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August 4, 2000

File: 15-76-20

Alberta Infrastructure
9621-96 Avenue
Bag 900, Box 29
Peace River, Alberta
T8S 1T4

Attention: Mrs. Helen Tetteh-Wayoe

**HWY33:10 MORSE RIVER SLIDE
EMERGENCY CALL-OUT FOR EMBANKMENT SLIDE AND DITCH EROSION
LOCATED APPROXIMATELY 27 KM NORTH OF Ft. ASSINIBOINE**

Dear Sir;

This report presents the results of an emergency call-out conducted by Mr. Tom Bradka, P.Eng. of Thurber Engineering Ltd. on July 28, 2000. The site is located along HWY33:10 adjacent to the Morse River and Hwy 33 intersection, approximately 27 km north of Ft. Assiniboine.

Mr. Fred Bickle of Alberta Infrastructure (AI) made the request on July 27, 2000 for the emergency call out.

1. OBSERVATIONS

Upon arrival to the site an embankment slide and severe ditch erosion were observed along the north side of the highway. Observations of the side slope indicate that the embankment slide is not deep seated. A sketch of the site in plan showing the approximate location and extent of the embankment slide and ditch erosion is provided on Figure 1, while sketches of cross-sections A-A' through the slide area and B-B' through the eroded area are provided on Figure 2. Also, Plate 1, 2, and 3 provide photos of the slide and erosion areas under investigation.



The dimensions on the site plan and cross-sections were obtained by pacing and by the use of a hand held inclinometer, and thus should be taken as approximate.

In addition, observed utilities at the site include: overhead powerlines and power poles located along the right-of-way just above the crest of the north side embankment; and a Telus fiber optic cable which runs parallel to highway in the south ditch, as shown in Figure 1. However, the location of the Telus line has not been confirmed.

2. PRELIMINARY ASSESSMENT

Due to the recent amount of high rainfall in the area over the past two months, of which have caused high runoff flows to occur along the ditches of the highway, severe erosion of the north ditch has occurred.

The erosion has created an open hole approximately 35 to 45 m long, 8 to 10 m wide, and 4 to 5 m deep, as can be seen in Plate 3 at the end of this report.

It should be noted that the embankment slide was observed previously during a site visit conducted in May, 2000, as part of the Peace Swan Hills Region Instrumentation Monitoring Program for AI.

3. RECOMMENDATIONS

3.1 Immediate Action

Our immediate recommendation is to fix the eroded section of embankment while doing nothing to the slide area.

The reason for leaving the slide area alone is to avoid causing any further disturbance, which may create movements. Currently, the sloughed material at the base of the embankment slide (toe of the slide) is acting as a type of berm that is helping to stabilize the slope and also to prevent any potential movement of the power pole located at the top of the slope.

It was observed, during the site inspection that the toe of the slide appeared to be encroaching somewhat into the north ditch, however this does not appear to impede runoff flow or posing any immediate threat to the highway. Should the toe of the slide become a concern, a culvert maybe installed along the toe to better facilitate the flow of water through the ditch, and backfilled at the top in order to help stabilize the slope.

To fix the eroded section of highway we recommend using inorganic clay or gravel fill compacted to a minimum 95% Standard Proctor placed in 300-mm lifts to fill the eroded section. Fill material can be obtained from the slope surface above the eroded section provided that the embankment slide area remains undisturbed, a minimum slope angle of 3H:1V should be maintained for the borrow area, and the topsoil layer be stripped off prior to fill placement. In addition, a topographic survey of the slope surface should be conducted.

3.1 Short-term Action

Short-term remedial solutions should consist of providing erosion protection for the backfilled area of the north ditch along the area where the severe ditch erosion exists. A topographic survey of the area the area will be required.

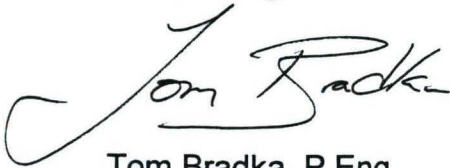
3.2 Long-term Action

For the embankment slide we recommend to continue observing by MCI and under the Swan Hills Instrumentation Program until the slide poses a danger to either the highway or power pole located near the crest of the slope. At present, there is one slope inclinometer (SI#4) located within the slide area near the crest, and one SI (SI#5) located at the base of the slide near the toe, as illustrated in Figure 1. Both SI's had shown no movement in the Spring 2000 readings.

