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G.I.-30 SEPT. 1976

GEOCRES No. 40P16-13

DIST. 3 REGION Southwestern

W.P. No. 197-66-00

CONT. No. 75-143

W. O. No. 73-11075

STR. SITE No. _____

HWY. No. 9

LOCATION West of Orangeville W'y.

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. _____

REMARKS: DOCUMENTS TO BE UNFOLDED BEFORE
MICROFILMED

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. T. Stermac,
Foundations Engineer,
Downsview.

FROM: Materials and Testing Office,
London.

ATTENTION: Mr. K. Selby.

DATE: August 20, 1973.

OUR FILE REF.

IN REPLY TO

SUBJECT: Highway 9, Orangeville Westerly.

73-11075

Highway 9 west of Orangeville traverses an extensive swamp area from the mid point of Concession 3, westerly to Concession 7, Amaranth Township. Borings carried out in 1958 indicate the depth varies up to 15 ft. with several ridges of sand and fine gravel crossing the right-of-way. When the highway was reconstructed under W.P. 87-58 in 1960 (Contract 60-68) it was decided to ride the swamp with fills varying from 1 ft. to 4.5 ft. over the original 20 ft. wide concrete pavement, which was left in.

Contract 61-188 provided a binder course pavement over the entire length and because of flushing a dense graded pavement (Dix-Seal) was applied under Contract 63-107 including the subject section.

A further resurfacing under Contract 67-87 (W.P. 26-60-02) provided HL 4 padding with 1-1/4" HL 3 surface course.

During the reconstruction of this road in 1960 the road surface dropped a few feet, due to the granular material added over the old pavement, and caused a mud wave to form along the north side of the fill. A berm was constructed to stabilize the settlement.

Owen Sound District took cross-sections in 1962 to provide data for W.P. 26-60-02, Resurfacing, but we do not have a record of these in this office. I believe that your section was consulted on this location a number of times and with these work project numbers you may be able to locate some history.

However, the District have recently asked for an opinion on the condition and alternative suggestions for, if possible, a final permanent solution to the continuing settlement.

Following our recent conversations on this then will you please carry out investigations to determine the present condition and suggest possible treatment(s).

I have a copy of our soils profile being prepared which will be sent as soon as possible under separate cover.

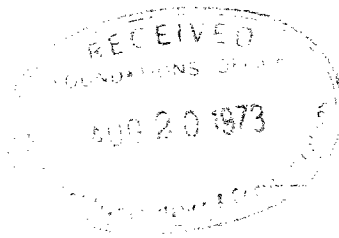
RM:hp

c.c. - W. Neilipovitz,
G. A. Wrong,
A. Rutka,
J. G. Tillcock,
R. Mephram,
File.



R. MEPHAM,

FOR: J. G. FORSTER,
SENIOR SOILS ENGINEER.



MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

Copy for the information of Mr. K. Selby

Mr. F. E. Loscombe,
Reg. Super^y of Eng. Surveys,
Southwest Region.

Mr. G. A. Baun,
Field Supervisor,
Southwest Region.

Mr. P. J. Rule

September 19, 1973.

RE: W. O. 73-37031, Hwy. 9
Township of Amaranth, County of Dufferin
District No. 3, Stratford
Party Chief: G. Telford

Please be advised that the request received from K. Selby, Supervising Foundations Engineer, Foundation Section, Head Office, September 12, 1973, was completed September 14, 1973 and a copy of the field notes are now available for filing in Documents.

Fifteen borehole locations were tied into E. Hwy. 9 chainage by plus and offset between Sta's. 235+00 - 247+00. An elevation was obtained at ground level at each one also. A duplicate set of survey notes were given to P. Kargemagi, the engineer at the site, and a copy forwarded to this office.

Information being submitted is as follows:

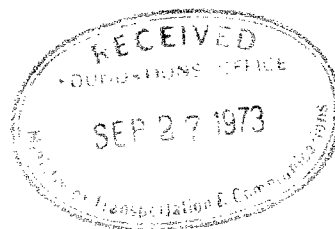
1 field book containing borehole location and offset
plan and profile covering survey limits.

NOTE: there is no W. P. for this request. A phone call to P. Kargemagi on September 17, 1973 verified this.

G. A. Baun,
Field Supervisor.

GAB:rw

c.c.
Mr. A. Crowley,
Mr. A. Wittenberg, Att. E. Pritchard
Mr. K. Selby.



MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. J. G. Forster,
Senior Soils Engineer,
Southwestern Region,
London, Ontario.

FROM: Foundations Office,
Design Services Branch,
West Bldg., Downsview.

ATTENTION:

DATE: November 21, 1973.

OUR FILE REF.

IN REPLY TO

REV 20 1973

SUBJECT:

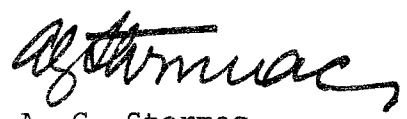
HOF14-13.

FOUNDATION INVESTIGATION REPORT
For
Hwy. 9, West of Orangeville From
Mid Point of Conc. 3 Westerly
To Conc. 7, Amaranth Twp.
District #3, Stratford
W.O. 73-11075

Attached we are forwarding to you our detailed foundation investigation report on the subsoil conditions existing at the above-mentioned site.

We believe that the factual data and recommendations contained therein will prove adequate for your design requirements. Should additional information be required, please do not hesitate to contact our Office.

AGS/ao
Attch.


A. G. Stermac,
PRINCIPAL FOUNDATIONS ENGINEER.

c.c. A. E. Argue
J. G. Tillcock
W. D. Neilipovitz
J. M. Crannie
B. J. Giroux
A. Wittenberg
J. R. Roy
A. Rutka

Foundations Files
Documents

TABLE OF CONTENTS

1. *INTRODUCTION.*
 2. *DESCRIPTION OF SITE AND GEOLOGY.*
 3. *FIELD AND LABORATORY INVESTIGATION.*
 4. *SUBSOIL CONDITIONS.*
 - 4.1) *General.*
 - 4.2) *Sand Some Gravel Traces of Silt and Clay.*
 - 4.3) *Sand with Silt.*
 - 4.4) *Peat.*
 - 4.5) *Sand Some Gravel and Silt & Traces of Organics.*
 5. *GROUNDWATER.*
 6. *DISCUSSION AND RECOMMENDATIONS.*
 7. *MISCELLANEOUS.*
-

FOUNDATION INVESTIGATION REPORT
For
Hwy 9, West of Orangeville From
Mid Point of Conc. 3, Westerly
To Conc. 7, Amaranth Twp.
District #3, Stratford
W.O. 73-11075

1. INTRODUCTION:

A foundation investigation has been carried out at the above mentioned site to determine the existing subsoil and ground water conditions. For the reconstruction of Hwy. 9 in 1960 it was decided to ride the swamp with fills varying from 1 to 4.5 feet, over the original surface. During the work the road surface settled a few feet and caused a mud wave along the north side. A berm was placed to stabilize the settlement. The road has been resurfaced in 1961, 1963, and 1973, and is subject to constant cracking due apparently to differential settlements under the pavement.

A memo requesting the investigation was received from Mr. J. G. Forster, Senior Soils Engineer for the Southwestern Region, dated August 20, 1973. This report contains the results of both the field and laboratory investigation pertaining to this site.

2. DESCRIPTION OF SITE AND GEOLOGY:

The area of the site is relatively flat. The highway passes through a swamp at this location and both sides of the highway are well treed and overgrown with underbrush. A berm has been placed on the north side of the road because of a previous failure.

Physiographically, this region is known as the Hillsburg Sand Hills. This area is characterized by rough topography,

sandy materials, and the flat-bottomed swampy valley running through the moraines from Orangeville to Hillsboro

3. FIELD AND LABORATORY INVESTIGATION:

The field work consisted of 15 sampled boreholes. The drilling was done by a muskeg vehicle mounted C.M.E. 45 equipped with hollow stem augers. Disturbed samples were obtained by standard split spoon samplers driven into the subsoil. The driving energy conformed to the requirements of the Standard Penetration Test. The penetration 'N' values and all field and laboratory results are recorded on the accompanying borelog sheets. The elevations of the various boreholes were determined in the field by the Engineering Surveys Branch, Southwestern Region.

Soil samples were examined in the field and again upon arrival in the laboratory. Laboratory tests to determine moisture content and grain size distribution were carried out on representative samples.

Groundwater levels at the site were determined by recording the water levels within the boreholes over the duration of the field investigation. The locations and elevations of the boreholes as well as a stratigraphical profile are plotted on drawing 73-11075 attached at the end of this report.

4. SUBSOIL CONDITIONS:

4.1) General:

The subsoil at this site consists of the different road bed materials overlying peat followed by a sand bottom. The layers are: sand some gravel, traces of silt and clay, sand with silt, organics (peat) followed by sand some gravel and silt, traces of organics.

4.2) Sand Some Gravel Traces of Silt and Clay:

This material was encountered in all boreholes placed on the shoulder of the highway and in one borehole placed in the

ditch. The road bed material varies in thickness from 4 to 26 feet. The 'N' values measured within this layer were between 2 and more than a 100 blows per foot corresponding to a relative density of very loose to very dense. The moisture content and grain size distribution are as follows:

Natural Moisture Content:	3 - 19%
Gravel:	9 - 39%
Sand:	44 - 80%
Silt and Clay:	10 - 18%

A typical grain size curve envelope is included in the Appendix as Figure 1.

