Alberta Transportation

CENTRAL REGION
GEOHAZARD RISK ASSESMENT
SITE INSPECTION FORM

Klohn Crippen Berger

SITE NUMBER AND NAME	HIGHWAY & KM	PREVIOUS INSPECTION DATE	INSPECTION DATE
C57 H41:14 Pavement Distress	km 22	October 23, 2009	**May 18, 2010**

LEGAL DESCRIPTION	NAD 83 COORDINATES	RISK ASSESMENT
SE18-37-6-W4	N 5780380 E 510040	PF: 9 CF: 4 TOTAL: **36**

SUMMARY OF SITE INSTRUMENTATION:	INSPECTED BY:
None LAST READING DATE:	PROFESSIONAL ENGINEER OF ALBERTA DARREN W. RATCLIFFE

PRIMARY SITE ISSUE:
Pavement Distress

APPROXIMATE DIMENSIONS: About 400 m.

DATE OF ANY REMEDIAL ACTION:

ITEM	CONDITION EXISTS		DESCRIPTION AND LOCATION	NOTICABLE CHANGE FROM LAST INSPECTION	
	YES	NO		YES	NO
Pavement Distress	X		There are several bumps and dips in the pavement.		X
Slope Movement		X			
Erosion		X			
Seepage		X			
Culvert Distress	X		One end of the culvert is damaged and partially blocked.		X

COMMENTS

See attached photos and previous callout report.
Investigation recommendations are provided in the attached letter.

Klohn Crippen Berger

May 26, 2010

Alberta Transportation
Central Region
#401, 4902 – 51 Street
Red Deer, Alberta
T4N 6K8

Mr. Dennis Grace, P.Eng.
Project Engineer

Dear Mr. Grace:

Central Region GeoHazard Assessments
Site C57 H41:14 km 22 Pavement Distress
May 2010 Site Assessment Report

Alberta Transportation has initiated a process of risk management at specific geohazard sites that includes a document control system. This annual site assessment report forms Section B of the document control system for the above site.

The site was inspected on May 18, 2010 by Mr. Darren Ratcliffe, P.Eng. of Klohn Crippen Berger Ltd. Photographs from the inspection are attached.

This report was prepared by Klohn Crippen Berger Ltd. for Alberta Transportation Central Region under Contract No. CE101/2008.

1. BACKGROUND

This site is located in the Neutral Hills on Highway 41:14 about 6 km south of the intersection with Highway 599 and about 22 km north of Consort, Alberta. The highway is severely distressed over a length of about 400 m corresponding with the topographical low of the area and on either side of the intersection with a local road.

The Neutral Hills are an example of glaciotectonism where a glacier has deformed and thrusted the shale bedrock of the Bearpaw Formation. Mixed and contorted bedrock, combined with tills, have been ice-thrusted into hills and ridges. These blocks or slabs may be up to 100 m thick.

The highway was constructed in 1978 and problems were encountered virtually immediately in this section, with patching in small areas starting in 1979 and larger

Klohn Crippen Berger Ltd. • 500 – 2618 Hopewell Place • Calgary AB T1Y 7J7 • CANADA
403.274.3424 t • 403.274.5349 f • www.klohn.com

patches in 1984. The distress observed in the road continued to the point of surface separation and a full width patch, 40 mm thick was placed over the full section.

2. SITE OBSERVATIONS

The following observations were noted:

- Despite a number of full width patches, the road surface is highly uneven and a 70 km/hr speed restriction is in effect. The greatest dip is located at the south end of the site and is adjacent to a large bulge in the east ditch slope.
- Deep cracks were observed in the highway surface
- The ditch vegetation was relatively dense and indicative of wet soil conditions.
- A single culvert was located and discharges to the west. The downstream end was blocked with soil and vegetation.

3. SITE ASSESSMENT

Based on the requirement for regular patching and the uneven nature of the road surface, it is considered that an unsuitable or poor quality sub-grade material in combination with poor drainage is the main issue at the site.

Based on the risk level criteria provided by Alberta Transportation relating to safety, a risk rating of 36 was assigned to this site. This is based on a probability factor of 9 for an unstable subgrade, and a consequence factor of 4 due to distress being observed in the highway.

4. RECOMMENDATIONS

The following recommendations are provided:

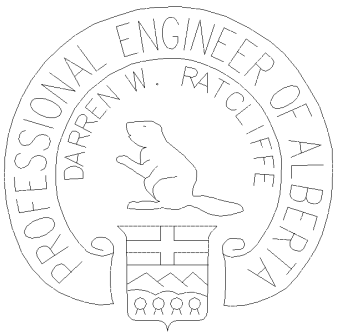
- The inlet and outlet areas of the culvert should be cleared of vegetation and graded to permit drainage.
- A site investigation should be conducted to determine the subsurface conditions of the road, including soil type and groundwater levels. It is recommended that about 6 standpipes to a depth of about 6 m to 8 m be installed along alternate sides of the shoulder of the highway. The cost of this investigation is estimated to be about [redacted] as shown in Table 1. As part of this investigation, an existing data review will be undertaken including a review of historical air photographs and Department records. The work will be summarized in a brief letter report including recommendations for future action.

Please contact the undersigned if you have any questions regarding this letter.

Yours truly,

KLOHN CRIPPEN BERGER LTD.

Danelle Stutt, EIT
Geotechnical Engineer



Darren W. Ratcliffe, P.Eng.
Project Manager

APEGGA Permit to Practice No. 9196