DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 40P4-42

DIST. 1 REGION

W.P. No. 141-67-01
82-71-01

CONT. No.

W. O. No.

STR. SITE No. 14-34

HWY. No. 7

LOCATION AUSABLE RIVER (1.1 MILES EAST OF HWY 82)

No. of PAGES -

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

REMARKS:

G.I.-30 SEPT. 1976

OVERSIZE DRAWING

Ministry of Transportation and Communications
Ontario

RECORD OF BOREHOLE No 1 METRIC

W P 141-67-01 LOCATION STA. 439 + 86 ; O/S 19' LT. ORIGINATED BY G.A.
DIST 1 HWY 7 BOREHOLE TYPE Washboring NX, BX Casing COMPILED BY P.T.
DATUM Geodetic DATE July 7-10, 1969 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%)	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES						GR SA SI CL
186.1	GROUND LEVEL										
0.0											
			1	SS	2						
			2	SS	3						
			3	SS	10						
			4	SS	47						
			5	SS	19						
			6	TW	PM						
			7	TW	PM+DR						
			8	SS	52						
			9	SS	>100						
			10	SS	>100						
			11	SS	80						

FEET: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 99
METRES: 5, 10, 15, 20, 25, 30

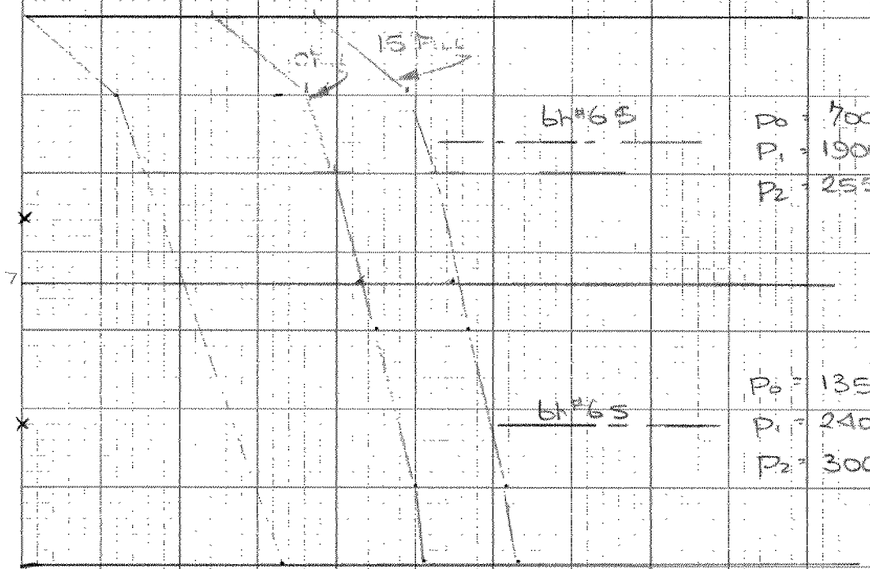
OFFICE REPORT ON SOIL EXPLORATION

$+^3$, $\times^5$: Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

EAST BANK

69 P 55



bh #6 S

P_0 = 700 = .35 e_0 = 0.85
P_1 = 1900 = .95 e_1 = .78
P_2 = 2550 = 1.28 e_2 = .755

$\delta_0 = \frac{.07}{1.85} \times 17 = 0.64$

$\delta_s = \frac{.095}{1.85} \times 17 = 0.87$

bh #6 S

P_0 = 1350 = .68 .521
P_1 = 2400 = 1.20 .516
P_2 = 3000 = 1.50 .514

$\delta_0 = \frac{.005}{1.52} \times 18 = .06$

$\frac{.007}{1.52} \times 18 = .08$

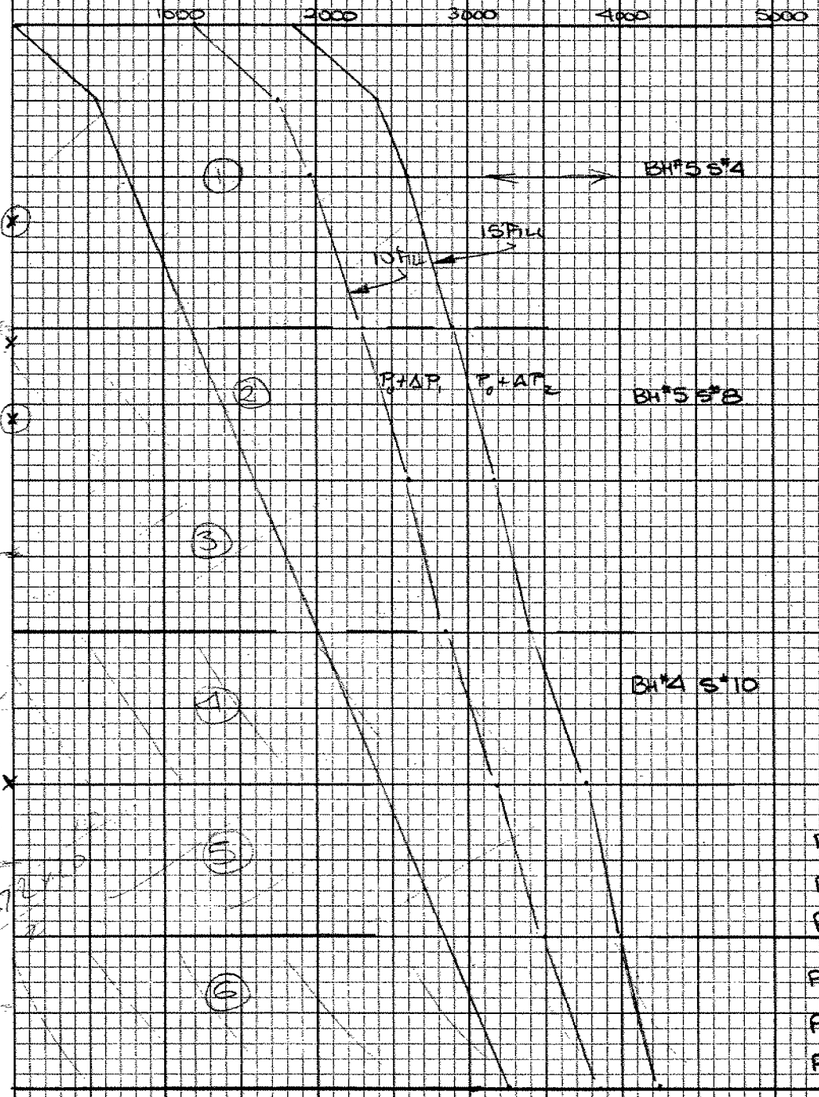
$\boxed{8\frac{1}{2}''}$

.95 $\boxed{11\frac{1}{2}''}$

1 WEST BANK

Void ratio

GO F.SS.



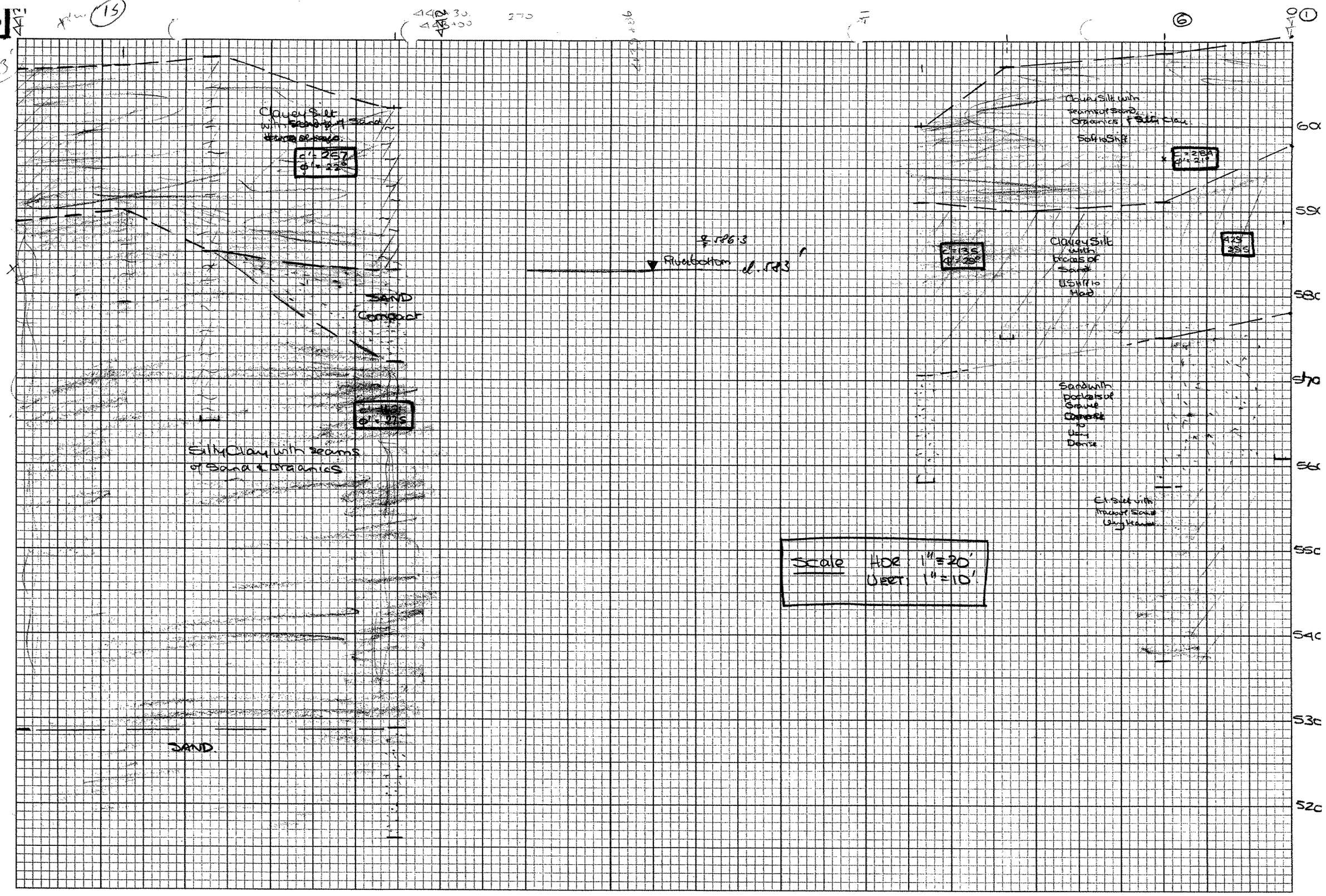
$\frac{\Delta e}{1+e_0}H$

①	BH#5 S#4	P_0 = 750	TON = 0.38	= 0.702	(e_0)	δ_{10} =	$\frac{.038}{1.7}\times 10$	= .45	δ_{15} =	$\frac{.054}{1.7}\times 20$	.64
		P_1 = 1950	.98	= .665	(e_1)						
		P_2 = 2600	1.30	= .648	(e_2)						
②	BH#5 S#8	P_0 = 1400	0.70	= 1.143	(e_0)	δ_{10} =	$\frac{.038}{2.14}\times 10$	.18	δ_{15} =	$\frac{.068}{2.14}\times 10$	.32
		P_1 = 2450	1.23	= 1.105	(e_1)						
		P_2 = 3050	1.53	= 1.075	(e_2)						
③		P_0 = 1800	.90	= 1.128	(e_0)	δ_{10} =	$\frac{.028}{2.13}\times 10$	.13	=	$\frac{.063}{2.13}\times 10$	.30
		P_1 = 2700	1.30	= 1.100	(e_1)						
		P_2 = 3300	1.65	= 1.065	(e_2)						
④	BH#4 S#10	P_0 = 2200	1.10	= 1.132	(e_0)	=	$\frac{.032}{2.13}\times 10$	.15	=	$\frac{.055}{2.13}\times 10$	.26
		P_1 = 3000	1.50	= 1.100	(e_1)						
		P_2 = 3600	1.80	= 1.077	(e_2)						
⑤		P_0 = 2640	1.32	= 1.112	(e_0)	=	$\frac{.026}{2.11}\times 10$	.12	=	$\frac{.047}{2.11}\times 10$	.22
		P_1 = 3320	1.66	= 1.086	(e_1)						
		P_2 = 3900	1.95	= 1.065	(e_2)						
⑥		P_0 = 3050	1.53	= 1.095	(e_0)	=	$\frac{.020}{2.09}\times 10$	.10	=	$\frac{.035}{2.11}\times 10$	.17
		P_1 = 3700	1.85	= 1.075	(e_1)						
		P_2 = 4100	2.05	= 1.060	(e_2)						

1.13" ie 13 1/2"

1.81 ie 22"

69F55



69-1100S Ausable River

Cut 439+00

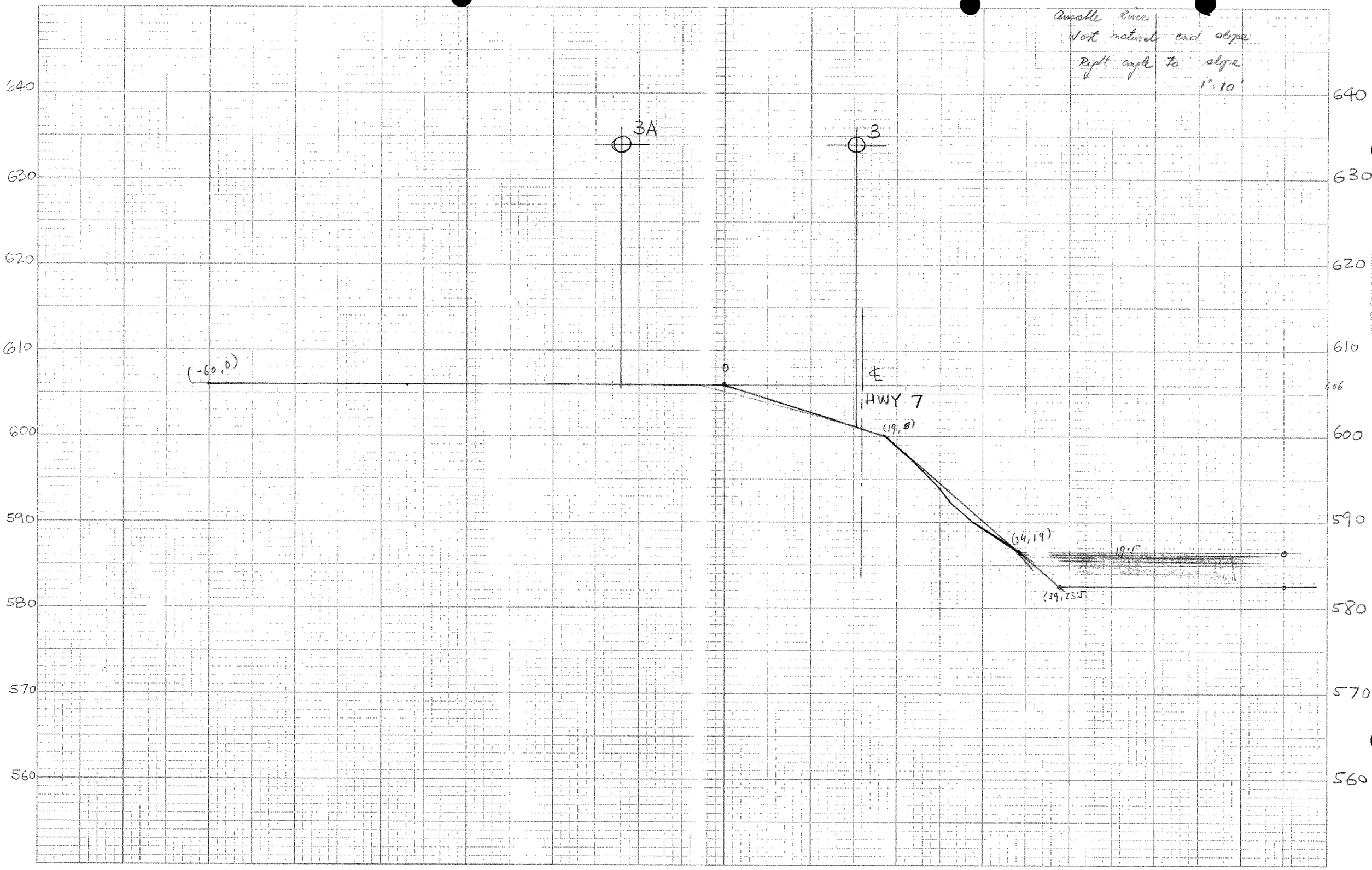
69-F-65

Arcadia River

West natural end slope

Right angle to slope

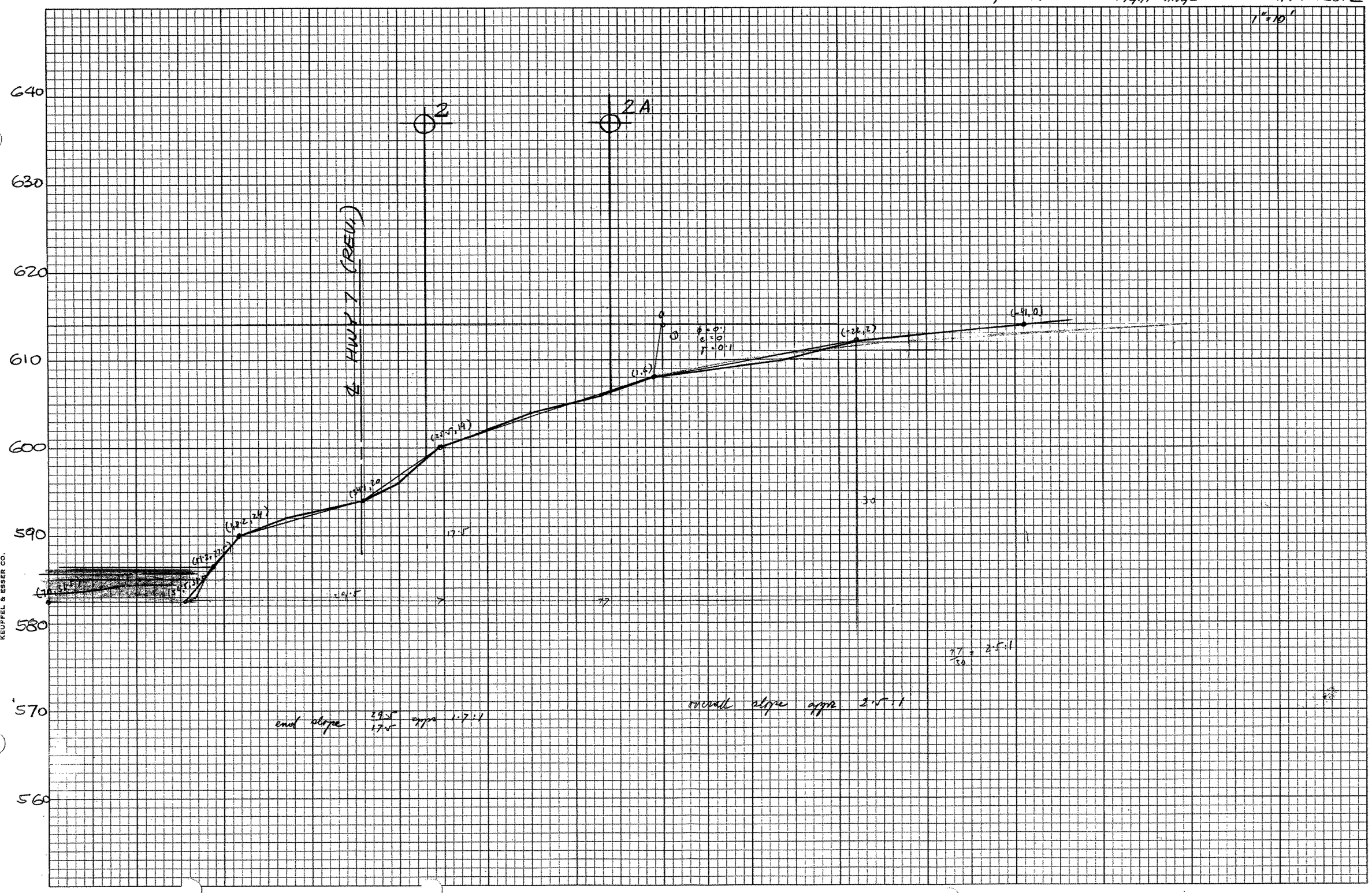
1" 10'

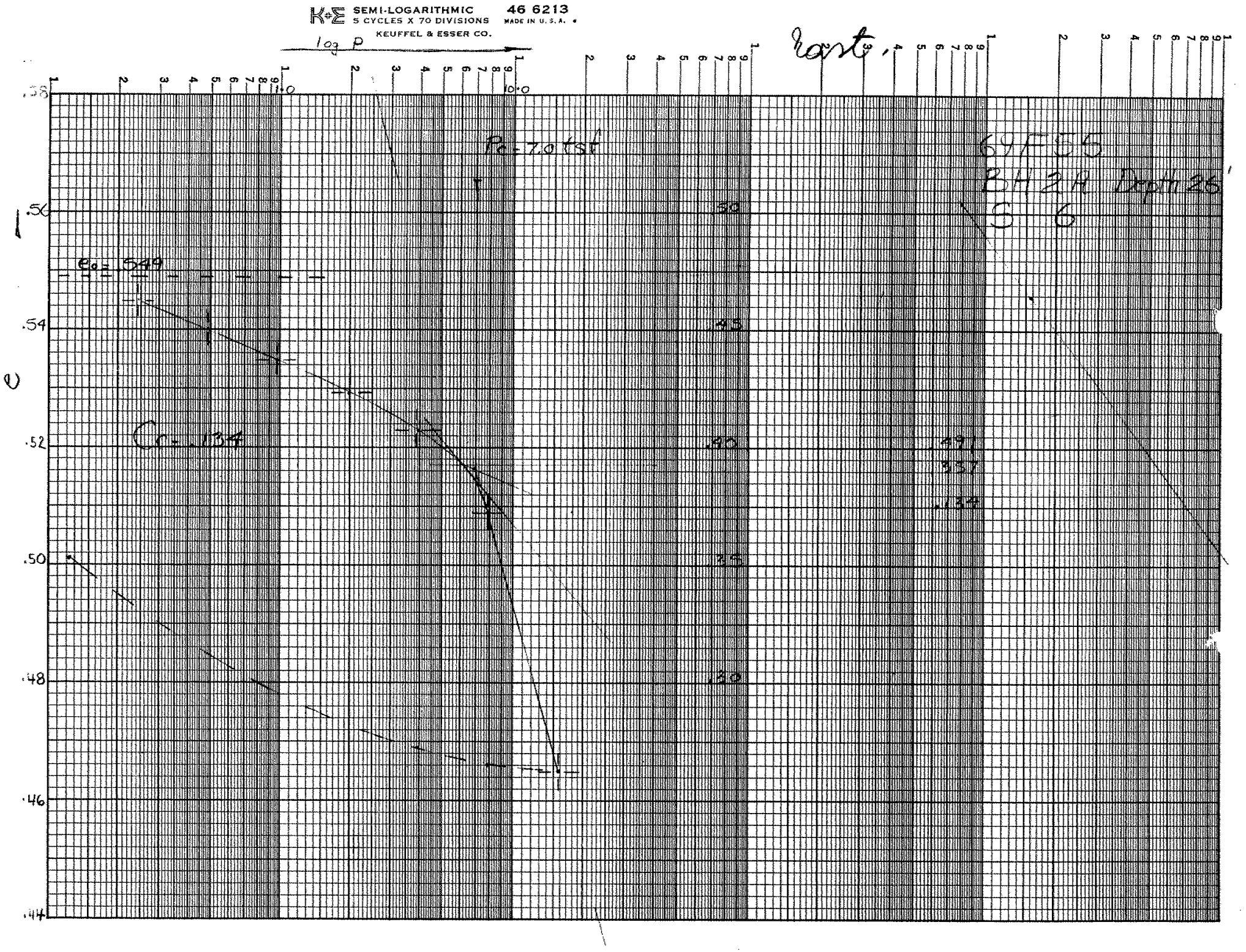


69-F-55

SECTION
RIGHT ANGLE TO NAT. SLOPE

1" = 10'




K+E SEMI-LOGARITHMIC 46 6213
5 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.
log P
e
.58
.56
.54
.52
.50
.48
.46
.44
10.0
Pc = 7.0 tsf
e₀ = .549
Cc = .134
.30
.25
.20
.15
.10
.49
.37
.134
Rosti,
69F56
BH2A Depth 26
5 6

FORM OB-MT-188
REVISED MARCH, 1968

DEPARTMENT OF HIGHWAYS ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS (A)

Project 69-F55 Borehole No. 2A' " Sample No. 6 Depth 26' 0"

Lab. work by _____ Calculations by _____ Checked by _____

Sample description Grey Clayey Silt

Specific Gravity 2.7 (Determined / Assumed)

DIMENSIONS OF APPARATUS:-

Ring No. IX Height .500 (inches) Diameter 1.93 (inches) Area (A) 2.92 (sq. inches)

WATER CONTENT DETERMINATION:-

LOCATION	WHOLE SAMPLE BEFORE TEST	WHOLE SAMPLE AFTER TEST	TOP	BOTTOM	SIDE
Container number	IX	IX			
Weight of wet soil & tare (gms.)	90.36	89.88			
Weight of dry soil & tare (gms.)	82.25	82.25			
Weight of water (gms.)	8.11	7.63			
Weight of tare (gms.)	40.51	40.51			
Weight of dry soil (gms.)	41.74	41.74 (Ws)			
Water content %	19.4	18.3			

INITIAL CALCULATIONS:-

Dry Density _____ (p.c.f.)

Wet Density _____ (p.c.f.)

Void Ratio _____

Initial Solids Height (2Ho) = $\frac{Ws \times 0.061}{Gs \times A}$ = .3230 (inches)

FINAL CALCULATIONS:-

Cv (Coefficient of Consolidation) = $\frac{0.848 \times (2H)^2}{4 \times t_{90}}$ sq.in./min.

