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GEOCRES No. 31D-366

DIST. 11 REGION

W.P. No. 55-86-00

CONT. No.

W. O. No.

STR. SITE No.

HWY. No. 69

LOCATION INTERSECTION OF MUSKOKA  
RD.  
32 SETTLEMENT

=====  
OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

REMARKS:

# memorandum



Geolres No 31D-366

To: J. McDougall  
Head  
Geotechnical Section  
Northern Region

Date: 1988 07 11

Attn: E.W. Veritsky

From: Foundation Design Section  
Room 315, Central Building

RE: Instability of Rock Fill Slopes  
Hwy. #69, Vicinity of Muskoka Rd. 38  
W.P. 55-86-00  
District #11 (Huntsville)

This is to confirm our verbal recommendations given to you on 1988 07 07 concerning the above subject.

- a) Flatten existing rock fill slopes to not steeper than  $1\frac{1}{4}:1$ .
- b) Construct half height rock fill berms in areas where instability has occurred
- c) The berm lengths are as follows:

<u>Embankment Height (m)</u>	<u>Berm Length (m)</u>
2.5	No Berm
3.0	2.5
5.0	9.0

- d) Prior to the berm construction a 60 cm thick granular pad should be placed on the top of the muskeg.
- e) The berm should be constructed in uniform lifts of not more than 1.0 m per lift.

The above recommendations are based on the subsurface information obtained by your Section.

A handwritten signature in dark ink, appearing to read "P. Payer".

P. Payer, P. Eng.  
Sr. Foundations Engineer

# memorandum



Mr. K. G. Selby

To: Chief Foundations Engineer West  
Foundation Design Section  
3rd Floor, Central Building  
DOWNSVIEW

Date: 88 01 27

Phone 1-705-472-7900  
Ext. 286, 7

FROM: Geotechnical Section  
Northern Region

WP 55-86-00

Hwy 69

From the Intersection with Muskoka Rd. 5  
to 2.8 km North of the Intersection  
with Muskoka Rd. 38  
District # 11, Huntsville

Enclosed is information concerning a settlement area in the vicinity of the intersection of Muskoka Rd. 32 and Hwy 69. At present the slopes are fairly steep at the swamp location and patching is required from time to time. From borings at the edge of pavement the thickness of the asphalt pavement is shallow but the depth of granular materials is 800 to 900 mm. Evidently, the thickness of the pavement at the edges does not reflect the thickness at other locations.

A number of boreholes were placed at the base of the fill on 1987 10 27 to determine the depth of muck and soft underlying material. At this time vane tests were also placed although limited in number. From this data it would seem that the swamp material cannot support the height of fill.

Also included in the material forwarded are a Plan and Profile of the highway at the location and additional borings in the vicinity adjacent to the highway completed during a preliminary investigation for the proposed four lane study. Locations of the borings are shown on the copy of a photo mosaic, areas 26 and 27, boreholes 40 and 39 on the left and 41, 42, and 43 on the right.

We do not have any information on the original construction such as Soils Profiles. Grading Contracts were 55-48 and 55-290. We are not aware of any subsequent work in the area except for lifts and patching from time to time by Maintenance Forces.

A handwritten signature, possibly "Jm", in the bottom right corner of the page.

The main concern is the instability of the slopes, especially at 17+225 RT where a vertical face exists for a short length and the steep slopes on both sides in the vicinity of 17+300 to 17+400 with fill heights 3.0 to 4.0 m. Your comments concerning this location are solicited. Original construction probably consisted of displacement of the muck and soft materials using rock fill. Possibly a berm should be considered in order to provide support for the fill slopes. Widening of some rock cuts in the area is a possibility to acquire material for the purpose. At present a report is being prepared for resurfacing the highway through the location. Subsequent patching will severely affect the roadbed cross-section.

A reply by 1933 03 15 would be appreciated.



E. W. Varitsky  
Pavement Design &  
Evaluation Officer

EWV/ap

Encl:

cc: G. A. Wrong  
File (2)

WP 81-81-00  
PORT SEVERN TO MACTIER  
85 01 22

- 4 -

TH # 38 40.00 LT C/L D-3.00  
(SWAMP 25)

0 - 300 Blk Org  
300 - 3.00 F Sa Si Firm  
3.00 NFP BR

TH # 39 40.00 LT C/L D-4.00  
(SWAMP 26)

0 - 4.00 Muck Amor *phous*  
4.00 - 12.20 Si Soft  
12.20 - 12.30 M Sa

TH # 40 40.00 LT C/L D-4.50  
(SWAMP 26)