4. CLOSURE

We trust the above information is sufficient for your present requirements. However if you have any questions or require any additional input please do not hesitate to call us.

Yours very truly,
Thurber Engineering Ltd.
D. Papanicolas, P.Eng.
Review Engineer

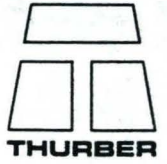


Tom Bradka, P.Eng.
Project Engineer

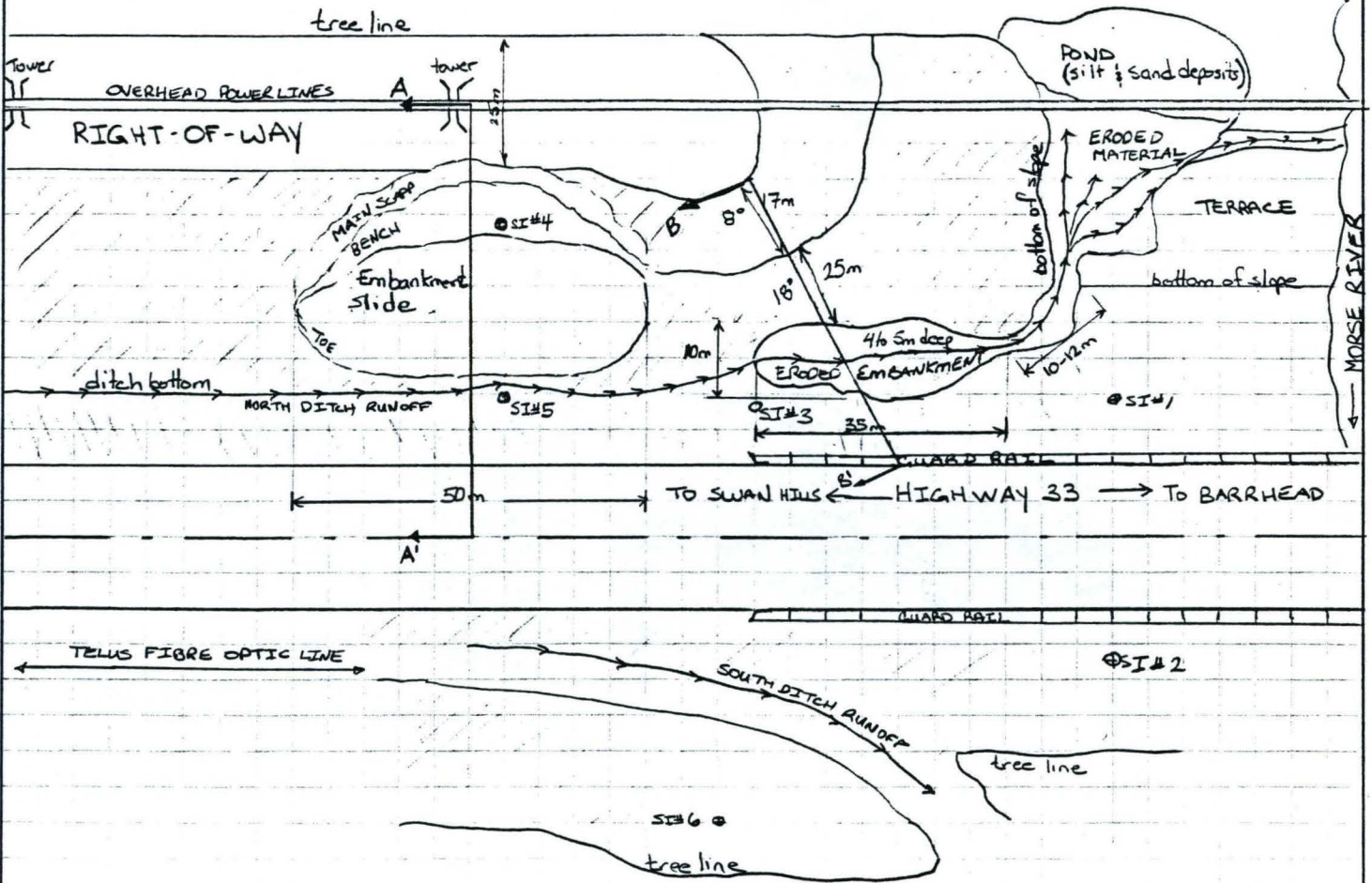
cc: Mr. Roger Skirrow, P.Eng
Alberta Infrastructure
Twin Atria Building
2nd Floor, 4999 – 98 Avenue
Edmonton, AB T7Z 1N4

