THURBER ENGINEERING LTD.
GEOTECHNICAL ▪ ENVIRONMENTAL ▪ MATERIALS

December 22, 2005 File: 15-85-13

Alberta Infrastructure and Transportation
Room 301, Provincial Building
9621 - 96 Avenue
Peace River, Alberta
T8S 1T4

Attention: Mr. Ed Szmata

PEACE REGION (PEACE – HIGH LEVEL AREA) GEOHAZARD ASSESSMENT
HWY 744:04 JUDAH HILL (PH12) HEART RIVER SLIDES
2005 ANNUAL INSPECTION REPORT

Dear Sir;

This letter documents the 2005 annual site inspection of an area of slope instability located along Hwy 744 about 2.5 km south of the CN Rail crossing on the southern outskirts of Peace River, Alberta (refer to Figure PH12-1, attached for inclusion in Section F). Thurber Engineering Ltd. (Thurber) undertook this inspection in partial fulfillment of our Geotechnical Services for Geohazard Assessment, Instrumentation Monitoring and Related Work contract (CE047/2004) with Alberta Infrastructure and Transportation (AIT).

Messrs. Simon Cullum-Kenyon, P.Eng. and Don Proudfoot, P.Eng. of Thurber undertook the inspection on June 15, 2005 in the presence of Mr. Roger Skirrow, P. Eng. and Mr. Ed Szmata of AIT.

1. BACKGROUND

Thurber last visited the site in June 2004 and the site condition at that time is described in our Part B assessment letter in the site binder. Additional information for the site is provided in the Geotechnical File Review in Section A of the binder.

2. SITE OBSERVATIONS

The changes in condition since last year are shown on the attached site plan (Figure PH12-2A). Selected photographs taken during the visit are also attached.

Slides 1 and 4 do not appear to have changed since last year's inspection. Significant additional slumping has occurred at Slide 2, and the scarp of the slump is now about 3 m from the edge of the road; the scarp has retrogressed about 1 m since last year (Photo 1). There is some cracking in the ditch extending south beyond the scarp of Slide 2 and behind the scarp of Slide 3 as shown on the site plan. This cracking is approximately coincident with the old guard rail location.

The guardrail that ran along the east side of the ditch invert has been moved approximately 2 m to the west (i.e. along the edge of the pavement). A void was noted behind the scarp of Slide 3, and is probably a post hole from the previous guardrail at this location.

3. ASSESSMENT

Surface water drainage appears to be the primary factor driving development of these slides. Slide 2 is expected to continue to enlarge relatively quickly, as it now captures all of the ditch drainage. Using the past year's rate of regression of the scarp (1 m) as a guide, the slump may start affecting the pavement surface in two to four years, however a faster regression rate may occur if greater than normal precipitation levels are experienced this coming spring.

The 1998 repair work at Slide 1 appears to be functioning well at this time. The remaining slides are expected to develop further at a slower rate than Slide 2.

No assessment has been undertaken on the potential impact of slope conditions further down slope from the slides.

4. RISK LEVEL

The risk level for this site has been assessed as follows:

PF(11) * CF(2) = 22

Slide 2 is considered to be active with a moderate but potentially increasing rate of development. The consequence factor reflects the potential for further regression to involve a relatively small volume of soil and will likely not require closure of the roadway. This risk level is unchanged from last year.

5. RECOMMENDATIONS

5.1 Short Term

The slides are far enough away from the active road lanes that no immediate action is considered necessary. Regular inspections should be conducted, particularly after significant rainfall, to confirm that movements have not accelerated.

5.2 Long Term

Consideration should be given to repair work at Slide 2 similar to that undertaken in 1998 for Slide 1, which consisted of excavation and rebuilding with geogrid reinforced gravel fill and installation of a drain outlet.

The work could be deferred to a later date when the scarp is closer to the road surface, but the extent of future repair work required will be greater. The repair could be combined with more general improvements to drainage alongside the highway, such as installation of a subdrain to reduce further development of the slides in this area. As discussed previously, with no work, the slides will develop and expand to affect the layby and ultimately the active lanes.

The approximate construction cost for repairing Slide 2 is about $90,000 to $120,000 depending on the actual volume removed and rebuilt, and on the extent of drainage measures required. The installation of a subdrain along the ditch is estimated to cost an additional $30,000 to $50,000.

Continued monitoring of this site as currently programmed on an annual basis is recommended.

5.3 Investigation

As part of the design work, it is recommended to review stereo aerial photography of the entire slope area in the vicinity of the four slides to allow assessment of the potential for remedial work at the crest to affect the areas further down slope (and vice versa).

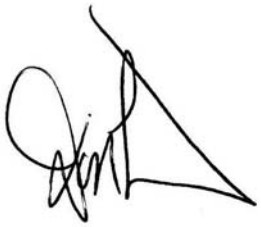
5.4 Maintenance

There are no maintenance items.

6. CLOSURE

We trust this assessment and recommendations meet with your needs at this time. Please contact the undersigned should questions arise or if the slide condition worsens.

Yours very truly,
Thurber Engineering Ltd.
Don Law, P.Eng.
Review Principal



Simon Cullum-Kenyon, P.Eng.
Project Geotechnical Engineer

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Attachments

cc: Mr. Roger Skirrow, P.Eng.
Director of Geotechnical Services, AIT