LOAD (t.s.f.)	DIAL READING (inches)	CORRECT READING (inches)	SAMPLE HEIGHT 2H (ins.)	2H-2Ho (inches)	VOID RATIO $\frac{2H-2Ho}{2Ho}$	FITTING TIME (minutes)	COEFFICIENT OF CONSOLIDATION Cv sq.in./min.	sq.ft./day
0	0	0	.5000	.1770	.5490			
.246	.0055	.0013	.4987	.1757	.5450			
.492	.0029	.0015	.4972	.1742	.5400			
.984	.0041	.0016	.4956	.1726	.5350			
1.97	.0039	.0017	.4939	.1709	.5290			
3.94	.0049	.0019	.4920	.1690	.5230			
7.87	.0078	.0044	.4876	.1646	.509			
15.74	.0186	.0146	.4730	.1500	.4650			
7.87	.0017	.0004	.4734	.1504	.4660			
3.94	.0021	.0009	.4743	.1513	.4690			
.123	.0172	.0136	.4881	.1651	.5120			

FORM OB-MT-125
REVISED AUGUST, 1965

DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

Job No. 69F55 Borehole No. 2A Sample No. 6

Depth 26 Press No. D Tested By CC

SCALE LOAD (in Lbs.)		16			.5								
LOAD (in T.S.F.)		3.94			.123								
DATE START.		Oct 6/69											
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0		200		3.00	200								0
10 SEC.		183	17		137	63							.41
20		181	19		124	76							.58
30		180½	19½		115	85							.71
40					109	91							.81
50		180	20		103	97							.91
1 MIN.		180	20		96	104							1
1¼		179½	20½										1.120
1½		179½	20½		87	113							1.225
2		179½	20½		78	122							1.41
2½		179	21		74	126							1.58
3		179	21		68	132							1.73
3½					65	135							1.87
4													2
5					56	144							2.25
6¼					51	149							2.5
9					45	155							3
12¼					39	161							3.5
16					36	164							4.0
20¼													4.5
25													5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL				4.10	28	172							

FORM OB-MT-125
REVISED AUGUST, 1965

DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

(2)

Job No. 69-F55 Borehole No. 2A Sample No. 6

Depth 26' Press No. D Tested By

SCALE LOAD (in Lbs.)	16	32	64	32
LOAD (in T.S.F.)	3.94	7.87	15.74	7.87
DATE START.				

T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0		0			0			0			200	0	0
10 SEC.		39			54			104			185	15	.41
20		43			62			131			184	16	.58
30		44			66			148			183½	16½	.71
40		45			69			156			183½	16½	.81
50		45½			69½			161			183½	16½	.91
1 MIN.		46			72			167			183	17	1
1¼		46½			73½						183	17	1.120
1½		47						173			183	17	1.225
2		48			76			177			183	17	1.41
2½		48½			77½			181			183	17	1.58
3								183			183	17	1.73
3½								184					1.87
4								186					2
5													2.25
6¼													2.5
9													3
12¼													3.5
16													4.0
20¼													4.5
25													5
36													6
49													7
64													8
81													9
100													10
200													14.1
300		load	Supported	after	Final	Reading							
400													
FINAL													

FORM OB-MT-125
REVISED AUGUST, 1965

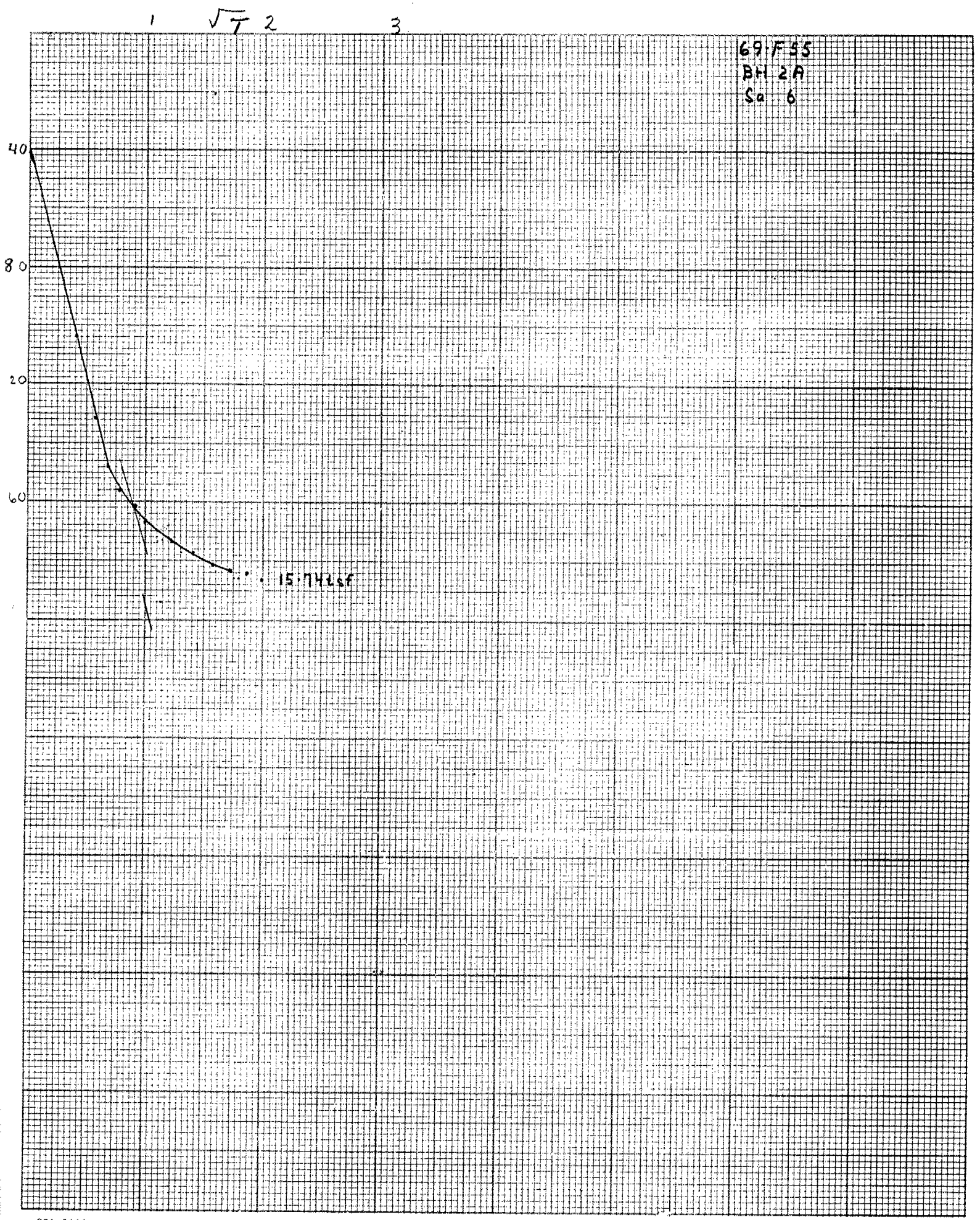
DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

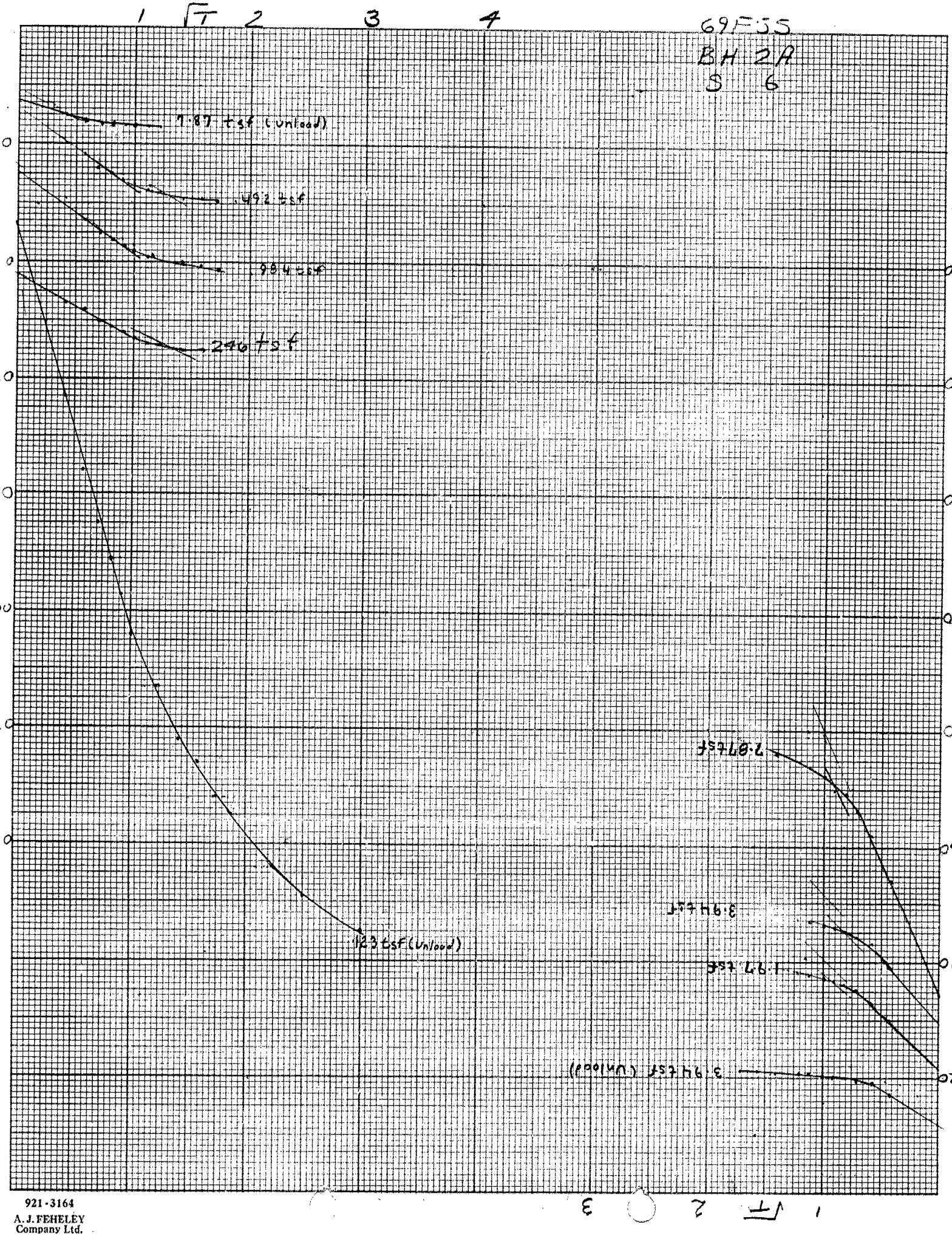
Job No. 69-F 55 Borehole No. 2A Sample No. 6

Depth 26' Press No. D Tested By

SCALE LOAD (in Lbs.)	1			2			4			8			
LOAD (in T.S.F.)	.246			.492			.984			1.97			
DATE START.	Sept 6/69												
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	$\sqrt{T}$
0	1:50	0			0			0			0		0
10 SEC.		47			20			29			30		.41
20		48			22			33			33		.58
30		50			24			35			35		.71
40		51			25			36			36		.81
50		52			26			37			36½		.91
1 MIN.		53			26½			38			37		1
1¼		54			27½			39			37½		1.120
1½		54			28						38		1.225
2		55			29			40			38½		1.41
2½		55			29			40½			39		1.58
3		55			29½			41					1.73
3½								41					1.87
4													2
5													2.25
6¼													2.5
9													3
12¼													3.5
16													4.0
20¼													4.5
25													5
36													6
49	load supported after final rdg.												7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL													

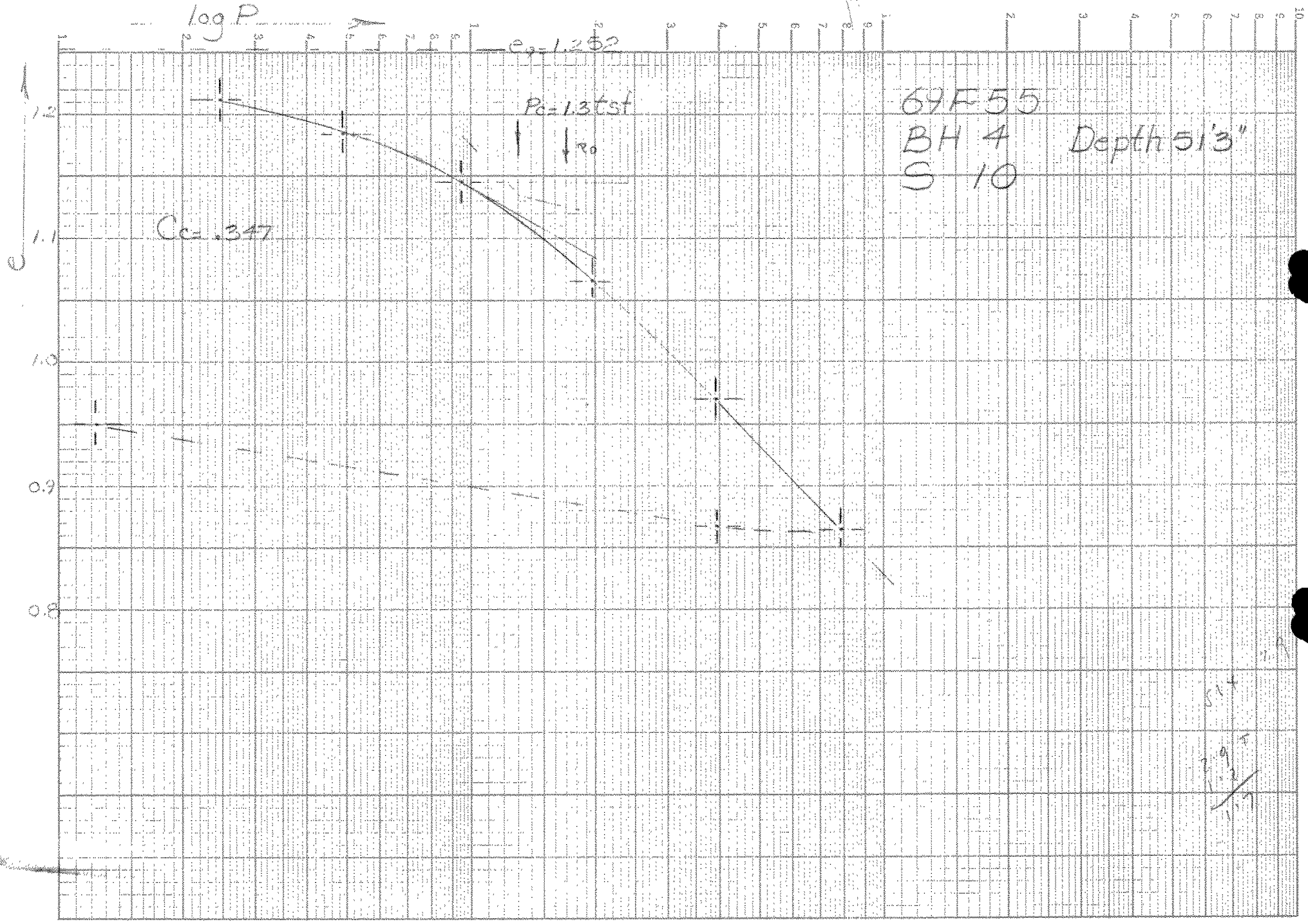


921-3164
A. J. FEHELEY
Company Ltd.



921-3164
A. J. FEHELEY
Company Ltd.

West



FORM OB-MT-188
REVISED MARCH, 1968

DEPARTMENT OF HIGHWAYS ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS (A)

Project 69-F 55 Borehole No. 4 Sample No. 10 Depth 51'3"

Lab. work by _____ Calculations by _____ Checked by _____

Sample description Grey Organic Clayey Silt - Seams of Yellow Organic Matl Trace of Shells

Specific Gravity _____ (Determined / Assumed)

DIMENSIONS OF APPARATUS :-

Ring No. 10 Height .500 (inches) Diameter 1.93 (inches) Area (A) 2.92 (sq. inches)

WATER CONTENT DETERMINATION :-

LOCATION	WHOLE SAMPLE BEFORE TEST	WHOLE SAMPLE AFTER TEST	TOP	BOTTOM	SIDE
Container number	10				
Weight of wet soil & tare (gms.)	82.08	79.60			
Weight of dry soil & tare (gms.)	70.06	70.06			
Weight of water (gms.)	12.02	9.54			
Weight of tare (gms.)	41.37	41.37			
Weight of dry soil (gms.)	28.69	28.69 (Ws)			
Water content %	41.9	33.2			

INITIAL CALCULATIONS :-

Dry Density _____ (p.c.f.)

Wet Density _____ (p.c.f.)

Void Ratio _____

Initial Solids Height (2Ho) = $\frac{Ws \times 0.061}{Gs \times A}$ = .2220 (inches)

1.750
7.88

FINAL CALCULATIONS :-

Cv (Coefficient of Consolidation) = $\frac{0.848 \times (2H)^2}{4 \times t_{90}}$ sq.in./min.

LOAD (t.s.f.)	DIAL READING (inches)	CORRECT READING (inches)	SAMPLE HEIGHT 2H (ins.)	2H - 2Ho (inches)	VOID RATIO $\frac{2H-2Ho}{2Ho}$	FITTING TIME (minutes)	COEFFICIENT OF CONSOLIDATION Cv sq.in./min.	sq.ft./day
0	0	0	.5000	.2780	1.252			
.246	.0164	.0092	.4908	.2688	1.212			
.492	.0074	.0058	.4850	.2630	1.184			
.948	.0118	.0088	.4762	.2542	1.145			
1.97	.0208	.0175	.4587	.2367	1.066			
3.94	.0248	.0215	.4372	.2152	.970			
7.87	.0272	.0232	.4140	.1920	.865			
3.94	+.0020	+.0007	.4147	.1927	.868			
.123	+.0232	+.0182	.4329	.2109	.950			

FORM OB-MT-125
REVISED AUGUST, 1965

DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

(1)

CONSOLIDATION TESTS

Job No. 69-F55 Borehole No. 4 Sample No. 10

Depth 51'2" Press No. D Tested By

SCALE LOAD (in Lbs.)	1.0			2.0			4.0			8.0			
LOAD (in T.S.F.)	.246			.492			.948			1.97			
DATE START.	Aug 19/69			Aug 20/69			Aug 21/69			Aug 22/69			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	$\sqrt{T}$
0	10:55	0		8:40	0		9:00	0		9:00	0		0
10 SEC.		82			25			41			52		.41
20		93			29			46			61		.58
30		98			31			49			67		.71
40		102			33.5			52			72		.81
50		105			35			55			76		.91
1 MIN.		109			36						79		1
1 1/4		112			37			58			83		1.120
1 1/2		113			38			60			85½		1.225
2		116			39.5			62			90		1.41
2 1/2		117½			40.5			63½			94		1.58
3		119			41.5			65			97		1.73
3 1/2		120			42			67			99		1.87
4		121			43			68			102		2
5		123.5			44			70			104.5		2.25
6 1/4		124			45			71.5			108		2.5
9		126			46.5			74.5			114		3
12 1/4		128			47.5			76.5			118		3.5
16		129.5									122		4.0
20 1/4		131									126		4.5
25					51								5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	8:35	164		8	74		8:40	118		10:10	208		

FORM OB-MT-125
REVISED AUGUST, 1965

DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

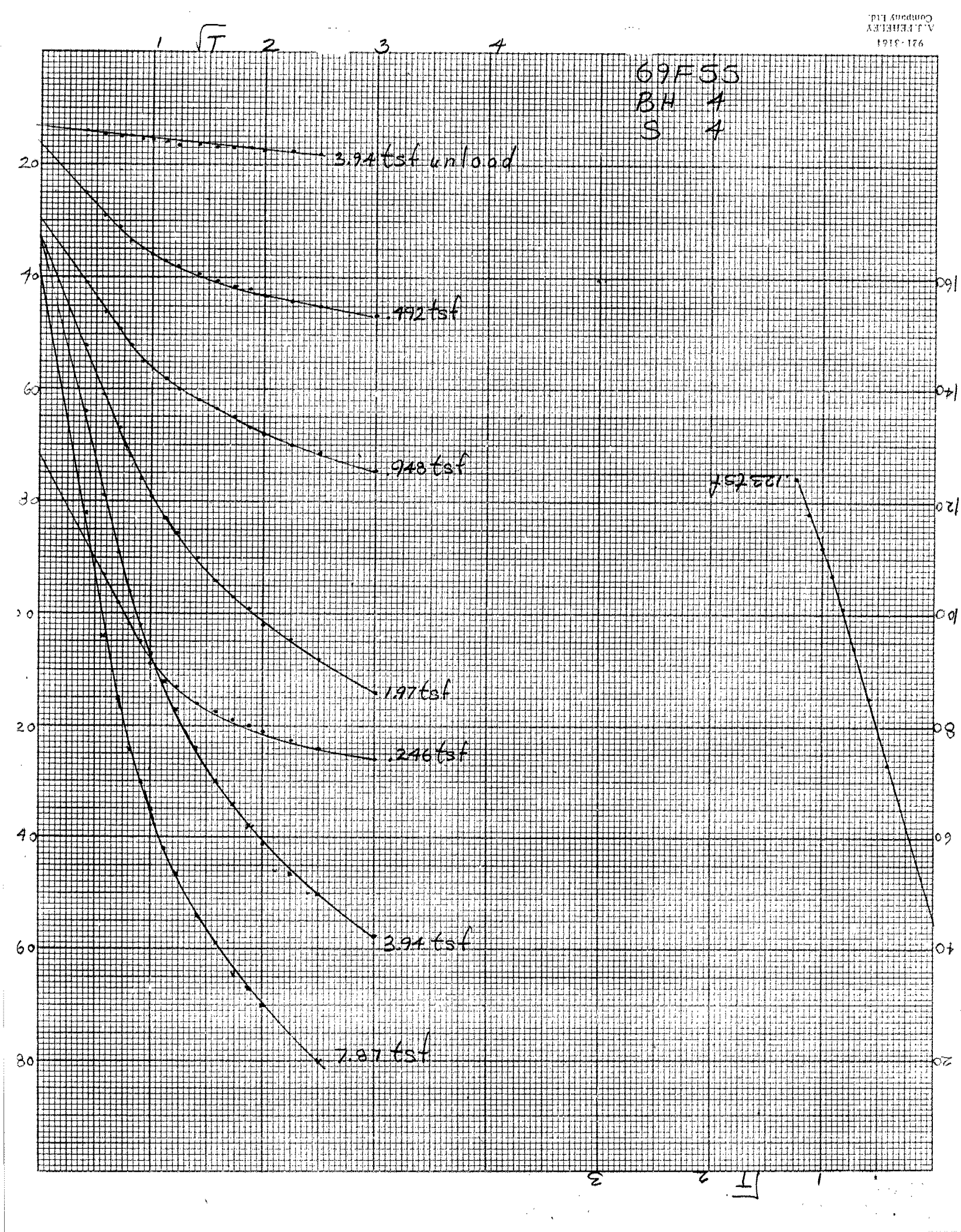
CONSOLIDATION TESTS

(2)

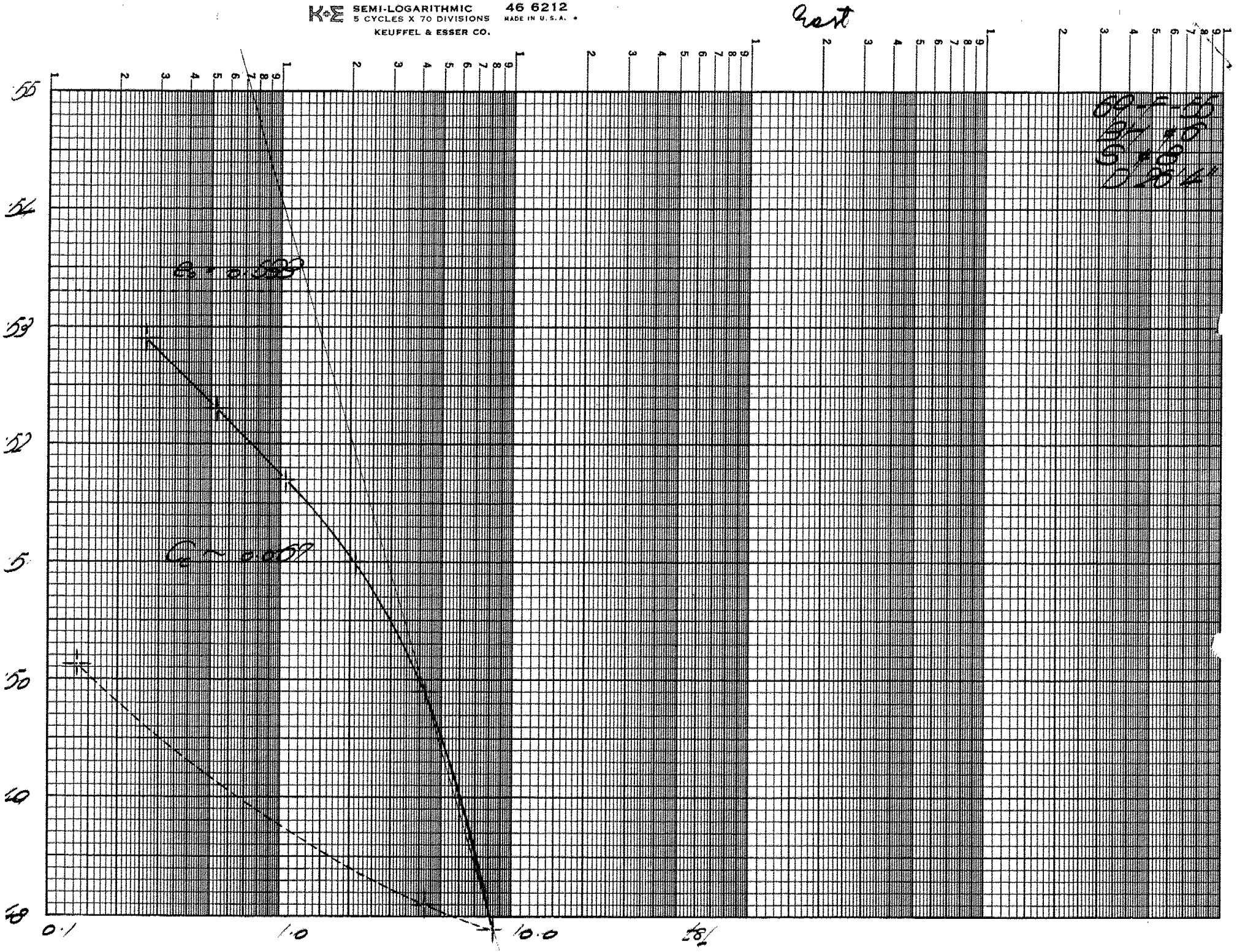
Job No. 69-F55 Borehole No. 4 Sample No. 4

Depth 51' 3" Press No. D Tested By

SCALE LOAD (in Lbs.)	16.0			32.0			16.0			.5			
LOAD (in T.S.F.)	3.94			7.87			3.94			.123			
DATE START.	Aug 25/69			Aug 26/69			Aug 27/69			Aug 28/69			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	10.15	0		8.40	0		9.00	2500		8.45	2500		0
10 SEC.		64			82			2486	14		2427	73	.41
20		79			104			85½	14½		15	85	.58
30		89			115			85	15		2406	94	.71
40		96			124			85	15		2399	101	.81
50		102			130			84½	15½		93	107	.91
1 MIN.		107			135			84½	15½		88	112	1
1¼		112			142			84	16		82	118	1.120
1½		117			146½			83½	16½		76	124	1.225
2		124			154			83½	16½		[illegible]		1.41
2½		130			159			83	17		59	141	1.58
3		134			164½			83	17				1.73
3½		138			167			83	17		50	150	1.87
4		141			170			82½	17½		47	153	2
5		146½						82½	17½		41	159	2.25
6¼		150			180			82	18		36	164	2.5
9		157½			188								3
12¼		163½			191½								3.5
16		168			196								4.0
20¼		173			200								4.5
25		177											5
36		183			209								6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	8.35	248		8[illegible]	272		8.40	2480	[illegible]0	8.30	2268	232	


69F55
BH 4
S 4
√T
1
2
3
4
3.94 tsf unload
.492 tsf
.948 tsf
1.97 tsf
.246 tsf
3.94 tsf
7.87 tsf
.123 tsf
20
40
60
80
20
40
60
80
20
40
60
80
100
120
140
160

K+E SEMI-LOGARITHMIC 46 6212
5 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.



