

FOUNDATION INVESTIGATION REPORT

For

Sideroad Underpass
3.4 Miles West of Hwy. 81
Hwy. 402, District 2, London
W.P. 41-66-28

INTRODUCTION

This report contains the results of a foundation investigation carried out at the site of the above mentioned project. Field work was done during the period July 2nd-3rd, 1975, utilizing a continuous flight auger machine equipped with 3¼ inch I.D. hollow stem augers.

SITE DESCRIPTION

The site is located some 3.4 miles west of Hwy. 81 in Lots 12 and 13, Con. 1 and 2, Township of Adelaide, County of Middlesex, at the intersection of Hwy. 402 Line 'A' and an existing surface treated gravel road. The topography of the area is gently rolling arable land engaged in mixed farming. In the immediate vicinity of the site the land slopes gently northwards towards a shallow watercourse.

SUBSURFACE CONDITIONSGeneral

Subsoil at the site consists of 30 to 45 feet of stiff to hard silty clay to clayey silt overlying at least 26 feet of very dense silty sand to sandysilt in which all borings were terminated. Reference should be made to the Record of Borehole sheets which are contained in the report Appendix and which show the boundaries between different soil strata and summarized results of all field and laboratory tests carried out during the investigation. Reference should also be made to Drawing No. 19-520-2 of the Contract Drawings which shows the locations and elevations of all borings, together with the inferred subsoil stratigraphy. Detailed descriptions of the various soil types and conditions in order of occurrence from ground level downwards are given below.

Silty Clay to Clayey Silt

This deposit extends from below about 12 inches of topsoil to depths ranging from 30 to 44 feet. Based on the results of Atterberg Limit tests

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INTRODUCTION

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SITE DESCRIPTION

The site is located some 3.4 miles west of Hwy. 81 in Lots 12 and 13, Con. 1 and 2, Township of Adelaide, County of Middlesex, at the intersection of Hwy. 402 Line 'A' and an existing surface treated gravel road. The topography of the area is gently rolling arable land engaged in mixed farming. In the immediate vicinity of the site the land slopes gently northwards towards a shallow watercourse.

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Subsoil at the site consists of 30 to 45 feet of stiff to hard silty clay to clayey silt overlying at least 26 feet of very dense silty sand to sandy silt in which all borings were terminated. Reference should be made to the Record of Borehole sheets which are contained in the report Appendix and which show the boundaries between different soil strata and summarized results of all field and laboratory tests carried out during the investigation. Reference should also be made to Drawing No. 19-520-2 of the Contract Drawings which shows the locations and elevations of all borings, together with the inferred subsoil stratigraphy. Detailed descriptions of the various soil types and conditions in order of occurrence from ground level downwards are given below.

Silty Clay to Clayey Silt

This deposit extends from below about 12 inches of topsoil to depths ranging from 30 to 44 feet. Based on the results of Atterberg Limit tests

which showed plastic limits to range from 16 to 24 percent and liquid limits from 30 to 44 percent, the material is classified as silty clay to clayey silt. The natural moisture content as determined from laboratory tests ranges randomly from 18 to 23 percent with an average value of about 20 percent. Based on the results of Standard Penetration Test 'N' values which range from 14 to 62 blows per foot, the undrained shear strength of the deposit is estimated to range from about 2000 to 10,000 p.s.f., the higher values (4000 to 10,000 p.s.f.) being contained in an 8 to 10 foot thick desiccated zone, the surface of which occurs from 2 to 5 feet below ground level. Below this zone the undrained shear strength varies randomly from about 2000 to 5000 p.s.f.

Silty Sand to Sandy Silt

This deposit underlies the silty clay to clayey silt and extends for at least a further 26 feet to elev. 721. Based on the results of grain size distribution tests, the material is classified as silty sand to sandy silt. The natural moisture content, as determined from laboratory tests, ranges from 17 to 20 percent. Standard Penetration Test 'N' values (except in one isolated case) range from 43 to more than 100 blows per foot and in consequence, the material in the deposit may be classified as 'dense' to 'very dense'. The soil is highly dilatant and under conditions of sustained dynamic loading such as pile driving might tend to liquify.

Groundwater

Groundwater was observed in only one borehole at elev. 764±, some 20 feet below the ground surface. Due to the low permeability of the subsoil and the short duration of the field work it is unlikely that sufficient time was available to permit stabilization of groundwater in any of the borings. It is believed that groundwater levels would have eventually stabilized at depths of about 10 to 12 feet below the ground surface.

K. G. Selby

K.G. Selby, P. Eng.
Supervising Engineer

ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 1

W.P. 41-66-28

LOCATION Co-ord's 15,621,810 N; 1,214,429 E.

ORIGINATED BY RD

DIST. 2 HWY. 402

BORING DATE July 2, 1975

COMPILED BY RD

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger, Tricone & Cone Test

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w_L		
783.5	Ground Level														
0.0	Silty clay to clayey silt trace of sand Very Stiff to Hard		1	SS	33	780									0 3 60 37
			2	SS	59										
			3	SS	62										
			4	SS	31										
			5	SS	22	770									
			6	SS	26										
			7	SS	22	760									
753.5															
30.0	Silty sand to sandy silt trace of clay Very Dense		8	SS	93	750									0 72 (28)
			9	SS	100/3"										
			10	SS	100	740									
			11	SS	100/4"										
732.7															
			12	SS	100/4"										0 17 81 2
50.8	End of Borehole					730									

 20
15 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

ENGINEERING SERVICES BRANCH - GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 2

W.P. 41-66-28

LOCATION Co-ord's 15,621,707 N; 1,214,392 E.

ORIGINATED BY RD

DIST. 2 HWY. 402

BORING DATE July 3/75

COMPILED BY RD

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger Tricone & Cone Test

CHECKED BY *R.J.*

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ P.C.F.	REMARKS % GR. SA. SI. CL.
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
787.9	Ground Level															
0.0	Silty clay to clayey silt trace of sand		1	SS	13											4 7 59 30
			2	SS	30											
			3	SS	49											
			4	SS	61											
	Stiff to Hard		5	SS	33											
			6	SS	28											
			7	SS	14											0 2 58 40
			8	TW	PH											
			9	SS	38											
			10	SS	25											
753.9																
34.0	Silty sand to sandy silt		11	SS	14											0 30 65 5
	trace of clay		12	SS	100/3"											
	Compact to Very Dense		13	SS	52											
			14	SS	160/11"											0 25 70 5
			15	SS	161/10"											
727.4																
			16	SS	100/6"											0 68 (32)
60.5	End of Borehole Note: W.L. not established															

20
15 \diamond 5 % STRAIN AT FAILURE
10

ENGINEERING SERVICES BRANCH - GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 3

W.P. 41-66-28

LOCATION Co-ord's 15,621,487 N; 1,214,434 E.

ORIGINATED BY RD

DIST 2 HWY. 402

BORING DATE July 2/75

COMPILED BY RD

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Augers, Tricone & Cone Test

 CHECKED BY *[Signature]*

SOIL PROFILE			SAMPLES		GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT		LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w		UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		20 40 60 80 100	20 40 60 80 100	w_p w w_L	WATER CONTENT %		
792.0	Ground Level										
	Silty clay to clayey silt		1	SS 39	790						
	Trace of sand		2	SS 49							
			3	SS 28							
			4	SS 20							
	Stiff to Hard		5	TW PH	780						
			6	SS 15							
			7	SS 20	770						
			8	SS 21	760						
			9	SS 16							
			10	SS 27	750						
748.0			11	SS 43							
44.0	Silty sand to sandy silt		12	SS 54	740						
	trace of clay		13	SS 118							
	Dense to Very Dense		14	SS 107/6"	730						
			15	SS 164/11"							
721.0			16	SS 135							
71.0	End of Borehole										
	Note: W.L. not established										

 20
15 \diamond 5 % STRAIN AT FAILURE
10

FOUNDATION INVESTIGATION REPORT

For

Proposed Crossing of Hwy. 402 and
Adelaide Twp. Road, Dist. 2, London
(3.4 Miles West of Hwy. 81)
W.P. 41-66-28 Site 19-520

1. INTRODUCTION

A request for a foundation investigation at the above site was received from Mr. A.P. Watt, Regional Structural Planning Engineer, Southwestern Region, London.

