

**ALBERTA TRANSPORTATION  
GEOHAZARD ASSESSMENT PROGRAM  
PEACE REGION – GRANDE PRAIRIE DISTRICT  
2020 CALL OUT**



<b>Site Number</b>	<b>Location</b>	<b>Name</b>	<b>Hwy</b>	<b>km</b>
Call Out	W of Grande Cache	Backslope Mudflows	40:34	35.0
<b>Legal Description</b>		<b>UTM Co-ordinates (NAD 83)</b>		
Km 35.0: SE32-56-8-W6		11U N 5,973,287	E 358,670	

	<b>Date</b>	<b>PF</b>	<b>CF</b>	<b>Total</b>
<b>Previous Inspection:</b>				
<b>Current Inspection:</b>	May 25, 2020	13	3	39
<b>Road AADT:</b>	1,540	<b>Year:</b>		2019
<b>Inspected By:</b>	Don Proudfoot, Nicole Wilder (Thurber) Ed Szmata, Rishi Adhikari, Dwayne Lowen (AT)			
<b>Report Attachments:</b>	<input checked="" type="checkbox"/> Photographs <input checked="" type="checkbox"/> Plans <input checked="" type="checkbox"/> Maintenance Items			

<b>Primary Site Issue:</b>	A high and steep backslope is being affected by shallow landslides/mudflows that are accumulating and blocking the east highway ditch.	
<b>Dimensions:</b>	Debris/mud and water accumulation in the east ditch is about 175 m in length. The highway backslope cut is about 40 m high in a 70 m high valley slope.	
<b>Date of any remediation:</b>		
<b>Maintenance:</b>		
<b>Observations:</b>	<b>Description</b>	<b>Worse?</b>
<input checked="" type="checkbox"/> Pavement Distress	Ditch erosion is starting to affect the edge of pavement.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Slope Movement	Several active shallow landslides/mudslides are moving down the backslope and are accumulating in the highway ditch.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Erosion	Backslope erosion and surficial slumping has occurred and continues to as water was actively flowing down the face and eroding sediments. An erosion gully exists in the east ditch which is eroding the highway shoulder.	<input type="checkbox"/>
<input checked="" type="checkbox"/> Seepage	Water was also observed trickling down the backslope at several different runoff channels. Water was running along the ditch erosion as well.	<input type="checkbox"/>
<input type="checkbox"/> Bridge/Culvert Distress		<input type="checkbox"/>
<input type="checkbox"/> Other		<input type="checkbox"/>
<b>Instrumentation:</b> None		
<b>Assessment:</b>		
<p>The mud flows are likely due to saturation and softening of the slope surface by heavy rainfall combined with runoff coming down the slope. The backslope is high (40 m) and steep (1.3H:1V). Changes in surface soil moisture content and strength will result in these shallow types of landslides. It is possible that overland flow is also flowing over the crest of the 70 m high natural slope.</p> <p>The debris accumulation existing in the east ditch was generally fan shaped and progressively finer material has been deposited towards the lower end extremities and extended over a length of about 175 m. The mud/debris accumulation in the east ditch has forced runoff around the west edge of the debris and up against the edge of the highway shoulder and has now cut into the highway shoulder. Additional</p>		

sloughing of material should be expected as the runoff channels were flowing during our inspection and will likely continue to bring sediments downslope especially during precipitation events.

**Recommendations:**

**Maintenance:**

Once the debris has been cleared and the ditch re-established it will be important to routinely inspect the ditch areas following any major rainfall event and promptly clear any ensuing debris as described above.

**Short Term:**

The short-term recommendation is to remove the built-up debris as noted above and dispose of it in stable areas outside the valley. Also repair any damaged road sideslopes or ditch erosion (using gravel and soil coverings).

