

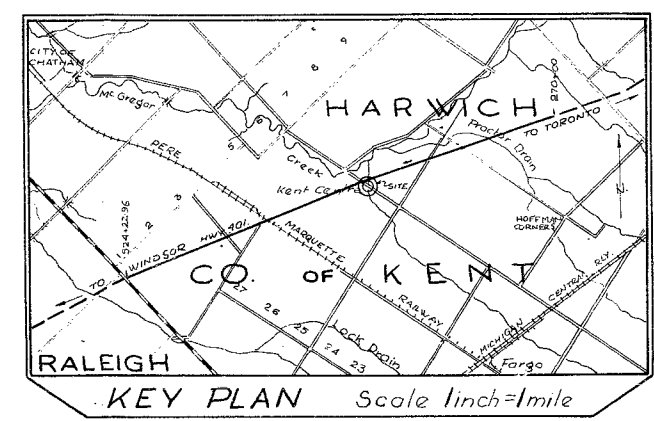
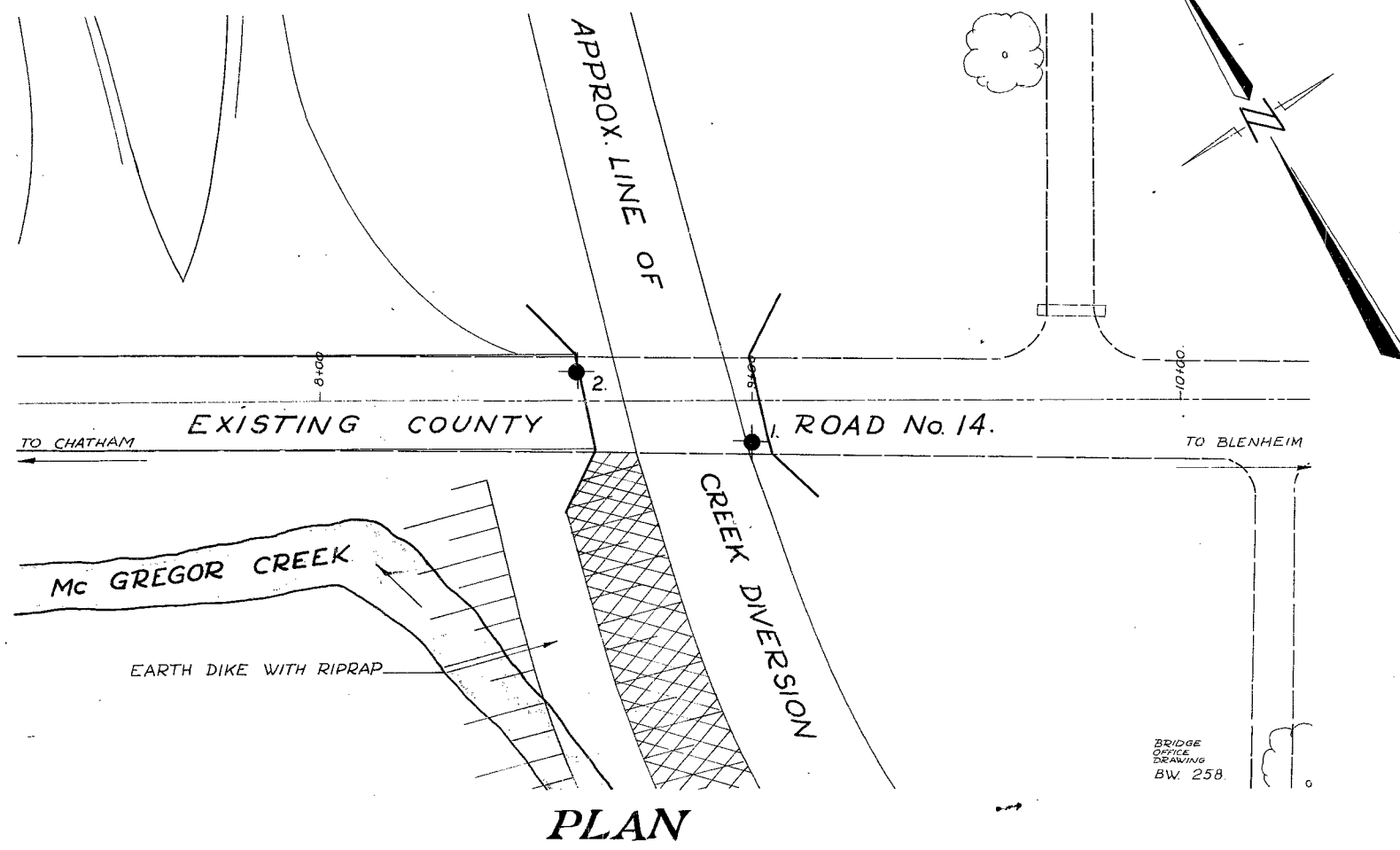
#59-F-74