Client: MORSE RIVER SLIDE
 Project: HWY 33:10 Emergency Call
 27km North of Ft. Assiniboine

Sheet 1 of 2 File No. 15-76-20
 Prepared by TDS Date July 31, 2000
 Checked by Date



"Site Sketch"

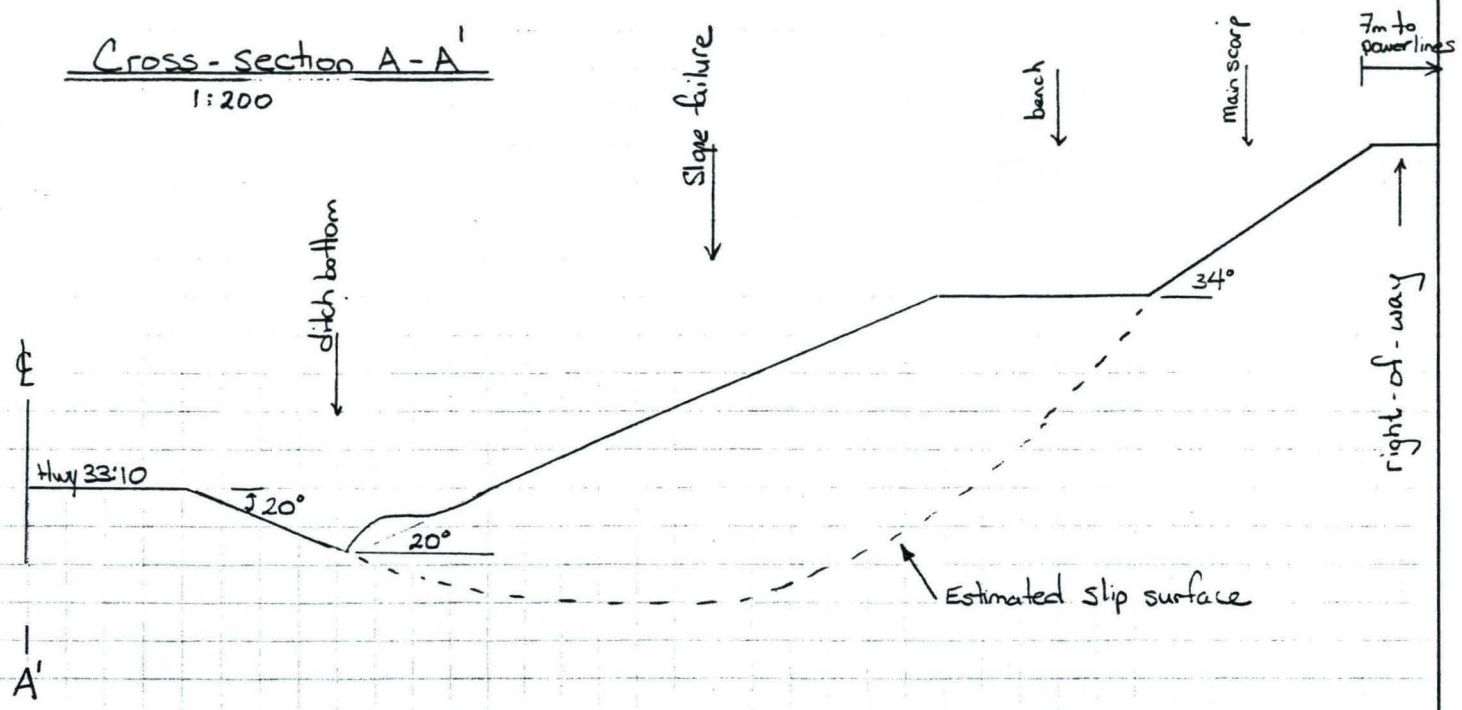


PLAN VIEW OF SLIDE AREA
FIGURE 1 N.T.S.