A field investigation was subsequently carried out by the Soil Mechanics Section to determine the subsoil conditions existing at the site. This report contains the results of our field and laboratory investigations, together with our recommendations relating to the design of the proposed structure foundations.

2. DESCRIPTION OF THE SITE

The proposed underpass is located 3.4 miles west of Hwy. 81 and approximately 1 mile south of Hwy. 22. The surrounding area is gently rolling arable land engaged in mixed farming. In the immediate vicinity of the site the land slopes gently to the north toward a shallow watercourse.

3. FIELD AND LABORATORY INVESTIGATION PROCEDURES

Field work consisted of three sampled boreholes advanced employing hollow stem augers, as well as three dynamic cone penetration tests.

Disturbed samples were obtained using a 2-inch O.D. split spoon sampler driven according to the specifications for the Standard Penetration Test. 'Undisturbed' samples were recovered using 2-inch I.D. Shelby tubes

advanced into the soil hydraulically.

All boreholes were surveyed in the field by personnel from London Region Engineering Surveys Section. The locations and elevations of the boreholes are shown on Drawing No. 416628-A which accompanies this report.

All samples were visually examined and classified at the site as well as in the laboratory. Following this inspection, laboratory tests were carried out on selected representative samples to determine the following physical properties:

Atterberg Limits
Natural Moisture Content
Grain-size Distribution
Undrained Shear Strength

The test results are summarized on the Record of Borehole Sheets contained in the Appendix of this report.

4. SUBSOIL

Subsoil at this site consists of 30 to 45 feet of silty clay to clayey silt overlying a deposit of at least 20 feet of silty fine sand to sandy silt in which all three boreholes terminated.

The silty clay to clayey silt deposit has a well developed desiccated crust. Generally it has a hard to stiff consistency with Standard Penetration 'N' values ranging from 14 to over 60.

The sandy silt to silty fine sand has a dense consistency with 'N' values generally in excess of 100.

5. DISCUSSION AND RECOMMENDATIONS

5.1 General

An underpass is proposed to carry the Township Road over Hwy. 402. This will involve the construction of embankments approximately 20 feet in height and a bridge of two spans each of which will be 126' in length.

5.2 Center Pier

It is recommended that the center pier be supported on spread footings at approximate elevation 781. A net safe bearing pressure of 4 tons per sq. ft. may be used for design purposes. Resistance to sliding may be determined using an adhesion design value of 2000 p.s.f.

5.3 Perched Abutments

The abutments may be constructed within the approach fills supported on well compacted granular 'A'. A net safe design load of 2.5 t.s.f. may be assumed. For calculations of sliding resistance, a friction coefficient of .55 may be assumed to apply between the footing and granular 'A'. A construction scheme is outlined in Fig. 1 of the Appendix.

As an alternative, the abutments may be supported on steel tube piles (12-3/4" X 1/4") driven into the desiccated crust. These piles should be driven to elevation 785 for the south abutment and 777 for the north abutment. The piles must not be driven below these elevations as undrained shear strength decreases with depth. A safe design load of 25 tons per pile should be assumed for design purposes. Any horizontal loading should be resisted by battered piles.

5.4 Settlements

Total short and long term settlements of approximately 2 inches at the abutments and 1-1/2 inches at the center pier are anticipated. The structure design should however accommodate differential settlements of up to 1 inch.

5.5 Dewatering

No dewatering problems are anticipated due to the relatively impervious nature of the upper layers of the subsoil.

5.6 Approach Embankments

No stability problems are anticipated with embankment fills (20 ft.) if 2:1 slopes are employed. Cobbles exceeding 3" diameter should be removed from fill placed at locations through which piles have to be driven.

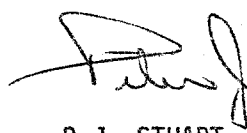
5.7 Frost Protection

All pile caps or spread footings should be protected against frost action by a minimum 4 feet of cover.

6. MISCELLANEOUS

The field work on the project was carried out July 2nd and 3rd, 1975 under the supervision of Mr. R. Donnelly, Student Technician. This report was written by Mr. P.J. Stuart, Project Engineer and reviewed by Mr. K.G. Selby, Supervising Engineer.

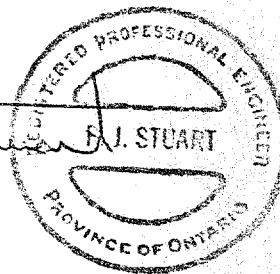
The equipment used was owned and operated by Master Soils Investigation Limited.



P.J. STUART
Project Engineer



K.G. SELBY
Supervising Engineer



July 1975

RECORD OF BOREHOLE NO 1

W.P. 41-66-28

LOCATION Co-ord's 15,621,810 N; 1,214,429 E.

ORIGINATED BY RD

DIST. 2 HWY. 402

BORING DATE July 2, 1975

COMPILED BY RD

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger & Tricone

CHECKED BY *rd*

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT	LIQUID LIMIT — w_L	UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20 40 60 80 100	PLASTIC LIMIT — w_p		
							SHEAR STRENGTH P.S.F.		WATER CONTENT %	
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE		w_p — w — w_L 10 20 30	
783.5	Ground Level									
0.0	Silty clay to clayey silt		1	SS	33	780				0 3 60 37
	trace of sand		2	SS	59					
	Very Stiff to Hard		3	SS	62					
			4	SS	31					
			5	SS	22	770				
			6	SS	26					
			7	SS	22	760				
753.5										
30.0	Silty sand to sandy silt		8	SS	93	750				0 72 (28)
	trace of clay		9	SS	100/3"					
			10	SS	100					
	Very Dense		11	SS	100/4"	740				
732.7			12	SS	100/4"					0 17 81 2
50.8	End of Borehole					730				

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO
ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 2

W.P. 41-66-28 LOCATION Co-ord's 15,621,707 N; 1,214,392 E. ORIGINATED BY RD
DISC 2 HWY. 402 BORING DATE July 3/75 COMPILED BY RD
DATUM Geodetic BOREHOLE TYPE Hollow Stem Auger & Tricone CHECKED BY *RD*

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20	40	60	80	100	w_p	w	w_L		
787.9	Ground Level															
0.0	Silty clay to clayey silt trace of sand		1	SS	13											4 7 59 30
			2	SS	53											
			3	SS	49											
			4	SS	61											
	Stiff to Hard		5	SS	33											
			6	SS	28											
			7	SS	14											0 2 8 40
			8	TW	PH											
			9	SS	38											
			10	SS	25											
753.9																
34.0	Silty sand to sandy silt		11	SS	14											0 30 65 5
			12	SS	100/3"											
	trace of clay		13	SS	52											
	Compact to Very Dense		14	SS	160/11"											0 25 70 5
			15	SS	161/10"											
727.4			16	SS	100/6"											0 68 (32)
60.5	End of Borehole Note: W.L. not established															

ENGINEERING SERVICES BRANCH - GEOTECHNICAL OFFICE - SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 3

W.P. 41-66-28

LOCATION Co-ord's 15,621,487 N; 1,214,434 E.