FORM OB-MT-188
REVISED MARCH, 1968

DEPARTMENT OF HIGHWAYS ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS (A)

Project 69-F-55 Borehole No. 6 Sample No. 8 Depth 26'4"

Lab. work by _____ Calculations by _____ Checked by _____

Sample description Grey & brown mottle clayey silt

Specific Gravity 2.62 (Determined / Assumed)

DIMENSIONS OF APPARATUS:-

Ring No. 5 Height .512 (inches) Diameter 1.87 (inches) Area (A) 2.75 (sq. inches)

WATER CONTENT DETERMINATION:-

LOCATION	WHOLE SAMPLE BEFORE TEST	WHOLE SAMPLE AFTER TEST	TOP	BOTTOM	SIDE
Container number	5	5			
Weight of wet soil & tare (gms.)	80.90	80.89			
Weight of dry soil & tare (gms.)	72.84	72.84			
Weight of water (gms.)	8.06	8.05			
Weight of tare (gms.)	33.50	33.50			
Weight of dry soil (gms.)	39.34	39.34 (Ws)			
Water content %	20.5	20.4			

INITIAL CALCULATIONS:-

Dry Density _____ (p.c.f.)

Wet Density _____ (p.c.f.)

Void Ratio _____

Initial Solids Height (2Ho) = $\frac{Ws \times 0.061}{Gs \times A}$ = .8340 (inches)

V_1 = 23.1
8.06
5.04
.262

V_2 = 20.00
8.05
11.95

FINAL CALCULATIONS:-

Cv (Coefficient of Consolidation) = $\frac{0.848 \times (2H)^2}{4 \times t_{90}}$ sq.in./min.

LOAD (t.s.f.)	DIAL READING (inches)	CORRECT READING (inches)	SAMPLE HEIGHT 2H (ins.)	2H-2Ho (inches)	VOID RATIO $\frac{2H-2Ho}{2Ho}$	FITTING TIME (minutes)	COEFFICIENT OF CONSOLIDATION Cv sq.in./min.	sq.ft./day
0	0	0	.5120	.1780	.533			
.262	.0030	.0018	.5107	.1767	.520			
.524	.0025	.0021	.5096	.1746	.523			
1.05	.0028	.0018	.5068	.1728	.517			
2.10	.0030	.0026	.5042	.1702	.510			
4.10	.0058	.0037	.5005	.1665	.400			
8.38	.0090	.0057	.4938	.1598	.470			
4.10	-.0022	-.0000	.4947	.1607	.481			
.18	-.0158	-.0102	.5040	.1700	.511			

FORM OB-MT-125
REVISED AUGUST, 1965

DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

Job No. 69-F-55 Borehole No. 6 Sample No. 8

Depth 26'4" Press No. B Tested By Karam

SCALE LOAD (in Lbs.)	1			2			4			8			
LOAD (in T.S.F.)	.262			.524			1.05			2.10			
DATE START.	9th July 1970			10 July 70			13th July 1970			14/7/70			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	2.09	2500	0	8:20	2500	0	8.15	2500	0	8.47	2500	0	0
10 SEC.		2482	18		2491	9		2488	12		2482	18	.41
20		2480	20		90	10		2486	14		2480	20	.58
30		2479	21		89	11		2485	15		2478	22	.71
40		2478.5	21.5		88	12		84.5	15.5		77	23	.81
50		2478.0	22.0		87	13		83.8	16.2		76.5	23.5	.91
1 MIN.		2477.5	22.5		86	14		83.4	16.6		76	24.0	1
1 1/4		2477.0	23.0		85½	14½		83.2	16.8		75.5	24.5	1.120
1 1/2		2476.5	23.5		85	15		82.9	17.1		74.7	25.3	1.225
2		2476.0	24.0		84½	15½		82.6	17.4		74.3	25.7	1.41
2 1/2		2475.6	24.4		84	16		82.1	17.9		73.9	26.1	1.58
3		2475.3	24.7		84	16		81.9	18.1		73.5	26.5	1.73
3 1/2		2475.0	25.0		83½	16½		81.7	18.3		73.2	26.8	1.87
4		2474.5	25.5		83½	16½		81.5	18.5		73.0	27.0	2
5		2474.0	26.0		83	17		812	18.8		72.5	27.5	2.25
6 1/4		2473.6	26.4		83	17		81.0	19.0		72.1	27.9	2.5
9		2473.2	26.8		82½	17½		80.5	19.5		71.5	28.5	3
12 1/4											70.6	29.4	3.5
16													4.0
20 1/4													4.5
25													5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	8:20	2470	30	9.12	2475	25.0	8.44	2472.5	27.5	8.49	2461	39.0	
				13/7/70			14/7/70			15/7/70			

FORM OB-MT-125
REVISED AUGUST, 1965

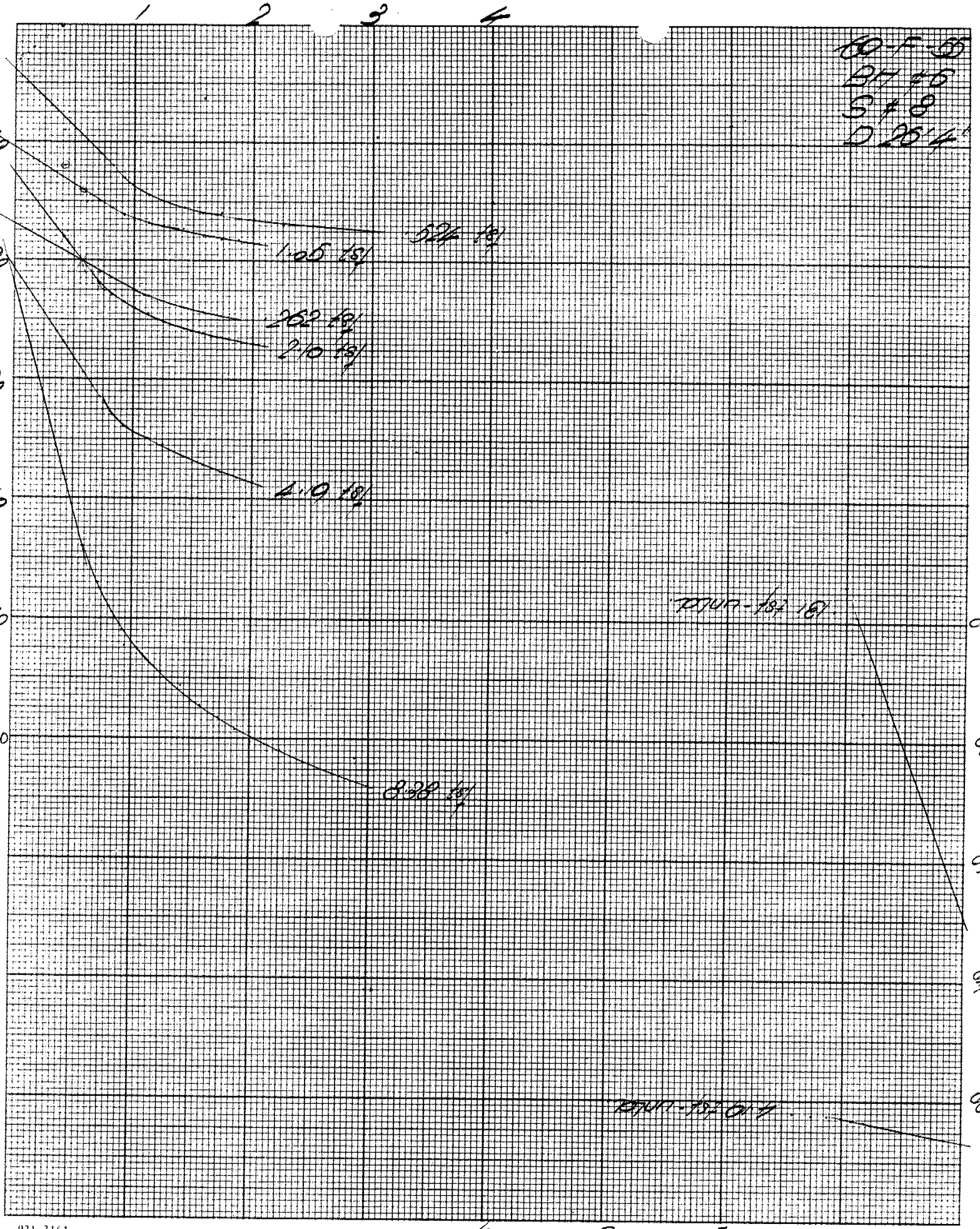
DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

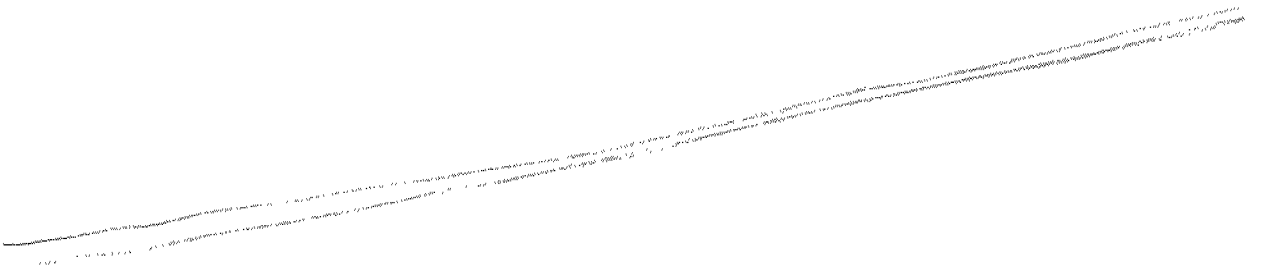
CONSOLIDATION TESTS

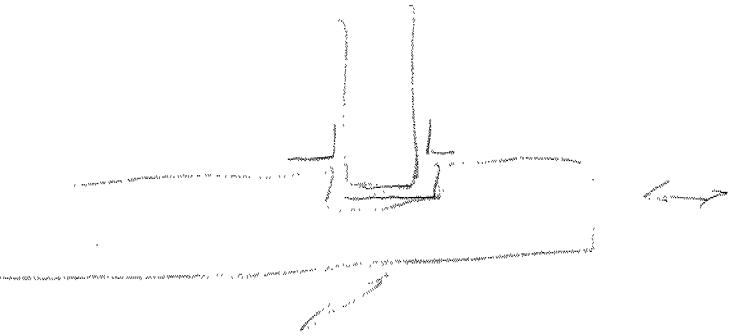
Job No. 69-F-55 Borehole No. 6 Sample No. 8

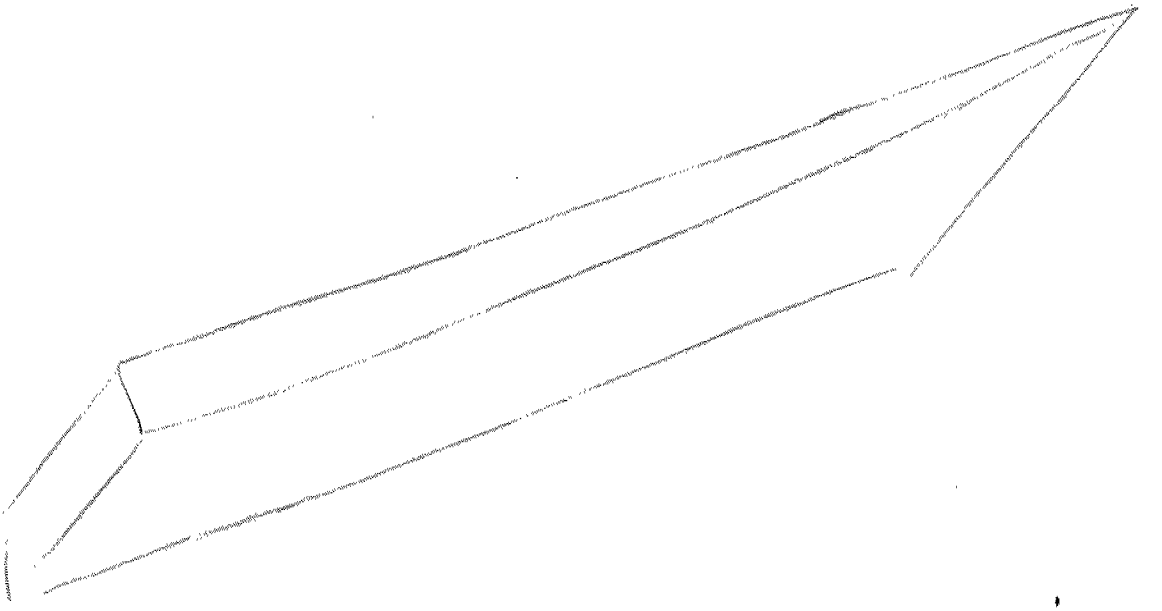
Depth 26'4" Press No. B Tested By Karan

SCALE LOAD (in Lbs.)	16			32			16			0.5			
LOAD (in T.S.F.)	4.19			8.38			4.19			0.131			
DATE START.	15/7/70			16/7/70			17/7/70			20/7/70			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	8.45	2500	0	8.46	2500	0	8.48	0	0	8:15	0		0
10 SEC.		2473	27		2462	38		15			74		.41
20		2470.5	29.5		2456	44		15.5			83		.58
30		68.5	31.5		2453	47		16.0			90		.71
40		67.0	33.0		51	40		16.5			96		.81
50		66.0	34.0		49	51		16.8			101		.91
1 MIN.		65.5	34.5		48	52		17.1			104		1
1 1/4		65.0	35.0		46.5	53.5		17.3			109		1.120
1 1/2		64.5	35.5		45.5	54.0		17.5			112		1.225
2		63.5	36.5		43.8	55.2		17.8			117		1.41
2 1/2		62.9	37.1		42.7	57.3		18.0			120		1.58
3		62.3	37.7		41.7	58.3		18.2			123		1.73
3 1/2		61.8	38.2		40.7	59.3		18.5			125		1.87
4		61.4	38.6		39.7	60.3		18.7			127		2
5		60.8	39.2		39.0	61		19.0			130		2.25
6 1/4		60.0	40.0		38.0	62		19.4			132		2.5
9		59.0	41.0		36.0	64		20.0			135		3
12 1/4		58.0	42.0		34.6								3.5
16													4.0
20 1/4													4.5
25													5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	8.45	2442	158	8.46	2411		8:15	22		8:21	153		
				17/7/70						21/7/70			



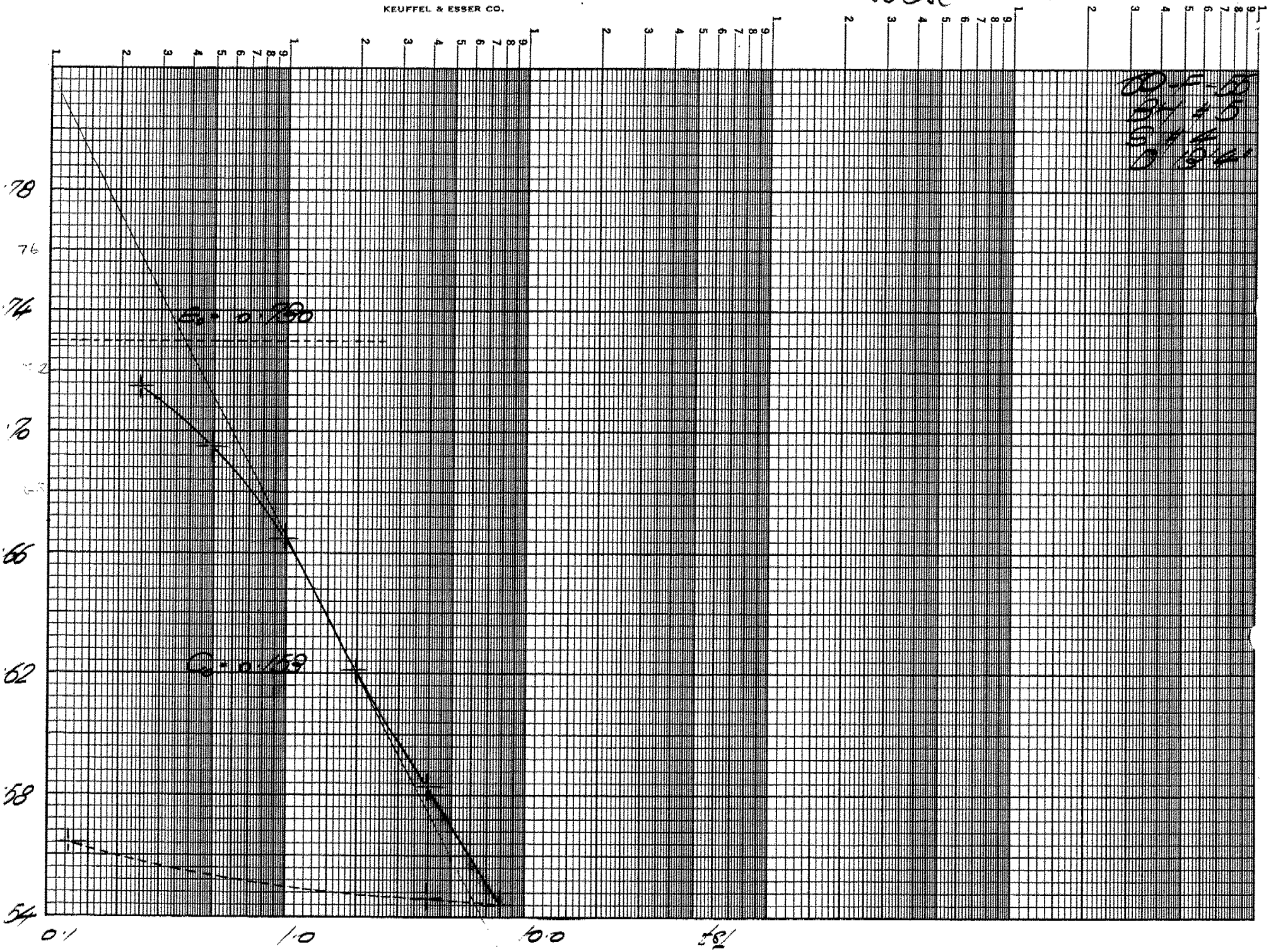






K+E SEMI-LOGARITHMIC 46 6212
5 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

West



FORM OB-MT-188
REVISED MARCH, 1968

DEPARTMENT OF HIGHWAYS ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS (A)

Project 69-F-55 Borehole No. 5 Sample No. 4 Depth 13'4"

Lab. work by _____ Calculations by _____ Checked by _____

Sample description Grey Clayey silt with traces of Sand.

Specific Gravity 2.63 (Determined / Assumed)

DIMENSIONS OF APPARATUS:-

Ring No. X Height 0.500 (inches) Diameter 1.93 (inches) Area (A) 2.92 (sq. inches)

WATER CONTENT DETERMINATION:-

LOCATION	WHOLE SAMPLE BEFORE TEST	WHOLE SAMPLE AFTER TEST	TOP	BOTTOM	SIDE
Container number	X	X			
Weight of wet soil & tare (gms.)	87.89	85.34			
Weight of dry soil & tare (gms.)	77.76	77.76			
Weight of water (gms.)	10.13	7.58			
Weight of tare (gms.)	41.37	41.37			
Weight of dry soil (gms.)	36.39	36.39 (Ws)			
Water content %	27.9	20.8			

INITIAL CALCULATIONS:-

Dry Density _____ (p.c.f.)

Wet Density _____ (p.c.f.)

Void Ratio _____

Initial Solids Height (2Ho) = $\frac{Ws \times 0.061}{Gs \times A}$ = .2800 (inches)

V_1 = 23.9 + 10.13 = 13.77 → 2.65

V_2 = 21.6 + 7.58 = 14.02 → 2.6

FINAL CALCULATIONS:-

Cv (Coefficient of Consolidation) = $\frac{0.848 \times (2H)^2}{4 \times t_{90}}$ sq.in./min.

LOAD (t.s.f.)	DIAL READING (inches)	CORRECT READING (inches)	SAMPLE HEIGHT 2H (ins.)	2H - 2Ho (inches)	VOID RATIO $\frac{2H-2Ho}{2Ho}$	FITTING TIME (minutes)	COEFFICIENT OF CONSOLIDATION Cv sq.in./min.	COEFFICIENT OF CONSOLIDATION Cv sq.ft./day
0	0	0	.5000	.2110	.73			
.245	.0030	.0044	.4956	.2066	.715			
.402	.0071	.0056	.4900	.2010	.695			
.984	.0095	.0087	.4913	.1923	.665			
1.07	.0140	.0126	.4887	.1707	.621			
2.94	.0152	.0111	.4576	.1686	.583			
7.87	.0155	.0114	.4462	.1572	.544			
3.94	-.0010	-.0007	.4400	.1570	.546			
128	-.0098	-.0051	.4520	.1630	.564			

FORM OB-MT-125
REVISED AUGUST, 1965

DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

Job No. 69-F-55 Borehole No. 5 Sample No. 4

Depth 13' 4" Press No. D Tested By

SCALE LOAD (in Lbs.)	1			2			4			8			
LOAD (in T.S.F.)	.246			.492			.984			1.97			
DATE START.	9th July 1970			10/7/70			13/7/70			14/7/70			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	10.20	0	0	8.40	0	0	8.02	0	0	8.38	0	0	0
10 SEC.		55			19			23			42		.41
20		59			23			29			53		.58
30		63			25			32.5			59		.71
40		64.5			27			34.6			63		.81
50		65.5			28			37.0			66		.91
1 MIN.		67.			29			39.0			68.5		1
1 1/4		68			30.5			41.0			71.2		1.120
1 1/2		68.5			31.5			42.0			73.5		1.225
2		69			32.7			44.0			77.0		1.41
2 1/2		70			34.0			46.3			79.5		1.58
3		70.5			34.8			48.0			81.9		1.73
3 1/2		71.0			35.4			49.0			83.5		1.87
4		71.4			36.1			50.0			85.0		2
5		72.0			37.0			52.0			87.5		2.25
6 1/4		72.7			38.0			54.0			90.0		2.5
9		74.0			40.0			57.0			94.5		3
12 1/4								59.0			97.0		3.5
16													4.0
20 1/4													4.5
25													5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	8.37	89.0		8.00	71		8.36	95.0		8.34	140		
				13/7/70			14/7/70			15/7/70			

FORM OB-MT-125
REVISED AUGUST, 1965

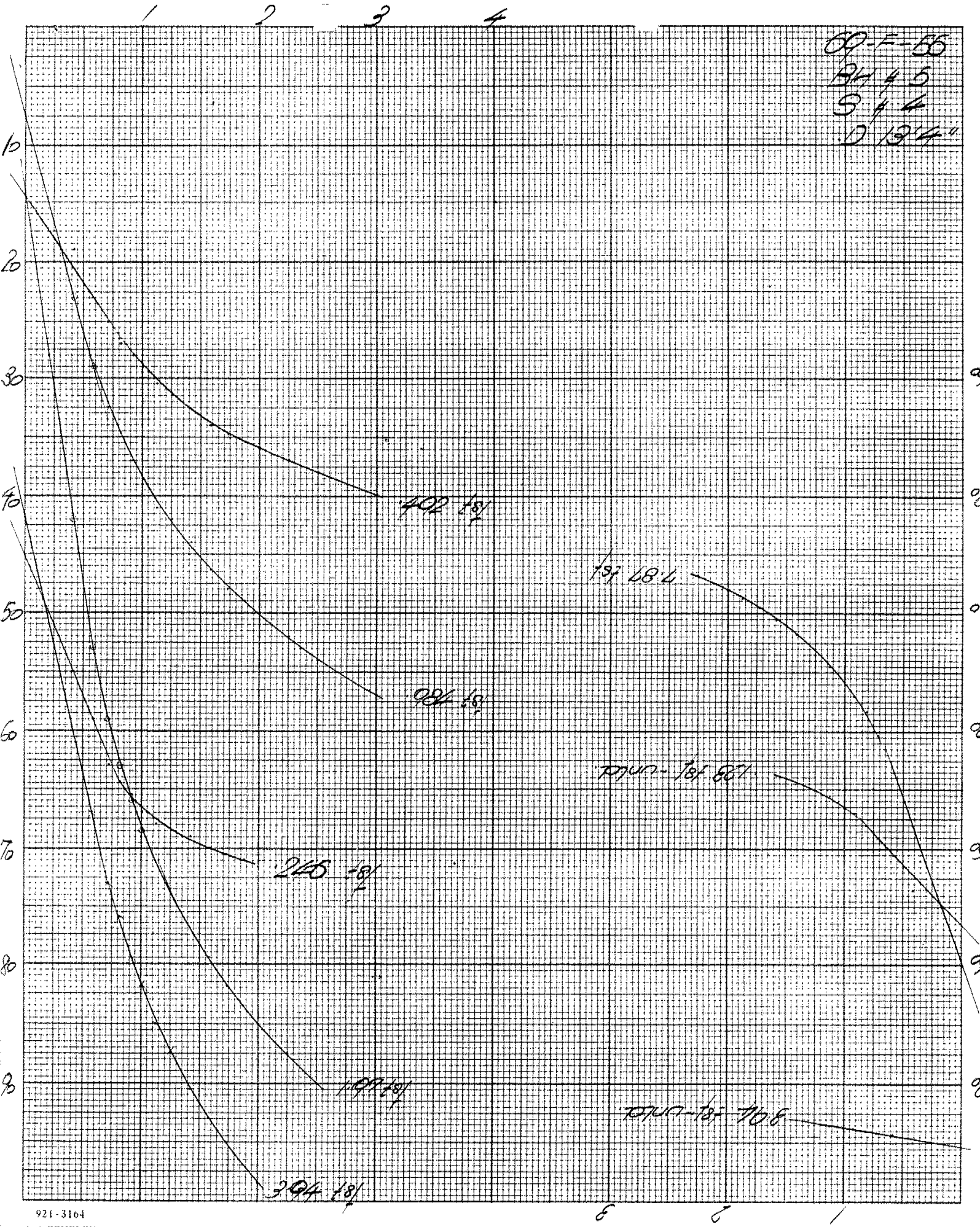
DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

