

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. G.E.C. Burkhardt, (3) FROM: Soil Mechanics Section,
Reg. Structural Planning Geotechnical Office,
Engineer, West Building, Downsview.
Central Region, Toronto.

ATTENTION:

DATE: July 22nd, 1974.

OUR FILE REF.

IN REPLY TO

SUBJECT:

FOUNDATION INVESTIGATION REPORT
Investigation of Slope Stability
Highway #406, Westchester Crescent
to Welland Vale Road,
City of St. Catharines,
District 4, Hamilton.
W.O. 74-11018 W.P. 46-74-00.

30M3-137
GEOCRE No.

Attached we are forwarding to you our detailed foundation investigation report on the subsoil conditions existing at the abovementioned 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.

K.G. Selby
K.G. Selby,
Supervising Engineer.

KGS/mj
Attach*

c.c. E.J. Orr
B.R. Davis
R.S. Pillar
C.R. Robertson
B.J. Giroux
D. Gunther
G.A. Wrong
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Documents

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1. INTRODUCTION:

A request for a foundation investigation for the abovementioned project was received from Mr. G.C. Burkhardt, Regional Planning Engineer, Central Region, in a memo dated April 22nd, 1974. The main purpose of the investigation is to study the stability of the various cuts and fills along the proposed highway alignments.

A letter containing our comments and recommendations concerning alignment Scheme "A" and Scheme "B" from Sta. 258+00 to Sta. 345+00 was issued June 28th, 1974.

Presented in this report are results of our supplementary stability analyses, mainly for Scheme "C", as well as the results of all of the field investigations and laboratory tests.

2. SITE DESCRIPTION AND GEOLOGY:

Most of the investigated area lies in the Twelve Mile Creek Valley in the west side of the city of St. Catharines. The proposed project extends from Westchester Crescent to Welland Vale Road, passing through the Glenridge fill area and along the north shore of the Twelve Mile Creek.

The topology of the site is very non-uniform. It varies from flat high grounds in the west to undulating riverbank lowland, confined by rising slopes and the Twelve Mile Creek, and then to the Glenridge fill area which is a broad valley surrounded by high ground. The area in question is partially unused with heavy vegetation and occasional swamps, partially built-up residential districts and industrial developments.

Geologically, the area may be considered to be part of the Niagara Escarpment physiographic region, lying just north of it, where the valley of the Twelve Mile Creek cuts into the pre-glacial strata, and the slopes are mantled by a very much dissected series of glacial deposits.

3. FIELD AND LABORATORY INVESTIGATIONS:

A total of 112 sampled boreholes have been included in this report. Summary sheets for 107 of these boreholes were obtained from previous reports for the same site and 5 additional holes were drilled for this report. A summary of the boreholes and the reports from which they were obtained follows:

<u>Borehole No.</u> (This Report)	<u>Original</u> <u>Report No.</u>	<u>Original</u> <u>Borehole No.</u>
1-9	W.O. 71-11069 <i>Geneva St</i> W.P. 230-66	1-9
101-113 115-124	W.O. 71-11086 <i>- N.A.</i> W.P. 126-58	1-13 15-24
201-242A	W.O. 71-11060 W.P. 126-58	1-42A
301-323 338-339 345 349-355	Preliminary (1963) from H.Q. Golder & Assoc. W.O. 71-F-205C W.P. 126-58-3 Golder Project No. 6398	1-23 38-39 45 49-55
401-405	New Boreholes for this Report.	-

Boreholes 401 to 405 were advanced using hollow stem augers. Standard Penetration 'N' values were obtained with a split-spoon sampler driven according to the specifications of the Standard Penetration Test with a driving energy of 350 ft.-lbs. (475 J) per blow. Undisturbed samples were taken by means of 2-1/8" O.D. Shelby tubes pushed hydraulically into the soil. Field vane shear tests were taken wherever possible at 18 inches below the soil samples.

Laboratory tests were performed on selected samples to determine moisture content, Atterberg limits, grain-size distributions, undrained shear strengths and effective stress parameters.

Effective stress parameters were selected as follows: The results of six triaxial compression tests were available from boreholes for W.O. 71-11060. In addition, full and partial slopes were analysed for stability at Sta. 291+50 for scheme 'A' using various values of ϕ' with $0' = 0$. Results of these analyses were plotted graphically. Knowing that the present slopes are stable, and in conjunction with the six triaxial compression test values of $c' = 200$ p.s.f. and $\phi' = 25^\circ$ were selected as reasonable for cohesive subsoils across the site. Three additional triaxial compression tests were performed on samples from B.H.'s 403 and 404 to confirm the above values.

To determine whether the subsoil in the proposed cuts is suitable for fill material, three Standard Proctor tests were carried out on samples from B.H.'s 403 and 404.

4. SUBSOIL CONDITIONS:

4.1) Subsoil Profiles.

Descriptions of soil types encountered are shown in the self-explanatory bore logs.

The predominant deposits in the area are firm to stiff silty clay and clayey silt, containing scattered fine sand seams, silt pockets, and few fine gravel inclusions. This stratum extends to considerable depths, up to 75 ft. in some locations. Standard penetration tests yielded the 'N' values for this material from 6 blows/ft. to over 30 blows/ft., with 12 blows/ft. as the average. The plastic and the liquid limits of the clayey silt samples were

found to be in the range of 14-21% and 25-34% respectively, while those of the silty clay samples in the range of 18-24% and 36-50%. The natural moisture content near the surface lie close to the plastic limits, indicating some overconsolidation by desiccation. Further down the moisture content is somewhere in between the plastic and the liquid limits, suggesting a normally consolidated deposit.

Below the abovementioned cohesive stratum, hard glacial till or dense to very dense silty sand and sandy silt, slightly stratified with occasional clay seams, were encountered. The 'N' values ranged from 30 blows/ft. to over 100 blows/ft.

In the Glenridge fill and some areas in the riverbank lowland, the silty clay or clayey silt is overlain by soft to firm cohesive silty fill, containing cinders, brick fragments, organic matter, etc.

4.2) Groundwater Conditions.

The prevailing groundwater levels were measured in the boreholes or in the installed stand pipes.

In the Glenridge area, the water levels were found to lie between elev. 278 ft. and 288 ft., corresponding to some 9-11 ft. below the lowest ground level. In the riverbank lowland, groundwater existed between elev. 269 ft. and 272 ft., which are depths at 1 to 2 ft. below ground surface; while in the adjacent high ground, water levels were encountered between elev. 278 ft. and 300 ft.

Artesean water was observed in the region from Sta. 294+00(B) to Sta. 300+00(B). A head of 4.8 ft. and 10.8 ft. above the ground was noted in B.H. 314 and B.H. 212 respectively.

4.3) Shear Strength Parameters.

The selection of appropriate values for soil shear strength parameters was mentioned in Section 3.

The undrained shear strengths of the cohesive soils were determined from unconfined compression tests and field vane tests, and the effective stress parameters were obtained from consolidated drained triaxial tests on thin-wall Shelby samples. The angles of

internal friction of granular soils were chosen according to the relative density indicated by the 'N' values of the standard penetration tests.

A summary of the parameters used in our stability analyses is tabulated in Appendix II.

5. COMMENTS AND RECOMMENDATIONS:

It is understood that a section of Hwy. 406 is to be constructed between Westchester Crescent and Welland Vale Road in the City of St. Catharines. Investigations had been carried out in order to determine the stability of the proposed side fill cuts, retaining walls, embankment fills, and tunnel excavations.

Detailed plans showing three tentative alignments, referred to as Scheme A, B and C were supplied by Proctor and Redfern Ltd. (Mr. G. Smith), together with profiles and a number of typical cross-sections.

Locations of these alignments are shown in Drawings #74-11018 A, B, C, D and their centreline profiles in Drawings #74-11018 E, F. Simplified cross-sections of those locations where stability analyses were implemented are given in Drawings #74-11018 G, H in which the critical circles and the soil parameters used for the analyses are plotted.

Comments and recommendations concerning Scheme "A" and "B" and foundations for the possible structures are contained in our letter of June 28th, 1974. Presented below are summaries of our supplementary investigations not covered in the abovementioned letter.

5.1) Slope Stability.

Bishop's method of slices and slip circles was used to study slope stability. Two types of analyses were performed; namely, the total stress and the effective stress analyses. Results are given as follows:

Sta. 331+00(A): Stability analyses for the natural slope, as well as for the partly cut, partly fill tunnel wall near the edge of the slope, revealed unacceptable low factors of safety. The existing slope, in our opinion, is in the neighborhood of limiting equilibrium. Its stability will be reduced by the proposed fill and excavation. Therefore, the highway alignment should be relocated away from the slope.

Sta. 297+00(C): An adequate factor of safety was obtained for the proposed embankment fill with 4:1 side slope and a height of 7 ft. Since the toe of the fill is close to the turbulent Twelve Mile Creek, rip-rap for erosion protection should be constructed.

Sta. 303+00 (C): The proposed 14 ft. embankment with 4:1 side slope was found to be stable.

Sta. 305+00 (C): Both the embankment fill and the retaining wall as proposed were found to be stable.

Sta. 306+00 (C): The proposed 17 ft. high retaining wall with 3:1 backslope was found to be stable.

5.2) Embankment Materials.

As stated in our letter of June 28th, 1974, we believe the excavated material from Sta. 318+00 (A) to 340+00 (A) can be used as embankment fill. Our standard Proctor compaction tests confirm this belief, and the results are listed below:

<u>Sample</u>	<u>B.H.</u>	<u>Depth(Ft.)</u>	<u>Ave. W_n (%)</u>	<u>$W_{opt.}$ (%)</u>	<u>Max. γ_d (p.c.f)</u>
A	403	0-10	21.5	18.9	108.9
B	404	0-7½	20.5	20.0	108.1
C	404	7½-17½	20.5	20.2	107.0

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6. MISCELLANEOUS:

The preliminary field work was undertaken by H.Q. Golder & Assoc. in 1963. Subsequent field investigations by M.T.C. were carried out under the supervision of Messrs. K. Williams and W. Alcock from July 15 to August 13, 1971, P. Korgemagi from November 2 to December 16, 1971, and W. Alcock from June 20 to June 24, 1974.

Stability analyses were performed by Messrs. W. Greskow, W. Alcock and B. Ly.

This report was prepared by Messrs. W. Alcock and B. Ly, and was reviewed by Mr. K. Selby, Supervising Engineer.

BL/mj
July, 1974.

B. Ly
B. Ly
Project Engineer

K. G. Selby
K.G. Selby
Supervising Engineer



A P P E N D I X I

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 1

JOB 74-11018

LOCATION Co-ords. 15,681,296 N; 1,069,571 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 20-23, 1971.

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill & Washboring, BX Casing

CHECKED BY BL

OFFICE REPORT ON SOIL EXPLORATION

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W W _P — W — W _L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)					
93.0 0.0	305.2 0.0	Ground Level.								
		Clayey silt to silty clay.		1	SS	7	300			
				2	SS	13	91.4			
90.3 2.7	296.2 9.0	----- Fill		3	SS	35				
		Bituminous mixture.		4	SS	14				
88.4 4.6	290.2 15.0	Silty sand with fibrous organic mat		5	SS	4	88.4			
86.8 6.2	284.9 20.3	Silty clay, traces of sand. Very stiff.		6	SS	15				
				7	TW	PH	280 85.3			
83.7 9.3	274.7 30.5			8	SS	27				
83.0 10.0	272.2 33.0	Gravel & boulder		9	RC	15' Rec	270 82.3			
		Clayey silt to silty clay, traces of sand & gravel. Stiff. Greyish-brown.		10						
				11	TW	PH				
				12	SS	10	260 79.2			
				13	TW	PM				
76.9 16.1	252.2 53.0	Silty sand to sandy silt, some clay & traces of gravel. Dense to very dense.		14	SS	27	250 76.2			
				15	SS	41				
							240 73.1			
				16	SS	72				
				17	SS	30	230 70.1			
				18	SS	84				
				19	SS	50	220 67.0			
64.7 28.3	212.2 93.0	End of Borehole		20	SS	92				
				21	SS	122				
								50 kPa	100	

CHECKED BY BL

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 3

JOB 74-11018

LOCATION Co-ords. 15,681,200 N; 1,069,616 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE July 21, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Cone Penetration Only

CHECKED BY PL

SOIL PROFILE			SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100	LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W W_P — W — W_L WATER CONTENT %	BULK DENSITY γ P.C.F. GR.SA.SI.CL.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE					
m. 90.0 0.0	295.1 0.0	Ground Level							
					290 88.4				
					280 85.3				
83.3 6.7	273.2 21.9	End of Cone Test			270 82.3		130/9"		

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 4

JOB 74-11018

LOCATION Co-ords. 15,681,192 N; 1,069,568 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 15-20, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill & Washboring, BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000	LIQUID LIMIT — w _L PLASTIC LIMIT — w _p WATER CONTENT — w w _p — w — w _L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. GR. SA. SI. CL. T/m ³	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)					
89.9 0.0	0.0									
	Ground Level									
	Silty clay to clayey silt, traces of sand, occasional lamination. Firm to stiff. Grey, upper zone mottled.		1	SS	8	290				
			2	SS	11	88.4				
			3	SS	10					
			4	SS	15	280				
			5	SS	17	85.3				
			6	TW	PH					
			7	SS	11	270				
			8	TW	PM	82.3				
			9	SS	12	260				
			10	TW	PH	79.2				
			11	SS	9	250				
			12	TW	PH	76.2				
73.6	241.5									
16.3	53.5		13	SS	36	240				
	Clayey silt to silt, Hard. Reddish-brown.		14	SS	44	73.1				
70.3	230.5		15	SS	66	230				
19.6	64.5		16	SS	17	70.1				
	Silty fine sand. Compact. Grey.									
			17	SS	13	220				
						67.0				
			18	SS	15	210				
						64.0				
			19	SS	11	200				
						60.9				
59.1	194.0		20	SS	53	190				
30.8	101.0		21	SS	105					
57.7	189.3		22	SS	50/1					
32.2	105.7									
	End of Borehole					57.9				

20
15 5 % STRAIN AT FAILURE
10

OFFICE RECORD ON SOIL EXPLORATION

RECORD OF BOREHOLE NO 5

JOB 74-11018

LOCATION Co-ords. 15,681,071 N; 1,069,612 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE July 19-21, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY EL

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE			LIQUID LIMIT			BULK DENSITY	REMARKS
ELEV. m.	DEPTH ft.	DESCRIPTION	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. ft./m	BLOWS / FOOT (0.3 m)	SHEAR STRENGTH P.S.F./kPa	W _p	W _L	WATER CONTENT %		
89.8	294.7	Ground Level						20 40 60 80 100					
0.0	0.0							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					
								100 800 1200 1600 2000					

15 ϕ 5 % STRAIN AT FAILURE

Continued

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 5 Continued

JOB 74-11018

LOCATION Co-ords. 15,681,071 N; 1,069,612 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE July 19-21, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)				LIQUID LIMIT —w _L PLASTIC LIMIT —w _p WATER CONTENT —w			BULK DENSITY γ P.C.F.	REMARKS
m. ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE				WATER CONTENT % w _p — w — w _L 20 40 60				
58.1	190.7	continued													
31.7	104.0	Sandy silt, silty fine sand, some clay Compact to Very Dense		22	SS	25	57.9								
54.8	179.7						180								
35.0	115.0	Silty sand with clay and gravel Very Dense		23	SS	50/1	54.8								
53.2	174.7			24	SS	50/1									
36.6	120.0	End of Borehole													

OFFICE REPORT ON SOIL EXPLORATION

CHECKED BY EL

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 7

JOB 74-11018

LOCATION Co-ords. 15,680,985 N; 1,069,591 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 23-26, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY BL

SOIL PROFILE			SAMPLES			ft./m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000	LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w w_p w w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. T/m ³	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)					
90.8 0.0	297.9 0.0									
89.3 1.5	292.9 5.0		1	SS	6					
			2	SS	9					
			3	TW	PH					
			4	SS	13					
			5	TW	PM					
			6	SS	6					
			7	SS	11					
			8	TW	PH					
			9	SS	14					
			10	TW	PH					
			11	SS	10					
			12	TW	PH					
74.3 16.5	243.9 54.0		13	SS	102					
			14	SS	94					
70.9 19.9	232.5 65.4		15	SS	114	10"				
							50 kPa	100		

ORIGINATED BY WA

COMPILED BY AKB

CHECKED BY 3L

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 9

JOB 74-11018

LOCATION Co-ords. 15,680,849 N; 1,069,529 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 29 - Aug. 5, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY FL

SOIL PROFILE			SAMPLES		ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	20	40	60	80	100	W _P	W	W _L	
93.7 0.0	907.4 0.0	Ground Level													
	Silty clay to clayey silt, traces of sand and gravel. Occasionally laminated. Very stiff to soft. Grey, upper zone is desiccated.		1	SS	19										
			2	SS	25	300									
			3	SS	19	91.4									
			4	SS	18										
			5	SS	17	290									
			6	TW	PH	88.4									
			7	SS	10										
			8	TW	PH	280									
			9	SS	10	85.3									
			10	TW	PH	270									
			11	SS	16	82.3									
			12	TW	PH	260									
			13	SS	13	79.2									
			14	TW	PH	250									
			15	SS	57	76.2									
74.3 19.4	243.9 63.5		16	SS	73	240									
	Clayey silt to silt, some sand & gravel. Hard. Reddish brown.		17	SS	60/5"	73.1									
70.7 23.0	231.9 75.5		18	SS	1	230									
	Silty sand to sandy silt, some clay and traces of gravel. Compact to very dense. Reddish brown.		19	SS	15	70.1									
			20	SS	61	220									
			21	SS	59	67.0									
						210									
						64.0									

 20 50 100 kPa
15 5 10 % STRAIN AT FAILURE

Continued

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 9 Continued

JOB 74-11018

LOCATION Co-ords. 15,680,849 N. 1,069,529 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 29 - Aug. 5, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY SL

SOIL PROFILE			SAMPLES			Ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)				LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W W_P — W — W_L				BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE				WATER CONTENT % 20 40 60					
m. 62.0 31.7	203.4 104.0	Continued				200 60.9										
		Silty Sand to sandy silt, some clay & traces of gravel		22	SS	65										
		Compact to Very Dense				190 57.9										
		Reddish Brown		23	SS	48										
						180 54.8										
				24	SS	60 1/2"										8 34 55 3
52.4 41.3	171.9 135.5	Weathered shale End of Borehole		25	SS	60 1/4"										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 101

JOB 74-11018

LOCATION Co-ords. 15,681,332 N; 1,069,811 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Nov. 18, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY B.L.

SOIL PROFILE			SAMPLES			ft./m	DYNAMIC PENETRATION, RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ	REMARKS			
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa					WATER CONTENT %							
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE					w_p	w	w_L					
m.						20	40	60	80	100	400	800	1200	1600	2000	20	40	60	
88.2	289.5	Ground Level																	P.C.F. GR. SA. SI. CL.
0.0	0.0	Fill																	T/m ³
85.8	281.5	Silty sand with pieces of concrete, iron and debris.		1	SS	10													9 59 23 9 281.0 85.7
2.4	8.0			2	TW	PM	280												
		Silty clay to		3	SS	7	85.3												
		clayey silt		4	TW	PM	270												
		random seams of silt		5	TW	PM	82.3												117 1.87
		and sand, traces of		6	TW	PM	260												128 2.05
		gravel.		7	SS	13	79.2												129 2.07
		Firm to stiff		8	TW	PM	250												
		Greyish Brown		9	SS	42	76.2												126 2.02
75.0	246.0			10	SS	165	240												
13.2	43.5	Silt with some sand, traces of clay.		11	SS	92	73.1												
		Red-brown		12	SS	65	230												
		Very Dense		13	SS	75	70.1												1 13 78 8
68.0	223.0																		
20.2	66.5	End of Borehole																	

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

 RECORD OF BOREHOLE N^o 102

JOB 74-11018

LOCATION Co-ords. 15,681,249 N; 1,069,807 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Nov. 18, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY BL

SOIL PROFILE		SAMPLES		ft/m	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		20	40	60	80	100	W _P	W	W _L		
91.3	299.4	Ground Level													
0.0	0.0	Fill													
		Silty clay mottled	1	SS	22										
		traces of sand and	2	TW	PH										
		organic matter,													
		oily substances.	3	TW	PH										
		Grey and Black													
		Very Stiff	4	SS	12										
84.3	276.4		5	AS											
7.0	23.0		6	TW	PH										
		Silty clay to													
		clayey silt, trace	7	TW	PM										
		of sand and organic	8	TW	PM										
		inclusions													
		Firm to Stiff	9	TW	PM										
			10	SS	14										
			11	TW	PM										
			12	TW	PM										
			13	SS	16										
			14	TW	PH										
75.1	246.4														
16.2	53.0		15	SS	21										
		Silty sand becoming	16	SS	22										
		fine sand, traces	17	SS	23										
		of gravel.	18	SS	24										
		Very Dense	19	SS	25										
		Red-Brown	20	SS	26										
			21	SS	27										
			22	SS	28										
68.0	222.9														
23.3	76.5	End of Borehole													

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 103

JOB 74-11018

LOCATION Co-ords. 15,681,212 N; 1,069,405 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Nov. 17, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			BULK DENSITY	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	SHEAR STRENGTH P.S.F. kPa					WATER CONTENT %			γ	
m.							O UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE					20 40 60			P.C.F.	GR.SA.SI.CL.
91.2	299.1	Ground Level														
0.0	0.0	Mixed organic fill sand, gravel, ashes, asphalt, pieces of wood.													T/m ³	
		Loose	1	SS	6	290										290.0
			2	SS	13	88.4										88.4
86.8	284.6														126	
4.4	14.5	Silty clay to clayey silt, traces of sand and gravel, random seams of sand	3	TW	PM	280									2.02	
			4	AS	--	85.3									118	
			5	TW	PM										1.89	
			6	SS	21	270										
			7	TW	PM	82.3									133	
		Firm to Very Stiff													2.13	
			8	TW	PM	260									130	
		Greyish Brown													2.08	
			9	SS	25	79.2										
			10	TW	PM										118	
76.5	251.1					250									1.89	
14.7	48.0	Sandy silt to silty sand, traces of clay.	11	SS	49	76.2										0 32 62 6
		Very Dense	12	SS	161/9"											
		Reddish Brown				240										
72.4	237.6		13	SS	102	73.1										0 70 24 6
18.8	61.5	End of Borehole														

