#56-24925

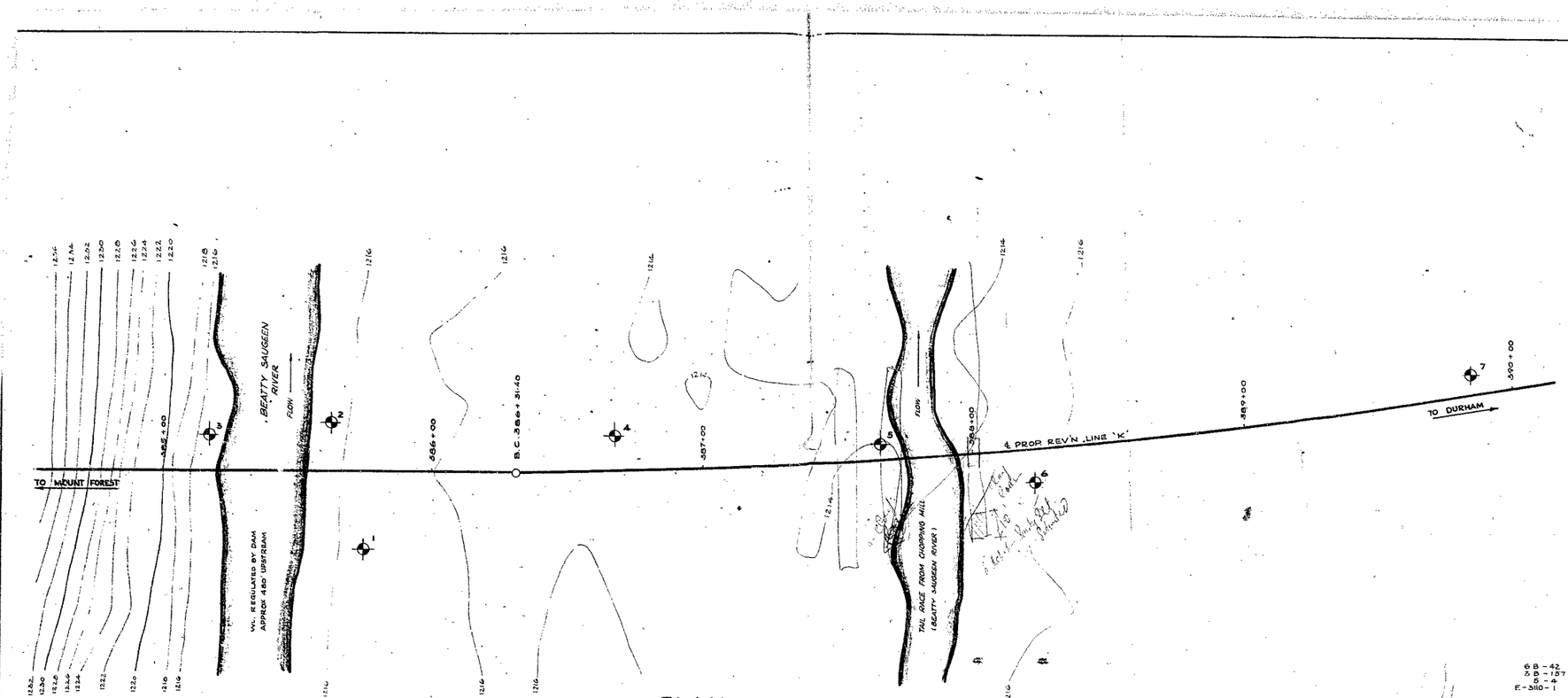
WP #548-56

HWY #6

CROSSING

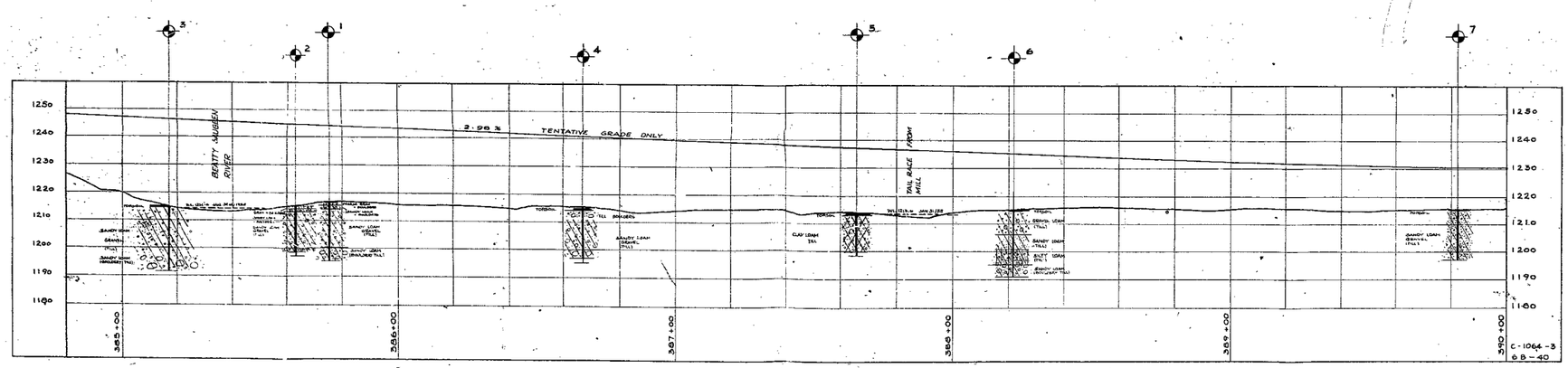
BEATTY SAUGEEN

RIVER



PLAN

SCALE - 1 IN = 20 FT



PROFILE

SCALE HOR - 1 IN = 20 FT
VER

6 B - 42
5 B - 157
D - 4
E - 3110 - 1

C - 1064 - 3
6 B - 40

LEGEND

BORE HOLES
PENETRATION HOLE
BORE & PENETRATION HOLE

HOLE NO.	ELEVATION	STATION	DISTANCE FROM ℄
1	1216.4'	385+75'	29' RT.
2	1214.9'	385+62.5'	17.5' LT.
3	1215.4'	385+16.5'	12' LT.
4	1215.2'	386+67.5'	13' LT.
5	1214.1'	387+66.5'	5.5' LT.
6	1215.7'	388+21'	12' RT.
7	1215.8'	389+885'	7' LT.

— NOTE —

THE BOUNDARIES BETWEEN SOIL STRATA HAVE BEEN ESTABLISHED ONLY AT BORE HOLE LOCATIONS. BETWEEN BORE HOLES THE BOUNDARIES ARE ASSUMED FROM GEOLOGICAL EVIDENCE AND MAY BE SUBJECT TO CONSIDERABLE ERROR.

DEPARTMENT OF HIGHWAYS:-ONTARIO-
MATERIALS & RESEARCH SECTION - DOWNSVIEW

BEATTY SAUGEEN RIVER & TAIL RACE PROPOSED CROSSING

THE KING'S HIGHWAY No. 6 (LINE 'K') DIV. No. 5
CO. GREY
TWP. NORMANBY LOT 16 CON. I

POSITIONS & ELEVATIONS OF HOLES

APPROVED

ENGINEER CHIEF ENGINEER

DESIGN CHECK
DRAWING R.E.F. CHECK
TRACING CHECK
DATE JANUARY 17, 1957

CONTRACT NUMBERS W.P. 548-56
LOADING
DRAWING NUMBER F-56-24 A.

REVISIONS: DATE BY DESCRIPTION REFERENCE PLANS

Copy to: Foundation Section

Mr. A. Toye,

Bridge Engineer

April 2, 1957.