Job No. 69-F-55 Borehole No. 5 Sample No. 4

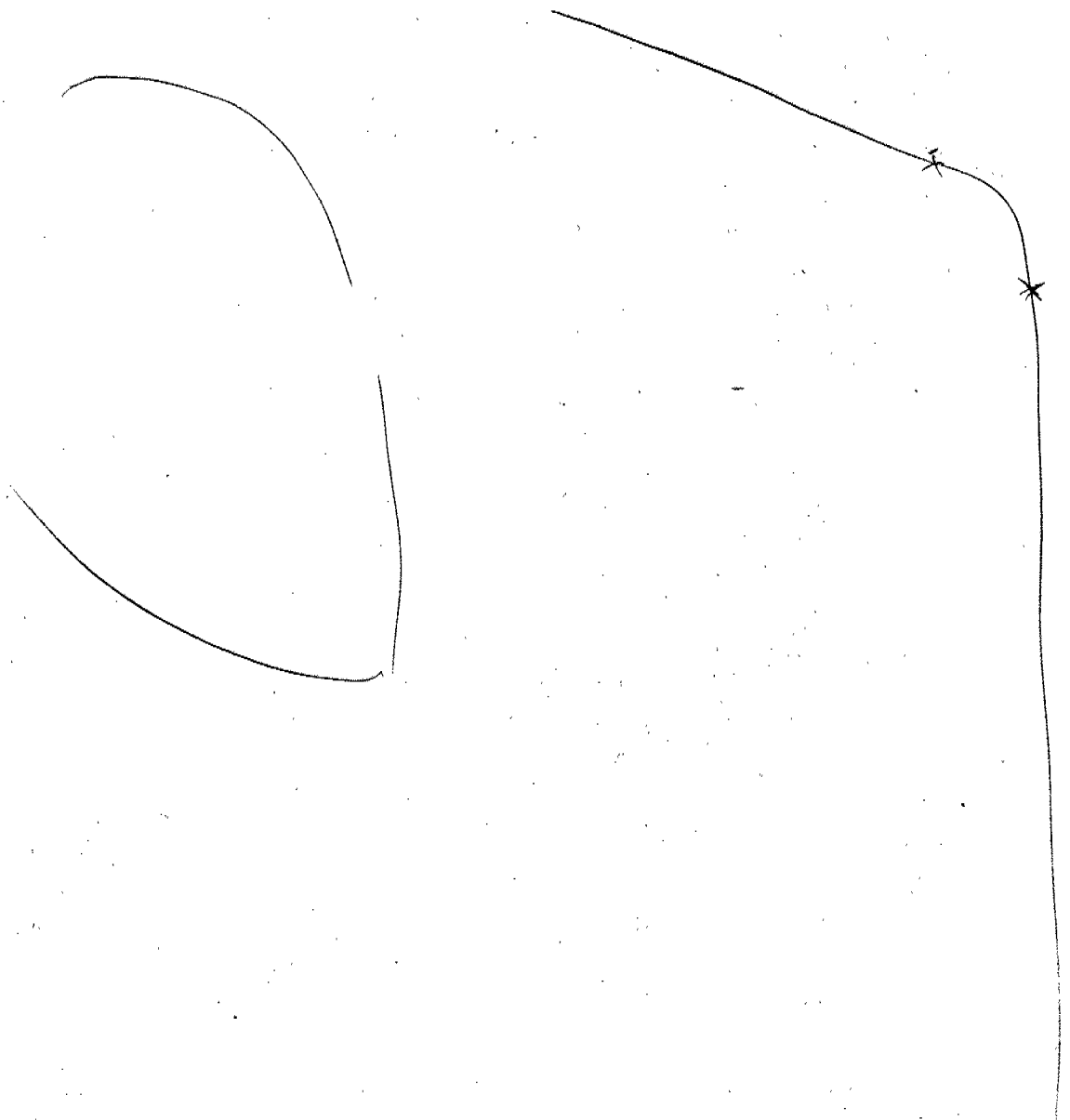
Depth 13' 4" Press No. D Tested By

SCALE LOAD (in Lbs.)	16			32			16			0.5			
LOAD (in T.S.F.)	3.94			7.87			3.94			.123			
DATE START.	15/7/70			16/7/70			17/7/70						
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	8.40	0	0	8.40	0	0	8.40	2500	0	8.22	2500	0	0
10 SEC.		55			64			2490	10		2447	53	.41
20		67			73			2488.5	11.5		2441	59	.58
30		73			79.5			2488.3	11.7		2438	62	.71
40		76			83.5			2488.0	12.0		2436	64	.81
50		79.5			86.0			2487.6	12.4		2434	66	.91
1 MIN.		82			88.5			2487.3	12.7		2433	67	1
1 1/4		85			91.0			2487.0	13.0		2431	69	1.120
1 1/2		87.4			93.0			2486.6	13.4		30	70	1.225
2		90.5			96.5			2486.2	13.8		29	71	1.41
2 1/2		93.0			99.0			2486.0	14.0		27.5	72.5	1.58
3		95.0			101.0			2485.8	14.2		26.0	74.0	1.73
3 1/2		97.0			102.5			2485.5	14.5		25.0	75.0	1.87
4		98.5			104.0			2485.2	14.8		24.0	76.0	2
5		101.0			106.5			2485.0	15.0		23.0	77.0	2.25
6 1/4		103.5			109.0			2484.5	15.5		21.0	79.0	2.5
9		107.5			113.0						19.5	80.5	3
12 1/4		110.5			116.0						18.0		3.5
16		113.3			119.0								4.0
20 1/4											16.0	84.0	4.5
25													5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	8.38	153.0		8.38	155		8.20	2484.0	16.0	8.20	2402	98	
				17/7/70			29/7/70			21/7/70			



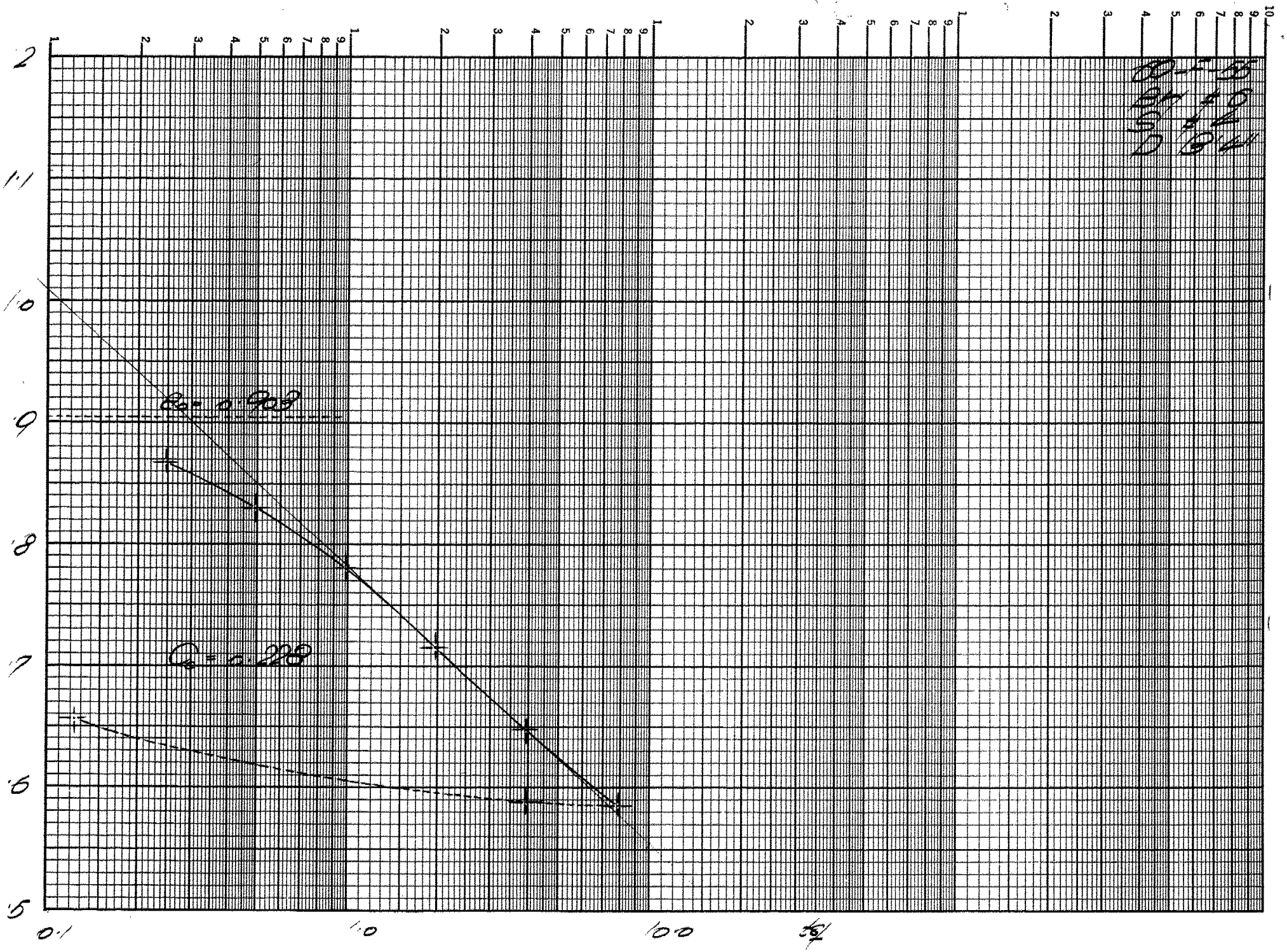
$$\Delta H = \frac{\Delta e}{1+e_0} \times H$$

$$\Delta H = \sum \Delta H_1 + \sum \Delta H_2$$



K+E SEMI-LOGARITHMIC 46 6012
4 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

East



FORM OB-MT-188
REVISED MARCH, 1968

DEPARTMENT OF HIGHWAYS ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS (A)

Project 69-F-55 Borehole No. 6 Sample No. 4 Depth 13'4"

Lab. work by C.C. Calculations by _____ Checked by _____

Sample description Light gray Clayey silt with some organics

Specific Gravity 2.70 (Determined / Assumed)

DIMENSIONS OF APPARATUS :-

Ring No. IX Height 0.500 (inches) Diameter 1.93 (inches) Area (A) 2.92 (sq. inches)

WATER CONTENT DETERMINATION :-

LOCATION	WHOLE SAMPLE BEFORE TEST	WHOLE SAMPLE AFTER TEST	TOP	BOTTOM	SIDE
Container number	IX	IX			
Weight of wet soil & tare (gms.)	85.49	82.72			
Weight of dry soil & tare (gms.)	74.47	74.47			
Weight of water (gms.)	11.02	8.25			
Weight of tare (gms.)	40.51	40.51			
Weight of dry soil (gms.)	33.96	33.96 (Ws)			
Water content %	32.5	24.3			

INITIAL CALCULATIONS :-

Dry Density _____ (p.c.f.)

Wet Density _____ (p.c.f.)

Void Ratio _____

Initial Solids Height (2Ho) = $\frac{Ws \times 0.061}{Gs \times A}$ = 2.525 (inches)

V_1 = 23.95 + 11.02 = 12.93 → 2.62

V_2 = 20.80 + 8.25 = 12.55 → 2.70

FINAL CALCULATIONS :-

Cv (Coefficient of Consolidation) = $\frac{0.848 \times (2H)^2}{4 \times t_{90}}$ sq.in./min.

LOAD (t.s.f.)	DIAL READING (inches)	CORRECT READING (inches)	SAMPLE HEIGHT 2H (ins.)	2H - 2Ho (inches)	VOID RATIO $\frac{2H-2Ho}{2Ho}$	FITTING TIME (minutes)	COEFFICIENT OF CONSOLIDATION Cv sq.in./min.	sq.ft./day
0	0	0	.5000	2.375	.903			
.246	.0120	.0093	.4907	2.282	.808			
.492	.0108	.0103	.4804	2.180	.880			
.984	.0187	.0173	.4673	2.048	.79			
1.97	.0125	.0165	.4508	1.883	.716			
3.94	.0104	.0181	.4327	1.702	.648			
7.87	.0104	.0165	.4161	1.536	.584			
3.94	-.0023	-.0011	.4172	1.547	.588			
.123	-.0215	-.0175	.4347	1.722	.655			
	36							

FORM OB-MT-125
REVISED AUGUST, 1965

DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

Job No. 69-F-55 Borehole No. 6 Sample No. 4

Depth 13' 4" Press No. C Tested By Kavan

SCALE LOAD (in Lbs.)	1			2			4			8			
LOAD (in T.S.F.)	.246			.492			.984			1.97			
DATE START.	20/7/70			21/7/70			22/7/70			23/7/70			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	10:30	100	0	8:20	0		8.21	0	0	8:50	0		0
10 SEC.		48			16			22			34		.41
20		54			20			29			45		.58
30		58			24			34			52		.71
40		62.5			27			38			58		.81
50		66.0			29			42			64		.91
1 MIN.		69.0			31			45			69		1
1 1/4		72.0			34			50			75		1.120
1 1/2		75.0			36			53			80		1.225
2		80.0			40			59			88		1.41
2 1/2		84.0			43			64			95		1.58
3		87.0			46			68.5			100		1.73
3 1/2		90.0			48			72.0			104		1.87
4		92.0			50			75.0			108		2
5		94.5			53			79.0			113		2.25
6 1/4		97.2			56			83.5			118		2.5
9		101.0			61			89.0			125		3
12 1/4		104.0			64			93.5			130		3.5
16		105.5			66			100.5			134		4.0
20 1/4					67 1/2								4.5
25					68 1/2								5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	8:20	126		8.20	108		8:50	137		8:45	175		
				22/9/70						24/7/70			

FORM OB-MT-125
REVISED AUGUST, 1965

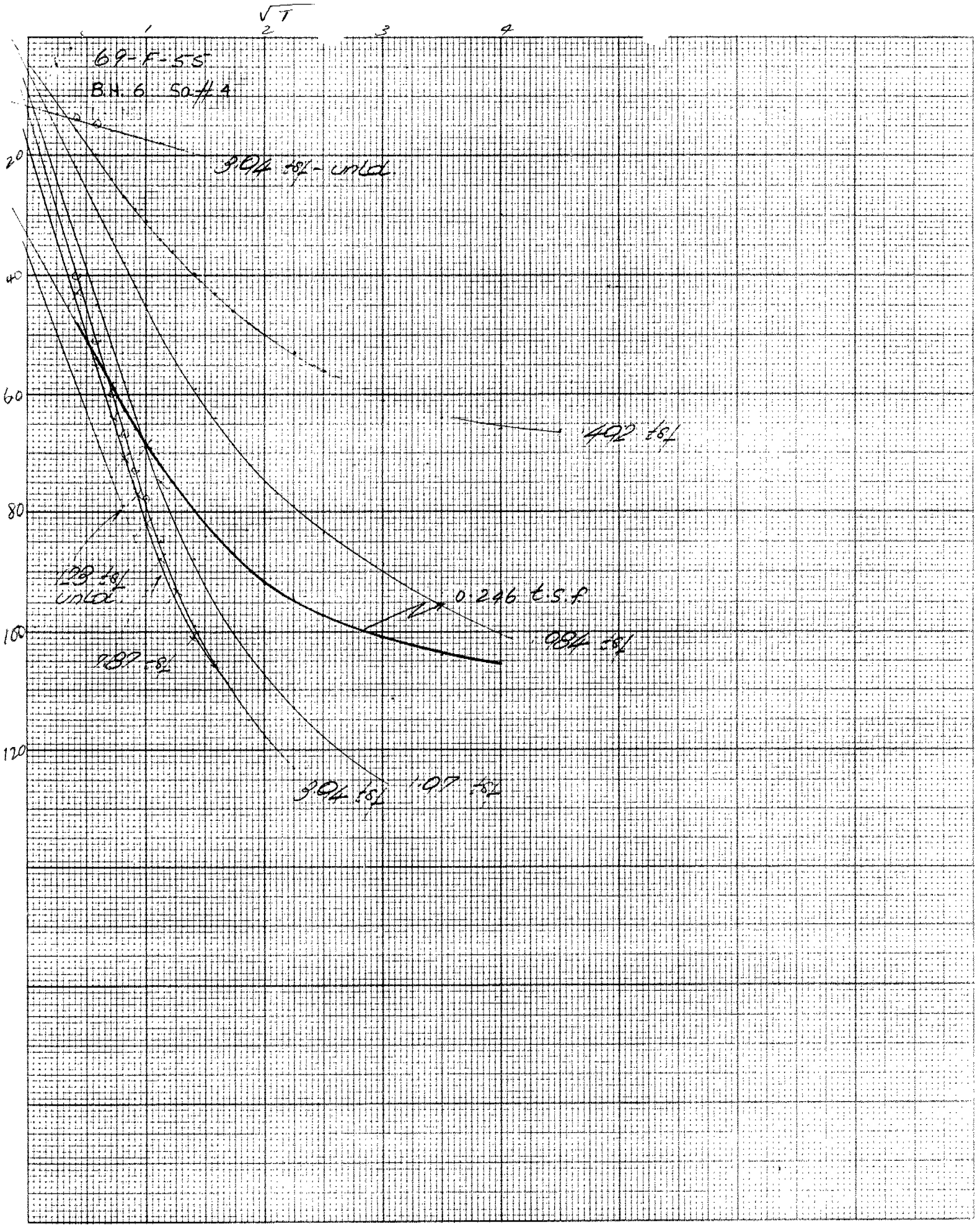
DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

Job No. 69-F-55 Borehole No. 6 Sample No. 4

Depth 13'4" Press No. C Tested By Karan

SCALE LOAD (in Lbs.)	16			32			16			0.5			
LOAD (in T.S.F.)	3.94			7.87			3.94			.123			
DATE START.	24/7/70			27/7/70			28/7/70			29/7/70			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	8.47	0	0	8.45	0	0	8.45	2500	0	8.40	2500	00	0
10 SEC.		40			43			2486	14		2444	56	.41
20		51			55			2485	15		2433	67	.58
30		60			64			2484	16		2426	74	.71
40		67			71			83.5	16.5		2421	79	.81
50		73			77			83.0	17		2415	85	.91
1 MIN.		78			82			82.5	17.5		2410	90	1
1¼		85			88			82.0	18		2405	95	1.120
1½		90			93			81.5	18.5		2400	100	1.225
2		99			101			81.0	19.0		2391	109	1.41
2½		105			106			80.5	19.5		2384	116	1.58
3		110			110			80.0	20.0		2376	124	1.73
3½		115			113			79.5	20.5		2371	129	1.87
4		118			116			79.3	20.7		2367	133	2
5		123			120.5			79.0	21.0		2360	140	2.25
6¼		127			125.0			78.7	21.3		2353	147	2.5
9		134			131.0						2341	159	3
12¼		138.5			135.0						2333	167	3.5
16		142.0			138.5						2326	174	4.0
20¼													4.5
25													5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	P43 27/7/70	194		8.40 27/7/70	184.0		8.38 29/7/70	247.0	23.0	8.40 30/7/70	2289	211	

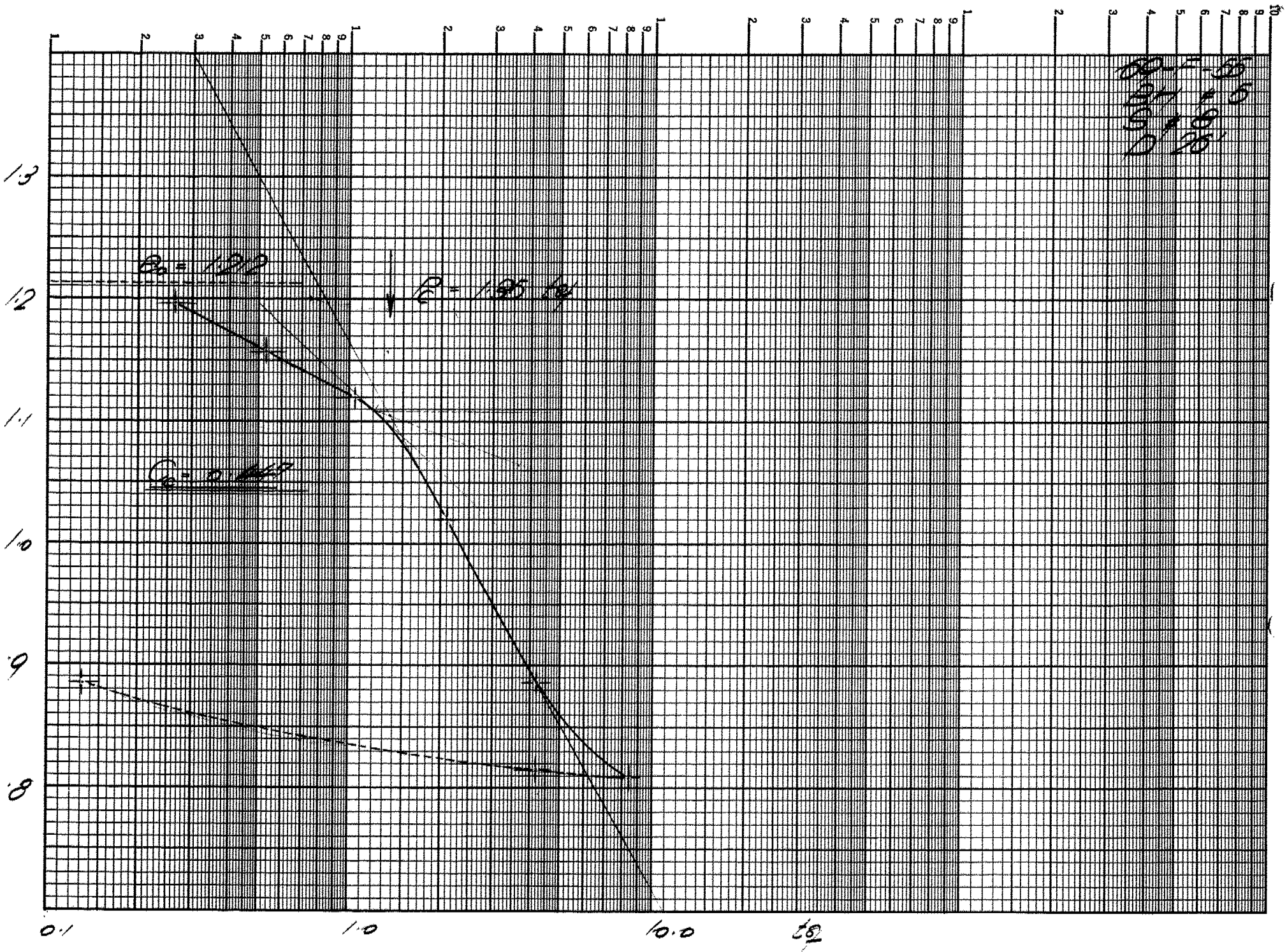


921-3164

A. J. FEHELEY
Company Ltd.

K+E SEMI-LOGARITHMIC 46 6012
4 CYCLES X 70 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

West



FORM OB-MT-188
REVISED MARCH, 1968

DEPARTMENT OF HIGHWAYS ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS (A)

Project 69-E-55 Borehole No. 5 Sample No. 8 Depth 26'0"

Lab. work by C.C. Calculations by _____ Checked by _____

Sample description Grey clayey silt with organics

Specific Gravity 2.66 (Determined / Assumed)

DIMENSIONS OF APPARATUS:-

Ring No. VI Height .503 (inches) Diameter 1.87 (inches) Area (A) 2.75 (sq. inches)

WATER CONTENT DETERMINATION:-

LOCATION	WHOLE SAMPLE BEFORE TEST	WHOLE SAMPLE AFTER TEST	TOP	BOTTOM	SIDE
Container number	VI	VI			
Weight of wet soil & tare (gms.)	22.35	62.11			
Weight of dry soil & tare (gms.)	59.99	59.99			
Weight of water (gms.)	12.36	9.12			
Weight of tare (gms.)	33.75	33.75			
Weight of dry soil (gms.)	26.24	26.24 (Ws)			
Water content %	47.0	34.7			

INITIAL CALCULATIONS:-

Dry Density _____ (p.c.f.)

Wet Density _____ (p.c.f.)

Void Ratio _____

Initial Solids Height (2Ho) = $\frac{Ws \times 0.061}{Gs \times A}$ = .2275 (inches)

V_1 = 22.65 − 12.36 = 10.29 → 2.55

V_2 = 19.32 − 9.12 = 10.20 → 2.51

FINAL CALCULATIONS:-

Cv (Coefficient of Consolidation) = $\frac{0.848 \times (2H)^2}{4 \times t_{90}}$ sq.in./min.

