERTA TRANSPORTATION

PEACE REGION (PEACE RIVER / HIGH LEVEL)

HWY 743 KEY MAP

FIGURE 1



DRAWN BY	KLW
DESIGNED BY	KEF
APPROVED BY	DWP
SCALE	1:20000
DATE	DECEMBER 2020
FILE No.	13351



THURBER ENGINEERING LTD.



Photo 1 – Looking south at seepage and rutting in road surface at PH038.



Photo 2 – Looking south at north end of PH075-2 slide



Photo 3 – Looking north along scarp in highway shoulder at south end of PH075-2 Site.

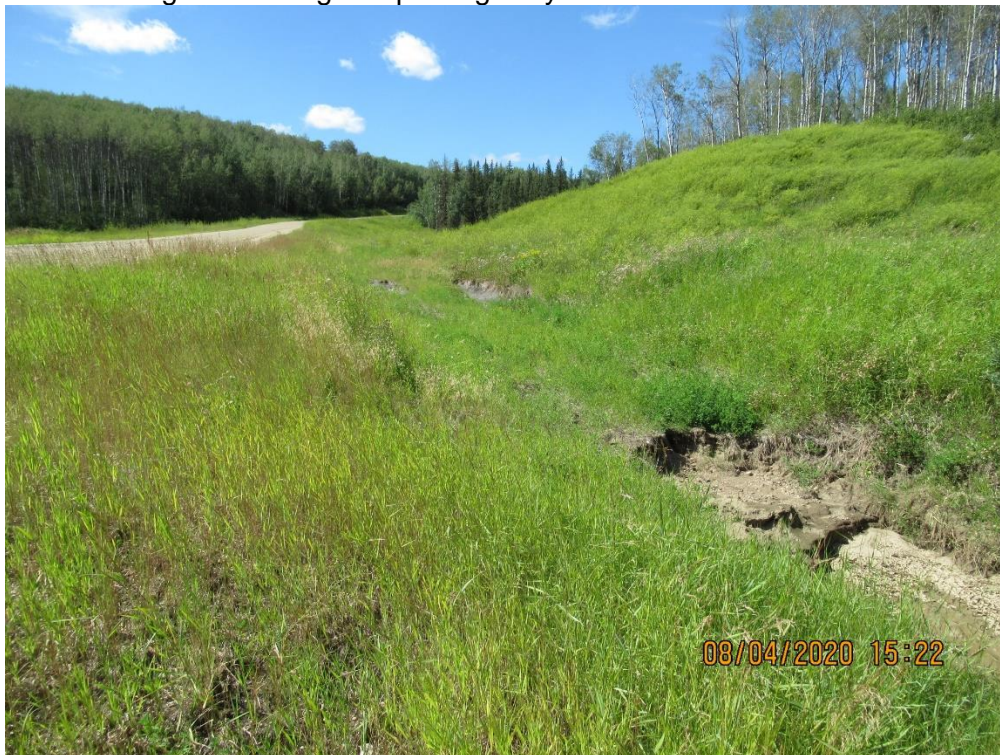
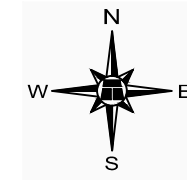
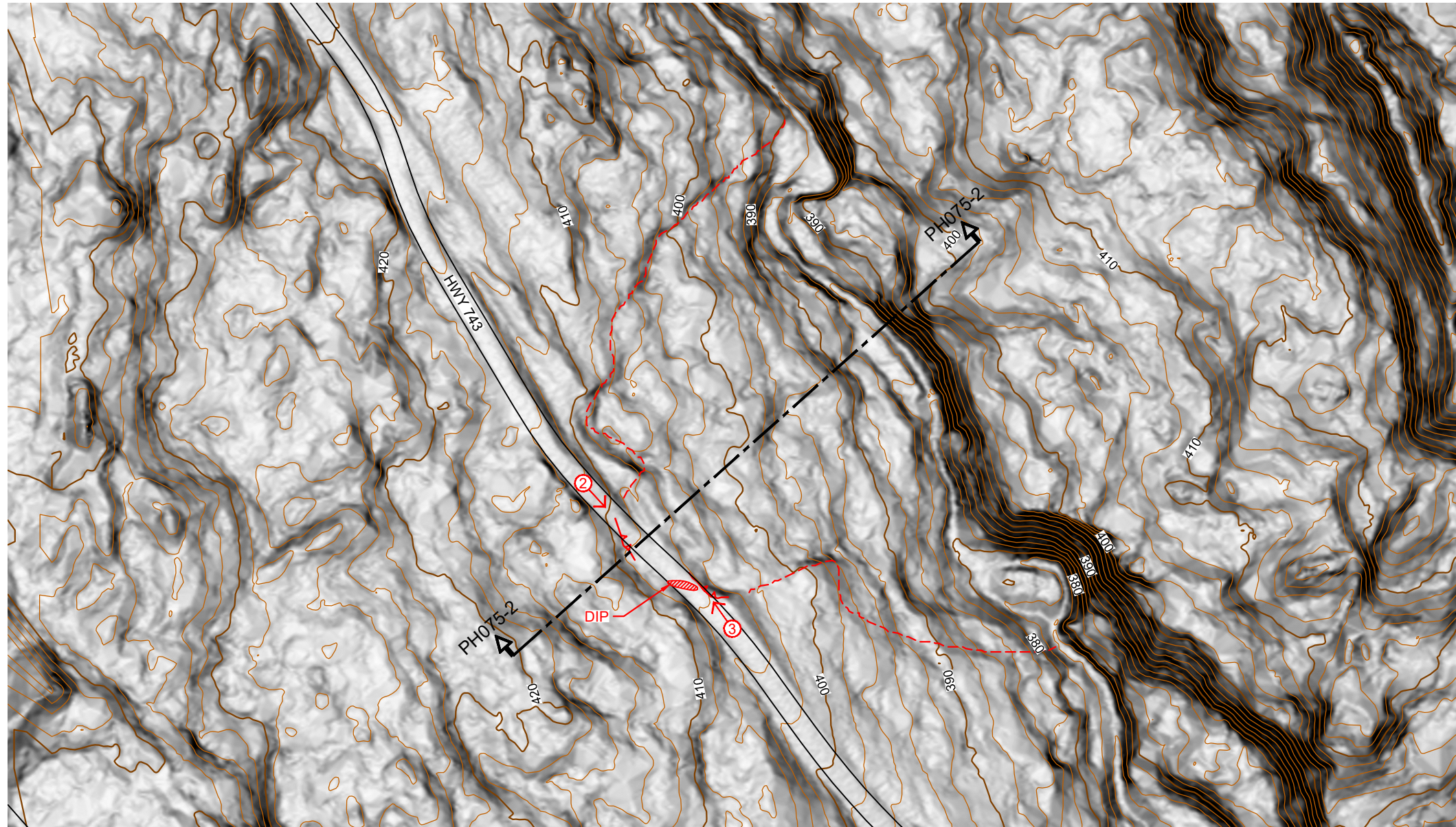


