

DOCUMENT MICROFILMING IDENTIFICATION

G.I.F-30 SEPT. 1976

GEOCRES No. 52E-10

DIST. 20 REGION Northwestern

W.P. No. 55-69-01

CONT. No. 73-174

W. O. No. 71-11020

STR. SITE No. _____

HWY. No. 604

LOCATION Township of Jaffray

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. _____

REMARKS: ① documents to be unfolded
before microfilming

FOUNDATION INVESTIGATION REPORT
For
Hwy. #604 - Township of Jaffray
District No. 20 (Kenora)
W.O. 71-11020 -- W.P. 55-69-01

The Foundation Section were requested to perform a subsoil investigation at several swamp crossings of the proposed realignment of Hwy. #604. The request was made verbally by Mr. R. Morgenroth, Regional Materials Engineer, Thunder Bay - (Northwestern Region), on March 12, 1971.

AREA #1 - Station 42+00 to Station 45+00:

The existing road rides the swamp on 3 - 6 ft. of fill. The swamp lies to the left of the highway with Round Lake on the immediate right. From Station 35+00 to 42+00, the road is on a side cut through bedrock. Beyond Station 45+00 the road follows the contours of the land away from the lake up a 1 in 10 grade.

Two boreholes were put down - i.e., #1 and #2. The subsoil consists of 20 to 38 ft. of organic deposits in B.H.'s #1 and #2, respectively, overlying shallow layers of silt and silty clay and finally, a layer of sand and gravel and some silt - the latter being found at 27 ft. - B.H. #1, and 50 ft. - B.H. #2.

It is intended to raise the grade in this area from 1 - 3 feet, meaning fills of up to 9 ft. in height.

The organic material noted above, consists of soft to firm organic silt with some fine sand to sandy silt with organics. This type of material is not easily displaceable, and it is recommended that this deposit be excavated to a depth of 12 feet. The backfill can be made up of the rock from the nearby excavation. No problems are anticipated with regard to stability of the fill if this procedure is adopted, but some settlement is inevitable.

AREA #2 - Station 177+00 to Station 182+00:

The existing road crosses swamp on a fill averaging some 2 feet high, although this is somewhat higher at the ends of the swamp.

Hand auger work undertaken by Regional personnel indicated that the critical location lies between Station 178+00 and Station 180+00. One borehole (#3) was undertaken at Station 180+00. The subsoil in this location was found to consist of 18 ft. of very soft, saturated, woody peat overlying 20 ft. of very soft to soft grey silty clay to clay with some organics and seams of fine sand. Underneath the clay layer is a very loose to loose deposit of sandy silt; the borehole was terminated in this layer.

It is proposed to increase the grade of the highway 1 to 2 ft. over the area, meaning fills of 7 feet at Station 177+00, decreasing to 3 feet at Station 180+00.

It is recommended that the peat deposit be excavated to the maximum depth possible and replaced with suitable granular fill. If complete excavation is not feasible, then the remaining peat should be surcharged to such an extent that settlement and displacement will occur until a stable situation is reached. The mud waves formed in front and at the sides should be excavated as the operation proceeds.

AREA #3 - Station 225+00 to Station 229+00:

The existing road crosses the swamp on fills ranging in height from 3 ft. at Station 225+00 to 12 ft. at Station 229+00. The new fill will have a height of 10 ft.

Hand auger work by the Region indicated a maximum of 5 feet of peat overlying sand. One borehole was put down in this area at Station 227+00, which substantiated the findings of the Region. The subsoil at this one location was found to consist of 4.5 feet of soft peat overlying loose to very dense fine to medium sand. It is therefore recommended that the shallow peat deposit be completely excavated in this area.

MISCELLANEOUS:

The field work, performed during the period March 23 to 27, 1971, was carried out by Mr. G. Allen, Project Foundation Engineer.

Equipment used was owned and operated by Dominion Soil Investigation Ltd.

This report was prepared by Mr. G. Allen.