ORIGINATED BY RD

DIST. 2 HWY. 402

BORING DATE July 2/75

COMPILED BY RD

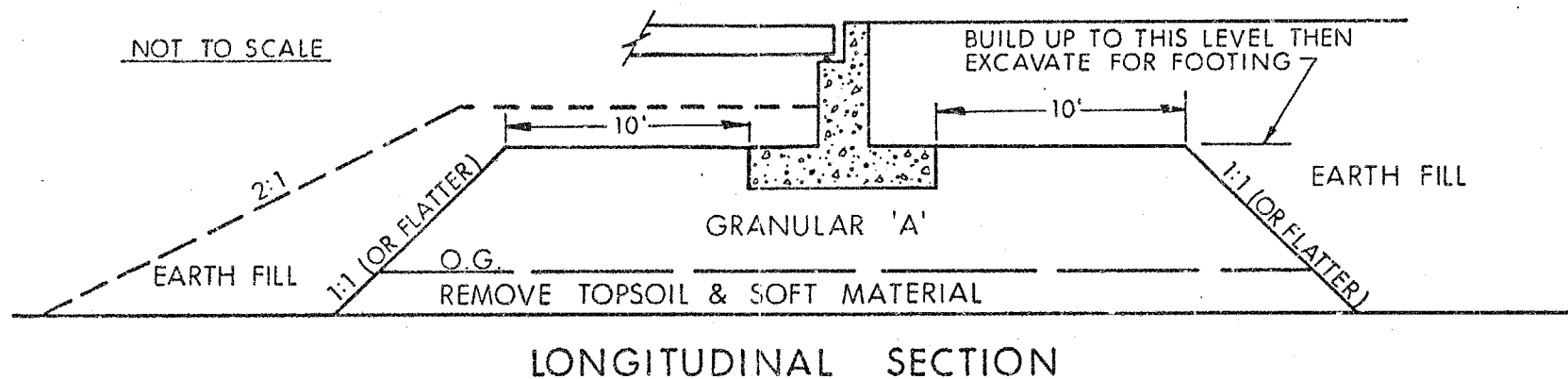
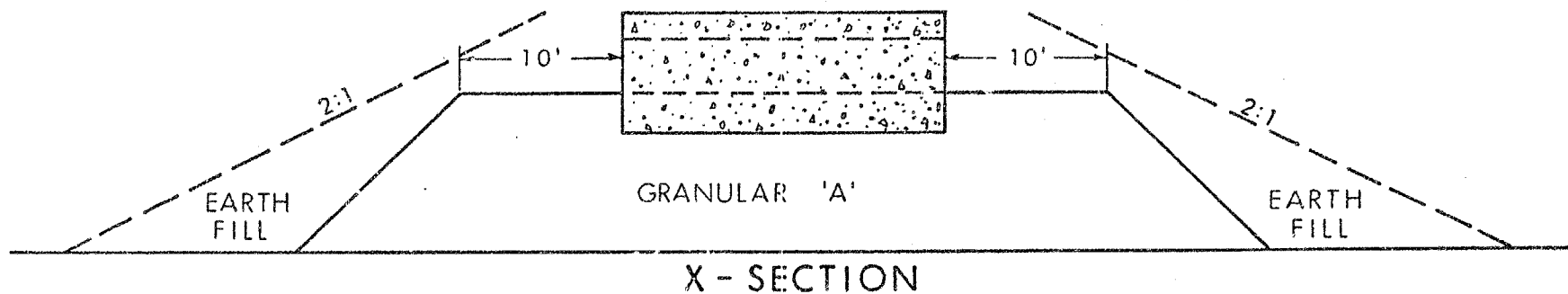
DATUM Geodetic

BOREHOLE TYPE Hollow Stem Augers & Tricone

CHECKED BY *el.f.*

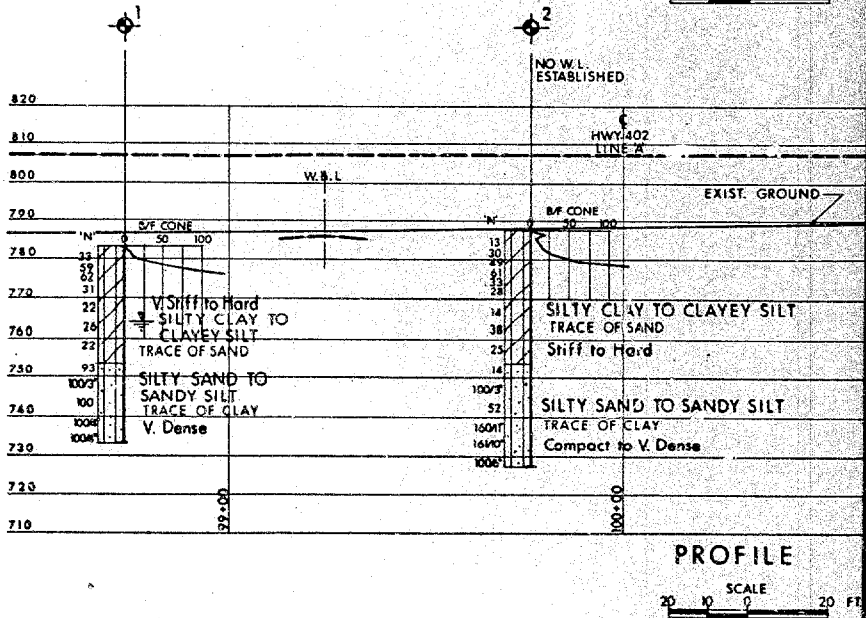
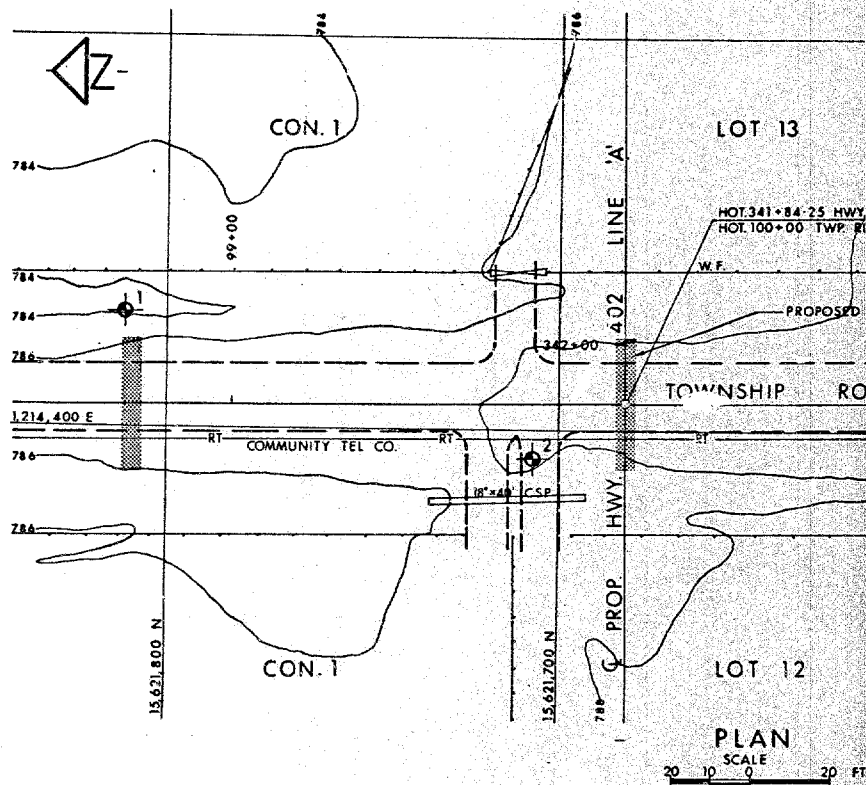
SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	N' VALUES		20	40	60	80	100	W_P	W	W_L		
792.0	Ground Level						1000	2000				10	20	30	P.C.F.	GR. SA. SI. CL.
	Silty clay to clayey silt		1	SS	39	790										
	Trace of sand		2	SS	49											0 2 58 40
			3	SS	28											
			4	SS	20											
	Stiff to Hard		5	TW	PH	780										
			6	SS	15											
			7	SS	20	770										
			8	SS	21	760										
			9	SS	16											
			10	SS	27	750										0 0 55 45
748.0			11	SS	43											0 82 (18)
44.0	Silty sand to sandy silt		12	SS	54	740										
	trace of clay		13	SS	118											
	Dense to Very Dense		14	SS	107/6"	730										
			15	SS	164/11"											
721.0			16	SS	135											0 81 (19)
71.0	End of Borehole															
	Note: W.L. not established															