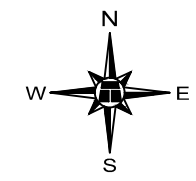
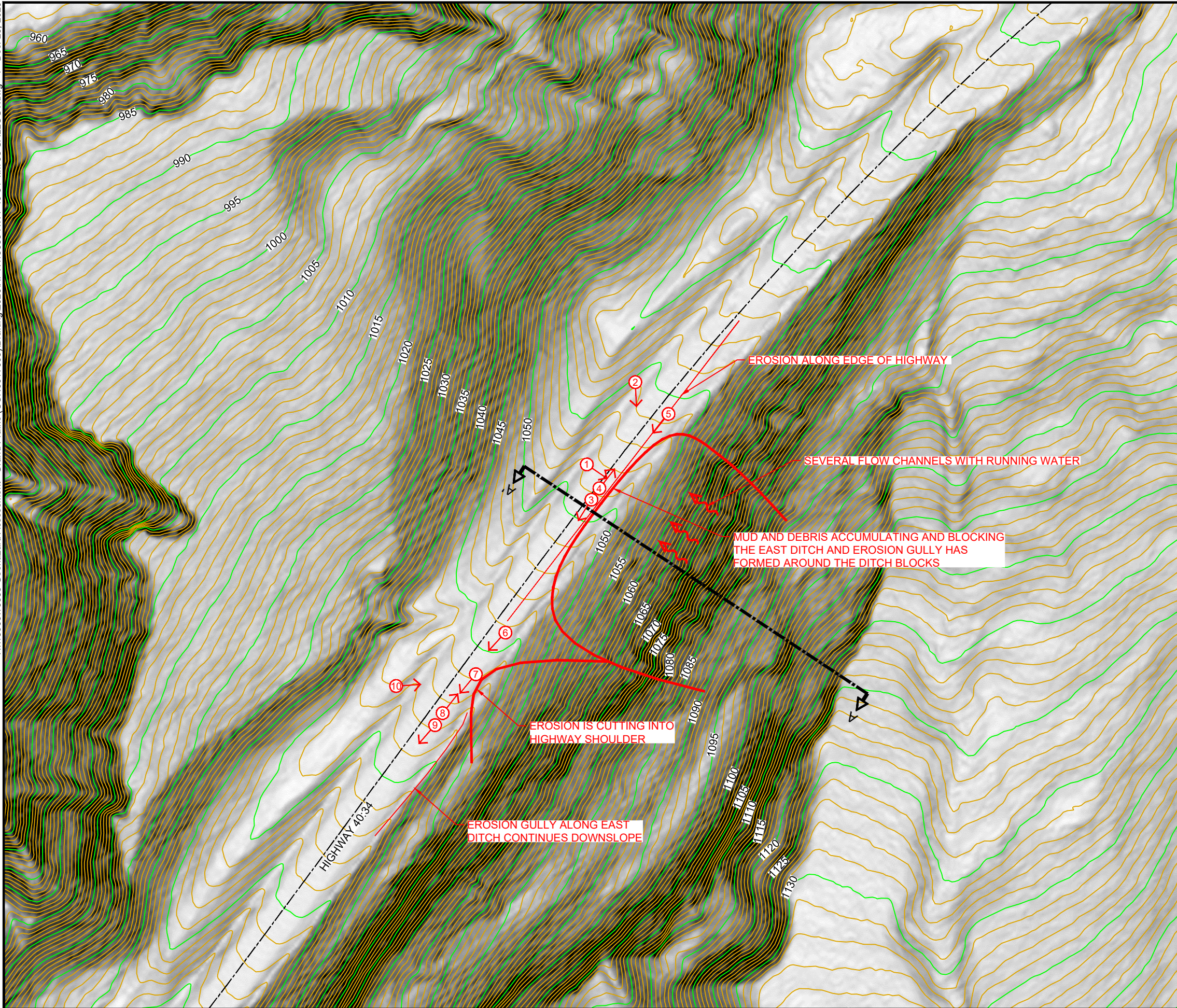
**Ball Park Cost \$50,000**

**Medium Term:**



The top of the valley slope and plateau drainage could be inspected to determine whether a catchwater ditch should be constructed to intercept runoff at the top of the slope and convey it on a diagonal alignment down to the highway ditch further to the north. The ditch would be about 350 m in length and require rip rap armour protection.

**Ball Park Cost \$200,000**

H:\13000\13353 Geohazard Assessment - Grand Prairie (CON0017603)\Drafting\2020\NPW\13353 HWY 40 34 km 35 CALLOUT.dwg - 1 - Dec. 23, 2020

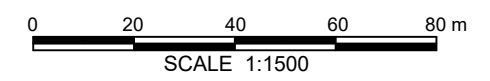


**LEGEND**

-  DIRECTION AND NUMBER OF PHOTO
-  GROUND SURFACE CONTOUR (CONTOUR INTERVAL = 1m)

**NOTES:**

- 1. FEATURE LOCATIONS ARE APPROXIMATE.