W.P. 304-59

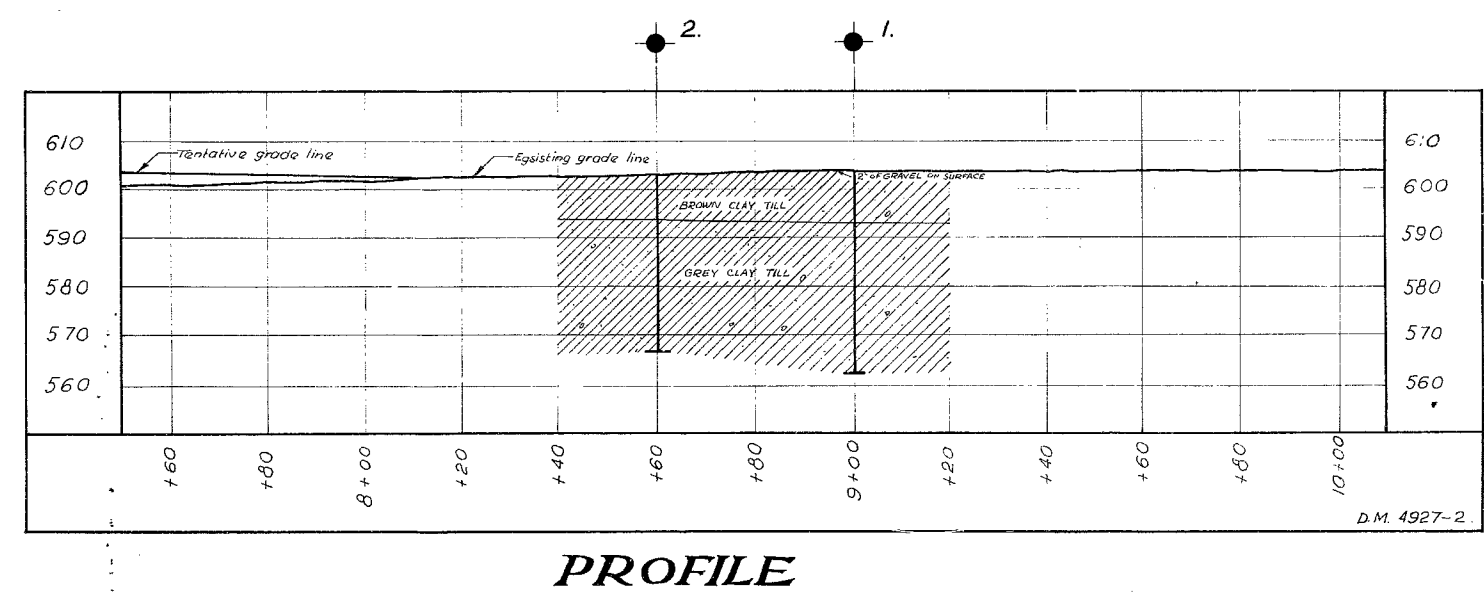
Co. RD. # 14

MCGREGOR CREEK

DIV., DIST 1



LEGEND			
Bore hole			
HOLE NO.	ELEVATION	STATION	DISTANCE FROM E.
1.	6030	9+00	9' 2"
2.	6030	8+60	6' 5" 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.