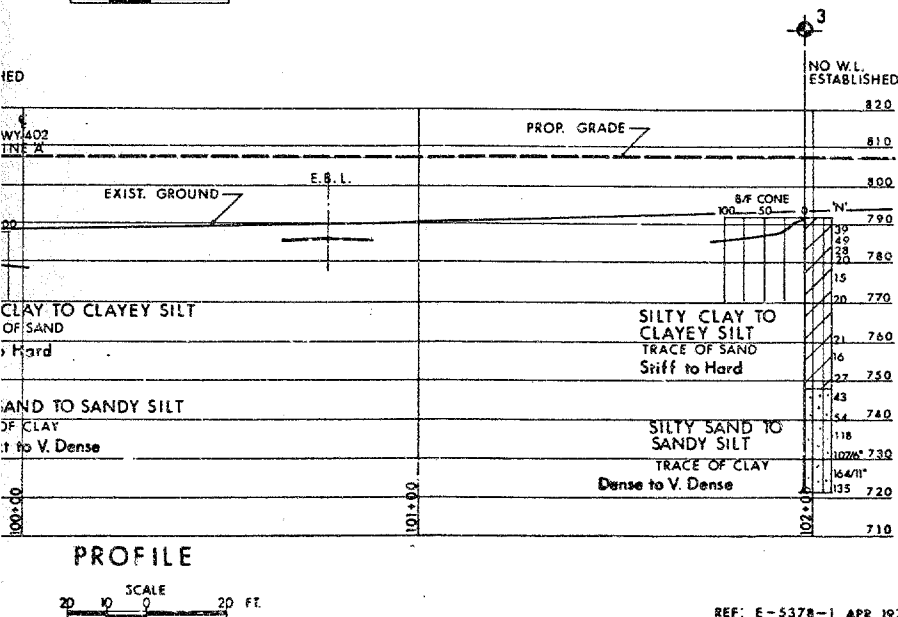
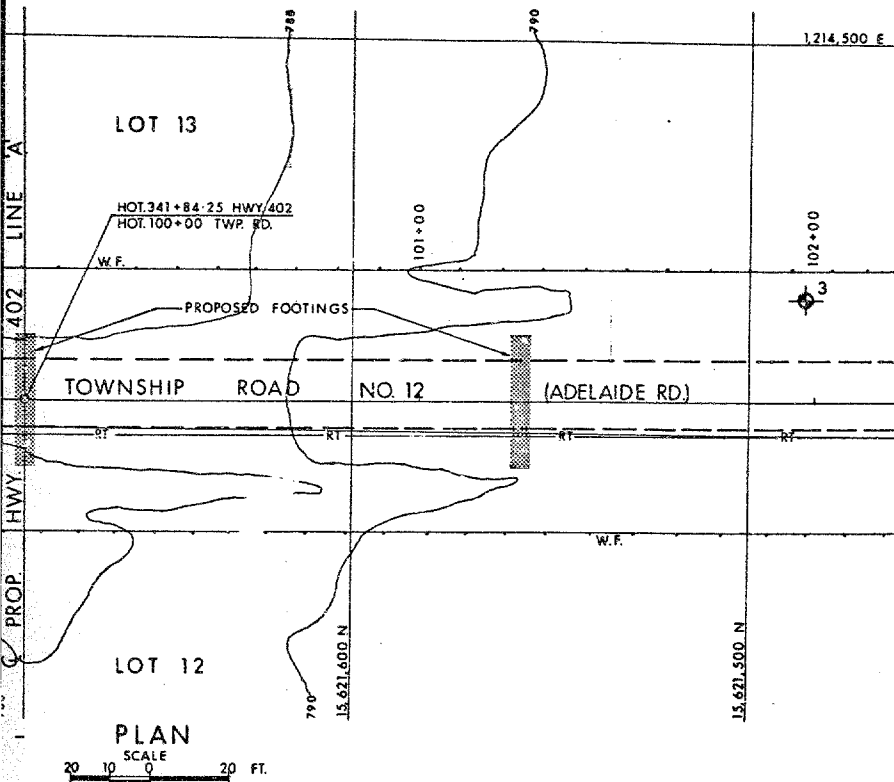
ABUTMENT ON COMPACTED FILL SHOWING GRANULAR 'A' CORE



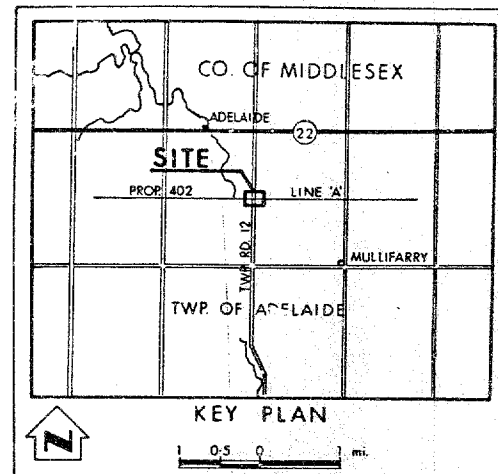
NOTES

- 1 - REMOVE TOPSOIL &/OR SOFT SUBSOIL UNDER AREA OF COMPACTED GRANULAR 'A'.
- 2 - PLACE GRANULAR 'A' TO TOP OF FOOTING LEVEL, COMPACTED ACCORDING TO CURRENT M.T.C. STANDARDS.
- 3 - EXCAVATE COMPACTED GRANULAR 'A' MATERIAL FOR FOOTING.





REF: E-5378-1 APR. 1975



LEGEND

- Bore Hole
- ⊕ Dynamic Cone Penetration Resistance Test
B/F CONE - Blows/ft. Cone Test (350 ft. lbs. energy/blow)
- ⊕ Bore Hole & Cone Test
- W.L. Water Levels established at time of field investigation JULY 1975
NO W.L. Established B.H. 2 & 3

NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	783.5	15,621,810	1,214,429
2	787.9	15,621,707	1,214,392
3	792.0	15,621,487	1,214,434

NOTE: FOR CONTRACT DOCUMENTS
The complete foundation investigation report for this structure may be examined at the Structural Office and Foundations Office, Downsview, and at the LONDON District Office.

