

G.I.-30 SEPT. 1976

GEOCRES No. \_\_\_\_\_

DIST. 18 REGION \_\_\_\_\_

W.P. No. \_\_\_\_\_

CONT. No. \_\_\_\_\_

W. O. No. 94-11002

STR. SITE No. \_\_\_\_\_

HWY. No. 546LOCATION Hwy 546 Slope Failure  
Top of NouvelNo of PAGES -       =====

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. \_\_\_\_\_

REMARKS: \_\_\_\_\_

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# memorandum



To: P.J. Bound  
Acting Head, Geotechnical Section  
Northwestern Region

Date: 94 06 21

From: Foundation Design Section  
Room 315, Central Building

Subject: Hwy 546 Slope Failure  
Sta. 16+675 to 16+875  
Township of Nouvel  
W.O. 94-11002  
District 18, Sault Ste Marie

It was brought to our attention some time back regarding a slope problem on Hwy 546, about 17.8 km north of Hwy 554 junction. Apparently some slips had taken place and the highway had to be closed at times to clear the wash-out materials.

According to the cross-section data and photographs attached to your memorandum dated 93 01 28, the area appeared to be a working gravel pit with cut slopes formed facing north and west. The west slope is benched with slope height of 20 to 30 m. The north slope extends to a height of 50+ m without any bench. Some trees are found near the top of the slopes but majority parts of the slope surface are bare. The gradient of the slopes varies but typically between 1.5H:1V to 1.3H:1V.

According to the geological map in the Northern Ontario Engineering Geology Terrain Study produced by the Ministry of Natural Resources, the general area consists of sand & gravel and glacial till materials. By the look of the slopes from the photographs, it appears that the slips are shallow and of erosional in nature rather than deep seated failures. The as-constructed slope gradients are close to the angle of repose of the material and hence are too steep for the type of material and the magnitude of the slope height to provide adequate factor of safety. The soil is generally non-cohesive in nature and is therefore highly susceptible to erosion under varies weather elements.

Although no deep seated slope failure is envisaged, wash-outs may still be hazardous to the users on the highway in view of the height of the slope. The optimum solution is to trim the slope back to a safe gradient. Based on the limited information of the subsoil, it is recommended to cut the slope back to 2H:1V with a 2 m wide berm every 8 m, as shown on the attached sketch. The excavated material can be stockpiled for future use. If this solution is not economically feasible at this time, an alternative is

to protect the highway from the material washed down from the slope by means of a gabion wall at the toe of the slope. Routine maintenance will be required to clear the debris behind the gabion wall. It is also advisable to protect the slope face from further erosion. Sodding may be difficult in view of the steep gradient. Even special methods such as hydroseeding may have a problem with sand and gravel material. Other means such as shotcreting would be very expensive.

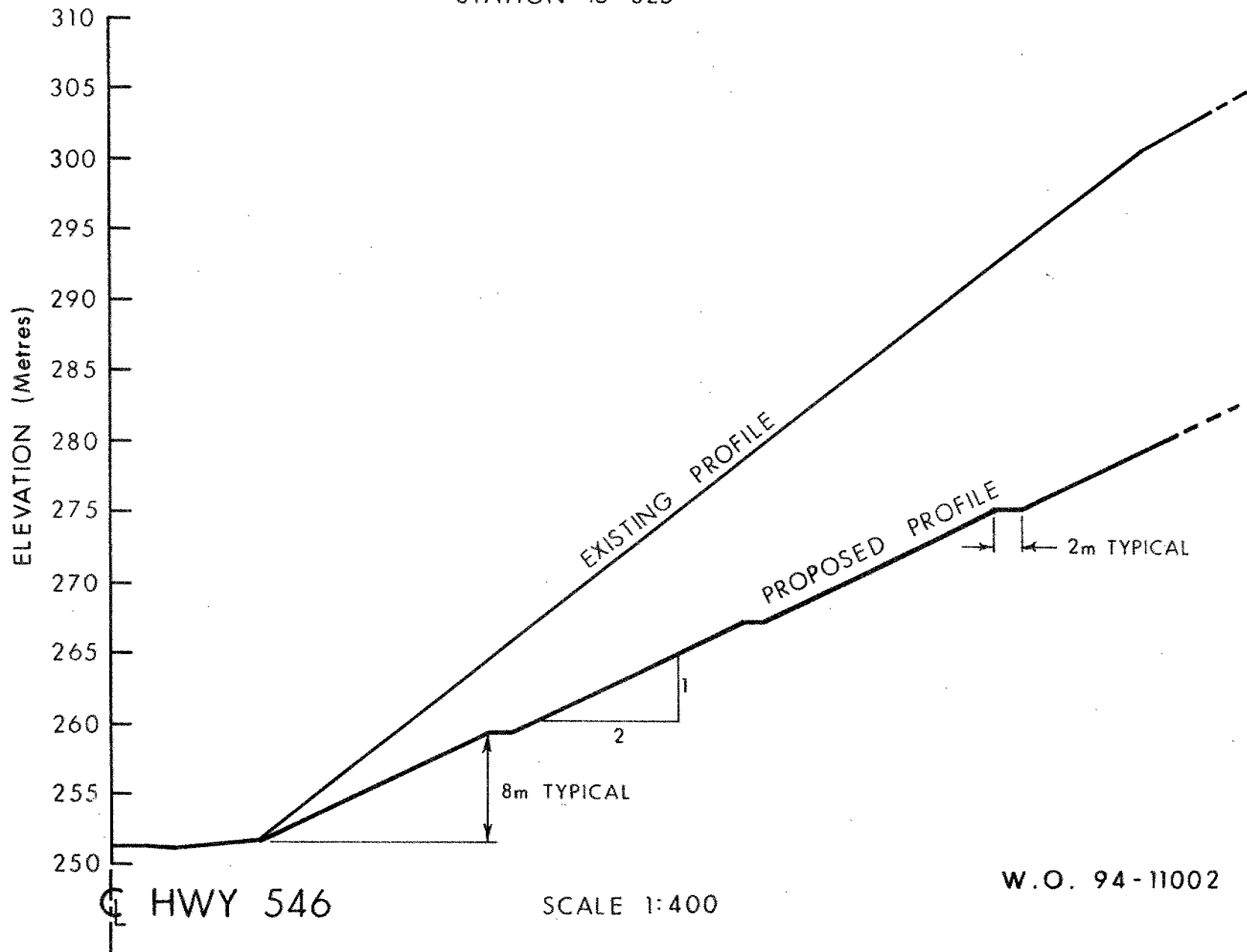
We believe the above is adequate for the present purpose. Should you require further details on any of the above schemes, please contact our office.