F. C. Brownridge
Per: A. Rutka

Foundation Report - Hwy. No. 6,
Beatty Saugeen River -
Tail Race - 7 Miles North Mt. Forest.
W.P. 548-56 W.J. F-56-34 & 25

Attached herewith is the foundation report for the above mentioned structures.

The subsoil conditions are such that spread footings are recommended. In the case of the Beatty Saugeen River structure, it is pointed out that there is a dam upstream and that it might be advisable to consider securing action at this site should the dam, for some reason, fail. In the case of the tail race structure, a culvert may be considered adequate. If such is the case, 2.5 tons per square ft. is considered to be a fairly conservative bearing value. If a box culvert is constructed, the elevation of this box foundation could be placed at a higher elevation than that for the spread footing foundation in view of the lesser bearing value required.

F. C. Brownridge
MATERIALS & RESEARCH ENGR.

per:

A. Rutka,
PRINCIPAL BRIDGE ENGR.

AH/MdeF
Attach.

cc: Messrs. A. Toye
H. Tregaskos
D. G. Ramsay
F. B. Whiteley

Foundation Section
File

FOUNDATION REPORT

on

New Bridges at Highway No. 6
crossing Beatty Saugeen River,
about 7 miles North of Mount Forest.

Site Plan No: E-3110-1

Stations: 385+40
387+90

Distribution:

Mr. A. Toye Bridge Engineer	(2)
Mr. H. Tregaskes Construction Engineer	(1)
Mr. D. G. Ramsay Design Engineer	(1)
Mr. F. B. Whitely District Engineer Owen Sound, Ontario	(1)
Foundation Section	(1)
File	(1)

W.P. 548-56

W.J. F-56-24 & 25

I N D E X

1. INTRODUCTION:

Subsoil investigation was carried on to determine the bearing value of the layers to support the foundations of the proposed bridge.

The site is some 7 miles north of Mount Forest, where Highway No. 6 crosses Beatty Saugeen river and its tail race, (profile No. 68-40, stations 385/40, and 387/90).

II. PROCEDURE:

The subsoil investigation was carried out by means of a skid mounted core drill machine. In all, seven boreholes were made to investigate the bearing value of the layers, both for supporting the foundations of the structures and for stability of the approach fills to these structures.

The locations and elevations of the boreholes are shown in Drawing No. F-56-24A, and their logs under Appendix I.

III. SUBSOIL FINDINGS AND ANALYSIS:

The Beatty river is a tributory of the Saugeen river. The revision line is some 350 ft. west of the existing highway. Some 500 ft. to the east the river is dammed and forms a pond whose waters are used to run the existing mill. Starting from this mill, a tail race flows parallel to and 200 ft. to the north of the river.

The site is within the Saugeen Kame Moraine area. The valley is glacial spillway covered with cedar trees.

The investigations revealed the subsoil to be till formation with sand, silt and clay loams full of gravel and boulders. No defined stratification was apparent. The

III. SUBSOIL FINDINGS AND ANALYSIS: (Cont'd.)

penetrations and boreholes were pushed down as far as the boulders would allow. No bedrock was encountered.

The nature of the soil prevented the extracting of undisturbed samples. The extracted samples were tested in the laboratory to classify the soil and determine its density and moisture content. From the laboratory tests, the moisture content of the soil is not higher than 10% and its density not less than 150 p.c.f. No plastic or liquid limits could be determined, norany dependable unconfined compression results could be obtained. The subsoil, in general, is hard till made up of silt, sand, and some clay in the form of loam with numerous gravel and boulders. The indications are that the subsoil is to a certain degree saturated but not submerged.

Spread footing foundations would be considered. The minimum average penetration resistance is found to be 25 blows per foot. For a 7 ft. wide spread footing placed on this soil, the bearing value will be 2.6 t.s.f. for one inch settlement and with a safety factor of 3.

Due to the fact that the river water is dammed some 500 ft. to the south, there is no substantial variation in the water level at the bridge crossings. So long as this situation exists, the structures will not be subjected to any scouring hazards.