— NOTE —

The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

DATE	BY	DESCRIPTION

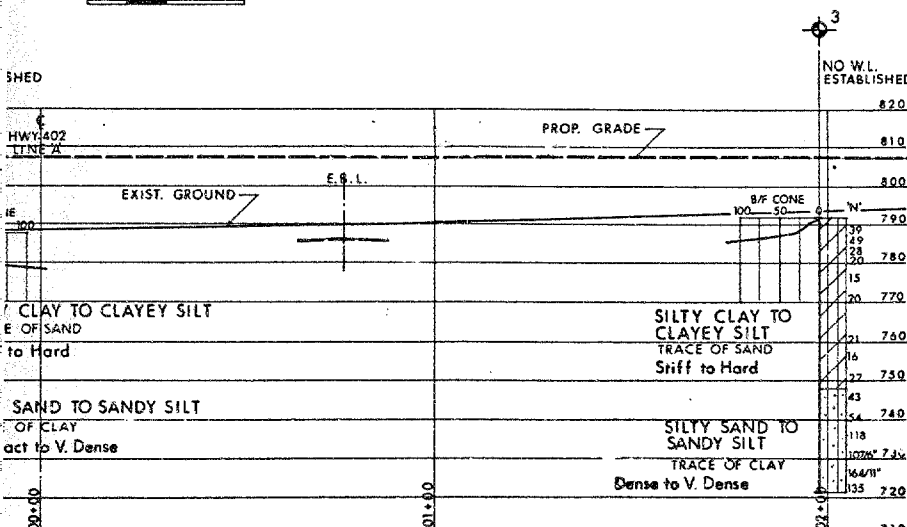
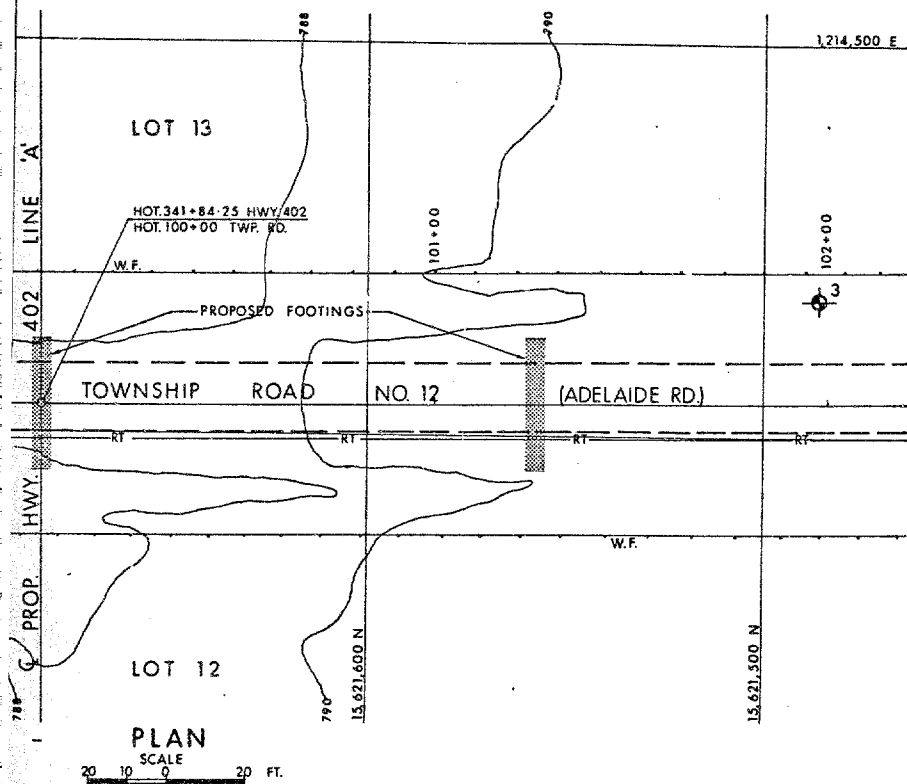
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO
ENGINEERING SERVICES BRANCH—GEOTECHNICAL OFFICE—SOIL MECHANICS SECTION

PROPOSED CROSSING ADELAIDE RD. NO. 12 PROP. HWY. NO. 402 LINE 'A'

HIGHWAY NO. 402 DIST. NO. 2
CO. MIDDLESEX
TWP. ADELAIDE LOT 12 & 13 CON. 1 & 2

BORE HOLE LOCATIONS & SOIL STRATA

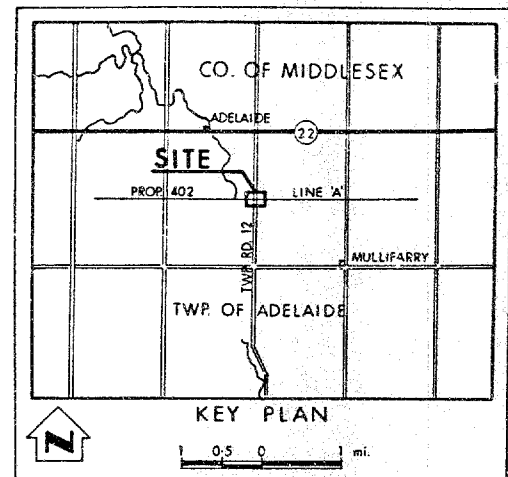
SURV. P. S.	CHECKED	W.P. NO. 41-66-28	DRAWING NO.
DRAWN O. L. J.	CHECKED	W.C. NO.	416628-A
DATE 29 JULY 1975		SITE NO. 19-520	BRIDGE DRAWING NO.
APPROVED		CONT. NO.	



PROFILE



REF: E-5378-1 APR. 1975

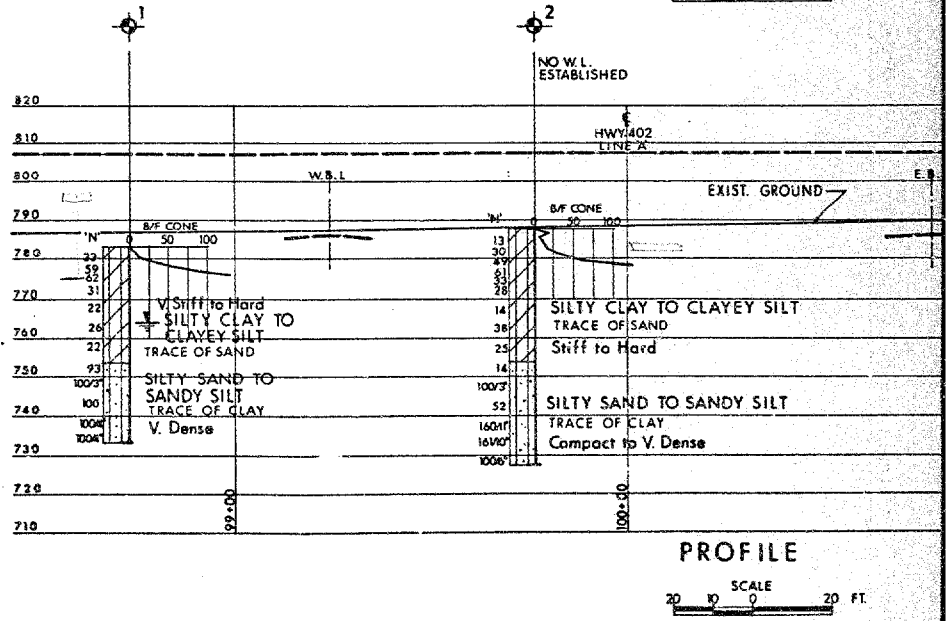
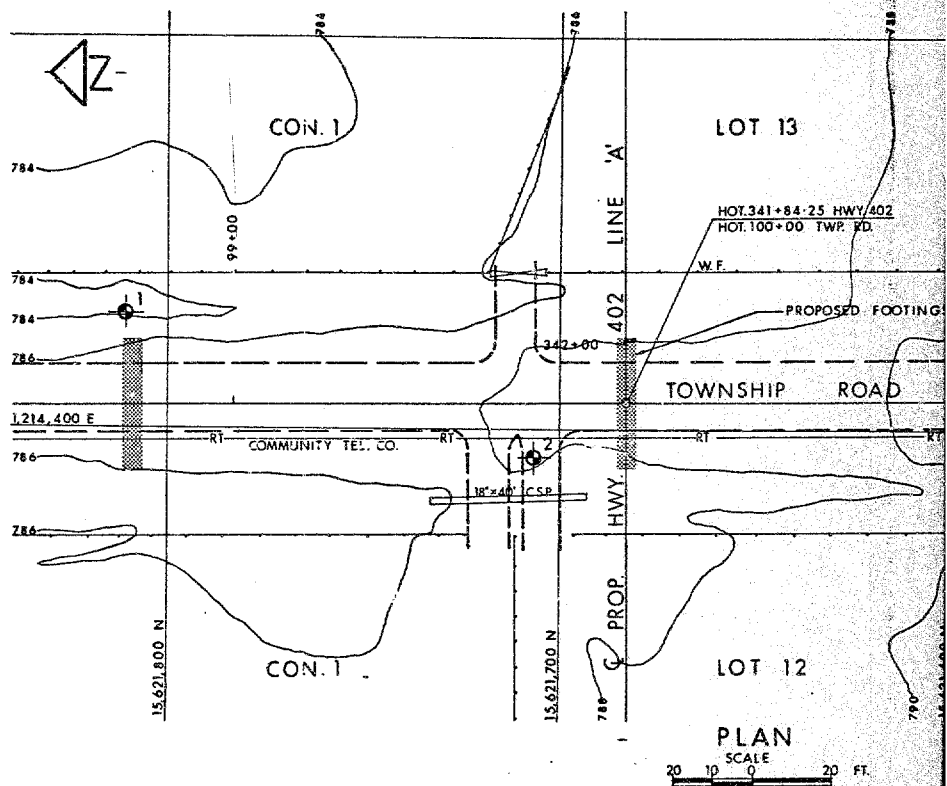


