

September 20, 2014

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

**Mr. Dennis Grace, P.Eng.  
Construction Engineer**

Dear Mr. Grace:

**Central Region Geohazard Assessment  
H849:04 km 6.38 Slide  
September 2014 Callout Report**

The above site was visited on September 19, 2014 by Mr. Darren Ratcliffe, P.Eng. of Klohn Crippen Berger (KCB). Photographs from the inspection are included in this report. This callout report was prepared by KCB for Alberta Transportation Central Region (AT) under Contract No. CON0013499.

The results of KCB's site inspection observations and our recommendations for further work are presented herein.

## **1 PROJECT LOCATION**

The site is located on Highway 849:04 (km 6.38) about 6 km north of the intersection with Highway 576 and about 12 km east of Drumheller. The 2013 Annual Average Daily Traffic (AADT) for H849 was 100.

## **2 SITE OBSERVATIONS**

Observations made during the September 19, 2014 site inspection are briefly summarized as follows:

- The embankment appears to be about 6 m high with steep original slopes of about 1H:1V. A 0.7 m diameter timber culvert is installed at the base.
- The extent of the slide along the highway measures about 15 m with the main scarp about 6 m long. The base width of the slide at the toe of the slope is about 3 m.
- Ponded water was observed at the toe.

- At the time of the inspection, the west side of the embankment had been stripped and some gravel had been placed at the crest. Due to the very soft nature of the fill, the gravel was slumping with the fill to the toe of the slope and covering the end of the culvert.

KCB understands that historic rural road construction practices often included placing poor quality fill beneath the slopes of the embankment and also did not include foundation preparation. As a result, there is a relatively high likelihood that weak layers (e.g. organic rich soils) could have been left in place and valley slope seepage locations may not have been properly treated (i.e. drainage not provided) below such embankments.

### 3 SITE ASSESSMENT

To remediate the slide area on the west side of the embankment, the following approach of extending the culvert and replacing the soft fill is recommended:

- The toe area around and downstream of the culvert should be excavated to a depth of about 1 m for a width of about 3 m or to a depth where stiff material is encountered. This excavation should be backfilled with compacted gravel.
- A 6 m long section of 0.75 m diameter CSP should be slid over the existing timber culvert to extend the culvert out of the slumping zone. A minimum overlap of 0.5 m is required (more would be preferable).
- The downstream end of the culvert should be backfilled with compacted gravel.
- The soft fill material in the embankment slope should be replaced with compacted gravel and covered with the excavated fill at the toe to provide weight. The final slope should be about 2H:1V.

The proposed repair is illustrated on the attached Figure. The estimated gravel quantity is about 60 m<sup>3</sup> depending on how steep the backslope can be cut.