IV. CONCLUSIONS AND RECOMMENDATIONS:

From the above discussion it will follow that:

1. The terrain is glacial spillway. The subsoil is made up of dense sand, silt, and clay loams, mixed with gravel and boulders.
2. As undisturbed samples could not be extracted, the bearing value calculations are solely based on field standard penetration results.
3. To support a bridge over the Beatty Saugeen river (boreholes No. 1, 2, 3) the spread footing foundations could be placed at elevation 1209 ft. At this level the soil can provide a bearing value of 2.5 t.s.f. for one inch settlement with a safety factor of 3.
4. To support the bridge over the tail race (boreholes No. 5, 6), the spread footing foundations could be placed at elevation 1209. At this level the soil can provide a safe bearing value of 2.5 t.s.f. for one inch settlement, with a safety factor of 3.
5. For this second site (tail race), the use of a box culvert could be considered adequate. In which case, the footings could be placed at higher elevation.

V. APPROACH FILL STABILITY:

The nature of the subsoil, investigated from stations 385+00 to 390+00 for fill stability considerations, does not present any special foundation difficulty.

V. Korlu,

Foundation Engineer.

APPENDIX I

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-2 OPERATION BORE & PENET'N. JOB F-56-24 W.P. 548-56 BORING 1 STA. 385+75 (29' RT.)

CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JAN. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 24 INCHES COMPILED BY H.S. CHECKED BY AL. DATE BORING 1 DEC. 1956

ABBREVIATIONS

V - INSITU VANE SHEAR TEST; M - MECHANICAL ANALYSIS; U - UNCONFINED COMPRESSION; Q_c - TRIAXIAL CONSOLIDATED QUICK; Q - TRIAXIAL QUICK; S - TRIAXIAL SLOW; W.L. - WATER LEVEL IN CASING; W.T. - WATER TABLE IN SOIL; K - PERMIABILITY; C - CONSOLIDATION; CA. - CASING; δ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK; D.O. - DRIVE OPEN; D.F. - DRIVE FOOT VALVE; T.O. - THIN WALLED OPEN; S.S. - SLEEVE SAMPLE; P.S. - PISTON SAMPLE; W.S. - WASHED SAMPLE; R.C. - ROCK CORE

SAMPLE CONDITION

D - DISTURBED; F - FAIR; G - GOOD; L - LOST

SOIL PROFILE

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT
1216.4		GROUND LEVEL	
1215.4 / 1.0		COARSE GRAVEL & BOULDERS	
1.5 / 1214.4' / 2.0'	W.L	SANDY LOAM & BOULDERS	
6.5		SANDY LOAM GRAVEL (TILL)	
11.5			
16.5 1199.9' / 16.5'		SANDY LOAM (BOULDERY TILL)	
1195.4' / 21.0' 21.5		END OF BOREHOLE	

ELEVATION SCALE: 1215, 1210, 1205, 1200, 1195

WATER CONTENT W % — 0 - NAT. □ - P.W. Δ - L.W.

PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)

D. CONE PEN. X-------X-------X STAND. PEN. ●——●——● 50 100 150 200

REFUSAL AT ELEV. 1199.9' HAMMER BOUNCING!

SAMPLES

CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
						1216.4
7						1.5
13						
26						
24						1211.4'
13		X	D.O.	1	46	67 6.5
66						
92						
47						
55						1206.4'
22		X	D.O.	2	78 or 9"	22 11.5
63						
82						
66						
96						1201.4'
177		X	D.O.	3	43 for 5"	28 16.5
			ANT. R.C.			21.5

TL-129 (REV 56)

H.D.R.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-2 OPERATION BORE & PENET'N JOB F-56-24 W.P. 548-56 BORING 2 STA. 385+62.5 (17.5' LT)

CASING B x (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JAN. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 28 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 4. DEC. 1956