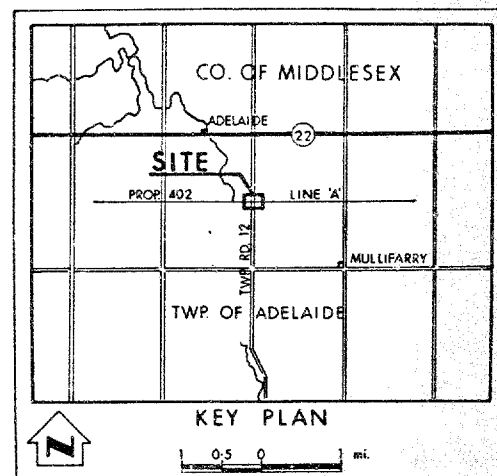
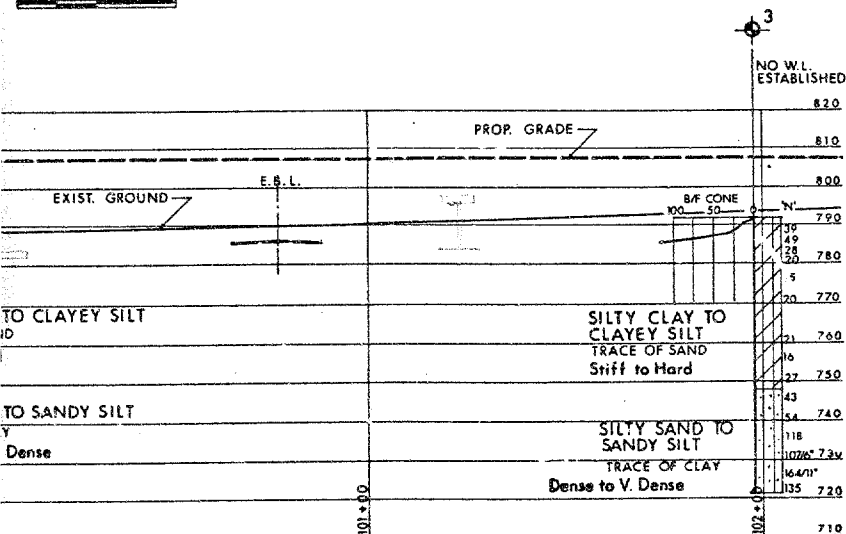
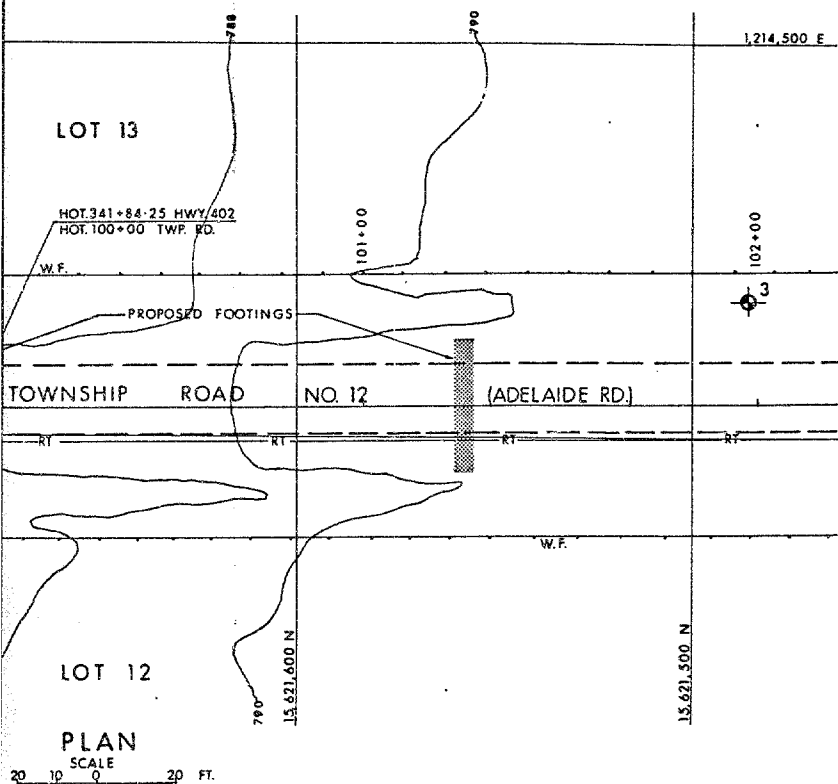
LEGEND			
	Bore Hole		
	Dynamic Cone Penetration Resistance Test B/F CONE - Blows/Ft. Cone Test (350 ft. lbs. energy/blow)		
	Bore Hole & Cone Test		
	Water Levels established at time of field investigation: JULY 1975 NO W.L. Established B.H. 2 & 3		
NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	783.5	15,621,810	1,214,429
2	787.9	15,621,707	1,214,392
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MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO ENGINEERING SERVICES BRANCH—GEOTECHNICAL OFFICE—SOIL MECHANICS SECTION			
PROPOSED CROSSING ADELAIDE RD. NO. 12 PROP. HWY. NO. 402 LINE 'A'			
HIGHWAY NO. 402		DIST. NO. 2	
CO. MIDDLESEX			
TWP. ADELAIDE		LOT 12 & 13 CON. 1 & 2	
BORE HOLE LOCATIONS & SOIL STRATA			
SUBNO. P.S.	CHECKED	WP. NO. 41-66-28	DRAWING NO.
DRAWN. O.L.J.	CHECKED	W.O. NO.	416628-A
DATE 29 JULY 1975		SITE NO. 19-520	BRIDGE DRAWING NO.
APPROVED		CONF. NO.	