ORIGINATED BY PK

COMPILED BY AKB

CHECKED BY SL

20
15 ϕ 5 % STRAIN AT FAILURE
10

CHECKED BY SL

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 108

JOB 74-11018

LOCATION Co-ords. 15,680,700 N; 1,069,345 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 4-5, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY SL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000					WATER CONTENT % w_p — w — w_L			γ	
90.7 0.0	Ground Level															P.C.F. GR.SA.SI.CL.
89.2 1.5	Cinder and ash mixed fill.		1	SS	9										T/m ³	
			2	SS	19	290									121	286.9
	Silty clay, traces of sand and gravel.		3	TW	PH	88.4									1.94	87.4
	Very Stiff to Firm		4	TW	PH	280									121	
			5	SS	12	85.3									1.94	
	Grey and Brown		6	TW	PH	270									120	
			7	TW	PH	82.3									1.92	
			8	TW	PH	260									121	
79.7 11.0	Clayey silt, traces of sand and gravel.		9	SS	23	79.2									1.94	
	Very Stiff to Stiff		10	SS	21	250									152	
			11	SS	27	76.2									2.48	
			12	SS	21	240									1.7	
			13	SS	13	73.1									2.23	
70.3 20.4	Sandy silt, some clay, traces of gravel.		14	TW	PH	230									122	
	Very Dense		15	SS	16	70.1									1.95	
67.4 23.3	End of Borehole		16	SS	90										1.85	
																5 22 61 12

ORIGINATED BY PK

COMPILED BY AKB

CHECKED BY BL

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 110

JOB 74-11018

LOCATION Co-ords. 15,680,876 N; 1,069,401 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 5-8, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY FL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			BULK DENSITY	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	SHEAR STRENGTH P.S.F./kPa O UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE 400 800 1200 1600 2000					WATER CONTENT % W_P W W_L			γ P.C.F. T/m ³	
89.6 0.0	294.0 0.0	Ground Level										20	40	60		GR.SA.SI.CL.
		Fill														
		Mixed cinder, ashes, organics, silty clay, numerous shells	1	SS	5	290 88.4										
			2	SS	4											
			3	SS	8	280										
		Very loose to Loose and Soft	4	SS	4	85.3										
			5	SS	3											
81.7 7.9	268.0 26.0	Clayey silt to silty clay, traces of sand and gravel. Stiff Grey and Brown	6	SS	6	270 82.3										
			7	TW	PH											
			8	SS	10	260 79.2										
			9	TW	PH											
			10	SS	PH	250 76.2										
74.7 14.9	245.0 49.0	Sandy silt to silty sand, some clay, traces of gravel. Very Dense.	11	SS	93											
			12	SS	51	240 73.1										
			13	SS	104	8"										
			14	SS	100	8"										
69.3 20.3	227.5 66.5	End of Borehole														

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 111

JOB 74-11018

LOCATION Co-ords. 15,680,949 N; 1,068,824 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 16, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY EL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT w_L	PLASTIC LIMIT w_P	WATER CONTENT w	BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F.kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000					WATER CONTENT % w_P — w — w_L			P.C.F. T/m ³	
87.1 0.0	Ground Level															GR. SA. SL. CL.
82.2 4.9	Organic silt, some vegetable matter Black and Grey Compact		1	SS	12	280 85.3										86.9
			2	SS	25											
			3	SS	25	270 82.3										1 9 50 40
	Silty clay to clayey silt, traces of sand and gravel. Firm to Very Stiff Greyish Brown		4	SS	12											
			5	SS	11	260 79.2										
			6	TW	PH											119 1.91
			7	TW	PH	250 76.2										136 2.18
76.2 11.9	Sandy silt to silty sand, traces of clay. Very Dense Reddish Brown		8	SS	76											
			9	SS	100	240 73.1										0 23 69 8
71.4 15.7	End of Borehole		10	SS	17											0 79 (21)

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 112

JOB 74-11018

LOCATION Co-ords. 15,680,835 N; 1,068,895 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 12-15, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY BL

SOIL PROFILE			SAMPLES			ft./m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w w_p ——— w ——— w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. T/m ³	REMARKS	
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)						
m. 86.6	284.0	Ground Level									
0.0	0.0	Fill				280					
		Clayey silt to silty clay, some sand and organic matters, pieces of asphalt and other debris.		1	SS	12	85.3				
		Firm to Stiff		2	SS	6	270				
				3	TP	PH	82.3				
80.0	262.5			4	TP	PH					
6.6	21.5	Sandy silt to silty sand, traces of clay and gravel.		5	SS	27	260				
				6	SS	14	79.2				
				7	SS	100/2	250				
		Compact to Very Dense		8	SS	61	76.2				
				9	SS	17	240				
		Brown and Grey		10	SS	35	73.1				
				11	SS	30	230				
				12	SS	66	70.1				
				13	SS	100/2	220				
65.7	215.5						67.0				
20.9	68.5	Silt to sandy silt, traces of clay & gravel.		14	SS	50	210				
		Hard		15	SS	82	64.0				
61.7	202.5	Reddish Brown		16	SS	75					
24.9	61.5	End of Borehole									
								50			
								kPa	100		

20
15 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 113

JOB 74-11018

LOCATION Co-ords. 15,680,497 N; 1,069,276 E

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 2-3, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F. T/m ³	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	20	40	60	80	100	w_p	w	w_L		
90.3	296.1	Ground Level														
0.0	0.0	Fill														
88.1	289.1	Cinder, gravel, organics Very Loose	1	SS	3	290										
2.2	7.0		2	SS	7	88.4										
			3	TW	PH											
			4	SS	9											
		Silty clay to clayey silt, traces of sand and gravel.	5	TW	PH	280										
			6	TW	PH	85.3										
			7	TW	PH	270										
		Firm to Very Stiff	8	SS	10	82.3										
			9	TW	PH	260										
			10	SS	12	79.2										
			11	TW	PH	250										
			12	TW	PH	75.2										
74.1	243.1															
16.2	53.0	Clayey silt with sand and gravel Hard.	13	SS	100	240										
72.3	237.1	Reddish Brown				73.1										
18.0	59.0	Sandy silt with some clay.	14	SS	100/9"											
		Very dense to dense	15	SS	88	230										
		Grey and brown	16	SS	37	70.1										
			17	SS	16	220										
						67.0										
65.4	214.6		18	SS	31											
24.9	81.5	End of Borehole														

20
15 \diamond 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE N^o 115

JOB 74-11018

LOCATION Co-ords. 15,680,606 N; 1,069,219 E

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 3-4, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY SL

SOIL PROFILE				SAMPLES		ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L			BULK DENSITY γ P.C.F. GR. SA. SI. CL.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT			SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000				
m. 91.2 0.0	299.1 0.0	Ground Level										
		Silty clay to clayey silt, traces of sand and gravel Very stiff to stiff. Brown & Grey		1	SS	15						
				2	SS	15						
				3	SS	10						
				4	TW	PH						
				5	TW	PH						
				6	TW	PH						
				7	SS	19						
				8	TW	PH						
				9	SS	15						
				10	TW	PH						
				11	TW	PH						
				12	TW	PH						
				13	TW	PH						
73.8 17.4	242.1 57.0	Sandy silt to silty sand, some clay. Very Dense		14	SS	100						
				15	SS	97						
				16	SS	27						
69.4 21.8	227.6 71.5	End of Borehole										

OFFICE REPORT ON SOIL EXPLORATION

20
15 ϕ 5 % STRAIN AT FAILURE
10

ORIGINATED BY Pk

COMPILED BY AKB

CHECKED BY SL

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 117

JOB 74-11018

LOCATION Co-ords. 15,680,643 N; 1,068,568 E

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 16-17, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY BL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F. T/m ³	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		20	40	60	80	100	w_p	w	w_L		
m. 85.9 0.0	Ground Level					280 85.3										281.8 85.9
	Silty clay to clayey silt, occasionally laminated, traces of sand and gravel.		1	SS	6											
			2	TW	PH	270 82.3										119 1.91
	Firm to Stiff		3	TW	PH											
	Greyish Brown		4	TW	PH	260 79.2										134 2.15
77.8 8.1	255.3 26.5		5	SS	10											
	Sandy silt to silty sand, traces of clay.		6	SS	66	250 76.2										
	Very Dense		7	SS	92											
	Reddish Brown		8	SS	100	240 73.1										
71.7 14.2	235.3 46.5		9	SS	54											1 77 19 3
	End of Borehole															

RECORD OF BOREHOLE NO 118

JOB 74-11018

LOCATION Co-ords. 15,680,465 N; 1,068,866 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 25-26, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY

SOIL PROFILE				SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L	BULK DENSITY γ P.C.F. GR. SA. SI. CL. T/m ³	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		20 40 60 80 100	PLASTIC LIMIT — w_p		
							SHEAR STRENGTH P.S.F. kPa	w_p — w — w_L	WATER CONTENT %	
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE			
							400 800 1200 1600 2000		20 40 60	
105.2 0.0	345.1 0.0	Ground Level								
		Silty clay, traces of sand and gravel		1	SS	39				
		Desiccated		2	SS	37				
		Hard		3	SS	39				
		Brown		4	SS	37				
				5	SS	46				
				6	SS	60				
94.4 10.8	309.6 35.5	Silty clay, pockets of silt, occasional gravel		7	SS	31				
		Stiff to Very Stiff		8	TW	PH				124 1.99
		Greyish Brown		9	TW	PH				121 1.94
				10	TW	PH				145 2.32
				11	SS	16				
				12	TW	PH				120 1.92
				13	TW	PH				115 1.84
				14	TW	PH				120 1.92
81.4 23.8	267.1 78.0	Clayey silt to silt, some sand and occasional gravel. Very stiff to Hard		15	SS	21				
		Reddish Brown		16	SS	29				
				17	SS	28				
				18	SS	22				
74.3 30.9	243.6 101.5	End of Borehole		19	SS	100/8"				

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

OFFICE REPORT ON SOIL EXPLORATION

ORIGINATED BY PK

COMPILED BY AKB

CHECKED BY SL

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 120

JOB 74-11018

LOCATION Co-ords. 15,680,390 N; 1,068,369 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 18-19, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY

SOIL PROFILE			SAMPLES		ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w w_p — w — w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. GR. SA. SI. CL.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE					
m. 90.0 0.0	ft. 295.2 0.0								
	Ground Level								
	Fill								
	Silty clay to clayey silt with mixed fill material.		1	TW PH	290			109	
			2	SS 8	288.4			1.75	
	Occasional organic contamination, various debris, glass, paper ashes, etc.		3	TW PH	280			126	
			4	TP PH	285.3			2.02	
	Soft to Stiff		5	TW PH	270			125	
			6	SS 16	282.3			2.00	
			7	TP PH	260			118	
			8	TW PH	279.2			1.89	
			9	TW PH	250			126	
76.0	249.2		10	SS 63	276.2			2.02	
14.0	46.0		11	SS 105	240			110	
	Silty sand to sand.							1.76	
	Grey								
	Very Dense								
71.2	233.7		12	SS 110	73.1				
18.8	61.5								
	End of Borehole								

 20
15 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 121

JOB 74-11018

LOCATION Co-ords. 15,680,330 N; 1,068,477 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Nov. 24, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY EL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		20	40	60	80	100	w_p	w	w_L		
86.9 0.0	285.0 0.0															
	Ground Level															
	Silty clay to clayey silt, traces and pockets of sand, occasional gravel		1	TW	PH	85.3									115	
			2	TW	PH										1.84	
			3	TW	PH	82.3									119	
			4	TW	PH										1.91	
	Firm to Stiff		5	SS	14	260									135	
			6	TW	PH	79.2									2.16	
			7	SS	64	250									129	
			8	SS	40	76.2									2.07	
			9	SS	75	240									121	
			10	SS	12	73.1									1.94	
	Silty sand to sandy silt. Dense to Very Dense Grey & Reddish Brown		11	SS	41	230										
69.7 17.2	228.5 56.5					70.1										
	End of Borehole															

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 122

JOB 74-11018

LOCATION Co-ords. 15,680.265 N; 1,068,579 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 22-23, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ	REMARKS	
ELEV. m.	DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT (0.3 m)	20	40	60	80	100	w_p	w			w_L
98.5	0.0	Ground Level															
0.0	0.0	Silty clay to clayey silt, occasional pockets of silt, random stratification. Very Stiff to Firm Brown & Grey		1	TW	PH	320										
							97.5										
						2	TW	PH									
							310										
						3	TW	PH	94.5								
						4	TW	PH									
							300										
						5	SS	36	91.4								
				6	TP	PH											
					290												
				7	TW	PH	88.4										
				8	TW	PH											
					280												
				9	TP	PH	85.3										
				10	TW	PH											
				11	SS	11	270										
							82.3										
				12	SS	23											
				13	SS	35											
					260												
				14	SS	19	79.2										
				15	SS	22	250										
					76.2												
				16	SS	99											
				17	SS	164											
							240										
					73.1												
72.3	237.0	End of Borehole		18	SS	100	6"										
26.2	86.0																
								50			100						
									kPa								

20
15 \div 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

JOB	<u>74-11018</u>	LOCATION	<u>Co-ords. 15,679,978 N; 1,068,451 E</u>	ORIGINATED BY	<u>PK</u>
W.P.	<u>46-74-CO</u>	BORING DATE	<u>Nov. 24, 1971</u>	COMPILED BY	<u>AKB</u>
DATUM	<u>Geodetic</u>	BOREHOLE TYPE	<u>Auger</u>	CHECKED BY	<u>PK</u>

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 124

JOB 74-11018

LOCATION Co-ords. 15,680,478 N; 1,068,481 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Dec. 14-15, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY EL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT —w _L PLASTIC LIMIT —w _p WATER CONTENT —w w _p — w — w _L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS		
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)						SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000	
m. 86.5 0.0	283.7 0.0	Ground Level										
			1	SS	9	280						
			2	SS	21	85.3						
			3	TW	PM							
			4	TW	PM							
			5	TW	PH	270						
			6	TW	PM	82.3						
			7	SS	11	260						
			8	SS	11	79.2						
77.8	255.2	Silty clay to clayey silt, traces of gravel. Firm to Stiff	9	TW	PH							
8.7	28.5		10	SS	109							
			11	SS	71	250						
74.6	244.7	Sandy silt, some clay, traces of gravel (Till) Very dense Reddish-Brown										
11.9	39.0	End of Borehole	12	SS	44	76.2						
							50	kPa	100			

ORIGINATED BY WA

COMPILED BY AKB

CHECKED BY 3L

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 202

JOB 74-11018

LOCATION Co-ords. 15,679,472 N; 1,067,921 E.

ORIGINATED BY WA

W.P. 46-74-CO

BORING DATE June 23, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY SL

SOIL PROFILE		SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	NUMBER	TYPE		20	40	60	80	100	W _P	W	W _L		
m. 89.6 0.0	293.8 0.0	Ground Level			SHEAR STRENGTH P.S.F. kPa					WATER CONTENT %				
					○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
					400 800 1200 1600 2000					20 40 60				
86.5	283.8	1	SS	7	290					○			122	1 12 82 5 0 0 52 48 0 21 66 13
		2	SS	5	68.4					○			1.95	
3.1	10.0	3	SS	54/3						○			127	
		4	SS	17	280					○			2.03	
		5	TW	PH	85.3					○			128	
		6	SS	13						○			2.05	
		7	TW	PH	270					○			125	
		8	SS	13	82.3					○			2.00	
		9	TW	PH	260					○				
		10	SS	7	79.2					○				
		11	TW	PH	250					○				
74.9	245.8	12	SS	60/5	76.2					○				
14.7	48.0	13	SS	91	240					○				
		14	SS	60/3	73.1					○				
		15	SS	32	230					○				
		16	TW	PH	70.1					○				
67.0	219.8	17	SS	16	220					○				
22.6	74.0	18	SS	68	67.0					○				
59.7	195.8				210					○				
29.9	98.0				64.0					○				
					200					○				
					60.9					○				
					190					○				

 20
15 5 % STRAIN AT FAILURE
10

Continued

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE N^o 202 Continued

JOB 74-11018

LOCATION Co-ords. 15,679,472 N; 1,067,921 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE June 23, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY B

SOIL PROFILE			SAMPLES		ft/m	DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT —WL			BULK DENSITY	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	BLOWS / FOOT (0.3 m)				PLASTIC LIMIT —WP	WATER CONTENT —W		
							SHEAR STRENGTH P.S.F.							
							O UNCONFINED + FIELD VANE							
							● QUICK TRIAXIAL X LAB VANE							
							WATER CONTENT %							
							20 40 60							
							P.C.F. GR.SA.SI.CL							
57.9	189.8	Continued												
31.7	104.0		19	SS	60/41									
55.5	182.1	Clayey silt, some sand, traces of gravel. Hard. Brown												2 22 48 28
34.1	111.7	End of Borehole				180 54.8								

20
15 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 203

JOB 74-11018

LOCATION Co-ords. 15,679,543 N; 1,067,714 E

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE June 24-29, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY SL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — w_L			BULK DENSITY	REMARKS
ELEV. m.	DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	BLOWS / FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa	PLASTIC LIMIT — w_p	WATER CONTENT — w		
100.1	328.5	Ground Level							o UNCONFINED + FIELD VANE				
0.0	0.0	Silty sand, traces of gravel (fill)		1	SS	14			• QUICK TRIAXIAL x LAB VANE				
97.7	320.5	Compact, brown.		2	SS	15	320		400 800 1200 1600 2000				
2.4	8.0	Clayey silt to silty clay, traces of coarse sand.		3	SS	22	97.5						
		Firm to very stiff.		4	SS	36							
		Brown becoming Grey.		5	SS	30	310						
				6	SS	22	94.5						
				7	SS	18	300						
				8	SS	17	91.4						
				9	SS	10	290						
				10	TW	PM	88.4						
				11	SS	11							
				12	TW	PM	280						
				13	TW	PM	85.3						
82.4	270.5	Clayey silt with sand and gravel.		14	SS	27	270						
17.7	58.0	Very stiff.		15	SS	28	82.3						
				16	SS	31	260						
				17	SS	16	79.2						
75.4	247.5	Sandy silt with some clay and traces of gravel.		18	TW	PM	250						
24.7	81.0	Very dense.		19	SS	113	76.2						
		Brown.		20	SS	121	240						
				21	SS	82	73.1						
				22	SS	93							
68.7	225.5			23	SS	148	230						
31.4	103.0						70.1						

20
15 5 % STRAIN AT FAILURE
10

Continued

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

 RECORD OF BOREHOLE N^o 203 Continued

JOB 74-11018

LOCATION Co-ords. 15,679,543 N; 1,067,714 E

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE June 24-29, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY SL

SOIL PROFILE			SAMPLES			f/m 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 %			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 × LAB VANE												
68.4	224.5																		
31.7	104.0	Silty sand, traces of gravel. Very Dense	24	SS	14											3 79 (18)			
						220													
						67.0													
65.1	213.5	Silt to clayey silt. Hard	25	SS	120	7"													
35.0	115.0																		
						210													
						64.0													
61.8	202.8		26	SS	100	8"													

OFFICE REPORT ON SOIL EXPLORATION

ORIGINATED BY KW

COMPILED BY AKB

CHECKED BY BL

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 205

JOB 74-11018

LOCATION Co-ords. 15,679,284 N; 1,067,778 E

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE June 24-28, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY SL

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 100 200 1200 1600 2000	LIQUID LIMIT —w _L PLASTIC LIMIT —w _p WATER CONTENT —w w _p — w — w _L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS	
m. ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)							
83.6 0.0	274.3 0.0	Ground Level										
		Clayey silt with traces of sand, seams of sand and gravel, organic contamination Firm to stiff.		1	SS	4	270					▽ 271.2 82.7
				2	SS	14	82.3					
				3	SS	11						
				4	TW	PH	260	+s=2.7				
				5	TW	PH	79.2	+s=2.4				0 3 34 63
				6	SS	5		+s=7.2				
				7	TW	PH	250	+s=2.7				
75.7 7.9	248.3 26.0	Clayey silt with sand and gravel. Hard. Red-brown.		8	SS	73	76.2	+s=3.2				
				9	SS	87	240					
				10	SS	66/1"	73.1					5 16 57 22
70.5 13.1	231.3 43.0	Clayey silt, Traces of sand to silt, some sand. Very stiff to hard & dense. Grey becoming red-brown.		11	SS	22	230					
				12	SS	16	70.1					
				13	TW	PH	220					0 9 90 1
				14	SS	14	67.0					
				15	SS	43	210					
				16	SS	46	64.0					
				17	SS	43	200					
				18	SS	60/2"	60.9					
55.0 28.6	180.6 93.7	End of Borehole					190 57.9					
							180 54.8					
								50 kPa 100				

 20
15 ϕ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 206

JOB 74-11018

LOCATION Co-ords. 15,679,659 N; 1,067,524 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 8 - 12, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Washboring BX Casing

CHECKED BY SL

SOIL PROFILE			SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000	LIQUID LIMIT — w _L PLASTIC LIMIT — w _p WATER CONTENT — w w _p — w — w _L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. GR. SA. SI. CL.	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE					
108.7	356.5	Ground Level							
0.0	0.0	Gravelly sand to sandy gravel, traces of silt. Compact to dense. Brown.		1	SS	51			41 51 (8)
				2	SS	18			
				3	SS	25			346.2 105.5
				4	SS	10			68 26 (6)
				5	SS	42			33 53 (14)
102.3	335.5						100/7"		
6.4	21.0	Clayey silt to silty clay, Traces of sand & gravel. Occasionally laminated. Firm to stiff. Grey.		6	SS	14			
				7	TW	PH			123
				8	TW	PH			1.97
				9	TW	PH			129
				10	TW	PH			2.06
				11	TW	PH			127
				12	TW	PH			2.03
				13	TW	PM			119
				14	TW	PH			1.90
				15	TW	PH			118.5
				16	TW	PH			1.90
				17	TW	PH			
				18	SS	18			117
				19	SS	9			1.87
									120
									1.92
									119
									1.91
									120
									1.92
						</			