4.3) Sand with Silt:

In six boreholes a layer of sand with silt was encountered within the sand some gravel layer. This layer was probably used as a road bed material (granular 'B'). In B.H. #1, 2 and 3 the sand with silt was 2 to 3 feet thick and 4 to 6 feet below the road surface. In B.H. #6 and 15 this layer was 2 feet thick and 9 to 10 feet below the road surface. The 'N' values measured within this layer were between 29 and 37 blows per foot corresponding to a dense relative density. The natural moisture content and grain size distribution are:

Natural Moisture Content:	11 to 13%
Gravel:	2%
Sand:	66%
Silt:	28%
Clay:	4%

4.4) Peat:

The peat at this site ranged from the ground surface elevation 1549 to a depth of 29 foot elevation 1526. In the boreholes placed in the ditch the peat was encountered at or near the surface and was 7 to 15 feet thick. In the boreholes placed on the shoulder of the highway the peat was, at the north

shoulder 1 to 13 feet thick and at the south shoulder 4 to 8 feet thick. The N values of the organic deposit near the surface, in the ditch, varied between 1 and 2 blows per foot corresponding to a consistency of very soft and the 'N' values below the road fill varied between 3 and 20 blows per foot corresponding to a consistency of soft to very stiff. The natural moisture content of the organic deposit was measured to be between 72 and 795%. If the natural moisture of the peat content is below about 120% the organics were found to be mixed with sand or silt. In 4 boreholes a 4 to 5 inch layer of silt with clay (marl) was sampled just below the organic deposit.

4.5) Sand Some Gravel and Silt & Traces of Organics:

Below the organics a strata of sand, some gravel and silt and traces of organics was sampled. This material appears to be the bottom of the swamp. When the augers reached this level the sand blew up into the augers indicating an unbalanced head of water. The 'N' values measured within this deposit were 5 to more than 100 blows per foot corresponding to a relative density of loose to very dense. The low 'N' values were probably caused by the sand blowing up into the augers. The natural moisture content and grain size distribution are:

Natural Moisture Content:	15 - 72%
Gravel:	0 - 40%
Sand:	48 - 94%
Silt and Clay:	6 - 30%

A typical grain size curve envelope is included in the Appendix as Figure 2.

5. GROUNDWATER:

The groundwater elevations in the boreholes were measured to be at the following elevations.

B.H. #1 - 1548.2	B.H. #2 - 1546.6
3 - Not Established	4 - 1547.6
5 - 1547.0	6 - Not Established

B.H. #7 - 1546.6

9 - 1545.8

11 - 1546.4

13 - Not Established

15 - 1546.1

B.H. #8 - 1546.1

10 - Not Established

12 - 1547.3

14 - 1547.6

In a number of boreholes, the above recorded water levels did not appear until the borehole was advanced through the peat and into the sand. There is probably a perched water table in the material above the peat.

6. DISCUSSION AND RECOMMENDATIONS:

The construction of Hwy. 9 across this swamp has caused the peat to compress under the weight of the fill and in some locations to flow laterally. The fill in some places has completely or almost completely displaced the organics thereby resulting in an uneven thickness of the peat. The irregular consolidation of the peat therefore has resulted in differential settlements of the road surface.

A final permanent solution to the continuing settlement would be expensive. There are however number of possibilities.

1. The complete removal of the peat would eliminate future settlements, but the fact that the peat was sampled to a depth of 29 feet makes its complete removal not practicable.
2. Lowering of the existing grade would have the result of decreasing the weight of material presently causing consolidation and compression of the peat, hence reducing the settlements, this again is probably not practicable.
3. Construction of toe berms (flattening the side slopes) could prevent or reduce lateral squeezing of the peat. This may reduce the settlement somewhat but it would not reduce settlements caused by consolidation or compression of the peat.

In conclusion it must be stated that no measures other than the complete removal of peat mentioned in 1. could be guaranteed to eliminate or even substantially reduce settlements. In our view it would be worth trying method 3. on at least one area (say 100 feet long, eg. Station 238+50 - Station 239+50) and see

whether in fact improvements do result.

We would be pleased to advise in more detail on this if the District shows interest.

7. MISCELLANEOUS:

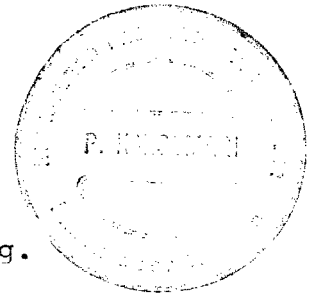
The field work was carried out from September 13 to September 19, 1973 under the supervision of Mr. P. Korgemagi, Project Foundations Engineer.

The equipment used was owned and operated by PVK and Sons Ltd., Burford, Ontario.

This report was written by Mr. P. Korgemagi and reviewed by Mr. K. G. Selby, Supervising Foundations Engineer.

P. Korgemagi

P. Korgemagi, P. Eng.



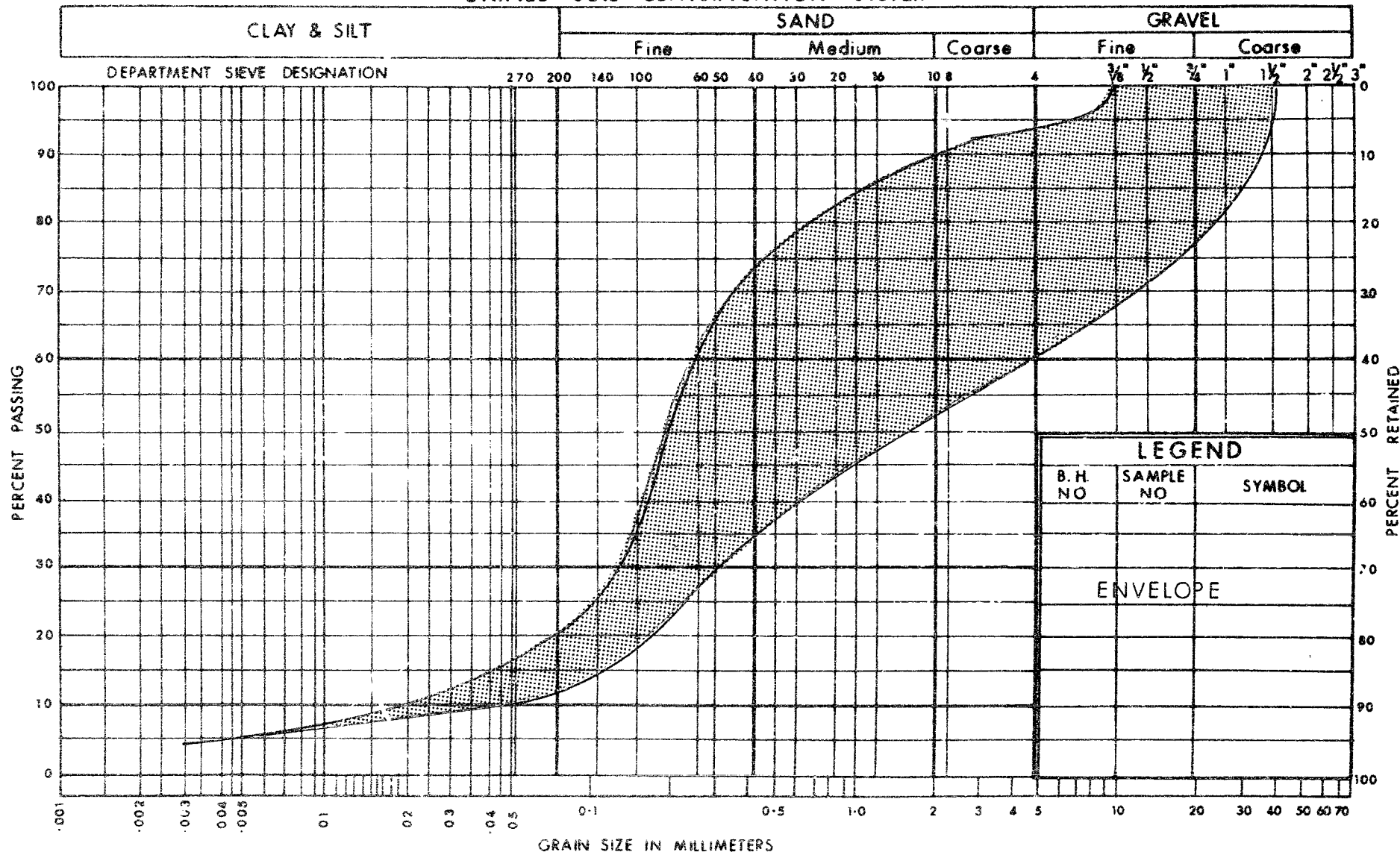
K. G. Selby

K. G. Selby, P. Eng.

PK/ji
November 20, 1973.