LEGEND			
	Bore Hole		
	Dynamic Cone Penetration Resistance Test		
	Bore Hole & Cone Test		
	Water Levels established at time of field investigation, JULY 1975		
	NO W.L. Established B.H. 2 & 3		
NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	783.5	15,621,810	1,214,429
2	787.9	15,621,707	1,214,392
3	792.0	15,621,487	1,214,434

NOTE: FOR CONTRACT DOCUMENTS

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

— 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
ENGINEERING SERVICES BRANCH—GEOTECHNICAL OFFICE—SOIL MECHANICS SECTION

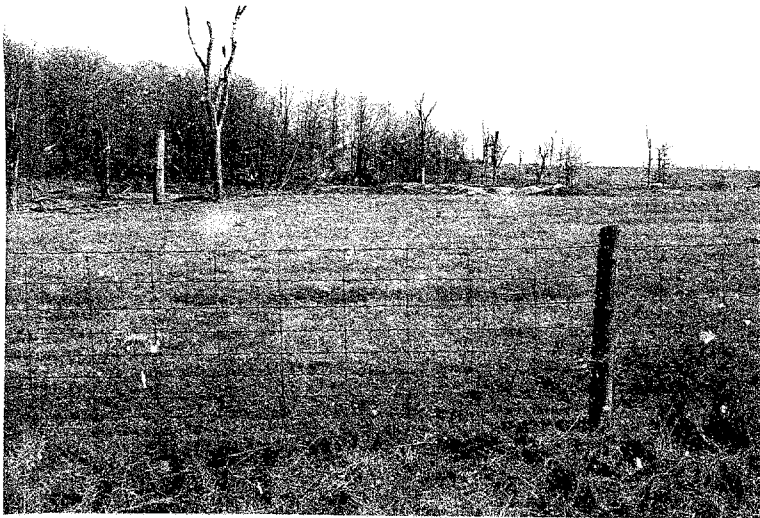
PROPOSED CROSSING ADELAIDE RD. NO. 12 PROP. HWY. NO. 402 LINE 'A'

HIGHWAY NO. 402 DIST. NO. 2
CO. MIDDLESEX
TWP. ADELAIDE LOT 12 & 13 CON. 1 & 2

BORE HOLE LOCATIONS & SOIL STRATA

SUBWD P.S.	CHECKED	WP NO. 41-66-28	DRAWING NO.
DRAWNOL J.	CHECKED	W.C. NO.	416628-A
DATE 29 JULY 1975	SITE NO. 19-520	BRIDGE DRAWING NO.	
APPROVED	CONF. NO.		