 20
15 5 % STRAIN AT FAILURE
10

Continued

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 206 Continued

JOB 74-11018

LOCATION Co-ords. 15,679,659 N; 1,067,524 E

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 8-12, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Washboring BX Casing

CHECKED BY PL

		SOIL PROFILE			SAMPLES			ft/m		DYNAMIC PENETRATION RESISTANCE			LIQUID LIMIT — w_L			BULK DENSITY γ	REMARKS
		ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	BLOWS / FOOT (0.3 m)			PLASTIC LIMIT — w_p			WATER CONTENT %		
									SHEAR STRENGTH P.S.F.			WATER CONTENT — w					
m.										O UNCONFINED + FIELD VANE			w_p — w — w_L				
										● QUICK TRIAXIAL X LAB VANE			20 40 60			P.C.F. GR. SA. SI. CL.	
76.5	250.8		Continued														
32.2	105.7		Clayey si. with sa. & gravel (Till)		20	SS	60/5	250									
74.9	245.8		Hard. Red.		21	SS	60/2	76.2									
33.8	110.7		End of Borehole														
					</												

RECORD OF BOREHOLE N° 207

JOB 74-11018

LOCATION Co-ords. 15,679,212 N; 1,067,400 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 14-15, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY SL

SOIL PROFILE				SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	Liquid Limit — w_L Plastic Limit — w_p Water Content — w	BULK DENSITY γ	REMARKS
m. ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		20 40 60 80 100	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE		
83.2 0.0	273.0 0.0	Ground Level								
81.8 1.4	268.5 4.5	Mixed Fill.		1	SS	2	82.3			270.9 82.6
		Clayey silt to silty clay, layers of sand and gravel.		2	SS	6				1 55 34 10
		Traces of organics		3	SS	3				
		Very soft to soft		4	SS	2	260			
		Brown & Grey		5	SS	5	79.2			
				6	TW	PH				
				7	TW	PH	250			
74.7 8.5	245.0 28.0	Clayey silt, some sand & gravel. Hard. Red-brown		8	SS	19	76.2			
				9	SS	30	240			
				10	SS	37	73.1	100/10 $\frac{1}{2}$		
				11	SS	59	230			0 70 (30)
69.8 13.4	229.0 44.0	Silty sand. Compact. Grey - brown.		12	SS	20	70.1			
				13	SS	16	220			
65.3 17.9	214.2 58.8	Clayey silt, Traces of sand. Hard.		14	SS	43	67.0			
				15	SS	43	210			
				16	SS	34	64.0			
							200			
57.9 25.3	190.0						190			
57.3 25.9	187.9 65.1	Weathered Shale. End of Borehole		17	SS	60/4	57.9			18 42 30 10
				18	SS	60/2				
							50	kPa	100	

20
15 ϕ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 208

JOB 74-11018

LOCATION Co-ords. 15,679,496 N; 1,067,347 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE July 1-7, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY

SOIL PROFILE			SAMPLES			ft./m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3m)					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3m)	ELEV. SCALE	20	40	60	80	100	W _P	W	W _L		
99.0	324.7	Ground Level														
0.0	0.0	Silty sand, traces of gravel.														
97.0	318.2	Loose	1	SS	7	320									T/m ³	59 26 6
2.0	6.5	Clayey silt to silty clay with traces of sand and gravel occ. laminated	2	SS	4	97.5										320.2
			3	SS	4											97.6
			4&5	TW	PM	310										
			6&7	TW	PM	94.5										
			8	SS	PM											
		Firm to Very Stiff	9	SS	8	91.4										
			10	TW	PM											
		Grey	12	SS	7	88.4										
			13	TW	PM											
			14	SS	8	85.3										
			15	TW	PM											
			16	SS	24	82.3										
			17	SS	21											
			18	SS	31	79.2										
77.6	254.7															
21.4	70.0	Silty sand to sandy silt with some gravel and clay (Glacial Till)	19	SS	101	250										30 42 24 4
		Very Dense	20	SS	100	76.2										
73.1	239.7	Red	21	SS	100											1 18 60 21
25.9	85.0	Silty sand	22	SS	9	73.1										
		Very Dense														
70.8	232.2		23	SS	79											0 77 (23)
28.2	92.5	End of Borehole														

 20
15 \diamond 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE N^o 209

JOB 74-11018

LOCATION Co-ords. 15,679,479 N; 1,067,187 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 5, 6, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY SL

SOIL PROFILE				SAMPLES		ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT					
92.3	302.7	Ground Level								
0.0	0.0	Clayey silt to silty clay with traces of sand and gravel.								
			1	SS	10	91.4				
			2	SS	16					
			3	SS	29					
		Occasionally laminated.	4	SS	45	290				
			5	SS	43	88.4				
		Stiff to Hard	6	SS	21					
		Grey	7	TW	PH	280				
			8	SS	9	85.3				
			9	TW	PM	270				
			10	SS	24	82.3				
			11	TW	PH	260				
			12	SS	31	79.2				
			13	SS	100	250				
74.6	244.7					76.2				
17.7	58.0	Silt with pockets of clayey silt.	14	SS	60/4"	240				
		Hard	15	SS	55	73.1				
70.0	229.7					230				
69.6	228.2	Silty sand.	16	SS	41	70.1				
22.7	74.5	End of Borehole								
							50 kPa	100		

OFFICE REPORT ON SOIL EXPLORATION

20
15 ϕ 5 % STRAIN AT FAILURE
10

CHECKED BY SE

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 211

JOB 74-11018

LOCATION Co-ords. 15,679,672 N; 1,066,665 E

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE July 7, 8, 1971

COMPILED BY KW

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS	
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)						ELEV. SCALE
m. 91.7 0.0	300.8 0.0	Ground Level									
				</							

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 212

JOB 74-11018

LOCATION Co-ords. 15,679,348 N; 1,066,916 E.

ORIGINATED BY WA

W.P. 46-64-00

BORING DATE June 30, July 1, 5, 1971

COMPILED BY KW

DATUM Geodetic

BOREHOLE TYPE Pendrill and BX Washbore

CHECKED BY EL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L			BULK DENSITY	REMARKS
ELEV.	DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE		BLOWS/FOOT	BLOWS / FOOT					PLASTIC LIMIT — w_p			
m	ft.					SHEAR STRENGTH P.S.F. kPa					WATER CONTENT — w			γ		
		○ UNCONFINED + FIELD VANE					w_p — w — w_L			GR. SA. SI. CL.						
		● QUICK TRIAXIAL x LAB VANE					WATER CONTENT %				P3					
		400 800 1200 1600 2000					20 40 60			P1						

RECORD OF BOREHOLE № 213

JOB 74-11018

LOCATION Co-ords. 15,679,403 N; 1,066,715 E.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE June 28, 29, 30, 1971

COMPILED BY KW

DATUM Geodetic

BOREHOLE TYPE Pendrill, BX & AXT Washboring

CHECKED BY BL

SOIL PROFILE			SAMPLES			ft/m		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — w_L		BULK DENSITY γ	REMARKS	
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE (0.3m)	BLOWS / FOOT (0.3m)		SHEAR STRENGTH P.S.F. kPa		PLASTIC LIMIT — w_p			
											WATER CONTENT — w			
82.8	271.7	Ground Level												
0.0	0.0	Organic silt with traces of sand.		1	SS	9	270							
		Very Loose		2	SS	3	82.3							
		Dark Brown & Grey		3	SS	3								
				4	SS	2	260							
				5	SS	12	79.2							
77.3	253.7			6	SS	30								
5.5	18.0	Silt to silty sand, seams of gravel, traces of clay.		7	SS	24	250							
		Compact		8	SS	21	76.2							
		Brown		9	SS	21								
70.9	232.7			10	SS	64	240							
11.9	39.0	Clayey silt to silt with some sand and gravel		11	SS	60 7/8"	73.1							
		(Glacial Till)		12	SS	60 7/8"	230							
		Red-Brown		13	SS	60 1/2"	70.1							
							220							
							67.0							
63.8	209.2			14	RC	50"	210							
19.0	62.5	End of Borehole					64.1							

20
15 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 214

JOB 74-11018

LOCATION Co-ords. 15,679,467 N; 1,066,514 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE June 29, 1971

COMPILED BY KW

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3m)					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT (0.3m)		20	40	60	80	100	SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE				
82.3	270.0	Ground Level														
0.0	9.0	Organic silt with some sand, traces of vegetable matter. Very Loose		1	SS	2										
				2	SS	4										
				3	SS	3	260									
		Dark Brown and Black		4	SS	4	79.2									
77.7	255.0			5	SS	42										
4.6	15.0	Silt to sandy silt, traces of clay and gravel. Very Dense		6	SS	121	250									
				7	SS	57	76.2									
				8	SS	70	240									
		Grey					73.1									
71.6	235.0			9	SS	91										
10.7	35.0	Clayey silt with some sand and gravel. (Glacial Till) Hard		11	SS	93/6"	230									
				12	SS	100/6"	70.1									
				13	SS	101/7"	220									
		Red ^m Brown					67.0									
65.7	215.4			14	SS	50/4"										
16.6	54.6	End of B orehole														

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 215

JOB 74-11018 LOCATION Co-ords. 15,679,710 N. 1,066,436 E. ORIGINATED BY K WA
 W.P. 46-74-00 BORING DATE July 13, 14, 1971 COMPILED BY KW
 DATUM Geodetic BOREHOLE TYPE Pendrill CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_P WATER CONTENT — w			BULK DENSITY γ P.C.F. GR. SA. SI. CL.	REMARKS
ELEV. DEPTH m ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3m)		20	40	60	80	100	w_p	w	w_L		
93.1 305.6	Ground Level															
0.0 90.4	0.0 296.6	X	1	SS	5	300									T/m ³	1 80 (19)
	Very Loose		2	SS	3	91.4										
2.7 90.4	9.0 296.6	X	3	SS	10											119 1.906
	Brown		4	SS	8											
	Clayey silt to silty clay, traces of sand and gravel.	X	5	TW	PM	290										124 1.986
			6	SS	15	88.4										
		X	7	TW	PM	280										127 2.034
			8	SS	19	85.3										
	Stiff to Very Stiff	X	9	TW	PM/PH 15"	270										133 2.130
			10	SS	24	82.3										
	Grey	X	11	TW	PH	260										137 2.194
			12	SS	73	79.2										
78.5 14.6	257.6 48.0	X	13	SS	100/11"	250										122 1.954
	Clayey silt to silt, traces of sand.		14	SS	88	76.2										
	Hard	X	15	SS	105/11"	240										0 8 75 17
	Red-Brown		16	SS	60/4"	73.1										
72.1 21.0	236.7 68.9															
	End of Borehole															

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 216

JOB 74-11018

LOCATION Co-ords. 15,679,834 N; 1,066,169 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE July 8, 9, 1971

COMPILED BY KW

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY PL

SOIL PROFILE			SAMPLES			ft/m 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 ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3m)		20	40	60	80	100	w_p	w	w_L		
99.0	324.7	Ground Level														
0.0	0.0	Clayey silt with organics. Firm	1	SS	6	320										
96.7	317.2	Dark Grey	2&3	SS	5	97.5										
2.3	7.5	Clayey silt to silty clay with traces of sand and gravel. occasionally laminated	4	SS	16											
			5	SS	25	310										
			6	SS	31	94.5										
			7	SS	34											
			8	SS	24	91.4										
			9	SS	27											
			10	SS	17	88.4										
		Stiff to Hard	11	SS	13											
			12	TW	PM	85.3										
		Grey & Brown	13	SS	29											
			14	SS	32	82.3										
80.7	264.7		15	SS	100/1"											
18.3	60.0	Clayey silt with some sand & gravel (Glacial Till)	16	SS	100/1"	79.2										
		Red	17	SS	70/5"											
		Hard	18		50/1"											
76.2	250.1															
22.8	74.6	End of Borehole														

 20
15 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 217

JOB 74-11018

LOCATION Co-ords. 15,679,992 N; 1,066,055 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE July 15, 16, 1971

COMPILED BY KW

DATUM Geodetic

BOREHOLE TYPE Penndrill

CHECKED BY EL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3m)					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3m)	ELEV. SCALE	SHEAR STRENGTH P.S.F. kP_a					WATER CONTENT %			γ	
							400	800	1200	1600	2000	20	40	60	P.C.F.	GR.SA.SI.CL.
99.1	325.2	Ground Level														
0.0	0.0	Silty sand, some organics.														
		Loose	1	SS	7	320									T/m ³	
97.1	318.7		2	SS	12	97.5										
2.0	6.5		3	SS	17											
		Clayey silt to silty clay, traces of sand and gravel.	4	SS	28	310										
			5	SS	30	94.5										1 3 45 51
			6	SS	28											
		Stiff to Hard	7	SS	26	300										
			8	SS	28	91.4										
			9	SS	17	290										
			10	SS	10	88.4										
		Grey	11	TW	PM	280									131	
			12	SS	45	85.3									2.098	
															134	
															2.146	
83.0	272.2															
16.1	53.0	Clayey silt to silt, some sand.	13	SS	50/	270										
		Hard	14	SS	50/4"	82.3										
		Red-Brown	15	SS	50/3"	260										
						79.2										
77.6	254.7		16	SS	50/4"											
21.5	70.5	End of Borehole														
		Note: Hole caved in to El. 267.± immediately														

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 218

JOB 74-11018

LOCATION Co-ords. 15,679,963 N; 1,065,885 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE July 12, 1971

COMPILED BY KW

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY SL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3m)					LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w			BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT (0.3m)		20	40	60	80	100	w_P	w	w_L		
83.2	273.0	Ground Level														
0.0	0.0	Silty fine sand.				270										
81.5	267.5	Loose	1&2	SS	6	82.3										\bar{V} 267.9
1.7	5.5	Clayey silt, some sand and organics.	3	SS	3											\bar{V} 81.7
		Soft to Firm	4	SS	6											
		Dark Grey	5	SS	4	260										
78.0	256.0	Dark Grey	6	TW	PM	79.2										
5.2	17.0	Clayey silt to silt, some sand & gravel.	7	SS	50/3 1/2"											
		Hard				250										
		Dark Brown	8	SS	50/2 1/2"	76.2										
74.1	243.2		9	SS	50/2 1/2"											0 38 44 1
9.1	29.8	End of Borehole														

ORIGINATED BY KW

COMPILED BY KW

CHECKED BY 31

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 220

JOB 74-11018

LOCATION Co-ords. 15,679,705 N; 1,066,028 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE July 12, 1971

COMPILED BY KW

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY

SOIL PROFILE				SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L			BULK DENSITY	REMARKS
ELEV. m	DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3m)		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					WATER CONTENT %				
								● QUICK TRIAXIAL × LAB VANE					20 40 60				
83.4	273.5	Ground Level														P.C.F.	GR.SA.SI.CL.
0.0	0.0																
		Clayey silt with some sand & gravel.		1	SS	22	270										
							82.3										
				3	SS	67											
				4	SS	62											
		Hard		5	SS	57	260										
							79.2										
				6	SS	76											
		Grey Brown and Red Brown		7	SS	60/2"											
							250										
				8	SS	75/6"	76.2										
74.3	243.7			9	SS	50/3"											4 31 49 16
9.1	29.8	End of Borehole															

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 221

JOB 74-11018

LOCATION Co-ords. 15,679,127 N; 1,067,734 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE Aug. 6-9, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY

SOIL PROFILE		STRAT. PLOT	SAMPLES		ft./m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3m)					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS
ELEV. DEPTH ft	DESCRIPTION		NUMBER	TYPE		20	40	60	80	100	W _P	W	W _L		
83.3	273.4	Ground Level													
0.0	0.0	Organic clayey silt, seams of silt & sand, occasional gravel.	1	SS	3										270.7
		Very Soft to Soft	2	SS	3										
		Black & Grey	3	SS	3										
			4	SS	4										
			5	SS	10										
			6	SS	3										
			7	TW	PH										
75.2	246.9		8	TW	PH										
8.1	26.5	Clayey silt with sand and gravel	9	SS	31										
		(Glacial Till)	10	SS	75										
		Reddish Brown	11	SS	70										
69.6	228.4	Hard	12	SS	56										
13.7	45.0		13	SS	18										
		Clayey silt to silt, traces of sand.	14	SS	22										
		Very stiff to hard	15	SS	17										
			16	SS	33										
			17	SS	40										
			18	SS	50										
			19	SS	27										
			20	SS	23										
			21	SS	33										
55.3	181.4		22	SS	75/3"										
28.0	92.0	End of Borehole													

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 222

JOB 74-11018

LOCATION Co-ords. 15,679,208 N; 1,067,946 E.

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE Aug. 10-11, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Pendrill

CHECKED BY PL

SOIL PROFILE			SAMPLES			ft/m 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 m ft	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (10.3m)		20	40	60	80	100	W _P	W	W _L		
83.2 0.0	272.9 0.0	Ground Level														
0.0	0.0	Layers of clayey silt to silt, sand and gravel heavily contaminated with organics.	1	SS	28	270										V 271.6
			1A	SS	3	82.3										82.8
			2	SS	20											
			3	SS	3	260										
			4	SS	38	79.2										
			5	SS	11											
			6	SS	4	250										
			7	SS	8	76.2										
74.7 8.5	244.9 28.0	Black and Grey Soft & Very Loose to Dense	8	SS	36											
			9	SS	75	240										
			10	SS	60	73.1										
			11	SS	58	230										
			12	SS	69	70.1										
			13	SS	54	220										
			14	SS	45	67.0										
63.2 20.0	207.4 65.5	Clayey silt with traces of sand (Glacial Till) Reddish Brown Hard	15	SS	92	210 64.0										
		End of Borehole														

 20
15 5 % STRAIN AT FAILURE
10

OFFICE RECORD ON SOIL EXPLORATION

ORIGINATED BY KW

COMPILED BY AKB

CHECKED BY EL

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

CHECKED BY EL

15 $\overset{20}{\underset{10}{\circ}}$ 5 % STRAIN AT FAILURE

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 225

JOB 74-11018

LOCATION Co-ords. 15,679,508 N; 1,067,820 E

ORIGINATED BY KW

W.P. 46-74-00

BORING DATE Aug. 17 - 19, 1971

COMPILED BY AKB

DATUM Geodetic

BOREHOLE TYPE Penndrill & Washboring BX Casing

CHECKED BY PL

SOIL PROFILE			SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F. T/m ³	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE			20 40 60 80 100	20 40 60	20 40 60		
91.6 0.0	Ground Level				91.4						
	Silty clay to		1	SS	39						
	clayey silt		2	SS	22						
	traces of sand		3	SS	20	290					
	and gravel		4	SS	9	88.4					
	Stiff		5	TW	PH		+ s=2.3			119	
	Grey & Brown		6	TW	PH		+ s=2.8			1.91	
			7	SS	13	85.3	+ s=2.8			118	
			8	TW	PH		+ s=3.3			1.89	
			9	SS	16		+ s=2.4			125	
			10	TW	PH	270	+ >2000			2.00	
			11	SS	14	82.3	+ s=1.9				
			12	TW	PH		+ s=1.7				
			13	SS	10	260				129	
			14	TW	PH	79.2	+ s=1.8			2.07	
			15	SS	28	250	+ s=2.7			123	
75.7 15.9	Clayey silt		16	SS	75	76.2	+ >2000			1.97	
	trace of sand &		17	SS	73	240					
	gravel		18	SS	58	73.1					
	Hard		19	SS	66	230					
	Brown		20	SS	3	70.1					
69.3 22.3	Silty sand to sand		21	SS	36	220					
	Dense		22	SS	66	67.0					
66.3 25.3	Clayey silt with		23	SS	95	210					
	sand and gravel										
63.7 27.9	Glacial till Hard										
	End of Borehole					64.0					

 20
15 \pm 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 226

JOB 74-11018

LOCATION Co-ords. 15,679,605 N; 1,067,657 E

ORIGINATED BY BM

W.P. 46-74-00

BORING DATE Dec. 13-15, 1971.