General supervision of the project and review of the report were undertaken by Mr. K. G. Selby, Supervising Foundation Engineer.

June, 1971

DEPARTMENT OF HIGHWAYS- ONTARIO

MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 71-11020

LOCATION Sta. 44 + 02 O/S 68' lt.

ORIGINATED BY G.A.

W.P. 55-69-01

BORING DATE March 23, 1971

COMPILED BY G.A.

DATUM Geodetic

BOREHOLE TYPE Washboring, NX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— w _L			BULK DENSITY γ P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT					PLASTIC LIMIT ——— w _p					
							20 40 60 80 100					WATER CONTENT — w					
							SHEAR STRENGTH P.S.F.							w _p — w — w _L			
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB. VANE							WATER CONTENT %			
														25 50 75			
1082.9	Ground Level																
0.0	Organic silt to silt with organics. Very soft to soft.		1	SS	1										1082.2		
			2	SS	3												
			3	SS	1												
			4	SS	1												
1062.9			5	SS	1												
20.0	Grey sandy silt.																
1059.9	Very loose.																
23.0	Grey silty cl. with seams of fine sand. Very soft.		6	SS	0												
1055.9																	
27.0	Het. mix. of silt, sa. & gra.v. dense		7	SS	100/4"												
1052.1																	
30.8	End of Borehole.																

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 71-11020 LOCATION Sta. 42 + 61 O/S 38' 1t.

ORIGINATED BY G.A.

W.P. 55-69-01 BORING DATE March 24 & 25, 1971

COMPILED BY G.A.

DATUM Geodetic BOREHOLE TYPE Washboring, NX Casings

CHECKED BY

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	20	40	60	80	100	25			50
1082.8	Ground Level														
0.0	Organic silt with some fine sand to sandy silt with organics. Soft to firm.		1	SS	2										
			2	SS	3										
			3	SS	3										
			4	SS	3										
			5	SS	11										
1045.8	37.5 Grey silty clay with up to 4" layers of fine sand. Very soft.		6	SS	0										
1039.8	44.0 Grey silt, traces of clay. Very loose.		7	SS	0										
1032.8	50.0 Het. Mix. sa. silt & gra. Compact.		8	SS	21										
1030.3	52.5 End Of Borehole. Probably sand, silt and gravel.														
1020.0	62.8 End of second Cone test.														

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 71-11020

LOCATION Sta 180 + 00 O/S 35' rt.

ORIGINATED BY G.A.

W.P. 55-69-01

BORING DATE March 25, 1971

COMPILED BY G.A.

DATUM Geodetic

BOREHOLE TYPE Washboring, NX Casings

CHECKED BY

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT ——— w_L			BULK DENSITY γ P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	BLOWS/FOOT				PLASTIC LIMIT ——— w_p				
							SHEAR STRENGTH P.S.F.				WATER CONTENT %				
							1000	2000							
1054.8	Ice level														
1053.5	Ground Level														
1.3	Peat.														
	Very soft.		1	SS	0	1050									
			2	SS	1										
			3	SS	1	1040									
1036.8			4	SS	2										
18.0	Grey silty clay to clay, some organics & thin seams of fine sand.		5	TW	Own wt.	1030									
	Very soft to soft.		6	SS	0										
1017.3						1020									
37.5	Sandy silt.														
	Very loose to loose.		7	SS	5	1010									
			8	SS	1										
1001.8						1000									
53.0	End of Borehole														
	Probably sandy silt.														
						990									
						980									
						970									
964.8															
90.0	End of second Cone Test.														