LOAD (t.s.f)	DIAL READING (inches)	CORRECT READING (inches)	SAMPLE HEIGHT 2H (ins.)	2H − 2Ho (inches)	VOID RATIO $\frac{2H-2Ho}{2Ho}$	FITTING TIME (minutes)	COEFFICIENT OF CONSOLIDATION Cv sq.in./min.	sq.ft./day
0	0	0	.5080	.2755	.212			
.262	.0072	.0035	.4995	.2670	1.102			
.524	.0100	.0090	.4905	.2580	1.07			
1.05	.0085	.0077	.4828	.2503	1.12			
2.10	.0268	.0232	.4596	.2271	1.02			
4.10	.0300	.0300	.4290	.2015	.336			
8.38	.0180	.0170	.4114	.1839	.864			
4.10	-.0024	-.0011	.4125	.1850	.914			
.131	-.0213	-.0160	.4285	.2010	.884			

FORM OB-MT-125
REVISED AUGUST, 1965

DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

Job No. 69-F-555 Borehole No. 5 Sample No. 8

Depth 26' 0" Press No. A Tested By Karan

SCALE LOAD (in Lbs.)	1			2			4			8			
LOAD (in T.S.F.)	.262			.524			1.05			2.10			
DATE START.	20th July 1970			21st July 1970			22/7/70			23/7/70			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	936	1000	0	8.25	1000	0	8:20	1000	0	8:20	1000	0	0
10 SEC.		964	36		982	18		975	25		942	58	.41
20		951	49		978	22		71	29		26	74	.58
30		948	52		976	24		68	32		14	86	.71
40		946	54		974	26		66	34		5	95	.81
50		944	56		973	27		64	36		898	102	.91
1 MIN.		943	57		972	28		63	37		91	109	1
1 1/4		942	58		971	29		61	39		83	117	1.120
1 1/2		941.5	58.5		970.3	29.7		60	40		78	122	1.225
2		940.5	59.5		969	31.0		58	42		70	130	1.41
2 1/2		940	60.0		68.5	31.5		56	44		63	137	1.58
3		939.5	60.5		68	32.0		55	45		58	142	1.73
3 1/2		939.0	61.0		67.5	32.5		54	46		54	146	1.87
4		38.5	61.5		67.0	33.0		53	47		51	149	2
5		38.0	62.0		660	34.0		51	49		46	154	2.25
6 1/4		37.3	62.7		65.0	35.0		50	50		41	159	2.5
9		36	64.0		63.5	36.5		48	52		33	167	3
12 1/4					62.6	37.4		45	55		27	173	3.5
16								43	57		22	178	4.0
20 1/4											17	183	4.5
25											14	186	5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	8.23	928	72.0	8:20	900	100	8:20	905	95	9:22	742	258	

21/7/70 23/7/70

FORM OB-MT-125
REVISED AUGUST, 1965

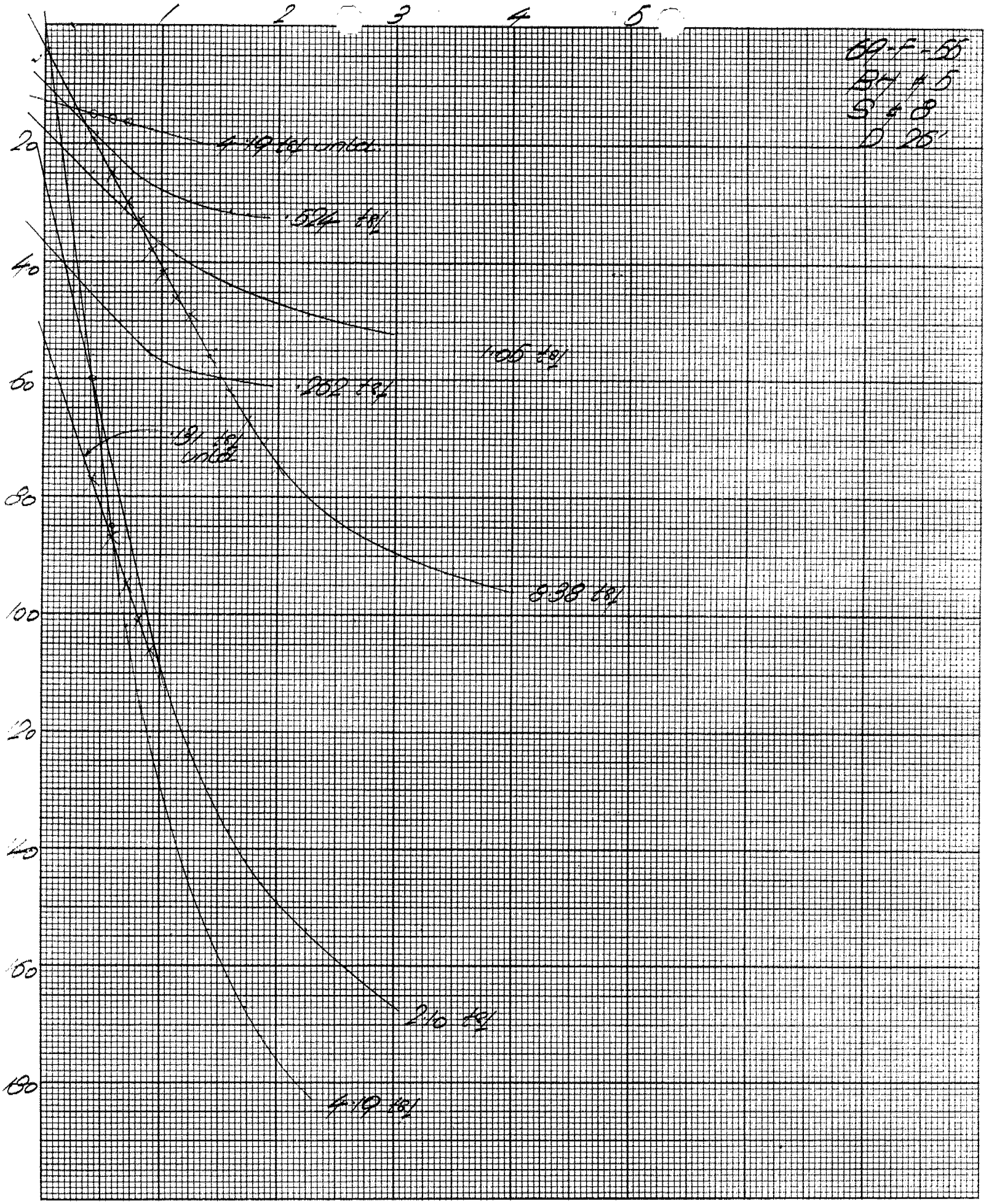
DEPARTMENT OF HIGHWAYS – ONTARIO
MATERIALS AND TESTING DIVISION

CONSOLIDATION TESTS

Job No. 69-F-55 Borehole No. 5 Sample No. 8

Depth 26'0" Press No. A Tested By Karam

SCALE LOAD (in Lbs.)	16			32			16			0.5			
LOAD (in T.S.F.)	4.19			8.38			4.19			.131			
DATE START.	24th July 70			27/7/70			28/7/70			29/7/70			
T	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	TIME	DIAL	ΔH (inches)	√T
0	9.25	1000	0	9.25	1000	0	9.25	1000	00	9.15	1000	0	0
10 SEC.		940	60		991	10		1015	15		1077	77	.41
20		915	85		975	25		1016	16		1087	87	.58
30		898	102		970	30		1016.5	16.5		1095	95	.71
40		887	113		967	33		1017	17		1101	101	.81
50		879	121		962	38		1017.5	17.5		1106	106	.91
1 MIN.		871	129		958	42		1018.0	18			111	1
1¼		863	137		954	46		1018.5	18.5			116	1.120
1½		856	144		951	49		1019	19.0			121	1.225
2		846	154		944	56		1019.5	19.5			129	1.41
2½		838	162		938	62		1019.7	19.7			134	1.58
3		833	167		933	67		1019.9	19.9			139	1.73
3½		828	172		929	71		1020.1	20.1			142	1.87
4		824	176		925	75		1020.2	20.3			146	2
5		818	182		920	80		1020.5	20.5			151	2.25
6¼		813	187		916	84		1020.6	20.6			155	2.5
9		805	195		910	90						161	3
12¼		799			908	92						166	3.5
16		792			904	96							4.0
20¼													4.5
25													5
36													6
49													7
64													8
81													9
100													10
200													14.1
300													
400													
FINAL	9.23	694	306	9.20	820	180	9.13	1024	24.0	8.58	1213	21.3	
				28/7/70			29/7/70			30/7/70			



RIGHT ANGLE INPUTS. 69-F-65

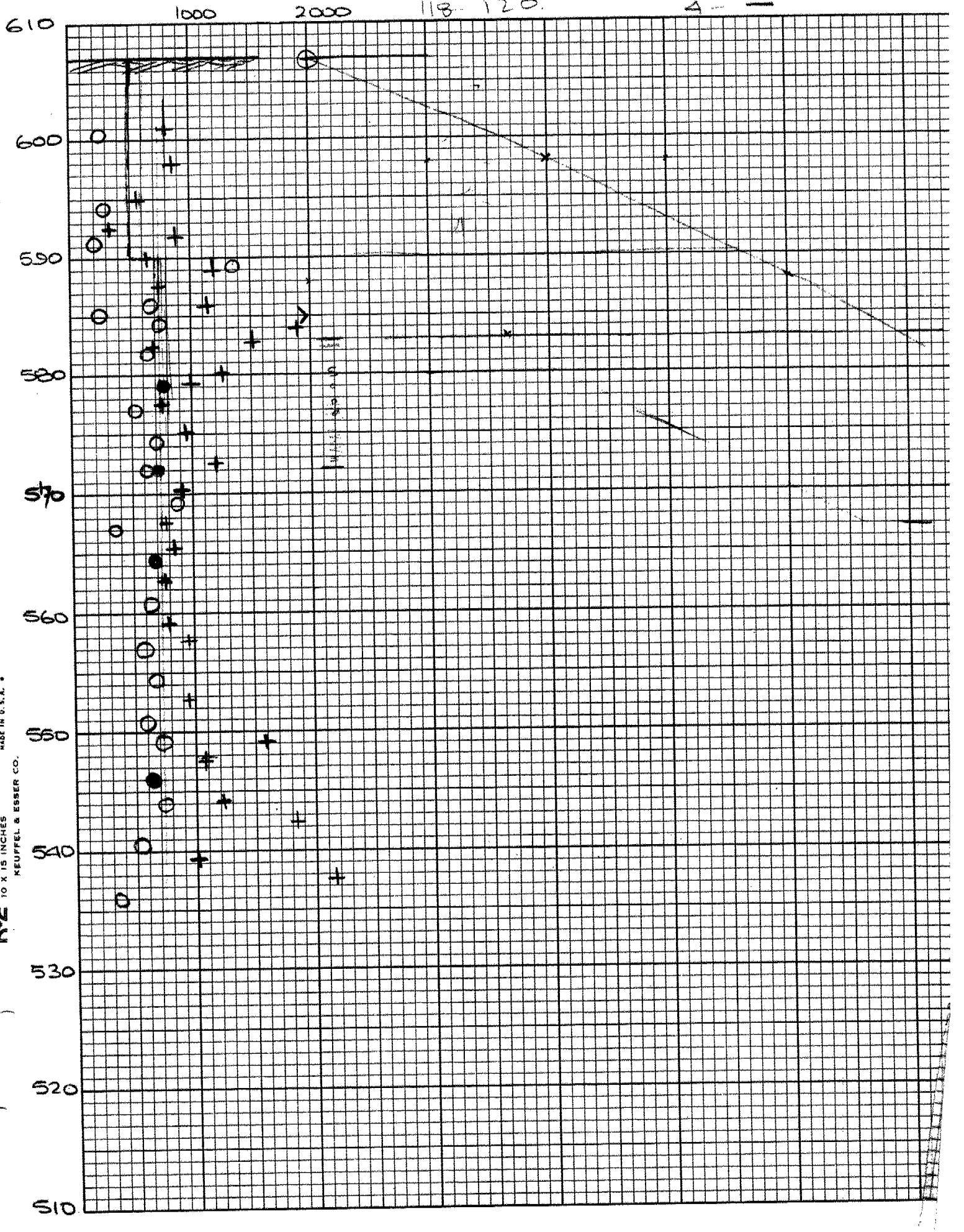
GEOMETRY	PARAMETERS		SAT	BACK	FS & REMARKS
EAST NAT.	EFF.	a' φ'	1 MARCH		
—"—	—"—	a' = 0	—"—		
—"—	TOT		2 MARCH		
—"— DESIGN	EFF	a' φ'	2 MARCH		
—"—	—"—	a' = 0	2 —"—		
—"—	TOT		2 MARCH		
WEST NAT	EFF	a' φ'	2. MARCH		
—"—	—"—	a' = 0	—"—		
—"— DESIGN	—"—	a' φ'			
—"— —"—	—"—	a' = 0			
—"— —"—	TOT	(2 GRADS)	= INTOR 3 MARCH		
—"— NAT	TOT		2. MARCH		

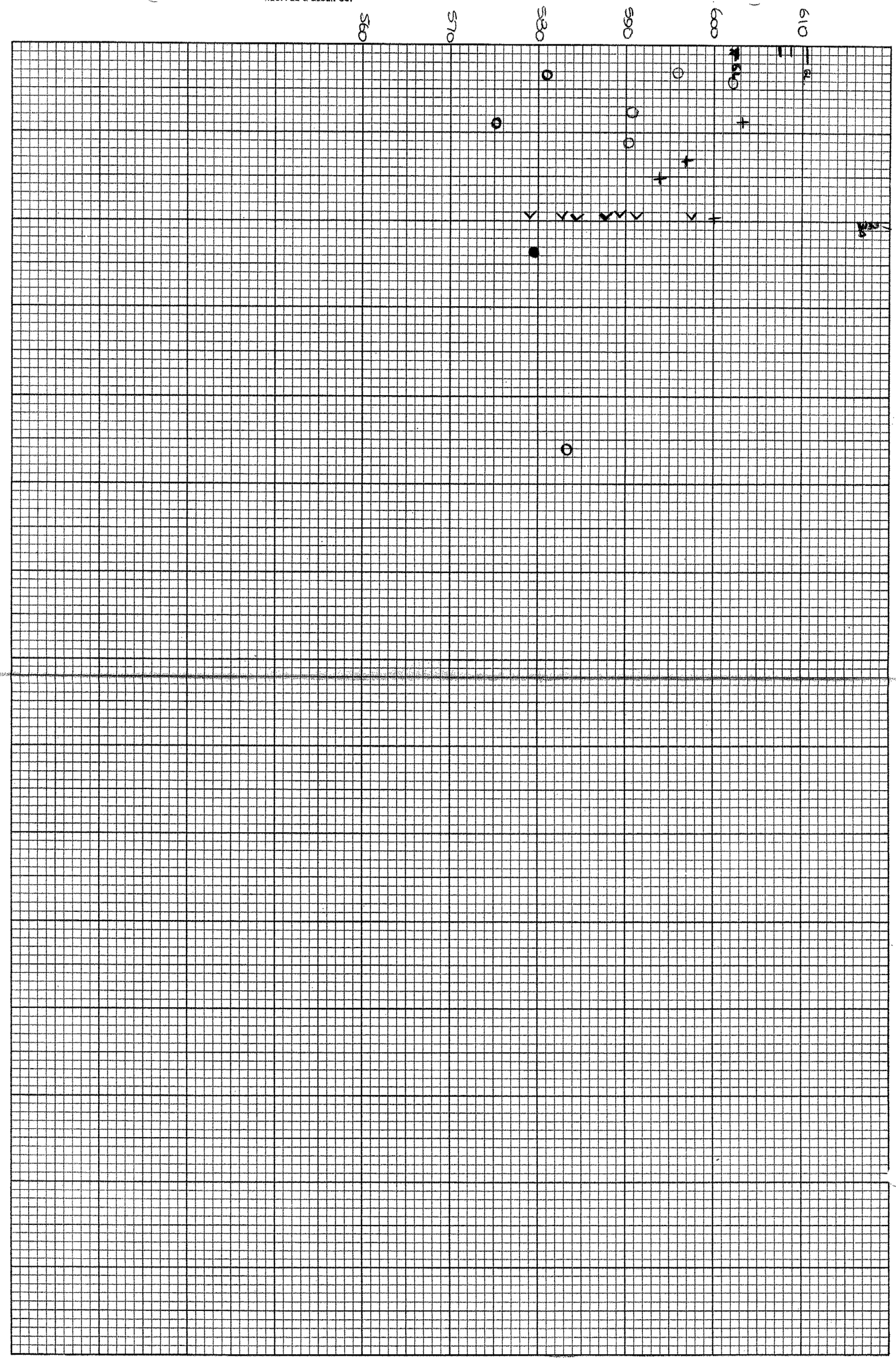
all these are ready for check. MAR 11

69-F-55

(West) bank BH 3 — 3-
3A —
4 —

118 120





6-F-55.

STABILITY

East side (RIGHT SIDE)

NAT. SLOPE (EFF) STABLE
APPR. FILL (TOT) —"—

WEST SIDE (LEFT)

FULL NAT. SLOPE (EFF) STABLE
LOWER —"— "— UNSTABLE
APPR. FILL. (TOT) —"—

---

1. TRY WITH 3:1 SLOPES AT WEST SIDE.
FOR APPR. FILL & RIVER BANK
INPUT TOT & EFF STRESS PARAMETERS
2. CHECK EAST SIDE APPR. FILL WITH
EFF. STRESSES

68 F 36
I.O. Mondou

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A.G. Stermac,
Principal Foundation Engr.,
Mat. & Test., Lab Bldg.,
DOWNSVIEW, Ontario.

Attention:

From: A.P. Watt,
Reg. Br. Planning Engr.,
London Regional Office.

Date: June 26th, 1969.

Our File Ref.

In reply to

Subject:

W.P. 141-67-01, Bridge Site 14-34,
Ausable River Bridge,
1.1 miles East of Hwy. 82,
Highway No. 7,
District 1 - Chatham.

Would you kindly arrange to have a Foundation Investigation conducted at the above location.

I have enclosed two copies of the site plan No. E-4835-1 with probable footing locations marked in red.

Attached please find a copy of the preliminary Reconnaissance Report for your use.

Even though the above work project has been deferred, we are requesting that the Foundations Investigation be conducted at your convenience because we anticipate an approach fill problem to the structure.

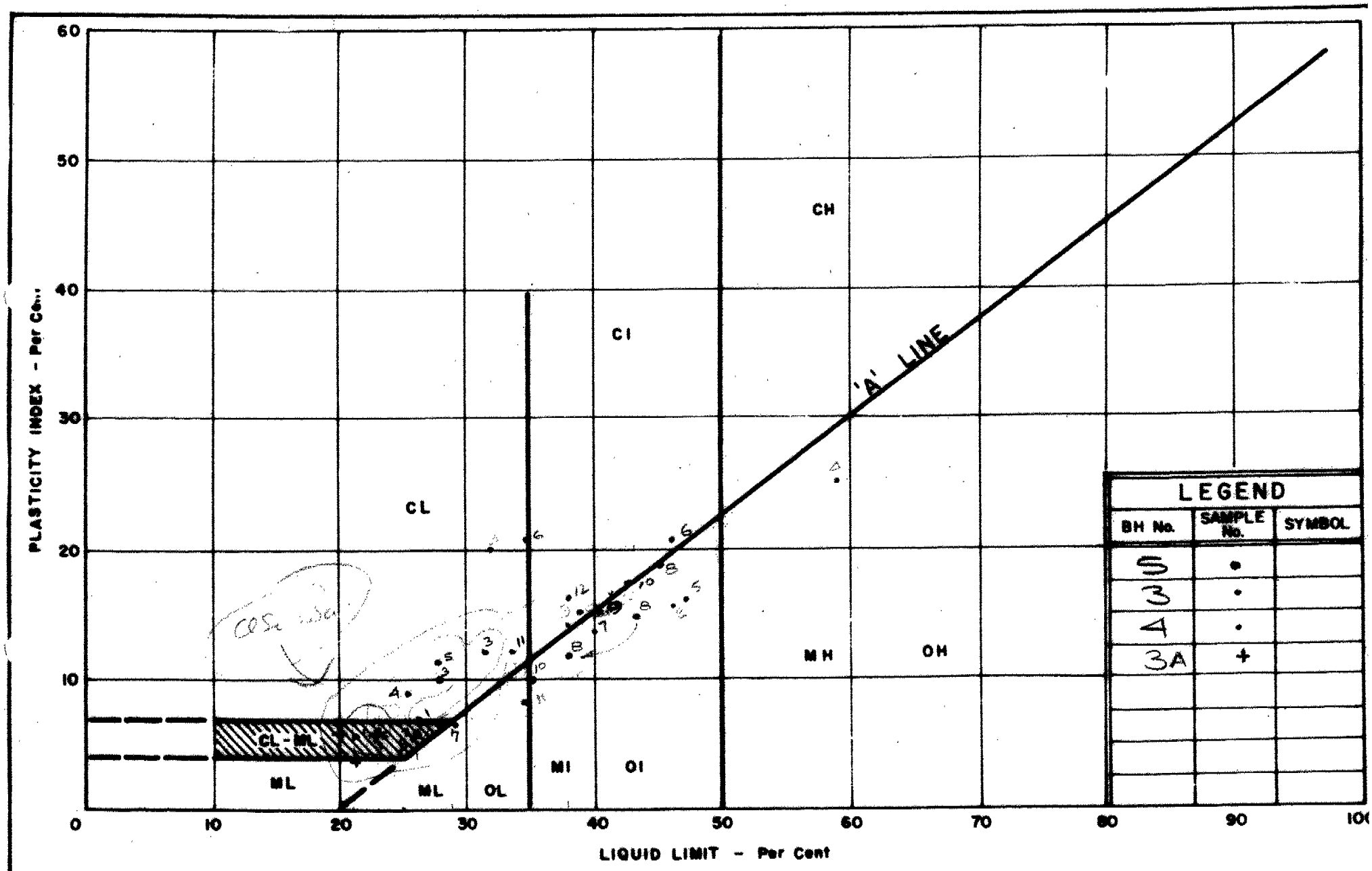
L.J. Wazynkwish

L.J. WAZYNKWISH
For: A.P. Watt,
Reg. Bridge Planning Engineer,
London Regional Office.

LJW/ss
Attch.

c.c. S. McCombie.
R. Fitzgibbon.

FORM OB-MT-252
REVISED JULY, 1966



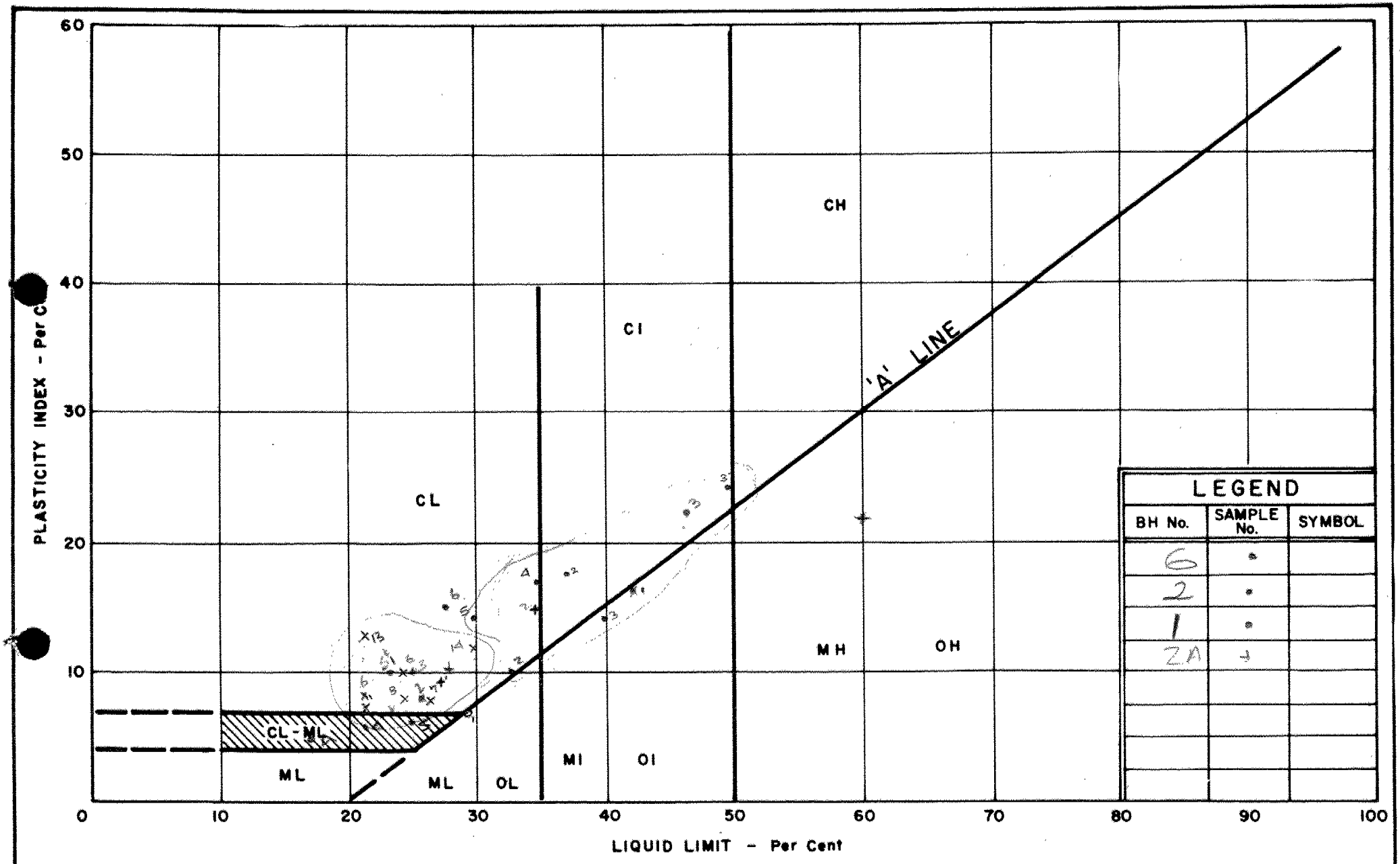
DEPARTMENT OF HIGHWAYS
MATERIALS and TESTING DIVISION

PLASTICITY CHART

W.P. No.

JOB No.

FORM OB-MT-252
REVISED JULY, 1966



DEPARTMENT OF HIGHWAYS
MATERIALS and TESTING DIVISION

PLASTICITY CHART

W.P. No.

JOB No.

FORM OB-MT-126 (REV. 1969)

OFFICE REPORT ON SOIL EXPLORATION

East abutment

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 69-F-55 LOCATION Sta 439+86 0.5 15' Rt. ORIGINATED BY G.A

W.P. 141-67-01 BORING DATE July 7-10 1969 COMPILED BY P.T

DATUM GEODETIC BOREHOLE TYPE Washboring, NX, BX Casing CHECKED BY

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	REMARKS (GR. SA. SI. CL.)
610.7	GROUND LEVEL						
0.0	Clayey Silt with seams of Sand & organics. Occasional seams of Silty Clay. Soft to Stiff		1	SS	2	610	
			2	SS	3	607.7	
			3	SS	10	600	3 40 36 21
597.7 / 13.0			4	SS	47		
	Clayey Silt with trace of Sand. Very Stiff to Hard		5	SS	19	590	
			6	TW	PM		c' = 429 φ = 29.5°
			7	TW	PM & DR	580	131
577.7 / 33.0			8	SS	52		
	Sand with Gravel Pockets. Dense to Very Dense		9	SS	>100	570	
			10	SS	>100		43 54 2 1
561.2 / 49.5	END OF BOREHOLE		11	SS	80	560	

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT — 20 40 60 80 100

SHEAR STRENGTH P.S.F. — ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB. VANE — 1000 2000

LIQUID LIMIT — w_L
PLASTIC LIMIT — w_P
WATER CONTENT — w

WATER CONTENT % — 15 30 45

BULK DENSITY γ P.C.F.