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger and Washboring

CHECKED BY SL

SOIL PROFILE			SAMPLES			ft./m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F. GR.SA.SI.CL T/m ³	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT % w_p — w — w_L				
108.4 0.0	355.5 0.0	Ground Level														
		Fill														
		Silty sand some		1	SS	5	350						○			
		gravel, some roots		2	SS	4	106.7						○			
		Dense		3	SS	6							○			
104.4 4.0	342.5 13.0			4	SS	10	340						○			
				5	SS	17	103.6						○			
		Silty clay to		6	SS	13							○			
		clayey silt,		7	SS	41							○			
		Traces of sand and		8	SS	36	330						○			
		gravel		9	SS	17	100.6						○			
		Occasional pockets		10	TW	PH							○			
		of silt		11	SS	--	320						○			
		Greyish brown		12	TW	PH	97.5						○			
		Firm to stiff		13	TW	PH							○			
				14	TW	PH	310						○			
				15	TW	PH	94.5						○			
				16	TW	PH							○			
				17	TW	PH	300						○			
				18	TW	PH	91.4						○			
				19	TW	PH							○			
				20	TW	PH	290						○			
				21	TW	PH	88.4						○			
				22	TW	PH							○			
				23	TW	PH	280						○			
				24	TW	PH	85.3						○			
				25	SS	--							○			
82.5 25.9	270.5 85.0	Clayey silt with		26	SS	--	270						○			
		some sand and gravel		27	SS	22	82.3						○			
		(Till)		28	SS	34							○			
		Very stiff to hard.		29	SS	30	260						○			
				30	SS	55	79.2						○			
				31	SS	20							○			

20 50 kPa 100
15 5 % STRAIN AT FAILURE
10

Continued

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 226 Continued

JOB 74-11018 LOCATION Co-ords. 15,679,605 N; 1,067,657 E ORIGINATED BY DM
 W.P. 46-74-00 BORING DATE Dec. 13-15, 1971 COMPILED BY PK
 DATUM Geodetic BOREHOLE TYPE Auger and Washboring CHECKED BY FL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)			LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ P.C.F.	REMARKS
m. ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. O UNCONFINED + FIELD VANE @ QUICK TRIAXIAL X LAB VANE			WATER CONTENT % w_p w w_L 20 40 60				
76.7	251.5	Continued												
31.7	104.0		32	SS	29	250								
75.8	248.5					76.2								
32.6	107.0	Silty fine sand.	33	SS	53									
		Very dense. Red.	34	SS	193									
72.9	239.0		35	SS	95	240								
35.5	116.5	End of Borehole				73.1								

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 227

JOB 74-11018

LOCATION Co-ords. 15,679,454 N; 1,067,628 E

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Nov. 29-30, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Penndrill & Cone Test

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		20	40	60	80	100	w_p	w	w_L		
95.9 0.0	Ground Level															
93.3 2.6	Sand with some silt and gravel Loose		1	SS	4	31.0										
			2	SS	9	94.5										
			3	SS	26											
			4	TW	PH	300										
			5	TW	PM	91.4										
			6	TW	PH											
			7	TW	PM	290										
			8	TW	PM	88.4										
			9	SS	7	280										
			10	TW	PM	85.3										
			11	TW	PM											
			12	SS	14	270										
			13	SS	27	82.3										
			14	TW	PM											
			15	SS	20	260										
			16	TW	PM	79.2										
			17	TW	PM											
76.4 19.5	Sandy silt, some clay, trace of gravel		18	SS	81	250										
74.1 21.8	Hard.		19	SS	74	76.2										
	End of Borehole															

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 228

JOB 74-11018 LOCATION Co-ords. 15,679,176 N; 1,067,619 E ORIGINATED BY PK
 W.P. 46-74-00 BORING DATE Nov. 29, 1971 COMPILED BY PK
 DATUM Geodetic BOREHOLE TYPE Auger & Cone Test CHECKED BY FL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		20	40	60	80	100	w_p	w	w_L		
83.9	Ground Level															
0.0	0.0		1	TW	PH											
	Fill		2	TW	PH											
	Organics		3	TW	PH											
	Sandy silt to silt, traces of clay, brick, wood, etc. Black and Grey		4	TW	PH											
			5	TW	PH											
			6	TW	PH											
78.1	256.4															
5.8	19.0		7	SS	26											
	Silty sand to sandy silt, traces of clay Compact to very dense.		8	SS	11											
			9	SS	44											
			10	SS	75											
74.3	243.9															
9.6	31.5															
	End of Borehole															

RECORD OF BOREHOLE № 229

JOB 74-11018

LOCATION Co-ords. 15,679,153 N; 1,067,506 E

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 29, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY _____

SOIL PROFILE			SAMPLES			ft./m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_P WATER CONTENT — w w_P — w — w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS
ELEV. m. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)					
83.7 0.0	274.5 0.0	Ground Level								
		Fill	1	TW	PH					
		Layers of silty clay, silty sand and silt.	2	SS	18	270				
		Organic matters throughout	3	TW	PH	82.3				
		Soft to stiff	4	TW	PH					
			5	TW	PH					
			6	TW	PH	260				
			7	SS	41	79.2				
			8	SS	6	250				
75.1	246.5					76.2				
8.6	28.0	Sandy silt, traces of clay, V. dense	9	SS	84					
73.9	242.5		10	SS	83					
9.8	32.0	End of Borehole								

OFFICE REPORT ON SOIL EXPLORATION

15 $\frac{20}{\phi}$ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 230

JOB 74-11018

LOCATION Co-ords. 15,679,277 N; 1,067,458 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Nov. 30, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY PL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ	REMARKS	
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)			SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 100 800 1200 1600 2000					WATER CONTENT % w_p — w — w_L 20 40 60
85.5 0.0	280.5 0.0	Ground Level										P.C.F.	GR. SA. SI. CL.
83.7 1.8	274.7 5.8	Gravelly sand with organics		1	TW	PH						T/m ³	40 48 (12)
				2	SS	32							277.0
				3	SS	26							84.4
				4	SS	27							
		Clayey silt to silty clay, traces of sand becoming stratified		5	TW	PH	270 52.3					128	
				6	TW	PH						2.05	
		clayey silt and silty clay pockets of silt		7	TW	PH						1.97	
				8	TW	PH	260 79.2					128	3 11 51 35
				9	TW	PH						2.05	
		Stiff		10	TW	PH						1.99	
				11	TW	PH	250 76.2					1.97	
				12	TW	PH						1.89	
74.8 10.7	245.5 35.0	Sandy silt, trace of clay, V. dense		13	SS	70						1.79	0 2 48 50
73.8 11.7	242.0 38.5	End of Borehole		14	SS	55						1.79	6 21 65 8
								50	kPa	100			

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 231

JOB 74-11018

LOCATION Co-ords. 15,679,337 N; 1,067,471 E

ORIGINATED BY DM

W.P. 46-74-CO

BORING DATE Nov. 30, 1971.

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger & Cone test

CHECKED BY EL

SOIL PROFILE			SAMPLES			ELEV. SCALE ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		20	40	60	80	100	w_p	w	w_L		
92.9 0.0	Ground Level															
89.2 3.7	Clayey silt traces of sand		1	SS	24	200						o				1 5 64 30
			2	SS	32	91.4						o				
			3	SS	33							o				
			4	SS	42							o				1 5 67 27
87.1 5.8	Gravelly sand, some silt. Dense		5	SS	33	290						o				N.L. EL. 16 67 (17)
			6	SS	32	88.4										288.9
			7	SS	33							o				88.1 35 40 20 5
	Silty clay, traces of sand		8	TW	PM											
			9	AS												
85.0 7.9	End of Borehole					280 85.3										

OFFICE REP. ON SOIL EXPLORATION

RECORD OF BOREHOLE NO 231A

JOB 74-11018

LOCATION Co-ords. 15,679,339 N; 1,067,475 E

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Nov. 30 - Dec. 3, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger and Wash Boring

CHECKED BY _____

SOIL PROFILE				SAMPLES			ELEV. SCALE ft./m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L	BULK DENSITY γ P.C.F. GR SA. SI. CL.	REMARKS	
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT							
m. 92.9	304.8	Ground Level										
0.0	0.0	Layers of gravelly sand, some silt and clayey silt										
			1	SS	19	300 91.4						
			2	SS	9							
					290 88.4							
			3	SS	25							
87.1	285.8	Silty clay, some sand, traces of gravel, occasional silt pockets. Stiff Greyish brown	4	TW	PM	280 85.3	s=3.6 + a s=5.2 + q					
5.8	19.0		5	TW	PM							
			6	TW	PM							
			7	SS	7							
			8	TW	PM	270 82.3						
			9	TW	PM							
			10	SS	14							
			11	TW	PM	260 79.2						
			12	TW	PM							
			13	SS	16							
			14	SS	34							
			15	SS	31							
76.4	250.8	Sandy silt, some clay. Dense to very dense.										
16.5	54.0		16	SS	68	250 76.2						
73.5	241.3	End of Borehole										
19.4	63.5						50 kPa	100				

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 232

JOB 74-11018

LOCATION Co-ords. 15,679,420 N; 1,067,484 E

ORIGINATED BY PK

W.P. 46-74-CO

BORING DATE Nov. 30 to Dec. 2, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w w_p ——— w ——— w_L			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000					WATER CONTENT % 20 40 60						
m. 97.0 0.0	318.3 0.0	Ground Level															
		Clayey silt, some organics. Stiff		1	TW	PH									124	GR SA. SI. CL	
				2	SS	12									1.99	0 5 65 30	
95.2 1.8	312.3 6.0	Silty sand, some gravel		3	SS	9	310										
		Dense		4	SS	30	94.5									14 54 26 6	
92.7 4.3	304.3 14.0			5	SS	32											
				6	SS	26											
				7	TW	PH	300								122/1.95		
				8	TW	PH	91.4								122/1.95		
		Silty clay													122	0 2 38 60	
		traces of sand													1.95		
		and gravel		9	TW	PH	290								133/2.13		
		pockets of silt		10	TW	PH	88.4								121.5/1.95		
				11	TW	PH									113	264.8	
				12	TW	PH	280								1.81	86.8	
				13	TW	PH	85.3								1.81	1 38 61	
				14	SS	9									1.95		
		sand seam													115/1.84		
		occasionally		15	SS	18	270								120	5 37 42 16	
				16	TW	PH	82.3								1.92		
		sand seam															
		laminated		17	TW	PH	260								133		
				18	SS	22	79.2								2.13		
		Stiff		19	TW	PH											
		Greyish brown		20	TW	PH	250									0 3 26 71	
75.7 21.3	248.3 70.0	Sandy silt, some clay. Compact to Very Dense		21	SS	19	76.2									8 32 43 17	
				22	SS	66											
72.5 24.5	237.8 80.5	End of Borehole		23	SS	100	24.0									5 27 57 11	
						</											

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 233

JOB 74-11018

LOCATION

Co-ords. 15,679,522 N; 1,067,477 E

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE

Dec. 2 to Dec. 7, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE

Auger and Wash Boring

CHECKED BY EL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F. T/m ³	REMARKS		
m. ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE			WATER CONTENT % w_p — w — w_L						
108.5	356.1	Ground Level												
0.0	0.0	Gravelly sand traces of silt Dense to very dense Brown												
			1	SS	43									
			2	SS	54	350								
			3	SS	29	106.7								
			4	SS	56									
			5	SS	30	340								
103.0	338.1	Clayey silt seams of sandy silt Stiff		6	AS	103.6								
5.5	18.0			7	SS	10								
				8	N/R		330							
				9	SS	7	100.6							
99.1	325.1	Gravelly sand traces of silt compact Silty clay pockets of sand & gravel Stiff to very stiff		10	TW	PH								
9.4	31.0			11	SS	27	320							
				12	SS	22	97.5							
96.8	317.6			13	SS	159	8"							
11.7	38.5			14	SS	48								
				15	SS	11								
			16	TW	PH	310								
92.5	303.6	Sandy silt with some gravel Very dense Clayey silt to silty clay stiff		17	TW	PH	94.5							
16.0	52.5			18	SS	71	300							
				19	SS	73	91.4							
90.2	296.1			20	SS	10								
18.3	60.0			21	TW	PH	290							
				22	SS	7	88.4							
			23	TW	PH									
			24	TW	PH	280								
			25	SS	10	85.3								
			26	TP	PH	270								
			27	SS	25	82.3								
			28	SS	27									
			29	TP	PH	260								
78.3	257.1	Clayey silt with some sand & gravel compact to very dense reddish brown		30	SS	37	79.2							
30.2	99.0			31	SS	24								

20
15-5 % STRAIN AT FAILURE
10

Continued

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 233 Continued

JOB 74-11018

LOCATION Co-ords. 15,679,522 N; 1,067,477 E.

ORIGINATED BY PK

W.P. 46-74-00

BORING DATE Dec. 2 to Dec. 7, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger and Washboring

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w _L PLASTIC LIMIT — w _p WATER CONTENT — w w _p — w — w _L WATER CONTENT % 20 40 60	BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)						
m. 76.8	252.1	Continued									
31.7	104.0	Clayey silt with some sand & gravel. Compact to Very dense Reddish Brown		32	SS	105	250				
							76.2				
74.8	245.6			33	SS	111					
33.7	110.5	End of Borehole									3 18 60 19

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 234

JOB 74-11018

LOCATION Co-ords. 15,679,530 N; 1,067,557 E

ORIGINATED BY PK&EM

W.P. 46-74-00

BORING DATE Dec. 8 - Dec. 10, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger and Washboring

CHECKED BY EL

SOIL PROFILE			SAMPLES			ft./m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ	REMARKS	
ELEV. m. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)			SHEAR STRENGTH P.S.F. KPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000					WATER CONTENT % w_p w w_L 20 40 60
108.2	355.0	Ground Level										P.C.F.	GR.SA.SI.CL
0.3	0.0	Asphalt										T/m ³	
		Silty sand		1	SS	8	350						
		traces of gravel		2	SS	3	106.7						9 66 20 5
				3	SS	3							
				4	SS	4							
		Concrete					340						6 79 (15)
		Very loose to loose		5	SS	16	103.6						12 75 (13)
				6	SS	7							
102.1	335.0			7	SS	7							
6.1	20.0	Silty clay seams		8	TW	PH	100.6					123	325.5
		of silt										1.97	99.2
		Stiff		9	TW	PH							V=21.68 (11)
99.1	325.0			10	SS	47							24 65 (11)
9.1	30.0	Gravelly sand		11	SS	58	320						9 9 53 29
		some silt & clay					97.5						
		V. dense		12	SS	9							
97.2	319.0			13	TW	PH						120/1.92	
11.0	36.0			14	TW	PH	310					119.5/1.91	
		Silty clay		15	TW	PH	94.5					120.5/1.93	
		to clayey silt		16	TW	PH						119/1.91	
		traces of sand		17	TW	PH	300					121/1.94	
		and gravel		18	TW	PH	91.4					121/1.94	
		pockets of silt		19	TW	PH						120/1.92	
				20	TW	PH	290					120/1.92	
		Stiff		21	TW	PH	86.4					114/1.83	
		Greyish brown		22	TW	PH						120/1.92	
				23	TW	PH	280					117.5/1.88	
				24	TW	PH	85.3					118.5/1.90	
				25	TW	PH						113/1.81	
				26	TW	PH	270					119	0 1 38 61
				27	TW	PH	82.3					1.91	
79.9	262.0			28	TW	PH						125	
28.3	93.0	Clayey silt with		29			260					2.00	
		sand and gravel		30	SS	24	79.2					128	
		(till)		31	SS	32						2.05	4 13 45 38
		Very stiff to hard		32	SS	28						131.5	
												2.11	

 20
15-5 % STRAIN AT FAILURE
10

Continued

OFFICE REPC ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 234 Continued

JOB 74-11018

LOCATION Co-ords. 15,679,530 N; 1,067,577 E

ORIGINATED BY PK & RM

W.P. 46-74-00

BORING DATE Dec. 8 - Dec. 10, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger and Washboring

CHECKED BY BL

SOIL PROFILE		STRAT. PLOT	SAMPLES		ft/m	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT W_L		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION		NUMBER	TYPE		BLOWS / FOOT	BL	PLASTIC LIMIT W_P	WATER CONTENT W		
m.	ft.										
76.5	251.0										
31.7	104.0										
	Continued										
	Clayey silt with		33	SS	20						
	sand and gravel		34	SS	29						
	(till)		35	SS	100						
	Very stiff to hard.		36	SS	105						
72.8	238.9										
35.4	116.1										
	End of Borehole										

20
15 ϕ 5 % STRAIN AT FAILURE
10

OFFICE REPLY ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 235

JOB 74-11018

LOCATION Co-ords. 15,679,734 N; 1,066,257 E

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Dec. 6-7, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger & Cone Test

CHECKED BY EL

SOIL PROFILE		SAMPLES		Ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	NUMBER	TYPE				W _P	W	W _L		
m. 94.7 0.0	310.6 0.0	Ground Level		310							
				94.5						T/m ³	
	Silty clay to	1	SS	40							
	clayey silt	2	SS	38							
	traces of sand and	3	SS	42							
	gravel,	4	SS	27							
	pockets of silt.	5	SS	33							
	Hard to stiff	6	TW	PM	290						
	Greyish brown	7	TW	PM	88.4					120	1 2 32 65
		8	TW	PM						1.92	
		9	SS	11						125	
		10	TW	PM	270					2.00	
		11	TW	PM	82.3					119	2 16 56 26
		12	SS	63	260					1.91	
		13	SS	168	79.2					127	8 22 56 14
		14	SS	146	250					2.03	
		15	SS	146	250					126	
		16	SS	146	250					2.02	
80.1 14.6	262.6 48.0	Sandy silt, some clay, traces of gravel (Till)		260							
				79.2							
				10"							
76.1 18.6	249.6 61.0	Very dense. End of Borehole		250							
				76.2							
					50	kPa	100				

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 236

JOB 74-11018

LOCATION Co-ords. 15,679,666 N; 1,066,129 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Dec. 13, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger & Cone Test

CHECKED BY FL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		20	40	60	80	100	w_p	w	w_L		
m. 85.0 0.0	Ground Level															
82.5 2.5	Clayey silt some sand Hard.		1	SS	39											
			2	SS	45	270										
			3	SS	40	82.3										
	Dense		4	SS	55											
	Sandy silt		5	SS	49											
	some clay															
	traces of gravel		6	SS	116	260										
	Very dense		7	SS	100/4"	79.2										
	Boulders		8	SS	100/6"	250										
75.7 9.3	End of Borehole					76.2										

267.2
 81.4
 0 15 80 5
 3 23 60 14

9 10 66 15

RECORD OF BOREHOLE N^o 237

JOB	<u>74-11018</u>	LOCATION	<u>Co-ords. 15,679,597 N; 1,066,076 E</u>	ORIGINATED BY	<u>DM</u>
W.P.	<u>46-74-00</u>	BORING DATE	<u>Dec. 17, 1971</u>	COMPILED BY	<u>PK</u>
DATUM	<u>Geodetic</u>	BOREHOLE TYPE	<u>Auger</u>	CHECKED BY	<u>MM</u>

SOIL PROFILE				SAMPLES			ft./m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT —w _L PLASTIC LIMIT —w _p WATER CONTENT —w w _p — w — w _L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. T/m ³	REMARKS	
m. ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)							
83.0 0.0	272.2 0.0	Ground Level				270 82.3						
81.2 1.8	266.2 6.0	Organics, rock fill some sand. Sandy silt some clay, traces of gravel Very Dense		1	SS	17						
				2	TW	PH						
				3	SS	8						
				4	SS	74						
				5	SS	148						
77.2 5.8	253.2 19.0	End of Borehole		6	SS	102	6"					
								50	kPa	100		

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 238

JOB 74-11018

LOCATION Co-ords. 15,679,825 N; 1,066,126 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Dec. 8, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger & Cone test

CHECKED BY

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS	
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	20		40	60	80	100	SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE			WATER CONTENT % W _P — W — W _L			
95.0 0.0	311.6 0.0	Ground Level																
		Fill		1	AS	310												
		Sandy silt, silty		2	SS	15	94.5											
		clay, some brick		3	SS	42												
		fragments		4	SS	36												
90.7 4.3	297.6 14.0	Silty clay		5	SS	32	91.4											
		traces of sand		6	TW	PH												
		pockets of silt		7	TW	PH	290											
		Stiff to Very Stiff.		8	SS	15	88.4											
				9	AS													
				10	TW	PH	280											
				11	TW	PM	85.3											
81.9 13.1	268.6 43.0	Sandy silt, some		12	SS	16	270											
		clay & gravel		13	SS	28	82.3											
		(till)		14	SS	47	260											
		Very dense		15	SS	105	79.2											
76.5 18.5	251.1 60.5	End of Borehole		16	SS	100	6"											
																	</	

RECORD OF BOREHOLE NO 239

JOB 74-11018

LOCATION Co-ords. 15.679,783 N; 1.066,089 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Dec. 9-10, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger & Cone test

CHECKED BY _____

SOIL PROFILE			SAMPLES			ft/m SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. GR. SA. SI. CL. T/m ³	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT (0.3 m)					
91.5 0.0	300.2 0.0	Ground Level				300				
		Clayey silt				290				
		traces of sand and gravel				280				
		Very stiff to Hard				270				
			1	SS	31					
			2	SS	39					
			3	SS	34					
			4	TW	PH					
			5	TW	PH					
			6	TW	PM					
			7	SS	22					
			8	TW	PM					
81.4 10.1	267.2 33.0	Sandy silt				260				
		some sand				250				
		traces of gravel				240				
		Boulders				230				
76.4 15.1	250.7 49.5	End of Borehole				220				

OFFICE REPORT ON SOIL EXPLORATION

20
15 ϕ 5 % STRAIN AT FAILURE
10

RECORD OF BOREHOLE N^o 240

JOB 74-11018

LOCATION Co-ords. 15,679,683 N; 1,066,015 E.

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Dec. 16-17, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY 3L

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT ——— w _L PLASTIC LIMIT ——— w _P WATER CONTENT ——— w w _P ——— w ——— w _L			BULK DENSITY γ P.C.F.	REMARKS
m. ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000					WATER CONTENT % 20 40 60						
82.8	271.7	Ground Level															
0.0	0.0	Rock Fill	⊗				270										
81.6	267.7						82.3										
1.2	4.0	Organic silt	⊕	1&2	SS & AS	6								○		▽ 267.2 81.4	
79.8	261.9		⊕	3	TW	PM								○			
3.0	9.8	Silt to sandy silt, traces of clay Very dense	⊕	4	SS	45	260							○			
			⊕	5	SS	98	79.2							○		0 4 90 6	
77.2	253.2		⊕	6	SS	176	6"							○		2 20 68 10	
5.6	18.5	End of Borehole															

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 241

JOB 74-11018 LOCATION Co-ords. 15,679,820 N; 1,065,996 E ORIGINATED BY DM
 W.P. 46-74-CO BORING DATE Dec. 16, 1971 COMPILED BY PK
 DATUM Geodetic BOREHOLE TYPE Auger & Cone test CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION, RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT % 20 40 60			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
m. 84.1 0.0	275.8 0.0	Ground Level														
82.6 1.5	270.8 5.0	Silty clay Hard				270						○			0 6 48 46	
			1	SS	37	82.3						○			∇ 268.0	
			2	SS	29							○			81.7	
			3	SS	57							○			6 23 56 15	
			4	SS	69							○				
			5	SS	53	260						○				
			6	SS	145	79.2						○				
76.2 7.9	250.0 25.0	End of Borehole	7	SS	100/5	250 76.2						○			9 23 53 15	

20
 15 ϕ 5 % STRAIN AT FAILURE
 10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 242 A

JOB 74-11018

LOCATION Co-ords. 15,679,767 N; 1,065,960 E

ORIGINATED BY DM

W.P. 46-74-00

BORING DATE Dec. 17, 1971

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Auger

CHECKED BY SL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w _L PLASTIC LIMIT — w _p WATER CONTENT — w w _p — w — w _L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
m. 82.7 0.0 81.6 1.1	271.2 0.0 267.7 3.5	Ground Level Rock Fill Organic silt some sand & gravel. Very loose				270 82.3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 301

JOB 74-11018

LOCATION Co-ords. 15,680,815 N; 1,068,960 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 11-13, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX Casing & Cone Test

CHECKED BY T.L.

