GEOHAZARD ASSESSMENT PROGRAM

PEACE RIVER / HIGH LEVEL AREA

2011 CALLOUT INSPECTION

Government of Alberta ■ Transportation

THURBER ENGINEERING LTD.
GEOTECHNICAL ▪ ENVIRONMENTAL ▪ MATERIALS

Site Number	Location	Name	Hwy	km
PH47	West of Deadwood, AB	Deadwood Slide	690:02	Approx. 2.2
Legal Description		**UTM Co-ordinates**		
SW1/4 28-89-23-W5M		11V N 6289120	E 462789	

	Date	PF	CF	Total
Previous Inspection:	June 06, 2011	13	3	39
Current Inspection:	August 2, 2011	14	3	42
Road AADT:	80		**Year:**	2010
Inspected By:	(Don Proudfoot , Thurber Engineering) (Roger Skirrow and Erwin Kurz, Alberta Transportation)			
Report Attachments:	☑ Photographs ☑ Plans ☐ Maintenance Items			

Primary Site Issue:	Slope movement affecting highway		
Dimensions:	See drawing		
Date of any remediation:	None in the last year		
Maintenance:	ACP patch (August 2008)	**Worsened?**	
Observations	**Description**	**Yes**	**No**
☑ Pavement Distress	Crack widening and vertical drop in asphalt pavement since June 2011 inspection.	☑	☐
☑ Slope Movement	Slow creep movement causing cracks in pavement	☑	☐
☐ Erosion		☐	☐
☐ Seepage		☐	☐
☐ Bridge/Culvert Distress		☐	☐
☐ Other		☐	☐

Instrumentation:

Two slope inclinometers were installed by J.R. Paine. Slope movement of about 10 mm is recorded between March and May 2011 at depths of about 9 m and 7 m in SI-10-1 and SI-10-2 respectively. The SI plots provided by J.R. Paine are attached with this report.

Assessment (Refer to Figure PH47-1)**:**

- As recommended during our 2010 assessment, geotechnical investigation was undertaken by J.R. Paine which involved drilling five test holes. Two slope inclinometers, three standpipe piezometers and a pneumatic piezometer were also installed as part of the investigation. The test hole logs are attached with this report. The approximate locations of the test holes and SI's are shown on Figures 47-1 and PH47-2. A stratigraphic cross-section is provided on Figure 47-3.
- The soil conditions as shown in the test hole logs indicate presence of clay fill, overlying clay/clay till followed by clay shale.
- The slip surface of the slide is based in the shale.

- The slope failure appears to be the result of toe erosion caused by the creek located immediately south of the highway leading to over-steeping of the slope. It is expected that, if left untreated, slow creep movements will continue. Heavy rainfall in July 2011 has triggered the additional movement and it is understood from Alberta Transportation that the slide movement rate increased on July 26, 2011, following a period of heavy rain.
- The pavement cracks have opened up to about 30 mm wide and vertical drops of about 100 mm.

Recommendations:

Three options have been identified as possible long term solutions.

The first option would involve the installation of a 1500 mm diameter CSP culvert along the toe of the slide, which would prevent further creek erosion of the toe of the slope. In addition to the culvert installation, a toe berm would be constructed and the slide mass re-graded to a flatter uniform slope in order to re-establish slope stability. A DFO authorization would be required to carry out this option.

The second solution would be based on the use of a pile wall to stabilize the highway side slope. Drilled, reinforced concrete piles would likely be needed to stabilize the slide. As the slide appears to be greater than 5 m to 6 m deep, tie-back anchors might also be needed.

The third option would include either partial or full excavation of the slide mass, construction of a deep shear key, and reconstruction of the highway sideslope. This option would also involve the lining of the creek bed with rip rap in order to prevent further toe erosion.

In the short term, the cracks, and vertical drops in the pavement structure should be milled and patched to maintain a smooth even road surface for traffic safety.