ABBREVIATIONS

V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Q_c - TRIAXIAL CONSOLIDATED QUICK
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
WL - WATER LEVEL IN CASING
WT. - WATER TABLE IN SOIL
K - PERMIABILITY
C - CONSOLIDATION
CA. - CASING
γ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK
D.O. - DRIVE OPEN,
D.F. - DRIVE FOOT VALVE
T.O. - THIN WALLED OPEN
S.S. - SLEEVE SAMPLE
P.S - PISTON SAMPLE
W.S. - WASHED SAMPLE
R.C. - ROCK CORE

SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT
1214.9'		GROUND LEVEL	
1213.9' / 1.0		COARSE GRAVEL & BOULDERS	
1212.9' / 2.0		SANDY LOAM & BOULDERS	
		SANDY LOAM GRAVEL (TILL)	
1198.4' / 16.5		END OF BOREHOLE	

SHEAR STRENGTH IN LBS PER SQ.FT ★ (500, 1000, 1500, 2000)

WATER CONTENT W % (5, 10, 15, 20) ○ - NAT. □ - P.W. Δ - L.W.

PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)

D. CONE PEN. X-------X-------X (100, 200, 300) STAND. PEN. ●——●——● (400)

ELEVATION SCALE: 1210, 1205, 1200, 1195

REFUSAL AT ELEV. 1196.9' HAMMER BOUNCING

CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
						1214.9'
Boulders						
40						
36						
20						
30						1209.9'
12		X	D.O	1	76	83
27						
39						
25						
53						1204.9'
22		X	D.O.	2	47	50
50						
50						
52						
79						1199.9'
67	G=168.9 SG=2.7	X	D.O.	3	110	67

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-2 OPERATION BORE & PENET'N JOB F-56-24 W.P. 548-56 BORING 3 STA. 385+16.5 (13' LT.)

CASING B x (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JAN. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 22 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 7. DEC. 1956

ABBREVIATIONS

V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Q_C - TRIAXIAL CONSOLIDATED QUICK
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL
K - PERMIABILITY
C - CONSOLIDATION
CA - CASING
γ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK
D.O. - DRIVE OPEN
D.F. - DRIVE FOOT VALVE
T.O. - THIN WALLED OPEN
S.S. - SLEEVE SAMPLE
P.S. - PISTON SAMPLE
W.S. - WASHED SAMPLE
R.C. - ROCK CORE

SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT
1215.4	WL	GROUND LEVEL	
1214.9' 0.5'		TOPSOIL & BOULDERS	
5.5		SANDY LOAM GRAVEL (TILL)	
10.5			
15.5			
1196.4' 19.0			
20.5		SANDY LOAM BOULDERY TILL	
1191.4' 24.0		END OF BOREHOLE	
25.5			

SHEAR STRENGTH IN LBS. PER SQ.FT. ★ 500 1000 1500 2000

WATER CONTENT W % 5 10 15 20 O - NAT. □ - P.W. Δ - L.W.

PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)

D. CONE PEN. X-------X-------X STAND. PEN. ●——●——● 50 100 150 200

ELEVATION SCALE: 1215, 1210, 1205, 1200, 1195, 1190

REFUSAL AT ELEV 1196.8' HAMMER BOUNCING

CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
						1215.4'
8 20 16 11 11						1210.4'
15 20 20 25 12		X	D.O	1	29	39
						1205.4'
12 30 49 52 73	f=169.3 p.c.f.	X	D.O.	2	26	61
						1200.4'
140 87 85 181		X	D.O.	3	18 for 3"	17
			AXT. R.C.			1196.4'

H.D.R.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-2 OPERATION BORE & PENET'N JOB F-56-24 W.P. 548-56 BORING 4 STA. 386+67.5 (13' LT.)

