

# memorandum



To: J. McDougall  
Head, Geotechnical Section  
Northern Region  
North Bay

Date: 1986 02 20

From: Foundation Design Section  
Room 315, Central Building  
Downsview

Re: Excavation of Mine Tailings  
Hwy. #66 Widening at Kirkland Lake  
W.P. 177-77-01; Site: Nil  
District #14 (New Liskeard)

As per your request, a field investigation consisting of two sampled Boreholes was carried out at this location. (Sta. 18+845). The thickness of the mine tailings (basically of sandy silt) was found to be 4 m to 5.2 m, the lower boundary being between elev. 314.7 and elev. 315.9. If required, references should be made to the attached record of borehole sheets for the encountered different strata and their physical properties.

In order to realize the possible maximum quantity of mine tailing material within the proposed new property line, it was agreed between Mr. K. G. Selby of this Section and Mr. H. Tippler of The Regional Planning and Design Section that a temporary subexcavation scope of 1:1 is feasible provided that the subexcavation is carried out in 'strips' not wider than 5 m (measured parallel to the  $\mathcal{Q}$ ) and backfilled immediately with granular type material. The design of the widened portion of the roadway will be carried out by the Regional Geotechnical Section.

This memorandum should be read in conjunction with Mr. K.G. Selby's letter (dated 85 12 13 and 86 01 16) and Mr. H. Tippler's memorandum of 86 01 07.

Should further information or clarification be required, please contact our office.

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

P. Payer, P.Eng.  
Senior Foundations Engineer

PP/mls

Attach.

c.c. H. Tippler

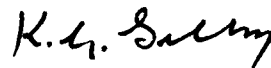
Mr. H. Tipler,  
Project Manager,  
Planning & Design Section,  
NORTHERN REGION - North Bay

86 01 16

From: Engineering Materials Office,  
Foundation Design Section,  
Central Building, Room 315

Re: W. P. 177-77-01, Kirkland Lake, Hwy. #66  
District #14, New Liskeard

This is in reply to your memo of 86 01 07. We are in full agreement with your proposal for excavation using the 1:1 slopes as outlined in your memo and with the requirements of Mr. McDougall.



K. G. Selby,  
Chief Foundations Engineer  
(West)

KGS:ma

cc: J. I. McDougall

# memorandum



To: J. McDougall  
Head, Geotechnical Section  
Northern Region  
North Bay

Date: 1985 12 13

From: Foundation Design Section  
Room 315, Central Building

RE: Hwy. 66 Widening at Kirkland Lake,  
Excavation of mine tailings.  
W.P. 177-77-01, District 14

This is to confirm our recommendations relating to the excavation to remove mine tailings and replacing with broken rock backfill to be carried out by L A C Minerals on the above mentioned project. The area to be excavated is on the south side of Hwy. 66. It is approximately level ground with the surface being about 1.2 m below the edge of shoulder of Hwy. 66. The ground water level established by us is about 2.4 m below the edge of shoulder. The proposed excavation could be commenced at the existing toe of slope continuing the present slope of Hwy. 66 (but not steeper than 2:1) downwards to the water level which must be established at the time of excavation. From that point on the slope must not be steeper than 3:1.

Filling operations adjacent to the highway should be carried out as soon as practically possible. Your attention is drawn to the existence of a sewer within the area to be excavated. We do not have details of this sewer however, Planning and Design will no doubt have the necessary information to ensure there is no conflict with the foregoing.

Please advise if we can be of further help.

A handwritten signature in dark ink, appearing to read "K. G. Selby".

K.G. Selby,  
Chief Foundations Engineer

KGS/ta

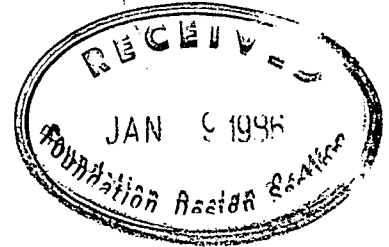
# memorandum



To: Mr. K. Selby,  
Chief Foundation Engineer  
Foundations Design Section,  
3rd Floor, Central Bldg.,  
Downsview

Date: January 7, 1986

FROM: Engineering & Right-of-Way Office  
Planning & Design Section  
Northern Region



RE: W.P. 177-77-01  
Kirkland Lake, Highway 66  
District 14 - New Liskeard


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This letter is a follow-up to the phone conversation that took place on December 17, 1985 between yourself and the undersigned.