APPENDIX I

UNIFIED SOIL CLASSIFICATION SYSTEM



GRAIN SIZE DISTRIBUTION
SAND
SOME GRAVEL TRACES OF CLAY & SILT

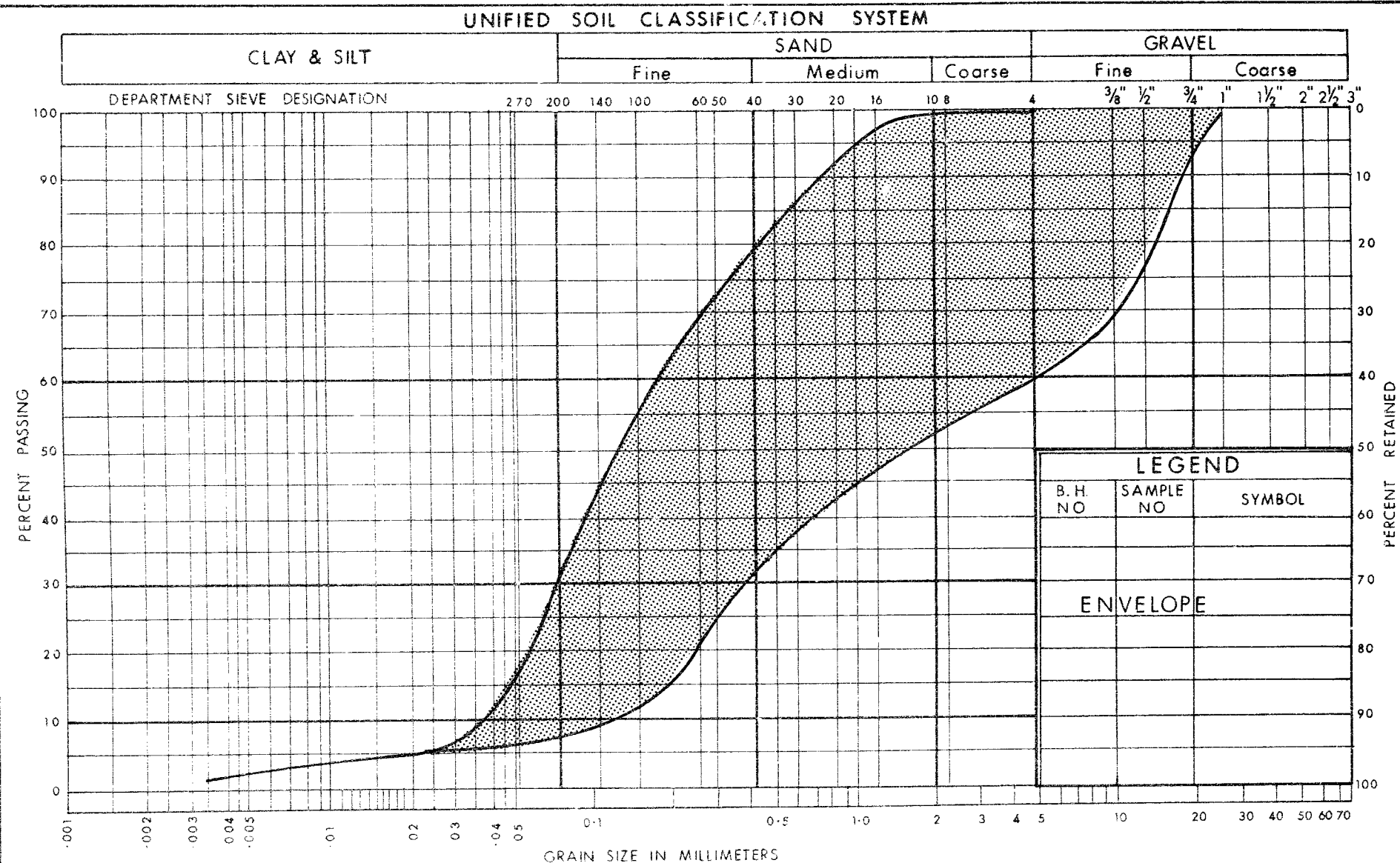


DEPARTMENT
OF
TRANSPORTATION AND COMMUNICATIONS
DESIGN SERVICES
BRANCH

W.P. No.

JOB No. 73-11075

FIG. 1



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

GRAIN SIZE DISTRIBUTION
SAND
SOME GRAVEL & SILT

W.P. No.

JOB No. 73-11075

FIG. 2

ABBREVIATIONS & SYMBOLS USED IN THIS REPORTPENETRATION RESISTANCE

'N' = STANDARD PENETRATION RESISTANCE : - THE NUMBER OF BLOWS REQUIRED TO ADVANCE A STANDARD SPLIT SPOON SAMPLER 12 INCHES INTO THE SUBSOIL, DRIVEN BY MEANS OF A 140 POUND HAMMER FALLING FREELY A DISTANCE OF 30 INCHES.

DYNAMIC PENETRATION RESISTANCE : - THE NUMBER OF BLOWS REQUIRED TO ADVANCE A 2 INCH, 60 DEGREE CONE, FITTED TO THE END OF DRILL RODS, 12 INCHES INTO THE SUBSOIL. THE DRIVING ENERGY BEING 350 FOOT POUNDS PER BLOW.

DESCRIPTION OF SOIL

THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE DENSITY OR DENSENESS OF COHESIONLESS SOILS ARE DESCRIBED IN THE FOLLOWING TERMS :-

<u>CONSISTENCY</u>	<u>c LB./SQ. FT.</u>	<u>DENSENESS</u>	<u>'N' BLOWS / FT.</u>
VERY SOFT	0 - 250	VERY LOOSE	0 - 4
SOFT	250 - 500	LOOSE	4 - 10
FIRM	500 - 1000	COMPACT	10 - 30
STIFF	1000 - 2000	DENSE	30 - 50
VERY STIFF	2000 - 4000	VERY DENSE	> 50
HARD	> 4000		

TERMS TO BE USED IN DESCRIBING SOILS:-

TRACE < 10 % , SOME 10-25 % , WITH 25-40 % , > 40 % SILTY, SANDY, GRAVELLY, CLAYEY ETC.

TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.T.	SLOTTED TUBE SAMPLE	D.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE

P.H. SAMPLE ADVANCED HYDRAULICALLY

P.M. SAMPLE ADVANCED MANUALLY

SOIL TESTS

U	UNCONFINED COMPRESSION	L.V	LABORATORY VANE
UU	UNCONSOLIDATED UNDRAINED TRIAXIAL	F.V	FIELD VANE
CU	CONSOLIDATED ISOTROPIC UNDRAINED TRIAXIAL	C	CONSOLIDATION
CID	" " DRAINED "	S	SENSITIVITY
CAU	" ANISOTROPIC UNDRAINED "		
CAD	" " DRAINED "		

ABBREVIATIONS & SYMBOLS USED IN THIS REPORTPENETRATION RESISTANCE

'N' = STANDARD PENETRATION RESISTANCE - THE NUMBER OF BLOWS REQUIRED TO ADVANCE A STANDARD SPLIT SPOON SAMPLER 12 INCHES INTO THE SUBSOIL, DRIVEN BY MEANS OF A 140 POUND HAMMER FALLING FREELY A DISTANCE OF 30 INCHES.

DYNAMIC PENETRATION RESISTANCE - THE NUMBER OF BLOWS REQUIRED TO ADVANCE A 2 INCH, 60 DEGREE CONE, FITTED TO THE END OF DRILL RODS, 12 INCHES INTO THE SUBSOIL, THE DRIVING ENERGY BEING 350 FOOT POUNDS PER BLOW.

DESCRIPTION OF SOIL

THE CONSISTENCY OF COHESIVE SOILS AND THE RELATIVE DENSITY OR DENSENESS OF COHESIONLESS SOILS ARE DESCRIBED IN THE FOLLOWING TERMS:-

<u>CONSISTENCY</u>	<u>c LB/SQ FT</u>	<u>DENSENESS</u>	<u>'N' BLOWS / FT.</u>
VERY SOFT	0 - 250	VERY LOOSE	0 - 4
SOFT	250 - 500	LOOSE	4 - 10
FIRM	500 - 1000	COMPACT	10 - 30
STIFF	1000 - 2000	DENSE	30 - 50
VERY STIFF	2000 - 4000	VERY DENSE	> 50
HARD	> 4000		

TERMS TO BE USED IN DESCRIBING SOILS:-

TRACE < 10% , SOME 10-25% , WITH 25-40% , > 40% SILTY, SANDY, GRAVELLY, CLAYEY ETC.

TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.T.	SLOTTED TUBE SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE

P.H. SAMPLE ADVANCED HYDRAULICALLY

P.M. SAMPLE ADVANCED MANUALLY

SOIL TESTS

U	UNCONFINED COMPRESSION	L.V	LABORATORY VANE
UU	UNCONSOLIDATED UNDRAINED TRIAXIAL	F.V	FIELD VANE
CU	CONSOLIDATED ISOTROPIC UNDRAINED TRIAXIAL	C	CONSOLIDATION
CD	" " DRAINED "	S	SENSITIVITY
CAU	" ANISOTROPIC UNDRAINED "		
CAD	" " DRAINED "		

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 1

JOB 73-11075

LOCATION

Sta. 234 + 92 17' 1"

ORIGINATED BY PK

W.P.