CASING BX (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JAN. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 22 INCHES COMPILED BY H.S. CHECKED BY AL. DATE BORING 10 DEC. 1956

ABBREVIATIONS

V - INSITU VANE SHEAR TEST; M - MECHANICAL ANALYSIS; U - UNCONFINED COMPRESSION; Q_C TRIAXIAL CONSOLIDATED QUICK; Q - TRIAXIAL QUICK; S - TRIAXIAL SLOW; W.L. - WATER LEVEL IN CASING; W.T. - WATER TABLE IN SOIL; K - PERMIABILITY; C - CONSOLIDATION; CA. - CASING; δ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK; D.O. - DRIVE OPEN; D.F. - DRIVE FOOT VALVE; T.O. - THIN WALLED OPEN; S.S. - SLEEVE SAMPLE; P.S. - PISTON SAMPLE; W.S. - WASHED SAMPLE; R.C. - ROCK CORE

SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

ELEVATION / DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT
1215.2		GROUND LEVEL	
1214.2' / 1.0'	W.L.	TOPSOIL	
		BOULDERS TILL	
		SANDY LOAM GRAVEL (TILL)	
1196.8' / 18.4'		END OF BOREHOLE	

ELEVATION SCALE: 1215, 1210, 1205, 1200, 1195

SHEAR STRENGTH IN LBS PER SQ.FT. * 500 1000 1500 2000

WATER CONTENT W% 5 10 15 20 — O - NAT. □ - P.W. Δ - L.W.

PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)

D. CONE PEN. X-------X-------X STAND. PEN. 50 100 150 200

CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
						1215.2
1						
10						
27						
25						
19						1210.2 5
31	δ=176.7 p.c.f.	X	D.O.	1	33	67
20						
20						
18						
44						1205.2 10
13		X	D.O.	2	31	44
29						
32						
25						
35						1200.2 15
32		X	D.O.	3	75	39
58						
165 / 188						
						20

REFUSAL AT ELEV 1195.5' HAMMER BOUNCING.

H.D.R.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-Z OPERATION BORE & PENET'N JOB F-56-24 W.P. 548-56 BORING 5 STA. 387+66.5 (5.5' LT.)

CASING B X (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JAN. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 22 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 11 DEC. 1956

ABBREVIATIONS

V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Q_C TRIAXIAL CONSOLIDATED QUICK
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
W.L. - WATER LEVEL IN CASING
W.T. - WATER TABLE IN SOIL
K - PERMIABILITY
C - CONSOLIDATION
C.A. - CASING
γ - UNIT WEIGHT

SAMPLE TYPES

C.S. - CHUNK
D.O. - DRIVE OPEN
D.F. - DRIVE FOOT VALVE
T.O. - THIN WALLED OPEN
S.S. - SLEEVE SAMPLE
P.S. - PISTON SAMPLE
W.S. - WASHED SAMPLE
R.C. - ROCK CORE

SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT
1214.1'	WT	GROUND LEVEL	
1213.1' / 1.0		TOPSOIL & BOULDERS	
		CLAY LOAM (TILL)	
1199.4' / 14.7		END OF BOREHOLE	

ELEVATION SCALE: 1210, 1205, 1200, 1195

SHEAR STRENGTH IN LBS PER SQ.FT. ★ (1000, 2000, 3000, 4000, 5000)

WATER CONTENT W % (5, 10, 15, 20) O - NAT. □ - P.W. Δ - L.W.

PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS. PER BLOW)

D. CONE PEN. X-------X-------X STAND. PEN. •——•——• (50, 100, 150, 200)

REFUSAL AT ELEV. 1198.6 HAMMER BOUNCING

CASING BLOWS (ACTUAL)
7
19
27
16
11
13
16
20
40
71
31
50
133
182
200

SAMPLES

OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
					1214.1'
					1209.1'
γ=153.0 pcf		D.O.	1	20	89
					1204.1'
γ=111.0 pcf		D.O.	2	47	61

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-2 OPERATION BORE & PENET'N JOB F-56-24 W.P. 548-56 BORING 6 STA. 388+21 (12' RT.)