15 20 5 10 % STRAIN AT FAILURE

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

last pier

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 69-F-55 LOCATION Sta 490+87 O.S. 17'-RT. ORIGINATED BY G.A.
W.P. 141-67-01 BORING DATE July 10,11,14,15 1969 COMPILED BY P.T.
DATUM GEODETIC BOREHOLE TYPE Washboring, NX & BX casing CHECKED BY

ELEV. / DEPTH (Datum 602.4)	DESCRIPTION	STRAT. PLOT	SAMPLE NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	BULK DENSITY γ P.C.F.	REMARKS GR, SA, SI, CL
0.0 / 599.8	Ground level							
2.6	Clayey Silt with seams of Sand & Organics, Soft to Firm		1	SS	5	595.9		
			2	SS	5			0 7 76 17
590.9 / 11.5			3	SS	3	590		
	Clayey Silt with trace of Sand		4	TW	PM			
			5	SS	18			
			6	TW	PM ADR	580	132	1 1 77 21
	Very Stiff to Hard		7	SS	15			
			8	T.W.	PM ADR		130	0 81 (19)
	Sand & Gravel layers		9	SS	35			
570.4 / 32.0			10	SS	96	570		2 81 (17)
	Sand with occasional Gravel Pebbles Very Dense		11	SS	100/6"			50 44 (6)
						560		
558.0 / 44.4	End of borehole		12	SS	120			

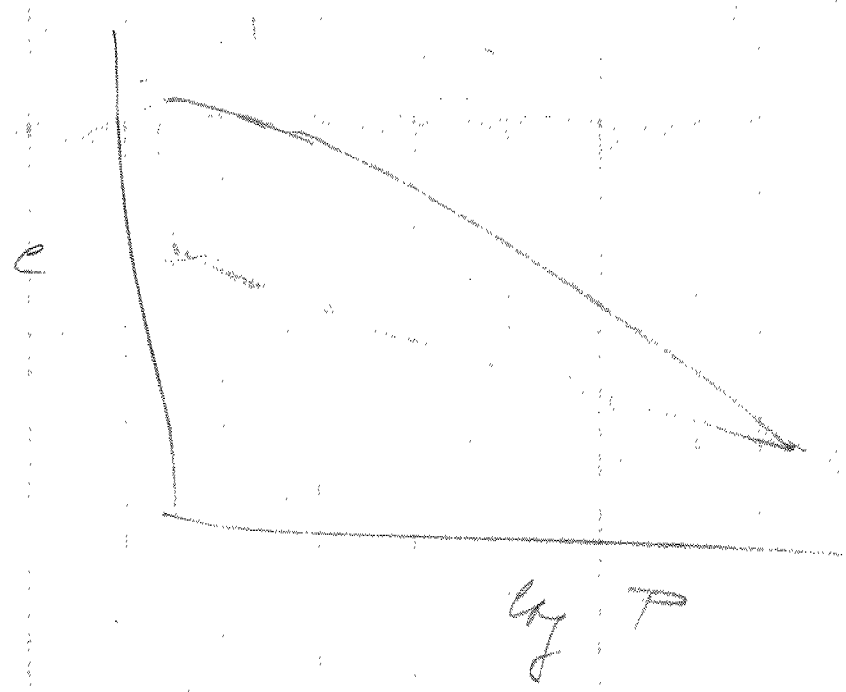
DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT

SHEAR STRENGTH P.S.F.
o UNCONFINED + FIELD VANE
● QUICK TRIAXIAL x LAB. VANE
1000 2000

LIQUID LIMIT — w_L
PLASTIC LIMIT — w_P
WATER CONTENT — w
w_P w w_L
WATER CONTENT %
15 30 45

50 / 2 / 1

20
15 5 % STRAIN AT FAILURE
10


e
$\ln_g$ P

FORM OB-MT-126 (REV. 1969)

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2A

FOUNDATION SECTION

JOB 69-F-55 LOCATION Sta 440+67, 0S 17'RT ORIGINATED BY GA
W.P. 141-67-01 BORING DATE July 16 1969 COMPILED BY PT
DATUM GEODETIC BOREHOLE TYPE Washboring, N-X Casing CHECKED BY

ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLE NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT / SHEAR STRENGTH P.S.F. (o UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, x LAB. VANE)	LIQUID LIMIT w_L / PLASTIC LIMIT w_P / WATER CONTENT w — WATER CONTENT %	BULK DENSITY γ P.C.F.	REMARKS GR.SA.SI.CL.
607.0	GROUND LEVEL									
0.0	Clayey Silt with seams of Sand & Organics, Occasional seams of Silty Clay. Soft to Firm		1	SS	2	600				
			2	SS	5	599.5				0 1 76
590.0 / 17.0			3	TW	PM	590			113	0 35 54 11
	Clayey Silt with trace of Sand. Very Stiff		4	SS	23					
			5	SS	20					
			6	TW	PM	580				
575.0 / 32.0	END OF BOREHOLE		7	TW						
			8	SS	—					
						570				

20
15 5 % STRAIN AT FAILURE
10

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

west pier

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 69-F-55 LOCATION Sta 442+11 O.S. 3' LT ORIGINATED BY G.A.
W.P. 141-57-01 BORING DATE July 14,15,16 & 17 1969 COMPILED BY P.T.
DATUM GEODETIC BOREHOLE TYPE Washboring NX & BX Casing CHECKED BY

ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	BULK DENSITY γ P.C.F.	REMARKS GR.SA.SI.CL.
603.0 / 0.0	GROUND LEVEL					600		
	Clayey Silt with seams of Sand & Organics Firm		1	SS	5	594.5		
			2	SS	5	590		
			3	TW	PM		120	0 27 58 15
583.0 / 19.0			4	SS	—	580		
	Fine Medium Sand Compact		5	SS	11			
572.0 / 30.0			6	SS	3	570		
	Silty Clay with seams of Sand & organics Firm		7	SS	3			
			8	TW	PM	560	109	0 3 81 16 c'=1.62 psf φ'=27.5°
			9	TW	PM		113	
			10	TW	PM	550	111.5	
			11	TW	PM			PL
			12	TW	PM	540	112	0 6 77 14
536.0 / 66.0			13	TW	PM & DR			6 78 (16) (Sand)
	Sand & Gravel Seams		14	SS	42	530		
529.0 / 73.0			15	SS	110/6"			
	Sand with Gravel Pockets Very Dense					520		
515.5 / 86.5	END OF BOREHOLE		16	SS	90/6"			7 79 ( )
						510		

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT — 20 40 60 80 100

SHEAR STRENGTH P.S.F.
o UNCONFINED + FIELD VANE
● QUICK TRIAXIAL x LAB. VANE
1000 2000

LIQUID LIMIT — w_L
PLASTIC LIMIT — w_P
WATER CONTENT — w
w_P w w_L
WATER CONTENT % 15 30 45

20
15 — 5 % STRAIN AT FAILURE
10

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3A

FOUNDATION SECTION

JOB 69-F-55 LOCATION Sta 442+54 0.5' 5' LT ORIGINATED BY G.A.
W.P. 141-67 01 BORING DATE July 23 1969 COMPILED BY P.T.
DATUM GEODETIC BOREHOLE TYPE Washboring, N.X Casing CHECKED BY

ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLE NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	BULK DENSITY γ P.C.F.	REMARKS GR.SA.SI.CL.
608.1 / 0.0	GROUND LEVEL							
	Clayey Silt with seams of Sand & Organics Soft to Firm		1	SS	4	600.4		
			2	SS	1	600		0 33 5 3
			3	SS	1			
			4	SS	2	590		
585.1 / 23.0	Silty Clay with seams of Sand & Organics Firm		5	T.W.	PM	580	116	0 79 (21)
			6	T.W.	PM		108	
			7	T.W.	PM	570	109	
565.1 / 43.0	END OF BOREHOLE		8	T.W.	PM		111	0 11.1

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80

SHEAR STRENGTH P.S.F. ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB. VANE 500 1000 2000

LIQUID LIMIT W_L PLASTIC LIMIT W_P WATER CONTENT W

WATER CONTENT % 10 30 45

+S=16.0
+S=3.4
+S=16.0
+S=9.2
+S=6.1

20
13 5 % STRAIN AT FAILURE
10

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

west abut meas.

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

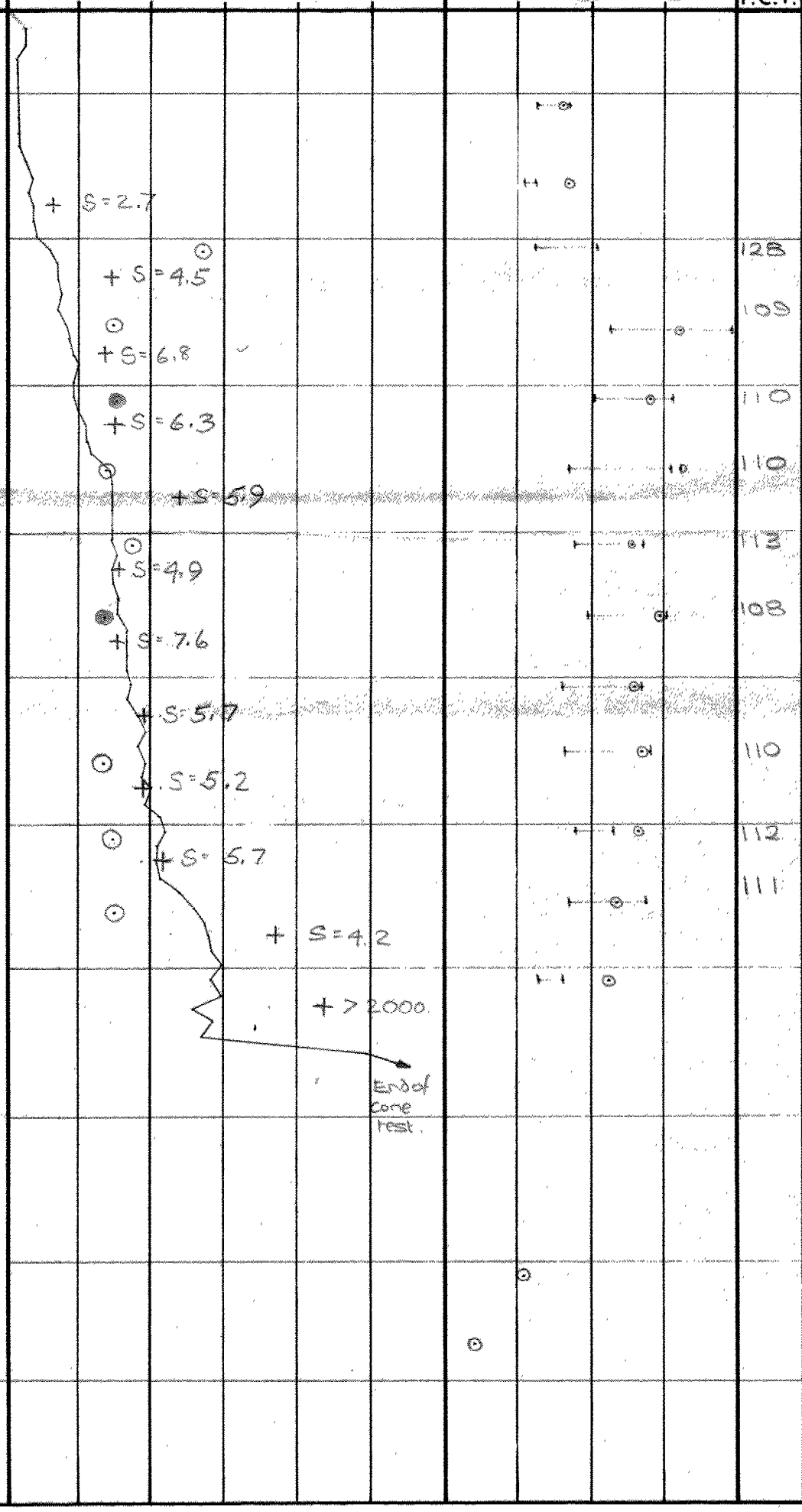
FOUNDATION SECTION

JOB 69-F-55 LOCATION Sta 443 on ℄ ORIGINATED BY G.A.
W.P. 141-67.01 BORING DATE July 17, 18, 21, 22 1969 COMPILED BY P.T
DATUM GEODETIC BOREHOLE TYPE Washboring, NX & BX Casing CHECKED BY

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	BULK DENSITY γ P.C.F.	REMARKS GR. SA. SI. CL.
606.5	GROUND LEVEL							
0.0	Clayey Silt with seams of Sand & Organics. Soft to Firm		1	SS	5	600		601.2
			2	SS	1			0 31 [illegible]
			3	TW	PM	590	128	
588.5 / 18.0			4	TW	PM		109	0 2 70 28
	Silty Clay with seams of Sand and Organics. Firm		5	TW	PM	580	110	
			6	TW	PM		110	
			7	TW	PM	570	113	
			8	TW	PM		108	
			9	TW	PM	560		0 4 71 25
			10	TW	PM		110	
			11	TW	PM	550	112	
			12	TW	PM		111	
			13	SS	5	540		
537.5 / 69.0	Sand & Gravel Seams		14	SS	—			
			15	SS	10	530		
528.5 / 78.0	Sand with Gravel Pockets Compact to Very Dense		16	SS	25			
			17	SS	86	520		0 87 [illegible]
			18	SS	127			53 43 [illegible]
513.1 / 93.4	END OF BOREHOLE		19	SS	>100			

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE
1000 2000



LIQUID LIMIT —— w_L
PLASTIC LIMIT —— w_P
WATER CONTENT —— w
w_P w w_L
WATER CONTENT % 15 30 45

20
15 ✦ 5 % STRAIN AT FAILURE
10

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

West

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 5

FOUNDATION SECTION

JOB 69.1105S LOCATION Sta 442+76 on ℄ ORIGINATED BY G.A.
W.P. 141-67-01 BORING DATE May 26 1970 COMPILED BY GA
DATUM Geodetic BOREHOLE TYPE Hollow stem auger CHECKED BY

ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLE NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT / SHEAR STRENGTH P.S.F. (o UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB. VANE)	LIQUID LIMIT w_L, PLASTIC LIMIT w_P, WATER CONTENT w (WATER CONTENT % 15 30 45)	BULK DENSITY γ P.C.F.	REMARKS GR.SA.SI.CL.
607.0 0.0	Ground level									
	Clayey Silt with some layers of Sand & Organics. Firm		1	SS	5					Org cont 1.1%
			2	TW	PH	600	s=2.5	oven	124	0 42 47 11
			3	SS	2		s=5.3			
			4	TW	PM		s=4.7	air oven	123	
			5	TW	PM	590	s=11.0		124	
589.0 18.0	Silty Clay with seams of Sand & Organics. Firm		6	SS	3		s=4.0	air oven		
			7	TW	PH		s=4.4		114	Org cont 2.6%
							s=3.1	air oven		
579.0 28.0	End of borehole		8	TW	PH	580	s=2.3			

20
15 ⊕ 5 % STRAIN AT FAILURE
10

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

rest

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 6

FOUNDATION SECTION

JOB 69-11055 LOCATION Sta 440+30 ORIGINATED BY GA
W.P. 141-67-01 BORING DATE May 25 & 26 1970 COMPILED BY GA
DATUM Geodetic BOREHOLE TYPE Hollow stem auger CHECKED BY

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLE NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	BULK DENSITY γ P.C.F.	REMARKS GR.SA.SI.CL.
608.6 / 0.0	Ground level							
	Clayey Silt with seams of Sand, Organics. Occasional seams of Silty Clay. Soft to Stiff		1	SS	5			
			2	TW	P.H		118	
			3	SS	12	600		0 2 67 31
			4	TW	P.H		117	c'=284 psf. φ'=20.7°
			5	SS	3			
590.6 / 18.0	Clayey Silt with traces of Sand. Very Stiff to Hard		6	TW	P.H.	590	138	
			7	SS	24			
			8	TW	P.H		136	
						580		
			9	SS	17			
569.6 / 39.0	Sand with occasional Gravel Pockets. Dense to Very Dense.		10	SS	38			
						570		
						560		0 32 6 2
557.4 / 51.2	Clayey Silt with traces of Sand. Hard.		11	SS	116			
			12	SS	70			
						550		
			13	SS	115			0 11 68 21
			14	SS	116			
						540		
537.1 / 71.5	End of borehole		15	SS	107			

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT

SHEAR STRENGTH P.S.F.
o UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE

1000 2000

LIQUID LIMIT —— w_L
PLASTIC LIMIT —— w_P
WATER CONTENT —— w

w_P w w_L

WATER CONTENT %
15 30 45

20
15 5 % STRAIN AT FAILURE
10

Mr. C. Grebski,
Structural Design Engineer.

Jan.12/72.

Re: W.P. 82-71-01, Bridge Site 14-34.

If in the design of the bridge deck replacement, it is felt that a new bridge is a possible answer to the problem, I am enclosing one set of signed survey plans bridge site plan E-4835-1, portion plan B-175-5 and B-176-13 and profile C-175-8 for the bridge replacement proposed on Line "F" as per the Functional Planning Report for your consideration. A foundation investigation for this bridge proposal was conducted by the Foundation Office. Because W.P. 141-67-01 was deferred to 1980, the report was not published. If the recommendations or report are desired, please contact Mr. K.G. Selby, Supervising Foundation Engineer, Foundation Office and ask for Foundation Investigation Report W.O. 69-11055 (New Numbering) or W.J. 69-F-55 (Old Numbering) under W.P. 141-67-01. A copy of the preliminary hydrology report BW 2381 is enclosed with the signed survey plans.

A. P. Watt

A.P. Watt
Reg. Bridge Planning Engineer,
Southwestern Region.

APW/ss
Encl.

c.c. A. McConnell.
W. Zonnenberg.
F.C. Brown.
A. Crowley.
J. Anderson.

GEOCRES # 40P4-42

69F55

BH #1

west abut

610.7
0.0

φ'=21 SPT 6
c'=280

c=300
γ=125

597.7
13

φ'=29
c'=400 ✓

c=2000
γ=130

577.7
33.0

φ=32
γ=130

SA

561.2
49.5

BH #2

east pier

607.4
0.0

φ'=31 SPT 6
c'=380

c=300
γ=125

CL

590.9
11.5

φ'=29
c'=135 ✓

c=2000
γ=130

CL

570.4
32

φ=32
γ=130

SA

558.0
44.4

BH #2A

east pier

607.0
0.0

φ'=32 SPT 6
c'=380

c=300
γ=125

CL

590.0
17

φ'=29 SPT 2
c'=135

c=2000
γ=130

CL

575
32.0

BH #3

west pier

602.0
0.0

φ'=21 SPT 5
c'=260

c=400
γ=120

583
19

φ=30
γ=125

572
30

φ'=27.5
c'=160 ✓

c=700
γ=110

536
66.0

φ=32
γ=130

SA

515.5
86.5

BH # 3A

west side

608.1
0.0

$\phi' = 21$
$c' = 250$

$c = 250$
$\gamma = 120$

585.1
23

$\phi' = 27.5$
$c' = 160$

$c = 700$
$\gamma = 110$

565.1
43.0

BH # 4

west abut.

606.5
0.0

$\phi' = 21$
$c' = 250$ ✓

$c = 250$
$\gamma = 120$

588.5
18

$\phi' = 27.5$
$c' = 160$

$c = 700$
$\gamma = 110$

537.5
69

$\phi = 32$
$\gamma = 130$

513.1
93.2

BH # 5

west side

607.0
0.0

$c = 400$
$\gamma = 123$

$c' = 250$
$\phi' = 22°$ ✓

589
18

$c = 700$
$\gamma = 110$

$c' = 0$
$\phi' = 28°$ ✓

579
28

BH # 6

east side

608
0

$c = 300$
$\gamma = 125$

$c' = 21$
$\phi' = 280$ ✓

589
18

$c = 2000$
$\gamma = 130$

569
39

$\phi = 32$
$\gamma = 130$

557
51

$c = 5000$
$\gamma = 135$

Effective stress parameters
(c' ϕ')
determined by stage tests.

BH 2
5.4

$\phi = 29$ ✓

$c = 135$

BH 1
5.6

$\phi = 29$ ✓

$c = 429$

BH 6
5.4

$\phi = 21$

$c = 280$

BH 5
5.8

$\phi = 28$ ✓

$c = 0$

BH 5
5.2

$\phi = 22$

$c = 260$

BH 3
5.8

$\phi = 27.5$ ✓

$c = 160$

FORM OB—MT—231

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING OFFICE

FIELD BORING LOG

(597) u hard.

DRILLING CO. PUK
DRILLER R. Lowes
ENGINEER GA.
SITE LOCATION Thedford
HOLE LOCATION East bank
REMARKS

DATUM ELEV.
GROUND ELEV. 610.7
CASING SIZE

B.H. NO. 1
JOB NO. 69 F 55
DATE July 7/69

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
0.0	10.0	1 1 2 2 3 3 3 3 4 8		
11.0	20.0	14 21 22 34 42 51 43 55 60 68		
21.0	22.0	93 100		
		END OF DAY		
		TUE. JULY 8		
0.0	3.0	Drive N.X & pull out		(2)
3.0	4.5	SP.SP. - Lost & Put sample in jar from bottom	SS1	1/1/1
		of casing. Light Brown Clayey Silt Sand &		
		Gravel (0 to 12") mixture Very soft		
3.0	6.0	Drive N.X & Pull out		* (3)
6.0	7.5	SP.SP Light brown Clayey Silt with some	SS2	1/1/2
		fine Sand. traces Organics Soft		
6.0	10.0	Drive N.X & wash out.		(10)
10.0	11.5	SP.SP. Grey sl. brown (dessicated) Clayey	SS3	2/4/6
		Silt traces of shells Stiff		
	13.0	Vane (lost 3" hard to push) >50		
10.0	11.75	Drive N.X & w/o		
11.75	15.0	Wash ahead - u hard washing		(47)
* 15.0	16.5	SP.SP Light brown Clayey Silt - Silt Very Hard	SS4	16/21/26
		with Fine/med Sand		
15.0	20.0	Wash ahead		(19)
20.0	21.5	SP.SP Grey/Brown (dess.) Clayey Silt	SS5	5/8/11
		U. Stiff as SS3		
		lunch		
20.0	25.0	Wash ahead		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. PUK
DRILLER R. Lowes
ENGINEER GA
SITE LOCATION Thedford
HOLE LOCATION Sta 440+85, 20' LT.
REMARKS

DATUM ELEV.
GROUND ELEV. app 610
CASING SIZE N-X

B.H. NO. 1
JOB NO. 69 F 55
DATE July 8/69

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
25.0	26.5	Shelby Stiff/ast 6" - Grey Clayey Silt	TW 6/16"	P.M.
		trace Sand		
	28.0	Vane (could be pushed would not turn) >50.		
11.75	21.75	Drive N-X casing & w/o		
21.75	30.0	Wash ahead		
30.0	31.5	Shelby (pushed 13" hamm 3") · Sandy Silt on tip	TW 7/16"	P.M. 13" 9 blows 3"
30.0	35.0	Wash ahead		(52)
35.0	36.5	SpSp · Grey Sandy Silt (odd piece of Gravel) Very Dense	SS 8	25/21/31
35.0	39.5	Wash ahead, v. hard at 39.5'		
39.5	39.75	SpSp Sand/Gravel mixt with some Clayey Silt Very Dense	SS 9	50/3"
0.0	38.0	Drive B-X casing		
		END OF DAY		
38.0	39.5	Drive B-X & w/o		
39.5	45.0	Drill Bicone · Fine/med sand in wash water		
		SpSp attempted - cave to 4'		
		Attempted to drive B-X further - hammer bouncing around 42.0'		
		Withdrew B-X - Large cobble in bottom 3' &		
		several pieces of Gravel up to 1½"		
		Attached casing shoe & washed down to 40.0'		
40.0	45.0	Drilled B-X casing (v. hard at 42.0')		(56/6")
45.0	46.0	SpSp Med/Coarse Sand (v little fines) with Gravel V. Dense	SS 10	51/56/

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

(w/ 2" shrink wp)

DRILLING CO. PUK
DRILLER R. Lowe
ENGINEER G.A
SITE LOCATION Thedford
HOLE LOCATION East bank Sta 439+85, 20' LT
REMARKS

DATUM ELEV.
GROUND ELEV. 610.0
CASING SIZE N.X

B.H. NO. 1
JOB NO. 69 F 55
DATE July 9 '69

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
45.0	48.0	Drilled B.X casing		
		— END OF DAY — Thurs July 10		
		6" material out of casing - cleaned out with BitCone		
		When Spoon put down 4" material still in		
		casing - boiling?		
				(80)
48.0	49.5	SPSP - lost! put down again	SS11	52/33/47
		9" material now in casing - boiling		
		Med/Coarse Sand with some fines		
		Left for 13 mins checked with Spoon again - 7"?		
		— END OF BOREHOLE —		
		▼ 3.0' Friday July 11th	Drive pipe to 25'	
		2.6 Mon July 14	Dig to 30'	
		2.7 Tues.		
		3.1 Hole caved at 16'		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

SHEET ___ OF ___

FIELD BORING LOG

DRILLING CO. PUK
DRILLER R. Lowes
ENGINEER GA
SITE LOCATION Thedford
HOLE LOCATION Eastbank (440+87' — 8' RT)
REMARKS Beneath ground 3.0

DATUM ELEV. 602.4'
GROUND ELEV. 599.8
CASING SIZE N-X

B.H. NO. 2
JOB NO. 69 F 55
DATE July 10/69

DEPTH FROM	DEPTH TO	DESCRIPTION (Sidre 25 Cuvier 5 32)	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
0.0	2.8	Lower N X to BL		
2.8	5.0	Drive N X & pull out		(5)
5.0	6.5	SP SP Light br/Grey Clayey Silt Firm	SS1	2/2/3
		with some fine Sand - trace of org & slight		
		trace of shells		
5.0	8.0	Drive N X & pull out		(5)
8.0	9.5	SP SP Br/Grey Clayey Silt with Firm	SS2	3/2/3
		some fine Sand traces roots & shells		
8.0	12.0	Drive N X & wash out		(3)
12.0	13.5	SP SP Grey Clayey Silt - Heavily Soft!	SS3	1/1/2
		Organic with shells, pieces wood!		
	15.0	Vane > 50 ! Caused by large pieces wood?		
12.0	15.0	Drive N X & wash out * shells, wood in wash water		6¼" own wt.
15.0	16.5	Shelby Cons amount of coarse Sand in tip	T.W.4/17"	PM
	18.0	Vane > 50		
15.0	17.7'	Drive N X & wash out - Wood, shells, fine sand in w/water		
	18.0	Wash ahead		(18)
18.0	19.5	SP SP Grey Clayey Silt - no V Stiff	SS5	5/7/11
		pieces of wood as such, but black roots		
		running vertically thro sample		
18.0	21.0	Wash ahead		
		END OF DAY		
		FRID JULY 11		
20.0	21.0	Wash ahead		
21.0	22.3	Shelby Grey (slight brown) Clayey Silt	TW6	PM 12" 116 blows 4"
21.0	24.0	Wash ahead		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