A handwritten signature in black ink, appearing to read 'David Kwok', is written over the typed name.

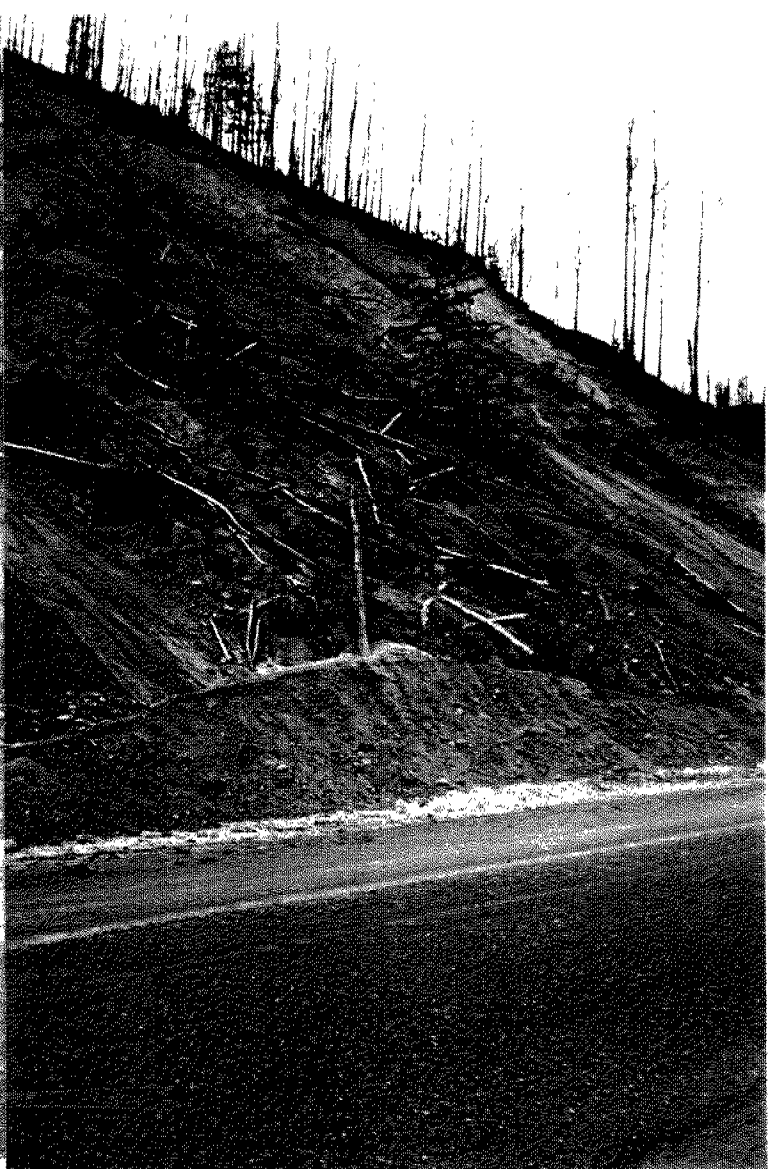
David Kwok, P. Eng  
Project Foundation Engineer  
for  
Paul Payer, P. Eng.  
Senior Foundation Engineer

# HIGHWAY 546 FAILURE

STATION 16+825



W.O. 94-11002





AREA WHERE  
WASHOUTS CLOSE  
ROAD.