CASING B^X (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JAN. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 22 INCHES COMPILED BY H.S. CHECKED BY A.L. DATE BORING 12 DEC. 1956

ABBREVIATIONS

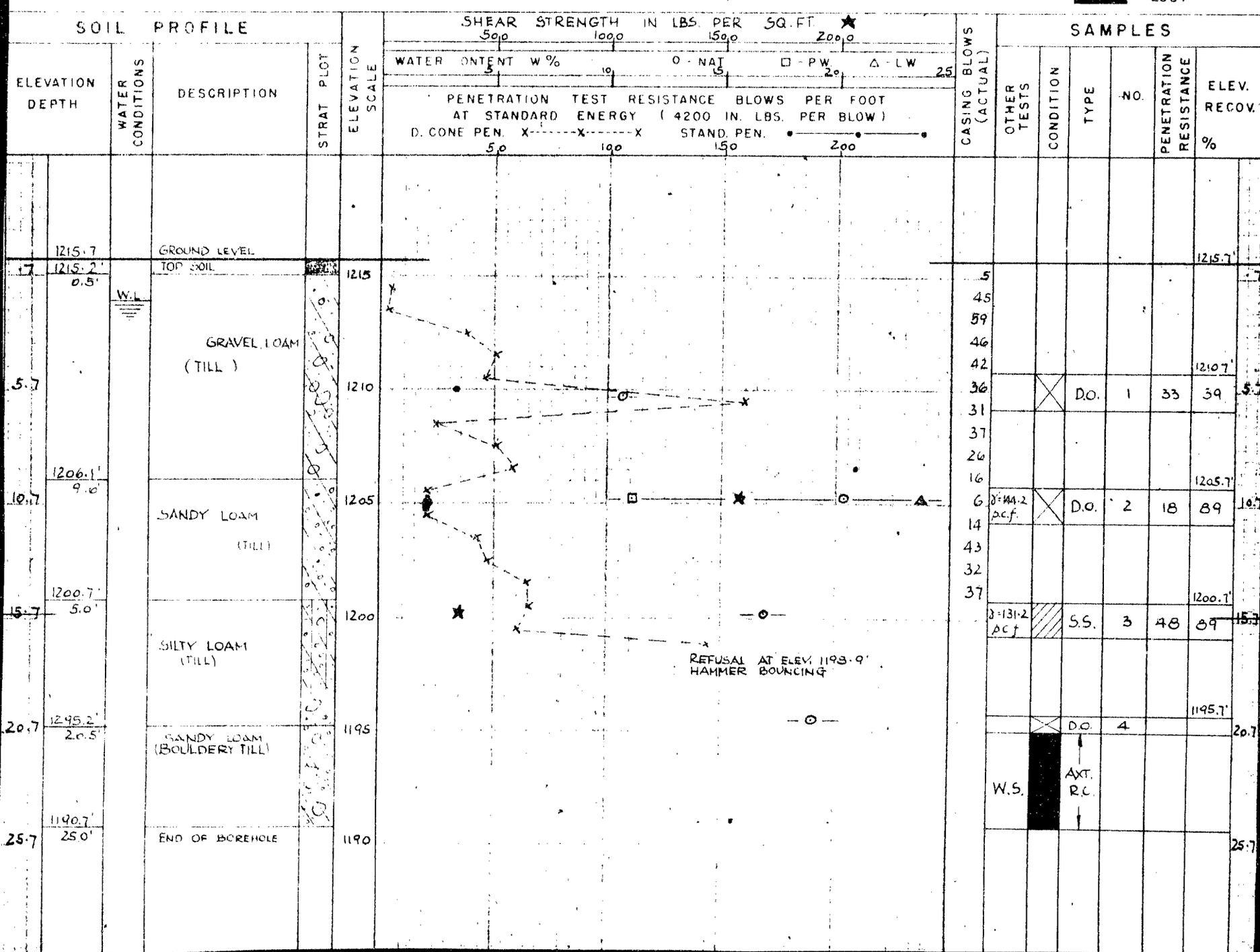
V - INSITU VANE SHEAR TEST; M - MECHANICAL ANALYSIS; U - UNCONFINED COMPRESSION; Q_C - TRIAXIAL CONSOLIDATED QUICK; Q - TRIAXIAL QUICK; S - TRIAXIAL SLOW; WL - WATER LEVEL IN CASING; WT - WATER TABLE IN SOIL; K - PERMIABILITY; C - CONSOLIDATION; CA. - CASING; γ - UNIT WEIGHT