SOIL PROFILE			SAMPLES			P.T./m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		20	40	60	80	100	w_p	w	w_L		
86.8	284.5	Ground Level														
0.0	0.0	Hard to firm grey or mottled grey & brown silty clay with some sand & cinder pockets (Fill)	1	SS	12	280										W.L. Stand-pipe B
84.6	277.5		2	SS	4	85.3										280.0
2.2	7.0	Soft to stiff (variable consistency) Reddish brown or grey silty clay, with some scattered coarse sand & gravel size particles	3	SS	2											W.L. Stand-pipe A
			4	SS	40											274.0
80.9	265.5	some wood fibres (Fill)	5	SS	6	270										83.6
5.9	19.0	Stiff reddish brown to grey silty clay with a few scattered sand and gravel size particles.	6	TW	14	82.3										265.0
			7	TW	PM	260										60.8
			8	TW	PM	79.2										
76.1	249.8					250										
10.7	34.7	Dense to compact grey or reddish-brown sandy silt, some clay containing some coarse sand & gravel above el. 242+ occasional layers or lenses of reddish-brown clayey silt below el. 242 typically 1 to 2" thick.	9	SS	45	76.2										120
			10	SS	49											1.92
			11	SS	27	240										
			12	TW	24	73.1										127
69.5	228.0		13	SS	39	230										2.03
17.3	56.5	End of Borehole				70.1										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 302

JOB 74-11018 LOCATION Co-ords. 15,681,015 N; 1,069,423 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Sept. 13-17, 1963 COMPILED BY MJ
 DATUM Geodetic BOREHOLE TYPE Washboring - HX Casing & Cone Test CHECKED BY BL

SOIL PROFILE			SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		20	40	60	80	100	W _P	W	W _L		
89.4 0.0	293.2 0.0	Ground Level													
87.5 1.9	287.0 6.2	Very stiff to hard Brown silty clay with an occasional brick fragment (Fill)	1	SS	26										
			2	SS	26										
		Heterogenous mixture of blocks of stiff brown or grey silty clay, brick fragments cinders and wood chips (Fill)	3	SS	11										
			4	SS	9										
84.4 5.0	276.7 16.5	Very soft grey silty clay with organic material, some sand & gr. between el. 274 & 275 & between el. 268 & 265. numerous blackened wood chips in wash water bet. el. 268 & 265.	5	SS	8										
			6	TW	PM										
80.7 8.7	264.7 28.5	Firm to Stiff Reddish brown or grey Silty clay	7	SS	23										
			8	WS	--										
			9	TP	PM										
			10	TP	PM										
			11	TW	PM										
75.7 13.7	248.2 45.0	Compact reddish brown fine sandy silt becoming a dense to very dense grey medium to coarse sand with some fine sand and silt below about el. 246.	12	SS	24										
			13	SS	49										
			14	SS	67										
			15	SS	98										
			16	SS	>100										
68.0 21.4	223.2 70.0	End of Borehole	17	SS	57										

CHECKED BY _____

20
15 ϕ 5 % STRAIN AT FAILURE
10

RECORD OF BOREHOLE N^o 304

JOB 74-11018

LOCATION Co-ords. 15,680,535 N; 1,068,670 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 17-19, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger & Cone Test

CHECKED BY B

SOIL PROFILE				SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. GR. SA. SI. CL.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)						
m. 98.9 0.0	324.6 0.0	Ground Level									
		Very stiff to stiff brown becoming grey below elev. 315 silty clay containing occasional scattered coarse sand and gravel size particles									
			1	SS	15	320 97.5					
			2	TW	PM			3000 +2000			127 2.03
			3	TW	PM	310 94.5			+2000		
			4	TW	PM			+s=2.1			121 1.94
			5	TP	PM	300 91.4		+s=2.2			
			6	TP	PM			+s=2.5			121 1.94
			7	TP	PM	290 88.4		+s=1.0			
			8	TP	PM			+s=2.0			119 1.91
			9	TP	PM	280 85.3		+s=2.5			
			10	TP	PM			+s=2.1			
			11	TP	PM	270 82.3		+2000			135 2.16
			12	TP	PM			+2000			
			13	TP	PM	260 79.2					
		14	SS	20							
76.7 22.2	251.6 73.0	Dense to very dense reddish brown sandy silt	15	SS	48	250 76.2					
74.0 24.9	242.8 81.8	with some gravel End of Borehole	16	SS	53						
							50 kPa	100			

20
15 ϕ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE N^o 305

JOB 74-11018

LOCATION Co-ords. 15,680,638 N; 1,068,552 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 18-20, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX & BX Casing & Cone Test

CHECKED BY _____

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100	LIQUID LIMIT — w _L PLASTIC LIMIT — w _P WATER CONTENT — w	BULK DENSITY γ	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)					
85.5	280.4	Ground Level								
0.0	0.0	Firm(very soft betw. elevs.271.5 & 273.5)		1	SS	10				
		Brown-grey		2	SS	12				
		Silty Clay with some scattered sand & gravel (Backfill for culvert)		3	SS	6				
				4	SS	3				
81.5	267.3			5	TW	PM				
4.0	13.1	Stiff to v. stiff Grey-brown, silty clay containing occasional scattered coarse sand & gravel size particles,upper 1 foot of stratum is streaked with black coloured organic material.		6	TW	PM				
				7	SS	7				
				8	SS	9				
				9	SS	11				
				10	TW	PM				
				11	TP	PM				
76.3	250.4									
9.2	30.0	Dense brown, silty sand to sandy silt with some grey-brown layers. Stratum contains occasional gravel size particles		12	SS	47				
				13	SS	48				
				14	SS	45				
71.8	235.5									
13.7	44.9	Very dense grey-brown		15	SS	72				
70.2	230.4	Silty sand with gravel								
15.3	50.0	End of Borehole								

280.4	270	267.3	260	250	240	235.5	230.4	220	210	200	190	180	170	160	150	140	130	120	110	100	90	80	70	60	50	40	30	20	10	0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5	69.5	68.5	67.5	66.5	65.5	64.5	63.5	62.5	61.5	60.5	59.5	58.5	57.5	56.5	55.5
0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0
85.5	84.5	83.5	82.5	81.5	80.5	79.5	78.5	77.5	76.5	75.5	74.5	73.5	72.5	71.5	70.5															

OFFICE REPORT ON SOIL EXPLORATION

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 306

JOB 74-11018 LOCATION Co-ords. 15,680,112 N; 1,068,478 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Sept. 21-24, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Power Auger CHECKED BY SL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT —WL PLASTIC LIMIT —WP WATER CONTENT —W			BULK DENSITY γ	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000					WATER CONTENT % Wp — W — Wl 20 40 60				
104.9 0.0	344.1 0.0	Ground Level													P.C.F.	GR.SA.SI.CL.
		Silty sand & Gravel													T/m ³	
		Stiff to hard Grey-brown Silty Clay with some scattered sand and gravel size particles (Earth fill embankment)		1	SS	17	340 103.6									
				2	SS	14										
				3	SS	16	330 100.6									
				4	TP	PH									128 2.05	
				5	SS	42	320 97.5									
				6	SS	45										
				7	TW	PH	310 94.5								131 2.09	
				8	SS	38										
				9	TW	PH	300 91.4								126 2.02	
				10	TW	PH										
				11	SS	51										
				12	SS	49	290 88.4									
86.1 18.8	282.6 61.5			13	SS	54										
		Stiff grey Silty clay containing some scattered sand and gravel size particles		14	SS	42	280 85.3									
				15	TW	PH									126 2.02	
				16	SS	19	270 82.3									
				17	TW	PH									134 2.15	
				18	TW	PH	260 79.2									
				19	TW	PM										
				20	SS	16	250 76.2								115 1.84	
73.3 29.6	247.1 97.0	Very dense reddish brown sandy silt with a trace of clay & some scattered gravel size particles		21	SS	99										

W.L. @
 286.8 Oct. 2
 87.5 1963
 W.L. @
 283.4
 86.4
 Sept. 25, 1960

20
 15 5 % STRAIN AT FAILURE
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Continued

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 306 Continued

JOB 74-11018 LOCATION Co-ords. 15,680,112 N; 1,068,478 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Sept. 21-24, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Power Auger CHECKED BY FL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ⊗ QUICK TRIAXIAL × LAB VANE				WATER CONTENT % 20 40 60				
m.															
73.5	241.1	Continued				73.1									
31.4	103.0		22	SS	68										
71.4	234.3		23	SS	>100										
33.5	109.8	End of Borehole													

RECORD OF BOREHOLE NO 307

JOB 74-11018

LOCATION Co-ords. 15,679,847 N; 1,068,315 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 24, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger Boring

CHECKED BY _____

[illegible]

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 308

JOB 74-11018

LOCATION Co-ords. 15,672,590 N; 1,068,190 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 25-26, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger Boring

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE					w_p — w — w_L WATER CONTENT %				
						400	800	1200	1600	2000	20	40	60	P.C.F.	GR.SA.SI.CL	
96.8	317.7	Ground Level												T/m ³		
0.0	0.0	Hard, till comp. of clay, silt, sand, gravel, and small stones to 3" size														
96.1	315.2		1	SS	16						○					
		Stiff to very stiff mottled brown & grey silty clay with some scattered sand & gravel size particles	2	SS	21	310					○					
		1" thick red-brown silty sand layer or lens at 18.8 ft. depth (desiccated zone)	3	SS	19	94.5					○○	○				
			4	TW	PH	300										
			5	SS	25	91.4					○					
89.8	294.7		6	TW	PH	290					○			120	W.L. in standpipe "A" at elev. 285.8	
7.0	23.0	Stiff grey silty clay with some scattered sand and gravel size particles	7	SS	8	68.4					+s=2.3	○		1.92	Oct. 25, 1963	
		some layers or lenses of grey clayey or sandy silt	8	TW	PH	280					+s=2.4	○		119	W.L. in standpipe "B" at elev. 273.8	
		1/16" to 12" in thickness	9	SS	9	65.3					○	○	○	1.91	83.5	
			10	TW	PH	270					+s=2.6	○○	○			
			11	SS	14	62.3						○	○			
			12	SS	18	260						○				
			13	SS	16	79.2						○				
			14	TW	PH	250										
			15	SS	11	76.2					+s=2.8	○○				
			16	SS	11							○	○			
74.9	245.7	Dense grey silty sand and gravel	17	SS	96	240										
21.2	242.0		18	SS	87	73.1										
74.2	243.4	Very dense reddish brown sandy silt with some gravel	19	SS	93	230										
22.6	74.3	some pockets of grey silty clay (Till)	20	SS	66	70.1										
69.4	227.7	End of Borehole														
27.4	90.0						50		kPa	100						

RECORD OF BOREHOLE N^o 309

JOB 74-11018 LOCATION Co-ords. 15,679,430 N; 1,067,822 E. ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Sept. 27, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Power Auger Boring CHECKED BY ...

SOIL PROFILE			SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		BULK DENSITY γ P.C.F. T/m ³	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE			BLOWS/FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000		
89.6 0.0	294.0 0.0	Ground Level								
85.6 4.0	280.8 13.2	Loose heterogeneous mixture of brick & concrete fragments brown silty sand & gravel (Fill)		1	AS	290 66.4				
				2	SS	8				
				3	SS	14	280 65.3			
				4	TW	17				
82.1 7.5	269.5 24.5	Very stiff brown silty clay with some scattered sand & gravel (Desiccated zone) upper 2 ft. mottled green grey-black center.		5	SS	15	270 62.3			
		Stiff to very stiff grey Silty Clay with some scattered sand and gravel size particles		6	SS	12				
		Dense silty sand layers at 34.5 to 35.2 and 44.7 to 46.0 ft. depth.		7	TW	PM	260 79.2			
				8	SS	8				
				9	TW	PM	250 76.2			
				10	SS	14				
75.1 14.5	246.5 47.5	Very dense reddish brown sandy silt with some gravel (Till) Hard grey clayey silt 63.7 to 64.5 ft. depth.		11	SS	59				
				12	SS	61	240 73.1			
				13	SS	69				
70.0 19.6	229.5 64.5	End of Borehole		14	SS	84	230 70.1			
								50	kPa	100

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE N^o 310

JOB 74-11018 LOCATION Co-ords. 15,619,258 N; 1,067,625 E. ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Sept. 20 - 23, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Wash Boring CHECKED BY EL

SOIL PROFILE			SAMPLES			ELEV. SCALE ft./m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT ——— w _L			BULK DENSITY γ P.C.F. T/m ³	REMARKS
ELEV. DEPTH m.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000	PLASTIC LIMIT ——— w _p	WATER CONTENT ——— w w _p ——— w ——— w _L WATER CONTENT % 20 40 60			
84.4	277.1	Ground Level										
0.0	0.0	4" Topsoil		1	SS	5						
82.8	271.8	Loose brown silty sand some brick fragments (Fill)		2	SS	16						
1.6	5.3	Stiff grey (Brown coloured & desiccated down to 10 ft. depth) Silty Clay with a few scattered sand and gravel size particles		3	SS	19	270					
				4	TW	PM	82.3					
				5	TP	PM	260					
				6	TP	PM	79.2					
				7	TP	PM	250					
75.6	248.1						76.2					
8.8	29.0	Dense to v.dense grey sandy and clayey silt with some gravel size particles, scattered throughout. few sand lenses (app.1/16" thick) in upper 2- 5 ft.		8	SS	43		+ s=3.7				
				9	SS	67	240					
72.1	236.6						73.1					
12.3	40.5	Very dense stratified sandy silts becoming stiff layered silty clay and clayey silt with some layers of fine sandy silt below about 4 1/2 ft. depth		10	SS	64						
				11	SS	33	230					
68.7	225.6						70.1					
15.7	51.5	End of Borehole		12	SS	16						
								50	kPa	100		

CHECKED BY _____

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15 ϕ 5 % STRAIN AT FAILURE
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ORIGINATED BY Golder

COMPILED BY MW

CHECKED BY _____

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 313

JOB 74-11018

LOCATION Co-ords. 15,679,290 N; 1,067,170 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 23-25, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX & BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			Ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_l PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ⊗ QUICK TRIAXIAL x LAB VANE					WATER CONTENT % w_p — w — w_l				
m. 83.3	273.2	Ground Level					400	800	1200	1600	2000	20	40	60	P.C.F.	GR. A. SI. CL.
0.0	0.0	Loose brown sand				270									T/m ³	W.L. in pipe @
82.1	269.3	Stiff brown silty clay	1	SS	6	82.3										Elev.
1.2	3.9	Very loose grey-brown & black organic silty sand & very soft organic clayey silt, contain numerous roots & wood chunks, some grey in lower 2 ft. of deposit.	2	SS	2											273.0
			3	SS	1											83.3
			4	SS	3	260										Oct. 25,
74.6	258.0	Soft grey brown silty clay	5	SS	3	79.2										1963
4.7	15.2		6	TP	PM											
77.8	255.2		7	SS	4	250										
5.5	18.0	Loose to compact stratified silts and sands with some layers of grey-brown silty clay (generally less than 1" in thickness) occasional gravel size particles	8	SS	23	76.2					9150	○			146	Y ~ 249
			9	SS	13						82830	○			2.34	76.0
			10	SS	46	240									141	
			11	SS	7	73.1									2.26	
						230										
						70.1										
67.6	221.7		12	SS	67											
15.7	51.5	End of Borehole							50		100					
		Note: Artesian water pressure first noticed during drilling when casing was at 35 ft. depth.							kPa							

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 314

JOB 74-11018 LOCATION Co-ords. 15,679,456 N; 1,066,720 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Sept. 25-27, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Wash Boring HX & BX Casing CHECKED BY ---

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS γ GR. SA. SI. CL.	
m. ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)							
82.6 0.0	270.9 0.0	Ground Level				270						
		3" Brown sandy topsoil				62.3						
		Loose mixture of chunks of brown, grey & black stiff silty clay, pieces of glass cinders, sand and some organic material (Fill)		1	SS	10						
				2	SS	6						
				3	SS	4						
				4	SS	3	260					
				5	SS	PM	79.2					
78.0 77.8 5.0	255.8 254.4 16.5	Soft silty clay		6	SS	23						
		Dense Brown-grey sandy & clayey silt with some gravel (Till)?		7	SS	33	250 76.2					
75.0 7.6	245.9 25.0			8	SS	57						
		Compact to very dense stratified silts and sands with some layers of clayey silt (generally 1/8" to 1" in thickness)		9	SS	28	240 73.1					
				10	SS	WH						
				11	SS	35	230 70.1					
				12	SS	95						
				13	SS	87	220 67.0					
66.7 15.9 65.7 16.9	218.9 52.0 215.6 55.3	Hard brown silty clay some sand and gravel End of Borehole		14	SS	100						

FOUNDATIONS OFFICE

JOB 74-11018 LOCATION Co-ords. 15,679,572 N; 1,066,212 E ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Sept. 28-Oct. 8, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Power Auger, Washboring & BX Casing CHECKED BY SL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w _L PLASTIC LIMIT — w _p WATER CONTENT — w			BULK DENSITY γ	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT % w _p — w — w _L				
82.5	270.6	Ground Level				270	400	800	1200	1600	2000	20	40	60	P.C.F.	GR SA. SI. CL.
0.0	0.0	Br. cl. silty with sand & boulders (Till)				82.3									T/m ³	W.L. in pipe
81.7	268.1															el. 266.5
0.8	2.5	Firm to very stiff brown to grey-green silty clay with occasional sand & gravel & a few pieces decayed wood		1	SS	4										21.3
				2	TN	PM										122
79.7	261.3			3	SS	16	260								1.96	Oct 25, 1963
2.8	9.3	Compact to very dense reddish brown (grey below 22 ft. depth +) silty sand to sandy silt with occasional gravel size particles		4	SS	26	79.2									
				5	SS	>100	250									
				6	SS	>100	76.2									
73.8	242.1			7	SS	>100	240									
8.7	28.5	Very dense reddish-brown clayey silt with sand & gravel (Till)		8	SS	>100	73.1									~236
71.6	234.8															72.0
10.9	35.8	End of Borehole						50		100						

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOPEHOLE NO 316

JOB 74-11018 LOCATION Co-ords. 15,679,095 N; 1,066,908 E. ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Sept. 27 - Oct. 1, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Wash Boring HX & BX Casing CHECKED BY

SOIL PROFILE			SAMPLES			Ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT %	BULK DENSITY γ P.C.F.	REMARKS
m. ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)					
82.3	270.0	Ground Level								
0.0	0.0	Cinders sand & gravel								
1.0	1.0	Stiff brown silty clay	1	SS	7					
2.0		Loose to very loose mixture of grey sa. cinders, gr. & some clay	2	SS	4					
79.7	261.5	one piece wire (Fill)	3	SS	3					
2.6	8.5	Very loose grey organic sandy silt containing a few pieces wood	4	SS	1	260				
			5	TW	5	79.2				
76.0	249.2		6	SS	18	250				
6.3	20.8	Very stiff brown-grey clayey & sandy silt with some gravel & a sand layer 27'-29' depth	7	SS	43	76.2				
74.3	243.8	Dense grey and brown dilatent sandy silt	8	SS	36	240				
8.0	26.2	Layered very stiff grey clayey silt & silty fine sand, 1" gravel layer at 51' depth	9	TW	FM	73.1				
72.8	239.0		10	SS	25					
9.5	31.0	Compact to dense stratified grey sandy silts and silty sands with some thin (typically 1/16") layers or lenses of soft grey clay, occasional gravel.	11	SS	15	230				
71.2	233.7		12	SS	27	70.1				
11.1	36.3		13	SS	28	220				
			14	SS	33	67.0				
			15	SS	46	210				
62.3	204.5		16	SS	100	64.0				
20.0	65.5	Hard reddish brown clayey silt with some sand & grav. few layers or lenses of grey sand				200				
60.9	200.0					60.9				
21.4	70.0	End of Borehole								

W.L. @
elv.
270.0
82.3
Oct. 2,
1963

244
74.4

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 317

JOB 74-11018 LOCATION Co-ords. 15,680,015 N; 1,065,805 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Oct. 8-9, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Wash Boring BX Casing CHECKED BY SL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT (0.3 m)					PLASTIC LIMIT — w_p				
m.	ft.					ELEV. SCALE	SHEAR STRENGTH P.S.F. kPa					w_p — w — w_L			P.C.F.	GR. SA. SI. CL.
							○ UNCONFINED + FIELD VANE					WATER CONTENT %				
							● QUICK TRIAXIAL x LAB VANE									
							400	800	1200	1600	2000	20	40	60		
82.5	270.6	Ground Level				270										
0.0	0.0	Compcat crushed graded rockfill	X	1	SS	13	82.3								135	N.L. in pipe @ elv. 266
81.3	266.6		X												2.16	21.2
1.2	4.0	Soft to firm grey clayey silt, containing wood fragments		2	TW	PM									126	Oct. 25, 1963
				3	TW	PM									2.02	
79.3	260.1														1.50	
3.2	10.5	Firm grey silty clay		4	TW	PM	260								2.08	
							79.2								125	
77.5	254.1			5	SS	14									2.00	
5.0	16.5	very dense reddish brown silt with some sand and clay & scattered shale fragments (Till)														
				6	SS	100	250									
							76.2									
74.7	245.1															
7.8	25.5	End of Borehole		7	SS	100										
						</										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 318

JOB 74-11018 LOCATION Co-ords. 15,680,436 N; 1,065,496 E. ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Oct. 10-11, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Washboring HX & BX Casing CHECKED BY BL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— w_L			BULK DENSITY	REMARKS		
ELEV. m	DEPTH ft	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT	BLOWS / FOOT					PLASTIC LIMIT ——— w_p				WATER CONTENT ——— w	
								SHEAR STRENGTH P.S.F. kPa					w_p ——— w ——— w_L			γ	P.C.F.	GR.SA.SI.CI.
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE					WATER CONTENT %					
								400	800	1200	1600	2000	20	40	60			
83.1	272.5	Ground Level																
0.0	0.0	Very stiff mottled Reddish Brown & Grey clayey & sandy silt with some grav. (Fill)		1	SS	15	270										T/m ³	W.L. in pipe
81.7	268.0			2	SS	14	82.3										130	268.5
1.4	4.5	Very stiff mottled brown silty clay with a few black streaks		3	TW	12											2.082	81.9
80.5	264.0			4	SS	100												Oct. 25, 1963
2.6	8.5	Very dense reddish brown silt with scattered gravel size particles, trace fine sand & clay (Till)					260											Y ~ 258.
78.4	257.0			5	SS	100	79.2											78.7
4.7	15.5	End of Borehole							50	kPa	100							

RECORD OF BOREHOLE N^o 319

JOB 74-11018

LOCATION Co-ords. 15,680,538 N; 1,065,365 E.