Photo 4 – Looking north at erosion in east ditch between Site Pho75-1 and the river.

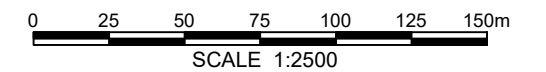


Photo 5 – Run off from ditch erosion went down the riverbank at this location.



LEGEND

- ACTIVE LANDSLIDE SCARP
- ANCIENT LANDSLIDE SCARP
- PHOTOGRAPH NUMBER AND DIRECTION



LIDAR PROVIDED BY ALBERTA TRANSPORTATION

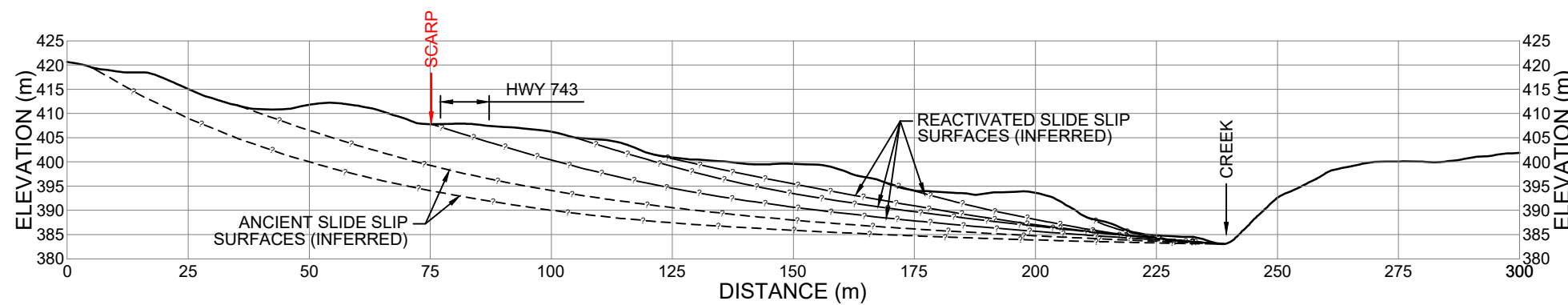


PEACE REGION (PEACE RIVER/HIGH LEVEL AREA)

PH075-2 AUGUST 4, 2020 CALL OUT PLAN

DWG No. 13351-PH075-2

DRAWN BY	KLW
DESIGNED BY	DWP
APPROVED BY	DWP
SCALE	1:2500
DATE	DECEMBER 2020
FILE No.	13351



SECTION
SCALE 1:1250