BORING DATE

Sept. 13, 1973

COMPILED BY PK

DATUM

Geodetic

BOREHOLE TYPE

Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT ——— w_L			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT ———				PLASTIC LIMIT ——— w_p				
							SHEAR STRENGTH P.S.F.				WATER CONTENT ——— w				
1554.7	Ground Level														
0.0	Sand, some gravel, traces clay & silt.	..	1	SS	59	1550									17 65 (18)
1548.9	Very Dense	..	2	SS	31										1548.9
1546.9	Sand with silt.	..	3	SS	20										
7.0	Dense	..	4	SS	8										
1544.2	Sand, some gravel	..	5	SS	6	1540									
10.5	Compact	..	6	SS	3										
1538.2	Organics (Peat)	~	7	SS	13										
16.5	Firm Black	~													
1529.7	Sand, traces of silt	..													
25.0	Compact	..				1530									0 92 (8)
	End of Borehole														

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO2

JOB 73-11075

LOCATION Sta. 237 +31 17' Rt.

ORIGINATED BY PK

W.P.

BORING DATE Sept. 13, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY *W.L.*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				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		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE				W_P ——— W ——— W_L WATER CONTENT % 10 20 30				
1554.3	Ground Level														
0.0	Sand, some gravel, traces of clay & silt.		1	SS	20	1550									
	Compact		2	SS	29										
5.2	Sand with silt. Compact		3	SS	9										
7.0			4	SS	21										
	Sand, some gravel, traces of silt and clay.		5	SS	10	1540									
			6	SS	9										
	Loose to Compact		7	SS	7										
25.8	Organics		8	SS	18	1530									
26.5	silt, some clay														
27.0	Sand, traces of silt														
1522.8	Compact		9	SS	16									285%	
31.5	End of Borehole					1520									

1546.8

19 63 (18)

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE No 3

JOB 73-11075

LOCATION Sta. 239 + 08 17' Rt.

ORIGINATED BY PK

W.P.


BORING DATE Sept. 13, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY *al.*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT % 10 20 30				BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
1554.2	Ground Level														GR.SA.SI.CL.	
0.0	Sand, some gravel.	...	1	SS	44	1550									2 66.28 4 Estim. 	
1549.2	Dense	...	2	SS	37											
1547.2	Sand with silt. Dense	...	3	SS	63											
7.0	Sand with gravel, some silt.	...	4	SS	31											
1542.2	Dense to Very Dense	...	5	SS	18	1540									39 44 16 1	
12.0	Organics (Peat)	~ ~ ~	6	SS	10											
		~ ~ ~	7	SS	9											
		~ ~ ~														
	Stiff to Very Stiff	~ ~ ~				1530									40 48 (12)	
1528.2	Sand with grav. V. Dense	...	8	SS	76											
26.0	End of Borehole															

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 4

JOB 73-11075

LOCATION Sta. 241 + 05 17' Rt.

ORIGINATED BY PK

W.P.

BORING DATE Sept. 13, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY *al. J.*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT —WL PLASTIC LIMIT —WP WATER CONTENT —W			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE				WP	W	WL		
1554.5	Ground Level														
0.0															
	Sand, some gravel, traces of silt & clay.		1	SS	57	1550					○				
			2	SS	15										
			3	SS	11						○				
			4	SS	2										
			5	SS	16	1540					○				
	Very Loose to very dense		6	SS	14										
	Organics		7	SS	21								○		
1532.0															
22.5	Organics (Peat)		8	SS	12	1530								379%	
1525.8	Stiff to Very Stiff														
28.7	Silt, some clay.		9	SS	20									975%	
30.0	Sand with gravel														
1521.0	Very Dense		10	SS	100										
33.5	End of Borehole					1520									

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 5

JOB 73-11075

LOCATION

Sta. 243 + 19 17' Rt.

ORIGINATED BY PK

W.P.

BORING DATE

Sept. 14, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE

Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				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		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE				W_P	W	W_L		
1554.4	Ground Level														
0.0	Sand, some gravel														
1550.4	Very Dense		1	SS	66	1550									
4.0	Sand with silt.														
1547.4	Compact														
7.0	Sand, traces of gravel, silt & clay.		2	SS	6										
	Loose to Compact		3	SS	9	1540									
1535.7			4	SS	14										
18.7	Organics (Peat)		5	SS	7										
1549.4	Stiff Black		6	SS	11	1530									
25.0	Sand, some gravel, traces of organics.														
1525.4	Compact		7	SS	25										
29.0	End of Borehole					1520									

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 6

JOB 73-11075 LOCATION Sta. 245 + 12 17' Rt. ORIGINATED BY PK
W.P. BORING DATE Sept. 13, 1973 COMPILED BY PK
DATUM Geodetic BOREHOLE TYPE Auger CHECKED BY W.J.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE						LIQUID LIMIT — w_L			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT						PLASTIC LIMIT — w_p				
							SHEAR STRENGTH P.S.F.						WATER CONTENT — w				

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 7

JOB 73-11075 LOCATION Sta. 243 + 19 47' Rt. ORIGINATED BY PK
W.P. BORING DATE Sept. 14, 1973 COMPILED BY PK
DATUM Geodetic BOREHOLE TYPE Auger CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT _____W _L			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT _____				PLASTIC LIMIT _____W _p				
							SHEAR STRENGTH P.S.F.				WATER CONTENT _____W				
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE				W _p W W _L				
						WATER CONTENT %				10 20 30			P.C.F.	GR.SA.SI.CL.	
1549.4	Ground Level	~				1540									1546.6
1547.4	Sand & organics	~													
2.0	Sand, some gravel, traces of silt.	~	1	SS	15										
		~	2	SS	7										
1539.9	Loose to Compact	~	3	SS	6										
1538.0	Firm.Organics(Peat)	~	4	SS	5										
11.4	Sand, trace of organics. Loose	~	5	SS	3										
1535.4		~													
15.0	Organics (Peat)	~				1530									
	Soft	~	6	SS	1									206%	
1526.4		~													
23.0	Sand, traces silt.	~	7	SS	37										
1521.9	Dense	~	8	AS	-									0 94 (6)	
27.5	End of Borehole					1520									

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 8

JOB 73-11075 LOCATION Sta. 239 + 08 39' Rt. ORIGINATED BY PK
 W.P. BORING DATE Sept. 18, 1973 COMPILED BY PK
 DATUM Geodetic BOREHOLE TYPE Auger CHECKED BY al. J.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w w_p ——— w ——— w_L WATER CONTENT % 10 20 30				BULK DENSITY γ P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE										
1549.1	Ground Level																
1547.1	Sand, traces of organics Very Loose	~														▼ 1546.1	
2.0	Organics (Peat)	~	1	SS	1	1540											
	Black	~	2	SS	2												
	Very Soft	~	3	SS	2												
		~	4	SS	1												
1533.1		~															
16.0	Sand, some gravel.	~															
1530.1	Compact	~	5	SS	29	1530							○				
19.0	End of Borehole																

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 9

JOB 73-11075

LOCATION Sta. 234 + 92 39' Rt.

ORIGINATED BY PK

W.P.


BORING DATE Sept. 18, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY *W.J.*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT			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		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE			w_p — w — w_L	WATER CONTENT % 10 20 30			
1548.6	Ground Level													
0.0	Organics (peat)	~ ~ ~				1540								1545.8 
	Very Soft	~ ~ ~	1	SS	2									
1541.6		~ ~ ~												
7.0	Sand with silt. some organics.	~ ~ ~	2	SS	1									
	Very Soft to Very Stiff	~ ~ ~												
1533.6		~ ~ ~	3	SS	19									7 63 30 0
15.0	Sand, Compact	~ ~ ~	4	AS	-									
1531.7		~ ~ ~												
17.5	End of Borehole					1530								

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE No 10

JOB 73-11075

LOCATION Sta. 247 + 19 17' Lt.

ORIGINATED BY PK

W.P.


BORING DATE Sept. 19, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY *[Signature]*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT ——— W_L PLASTIC LIMIT ——— W_P WATER CONTENT ——— W W_P ——— W ——— W_L WATER CONTENT % 10 20 30				BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
1554.1	Ground Level															GR. SA. SI. CL.
0.0	Sand, some gravel.	•••				1550										Estim. 
	Loose	•••	1	SS	9									○		
1541.1		•••														
		•••														
13.0	Organics (Peat) Stiff	~ ~	2	SS	12	1540										Org. 0.43%
1526.6	Sand, some gravel.	•••														
17.5	End of Borehole					1530										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE N^o 11

JOB 73-11075

LOCATION Sta. 241+05 17' Lt.

ORIGINATED BY PK

W.P. _____

BORING DATE Sept. 19, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY W. J.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w w_p ——— w ——— w_L WATER CONTENT % 10 20 30				BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
1554.4	Ground Level															
0.0	Sand with gravel.					1550										
	Compact to Very Dense		1	SS	12											▽1546.4
			2	SS	93	1540										
1535.4			3	SS	100/0"											
19.0	End of Borehole					1530										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 12

JOB 73-11075

LOCATION Sta. 238 + 20 17' Lt.

ORIGINATED BY PK

W.P.

BORING DATE Sept. 18, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT —WL PLASTIC LIMIT —WP WATER CONTENT —W			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE				Wp — W — WL WATER CONTENT % 10 20 30				
1554.3	Ground Level														
0.0	Sand with gravel, traces clay & silt.	• •<													

1547.3
26 61 (13)

332%

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 13

JOB 73-11075

LOCATION

Sta. 241 + 05 39' Lt.

ORIGINATED BY PK

W.P.

BORING DATE

Sept. 19, 1973

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE

Auger

CHECKED BY W.F.