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Oct. 10-11, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Washboring HX & BX Casing, BX Core

CHECKED BY _____

SOIL PROFILE			SAMPLES			ft/m 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 ft	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000		w_p — w — w_L WATER CONTENT % 20 40 60			
82.6	270.9	Ground Level										
0.0	0.0	Very stiff mottled brown silty clay containing a few rock fragments & occasional roots (Fill)		1	SS	13						
80.4	263.9			2	SS	16						
2.2	7.0			3	SS	PM						
79.5	260.7			4	SS	70						
3.1	10.2	Soft to firm brown silty clay becoming a grey sandy silt below 7.8 ft. depth.										
				5	SS	100						
				6	AX Core	-						
76.4	250.6			7	SS	100						
6.2	20.3	End of Borehole										

W.L. in pipe

263.5

80.3

251.

76.6

OFFICE REPORT ON SOIL EXPLORATION

20
15 ϕ 5 % STRAIN AT FAILURE
10

FOUNDATIONS OFFICE

ORIGINATED BY Golder

COMPILED BY MW

CHECKED BY

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 321

JOB 74-11018 LOCATION Co-ords. 15,680,935 N; 1,064,587 E. ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Oct. 21-22, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Washboring HX & BX Casing 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 WATER CONTENT %				
m 81.1	266.0	Ground Level												GR.SA.SI.CL.
0.0	0.0													V.L.in pipe
80.2	263.1													$\frac{V}{V} \frac{262.5}{80.1}$
0.9	2.9	Very dense reddish brown sandy silt with scattered subangular sand & gravel size particles (Till)		1	SS	27								Oct.25,1963
				2	SS	100	860							
				3	SS	100	79.2							
77.9	255.6			4	SS	100								$\gamma \sim 256.$
3.2	10.4	End of Borehole												

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 322

JOB 74-11018

LOCATION Co-ords. 15,680,795 N; 1,064,147 E.

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Oct. 10-11, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger Boring

CHECKED BY SL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY	REMARKS
ELEV. DEPTH ft	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0-3m)	ELEV. SCALE	SHEAR STRENGTH P.S.F. kPa					WATER CONTENT %			γ	
102.6	Ground Level						O UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE					20 40 60			P.C.F.	GR.SA.SI.CL
0.0	Very Stiff to Stiff brown silty clay with some fissures, few roots in upper portion (desiccated zone)		1	SS	20	330									T/m ³	
			2	SS	18	100.6										
			3	SS	18	320										
97.3			4	SS	11	97.5				+s=2.6						
319.2			5	TW	PM	310									122	
5.3	Stiff to Firm Grey or Reddish Brown Silty Clay containing some sand and gravel size particles		6	SS	14	94.5				+s=1.8					1.954	
			7	TW	PH	300										
			8	SS	16	91.4										WL in pipe Oct. 25, 1963 V 299. 91.2
			9	SS	17	290										
			10	TW	PM	88.4										
			11	SS	14	280										
			12	TW	PH	85.3				+s=1.6						
82.8			13	SS	19											Y-272.
19.8	End of Borehole								50		100					83.

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 323

JOB 74-11018

LOCATION Co-ords. 15,680,912 N; 1,063,905 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Oct. 9-10, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger Boring

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000					WATER CONTENT % w_p w w_L				
100.8 0.0	330.8 0.0	Ground Level				100.6										
		Very stiff brown silty clay with some fissures contains a few roots in the upper portion (desiccated zone)		1	SS	30										
				2	SS	21	320									
				3	SS	22	97.5									
26.3 4.5	315.8 15.0			4	SS	13	310									
		Firm to stiff grey or reddish brown		5	TP	PM	94.5									
		Silty Clay with some scattered sand and gravel size particles		6	SS	7	300									
		occasional layers of grey clayey silt		7	TW	PM	91.4									
				8	SS	11	290									
				9	TW	PM	88.4									
				10	SS	16	280									
				11	SS	73	85.3									
80.6 20.2	264.3 66.5	End of Borehole					270									
							82.3									
							</									

W.L. in pipe @ El.

297.5
290.7
Oct. 25, 1963

265
80.8

20
15 ϕ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE N^o 338

JOB 74-11018

LOCATION Co-ords. 15,679,145 N; 1,066,693 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 30, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger

CHECKED BY _____

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F. T/m ³	REMARKS
m.	ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000					WATER CONTENT % w_p — w — w_L 20 40 60				
83.2	272.9	Ground Level															
0.0	0.0	Brown-black sandy & clayey silt, some gravel					270										
82.2	269.6						82.3										
1.0	3.3	Very stiff brown silty clay with some sand and gravel (desiccated zone)		1	SS	14											
				2	SS	15											
				3	SS	13											
79.5	260.9						260										
3.7	12.0	Very stiff grey silty clay with some sand		4	TW	PM	79.2		9		+s=2.5		0		123		
															1.97		
77.4	253.8			5	SS	61											
5.8	19.1	Very dense reddish brown becoming grey below 25 ft. depth sandy silt with some gravel					250										
				7	SS	92	76.2										
				8	SS	50											
							240										
							73.1										
71.5	234.7																
11.7	38.2	End of Borehole							50		100						
									kPa								

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 339

JOB 74-11018

LOCATION Co-ords. 15,681,145 N; 1,063,612 E.

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Oct. 16-17, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX & BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			BULK DENSITY	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000					WATER CONTENT % W_P W W_L			γ	
91.3	299.4	Ground Level														
0.0	0.0	Very stiff brown silty clay, few fissures (desiccated zone)	1	SS	10											
90.1	295.4		2	SS	6											
1.2	4.0															
		Stiff to very stiff grey silty clay with some scattered sand and gravel size particles	3	TW	PM	290										
			4	TW	PM	88.4										
			5	TW	PM	280										
			6	SS	3	85.3										
			7	TW	PM	270										
			8	SS	7	82.3										
			9	TW	PM	260										
78.5	257.4		10	SS	100	79.2										
12.8	42.0		11	SS	100	250										
		Very dense reddish brown silt, trace clay, with sand gravel and occasional boulders (Till)	12	SS	100	76.2										
			13	SS	100											
73.0	239.4					240										
18.3	60.0	End of Borehole				73.1										

RECORD OF BOREHOLE NO 345

JOB 74-11018 LOCATION Co-ords. 15,680,993 N; 1,063,670 E ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Oct. 16-19, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Power Auger Boring CHECKED BY EL

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)		LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000		w_p — w — w_L WATER CONTENT % 20 40 60					
99.9 0.0	327.6 0.0	Ground Level										P.C.F.	GR.SA.SI.CL.
		Topsoil										T/m ³	
		Hard to very stiff brown silty clay with a few fissures some roots in upper portion (desiccated zone)		1	SS	32	320						
				2	SS	27	97.5						
				3	SS	22	310						
93.8 6.1	307.6 20.0			4	SS	18	94.5						
		Stiff to firm grey or grey-brown silty clay with some sand & gravel size particles scattered throughout. some grey silt pockets (to 1/4" size) 2" thick sand layer or lense at 49' depth.		5	TW	PH	300					129 2.07	W.L. in pipe @ Elevation ∇ 297.3 90.7 Oct. 25, 1963
				6	SS	18	91.4						
				7	TW	PH	290						
				8	SS	13	88.4						
				9	TW	PM	280					120 1.92	
				10	SS	8	85.3						
				11	SS	11	270						
				12	TW	PH	79.2						
				13	SS	26	260						
							76.2						
77.6 22.3 77.0 22.9	254.6 73.0 252.6 75.0	v. dense red-br. sa. sl. tr. clay with gr. (Till)		14	SS	74							
		End of Borehole						50	100				
								kPa					

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 301

JOB 74-11018

LOCATION Co-ords. 15,680,815 N; 1,068,960 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 11-13, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX Casing & Cone Test

CHECKED BY T.L.

SOIL PROFILE			SAMPLES			P.T./m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		20	40	60	80	100	w_p	w	w_L		
m.						ELEV. SCALE	SHEAR STRENGTH P.S.F. kPa					WATER CONTENT %			P.C.F.	GR. SA. SI. CL.
86.8	284.5	Ground Level					UNCONFINED + FIELD VANE					400 800 1200 1600 2000				
0.0	0.0	Hard to firm grey or mottled grey & brown silty clay with some sand & cinder pockets (Fill)	1	SS	12	280										W.L. Stand-pipe B
84.6	277.5		2	SS	4	85.3										280.0
2.2	7.0	Soft to stiff (variable consistency) Reddish brown or grey silty clay, with some scattered coarse sand & gravel size particles	3	SS	2											W.L. Stand-pipe A
			4	SS	40											274.0
80.9	265.5	some wood fibres (Fill)	5	SS	6	270										83.6
5.9	19.0	Stiff reddish brown to grey silty clay with a few scattered sand and gravel size particles.	6	TW	14	82.3										265.0
			7	TW	PM	260										60.8
			8	TW	PM	79.2										
76.1	249.8					250										
10.7	34.7	Dense to compact grey or reddish-brown sandy silt, some clay containing some coarse sand & gravel above el. 242+ occasional layers or lenses of reddish-brown clayey silt below el. 242 typically 1 to 2" thick.	9	SS	45	76.2										120
			10	SS	49											1.92
			11	SS	27	240										
			12	TW	24	73.1										127
69.5	228.0		13	SS	39	230										2.03
17.3	56.5	End of Borehole				70.1										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 302

JOB 74-11018 LOCATION Co-ords. 15,681,015 N: 1,069,423 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Sept. 13-17, 1963 COMPILED BY MJ
 DATUM Geodetic BOREHOLE TYPE Washboring - HX Casing & Cone Test CHECKED BY BL

SOIL PROFILE			SAMPLES		ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W			BULK DENSITY γ	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		20	40	60	80	100	W _P	W	W _L		
89.4 0.0	293.2 0.0	Ground Level													
87.5 1.9	287.0 6.2	Very stiff to hard Brown silty clay with an occasional brick fragment (Fill)	1	SS	26										
			2	SS	26										
		Heterogenous mixture of blocks of stiff brown or grey silty clay, brick fragments cinders and wood chips (Fill)	3	SS	11										
			4	SS	9										
84.4 5.0	276.7 16.5	Very soft grey silty clay with organic material, some sand & gr. between el. 274 & 275 & between el. 268 & 265. numerous blackened wood chips in wash water bet. el. 268 & 265.	5	SS	8										
			6	TW	PM										
80.7 8.7	264.7 28.5	Firm to Stiff Reddish brown or grey Silty clay	7	SS	23										
			8	WS	--										
			9	TP	PM										
			10	TP	PM										
			11	TW	PM										
75.7 13.7	248.2 45.0	Compact reddish brown fine sandy silt becoming a dense to very dense grey medium to coarse sand with some fine sand and silt below about el. 246.	12	SS	24										
			13	SS	49										
			14	SS	67										
			15	SS	98										
			16	SS	>100										
68.0 21.4	223.2 70.0	End of Borehole	17	SS	57										

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 303

JOB 74-11018

LOCATION Co-ords. 15,680,440 N, 1,068,790 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 19-20, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger Boring

CHECKED BY

SOIL PROFILE				SAMPLES			ELEV. SCALE ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F. GR.SA.SI.CL.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000					WATER CONTENT % w_p — w — w_L						
m. 105.6 0.0	346.4 0.0	Ground Level															
103.8 1.8	340.4 6.0	Hard brown sandy silt with some gravel(probably fill)		1	SS	35	340						o				
		Very stiff to stiff brown becoming grey below elev. 337 silty clay containing occasional scattered coarse sand and gravel size particles		2	SS	30	103.6						o				
				3	SS	40	330						o				
				4	SS	38	100.6						o				
				5	TP	PH	320					3100	o			128 2.05	
				6	TP	PH	97.5					4100	o			125 2.00	
				7	TP	PH	310					2600	o			126 2.02	
				8	TP	PM	94.5					2800	o			126 2.02	
				9	TP	PM	300					+ s=2.2	o				
				10	TP	PM	91.4					+ s=3.1	o	o		115 1.84	
				11	TP	PM	290					+ s=2.2	o				
			a 6" thick layer of silty clay with gravel to 2" in size at elev. 328.0		12	TP	PM	88.3				+ s=2.3	o			121 1.94	
					13	TP	PM	280				+ >2000	o				
					14	SS	13	85.3				s=2.3	o				
84.3 21.3	276.4 70.0	End of Borehole								50	kPa	100				Hole Blocked & dry to El. 286.4 87.3 Oct.2,1963	

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 304

JOB 74-11018

LOCATION Co-ords. 15,680,535 N; 1,068,670 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 17-19, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger & Cone Test

CHECKED BY B

SOIL PROFILE		SAMPLES		ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100	LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W	BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	NUMBER	TYPE					
m.	ft.							
98.9	324.6							
0.0	0.0							
	Ground Level							
	Very stiff to stiff brown becoming grey below elev. 315 silty clay containing occasional scattered coarse sand and gravel size particles	1	SS 15	320				
		2	TW PM	97.5				
		3	TW PM	310				
		4	TW PM	94.5				
		5	TP PM	300				
		6	TP PM	91.4				
		7	TP PM	290				
		8	TP PM	88.4				
		9	TP PM	280				
		10	TP PM	85.3				
		11	TP PM	270				
		12	TP PM	82.3				
		13	TP PM	260				
		14	SS 20	79.2				
76.7	251.6							
22.2	73.0	15	SS 48	250				
	Dense to very dense reddish brown sandy silt with some gravel			76.2				
74.0	242.8	16	SS 53					
24.9	81.8							
	End of Borehole							

 20
15 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 305

JOB 74-11018

LOCATION Co-ords. 15,680,638 N; 1,068,552 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 18-20, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX & BX Casing & Cone Test

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		20	40	60	80	100	w_p	w	w_L		
m. 85.5	280.4	Ground Level				280										
0.0	0.0	Firm (very soft betw. elevs. 271.5 & 273.5)	1	SS	10	85.3										
		Brown-grey	2	SS	12											
		Silty Clay with some scattered sand & gravel (Backfill for culvert)	3	SS	6											
			4	SS	3											
81.5	267.3		5	TW	PM	270									124	
4.0	13.1	Stiff to v. stiff Grey-brown, silty clay containing occasional scattered coarse sand & gravel size particles, upper 1 foot of stratum is streaked with black coloured organic material.	6	TW	PM	82.3									1.99	
			7	SS	7										134	
			8	SS	9										2.15	
			9	SS	11	260										
			10	TW	PM	79.2									123	
			11	TP	PM										1.97	
76.3	250.4		12	SS	47	250										
9.2	30.0	Dense brown, silty sand to sandy silt with some grey-brown layers. Stratum contains occasional gravel size particles	13	SS	48	76.2										
			14	SS	46	240										
71.8	235.5		15	SS	72	73.1										
13.7	44.9	Very dense grey-brown Silty sand with gravel														
70.2	230.4															
15.3	50.0	End of Borehole														
							50				100					
											kPa					

JOB	<u>74-11018</u>	LOCATION	<u>Co-ords. 15,680,112 N; 1,068,478 E</u>	ORIGINATED BY	<u>Golder</u>
W.P.	<u>46-74-00</u>	BORING DATE	<u>Sept. 21-24, 1963</u>	COMPILED BY	<u>MW</u>
DATUM	<u>Geodetic</u>	BOREHOLE TYPE	<u>Power Auger</u>	CHECKED BY	<u>SL</u>

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT —WL PLASTIC LIMIT —WP WATER CONTENT —W Wp — W — WL WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F. T/m ³	REMARKS	
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT						SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000
104.9 0.0	344.1 0.0	Ground Level Silty sand & Gravel									
		Stiff to hard Grey-brown Silty Clay with some scattered sand and gravel size particles (Earth fill embankment)									
			1	SS	17	340 103.6					
			2	SS	14						
			3	SS	16	330 100.6					
			4	TP	PH						
			5	SS	42	320 97.5					128 2.05
			6	SS	45						
			7	TW	PH	310 94.5					131 2.09
			8	SS	38						
			9	TW	PH	300 91.4					126 2.02
			10	TW	PH						
			11	SS	51						
			12	SS	49	220 88.4					
86.1 18.8	282.6 61.5	Stiff grey Silty clay containing some scattered sand and gravel size particles	13	SS	54						
			14	SS	42	280 85.3					
			15	TW	PH						
			16	SS	19	270 82.3					126 2.02
			17	TW	PH						
			18	TW	PH	260 79.2					134 2.15
			19	TW	PM						
			20	SS	16	250 76.2					115 1.84
73.3 29.6	247.1 97.0	Very dense reddish brown sandy silt with a trace of clay & some scattered gravel size particles	21	SS	99						
							50 kPa	100			

W.L. @
286.8 Oct. 2
87.5 1963
W.L. @
283.4
86.4
Sept. 25, 196

126
2.02

270
82.4

115
1.84

255
77.7

15 ϕ 5 % STRAIN AT FAILURE

Continued

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 306 Continued

JOB 74-11018 LOCATION Co-ords. 15,680,112 N; 1,068,478 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Sept. 21-24, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Power Auger CHECKED BY FL

SOIL PROFILE			SAMPLES			ft/m 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 % 20 40 60			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT $(\frac{lb}{sq. ft.})$		SHEAR STRENGTH P.S.F. O UNCONFINED + FIELD VANE @ QUICK TRIAXIAL X LAB VANE								
m. 73.5	241.1	Continued				73.1									
31.4	103.0		22	SS	68										
71.4	234.3		23	SS	>100										
33.5	109.8	End of Borehole													

20
 15 \diamond 5 % STRAIN AT FAILURE
 10

CHECKED BY _____

20
15 ϕ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 308

JOB 74-11018

LOCATION Co-ords. 15,672,590 N; 1,068,190 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 25-26, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger Boring

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)			LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ	REMARKS		
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE			WATER CONTENT % w_p — w — w_L						
96.8	317.7	Ground Level					400	800	1200	1600	2000	20	40	60	P.C.F.	GR.SA.SI.CL
0.0	0.0	Hard clay till comp. of	128												T/m ³	
96.1	315.2	of br. & sl. brick &														
0.7	2.5	concrete fragments to 3" size														
		Stiff to very stiff	1	SS	16							o				
		mottled brown & grey	2	SS	21	310						o				
		silty clay with some				94.5						oo	o			
		scattered sand & gravel	3	SS	19											
		size particles														
		1" thick red-brown	4	TW	PH	300										
		silty sand layer or				91.4										
		lens at 18.8 ft. depth	5	SS	25							o				
		(desiccated zone)														
89.8	294.7		6	TW	PH	290									120	W.L. in
7.0	23.0					68.4									1.92	standpipe "A"
		Stiff grey silty clay	7	SS	8											el. 285.8
		with some scattered														87.1
		sand and gravel size	8	TW	PH	280										Oct. 25,
		particles				65.3										1963
		some layers or	9	SS	9											
		lenses of grey				270										W.L. in
		clayey or sandy silt	10	TW	PH	62.3										standpipe "B"
		1/16" to 12" in	11	SS	14											el. 273.8
		thickness	12	SS	18											83.5
			13	SS	16											
						260										
			14	TW	PH	79.2										
			15	SS	11											
			16	SS	11											
						250										
						76.2										
74.9	245.7															
21.2	22.0	Dense grey silty														
74.2	243.4	sand and gravel	17	SS	96											
22.6	74.3	Very dense reddish														
		brown sandy silt	18	SS	87	240										
		with some gravel				73.1										
		some pockets of grey														
		silty clay	19	SS	93											
		(Till)				230										
69.4	227.7		20	SS	66	70.1										
27.4	90.0	End of Borehole														
							50				100					
								kPa								

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 309

JOB 74-11018

LOCATION Co-ords. 15,679,430 N; 1,067,822 E.