SHEET___ OF___

FIELD BORING LOG

DRILLING CO. Puk. DATUM ELEV. 602.4 B.H. NO. 2
DRILLER R.L. GROUND ELEV. JOB NO. 69 F 55
ENGINEER G.A. CASING SIZE N X DATE July 11
SITE LOCATION Thedford
HOLE LOCATION
REMARKS

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
				(15)
24.0	25.5	SP.SP. Grey/Br. Clayey Silt + V.Stiff	SS7	5/6/9
		(note no traces of organics at all)		
	27.0	Vane could not be pushed further than 6"		
24.0	27.0	Wash ahead		
27.0	28.3	Shelby - Grey Clayey Silt	Tw8/15"	PM 20 blows 3" 13"
27.0	30.0	Wash ahead		(35)
30.0	31.5	SP.SP. Grey Clayey Silt - layers of Hard	SS9	14/16/19
		Sand & Gravel ! (Hor & Vert !!)		
30.0	32.2	Wash ahead hard stopped at this point - stone?		
		Tried Spoon - up casing 2"?		(96)
32.2	33.7	SP.SP. Mainly med/coarse Sand with some	SS10	25/40/56
		fines - "Solid" in tip		
		END OF DAY		
		Mon. July 14		
0.0	32.0	Set down BX casing		
	33.0	Wash down B.X casing		
33.0	37.0	Ran BX casing w. diam shoe		
37.0	37.5	SP.SP. Gravel & Sand mixt (up to 2")	SS11	100/6"
		some fines END OF DAY Tues July 15		
37.0	42.9	Ran B.X casing Cleaned out with Bit Cone &		(120)
42.9	44.4	SP.SP ~~Gravel~~ lost pick down spoon again	SS12	32/69/51
		Gravel & Sand mixt - some fines		
		W.L. 6.5 inside casing Wed. July 16 - 6.0 pm		
		6.5 " " Thurs 17 11.0 am		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

SHEET ___ OF ___

FIELD BORING LOG

DRILLING CO. PUK
DRILLER R Lowes
ENGINEER GA
SITE LOCATION Thedford
HOLE LOCATION (440+67) offset 17' RT.
REMARKS

DATUM ELEV.
GROUND ELEV. app. 607.
CASING SIZE N.X

B.H. NO. 2 'A'
JOB NO. 69 F. 55
DATE Wed July 16

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
0.0	5.0	Drive N.X & pull out		(2)
5.0	6.5	Brown Clayey Silt Silt with Some Sand	SS1	1/1/1
		traces roots, shells		
5.0	10.0	Drive N.X & w/o		(5)
10.0	11.5	SpSp. Brown/Grey Clayey Silt traces shells	SS2	1/2/3
10.0	11.3	Drive N.X & w/o		
10.0	15.0	W/A		
15.0	16.5	Shelby	TW3/	PM.
	18.0	Vane would not turn >50		
15.0	18.5	Wash ahead		(28)
18.5	20.0	SpSp Brown/Grey Cl Silt - no trace shells or	SS4	7/10/13
		roots		
18.5	20.5	W/A		(20)
20.5	22.0	SpSp Grey/Brown Cl Silt, traces of shells	SS5	7/9/11
20.0	25.0	W/A		
25.0	26.5	Shelby Grey Cl Silt	TW6/17"	PM
	28.0	Vane Pushed. would not turn >50		
25.0	30.0	W/A		
30.0	30.5	Shelby (pushed 6" only). Fine Med Sand in tip	TW7/4"	
30.6	32.0	SpSp Grey Cl Silt - layers of Silt & Sand	SS 8/	
		7.5' — 11.0. Thurs. July 17	Caved at 25'	

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Master Soils
DRILLER
ENGINEER G.A.
SITE LOCATION Thedford
HOLE LOCATION W. Bank Sta (442 + 11) o.s. 3' LT.
REMARKS

DATUM ELEV.
GROUND ELEV. 602.0
CASING SIZE N.X

B.H. NO. 3
JOB NO. 69 F 55
DATE July 14/69

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
0	10.0	5 5 5 4 6 5 5 2 2 3		
11.0	20.0	4 4 5 6 8 8 10 8 7 9		
21.0	30.0	30 30 30 28 64 34 16 16 15 16		
31.0	40.0	28 28 26 24 25 28 28 29 24 25		
41.0	50.0	36 38 37 35 35 36 37 33 34 34		
51.0	60.0	51 45 40 46 48 48 51 57 60 64		
61.0	70.0	73 71 70 57 51 60 71 67 62 60		
70.0	76.0	60 70 70 67 77 120		
		END OF DAY		
		Tues July 15		
0.0	5.0	Drive N.X & pull out		(5)
5.0	6.5	SPSP Light brown Clayey Silt-Silt	SS1	2/2/3
		· traces of roots one or two shells		
5.0	10.0	Drive N.X		(5)
10.0	11.5	SPSP Brown/Grey Clayey Silt with	SS2	2/2/3
		Fine Sand · traces of roots one or two shells		
10.0	15.0	Wash ahead		
14.0		Pieces wood coming up in w/w.		
15.0	16.5	Shelby Grey Cl Silt w some Sand in tip	TW 3/8"	P.M.
	18.0	Vane 48 @ 12" = 1920 psf		
		12 @ 12" = 480 psf		
10.0	15.0	Drive N.X casing & w/o		
15.0		Wash ahead wood sand in w/w. Hit piece wood 15.0' here		
15.0	20.0	Drove N.X & w/o - material came up		
		casing 1' !! Boiling!		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Master
DRILLER
ENGINEER GA
SITE LOCATION Thedford
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV. ave 601
CASING SIZE N·X

B.H. NO. 3
JOB NO. 69 F 55
DATE July 15

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
		Came up 4" before placing spoon		
20.0	21.0	SD.SP - after 1st 12" casing began moving	SS4T LOST	14/30 hrs
		down with spoon: abandoned		unreliable
		Pumping water down hole while removing		
		spoon: casing came up with spoon!!		
		No recovery - Fine Sand? - took water samples		
20.0	25.0	Drive N·X - Material came up to 16' (ie 4')		
		Put down wash bit - unable to wash out further		
		than 22.5		
		Checked W.L. - remaining constant at 3.8		
		Water Samples - Fine/Med Sand		
		Put down open-ended wash bit		
		& washed out to 25'. put down Spoon & washed out		
25.0	26.0	SPSP Med Sand with some fines.	SS5	5/5/6
		lost most of Sample	LOST	
25.0	30.0	Drive N·X &w/o with open bit		
29.0		Roots coming up in wash water		
		note - no boiling noticed!		(3)
30.0	32.0	SP.SP. Med/Coarse Sand with some Grey	SS6	1/1/2/2
		Clayey Silt!! traces leaves!		
0.0	35.0	Drive B·X casing &w/o		(3)
35.0	37.0	SPSP Grey Clayey Silt with appreciable	SS7	1/1/2/2
		amount of shells & odd piece of wood		
		(BX) Vane could not be pushed!		
35.0	40.0	Wash ahead		
40.0	41.5	Shelby Grey Clayey Silt at tip slight trace	TW 8/13"	P.M.
		Sand		
	43.0	(BX Vane) 10 e 12" 800 psf		
		10 e 6" 400 psf		

390

405

12 gal

190
156
34

190
156
34

362
156
206

218
153
65

34
206

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Master
DRILLER Rea Dickie
ENGINEER GA
SITE LOCATION
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV.
CASING SIZE N.X - BX

B.H. NO. 3
JOB NO. 69 F.55
DATE July 15

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
40.0	45.0	Wash ahead. No wood in w/w just fine sand &	shells	
45.0	46.3	Shelby (could only be pushed 14")	TW9/12"	P.M. 14"
		Grey Clayey Si - traces roots in tip		
		— END OF DAY — Wed July 16		
45.0	50.0	Wash ahead		
50.0	51.5	Shelby Grey Clay Si. w/some Sand, Shells, Roots!	TW10/9"	P.M.
	53.0	Vane (BX) 40 @ 6" : 1600 psf		
		11 @ 6" : 440 psf		
50.0	55.0	Wash ahead		
55.0	56.5	Shelby Grey as above	TW11/16"	PM.
	58.0	Vane (BX) 31.5 @ 6" : 1,260		
		7 @ 6" : 280		
55.0	60.0	Wash ahead		
60.0	61.5	Shelby as above	TW12/12"	P.M.
	63.0	Vane (BX) : 25 @ 6" : 1000 psf		
		8 @ 6" : 320		
60.0	65.0	Wash ahead		
65.0	66.5	Shelby (only pushed 10") as above	TW13/10"	P.M. Hammer 10" 8"
65.0		Wash ahead		
69.0		Hard!		(42)
70.0	70.6	SPSP	SS14 A	19/14/28
70.6	71.0	Grey Clay Silt with some Sand - numerous roots & shells	B	
71.0	71.5	Coarse Sand & Gravel - Some Fines	C	
		nb. @ 71.0 - Thin 1/8" shale layer		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Master
DRILLER Rea Dickie
ENGINEER GA
SITE LOCATION Thedford
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV.
CASING SIZE B.X

B.H. NO. 3
JOB NO. 60-F-55
DATE July 16

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
35.0	75.0	Drive B.X casing & w/o		
75.0		Put down SpSp - sand up 3.5' in casing		
		Tried washing out with open ended bit -		
		Coarse sand in w/water - very few fines - water clear		
		Pumped water - shut 2' boil		
		Washed Spoon through this & took sample		
		as below -		
75.0	76.0	SpSp - Gravel & Coarse Sand - very little	SS15	74/110/-
		recovery V. Dense		
		Sand jamming in casing on removal		
75.0	80.0	Drove BX casing - V. Hard & w/o		
		Wash sample - Coarse Sand - no fines	15A	
		2.5' "boil" - washing out with SpSp		
		As soon as spoon raised - sand rises up		
		casing - spent ½ hr - shut 1'0" above		
		unable to progress further		
		end of day		
80.0	85.0	Drive B.X casing - v. hard ie 165 blows/hr one foot		
		& w/out		
		2.5' boil - washed out with Spoon & took		
		sample as below - good recovery		
85.0	86.5	SpSp Fine Med Sand with some Coarse Sand	SS16	80/73/90
		& traces Gravel V. Dense		
▽ W.L	7.3	Fri July 18		
	7.5	Mon July 21 END OF BOREHOLE		
	7.5	Tues " 22		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

602 - 40'

DRILLING CO. Master
DRILLER R. Dickie
ENGINEER
SITE LOCATION
HOLE LOCATION
REMARKS 602

DATUM ELEV.
GROUND ELEV. 608.1
CASING SIZE N.X

B.H. NO. 3A
JOB NO. 69 F 55
DATE July 23/69

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
0.0	5.0	Drive N X & pullout. Brown Clayey Silt-Silt w Org.		④
5.0	6.5	Sp Sp. Brown Clayey Silt-Silt, traces V. Soft of roots	SS1	2/2/2
5.0	10.0	Drive N.X & wash out.		①
10.0	11.5	SpSp Brown & Grey Clayey Silt - Silt & Fine Sand, trace roots U. Soft	SS2	1/1/1
10.0	15.0	Drive N.X & wash out		①
15.0	16.5	SpSp Grey Clayey Silt Silt with Fine Sand, some Organics · roots	SS3	1/1/1
	18.0	Vane 16 @ 12" = 640 psf		
		rem. 2 @ 6" = 40 psf		
15.0	20.0	Wash ahead. pieces wood in w/w, & Fine Sand		②
20.0	21.5	SpSp Grey Clayey Silt - Heavily organic layers of Fine to med Sand & roots	SS4	1/1/1
	23.0	Vane >50 =		
20.0	25.0	Wash ahead.		
25.0	26.5	Shelby (Coarse Sand in tip) Grey Clayey Silt, rounded shells.	TW 5	PM
	28.0	Vane 32 @ 12 = 1,280		
		21 @ 6 = 420		
25.0	30.0	Wash ahead Fine Sand, roots, pieces wood & w/w.		
30.0	31.5	Shelby Grey Clayey Silt, traces roots shells - tip	TW 6	PM
	33.0	Vane 24 @ 12 = 960		
		3 @ 6 = 60		

FORM OB-MT-231
(FORMERLY OB-ML-231)
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DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Master
DRILLER
ENGINEER
SITE LOCATION
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV.
CASING SIZE N.X

B.H. NO. 3'A'
JOB NO. 69 F 55
DATE July 23

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
30.0	35.0	Wash ahead Roots/wood/ Fine Sand in w/w.		
35.0	36.5	Shelby Grey Clay Silt traces roots in hip	Tw 7/15"	PM
	38.0	Vane 23 @ 12" = 920 psf		
		5 @ 6" = 100 psf		
35.0	40.0	Wash ahead		
40.0	41.5	Shelby	Tw 8/9"	PM
	43.0	Vane 21½ @ 12" = 860 psf		
		7 @ 6" = 140 psf		
		— END OF BH — 1.0.		
		W.L. 7.7' 3.0pm July 23.		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Master
DRILLER Rea Dickie
ENGINEER G.A.
SITE LOCATION Thedford
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV. 606.5
CASING SIZE N-X

B.H. NO. 4
JOB NO. 69-F-55
DATE July 17/69

DEPTH FROM	DEPTH TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
0.0	10.0	5 5 3 3 3 3 3 3 3 5		
11.0	20.0	7 6 7 7 8 12 14 14 15 14		
21.0	30.0	16 17 18 20 18 18 20 22 22 23		
31.0	40.0	28 29 29 29 29 29 30 29 29 30		
41.0	50.0	30 33 33 33 33 34 33 36 38 36		
51.0	60.0	38 37 40 38 42 43 41 41 42 47		
61.0	70.0	51 54 55 56 59 56 59 51 56 53		
71.0	72.0	98 110		
0.0	5.0	Drive N.X & pull out Light Brown Clayey Silt-Silt with Sand		(5)
5.0	6.5	SPSP Light Brown/Grey Firm	SS1	2/2/3
		Clayey Silt traces shells, roots, some Sand		
5.0	10.0	Drive N.X		
		— end of day —		
		Friday July 18		
5.0	10.0	Wash out N.X		16 blows (1)
10.0	11.5	SPSP Grey Clayey Silt-Silt with Fine	SS2	1/1/1
		Sand slight trace shells U. Soft		
	13.0	Vane (BX)* 8 @ 6" = 320 psf		
		6 @ 3" = 120 psf		
10.0	15.0	Drive N.X & w/o		
15.0	16.5	Shelby Grey Clayey Silt-Si.Cl. sl. trace shells	TW3/18"	P.M
	18.0	Vane (N.X) 18 @ 12" = 720 psf		
		8 @ 6" = 160 psf		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

SHEET 2 OF ___

FIELD BORING LOG

DRILLING CO. Master
DRILLER R. Dickie
ENGINEER G.A
SITE LOCATION Thedford
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV. 606.5
CASING SIZE N.X

B.H. NO. 4
JOB NO. 69 F.55
DATE July 18

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
15.0	20.0	Wash ahead		
20.0	21.5	Shelby Grey Silt Brown Clay Silt some	TW 4/18"	P.M.
		Sand - trace of shells, roots		
	23.0	Vane (NX) 17 @ 12" = 680 psf		
		5 @ 6" = 100 psf		
20.0	25.0	Wash ahead		
25.0	26.5	Shelby As above traces of roots - 1/4"	TW 5/17"	P.M.
		missing from bottom - Sand layers?		
	28.0	Vane (NX) 19 @ 12" = 760 psf		
		6 @ 6" = 120 psf		
25.0	30.0	Wash ahead		
30.0	31.5	Shelby As above - 1/4" missing from bottom	TW 6/16"	P.M.
		of tube. Sand seams?		
	33.0	Vane (NX) 28.5 @ 12" = 1180 psf		
		10 @ 6" = 200 psf		
		END OF DAY		
		Monday July 21		
30.0	35.0	Wash ahead		
35.0	36.5	Shelby As above 1/4" missing, sand in tube	TW 7/16"	PM
	38.0	Vane (NX) 19.5 @ 12" = 780 psf		
		8 @ 6" = 160 psf		
35.0	40.0	Wash ahead		
40.0	41.5	Shelby No loss as above	TW 8/15"	PM
	43.0	Vane (NX) 19 @ 12" 760 psf		
		5 @ 6" 100 psf		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Mashin. DATUM ELEV. _____ B.H. NO. 4
DRILLER R.D GROUND ELEV. 606.5 JOB NO. 69-F-55
ENGINEER GA CASING SIZE NX DATE July 21
SITE LOCATION Thedford.
HOLE LOCATION _____
REMARKS _____

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
40.0	45.0	Wash ahead		
45.0	46.5	Shelby ½" missing. Grey Clayey Silt some	TW9/15"	P.M.
		Sand in tip		
	48.0	Vane 23 @ 12" = 920 psf		
		8 @ 6" = 160 psf		
45.0	50.0	W/A		
50.0	51.5	Shelby full. Grey Clay Si. trace Sand, shells	TW10/16"	PM
		roots		
	53.0	Vane 23.5 @ 12" = 940 psf		
		9 @ 6" = 180 psf		
50.0	55.0	W/A		
55.0	56.5	Shelby Grey Clay Si trace Sand. one	TW11/12"	PM.
		no. of shells		
	58.0	Vane 27.0 @ 12" = 1080 psf		
		9.5 @ 6" 190 psf		
55.0	60.0	W/A		
60.0	61.5	Shelby Fine/Med Sand in tip	TW12/16"	P.M.
	63.0	Vane 46 @ 12" = 1840 psf		
		22 @ 6" = 440 psf		
60.0	65.0	W/A		
65.0	66.5	SSP Clayey Silt with Fine/Med Sand Firm	SS13/	1/2/3 (5)
		V. Highly Organic with shells, roots		
	68.0	Vane (would not turn) >50		
65.0	70.0	Drive BX & w/o - Coarse Sand in w/w		
		from 65'		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Masters
DRILLER R Dickie
ENGINEER G.A
SITE LOCATION Thedford
HOLE LOCATION Spun 2.3'
REMARKS Dropped rod 2'-10" Shoe up Casing 8"

DATUM ELEV.
GROUND ELEV. 606.5
CASING SIZE BX

B.H. NO. 4
JOB NO. 69 F 55
DATE July 21

DEPTH FROM	DEPTH TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
				(17)
70.0	71.5	SpSp - lost! Put down again to 72.0'	SS14	14/10/7
		Grey Clayey Silt in tip with Coarse Sand		
		some fines	16 No	
75.0	77.5	Note realized that casing was down to 75.0'		
		Hence washed out to 75.0'		
				(10)
75.0	76.5	SpSp poorly graded - Grey Clayey Silt	SS15	9/6/4
		layered with Coarse Sand.		
		END OF DAY		
		Gord Smith - driller Tuesday 22		
75.0	80.0	Drive BX & wash out - Fine med Sand in w/w & pieces wood		
		6" material in casing - washing out with Spoon		
	78.0	Wash Sample F/M Sand pieces wood	15A	(25)
80.0	81.5	SpSp - lost! Put down again. Compact	SS16	27/16/9
		material come up 2.0' inside casing	LO	
		Tried spoon casing going down with spoon		
		- with drew.		
80.0	86.0	Drive BX - easy to drive & wash out (1' lower - casing dropped)		
		- No boiling apparent!		(86)
86.0	87.5	SpSp - Grey Fine Sand V Dense	SS17	51/36/50
		lined		
86.0	90.0	Drive BX (v hard from 88') & w/o - Grey Fine		
		to Med Sand in wash water		
		No boiling!		

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

FIELD BORING LOG

DRILLING CO. Master Soils
DRILLER
ENGINEER GA
SITE LOCATION Thedford
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV. 606.5
CASING SIZE N X - B X

B.H. NO. 4
JOB NO. 69-F-55
DATE July 22/69

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
		36		(127)
90.0	91.5	SP SP Grey Gravel Sand mixture V. Dense	SS18	80/64/63
		Gravel upto 1½" diam		
90.0	91.7	Drive B.X - v. hard		
		Washing down with casing - extremely hard		
		virtually stopping at 93.0'		
93.0	93.4	SP SP (nb 40 blows last ½") - No recovery	SS19	140/3½"
		Drove		
93.0	93.4	Drove BX casing no progress further than 93.4'		
		Washbit bouncing @ 93.4' - b'rock?		
		END OF BOREHOLE		
		W.L 5.3' - Wed July 23 8.00 am		51'10"
		5.3 ——— 4.0 pm		

FORM OB–MT–231

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING OFFICE

SHEET___ OF___

FIELD BORING LOG

* 23' from metal rod

DRILLING CO. PUK
DRILLER W Barley
ENGINEER G. Owen
SITE LOCATION Thedford
HOLE LOCATION Sta. 442+76
REMARKS

DATUM ELEV.
GROUND ELEV. 607.0
CASING SIZE HS Auger

B.H. NO. 5
JOB NO. 69-F-55
DATE May 25/70

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
0.0	3.0	Auger down		(6)
	4.5	SDSP Brown Clayey Silt with some Sand	SS 1	1/3/2
		- Firm		
	6.0	Vane 20 @ 12" = 800 psf		
		16 @ 6" = 320 psf S = 2.5		
3.0	6.0	Auger down		
	7.5	Shelby as above	TW2	P.M.
	9.0	Vane 21 @ 12" = 840 psf		
		8 @ 6" = 160 psf S = 5.2		
6.0	9.0	Auger down		(2)
	10.5	SDSP Br. Silt with Sand & scattered roots	SS3	1/1/1
	12.0	Vane 14 @ 12" = 560 psf		
		6 @ 6" = 120 psf S = 4.7		
9.0	12.0	Auger down		
	13.5	Shelby - Grey Brown Si. Clay with Sa. tr. Org.	TW4	P.M.
	15.0	Vane 22 @ 12" = 880 psf		
		4 @ 6" = 80 psf S = 11.0		
12.0	15.0	Auger down		
	16.5	Shelby (Axis) as above	TW5	P.M.
	18.0	Vane 30 @ 12" = 1200 psf		
		15 @ 6" = 300 psf S = 4.0		
15.0	18.0	Auger down		(3)
	19.5	SDSP Grey Clay with seams of Sa. & Organics	SS6	2/1/2
	21.0	Vane 29 @ 12" = 1160		
		13 @ 6" = 260 S = 4.4		
18.0	21.0	Auger down		
	22.5	Shelby as above (p.s)	TW7	P.M.
	23.0	Vane 38 @ 12" = 1520		
		24 @ 6" = 430 S = 3.1		

FORM OB—MT—231

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING OFFICE

SHEET___ OF___

FIELD BORING LOG

DRILLING CO. RK
DRILLER W Barley
ENGINEER G.A.
SITE LOCATION Thedford.
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV.
CASING SIZE HSA

B.H. NO. 5
JOB NO. 69 F.55
DATE May 25/70

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
21.0	25.0	Auger down		
	26.5	Shelby Grey	TWB	P.H.
	28.0	Vane 25 @ 12" = 1000		
		10 @ 6" = 400		
		S = 2.3		
		— Bottom —		

FORM 8B-MT-231

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING OFFICE

SHEET 1 OF ___

440+30' 2' **FIELD BORING LOG** 610.1 - 1.5

DRILLING CO. Pure
DRILLER W. Fraser
ENGINEER GA
SITE LOCATION Thedford
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV. 608.6
CASING SIZE HSA

B.H. NO. 6
JOB NO. 69 F 55
DATE May 25/70

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
0.0	3.0	Auger down		(5)
	4.5	SP.SP Brown Clayey Silt with Sa,	SS1	2/2/3
		traces of roots. Firm		
	6.0	Vane 22 @ 10" = 880 psf		
		16 @ 6" = 320 psf s = 3.8		
3.0	6.0	Auger down		
	7.5	Shelby as above.	TW 2	P.H.
	9.0	Vane 50 @ 12" = 2,000 psf ? Brown U Shaft Silt low plastic		
		16 @ 6" = 320 psf. / Sand on vane		
6.0	9.0	Auger down		(12)
	10.5	SP.SP. Br Si Cl w.s Sand to Grey Br. Cl Si heavy black organics	3	3/4/8
		Vane 32 @ 12" = 1,280		
		30 @ 6" = 600 s = 2.1		
9.0	12.0	Auger down		
	13.5	Shelby Grey Si Cl w.s Sand.	TW 4	PH
	15.0	Vane 38 @ 12" = 1,520		
		12 @ 6" = 240 s = 6.3		
12.0	15.0	Auger down		(3)
	16.5	SP.SP Grey to Br Si Cl w.s Sand - Soft	SS5	1/1/2
	18.0	Vane ~~Should push last 6"~~		
		Would not turn!		
15.0	18.0	Auger down		
	19.5	Shelby - bushed 15' only but dented!	TW6	PM15'
		Grey Cl Silt, tr Sa.		
~~18.0~~				
18.0	21.0	Auger down		

FORM QB—MT—231

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING OFFICE

SHEET___ OF___

FIELD BORING LOG

DRILLING CO. Pulk
DRILLER W Bailey
ENGINEER GA
SITE LOCATION Thedford
HOLE LOCATION
REMARKS

DATUM ELEV.
GROUND ELEV.
CASING SIZE

B.H. NO. 6
JOB NO. 69 F 55
DATE May 25/70

DEPTH FEET FROM	TO	DESCRIPTION	SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
				(29)
21.0	22.5	SP SP Grey Cl Silt trace Sand	SS7	4/10/19
		Very Stiff		
21.0	25.0	Auger down		
25.0	26.5	Shelby Grey Cl Silt, tr Sand & Gr	TW8	P.H
25.0	30.0	Auger down		(17)
30.0	31.5	SP SP 1st 6" as above	SS9	4/7/10
		6"-15" Sandy Silt	9A	
		15"-18" Grey Cl Silt		
31.5		None could not be pushed		(38)
30.0	35.0	Auger down		14/19/19
	36.5	SP SP Grey Silty fine Sand - Dense	SS10	
35.0	40.0	Auger down - Gravel in from 37?		
		Boiling up to 18" ! On attempt spoon		
		End of day Tues May 26		
		Pulled augers to clean out &		
40.0	50.0	Auger down		(116)
50.0	51.2	SP SP - Med Sand chg. to	SS11	26/53/63
51.2	51.5	Grey Cl Silt (last 3" - U.Stff)	11A	
				(70)
55.0	56.5	Spoon Grey Cl Silt trace Sand & Gra - V. Hard	SS12	17/29/41
55.0	60.0	Auger down		(116)
	61.5	SP SP as above V. Hard	SS13	16/44/72
60.0	65.0	Auger down		(116)
	66.5	SP SP as above V. Hard	SS14	22/42/74
65.0	70.0	Auger down		(107)
	71.5	SP SP V. Hard	SS15	21/45/62

FORM OB-MT-231
(FORMERLY OB-ML-231)
REVISED OCT. 1965

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS AND TESTING DIVISION

SHEET___ OF___

FIELD BORING LOG

DRILLING CO._____ DATUM ELEV._____ B.H. NO._____

DRILLER_____ GROUND ELEV._____ JOB NO._____

ENGINEER_____ CASING SIZE_____ DATE_____

SITE LOCATION_____

HOLE LOCATION_____

REMARKS_____

DEPTH FEET FROM	TO	DESCRIPTION (34 5' Lt of bar)			SAMPLE TYPE, NO. & RECOVERY	METHOD OR BLOWS & DISTANCE
Date.		Piez #1	Piez #2	Piez #3 6' behind #3		& 3' left
		Elev 602.5	611.3	Elev. 604.1	41.5	
		Tip 570.0	584.8	562.6		
July 21	3.0	6.8'	4.0'			
			Took water out.			
23	2.0	6.8.	5.6.	6.2.		
24						
		~~604.6~~				
		~~595.7~~	605.7	~~591.9~~		
		5.8	4.6	5.2		
		605.00	610.7			

DR-EG-5

DEPARTMENT OF HIGHWAYS, ONTARIO

PARTY NAMES _____ W.P. No. _____

_____ DATE _____

STA.	B.S.	HI.	I.S.	F.S.	ELEV.	REMARKS
		614.05				
HOLE # 2			14.3		599.85	G/ELEV
			11.70		602.35	MARK ON TREE
T.P.	11.23	623.40		1.79	612.26	
B.M.	0.25	620.61		3.13	620.36	EL. 620.36 CUT "+" ON ABUT.
T.P.	4.80	611.66		13.76	606.85	
HOLE # 3			2.7		602.0	G/ELEV.
HOLE # 4			5.2		606.5	G/ELEV.
T.P.	14.22	621.08		4.80	606.85	
B.M.				0.72	620.36	EL. 620.36 RED. CUT "+" ON CH'K'D. ABUT.