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT ——— W_L PLASTIC LIMIT ——— W_P WATER CONTENT ——— W W_P ——— W ——— W_L WATER CONTENT % 10 20 30			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE								
1549.4	Ground Level	~				1540									GR. SA. SI. CL. Estim. $\frac{V}{\square}$ 9 74 (17) 6 80 (14)
0.0	Sand, some organics	~													
1544.9	Organics (Peat) Very Soft	~	1	SS	1										
4.5	traces of organics	.	2	SS	9										
		.	3	SS	10										
	Sand, some gravel	.													
	Loose	.	4	SS	10										
1530.4	traces of organics	.	5	SS	5										
19.0	End of Borehole														

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 14

JOB 73-11075

LOCATION Sta. 238 + 20 35' Lt.

ORIGINATED BY PK

W.P.

BORING DATE

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE

CHECKED BY *W.J.*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT _____W _L PLASTIC LIMIT _____W _P WATER CONTENT _____W W _P W W _L WATER CONTENT % 10 20 30			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE								
1549.9	Ground Level														
0.0	sand, some silt and organics.														1547.6 ▽
1542.9															
7.0	Organics (Peat) Soft		1	SS	2	1540								123%	
1535.4															
14.5	Sand with gravel, traces of silt.		2	SS	22										
1531.4	Compact														
18.5	End of Borehole					1530									

1547.6

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 15

JOB 73-11075

LOCATION

Sta. 236 + 10 17' Lt.

ORIGINATED BY PK

W.P.

BORING DATE

Sept. 18, 1973

COMPILED BY PK

DATUM

Geodetic

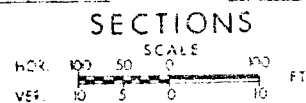
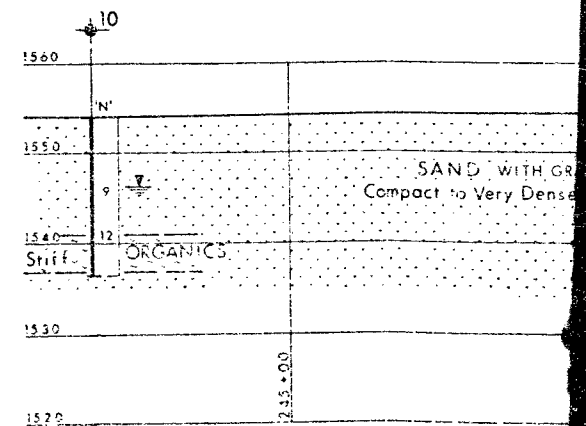
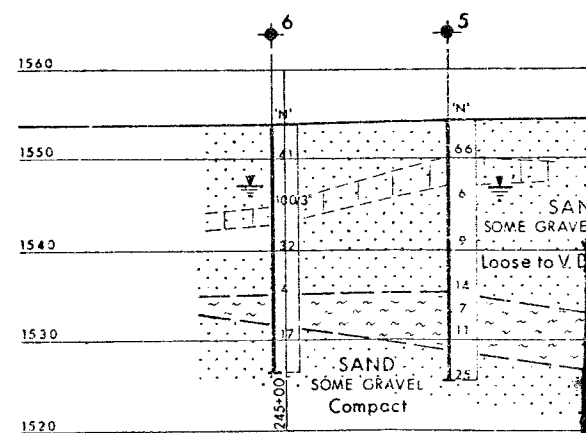
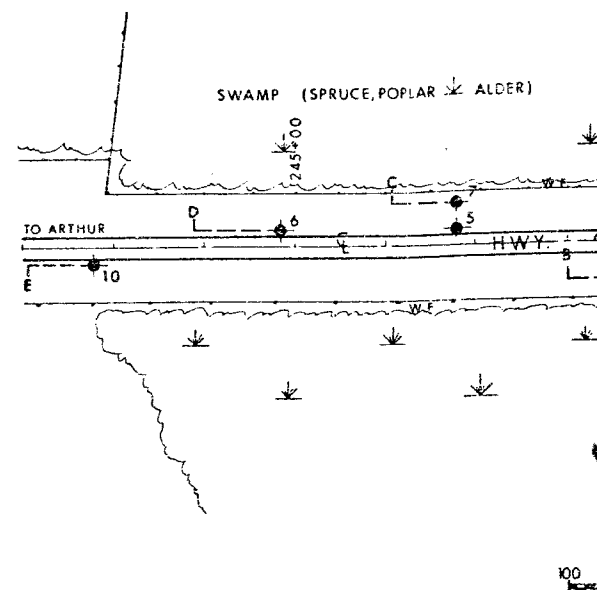
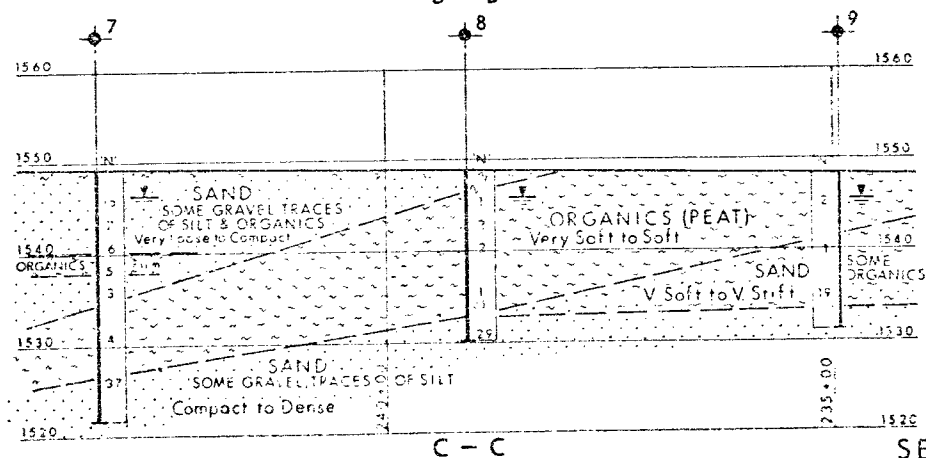
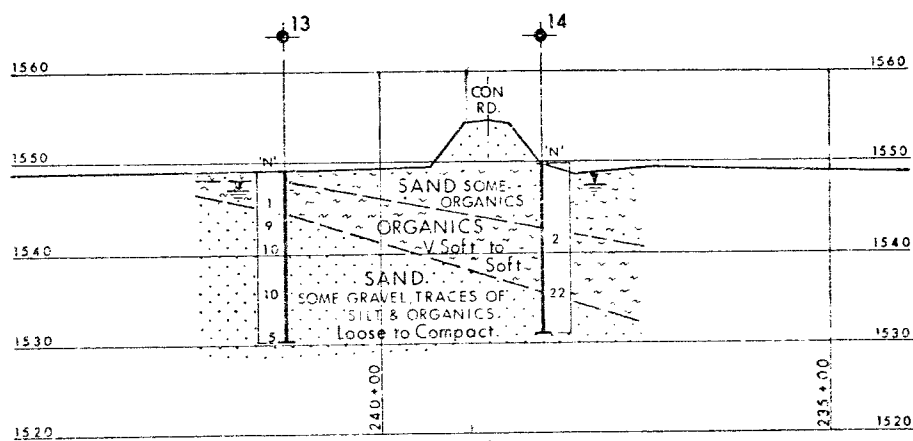
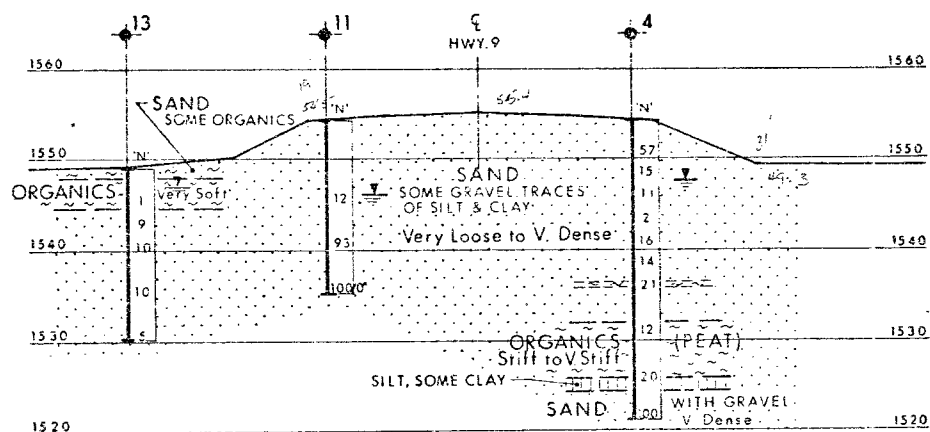
BOREHOLE TYPE