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 27, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger Boring

CHECKED BY

SOIL PROFILE			SAMPLES		ft/m	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L			BULK DENSITY	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT	BLOWS / FOOT (0.3 m)					PLASTIC LIMIT — w_p				WATER CONTENT — w
m.	ft.					SHEAR STRENGTH P.S.F. kPa					WATER CONTENT %			γ		
						o UNCONFINED + FIELD VANE					w_p — w — w_L			P.C.F.	GR.SA.SI.CL.	
						o QUICK TRIAXIAL x LAB VANE					20 40 60					
						400	800	1200	1600	2000						
89.6	294.0	Ground Level														
0.0	0.0															
		Loose heterogeneous mixture of brick & concrete fragments brown silty sand & gravel (Fill)														
			1	AS	290											
			2	SS	8											
85.6	280.8				280											
4.0	13.2	Very stiff brown silty clay with some scattered sand & gravel (Desiccated zone) upper 2ft. mottled green grey-black carbon.			25.3											
			3	SS	14											
			4	TW	17											
82.1	269.5		5	SS	15											
7.5	24.5	Stiff to very stiff grey Silty Clay with some scattered sand and gravel size particles			82.3											
			6	SS	12											
			7	TW	PM	260										
			8	SS	8	79.2										
		Dense silty sand layers at 34.5 to 35.2 and 44.7 to 46.0 ft. depth.			250											
			9	TW	PM	76.2										
			10	SS	14											
75.1	246.5		11	SS	59											
14.5	47.5	Very dense reddish brown sandy silt with some gravel (Till) Hard grey clayey silt 63.7 to 64.5 ft. depth.			240											
			12	SS	61	73.1										
			13	SS	69											
70.0	229.5		14	SS	84	230										
19.6	64.5	End of Borehole			70.1			50		100						
								kPa								

OFFICE REPORT ON SOIL EXPLORATION

W.L. in pipe
@ elev. 270.6
82.5
Oct. 25,
1963

145
2.32

231
70.4

RECORD OF BOREHOLE N^o 310

JOB 74-11018 LOCATION Co-ords. 15,619,258 N; 1,067,625 E. ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Sept. 20 - 23, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Wash Boring CHECKED BY EL

[illegible]

CHECKED BY _____

20
15 ϕ 5 % STRAIN AT FAILURE
10

ORIGINATED BY Golder

COMPILED BY MW

CHECKED BY _____

20
15 ϕ 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 313

JOB 74-11018

LOCATION

Co-ords. 15,679,290 N; 1,067,170 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE

Sept. 23-25, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE

Wash Boring HX & BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w _L PLASTIC LIMIT — w _P WATER CONTENT — w			BULK DENSITY γ	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000					w _p — w — w _L WATER CONTENT % 20 40 60				
273.2	Ground Level													P.C.F.	GR. A. S. CL.	
0.0	Cinders Loose brown sand					270								T/m ³	W.L. in pipe @	
269.3	Stiff brown si. cl. (F12)		1	SS	6	82.3									Elv. 273.0	
3.9	Very loose grey-brown & black organic silty sand & very soft organic clayey silt, contain numerous roots & wood chunks, some grey in lower 2 ft. of deposit.		2	SS	2										83.3	
			3	SS	1										Oct. 25, 1963	
			4	SS	3											
258.0	Soft grey brown silty clay		5	SS	3	260										
15.2						79.2										
255.2			6	TP	PM											
18.0			7	SS	4	250										
	Loose to compact stratified silts and sands with some layers of grey-brown silty clay (generally less than 1" in thickness) occasional gravel size particles		8	SS	23	76.2				2150 2283	o o			146 2.34 141 2.26	Y ~ 249 76.0	
			9	SS	13											
						240										
			10	SS	46	75.1										
			11	SS	7											
						230										
						70.1										
221.7			12	SS	67											
51.5	End of Borehole								50		100					
	Note: Artesian water pressure first noticed during drilling when casing was at 35 ft. depth.								kPa							

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 314

JOB 74-11018 LOCATION Co-ords. 15,679,456 N; 1,066,720 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Sept. 25-27, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Wash Boring HX & BX Casing CHECKED BY ---

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT % 20 40 60	BULK DENSITY γ P.C.F.	REMARKS γ GR. SA. SI. CL.	
m. ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)							
82.6 0.0	270.9 0.0	Ground Level				270						
		3" Brown sandy topsoil				62.3						
		Loose mixture of chunks of brown, grey & black stiff silty clay, pieces of glass cinders, sand and some organic material (Fill)		1	SS	10						
				2	SS	6						
				3	SS	4						
				4	SS	3	260					
				5	SS	PM	79.2					
78.0 77.8 5.0	255.8 254.4 16.5	Soft silty clay		6	SS	23						
		Dense Brown-grey sandy & clayey silt with some gravel (Till)?		7	SS	33	250 76.2					
75.0 7.6	245.9 25.0			8	SS	57						
		Compact to very dense stratified silts and sands with some layers of clayey silt (generally 1/8" to 1" in thickness)		9	SS	28	240 73.1					
				10	SS	WH						
				11	SS	35	230 70.1					
				12	SS	95						
				13	SS	87	220 67.0					
66.7 15.9 65.7 16.9	218.9 52.0 215.6 55.3	Hard brown silty clay some sand and gravel End of Borehole		14	SS	100						

FOUNDATIONS OFFICE

JOB 74-11018 LOCATION Co-ords. 15,679,572 N; 1,066,212 E ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Sept. 28-Oct. 8, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Power Auger, Washboring & BX Casing CHECKED BY SL

SOIL PROFILE				SAMPLES			ft/m		DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w _L			BULK DENSITY	REMARKS
ELEV. DEPTH		DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	BLOWS / FOOT (0.3 m)					PLASTIC LIMIT — w _p			WATER CONTENT — w		
m.	ft.							SHEAR STRENGTH P.S.F. kPa					WATER CONTENT %					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					w _p — w — w _L					
								400	800	1200	1600	2000	20	40	60			
82.5	270.6	Ground Level					270											
81.7	268.1	Br. cl. silty with sand & boulders (Till)	X	1	SS	4	82.3										T/m ³	
81.7	268.1	Firm to very stiff brown to grey-green silty clay with occasional sand & gravel & a few pieces decayed wood		2	TN	PM											266.5	
79.7	261.3			3	SS	16	260										122	
2.8	9.3	Compact to very dense reddish brown (grey below 22 ft. depth) silty sand to sandy silt with occasional gravel size particles		4	SS	26	79.2										1.96	
				5	SS	>100	250											
				6	SS	>100	76.2											
73.8	242.1																	
8.7	28.5	Very dense reddish-brown clayey silt with sand & gravel (Till)		7	SS	>100	240											
71.6	234.8			8	SS	>100	73.1										~236	
10.9	35.8	End of Borehole								50	kPa	100					72.0	

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOPEHOLE NO 316

JOB 74-11018 LOCATION Co-ords. 15,679,095 N; 1,066,908 E. ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Sept. 27 - Oct. 1, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Wash Boring HX & BX Casing CHECKED BY

SOIL PROFILE			SAMPLES			Ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m) 20 40 60 80 100 SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L WATER CONTENT %	BULK DENSITY γ P.C.F.	REMARKS
m. ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)					
82.3	270.0	Ground Level								
0.0	0.0	Cinders sand & gravel								
1.0	1.0	Stiff brown silty clay	1	SS	7					
2.0		Loose to very loose mixture of grey sa. cinders, gr. & some clay one piece wire (Fill)	2	SS	4					
79.7	261.5		3	SS	3					
2.6	8.5	Very loose grey organic sandy silt containing a few pieces wood	4	SS	1	260				
			5	TW	5	79.2				
76.0	249.2					250				
6.3	20.8	Very stiff brown-grey clayey & sandy silt with some gravel & a sand layer 27'-29' depth	6	SS	18	76.2				
74.3	243.8		7	SS	43					
8.0	26.2	Dense grey and brown dilatent sandy silt				240				
72.8	239.0	Layered very stiff grey clayey silt & silty fine sand, 1" gravel layer at 51' depth	8	SS	36	73.1				
9.5	31.0		9	TW	PM					
71.2	233.7		10	SS	25					
11.1	36.3	Compact to dense stratified grey sandy silts and silty sands with some thin (typically 1/16") layers or lenses of soft grey clay, occasional gravel.	11	SS	15	230				
			12	SS	27	70.1				
			13	SS	28	220				
						67.0				
			14	SS	33	210				
						64.0				
62.3	204.5		15	SS	46					
20.0	65.5	Hard reddish brown clayey silt with some sand & grav. few layers or lenses of grey sand	16	SS	100	200				
60.9	200.0									
21.4	70.0	End of Borehole				60.9				

W.L. @
elv.
270.0
82.3
Oct. 2,
1963

21.4
74.4

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 317

JOB 74-11018 LOCATION Co-ords. 15,680,015 N; 1,065,805 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Oct. 8-9, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Wash Boring BX Casing CHECKED BY BL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT (0.3 m)					PLASTIC LIMIT — w_p				
m.	ft.					ELEV. SCALE	SHEAR STRENGTH P.S.F. kPa					w_p — w — w_L				
							○ UNCONFINED + FIELD VANE					WATER CONTENT %				
							● QUICK TRIAXIAL x LAB VANE									
							400	800	1200	1600	2000	20	40	60		
82.5	270.6	Ground Level				270									P.C.F.	GR.SA.SI.CL
0.0	0.0	Compcat crushed graded rockfill	X	1	SS	82.3									T/m ³	U.L. in p... @ elv.
81.3	266.6		X												135	266
1.2	4.0	Soft to firm grey clayey silt, containing wood fragments		2	TW										2.16	21.2
				3	TW										126	Oct. 25,
79.3	260.1					260									2.02	1963
3.2	10.5	Firm grey silty clay		4	TW	79.2									1.50	
															2.08	
77.5	254.1			5	SS										125	
5.0	16.5	very dense reddish brown silt with some sand and clay & scattered shale fragments (Till)				250									2.00	
				6	SS	76.2										
74.7	245.1			7	SS	100										
7.8	25.5	End of Borehole														
											</					

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 318

JOB 74-11018 LOCATION Co-ords. 15,680,436 N; 1,065,496 E. ORIGINATED BY Golder
W.P. 46-74-00 BORING DATE Oct. 10-11, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Washboring HX & BX Casing CHECKED BY BL

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT ——— w_L			BULK DENSITY	REMARKS		
ELEV. m	DEPTH ft	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT	BLOWS / FOOT					PLASTIC LIMIT ——— w_p				WATER CONTENT ——— w	
								SHEAR STRENGTH P.S.F. kPa					w_p ——— w ——— w_L			γ	P.C.F.	GR.SA.SI.CI.
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE					WATER CONTENT %					
								400	800	1200	1600	2000	20	40	60			
83.1	272.5	Ground Level																
0.0	0.0	Very stiff mottled Reddish Brown & Grey clayey & sandy silt with some grav. (Fill)		1	SS	15	270										T/m ³	W.L. in pipe
81.7	268.0			2	SS	14	82.3										130	268.5
1.4	4.5	Very stiff mottled brown silty clay with a few black streaks		3	TW	12											2.082	81.9
80.5	264.0			4	SS	100												Oct. 25, 1963
2.6	8.5	Very dense reddish brown silt with scattered gravel size particles, trace fine sand & clay (Till)		5	SS	100	260											Y ~ 258.
78.4	257.0						79.2											78.7
4.7	15.5	End of Borehole							50	kPa	100							

RECORD OF BOREHOLE № 319

JOB 74-11018

LOCATION Co-ords. 15,680,538 N; 1,065,365 E.

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Oct. 10-11, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Washboring HX & BX Casing, BX Core

CHECKED BY _____

SOIL PROFILE			SAMPLES			ft/m 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 ft	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000		w_p — w — w_L WATER CONTENT % 20 40 60			
82.6	270.9	Ground Level										
0.0	0.0	Very stiff mottled brown silty clay containing a few rock fragments & occasional roots (Fill)		1	SS	13						
80.4	263.9			2	SS	16						
2.2	7.0			3	SS	PM						
79.5	260.7			4	SS	70						
3.1	10.2	Soft to firm brown silty clay becoming a grey sandy silt below 7.8 ft. depth.										
				5	SS	100						
				6	AX Core	-						
76.4	250.6			7	SS	100						
6.2	20.3	End of Borehole										

OFFICE REPORT ON SOIL EXPLORATION

20
15 ϕ 5 % STRAIN AT FAILURE
10

RECORD OF BOREHOLE NO 320

FOUNDATIONS OFFICE

LOCATION Co-ords. 15,680,947 N; 1,064,960 E.

ORIGINATED BY Golder

BORING DATE Oct. 21-22, 1963

COMPILED BY MW

BOREHOLE TYPE Washboring NX & BX Casing, AX Core

CHECKED BY SL

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 321

JOB 74-11018 LOCATION Co-ords. 15,680,935 N; 1,064,587 E. ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Oct. 21-22, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Washboring HX & BX Casing 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 WATER CONTENT %				
m 81.1	266.0	Ground Level												GR.SA.SI.CL.
0.0	0.0													V.L.in pipe
80.2	263.1													$\frac{V}{V} \frac{262.5}{80.1}$
0.9	2.9	Very dense reddish brown sandy silt with scattered subangular sand & gravel size particles (Till)		1	SS	27								Oct.25,1963
				2	SS	100	860							
				3	SS	100	79.2							$\gamma \sim 256.$
77.9	255.6			4	SS	100								
3.2	10.4	End of Borehole												

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 322

JOB 74-11018

LOCATION Co-ords. 15,680,795 N; 1,064,147 E.

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Oct. 10-11, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger Boring

CHECKED BY SL

SOIL PROFILE				SAMPLES			ft/m 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
m ELEV. DEPTH ft	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0-3m)	SHEAR STRENGTH P.S.F. kPa					WATER CONTENT % w_p — w — w_L						
						O UNCONFINED + FIELD VANE ● QUICK TRIAXIAL X LAB VANE 400 800 1200 1600 2000											
102.6	336.7	Ground Level															
0.0	0.0	Very Stiff to Stiff brown silty clay with some fissures, few roots in upper portion (desiccated zone)														T/m ³	
			1	SS	20	330											
			2	SS	18	100.6											
			3	SS	18	320											
97.3	319.2	Stiff to Firm Grey or Reddish Brown Silty Clay containing some sand and gravel size particles														122 1.954	
5.3	17.5		4	SS	11	97.5											
			5	TW	PM	310											
			6	SS	14	94.5											
			7	TW	PH	300											
			8	SS	16	91.4											
			9	SS	17	290											
			10	TW	PM	88.4											
			11	SS	14	280											
			12	TW	PH	85.3											
82.8	271.7		13	SS	19											Y-272.	
19.8	65.0	End of Borehole														83.	

ORIGINATED BY Golder

COMPILED BY MW

CHECKED BY _____

20
15 ϕ 5 % STRAIN AT FAILURE
10

RECORD OF BOREHOLE N^o 338

JOB 74-11018

LOCATION Co-ords. 15,679,145 N; 1,066,693 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Sept. 30, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Power Auger

CHECKED BY _____

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			BULK DENSITY γ P.C.F. T/m ³	REMARKS
m.	ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000					WATER CONTENT % w_p w w_L 20 40 60				
83.2	272.9	Ground Level															
0.0	0.0	Brown-black sandy & clayey silt, some gravel					270										
82.2	269.6						82.3										
1.0	3.3	Very stiff brown silty clay with some sand and gravel (desiccated zone)		1	SS	14											
				2	SS	15											
				3	SS	13											
79.5	260.9						260										
3.7	12.0	Very stiff grey silty clay with some sand		4	TW	PM	79.2		9		+s=2.5		0		123		
															1.97		
77.4	253.8			5	SS	61											
5.8	19.1	Very dense reddish brown becoming grey below 25 ft. depth sandy silt with some gravel		6	SS	92											
				7	SS	50											
				8	SS	50											
							240										
							73.1										
71.5	234.7																
11.7	38.2	End of Borehole							50		100						
									kPa								

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 339

JOB 74-11018

LOCATION Co-ords. 15,681,145 N; 1,063,612 E.

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Oct. 16-17, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX & BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W			BULK DENSITY	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	ELEV. SCALE	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000					WATER CONTENT % W_P W W_L			γ	
91.3	299.4	Ground Level														P.C.F. GR.SA.SI.CL.
0.0	0.0	Very stiff brown silty clay, few fissures (desiccated zone)	1	SS	10										125	288.0
90.1	295.4		2	SS	6										2.00	87.8
1.2	4.0	Stiff to very stiff grey silty clay with some scattered sand and gravel size particles	3	TW	PM	88.4									122	Oct. 25, 1963
			4	TW	PM										1.95	
			5	TW	PM	280									120	
			6	SS	3	85.3									1.92	
			7	TW	PM	270									127	
			8	SS	7	82.3									2.03	
			9	TW	PM	260									131	
78.5	257.4	Very dense reddish brown silt, trace clay, with sand gravel and occasional boulders (Till)	10	SS	100	79.2									2.10	
12.8	42.0		11	SS	100	250										
			12	SS	100	76.2										
			13	SS	100	240										
73.0	239.4	End of Borehole				73.1										
18.3	60.0															

RECORD OF BOREHOLE N^o 345

JOB 74-11018 LOCATION Co-ords. 15,680,993 N; 1,063,670 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Oct. 16-19, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Power Auger Boring CHECKED BY PL

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w_L	PLASTIC LIMIT — w_p	WATER CONTENT — w	BULK DENSITY γ	REMARKS	
m.	ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000	w_p — w — w_L WATER CONTENT % 20 40 60	P.C.F.			GR.SA.SI.CL.
99.9	327.6	Ground Level									T/m ³		
0.0	0.0	Topsoil											
		Hard to very stiff brown silty clay with a few fissures some roots in upper portion (desiccated zone)		1	SS	32	320						
				2	SS	27	97.5						
				3	SS	22	310						
93.8	307.6			4	SS	18	94.5						
6.1	20.0			5	TW	PH	300					129	W.L.in pipe
		Stiff to firm grey or grey-brown silty clay with some sand & gravel size particles scattered throughout. some grey silt pockets (to 1/4 inch size) 2 inch thick sand layer or lense at 49 feet depth.		6	SS	18	91.4					2.07	@ Elevation
				7	TW	PH	290						297.3
				8	SS	13	88.4						90.7
				9	TW	PM	280					120	Oct. 25, 1963
				10	SS	8	85.3					1.92	
				11	SS	11	270						
				12	TW	PH	79.2						
			13	SS	26	260							
						76.2							
77.6	254.6												
22.3	13.0	v.dense red-br.sa.sil.											
77.0	252.6	tr.clay with gr.(Till)		14	SS	74							
22.9	75.0	End of Borehole						50	100				
								kPa					

RECORD OF BOREHOLE N^o 349

JOB 74-11018

LOCATION Co-ords. 15,69,246 N; 1,066,163 E.

ORIGINATED BY Golden

W.P. 46-74-00

BORING DATE Oct. 28-30, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Washboring HX & BX Casing

CHECKED BY _____

		SOIL PROFILE		SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)	LIQUID LIMIT — w _L		PLASTIC LIMIT — w _p	WATER CONTENT — w	BULK DENSITY γ P.C.F. T/m ³	REMARKS
m.	ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT (0.3 m)			SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 100 800 1200 1600 2000					
82.3	270.1	Ground Level												
0.0	0.0	Loose compact fine gr. silty clay contains twigs & a few pebbles	X	1	SS	10								
81.5	267.4			2	SS	7								
0.8	2.7	Soft to firm dark grey becoming a mottled grey & brown below about 7 ft. depth & Dark grey again below 14' depth. Clayey silt upper part contains twigs, few scattered gravel size part, below about 14 ft.		3	SS	3								
				4	TW	PM	260	66						
				5	SS	2	79.2			+s=3				
76.5	251.1			6	SS	24								
5.8	19.0	Very dense grey to reddish-brown silt with some fine sand and trace clay contains scattered red and grey coloured rock fragments (Till)		7	SS	100	250							
				8	SS	100	76.2							
72.7	238.6			9	SS	74	240							
9.6	31.5	End of Borehole					73.1		50	kPa	100			

OFFICE REPORT ON SOIL EXPLORATION

FOUNDATIONS OF FICE

ORIGINATED BY Golder

COMPILED BY MW

CHECKED BY _____

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 351

JOB 74-11018 LOCATION Co-ords. 15,680,440 N; 1,065,206 E. ORIGINATED BY Golden
W.P. 46-74-00 BORING DATE Oct. 29, 1963 COMPILED BY MW
DATUM Geodetic BOREHOLE TYPE Wash Boring BX Casing CHECKED BY PC

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w w_p ——— w ——— w_L WATER CONTENT %			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000											
m. 81.9	268.8	Ground Level														GR.SA.SI.CI.	
0.0	0.0	Stiff becoming soft to firm below about 4' depth, silty clay to clayey silt with some roots & twigs 1/2" sand & gravel layer at 5.5 ft. depth		1	CS	11										W.L. in pipe @ El. 268.1 81.8 Nov. 1, 1963	
				2	SS	9											
				3	SS	4											
79.0	259.3	Very dense reddish brown sandy and clayey silt with some gravel (Till)					260									250 76.2	
2.9	9.5			4	SS	100	79.2										
				5	SS	100											
75.8	248.8			6	RC	--	76.2										
6.1	20.0	End of Borehole								50		100					
										kPa							

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE NO 352

FOUNDATIONS OFFICE

JOB 74-11018

LOCATION Co-ords. 15,680,580 N; 1,064,945 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Oct. 30-31, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX & BX Casing

CHECKED BY

SOIL PROFILE		SAMPLES		ft/m	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT		BULK DENSITY	REMARKS
ELEV. m.	DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	BLANKS / FOOT (0.3 m)		
101.5	333.0	Ground Level								
0.0	0.0			1	CS	11	330			
		Hard to very stiff		2	SS	26	100.6			
		Brown-grey silty		3	CS	11				
		clay with some		4	SS	27				
		fissures, some		5	SS	26				
		scattered sand and		6	SS	25	320			
		gravel size		7	TW	21	77.5			
		particles, some		8	SS	23				
		roots & twigs in								
		upper portion		9	SS	33	310			
		(desiccated zone)					94.5			
94.8	311.0			10	SS	26				
6.7	22.0									
		Very stiff to firm		11	TW	20	300			
		grey silty clay					91.4			
		with a few grey		12	SS	11				
		silt pockets								
		(generally less than		13	TW	PM	290			
		1/4 inches in size)					88.4			
		and some scattered		14	SS	6				
		sand and gravel								
		size particles		15	TW	PM	280			
							85.3			
83.4	273.5			16	SS	12				
18.1	57.5	Dense reddish brown								
82.7	271.5	si. fine sa. few pebbles		17	TW	31				
18.8	61.5						270			
		Very dense reddish					82.3			
		brown sandy & clayey		18	SS	>100				
		silt, some grav. (Till)								
80.8	265.2			19	SS	>100				
20.7	67.8	End of Borehole								