REF: E-5378-1 APR. 1975



looking east



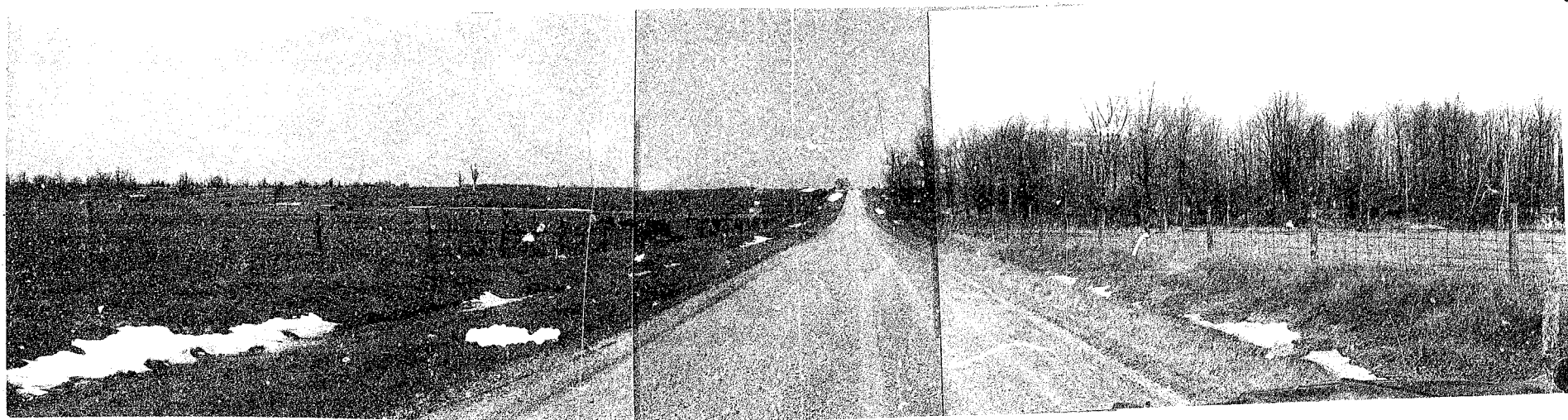
looking west

W.P. 41-66-28

Sideroad 12 Underpass

Hwy. 402

Bridge Site 19-520



General view looking north

DEPARTMENT OF _____

GEOCRE No. 41-13-41

DIST 2 REGION SOUTHWESTERN

W.P. No. 41-46-26

CONF. No. 76-122

W. O. No. _____

STR. SITE No. 19-522

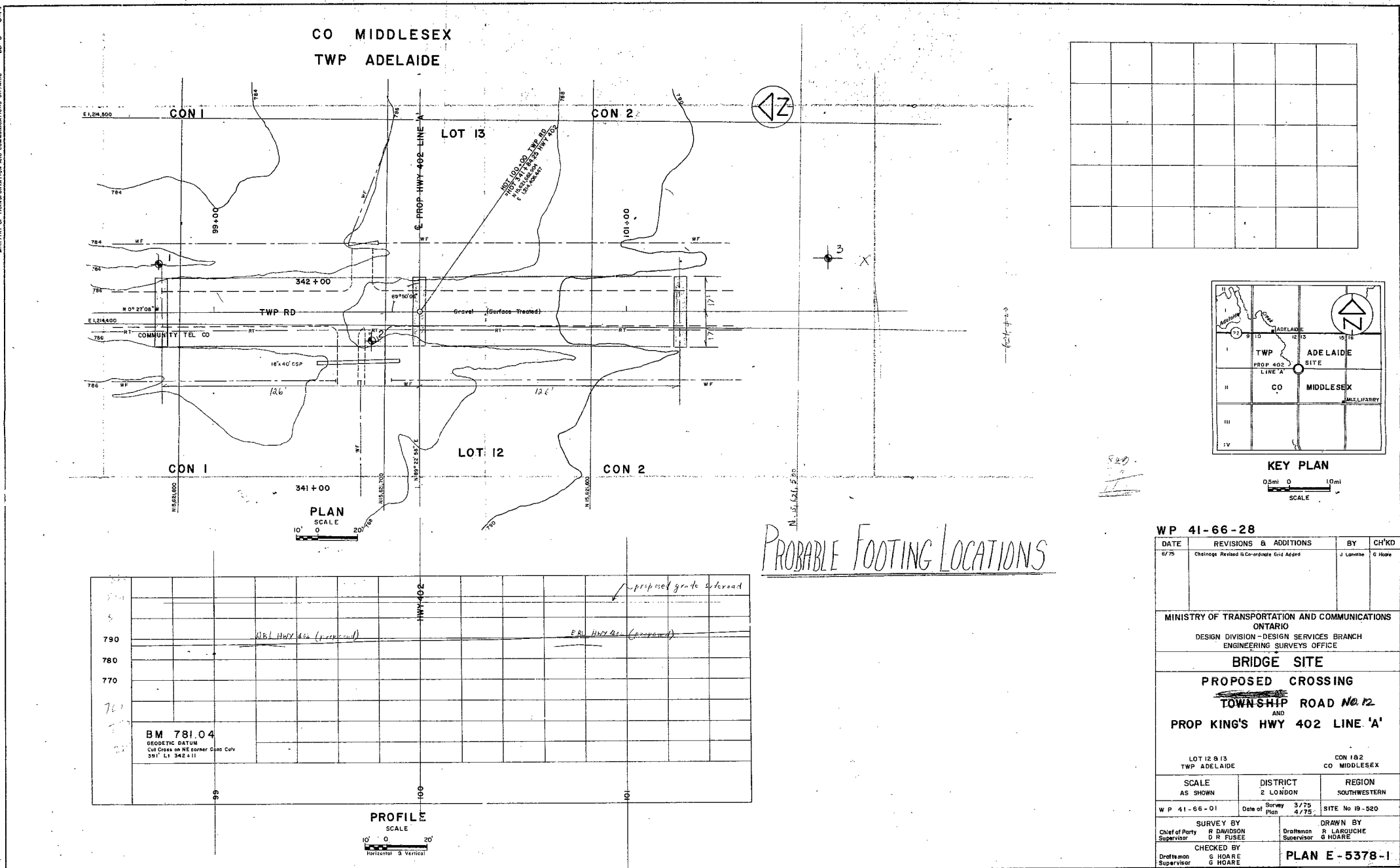
HWY No. 402

LOCATION RAISED CROSSING OF

HWY 402 AND ADELAIDE TWP RD

DEPARTMENT OF _____ 4

REMARKS: _____



40113-41

DIST. No 2
CONT No
WP No 41-66-28

SIDEROAD UNDERPASS
FOUNDATION LAYOUT



SHEET

LEGEND

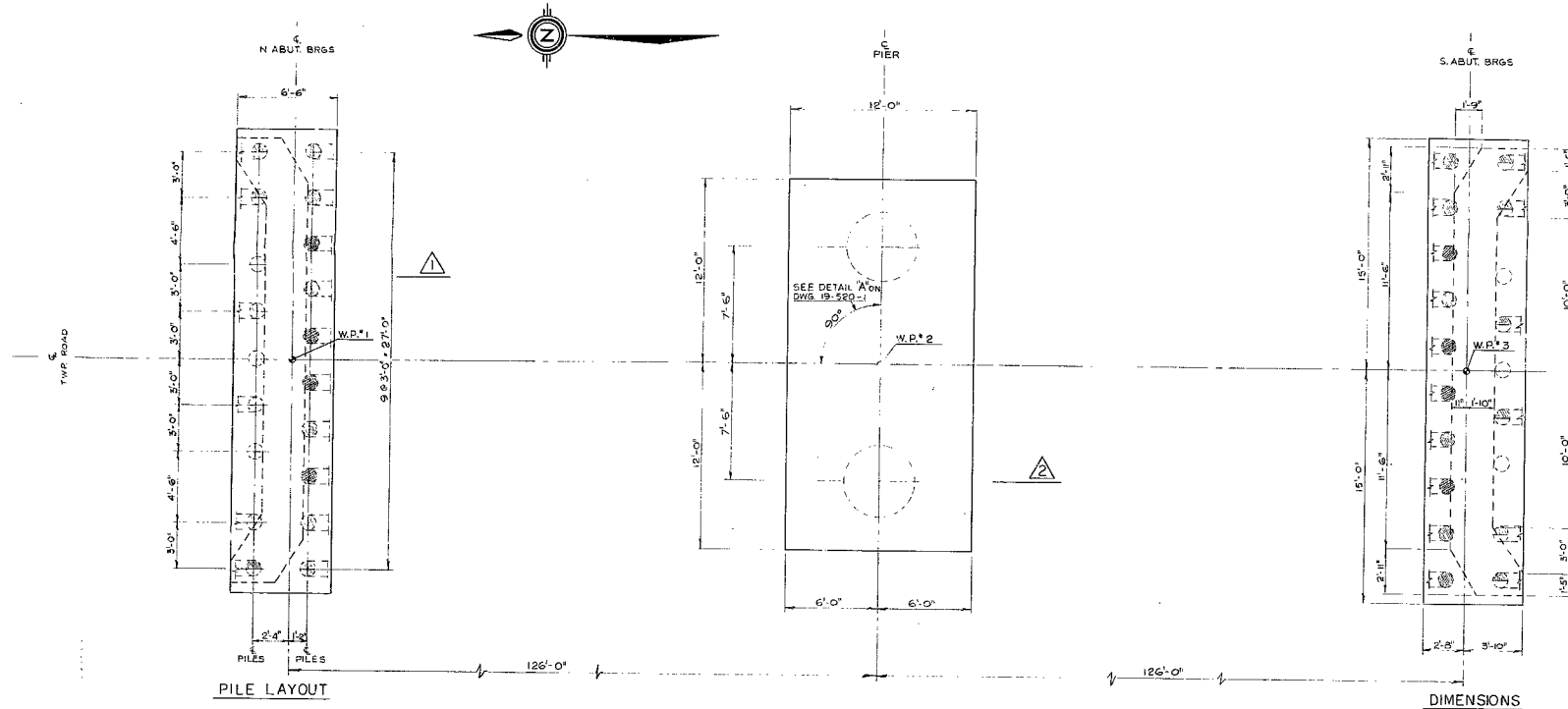
- ⊗ PILES BATTERED 3:1
- ⊗ PILES BATTERED 5:1
- ⊗ PILES BATTERED 8:1
- PILES DRIVEN VERTICALLY

NOTES:

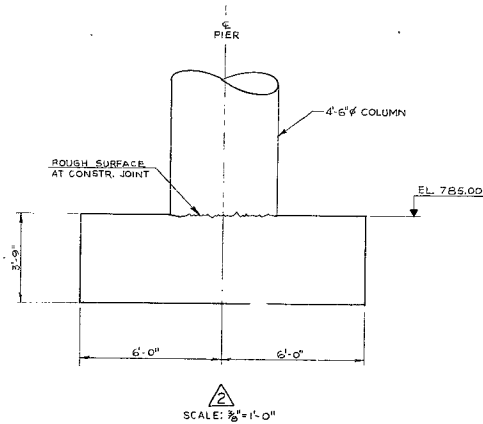
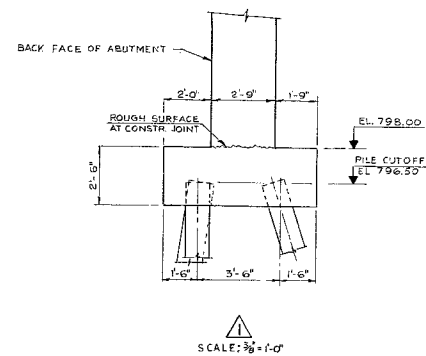
DIMENSIONS AND PILE LAYOUT SIMILAR FOR BOTH ABUTMENT FOOTINGS.
ABUTMENT PILE SPACING TO BE MEASURED AT UNDER SIDE OF FOOTING.
ALL PILES ARE 12 3/4" O.D. x 0.25" WALL THICKNESS STEEL TUBE PILES.
TUBE PILES TO BE FILLED WITH 3000 P.S.I. CONCRETE AFTER INSTALLATION AND INSPECTION.
PILES TO BE DRIVEN IN ACCORDANCE WITH SS 3-11 USING DESIGN LOAD 25 TONS/PILE, BUT NOT BELOW EL. 777.0 IN NORTH ABUTMENT AND NOT BELOW EL. 784.0 IN SOUTH ABUTMENT WITHOUT APPROVAL OF THE ENGINEER.

PILES SUPPLIED			
LOCATION	NO	LENGTH	TYPE
N. ABUTMENT	19	22'-0"	12 3/4" x .25" WALL THICKNESS
S. ABUTMENT	19	15'-0"	STEEL TUBE PILES

CONCRETE QUANTITY IN TUBE PILES — 22.0 C. Y.



PLAN
SCALE: 1/8" = 1'-0"



FOR REDUCED PLAN



REVISIONS	DATE BY	DESCRIPTION
1	4.1.1	CHECK 4.1.1
2	4.1.1	CHECK 4.1.1
3	4.1.1	CHECK 4.1.1