Attached is a cross-section at Sta. 18+490.00, which shows shaded areas, of the mining property, over which we are proposing to construct an additional of three lanes of highway.

When the M.T.C. Property Section approached the mining personnel, they received the comment that though the property could be purchased at a reasonable price the tailings lying on that property was valuable and they wish to have the material stockpiled for their later processing or be paid for the loss of profit accrue from same.

Based on the above, we wish to remove as much as possible of this material.

Using the information provided in your letter, dated December 13, 1985, we have shown the area recommened at that time for excavation. We have also considered that if a drag line is to be used, then an equal slope of 3:1/2:1 would be required southward (the right side of the cross-section). This is all shown thus 

If this is done then we have not accomplished any salvageable material for the mining company since in effect we will be locking in the area shaded thus , which is about equal to the area that we were trying to recover.

The question was asked: could we recover more by changing the slope. I believe you have agreed to/would consider a 1:1 slope. The excavation would start at the toe of existing slope, go down to the depth of 5 metres and maintain an open cut width of no more than 5 metres at the base of the excavation. The width being parallel to centre line. The excavation and back fill to be a continuous operation. This area is outlined thus. ■■■■■■

With reference now to the area to the left of the noted line. To

remove this material would require a sheet pile operation to which you indicate that tie backs must also be used, plus the length restriction in the longitudinal length would be imposed.

The cost per running foot of sheet piles plus the tie backs would cost more then the profit realized therefore we cannot anticipate that the mining company would want this material nor should they even consider a charge to the M.T.C. for this material.

It should be pointed out that a sewer system owned by the Town of Kirkland Lake is within this area which would require their aproval due to the easement. Also, since this sewer system was put in through the tailings, the material would be contaminated with the muck armor below.

After our conversation I spoke with Geotechnical Section, J. McDougall. It appears that the proposal will be acceptable to that section.

Their concerns were:

To prevent any longitudinal distorsion at the interface, between the rockfill and remaining tailing

1. That the backfill should not be any higher than existings tailings
2. That they would make recommendations for a similar type material to cover all area above this level
3. That possible a geotextile cloth should be *used*.

Would you please comment on the above and return your reply to either Geotechnical or the Planning and Design Section as soon as possible.

We wish to try and convince the mining company to carry out this operation before spring thaw.

HT/

  
Harold Tipler  
Project Manager.

c.c: G. Ricker  
W. Ferguson  
J. McDougall



# RECORD OF BOREHOLE No 2

METRIC

W P 177-77-01 LOCATION STA: 18+485; 0/s 18.3 m LT of C (PROPOSED) ORIGINATED BY JY  
DIST 14 HWY 66 BOREHOLE TYPE Cont. Flight Auger (H.S.) COMPILED BY PP  
DATUM Geodetic DATE 85 11 13 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ kN/m <sup>3</sup>	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
319.9	Ground Level																
0.0	Sandy Silt																
	Trace of Clay		1	SS	4			2									0 23 67 10
	Very Loose		2	SS	1			2									
	(Mine Tailings)		3	TW	PH			2									
			4	SS	4												0 35 63 2
314.7																	
5.2	Organic Material		5	SS	5												0 15 43 42
5.6	Silty Clay		6	SS	3												
	Some Sand		7	SS	5												
	Stiff		8	TW	PH			2									
			9	SS	1			2									
			10	SS	1												0 24 68 18
308.2																	
11.7	Sandy Silt																
	To		11A	SS	0												2 25 67 6
	Silty Sand		11	SS	6												
	Trace/Some Gravel																
	Trace of Clay																
305.7	Very Loose to Loose		12	SS	9												29 53 15 3
14.2	End of Borehole																