### 4 CLOSURE

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

Yours truly,  
**KLOHN CRIPPEN BERGER LTD.**

Darren Ratcliffe, P.Eng.  
Project Manager

APEGA Permit to Practice No. 9196

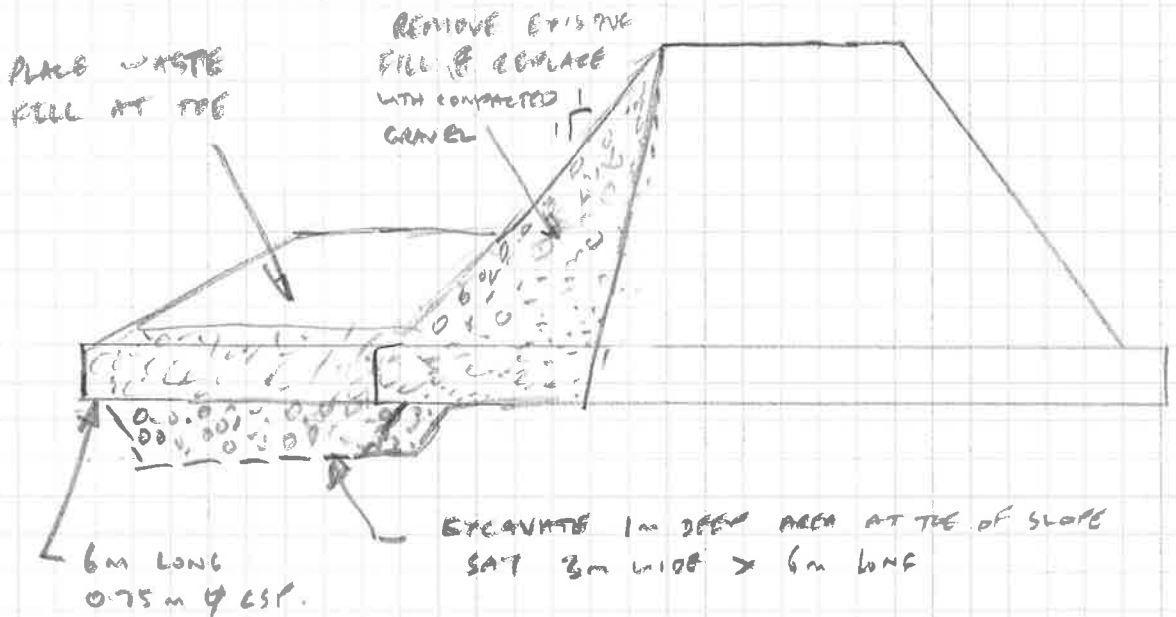
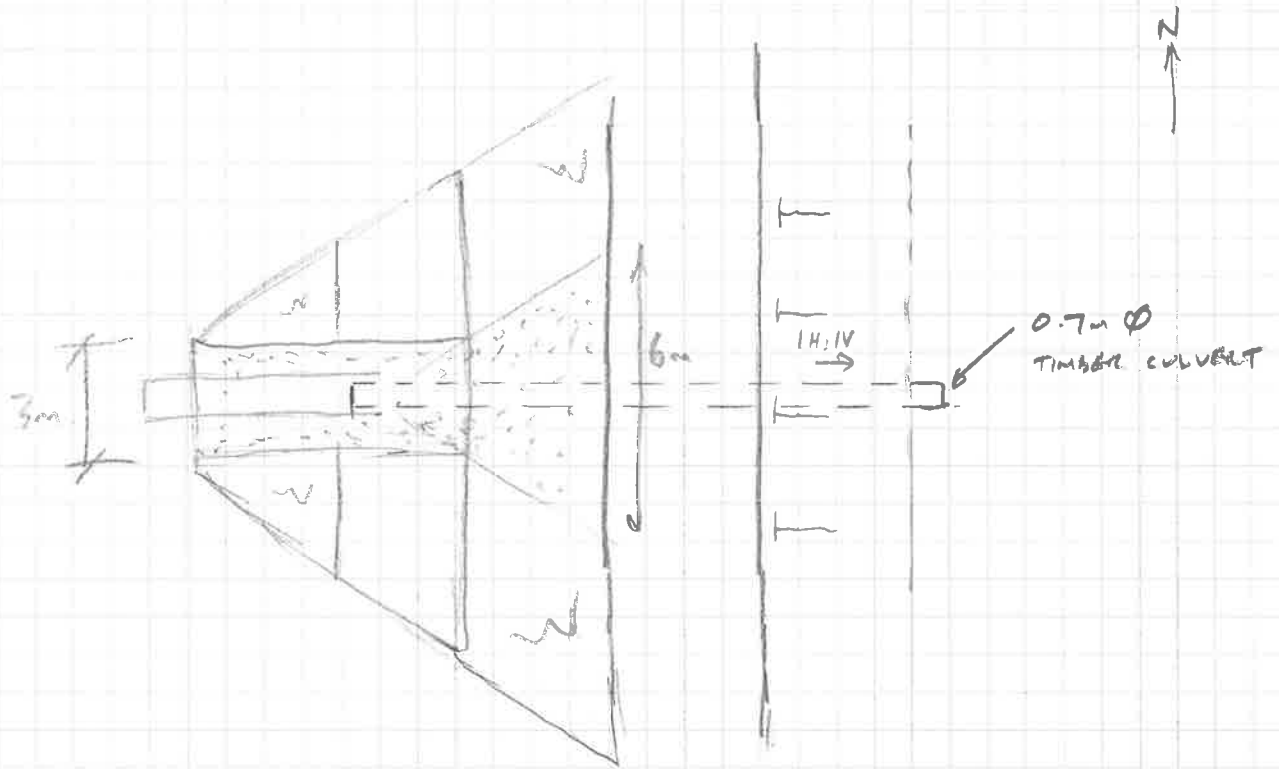
Attachments:

Figures

Photographs

## FIGURE

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**Klohn Crippen Berger**

PROJECT

NO.

DETAILS

ENG.

CHK.

DATE

SHEET OF

## PHOTOGRAPHS

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September 19, 2014