DD-ES-5

DEPARTMENT OF HIGHWAYS, ONTARIO

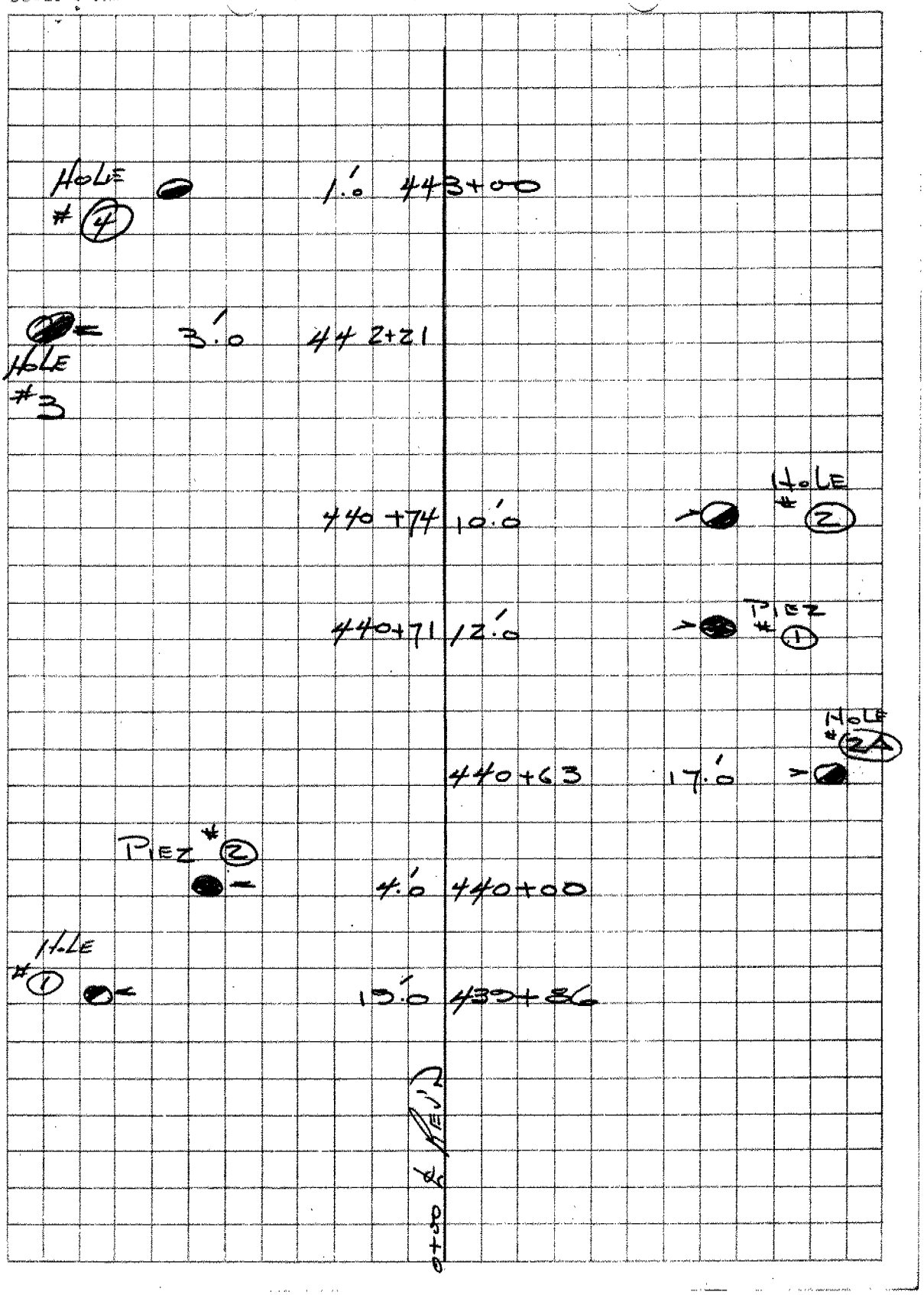
PARTY NAMES _____ W.P. No. _____

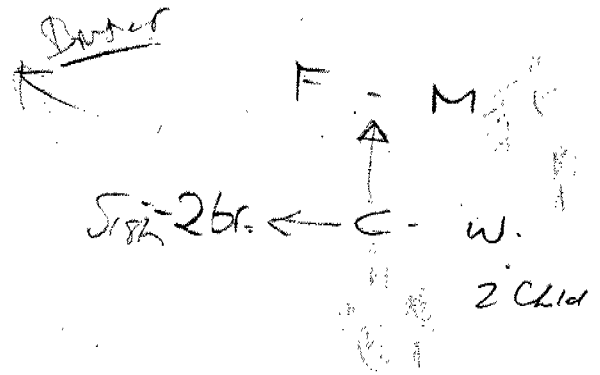
_____ DATE _____

STA.	B.S.	HI.	I.S.	F.S.	ELEV.	REMARKS
Pr. M.	3.70	624.15				EL. 620.36 CUT 4" TOP CONC. ABUT. OF ALTAIR RIVER BRIDGE N. SIDE N. END OF BRIDGE
T.P.	1.70	614.05		11.80	612.26	
HOLE # 1			3.4		610.7	G/ELEV.
PIEZ # 2			4.0		610.1	G. ELEV
			2.76		611.29	TOP ELEV
HOLE # 2A			6.3		607.8	G/ELEV.
PIEZ # 1			12.5		601.6	G./ELEV
			11.54		602.51	RED. TOP ELEV.
						CH'K'D.

OB-ES-4-60M

DEPARTMENT OF HIGHWAYS ONTARIO




Dwner
F - M
Sis-2br. ← C - W.
2 Child

24. Jan. 72.

Bt # 1 & 6

East abut. piles driven to appx el. 560 - full strength.

No spread footing

East pier.

Bt # 2

same as east pier.

Bt # 3

West pier piles driven to el. 520. for full strength.

Bt # 4

West abut

piles driven to el. 513 - 515 ft. full strength.

Pore. readings indicate water levels at the same elevations as in the boreholes.

Information is sufficient to carry out stability analysis for both natural banks and also for new approach fills.

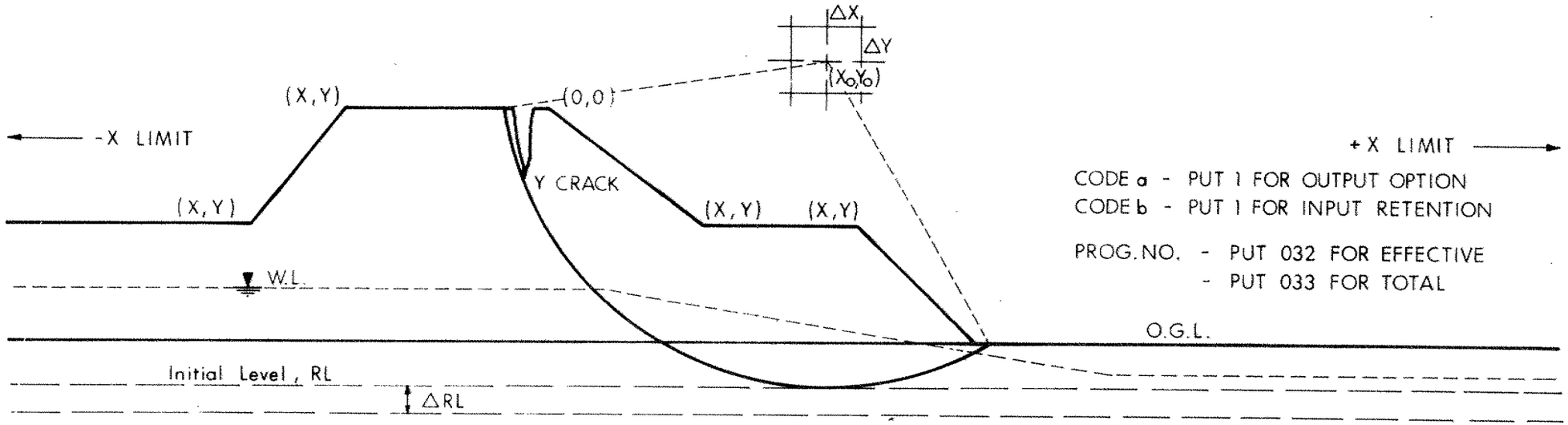
Settlements may be computed under approx. fills.

OVERSIZE DRAWING

FF - 46 Rev. 1971

SLOPE STABILITY ANALYSIS - (BISHOP METHOD)

INPUT SHEET 1



CODE a - PUT 1 FOR OUTPUT OPTION
CODE b - PUT 1 FOR INPUT RETENTION

PROG. NO. - PUT 032 FOR EFFECTIVE
- PUT 033 FOR TOTAL

	PROG. NO. (6)	a (9)	b	PROGRAM TITLE (11)	MADE BY (55)	W.P. (68)	JOB NO. (76)
H	033			AUSABLE R 10 FILL 7.5 BERM TOT	G. ALLEN		

	PROG. NO. (6)	a (9)	b
H R			

not used

	NO. OF SLICES (2)	INITIAL CIRCLE CENTRE X_0 (5)	Y_0 (13)	ΔX (21)	ΔY (25)	Y CO-ORD. OF RL (29)	Δ RL (39)	NO. OF LEVELS (43)	Y CO-ORD. OF CRACK (46)	NO OF POINTS -X SIDE (50)	+X SIDE (58)	-X CO-ORD. OF LIMIT LINE (61)	+X CO-ORD. OF LIMIT LINE (71)
A	35	30.	-100.	10.	12.	30.	5.	8	6.	1	4	-200.	250.

	SLOPE SURFACE X (2)	Y (11)	X (21)	Y (31)	X (41)	Y (51)	X (61)	Y (71)
B	-200.	0.	20.	10.	95.	10.	143.	44.
B	250.	44.	.	.	.	.	.	.
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FE 47 ,Rev.1971

INPUT SHEET 2

SECTION DETAILS

	SECTION NUMBER (8)	X CO-ORD. FEET (11)	SOIL TYPE (28)	Y CO-ORD. OF UPPER SOIL BOUNDARY FEET (31)	WATER LEVEL (41)
C	1	-200.	1	0.	100.
C	1	.	2	10.	.
C	1	.	3	27.	.
C	2	250.	1	0.	100.
C	2	.	2	10.	.
C	2	.	3	27.	.
C		.		.	.
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REMARKS

FF - 49 Rev.1971

INPUT SHEET 3

SOIL PROPERTIES

	SOIL TYPE NUMBER (8)	COHESIVE STRENGTH Cu OR C' P.S.F. (11)	ANGLE OF SHEAR ϕ' DEGREES (21)	BULK DENSITY γ OM P.C.F. (31)	SUBMERGED DENSITY γ SUB P.C.F. (41)
D	1	0.	30.	120.	58.
D	2	600.	0.	108.	46.
D	3	750.	0.	110.	48.
D					
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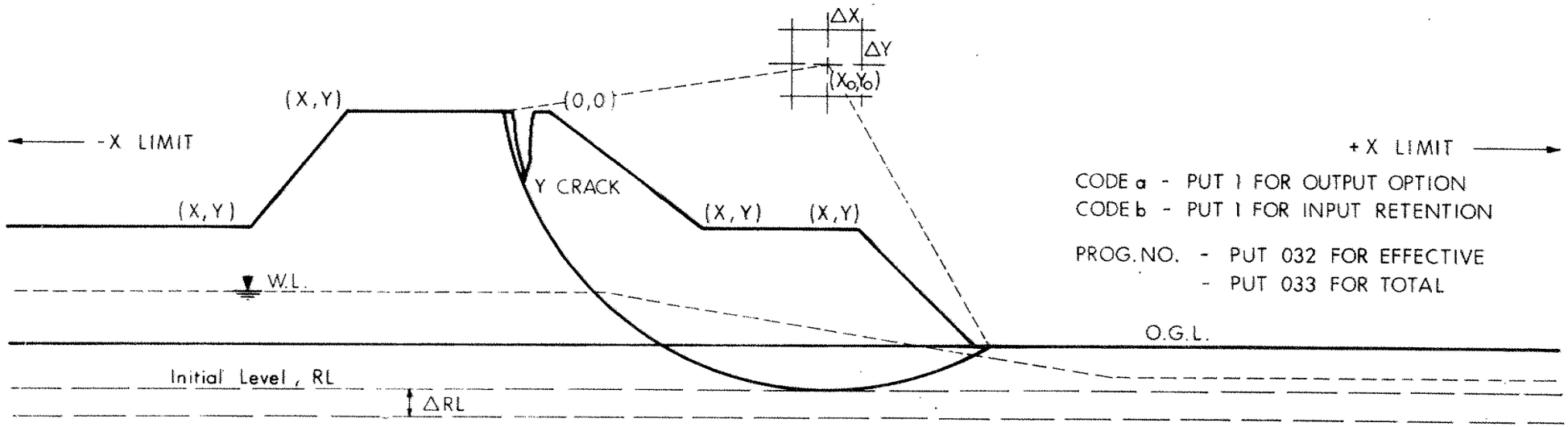
REMARKS

FE - 46 Rev. 1971

SLOPE STABILITY ANALYSIS - (BISHOP METHOD)

INPUT SHEET 1



CODE a - PUT 1 FOR OUTPUT OPTION
CODE b - PUT 1 FOR INPUT RETENTION

PROG. NO. - PUT 032 FOR EFFECTIVE
- PUT 033 FOR TOTAL

	PROG. NO. (6)	a b (9)	PROGRAM TITLE (11)	MADE BY (55)	W.P. (68)	JOB NO. (76)
H	033		AUSABLE R. 10 FILL 35 BERM T.D.	G ALLEN	69 1.1.0.55	

	PROG. NO. (6)	a b (9)
H R		

Not sort

	NO. OF SLICES (2)	INITIAL CIRCLE CENTRE X_0 (5)	Y_0 (13)	ΔX (21)	ΔY (25)	Y CO-ORD. OF RL (29)	ΔRL (39)	NO. OF LEVELS (43)	Y CO-ORD. OF CRACK (46)	NO OF POINTS -X SIDE (55)	+X SIDE (58)	-X CO-ORD. OF LIMIT LINE (61)	+X CO-ORD. OF LIMIT LINE (71)
A	35	70.	-80.	10.	12.	50.	5.	8	6.	1	4	-200.	200.

	SLOPE SURFACE X (2)	Y (11)	X (21)	Y (31)	X (41)	Y (51)	X (61)	Y (71)
B	-200.	0.	20.	10.	55.	10.	103.	44.
B	200.	44.	.	.	.	.	.	.
B	.	.	.	.	.	.	.	.
B	.	.	.	.	.	.	.	.
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FF - 47 Rev.1971

INPUT SHEET 2

SECTION DETAILS

	SECTION NUMBER 8	X CO-ORD. FEET 11	SOIL TYPE 28	Y CO-ORD. OF UPPER SOIL BOUNDARY FEET 31	WATER LEVEL 41
C	1	-200.	1	0.	100.
C	1	.	2	10.	.
C	1	.	3	27.	.
C	2	200.	1	0.	100.
C	2	.	2	10.	.
C	2	.	3	27.	.
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REMARKS

FF - 49 Rev. 1971

INPUT SHEET 3

SOIL PROPERTIES

	SOIL TYPE NUMBER 8	COHESIVE STRENGTH Cu OR C' P. S. F. 11	ANGLE OF SHEAR ϕ' DEGREES 21	BULK DENSITY γ OM P. C. F. 31	SUBMERGED DENSITY γ SUB P. C. F. 41
D	1	0.	30.	120.	58.
D	2	600.	0.	108.	46.
D	3	750.	0.	110.	48.
D		.	.	.	.
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REMARKS

E-4835-1

CO. LAMBTON
TWP. BOSANQUET
CON. 1
LOT 17

CO. MIDDLESEX
TWP. WEST WILLIAMS
CON. 21 BROKEN FRONT
LOT 17

PROBABLE FOOTING LOCATIONS

TO THEDFORD

TO PARKHILL

REV. HWY. 7

AUSABLE RIVER

LINE F

STEEL CONTINUOUS TRUSS THROUGH BRIDGE

PLAN S-175-5 & B-176-18
PROF C-175-8

20.0 BLACKTOP HWY. 7

PLAN
SCALE - 1 IN = 20 FT

ROAD SURFACE SECTION OF STRUCTURE
(ALSO SEE LONG. STRUCTURE)

KEY PLAN
SCALE - 1 IN = 1 MI.

TOP OF GRANULAR

VPI 446.30
EL. 579.20

350 VC
LVC 2.730

AUSABLE RIVER

WL 584.3 APRIL 1962

Clayey Silt with Sand Very Soft

Organic Silt with numerous Stems

Fine Sand (Compact)

Sand with Organic Silt

Sand & Gravel Strong

Sand with Organic Silt Dense to Very Dense

PROFILE
SCALE - HOR. VER. 1 IN = 20 FT

B.M. 820.36
GEODETIC DATUM
Elev. of Top of Conc. Base of Monument on N.E. Corner of Bridge

G.B.M. No. 348 616.553
C.N.Ry. Bridge over Ausable River 2.2 miles east of Arkona and 1 mile east 36.2 from St. Marys Junction. South abut. and concrete retaining wall at east end of bridge, 15 inches from east end of wall and 3 feet 6 inches below the Rail set horizontally.
QUADRANGLE 43081 LINE 19

STR WP 141-67.01

DATE	REVISIONS & ADDITIONS	BY	CHK'D

DEPARTMENT OF HIGHWAYS ONTARIO
DESIGN BRANCH
ENGINEERING SURVEYS OFFICE

BRIDGE SITE

PROPOSED CROSSING
AT
AUSABLE RIVER
AND
KING'S HWY. 7 PROP REV LINE F

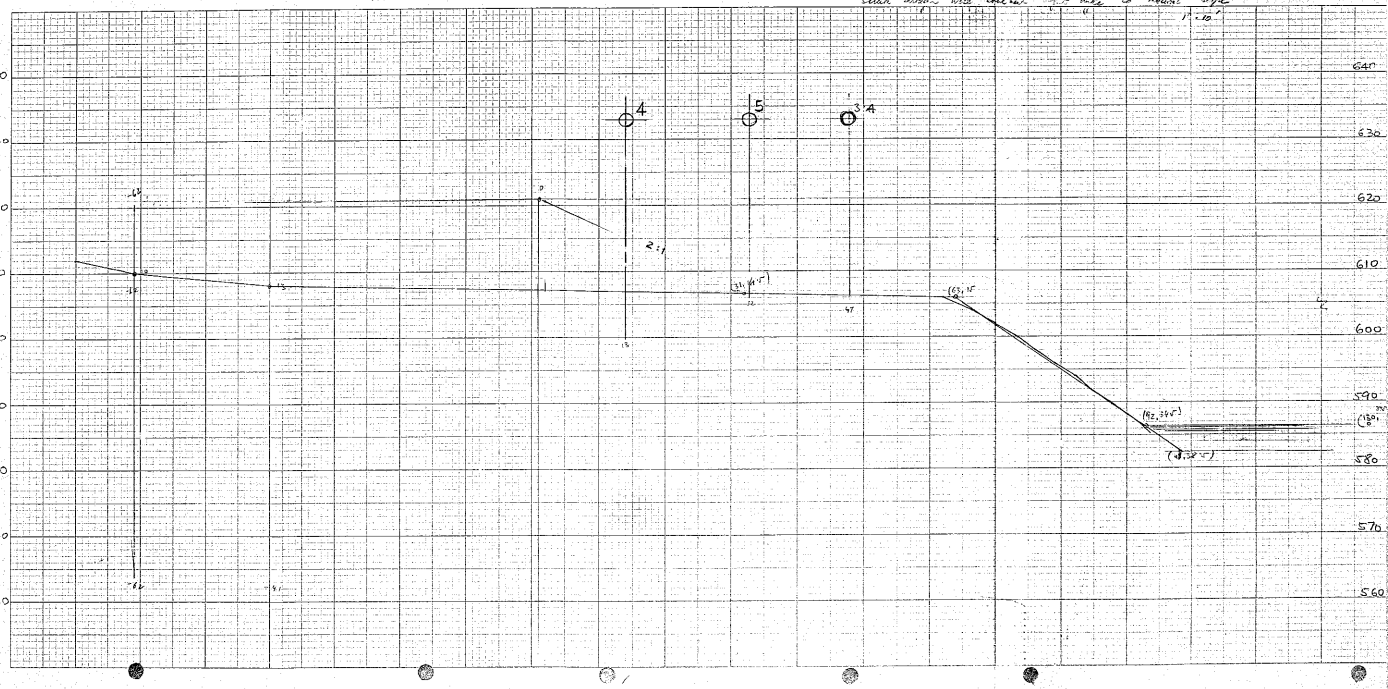
LOT 17 CON. 1
COUNTY OF LAMBTON
TOWNSHIP OF BOSANQUET

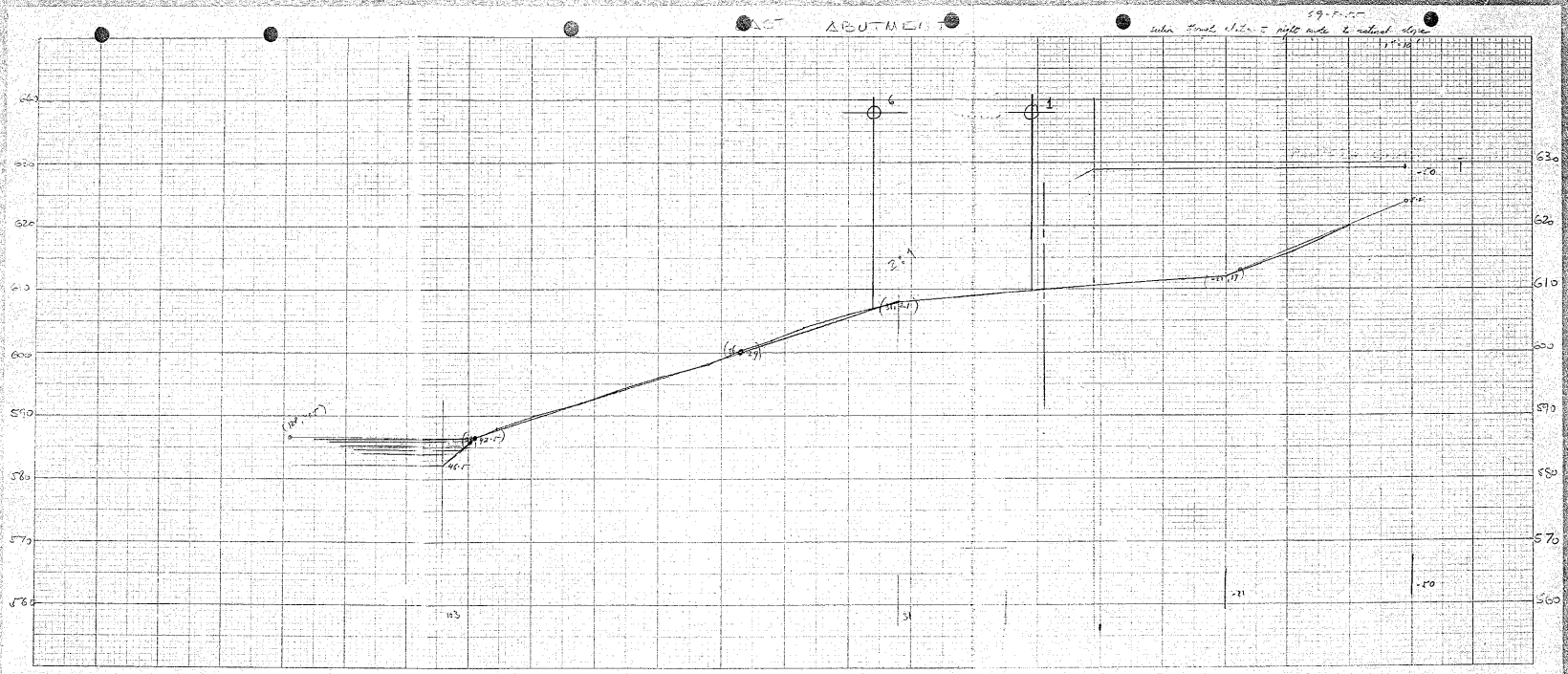
LOT 17 & CON. 21 BF
COUNTY OF MIDDLESEX
TOWNSHIP OF WEST WILLIAMS

SCALE AS SHOWN	DISTRICT CARLING & LONDON	PROJECT SOUTHWESTERN ONT.
WO 9382-141-67.01	DATE Oct. 1966	SHEET 1
SURVEY BY Chief of Party: K. Mitsopulos Supervisor: W. Smith	DRAWN BY Draftsman: K. Mitsopulos Supervisor: J. Ashton	
CHECKED BY Draftsman: J. Ashton Supervisor: J. Cavillero	PLAN E-4835-1	

E-4835-1

WEST ABUTMENT




ABUTMENT
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