20
10-5 % STRAIN AT FAILURE
10

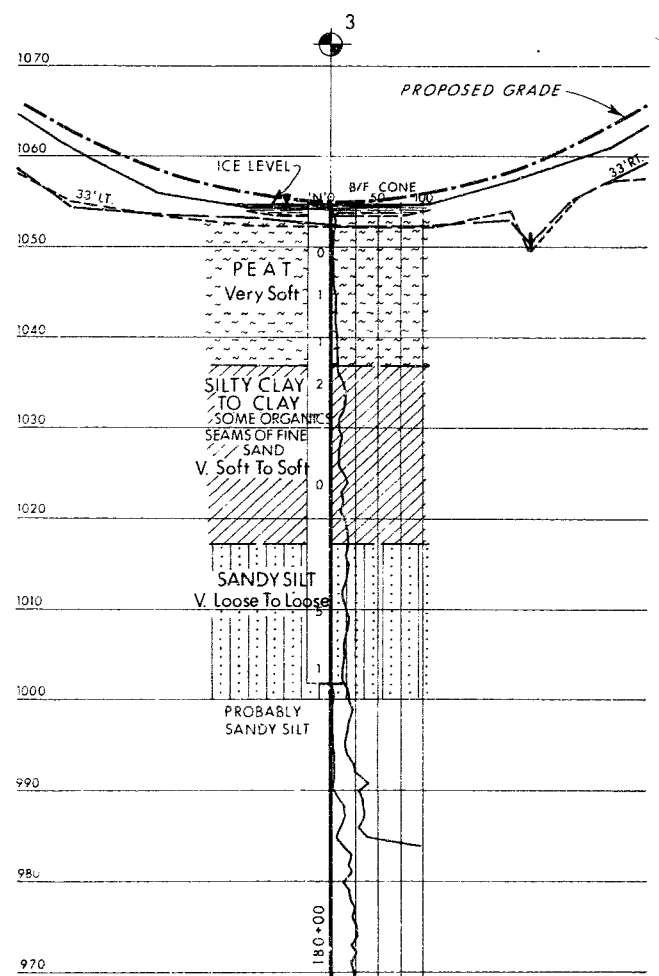
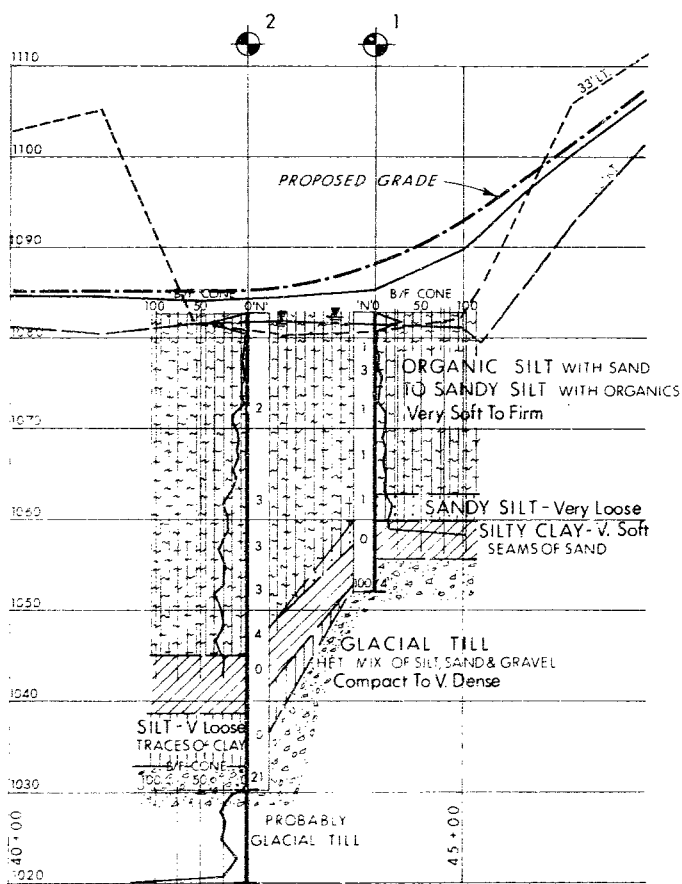