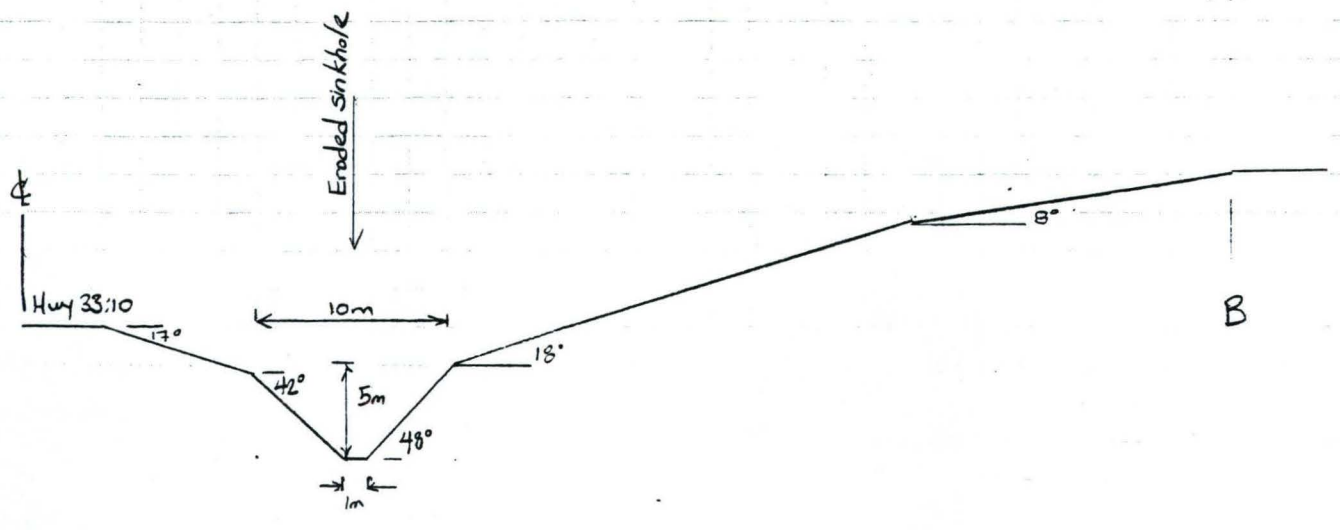


"Site Sketch"

Cross-section A-A'
 1:200



Cross-section B-B'
 1:400



Cross-section sketches
Figure 2 N.T.S



VIEW OF NORTH EMBANKMENT SLIDE AREA LOOKING WEST



VIEW OF NORTH EMBANKMENT SLIDE AREA LOOKING EAST

THURBER PROJECT NO. 15-76-20

ENGINEER	TDB
DRAWN	VH
DATE	AUG 2000
APPROVED	
SCALE	AS SHOWN

ALBERTA INFRASTRUCTURE

HWY 33:10 EMBANKMENT SLIDE AND EROSION
27km NORTH OF FT. ASSINIBOINE.
SELECTED PHOTOS ON JULY 28, 2000

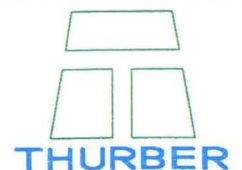


PLATE 1



VIEW OF ERODED EMBANKMENT SECTION LOOKING EAST



VIEW OF MATERIAL ERODED FROM EMBANKMENT AT
BASE OF SLOPE LOOKING EAST

THURBER PROJECT NO. 15-76-00

ENGINEER	TDB
DRAWN	VH
DATE	AUG 2000
APPROVED	
SCALE	AS SHOWN

ALBERTA INFRASTRUCTURE	
<p>HWY 33:10 EMBANKMENT SLIDE AND EROSION 27km NORTH OF FT. ASSINIBOINE. SELECTED PHOTOS ON JULY 28, 2000</p>	

