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THURBER

October 4, 2004 File: 15-16-192

Alberta Transportation
Room 223, Provincial Building
4709 – 44 Avenue
Stony Plain, AB T7Z 1N4

Attention: Mr. Rob Lonson, P.Eng.

NORTH CENTRAL REGION GEOHAZARD ASSESSMENT
HWY 759:02 SOUTH OF BERRYMOOR BRIDGE (NC7)
2004 ANNUAL INSPECTION REPORT

Dear Sir;

This letter documents the 2004 annual site inspection of a portion of Highway 759:02. The site is located approximately 1 km south of the Berrymoor Bridge over the North Saskatchewan River (11.5 km north of Jcn. Hwy 759 and Hwy 39). The work was undertaken by Thurber Engineering Ltd. (Thurber) in partial fulfillment of our Geotechnical Services for GeoHazard Assessment, Instrumentation Monitoring and Related Work contract (CE 046/2004) with Alberta Transportation (AT).

The inspection was undertaken on May 31, 2004 by Messrs. Don Proudfoot. P.Eng., and Renato Clementino, P.Eng. of Thurber. The site visit was carried out in the presence of Mr. Roger Skirrow, P.Eng, of AT Geotechnical Branch, Mr. Michael Baik of AT Stony Plain and Mr. Brian Swan AT MCI.

1. BACKGROUND

This portion of Hwy 759:02 traverses the south side of the North Saskatchewan River valley wall. In the area of the failure the highway appears to have been constructed as a side hill cut/fill with an embankment height of approximately 3 m.

On February 2004 remediation work started at this site consisting of the construction of a 90 m long and 12 to 14 m depth tied back concrete pile wall adjacent to the highway. Construction was completed on May 19, 2004.

The tie back system consisted of helical anchors with a set of four helixes. The anchors were installed into the stiff clay till. To monitor long term anchor loads with time, two load cells were installed in selected anchors, one in anchors G21L and one in anchor G33. Slope indicators SI04-1 and SI04-2 were also installed inside piles P21 and P32, respectively, to monitor the pile wall deflection with time. SI04-1 and SI04-2 were installed adjacent to G21L and G33, respectively, to track pile wall deformation versus anchor load.

Background regarding previous repair work undertaken at this site was provided in the 2000 report and hence is not repeated here. Further details about the recent pile wall construction are provided in Thurber's Construction Summary Report dated July 12, 2004.

2. SITE OBSERVATIONS

The highway roadway surface, back slopes and side slopes were inspected during the reconnaissance within the upper hill area in the vicinity of the roadway distress. The following points summarize the observations made during the reconnaissance. Site features are shown on the site plan Figure NC7-1 and selected photographs from the reconnaissance are also provided in Section F. A cross-section through the main portion of the slide was presented in our 2001 report and is included in Section F of the binder for you reference.

- A few new cracks and further widening and settlement of old cracks (Figure NC7-1) were noted, however, these are believed to be caused by the recent construction activity for the construction of the pile wall adjacent to the highway.
- The east side slope was recently reshaped, topsoiled and seeded as part of the construction of the pile wall.
- There are two new subdrain outlets on the east side slope, one located at the north end exiting at about mid slope height and the other located approximately at the centre of the pile wall exiting at the toe of the side slope. Water was noted flowing out of both subdrains
- The silt fence placed during construction at the toe of the south side slope is standing straight and in good condition.

3. ASSESSMENT AND RECOMMENDATION

The pile wall is expected to stabilize the upper portion of the slide which was previously affecting the road surface; however, down slope (east of the wall) movements are expected to continue until final equilibrium is reached.

The current road surface is not in good condition and high differential drop sections should be milled and the area should be re-patched to provide smoother driving conditions. The new patch will also provide a better baseline for

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assessment of the wall performance next year by eliminating the previous crack features.

It is recommended that this site be kept on the GeoHazard assessment program for a few more years to assess the effectiveness of the recent remedial measures.

4. RISK LEVEL

In light of the recent remedial measures carried out at this site the risk level has been reduced.

A risk level of 9 is considered applicable to this site, based on a Probability Factor of 3 (inactive, low probability of remobilization) and a Consequence Factor of 3.

6. CLOSURE

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

Yours very truly,
Thurber Engineering Ltd.
D. W. Proudfoot, P.Eng.
Review Principal

R. Clementino, P.Eng.
Project Engineer

Attachments

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

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N.E. Sec.11-50-06 W.5M.

N

WET AREA

CRACKS (2001)

CRACK (2003)

LONGITUDINAL CRACKS (2001)

DEPRESSED AREA (2001)

SI01-1 STA 16+095.6 13.15m LT

SP01-1 STA 16+095.1 13.22m LT

NEW CRACK (2004)

50mm DEEP ACROSS CRACK (2004)

PREVIOUS CUT OUT AREA

ASPHALT PATCH

HIGHWAY 759

60.12m ROW - PLAN 812 3365

20.12m R/A

14+900

15+000

15+100

15+150

15+200

15+250

SI03-1

SI02-1

SI04-1

SI02-2

SI04-2

SI02-3

SI01-2 STA 16+101.9 13.91m RT

SP01-2 STA 16+108.1 13.64m RT

150mm WIDE INFILLED GAP (2001)

RETAINING WALL

SUBDRAIN OUTLET

SUBDRAIN OUTLET

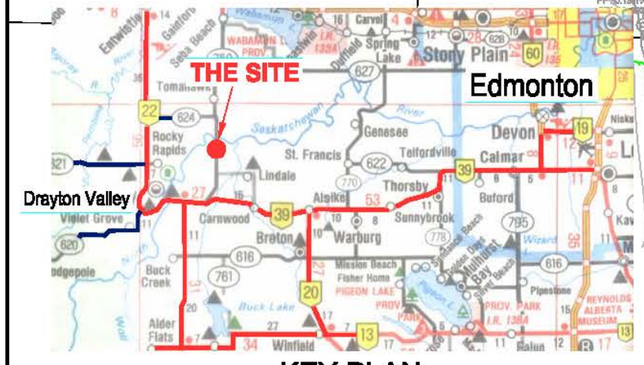
WET AREA

SI01-3 STA 16+110.7 41.79m RT

SP01-3 STA 16+118.3 42.15m RT

TOE BULGE

CIP 600mm x 18.24m SOUTH INV EL=998.168 NORTH INV EL=998.336



KEY PLAN
N.T.S

THURBER PROJECT #15-16-192

LEGEND

- STANDPIPE PIEZOMETER
- SLOPE INCLINOMETER
- REPAIR CUT-OUT(1999)
- ASPHALT PATCH
- CRACKS

NOTES :

1. FEATURE LOCATIONS ARE APPROXIMATE.
2. PREVIOUS OBSERVATIONS SHOWN IN BLACK
3. JUNE , 2004 OBSERVATIONS SHOWN IN RED

0 10 20 30 40 50
SCALE (m)

ENGINEER	RVC
DRAWN	ZD
DATE	JULY, 2004
APPROVED	
SCALE	1:1000

ALBERTA TRANSPORTATION

SITE PLAN

HWY 759:02 - km 15+100 SLIDE REPAIR

N.W. Sec.12-50-06 W.5M.
BERRYMOOR, AB

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DRAWING No.
FIGURE NC7-1

Photo 1. Side slope after pile wall construction.

Photo 2. Subdrain outlet