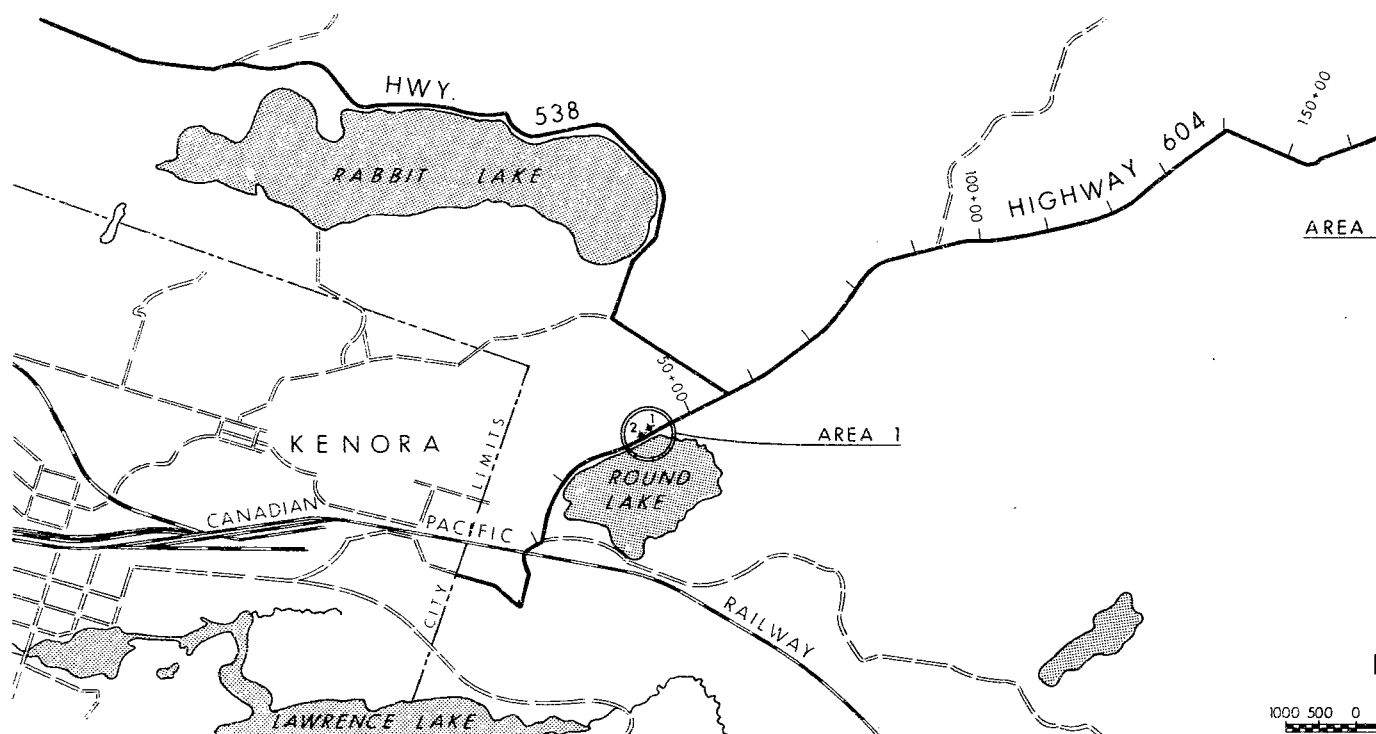
DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