0 - 1.00 Muck Amor  
1.00 - 1.80 F Sa Si Soft  
1.80 - 2.00 M Sa (Unable to  
push through layer)

TH # 41 40.00 RT C/L D-3.00  
(SWAMP 27)

0 - 4.50 Muck Amor  
4.50 - 7.00 F Sa Si Soft  
7.00 - 7.10 M Sa (unable to  
push through layer)

TH # 42 40.00 RT C/L D-3.30  
(SWAMP 27)

0 - 6.00 Muck Amor  
6.00 - 6.30 M Sa (Unable to  
push through layer)

TH # 43 40.00 RT C/L D-5.00  
(SWAMP 27)

0 - 1.00 Muck Amor  
1.00 - 1.10 M Sa (Unable to  
push through layer)

TH # 44 40.00 LT C/L D-4.00  
(SWAMP 28)

0 - 1.50 Muck Amor  
1.50 - 1.80 F Sa Si Stiff

TH # 45 40.00 LT C/L D-4.00  
(SWAMP 28)

0 - 1.00 Muck Amor  
1.00 - 1.30 F Sa Si Stiff

TH # 46 40.00 LT C/L D-3.50  
(SWAMP 29)

0 - 300 Wat  
300 - 750 Muck Amor  
750 - 1.00 M Sa (Unable to push  
through layer)

TH # 47 40.00 LT C/L D-3.50  
(SWAMP 29)

0 - 300 Wat  
300 - 1.00 Muck Amor  
1.00 - 7.00 F Sa Si Soft  
7.00 - 7.10 M Sa (Unable to push  
through layer)

TH # 48 40.00 LT C/L D-3.50  
(SWAMP 29)

0 - 300 Wat  
300 - 1.00 Muck Amor  
1.00 - 1.10 F-M Sa  
1.10 - 4.00 F Sa Si Soft  
4.00 - 4.10 M Sa (Unable to push  
through layer)

TH # 49 40.00 RT C/L D-2.00  
(SWAMP 30)

0 - 300 Wat  
300 - 1.00 Muck Amor  
1.00 - 2.00 F Sa Si Soft  
Stiff @ 1.80

TH # 50 40.00 LT C/L D-1.50  
(SWAMP 31)

0 - 1.20 Wat  
1.20 - 1.50 F-M Sa

WP 55-86-00  
TWP. GIBSON  
SETTLEMENT @ MUSKOKA RD.32  
87 10 27

17+225 20.00 RT C/L D-3.00

0 - 4.20 Muck  
4.20 NFP Blds

17+250 15.00 LT C/L D-300

0 - 300 Tps  
300 - 1.50 Br F Sa  
1.50 - 4.00 Gry F-M Sa Wet  
87 AX 210 SM  
% Pass 5 mm = 99.3  
" 2 mm = 98.2  
" 425 um = 79.1  
" 75 um = 7.3  
LSFH

17+250 25.00 LT C/L

0 - 6.30 Muck  
6.30 Gry Si Cl Till  
(Soft Wet)  
Shear Test @ 6.30  
1. 8 ft lbs 216 psf  
2. 5 ft lbs 135 psf

17+300 18.00 LT C/L D-3.00

0 - 300 Tps  
300 - 1.60 Br F Sa  
1.60 - 4.00 Gr F Sa Wet

17+300 25.00 LT D-3.00

0 - 6.30 Muck  
6.30 - 8.40 Gry Si Cl Till  
Soft Wet  
87 AX 211 CI  
Shear Test @ 8.40  
1. 10 ft lbs 270 psf  
2. 6 ft lbs 162 psf  
% Pass 5 mm = 100  
" 2 mm = 100  
" 425 um = 97.3  
" 75 um = 83.0  
LSFH

17+425 25.00 RT C/L D-4.00

0 - 1.20 Muck  
1.20 - 2.70 Gry Si Cl Till  
Soft Wet  
87 AX 212 CI  
w @ 1.80 = 50.5%  
% Pass 5 mm = 99.9  
" 2 mm = 99.9  
" 425 um = 96.5  
" 75 um = 75.2  
L-MSFH  
2.70 NFP Sloughing  
Shear Test @ 2.70  
1. 28 ft lbs 756 psf  
2. 12 ft lbs 324 psf

17+445 25.00 RT C/L D-4.00

0 - 300 Tps  
300 - 1.50 Gry Si Cl Till  
Wet  
1.50 NFP Sloughing  
Shear Test @ 1.50  
1. 49 ft lbs 1,323 psf  
2. 2 ft lbs 54 psf