+3, x5: Numbers refer to  
Sensitivity

20  
15 5 (%) STRAIN AT FAILURE  
10



# RECORD OF BOREHOLE No 1 & 1A

METRIC

W P 177-77-01 LOCATION STA: 18+485; 0/s 10.3 m LT of C (PROPOSED) ORIGINATED BY JY  
DIST 14 HWY 66 BOREHOLE TYPE Cont. Flight Auger (H.S.) COMPILED BY PP  
DATUM Geodetic DATE 85 11 12 and 13 CHECKED BY \_\_\_\_\_

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W <sub>p</sub>	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W <sub>L</sub>	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			20	40	60	80	100					
319.9	Ground Level																
0.0	Sandy Silt Traces of Clay Gravel and Organics Very Loose to Loose (Mine Tailings)		1	SS	6												
			2	SS	5												
			3	SS	2												
			4	SS	5												
			5	SS	4												
315.9			6	SS	3												
4.0	Organic Material Some Sand, Silt Soft		7	SS	12												
314.8			8	SS	4												
5.1	Silty Clay Trace of Sand and Organics  Soft to Firm		9	SS	6												
			10	SS	9												
			11	SS	6												
			12	SS	18												
			13	SS	2												
			14	SS	10												
308.2																	
11.7	<u>Boulders</u> Sand and Gravel Traces of Silt, Clay Loose to Very Dense		15	SS	6												
305.9			16	SS	50	7/8 cm											
14.0	Refusal  End of Borehole																

+3, x5 : Numbers refer to  
Sensitivity

20  
15 5 (%) STRAIN AT FAILURE  
10

EXISTING PROPERTY

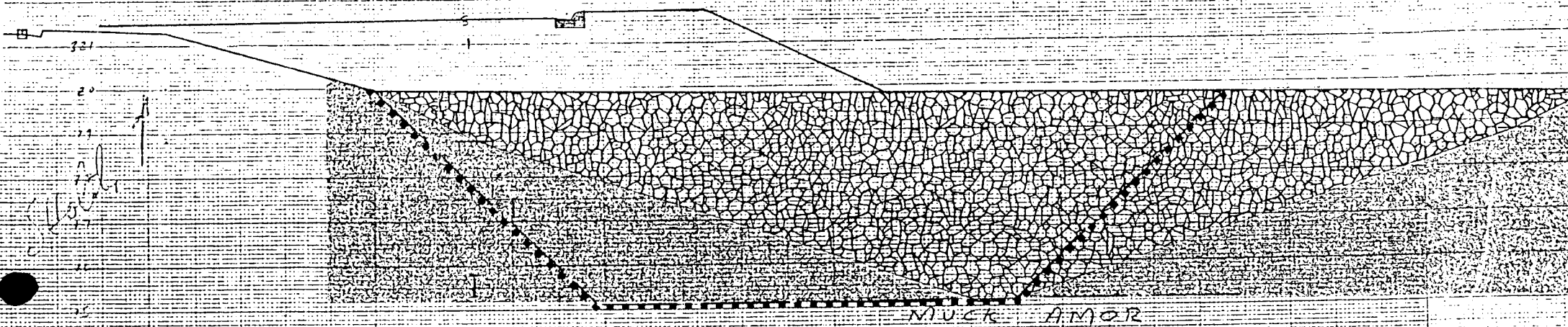
Proposed Property

1.7 21.28  
1.4 21.22  
1.3 21.30  
1.2 21.35  
0 321.32  
0.4 21.30  
1.4 21.25

8 19.93

16 19.81

25 19.74



18+490.00

SEWER LINE  
EASEMENT

MUCK AMOR



1.7	21.28
1.4	21.22
1.3	21.36
1.2	21.36
0	321.32
0.4	21.30
1.4	21.25

EXISTING PROPERTY

19.93

16 19.81

Proposed Property

25 19.74

321  
20  
19  
18  
17  
16  
15

18+490.00

SEWER LINE  
EASEMENT

MUCK AMOR