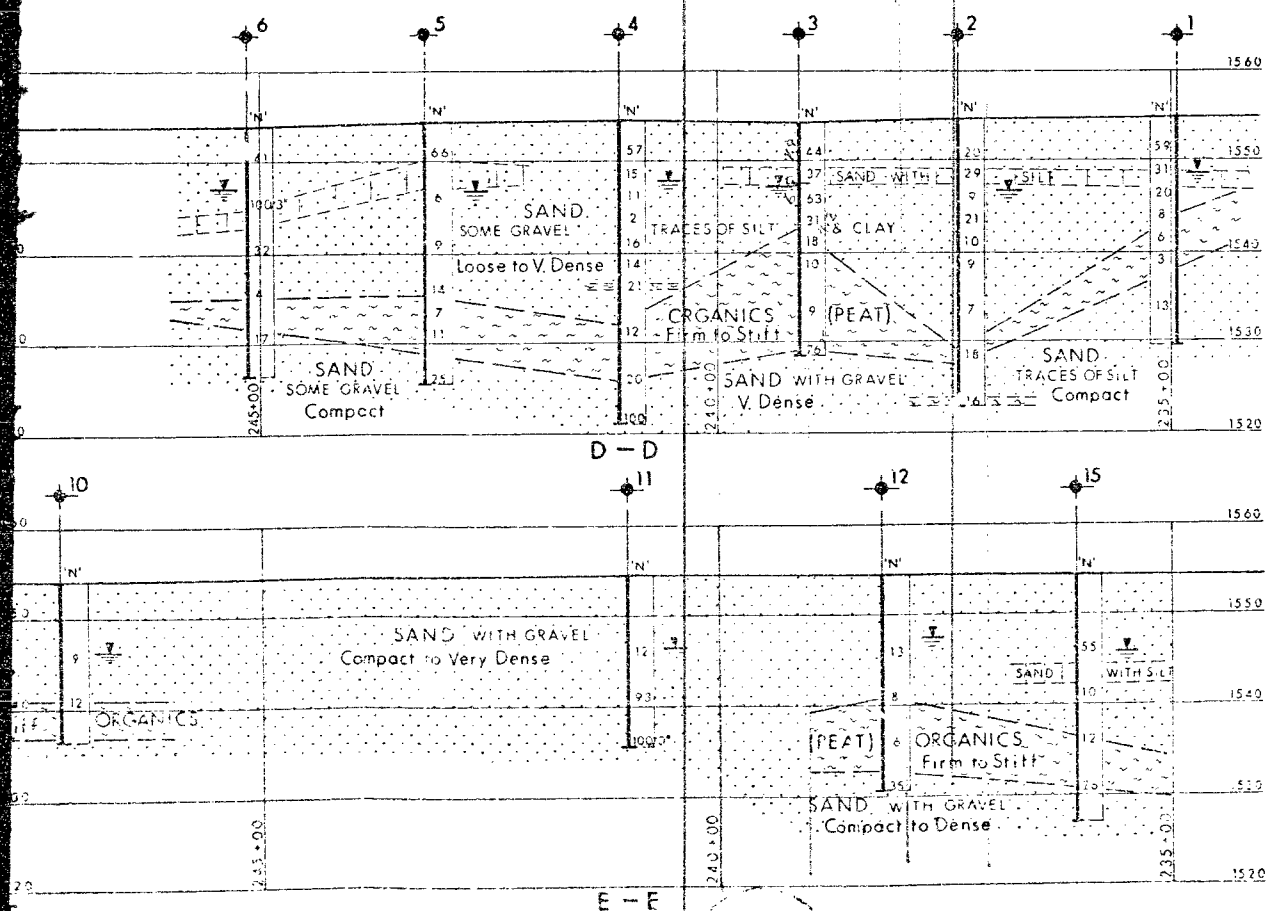
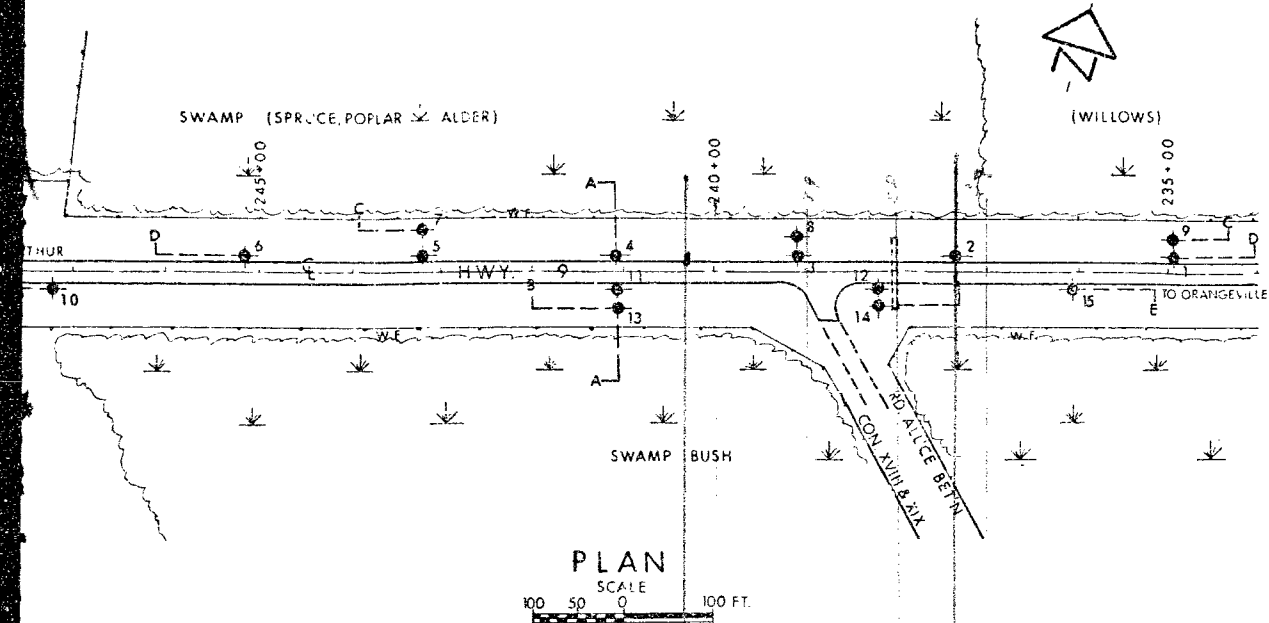
Auger

CHECKED BY

N.J.

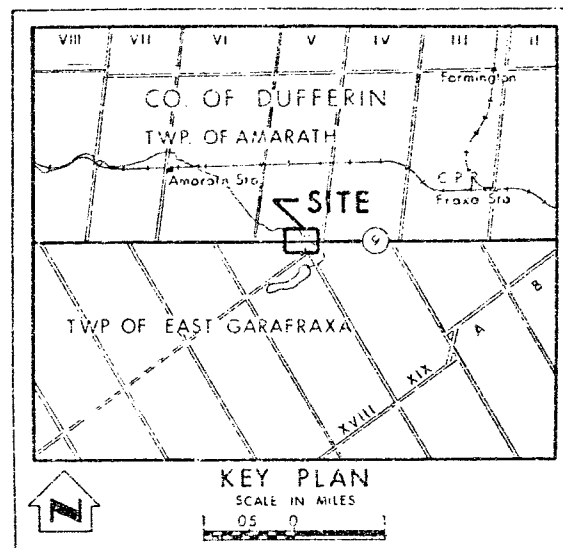
SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT — w_L			BULK DENSITY	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT				PLASTIC LIMIT — w_p					
							SHEAR STRENGTH P.S.F.				WATER CONTENT — w					
							○ UNCONFINED + FIELD VANE				w_p — w — w_L					
							● QUICK TRIAXIAL x LAB VANE				WATER CONTENT %					
											10 20 30					
1554.4	Ground Level													P.C.F.	GR.SA.SI.CL.	
0.0	Sand, some gravel	••				1550								283%	▼1546.07	
	Very Dense	••	1	SS	55											
1544.4		••														
10.0	Sand with silt. Dense	••														
12.0	Sand, some gravel traces of silt.	••	2	SS	10	1540					○					
1536.4	Compact	••														
18.0	Organics (Peat)	~ ~	3	SS	12											
1530.6	Stiff	~ ~														
23.8	Silt, some clay, sand with gravel.	••	4	SS	26	1530										
1526.9	Compact	••														
27.5	End of Borehole					1520										





NOTE

The complete foundation investigation report for this structure may be examined at the Structural Office and Foundations Office, Downsview, and at the STRATCO District Office.



LEGEND

- Bore Hole
- ⊕ Cone Penetration Test
- ⊕ Bore Hole & Cone Test
- ⊕ Water Levels established at time of field investigation, SEPT. 1973
- ⊕ Estimated Water Levels

NO.	ELEVATION	STATION	OFFSET
1	1554.7	234+92	17' RT.
2	1554.3	237+31	17' RT.
3	1554.2	239+08	17' RT.
4	1554.5	241+05	17' RT.
5	1554.4	243+19	17' RT.
6	1554.0	245+12	17' RT.
7	1549.4	242+19	47' RT.
8	1549.1	239+08	39' RT.
9	1546.6	234+92	30' RT.
10	1554.1	247+19	17' LT.
11	1554.4	241+05	17' LT.
12	1554.3	238+20	17' LT.
13	1549.4	241+05	39' LT.
14	1549.9	235+20	35' LT.
15	1554.4	236+10	17' 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.

REVISIONS	DATE	BY	DESCRIPTION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO
DESIGN SERVICES BRANCH—FOUNDATIONS OFFICE

SETTLEMENT WEST OF ORANGEVILLE

HIGHWAY NO. 9 DIST. NO. 3
CO. OF DUFFERIN
TWP. OF AMARATH LOT 1 & 2 CON. V & XIX

BORE HOLE LOCATIONS & SOIL STRATA

SUBNO. P. K. CHECKED BY	W. P. NO.	DRAWING NO.
DRAWING / CHECKED BY	W. P. NO. 73-11075	73-11075A
DATE 2 NOV. 1973	SHEET NO.	PROJ. DRAWING NO.
APPROVED BY	DATE	PROJECT NO.