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 353

JOB 74-11018 LOCATION Co-ords. 15,679,665 N; 1,065,522 E ORIGINATED BY Golder
 W.P. 46-74-00 BORING DATE Oct. 20 - Nov. 1, 1963 COMPILED BY MW
 DATUM Geodetic BOREHOLE TYPE Wash Boring HX Casing CHECKED BY FW

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w			BULK DENSITY γ P.C.F. GR. SA. SI. CL.	REMARKS	
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BIQWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000					w_p ——— w ——— w_L WATER CONTENT % 20 40 60					
101.6 0.0	333.3 0.0	Ground Level															
95.8 5.8	314.3 19.0	Very stiff mottled brown to brown silty clay with some fissures, contains a few gravel size particles, some roots & twigs in upper portion, (desiccated zone)	1	SS	18	330											
			2	SS	16	100.6											
			3	SS	18												
			4	SS	21	320											
						97.5											
			5	SS	23												
			6	TW	18	310										125	
						94.5										2.00	
			7	SS	11												
			8	TW	15	300										120	
						91.4										1.92	
			9	SS	13												
			10	TW	16	290											
						88.4											
84.9 16.7	278.5 54.8	Very dense reddish-brown sandy silt with some gravel (Till)	11	SS	10												
			12	TW	12	280											
						85.3											
82.7 18.9	271.3 62.0	End of Borehole															
						</											

20
 15 ϕ 5 % STRAIN AT FAILURE
 10

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE N^o 354

JOB 74-11018

LOCATION Co-ords. 15,681,171 N; 1,069,422 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Nov. 6 - 8, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Wash Boring HX & BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES		Ft./m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)		LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w		BULK DENSITY γ P.C.F.	REMARKS
m. ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE		WATER CONTENT % w_p — w — w_L			
90.7	297.4	Ground Level									
0.0	0.0	Firm mottled brown silty sandy clay with roots, twigs, cinders and pebbles (Fill)		1	SS	13					T/m ³
89.3	292.9			2	SS	8					
1.4	4.5	Loose to compact heterogeneous mixture of grey silty sand, cinders, pieces of wood and glass (Fill)		3	SS	5					
				4	SS	3					
86.1	282.4			5	SS	5					
4.6	15.0	Loose grey silty sand mixed with soft brown silty clay, some cinders (Fill)		6	SS	6					
83.4	273.4			7	TW	PM					111
7.3	24.0	Firm to stiff grey or reddish grey silty clay with a few scattered sand & gravel size particles		8	TW	PM					1.78
		few pieces of wood at 29 ft. depth, 2" thick sand layer at 38 ft. depth.		9	TW	PM					130
				10	SS	8					2.08
				11	TW	PM					120
76.3	250.4			12	SS	26					1.92
14.4	47.0	Compact to very dense grey or reddish grey silty fine to medium sand, trace clay, becoming a little coarser textured below about 66 ft. depth, bottom inch has a till structure		13	SS	>100					
				14	SS	>100					
				15	SS	>100					
69.2	227.1			16	SS	>100					
21.5	70.3	End of Borehole					50	100			

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE NO 355

FOUNDATIONS OFFICE

JOB 74-11018

LOCATION Co-ords. 15,679,605 N; 1,065,817 E

ORIGINATED BY Golder

W.P. 46-74-00

BORING DATE Nov. 5, 1963

COMPILED BY MW

DATUM Geodetic

BOREHOLE TYPE Washboring - HX & BX Casing

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT —w _L			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		BLOWS / FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa	PLASTIC LIMIT —w _p				
								○ UNCONFINED + FIELD VANE	w _p — w — w _L				
								● QUICK TRIAXIAL × LAB VANE	WATER CONTENT %			γ	
									20	40	60	P.C.F.	GR. SA. SI. CL.
83.1	272.8	Ground Level											
0.0	0.0	Hard to firm, brown silty clay with some gravel, few roots & twigs Compact to very dense reddish grey fine sandy silt, trace clay with some gravel.	1	Casing	1	270							
81.3	266.8		2	SS	14	82.3							
1.8	6.0		3	SS	24					o o o			
			4	SS	14								
			5	SS	30								
			6	SS	49	260							
			7	SS	>100	79.2							
77.5	254.3												
5.6	18.5	End of Borehole											

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 401

JOB 74-11018

LOCATION

Co-ords. 1,061,622 E; 15,681,578 N.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE

June 20, 1974

COMPILED BY GP

DATUM Geodetic

BOREHOLE TYPE

Hollow Stem Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w w_p — w — w_L			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 100 800 1200 1600 2000					WATER CONTENT %				
85.7 0.0	280.7 0.0	Ground Level				85.3										
		Fill														
		Mixture of gravel, sand, clayey silt and limestone fragments.		1	SS	40										3 23 50 21
				2	SS	40										9 26 58 7
82.7 3.0	270.7 10.0	Clayey Silt some sand, trace of gravel		3	SS	95/6"	270									∇ 269.7 \equiv 82.0
		Organic Silt firm to stiff red-brown to grey		4	SS	14	82.3			+ s=2.5						
				5	SS	18	260								9.11%	2 19 55 21
				6	TW	PH	79.2								Org.	
				7	SS	10	250			+ s=2.5						0 19 64 17
76.5 9.2	250.7 30.0	Weathered Shale					250									1 33 51 15
75.6 10.1	247.8 32.9	Very dense		8	SS	100/	76.2									
		End of Borehole								50 kPa	100					

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 402

JOB 74-11018

LOCATION Co-ords. 1,064,405 E; 15,681,333 N.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE June 20, 1974

COMPILED BY GP

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L			BULK DENSITY	REMARKS	
ELEV. m.	DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT (0-3)	ELEV. SCALE	BLOWS / FOOT					PLASTIC LIMIT — w_p			
								SHEAR STRENGTH P.S.F. kPa					WATER CONTENT — w				
								○ UNCONFINED + FIELD VANE					w_p — w — w_L				
								● QUICK TRIAXIAL × LAB VANE					WATER CONTENT %				
								400	800	1200	1600	2000	20	40	60	P.C.F.	GR. SA. SI. CL.
80.3	263.1	Ground Level															
0.0	0.0	Clayey Silt with sand trace gravel stiff to soft Organic Silt		1	SS	10	260										0 14 66 20
							79.2										259.0
				2	SS	3										0.65	78.9
																Org.	0 36 54 10
76.6	251.1	Sand & Gravel some clay; compact		3	SS	29	250										37 42 (21)
3.7	12.0						76.2										
75.7	248.1	Weathered Shale red-brown Hard.		4	SS	100/4"											
4.6	15.0																
73.7	241.4			5	SS	100/2"											
6.6	21.7	End of Borehole								50		100					
										kPa							

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 403

JOB 74-11018

LOCATION Co-ords. 1,062,609 E; 15,680,904 N.

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE June 20-24, 1974

COMPILED BY GP

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY

SOIL PROFILE			SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)					LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w w_p ——— w ——— w_L WATER CONTENT % 20 40 60			BULK DENSITY γ P.C.F. T/m ³	REMARKS
m. ELEV. DEPTH ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)		SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 400 800 1200 1600 2000									
100.5	329.4	Ground Level														GR.SA.SI.CL
0.0	0.0	Clayey Silt traces of sand hard to firm yellow-brown (desiccated)		1	SS	32										0 5 62 33
				2	SS	29	320									
						97.5										
95.9	314.4			3	SS	15										
4.6	15.0			4	SS	9	310									
						94.5										
		Silty clay		5	TW	PH				+s=1.7					124	0 6 54 40
		traces of sand								q					1.99	304.4
		grey		6	SS	15	300			+s=1.3						92.78
						91.4										
		firm		7	TW	PH				+s=3						
		to stiff		8	SS	6	290			+s=3						0 0 51 49
						88.4										
				9	TW	PH				+s=2.5					119	0 0 50 50
										σ					1.91	
										+s=2.5						
						280										
				10	SS	9	85.3									
										+s=2.4						
						270										
						82.3										
				11	TW	PH										
		very stiff								+s=1.8						
						260										
						79.2										
76.4	250.3					250										
24.1	79.1	Glacial Till, clayey				76.2										
75.2	246.5	silt with sand; hard														1 20 56 23
25.3	82.9	End of Borehole														
		Note:														
		Proctor:														
		Max.wet density 129.7 pcf.														
		Max.dry density 108.7 pcf.														
		Optimum Moisture Content														
		18.9%														

ORIGINATED BY WA

COMPILED BY GP

CHECKED BY _____

20
15 ϕ 5 % STRAIN AT FAILURE
10

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 405

JOB 74-11018

LOCATION Co-ords. 1,069,849 E; 15,681,068 N

ORIGINATED BY WA

W.P. 46-74-00

BORING DATE June 26, 1974

COMPILED BY GP

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY PL

SOIL PROFILE				SAMPLES			ft/m ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (0.3 m)				LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH m. ft.	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT (0.3 m)	SHEAR STRENGTH P.S.F. kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE 400 800 1200 1600 2000				w_p — w — w_L WATER CONTENT % 20 40 60						
92.7 0.0	Ground Level															
0.0	yellow-brown <															

20
15 5 % STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

A P P E N D I X I I

S U M M A R Y O F S O I L S H E A R S T R E N G T H P A R A M E T E R S

STATION	B.H.	ELEVATION		SUB-SOIL	N _{av.}	TOTAL STRESS		EFF. STRESS		BULK DENSITY
		FROM	TO			C	δ	C'	δ'	
264+20 (A)	103	330	303	Fill, soft	-	500	0	0	25	130
		303	284	loose Fill	-	0	29	0	29	125
		284	275	firm silty clay	-	700	0	200	25	120
		275	260	stiff silty clay	21	1250	0	200	25	130
		260	251	medium silty clay	-	900	0	200	25	118
251	354	251	238	sand, silt	100	0	32	0	32	130
		297	273	compact Fill	8	0	29	0	29	125
		273	260	stiff silty clay	-	1250	0	200	25	130
		260	250	firm silty clay	-	900	0	200	25	118
		250	-	silty, fine to medium sand	100	0	32	0	32	130
273+78 (A)	304	325	252	V. stiff silty clay	-	1600	0	200	25	120
		252	-	V. dense sandy silt	50	0	35	0	35	130
		346	340	sandy silt Fill	35	0	32	0	32	120
		340	310	V. stiff silty clay	36	3000	0	200	25	125
		310	263	V. stiff silty clay	-	1600	0	200	25	120

STATION	B.H.	ELEVATION		SUB-SOIL	N _{av.}	TOTAL STRESS		EFF. STRESS		BULK DENSITY
		FROM	TO			C	δ	C'	δ'	
280+68 (A)	123	303	273	firm silty clay	-	500	0	-	-	120
		273	262	V. stiff silty clay	30	2000	0	-	-	128
		262	245	stiff silty clay	-	1000	0	-	-	125
		245	237	silt to sandy silt	75	0	32	0	32	130
		272	249	firm clayey silt	9	500	0	0	25	115
289+00 (B)	205	249	231	V. stiff clayey silt some gravel	70	1750	0	200	25	120
		231	181	clayey silt	37	1300	0	200	25	120
		270	256	Silty clay Fill	4	400	0	0	25	113
		256	254	soft clay	-	750	0	0	25	115
		254	246	Dense clayey silt (Till?)	33	2000	0	200	25	128
300+00 (A)	314	246	-	V. dense silt & sand	60	0	32	0	32	130
		271	254	loose organic silt	3	400	0	0	25	113
		254	233	silty sand	24	0	32	0	32	130
		286	252	V. stiff clayey silt	12	1500	0	200	25	132
		252	231	silty sand	27	0	32	0	32	125
297+00 (A)	210	231	212	Hard Till	100	5000	0	300	27	130

STATION	B.H.	ELEVATION		SUB-SOIL	N _{av}	TOTAL STRESS		EFF. STRESS		BULK DENSITY
		FROM	TO			C	δ	C'	δ'	
283+61 (A)	308	320	246	stiff silty clay	16	1250	0	-	-	120
284+00 (B)	308	320	246	stiff silty clay	16	1250	0	200	25	120
293+00 (B)	230	274	245	stiff silty clay	-	1200	0	200	25	120
		245	242	sandy silt	63	0	32	0	32	125
	207	272	261	soft fill	-	500	0	0	25	110
		261	245	silty clay	-	1200	0	200	25	120
		245	229	V. stiff clayey silt	28	3000	0	300	26	125
		229	214	dense silty sand	37	0	32	0	32	125
288+00 (B)	223	275	255	silty clay, firm	7	500	0	-	-	110
		255	248	clayey silt, v. stiff	24	3000	0	-	-	125
		248	227	Hard Till	95	5000	0	-	-	130
	222	273	245	clayey silt, soft	4	500	0	-	-	110
		245	207	Hard Till	65	5000	0	-	-	130

STATION	B.H.	ELEVATION		SUB-SOIL	N _{av}	TOTAL STRESS		EFF. STRESS		BULK DENSITY
		FROM	TO			C	δ	C'	δ'	
291+50(B)	201	305	296	stiff silty clay	-	1000	0	200	25	125
		296	288	silty sand	30	0	32	0	32	125
		288	270	stiff silty clay	-	1200	0	200	25	116
		270	250	V. stiff silty clay	18	1500	0	200	25	116
		250	230	Hard Till	90	5000	0	300	27	130
		230	209	V. dense silty sand	43	0	32	0	32	125
		280	274	compact gravelly sand	-	0	33	0	33	122
		274	245	stiff silty clay	-	1200	0	200	25	120
		245	241	silty sand	63	0	32	0	32	130
		310	277	loose silty sandy Fill	5	0	28	0	28	120
		272	248	stiff silty clay	16	1200	0	200	25	130
		248	-	clayey silt	55	5000	0	300	27	130
	228	274	256	soft clayey silt	-	500	0	0	25	120
		256	244	V. dense silty sand	50	0	32	0	32	135

STATION	B.H.	ELEVATION		SUB-SOIL	N _{av.}	TOTAL STRESS		EFF. STRESS		BULK DENSITY
		FROM	TO			C	δ	C'	δ'	
297+00 (A)	212	272	238	soft clayey silt	4	500	0	-	-	125
		238	216	dense silty sand	23	0	32	0	32	125
		216	-	Hard Till	35	5000	0	-	-	130
305+00 (B)	216	325	317	firm clayey silt	5	500	0	0	25	110
		317	265	V. stiff silty clay	26	2000	0	200	25	123
		265	-	Hard Till	100	5000	0	300	27	130
		235	280	V. stiff silty clay	33	2500	0	250	25	125
320+00 (A)	352	311	264	stiff silty clay	-	1500	0	200	25	122
		280	250	sandy silt Till	100	0	27	0	27	140
		264	311	very stiff to hard, silty clay	27	2500	0	250	25	130
		333	273	Very stiff silty clay	15	1000	0	200	25	120
		311	271	Dense fine sand	31	0	30	0	30	130
327+00 (A)	322	273	-	Hard Till	100	5000	0	300	27	135
		271	319	Stiff silty clay	18	1500	0	200	25	125
		337	271	Stiff to firm silty clay	14	1000	0	200	25	120
		319								

STATION	B.H.	ELEVATION		SUB-SOIL	N _{av.}	TOTAL STRESS			EFF. STRESS		BULK DENSITY
		FROM	TO			C	φ	C'	φ'		
331+00 (A)	323	331	316	very stiff silty clay	22	2000	0	200	25	122	
		316	270	firm to stiff silty clay	12	1000	0	200	25	122	
		270	-	V. stiff silty clay	16	1500	0	200	25	125	
325+00 (A)	321	273	270	Hard silty clay	-	1000	0	200	25	120	
		270	264	Dense sandy silt	17	0	32	0	32	130	
		264	-	Hard Till	100	5000	0	300	47	130	
303+00 (C)	214	270	254	loose silt	3	400	0	0	25	113	
		254	235	sandy silt	60	0	32	0	32	130	
		311	280	V. stiff silty clay	36	2500	0	200	25	125	
306+00 (C)	235	280	263	V. stiff silty clay	-	1500	0	200	25	122	
		263	250	sandy silt	100	0	27	0	27	140	
		278	271	clayey silt, Hard	42	2500	0	200	25	125	
		271	248	dense to V. dense sandy silt	60	0	32	0	32	135	

STATION	B.H.	ELEVATION		SUB-SOIL	N _{av.}	TOTAL STRESS		EFF. STRESS		BULK DENSITY
		FROM	TO			C	δ	C'	δ'	
291+50 (B)	221	273	247	Organic clayey silt	4	500	0	0	25	120
		247	-	Hard Till	56	5000	0	300	27	130
	232	319	312	Stiff clayey silt	11	1000	0	200	25	124
		312	304	dense silty sand	31	0	32	0	32	130
		304	270	stiff silty clay	-	1200	0	200	25	120
		270	248	V. stiff silty clay	-	1500	0	200	25	130
294+00 (B)		248	237	V. dense sandy silt	66	0	32	0	32	130
	209	303	270	V. stiff silty clay	29	2000	0	200	25	120
		270	245	stiff silty clay	-	1200	0	200	25	120
		245	230	silt	60	0	32	0	32	125
	313	273	255	soft clayey silt	3	500	0	0	25	110
		255	-	compact sand & silt	23	0	32	0	32	125
280+68 (A)		286	281	V. stiff clayey silt Till	9	1000	0	200	25	120
	307	281	273	firm to stiff silty clay	5	500	0	0	25	120
		273	264	V. stiff silty clay	-	2000	0	200	25	128
		264	248	stiff silty clay	-	1000	0	200	25	130
		248	-	sandy silt Till	58	0	32	0	32	130

STATION	B.H.	ELEVATION		SUB-SOIL	N _{av.}	TOTAL STRESS		EFF. STRESS		BULK DENSITY
		FROM	TO			C	φ	C'	φ'	
305+00 (C)	315	271	268	Fill, clayey silt predominant	-	500	0	0	25	125
		268	261	firm to stiff silty clay	16	1200	0	200	25	120
		261	242	V. dense silty sand	100	0	32	0	32	130
		242	-	Hard Till	100	5000	0	300	27	130
297+00 (C)	212	270	238	Med. clayey silt	4	500	0	0	25	125
		238	216	silty sand	25	0	32	0	32	125
		216	204	Hard Till	40	5000	0	300	27	130

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
CIU	CONSOLIDATED ISOTROPIC UNDRAINED TRIAXIAL	C	CONSOLIDATION
CID	" " DRAINED "	S	SENSITIVITY
CAU	" ANISOTROPIC UNDRAINED "		
CAD	" " DRAINED "		

ABBREVIATIONS & SYMBOLS USED IN THIS REPORT

SOIL PROPERTIES

γ	UNIT WEIGHT OF SOIL (BULK DENSITY)
γ_s	UNIT WEIGHT OF SOLID PARTICLES
γ_w	UNIT WEIGHT OF WATER
γ_d	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
γ'	UNIT WEIGHT OF SUBMERGED SOIL
G	SPECIFIC GRAVITY OF SOLID PARTICLES $G = \frac{\gamma_s}{\gamma_w}$
e	VOID RATIO
n	POROSITY
w	WATER CONTENT
S_r	DEGREE OF SATURATION
w_L	LIQUID LIMIT
w_p	PLASTIC LIMIT
I_p	PLASTICITY INDEX
w_s	SHRINKAGE LIMIT
I_L	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$
I_c	CONSISTENCY INDEX = $\frac{w_L - w_p}{I_p}$
e_{max}	VOID RATIO IN LOOSEST STATE
e_{min}	VOID RATIO IN DENSEST STATE
I_D	DENSITY INDEX = $\frac{e_{max} - e}{e_{max} - e_{min}}$
	RELATIVE DENSITY D_r IS ALSO USED
h	HYDRAULIC HEAD OR POTENTIAL
q	RATE OF DISCHARGE
v	VELOCITY OF FLOW
i	HYDRAULIC GRADIENT
k	COEFFICIENT OF PERMEABILITY
j	SEEPAGE FORCE PER UNIT VOLUME
m_v	COEFFICIENT OF VOLUME CHANGE = $\frac{-\Delta e}{(1+e)\Delta\sigma}$
c_v	COEFFICIENT OF CONSOLIDATION
C_c	COMPRESSION INDEX = $\frac{\Delta e}{\Delta \log_{10} \sigma}$
T_v	TIME FACTOR = $\frac{c_v t}{d^2}$ (d , DRAINAGE PATH)
U	DEGREE OF CONSOLIDATION
τ_f	SHEAR STRENGTH
c'	EFFECTIVE COHESION INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
μ	COEFFICIENT OF FRICTION
S_t	SENSITIVITY

IN TERMS OF
EFFECTIVE STRESS
 $\tau_f = c' + \sigma' \tan \phi'$

IN TERMS OF
TOTAL STRESS
 $\tau_f = c_u + \sigma \tan \phi$

GENERAL

π	= 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e a$ OR $\ln a$	NATURAL LOGARITHM OF a
$\log_{10} a$ OR $\log a$	LOGARITHM OF a TO BASE 10
t	TIME
g	ACCELERATION DUE TO GRAVITY
V	VOLUME
W	WEIGHT
M	MOMENT
F	FACTOR OF SAFETY

STRESS AND STRAIN

u	PORE PRESSURE
σ	NORMAL STRESS
σ'	NORMAL EFFECTIVE STRESS ($\bar{\sigma}$ IS ALSO USED)
τ	SHEAR STRESS
ϵ	LINEAR STRAIN
γ	SHEAR STRAIN
ν	POISSON'S RATIO (μ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
η	COEFFICIENT OF VISCOSITY

EARTH PRESSURE

d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_0	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
ρ	ANGLE OF SLOPE TO HORIZONTAL