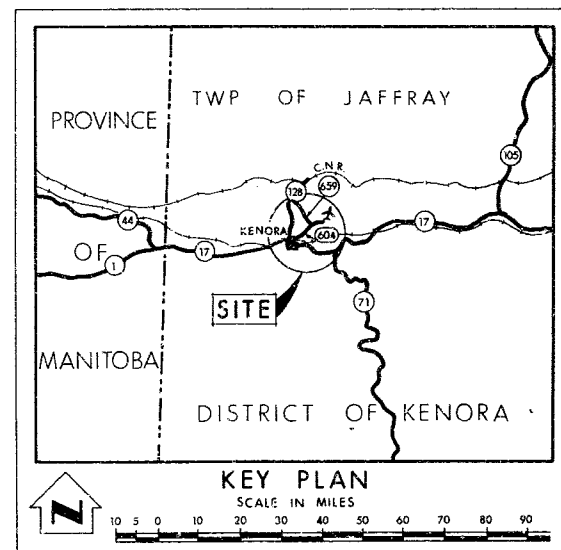
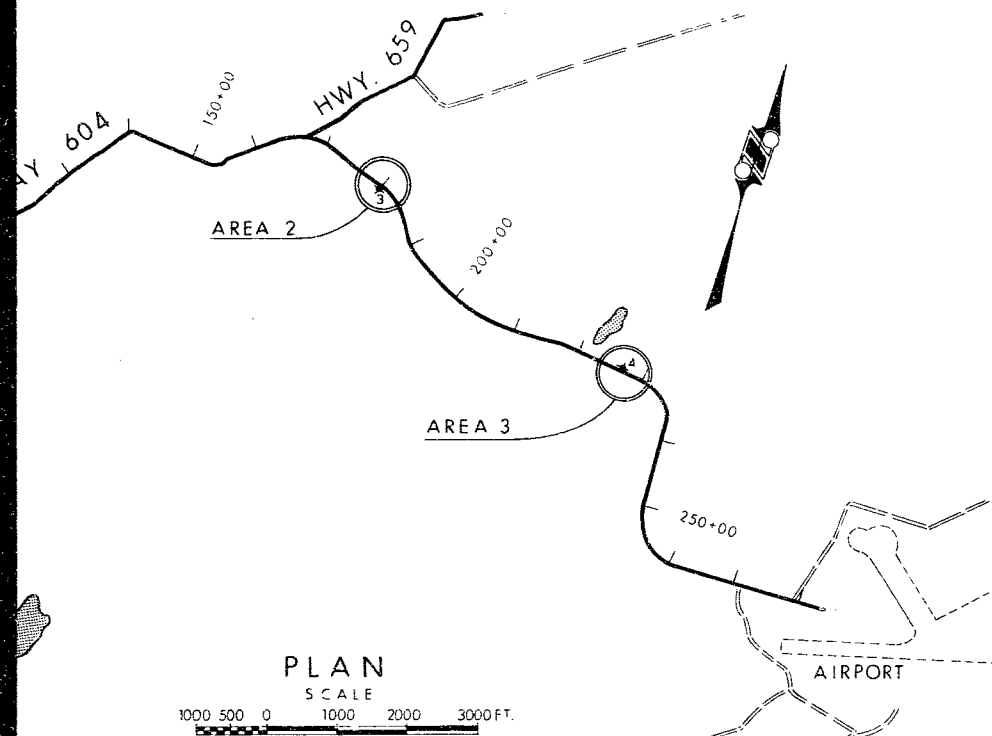
FOUNDATION SECTION