SAMPLE TYPES

CS - CHUNK; DO - DRIVE OPEN; DF - DRIVE FOOT VALVE; TO - THIN WALLED OPEN; SS - SLEEVE SAMPLE; PS - PISTON SAMPLE; WS - WASHED SAMPLE; RC - ROCK CORE

SAMPLE CONDITION

D - DISTURBED; F - FAIR; G - GOOD; L - LOST



TL-129 (REV 56)

H.D.R.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & RESEARCH BRANCH - FOUNDATIONS SECTION - DOWNSVIEW

OFFICE REPORT ON SOIL EXPLORATION

DRILL RIG 54-2 OPERATION BORE & PENETN JOB F-56-24 W.P. 548-56 BORING 7 STA. 389+85.5 (7' LT.)

CASING B.X (standard samplers to fit unless noted) DATUM GEODETIC DATE REPORT JAN. 1957

SAMPLER HAMMER WT. 250 LBS. DROP 22 INCHES COMPILED BY H.S. CHECKED BY ___ DATE BORING 14 DEC. 1956

ABBREVIATIONS

V - INSITU VANE SHEAR TEST
M - MECHANICAL ANALYSIS
U - UNCONFINED COMPRESSION
Q_C - TRIAXIAL CONSOLIDATED QUICK
Q - TRIAXIAL QUICK
S - TRIAXIAL SLOW
WL - WATER LEVEL IN CASING
WT - WATER TABLE IN SOIL
K - PERMIABILITY
C - CONSOLIDATION
CA - CASING
γ - UNIT WEIGHT

SAMPLE TYPES

CS - CHUNK
DO - DRIVE OPEN
DF - DRIVE FOOT VALVE
TO - THIN WALLED OPEN
SS - SLEEVE SAMPLE
PS - PISTON SAMPLE
WS - WASHED SAMPLE
RC - ROCK CORE

SAMPLE CONDITION

- DISTURBED
- FAIR
- GOOD
- LOST

SOIL PROFILE

ELEVATION DEPTH	WATER CONDITIONS	DESCRIPTION	STRAT PLOT	ELEVATION SCALE
1215.8'	WL	GROUND LEVEL		
1215.3' 0.5'		FORMER BOULDERS		1215
		SANDY LOAM GRAVEL (TILL)		1210
				1205
				1200
1197.3' 18.5'		END OF BOREHOLE		1195

WATER CONTENT W % 5 10 ○ - NAT 15 □ - P.W. 20 △ - L.W.

PENETRATION TEST RESISTANCE BLOWS PER FOOT AT STANDARD ENERGY (4200 IN. LBS PER BLOW)

D. CONE PEN. X------X------X STAND. PEN. ●——●——● 50 100 150 200

REFUSAL AT ELEV 1208.6' HAMMER BOUNCING.

CASING BLOWS (ACTUAL)	OTHER TESTS	CONDITION	TYPE	NO.	PENETRATION RESISTANCE	ELEV. RECOV. %
4						1215.8'
17						
41						
59						
74						1210.8'
31		X	D.O.	1	123	83
105						
169						
74						
44						1205.8'
23		X	D.O.	2	48	50
41						
33						
41						
37						1200.8'
37		X	D.O.	3	50	78 / 194.3
55						
53 / 182			W.S.	4		