DEPARTMENT OF HIGHWAYS - ONTARIO			
MATERIALS & RESEARCH SECTION			
COUNTY ROAD & Mc GREGOR CREEK DIVERSION PROPOSED CROSSING			
SHOWING POSITIONS & ELEVATIONS OF HOLES			
HWY. 14	DISTRICT 1	COUNTY KENT	
TOWNSHIP HARWICH		LOT 25-26	CON IWCR-E.C.R.
LOCATION KENT CENTRE			
DRAWN BY T. Szegvory	CHECKED BY:	W.P. 304-59	
DATE 11 AUG. 1954	APPROVED BY:	DRAWING NO.	
SCALE 1 inch = 20 Feet		F 59-74 A.	



DEPARTMENT OF HIGHWAYS

Memo to Mr. A. M. Toye, *Date* February 2, 1960.
Bridge Engineer. *Subject* D.H.O. FOUNDATION INVESTIGATION
From Materials & Research Section. W.P. 304-59 -- W.J. F-59-74.

Attention: Mr. S. McCombie.

Re: County Road No. 14 & McGregor Creek Diversion
Crossing at Kent Centre.
District 1.

As requested, we have carried out 2 borings at the above noted structure location where the County road crosses the McGregor Creek Diversion at Kent Centre. Presented herein, are the detailed results of our findings as presented in the borehole logs and summarized in Table No. 1. The locations of the boreholes as well as their subsoil profile, are shown in the accompanying Drawing No. F-59-74A.

Subsoil at the site consists of a dense, silty clay till stratum, which, according to our boring data as well as available geological information in the vicinity, extends a considerable depth to bedrock. The upper portion of the silty clay till has been subjected to oxidation resulting in its present brownish colour. Below the oxidized zone, the colour is predominantly grey. The silty clay till exists in a dense condition with shear strengths in excess of 2000 p.s.f. measured in the laboratory, and is fissured throughout the stratum. The average unit weight and moisture content were found to be 135 p.c.f. and 17%, respectively. It has an average penetration resistance of 20 and is of very low plasticity.

cont'd. /2 ...

Simple spread footings founded in the dense clay till are recommended. Assuming that the stream-bed of the creek diversion is at the same elevation as at the Hwy. 401 and McPherson Creek Diversion Crossing (F-59-73, W.P. 16-59) at approximately 591', to avoid undermining of the footings due to erosion and scour, and to allow for future deepening of the creek channel, it is recommended that footings be founded at Elev. 585' or below. At this elevation or below, for footings typically 7' to 10' in width, a safe allowable bearing pressure of 2 1/2 tons/sq.ft. can be used for spread footing design. Settlement consequent upon application of this bearing pressure, will be within tolerable limits.

No ground water seepage problems during footing excavations, are anticipated. The impermeable nature of the clay till will allow excavations to be carried out in the dry. To avoid 'piping' due to artesian water conditions in the water-bearing sand and gravel layer underneath the clay till stratum, as encountered in other sites in the locality, footing excavations should not be carried below Elev. 575'.

No approach fill stability problem is anticipated.

If we can be of further assistance in the foundation design of this structure, please contact our Office.

AKL/MdeF
Encls.

L. G. Soderman,
PRINCIPAL SOILS & FOUNDATIONS ENGINEER

Per:

AKL

A. K. Loh,

cc: Messrs. A. M. Toye (2) Project Foundation Engr.

H. A. Tregaskes

D. G. Ramsay

A. Gater

G. U. Howell

J. Roy

A. Watt

Foundation Office

Gen. Files.

APPENDIX I.