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

To: J.G. Forrester
Materials & Testing
London Region

FROM: District #3
Stratford, Ontario

ATTENTION:

DATE: November 30, 1973

OUR FILE REF.

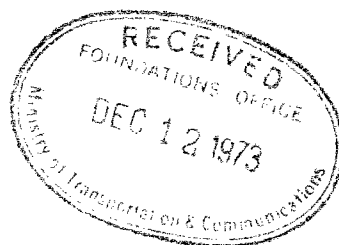
IN REPLY TO

SUBJECT: Hwy. 9 West of Orangeville from Mid Point of Con. 3
Westerly to Con. 7, Amaranth Township, W.O. 73-11075

With reference to the above foundation investigation report please see recommendations on Page 5.

The District is in agreement that the first two suggestions are not practicable.

Regarding the third recommendation concerning construction of toe berms, I would appreciate having your comments on this. If you are in agreement, please forward me your recommendations and I will consider requesting the necessary approval for the work to be completed.



Mr. W. D. Neillipovitz,
District Engineer,
Stratford.

Materials and Testing Office,
London.

Mr. P. Peacock.

December 11, 1973.

Highway #9, West of Orangeville,
from Mid Point Concession 3,
Westerly to Concession 7,
Amaranth Township, W.F. 73-11075.

We have reviewed the above foundation investigation report as requested in your memo November 30, 1973 and concur that the first two suggestions are not practicable.

However, because of the settlements at this site, any treatment that would alleviate this problem, I feel, would be warranted and therefore would suggest that Recommendation #3 as outlined and discussed in this report should be tried (i.e. - a minimum 100 ft. long test section).

Details of the design of the berm would have to be obtained from the Foundation Office and I will request this information from them.

As for the construction, the work could possibly be done by Maintenance forces or consideration could be given to including it with the proposed contract for Highway #104, from Highway #9 to Grand Valley (Work Projects 197-66 and 26-60-04) in 1974.

JGF:hp.

c.c. - A. Wittenberg,
K. Selby,
File.


J. G. FORSTER,
SENIOR SOILS ENGINEER.

A. Wittenberg
Systems Design
Southwest Region

P. H. Peacock
District No. 3
Stratford, Ont.

December 12, 1973

Hwy. 9, West of Orangeville, from Mid Point Concession 3,
Westerly to Concession 7, Amaranth Township, W.P. 73-11075.

Please refer to my memo of November 30 to J. G. Forster, M & T, and his reply thereto dated December 11, both of which memos copies were sent to you. The District would like to include work under Recommendation #3, however, I feel that the minimum 100 ft. long test section would be quite inadequate and at least 400 or 500 ft. is necessary. I will await further views of the Foundation Office on this.

It would be appreciated if you would arrange for this work to be carried out as part of the contract work on the reconstruction of Hwy. 104, W.P.s 197-66 and 26-60-04. It is felt this would be much more satisfactory than attempting to do it by District Forces, and the work on Hwy. 104 is reasonably close. It would be appreciated, therefore, if you would approach the Program Office on this matter with a view to this being assigned a W.P. for inclusion with the work on Hwy. 104.

PH:mc

cc: A. C. Stermac
Foundation Office
Design Services Branch
Downsview, Ont.

cc: J. C. Forster
Materials and Testing
London Region

P. H. Peacock
District Construction Engineer
For:
W. D. Neillpovitz
District Engineer

Mr. W. D. Neilipovitz,
District Engineer,
District #3,
Stratford, Ontario.
Mr. P. H. Peacock.

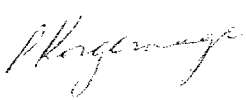
Geotechnical Office,
Engineering Services Branch,
West Bldg., Downsview.

January 4, 1974.

Highway #9, West of Orangeville,
From Mid Point Concession 3,
Westerly to Concession 7
Amaranth Township, W.P. 73-11075

We are looking into the design of a test section along Hwy. #9 as outlined in Recommendation #3 of Foundation Report W.O. 73-11075. We are proposing a 300 foot (91.4 m) section from Station 237+00 to 240+00 corresponding to the area where the peat is thickest. For this design cross-sections will be required. Would you please have cross-sections taken every 50 feet (15.2 m) between Stations 237+00 to 240+00 both sides of the centreline for a minimum of 100 feet (30.5 m), or 20 feet (6.1 m) beyond any waterway whichever is greatest.

PK/ao


P. Korgemagi,
Project Foundations Engineer,
For: K. G. Selby,
Supervising Foundations Eng.

Mr. W. D. Neilipovitz,
District Engineer,
District #3, Stratford.

Mr. P. Peacock.

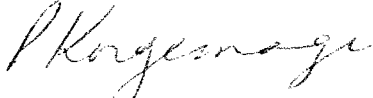
Geotechnical Office,
Engineering Services Br.,
West Bldg., Downsview.

January 21, 1974.

Highway 9 West of Orangeville,
From Mid Point Concession 3,
Westerly to Concession 7,
Amaranth Township, W.P. 73-11075

We agree with the proposal that the test section be tried
from Station 240+00 to 243+00 rather than Station 237+00 to
240+00 which contains the side road. Please have the
cross-sections taken as stated in our memo of January 4, 1974.

PK/ao


P. Korgemagi,
Project Foundations Eng.,
For: K. G. Selby,
Supervising Foundations Eng.

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Geotechnical Office,
Engineering Services Branch,
West Building,
M.T.C., DOWNSVIEW.

FROM: District #3, Stratford

ATTENTION: Mr. P. Korgemagi

DATE: January 31, 1974

OUR FILE REF.

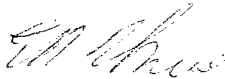
IN REPLY TO

SUBJECT: Test Section
Hwy. #9 West of Orangeville
W.P. 73-11075

Under separate cover, we are forwarding the cross-sections you requested for the above location.

One copy of the cross section will be sent to the Systems Design Office, London Region and the Field notes will be retained in the District.

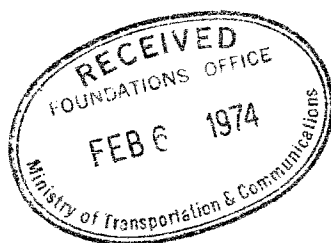
If you require further information, please contact this Office.


E. R. Uniac,
Construction Supervisor,
For:
P. H. Peacock,
District Construction Engineer.

ERU:tk

Enclosures

cc: Mr. C. E. Pritchard
Senior Project Design Engineer
London Region



Mr. W. Melinyshyn
Program Office
Downsview, Ontario

Mr. J. M. Davidson

P. H. Peacock
District No. 3
Stratford, Ontario

March 14, 1974

Test Section, Hwy. 9 West of Orangeville
W.O. 73-11075

There is a location through an extensive swamp area approximately five miles west of Orangeville where we have had constant trouble over the years with settlement. This results in constant resurfacing and some severe cracking which is more or less permanent. District would like to undertake work as recommended by Geotechnical Office which will be a short experimental section involving loading the sides. Although I have not full details, I understand from Geotechnical Office that approximately 5,000 Cu. Yds. of material will be brought in and work will also be involved in moving the ditch, fence, etc. We would like to incorporate this work in the reconstruction of Hwy. 104 which is at present being designed at Southwest Region under W.P.s 197-66 and 26-60-04. Although I have not full details, I estimate the cost would be about \$8,000 with a top limit of \$10,000.

As discussed with you on the telephone, it would be appreciated if you would give this work your approval and allot a W.P. number to it.

P. H. Peacock
Dist. Const. Eng.
For:
W. D. Neilipovitz
Dist. Eng.

FHP:mc

cc: L. Murray, Systems Design, London Region
R. Hepham, Materials and Testing, London Region
A. Prakash Geotechnical Office, Downsview
B. Uniac, Construction Supervisor, Stratford



MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Geotechnical Office
Engineering Services Branch
West Building
Downsview, Ontario

FROM: P. H. Peacock
District No. 3
Stratford, Ontario

ATTENTION: Mr. A. Prakash

DATE: March 14, 1974

OUR FILE REF. IN REPLY TO

SUBJECT: Test Section Hwy. 9 West of Orangeville
W.O. 73-11075

Reference my memo to Mr. A. Wittenberg, Systems Design, London Region dated December 12 copy to you, your memo of January 21, 1974, District memo of January 31, 1974 and my telephone conversation of today's date. I would appreciate knowing the position on this matter as we are anxious to proceed and get out a provisional cost of this work so that it may be incorporated in the design for the reconstruction of Hwy. 104, W.P.s 197-66 and 26-60-04. Your early attention would be appreciated.

PHP:mc

P. H. Peacock
Dist. Const. Eng.
For:
W. D. Neilipovitz
Dist. Eng.

cc: D. Murray
Systems Design
London Region

R. Mephram
Materials and Testing
London Region

R. Uniac
Construction Supervisor
Stratford District



MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Geotechnical Office
Engineering Services Branch
West Building, Downsview

FROM: P. H. Peacock
District No. 3
Stratford, Ontario

ATTENTION: Mr. A. Prakash

DATE: March 15, 1974

OUR FILE REF.