2005 LIDAR FROM ALBERTA TRANSPORTATION



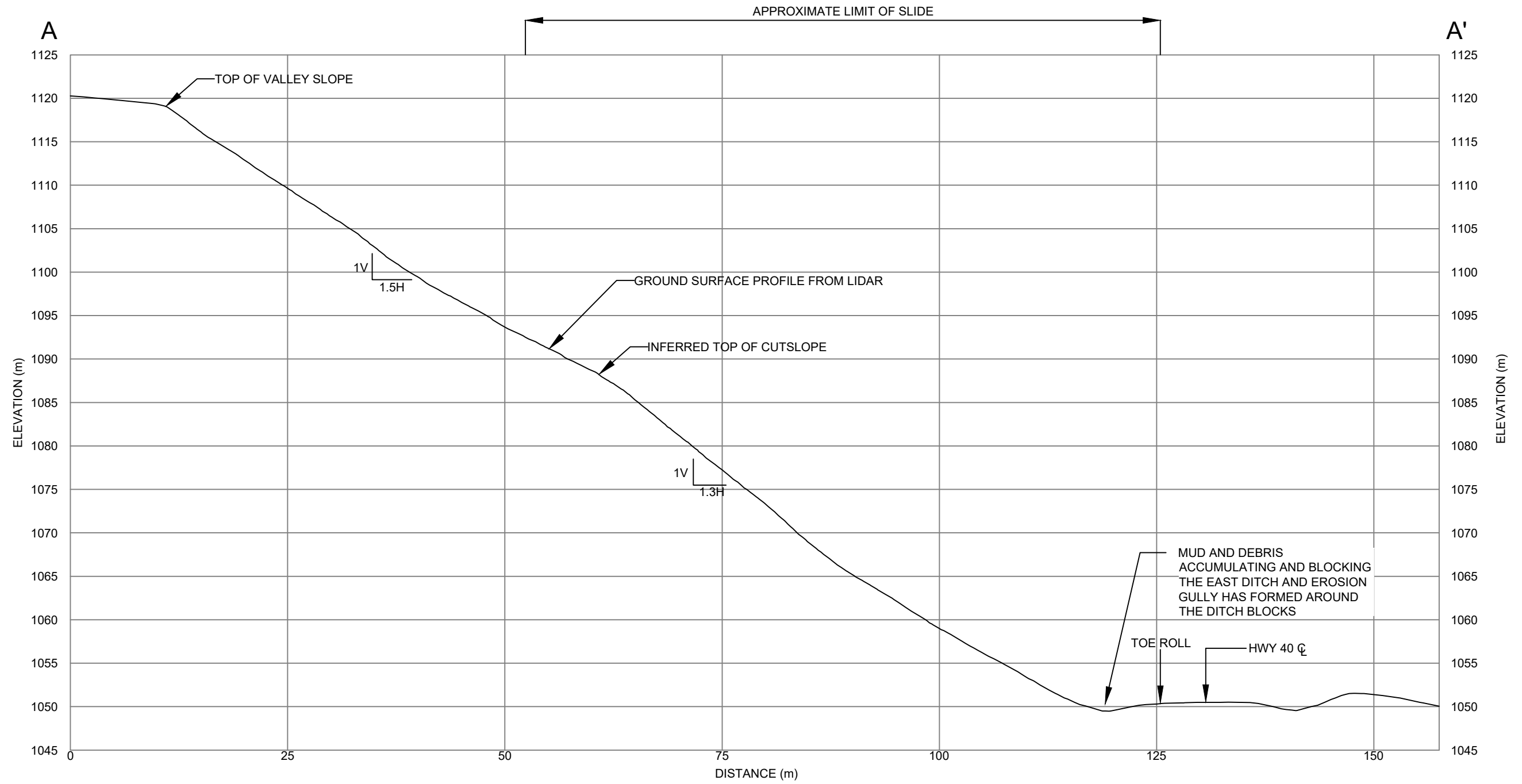
**PEACE REGION (GRANDE PRAIRIE)  
CALLOUT: HWY 40:34 km 35**

**CALLOUT PLAN**

**DWG No. 13353-HWY 40:34-1**

DRAWN BY	ML
DESIGNED BY	NPW
APPROVED BY	DWP
SCALE	1:1500
DATE	DECEMBER 2020
FILE No.	13353





PEACE REGION (GRANDE PRAIRIE)  
CALLOUT: HWY 40:34 km 35

CROSS - SECTION A - A'

DWG No. 13353-HWY 40:34-2

DRAWN BY	ML
DESIGNED BY	NPW
APPROVED BY	DWP
SCALE	1:1500
DATE	DECEMBER 2020
FILE No.	13353





**Photo 1.**  
Looking southeast  
at shallow  
landslides/mudslide  
s down the  
backslope.



**Photo 2.**  
Looking south at  
shallow  
landslides/mudslide  
s and accumulation  
of debris near base  
with trees still  
growing on mass  
that slid.



**Photo 3.**  
Looking southwest at east ditch and erosion that runoff is cutting down around the debris accumulation.



**Photo 4.**  
Looking northeast at debris which slid down into east ditch and erosion is cutting it's way down around it.



**Photo 5.**  
Looking southwest  
at east ditch further  
upslope where  
debris flow is  
saturated and has  
trees still growing.



**Photo 6.**  
Looking southwest  
at east ditch further  
downslope at  
erosion cutting into  
the highway  
shoulder.



**Photo 7.**  
Looking southwest  
at east ditch further  
downslope at  
erosion cutting into  
the highway  
shoulder.



**Photo 8.**  
Looking northeast  
at east ditch further  
downslope at  
erosion cutting into  
the highway  
shoulder and  
delineator has been  
placed.





**Photo 9.**  
Looking southwest  
at east ditch at the  
southmost portion  
of the site erosion.



**Photo 10.**  
Looking northeast  
at backslope from  
across highway 40.