

LANDSLIDE RISK ASSESSMENT
CENTRAL REGION

**SITE C3: NORTH OF BROWNFIELD
(1 km NORTH OF BATTLE RIVER)**

LEGAL LOCATION: SW 5-40-10-4

REFERENCE LOCATION
ALONG HIGHWAY: Sta. 37+290 - Sta. 37+410

UTM COORDINATES: N 5,806,345 E 471,780 (NAD83)

AI FILE: SH872:06

AI PLAN & PROFILE: N. of Battle River – Jct. SR608, Sheet 2 of 5

Date of Initial Observation: July 1990

Date of Previous Inspection: March 1995

Inspected By: Alberta Transportation and Utilities

Date of Current Inspection: May 26, 2000

Inspected By: Klohn-Crippen Consultants Ltd.

Instruments Installed: 7 Slope Inclinometers, 8 standpipe piezometers,
4 pneumatic piezometers (1992)

Instruments Operational: 1 Slope Inclinometer, 8 standpipe piezometers,
4 pneumatic piezometers (1995)

Date of Last Reading: March 15, 1995

Read By: Alberta Transportation and Utilities

Risk Assessment: $PF(7) * CF(2) = 14$

Last Updated by: Klohn-Crippen Consultants Ltd.
Date: May 29, 2000



Location and General Description of Instability

The slide is located on SH872 about 0.5 km north of the Battle River crossing and 10 km north of Brownfield. The slide was initially apparent as two "bumps" in the highway: the lower bump and bend in guardrail is at Sta. 37+290, and the upper bump at Sta. 37+410. The movement appears to be caused by a mass movement towards the Battle River on a shear zone in the clayshale bedrock, ranging from 15 m to 5 m below the surface.

In 1998, the pavement was removed in the areas of distress and replaced with a dust abatement coating. A 150 mm diameter perforated pipe was installed in the west ditch.

Geotechnical Conditions

Silty clay interbedded with sand over clayshale bedrock of the Upper Cretaceous Bearpaw Formation. The bedrock was observed to have bentonitic and sandstone layers.

Test hole logs and additional information are provided in Section G.



Chronology (Refer to Section G for Further Information)

October 1990

11 test pits were dug in the vicinity of the raised "bumps" in the road:

In the upper (north) bump area, silty sand with wet organic sandy soil was encountered. After the pits had been open for a period of time (11 days), water was observed at the ground surface in the pits. It was considered that the roadway fill was undergoing continuing settlement in a slough area. It was recommended that additional drainage measures be adopted to keep the highway fill relatively dry.

In the lower (south) "bump" area, the pits indicated dry clay till overlying shale bedrock at about 4.5 m depth. It was considered that the clay till is moving on top of the shale, particularly in the spring and rainy seasons. Additional drainage measures were recommended.

January 1991

Site investigation: 7 test holes were drilled in and around the bump areas that generally confirmed the results of the previous investigation.

September 1992

Site investigation: 15 test holes were drilled in the area to install 7 slope inclinometers, 8 standpipe piezometers and 4 pneumatic piezometers.

1992-1995

Over this period the inclinometers showed constant or accelerating movement on a shear plane at about elevation 645 m. By 1995, all of the slope inclinometers except for SI #5 had sheared.

Piezometric elevations range seasonally from 645 m to 653 m.

1998

Pavement removed and replaced with a dust abatement coating. Speed reduction in effect. A 150 mm diameter perforated pipe was installed in the west ditch and across the highway at the north end of the area of distress.