Table No. 1

SUMMARY OF FIELD & LABORATORY TESTS

JOB F 59-74W.P. 304-59

HOLE NO.	SAMP NO.	SAMPLE DEPTH (FEET)	MATERIAL DESCRIPTION	MOISTURE CONTENT (%)	PLASTIC LIMIT (%)	LIQUID LIMIT (%)	SHEAR STRENGTH (P.S.F.)	UNIT WEIGHT (P.C.F.)	REMARKS
1	S1	5' - 6.5'	Dense brown fissured silty clay till	16	17.4	-	-	-	129.1
	S2	10'-11.5'	Dense grey fissured silty clay till	20	16.3	-	-	-	133.1
	S3	15'-16.5'	" " " " " "	25	16.0	-	-	-	140.9
	S4	20'-21.5'	" " " " " "	22	17.0	-	-	-	134.8
	T5	25'-26.5'	" " " " " "	26	19.5	-	-	-	132.1
	S6	30'-31.5'	" " " " " "	22	17.9	15.8	24.9	2710	137.5
	S7	35'-36.5'	" " " " " "	20	18.1	-	-	2520	132.5
	S8	40'-41.5'	" " " " " "	20	16.5	-	-	1610	135.5
2	S1	5' - 6.5'	Dense brown fissured silty clay till	28	15.4	-	-	-	133.2
	S2	10'-11.5'	Dense grey fissured silty clay till	24	16.4	-	-	-	144.2
	S3	15'-16.5'	" " " " " "	23	16.3	-	-	-	136.5
	S4	20'-21.5'	" " " " " "	24	17.	-	-	-	146.2
	S5	25'-26.5'	" " " " " "	18	18.0	-	-	3630	133.9
	S6	30'-31.5'	" " " " " "	18	17.6	-	-	2020	139.0
	S7	35'-36.5'	" " " " " "	20	15.8	-	-	2660	138.0
			S - Denotes Split Spoon Sample T - Denotes Thin-walled Shelby tube Sample.						

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

N.P. --- 304-59 --- BORE HOLE NO. 1 ---

JOB F 59 - 74 STATION 9:00 (9: RT)

DATUM Elev. 603' COMPILED BY B.K.

BOHRING DATE July 24/59 CHECKED BY A.L.

2" DIA. SPLIT TUBE -----
2" SHELBY TUBE -----
2" SPLIT TUBE -----
2" DIA. CONE -----
2" SHELBY -----
CASING -----

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) _____	O
VANE TEST (C) AND SENSITIVITY (S) _____	+6
NATURAL MOISTURE AND	
LIQUIDITY INDEX _____	X
LIQUID LIMIT _____	
PLASTIC LIMIT _____	

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE			
				1000	2000	3000	4000 P.S.F. BLOWS/FT.
↓	Ground level	603.0	0	10	20	30	40
	Gravel						
	Dense brown fissured silty clay till	593.0	10				
	Dense grey fissured silty clay till						
			20				
			30				
			40				
	End of borehole	561.5					

CONSISTENCY		SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT - % DRY WT.			
10	20	30	
	x		S1 129.1
	x		S2 133.1
	x		S3 140.9
	x		S4 134.8
	x		T5 132.1
	x	o	S6 137.5
	x		S7 132.5
	x		S8 135.5

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND RESEARCH SECTION

I.P. --- 304-59 --- BORE HOLE NO. --- 2 ---

OB F 59 - 74 STATION 8-60 (6.5' LT)

ATUM Elev. 603' COMPILED BY B.K.

FORING DATE July 24/59 CHECKED BY A. L.

2" DIA. SPLIT TUBE -----
2" SHELBY TUBE -----
2" SPLIT TUBE -----
2" DIA. CONE -----
2" SHELBY -----
CASING -----

LEGEND

1/2 UNCONFINED COMPRESSION (Qu) -----	O
VANE TEST (C) AND SENSITIVITY (S) -----	+ ^s
NATURAL MOISTURE AND	
LIQUIDITY INDEX -----	X
LIQUID LIMIT -----	
PLASTIC LIMIT -----	

SYMBOL	DESCRIPTION	ELEV. FEET	DEPTH FEET	STRENGTH AND PENETRATION RESISTANCE			
				1000	2000	3000	4000
	↓ Ground level						
	gravel	603.0	0				
	Dense brown fissured silty clay till						
		594.0	10				
	Dense grey fissured silty clay till						
			20				
			30				
		566.5	40				
	End of borehole						

P.S.F.
 FLOWS/FT.

Depth (Feet)	Strength (P.S.F.)	Penetration Resistance (Flows/ft.)
0	-	-
5	~3000	~15
10	~2000	~12
15	~2000	~12
20	~2000	~12
25	~2000	~12
30	~2000	~12
35	~2000	~12
40	~2000	~12

CONSISTENCY			SAMPLE	NATURAL UNIT WT. P.C.F.
MOIST. CONTENT- % DRY WT.				
10	20	30		
x			S1	133.2
x			S2	144.2
x			S3	136.5
x			S4	146.2
x			S5	--
x			S6	139.0
x			S7	138.0