IN REPLY TO

SUBJECT: Test Section Hwy. 9 West of Orangeville
(W.O. 73-11075)

Further to my previous memo of March 14 and my telephone conversation with you, I understood that approximately 5,000 Cu. Yds. of material would be involved together with the relocation of the ditch and presumably the fence. Presumably we should also require property which might be either bought or, in view of the fact that this is all swamp, possibly we could do this with an easement. As this will involve property negotiations I would appreciate knowing your proposal as soon as possible in order that this can be arranged for incorporation with the work on Hwy. 104 which is due for letting this year.

P. H. Peacock
P. H. Peacock
Dist. Const. Eng.

For:
W. D. Neilipovitz
Dist. Eng.

PHP:mc

cc: D. Murray
Systems Design
London Region

R. Mephram
Materials and Testing
London Region

R. Uniac
Construction Supervisor
Stratford District



Mr. W.D. Neillipovitz,
District Engineer,
District #3, Stratford.

Soil Mechanics Section,
Geotechnical Office,
West Building, Downsview.

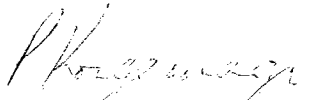
Mr. P.H. Peacock.

April 9th, 1974.

RE: Test Section, Hwy. #9 West of Orangeville,
W.O. 73-11075.

We have reviewed the conditions at this site and have chosen stations 239+00 to 242+00 for the test section.

The proposed berms should be half height, up to approximate elevation 1552.0 and placed on both sides of the road. It is recommended that the berms be 30 ft. in length with 40:1 slopes. End slopes of 2:1 will be stable. A transition zone of 50 ft. should be adequate. The ditch may be placed around the berm as required.

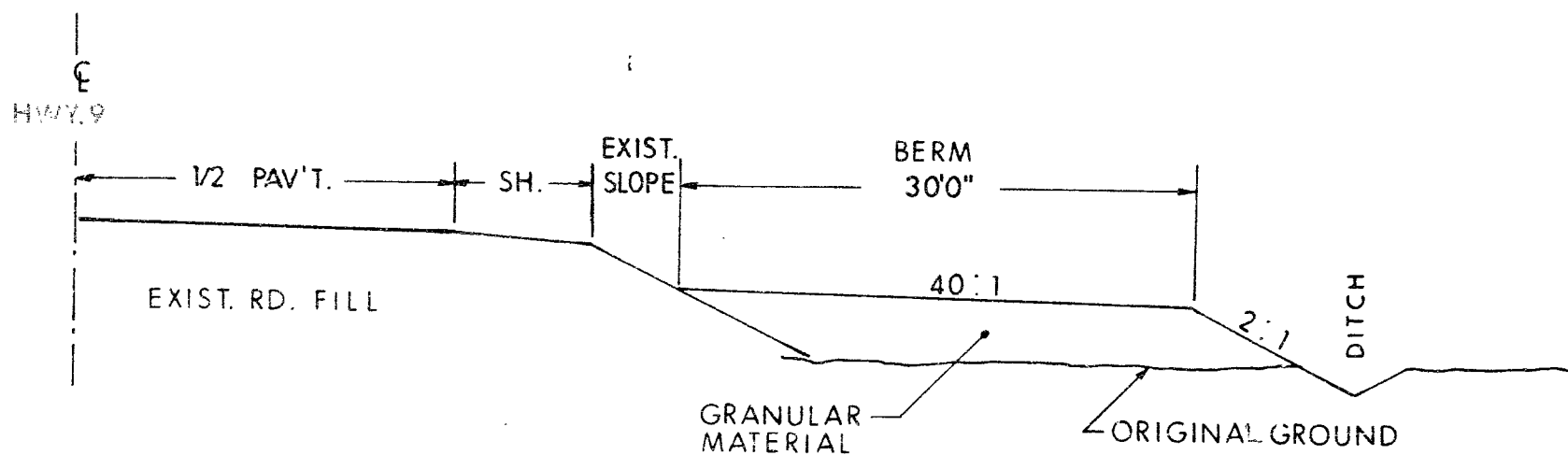
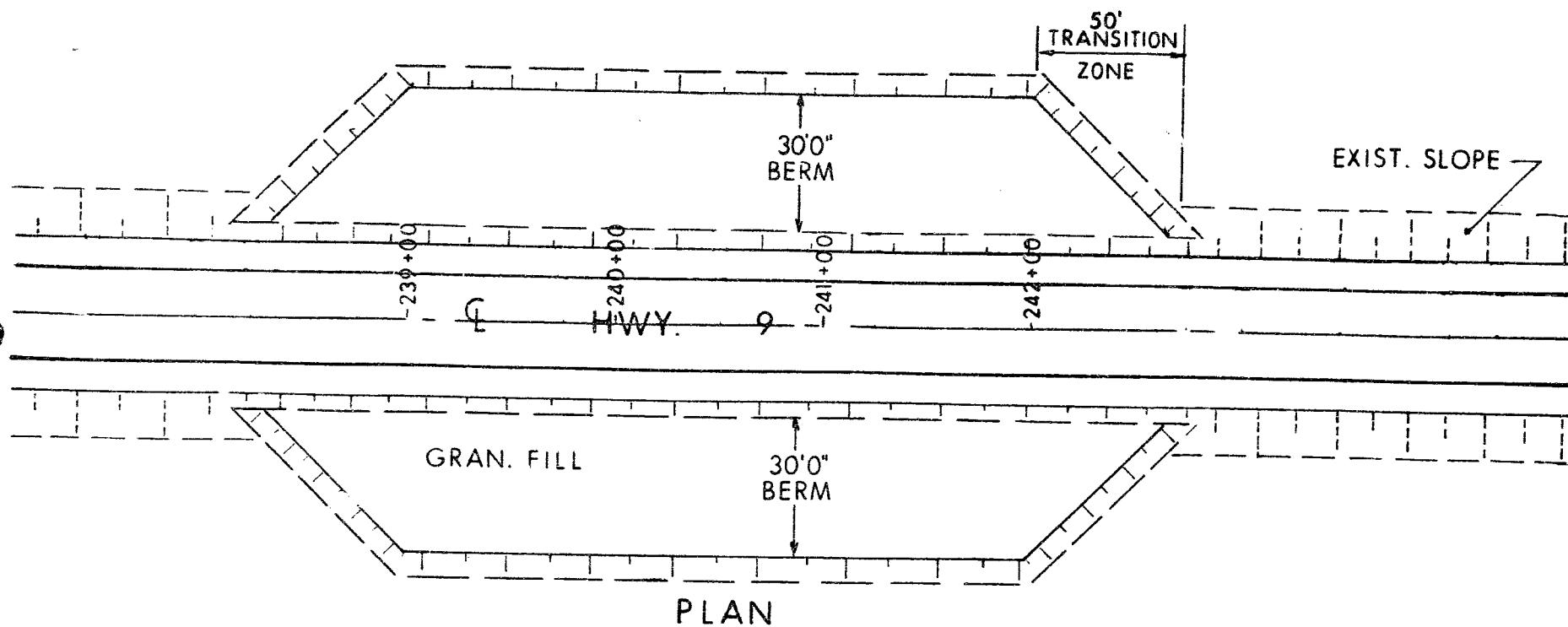


P. Korgemagi,
Project Engineer,
For: K.G. Selby,
Supervising Engineer.

PK/mj
c.c. A. Wittenberg,
J.G. Forster,
D. Murray,
A. Uniac.

Files,
Documents.

X ref to Job 73-1107



NOT TO SCALE

TYPICAL X-SECTION

FIG. 1



Memorandum

File 1045

W. P. 197-66

To: K. G. Selby
Soil Mechanics Section
Geotechnical Office
East Building, Downsview

From: Regional Planning and Design Office
Southwestern Region, London

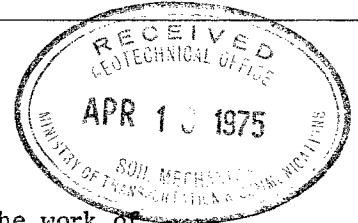
Attention:

Date: April 17th, 1975

Our File Ref.

In Reply to

Subject: Test Section, Highway 9, West of Orangeville
W.O. 73-11075



The above noted test berm section is to be included with the work of W.P. 197-66-00, Hwy. 25 in Grand Valley. In order to estimate the quantity of material required for the berm construction, the following information is required:

1. Since cross-sections of Hwy. 9 are not readily available in this area, what is the recommended height (in feet) of berm construction? Mr. P. Korgemagi's memo of April 9, 1974 addressed to Mr. W. Neilipovitz, suggests that the berms should be "half height".
2. Regional M & T states that the granular material referred to on the typical section of Mr. P. Korgemagi's memo, should not be interpreted to mean Granular A or B but to mean any uncohesive material. Please clarify, state specs, and provide a cu. yd. to ton conversion factor for the recommended granular.
3. It is possible that a certain amount of granular will be "lost" due to settlement in this swampy area. Based on your soils data, please suggest a percent or quantity of granular that should be included in this item, in addition to the quantity determined for the berm.

T. M. Prokopec
Engineer Designer
FOR
C. E. Pritchard
Area Manager

TMP:CEP:cak

Disseminated through the K. Selby who
agreed to the test section and to
the test section 4/17/75

10/1/75
The test section was prepared by Mr. P. Korgemagi
and the test section was prepared by Mr. P. Korgemagi
and the test section was prepared by Mr. P. Korgemagi

K. G. Selby