<p>THURBER</p>
<p>PLATE 2</p>



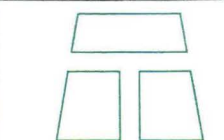
VIEW OF ERODED SECTION OF EMBANKMENT ON NORTH SIDE OF HIGHWAY 33

THURBER PROJECT #16-78-20

ENGINEER	TDB
DRAWN	VH
DATE	AUG 2000
APPROVED	
SCALE	AS SHOWN

ALBERTA INFRASTRUCTURE

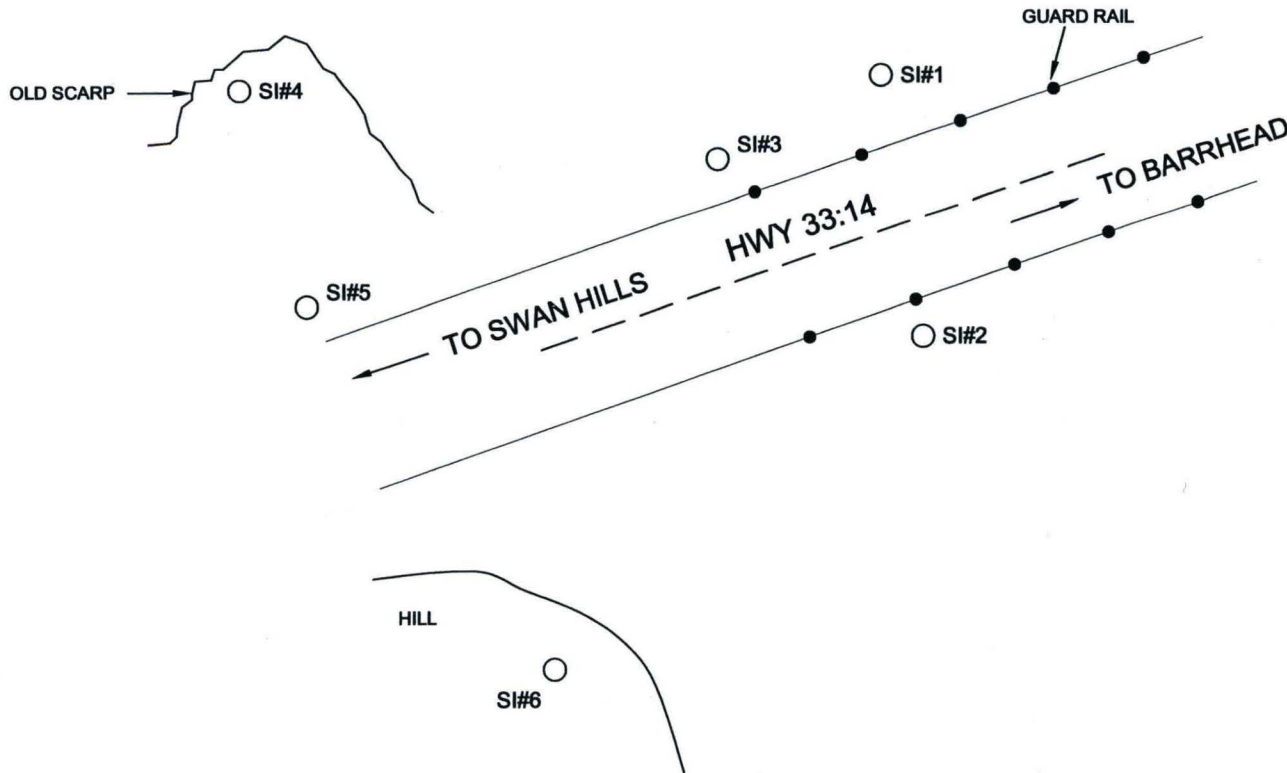
HWY 33:10 EMBANKMENT SLIDE AND EROSION
 27km NORTH OF FT. ASSINIBOINE
 SELECTED PHOTOS ON JULY 28, 2000



THURBER

PLATE 3

NORTH CENTRAL REGION



LEGEND

○ SI CASING

SH5 (NC) : HWY 33:10
MORSE RIVER SLIDE
SITE PLAN N.T.S

UPDATED: AUG., 2002
DRAWN: MNG
THURBER PROJECT #15-76-12

FIGURE SH5 (NC) - 1