JOB 71-11020 LOCATION Sta. 227 + 00 O/S 23' lt. ORIGINATED BY G.A.
 W.P. 55-69-01 BORING DATE March 27, 1971 COMPILED BY G.A.
 DATUM Geodetic BOREHOLE TYPE Washboring, NX Casing CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F.					WATER CONTENT % 25 50 75			
1217.8	Ground Level														
0.0	Feet.														
1213.3	Soft.		1	SS	5										
4.5	Grey to brown Fine to medium sand.		2	SS	10										
	Loose to very dense.		3	SS	21										0 95 (5)
			4	SS	7										
			5	SS	35										
1191.3			6	SS	56										
26.5	End of Borehole. Probably find to medium sand.														
1181.8															
36.0	End of Cone Test.														



AREA 2



LEGEND			
	Bore Hole		
	Cone Penetration Test		
	Bore Hole & Cone Test		
	Water Levels established at time of field investigation, MARCH, 1971		
NO.	ELEVATION	STATION	OFFSET
1	1082.9	44+02	68' LT.
2	1082.8	42+61	38' LT.
3	1054.8	180+00	35' RT.
4	1217.8	227+00	23' LT.

— NOTE —

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

REVISIONS	DATE	BY	DESCRIPTION

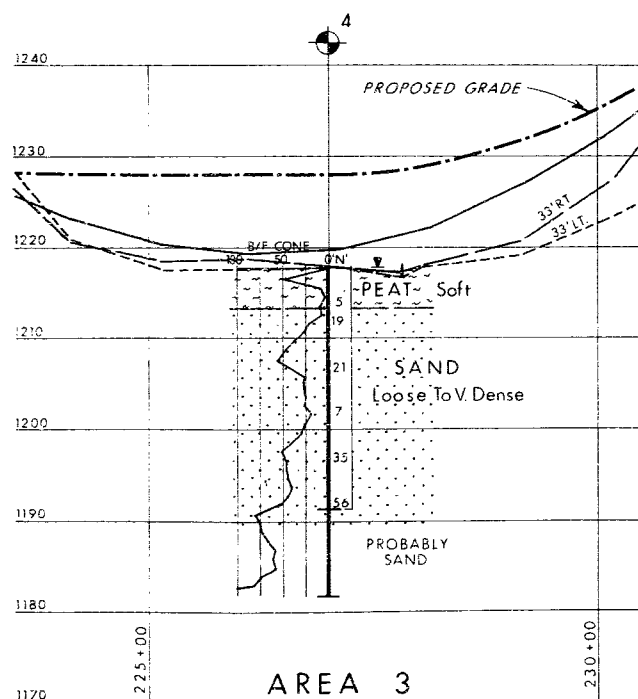
DEPARTMENT OF TRANSPORTATION & COMMUNICATIONS
DESIGN SERVICES BRANCH — FOUNDATION SECTION

SWAMP INVESTIGATION

HIGHWAY NO. 604 (AIRPORT ROAD) DIST. NO. 20
DIST. KENORA
TWP. JAFFRAY LOT. CON.

BORE HOLE LOCATIONS & SOIL STRATA

SUBMD. G. A. CHECKED	W.P. NO. 55-69-01	DRAWING NO.
DRAWN BY CHECKED	JOB NO. 71-11020	71-11020A
DATE JUNE 17, 1971	SITE NO.	BRIDGE DRAWING NO.
APPROVED	CONT. NO.	



— — — — — GROUND LINE RIGHT OF C 33'
- - - - - GROUND LINE LEFT OF C 33'

Mr. R. Morgenroth,
Regional Materials Engineer,
Thunder Bay Region.

file *ALS*
Soils Section,
Materials and Testing Office,
Room 134A, Laboratory Building.

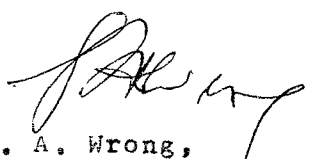
July 8, 1971.

✓ 71-11-020
W.P. 55-69-01
Secondary Highway 604
0.5 Miles East of Kenora E. Lts.,
N'ely. to end of Highway
District 20 - Kenora

The Foundation Investigation into three swamp crossings on the above mentioned work project was reported on June 29, 1971. The treatments recommended in this report at Areas 1 and 2 while suitable, appear to me to be rather excessive for this class of highway.

I would recommend that you review the treatment in these two areas and consider alternative solutions such as the lowering of the grade or possibly realignment as a means of making these crossings. Either of these treatments should be more economical and in keeping with the function of the road proposed.

I have indicated to Mr. Stermac that investigations requested by you as part of your soils design work should not be given the wide distribution normally assigned to his Structure Foundation Investigations. While your requests for Foundation Investigations may require other distribution, you should bring this to his attention.


G. A. Wrong,
Principal Soils Engineer.

GAW/sd

cc:- A. Stermac ✓