

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 40J9-15

W.P. No. 7-64-00

CONT. No. 72-015

W. O. No. 70-11033

STR. SITE No. 13-3

HWY. No. 40 DIST. 1

LOCATION Running Creek Br #3

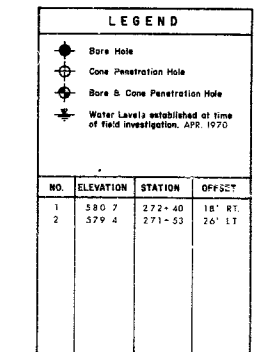
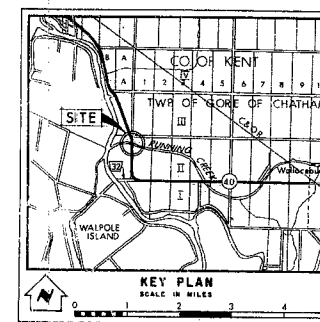
3.6 mi W. of Wallaceburg W. Lts.

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 1

REMARKS: _____

61-30 SEP 1976

91-6707



- 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.

REVISIONS			
	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS - ONTARIO			
MATERIALS & TESTING OFFICE - FOUNDATION SECTION			
RUNNING CREEK NO 3			
KING'S HIGHWAY NO. 40		DIST. NO. 1	
CO. KENT			
TWP. GORE of CHATHAM		LOT 1 & A	CON. 2
BORE HOLE LOCATIONS & SOIL STRATA			
SURVEY P.P.	CHECKED P.P.	R.P. NO. 7-52-00	M.B.T. DRAWING NO.
DRAWING M.P.	CHECKED M.P.	NO. 70-11033	70-11033-A
DATE 27 MAY 1970	SITE NO.	BRIDGE DRAWING NO.	
APPROVED <i>[Signature]</i>	CONT. NO.		

40J9-15
SECURITY No.

REF. NO E-4876-1

40J9 - 15

Mr. R. G. Gascoyne,
Regional Functional Planning
Engineer,
London.

Materials and Testing,
London.

March 27, 1969.

- Work Projects 323-61 and 7-64,
Running Creek Bridges 2 and 3,
Highway #40, Chatham District.
- cc-110-33

→ The above projects are both located in a clay plain area. At W.P. 7-64, the soil type is mapped as Brookston Loam. Hand auger holes placed at the creek banks encountered firm medium clay material. A marshy flooded area is present on the west side of the existing roadway such that it would appear to be advantageous to locate the detour on the east side of the existing structure. The creek banks will support Bailey Bridge cribs at this location.

At W.P. 323-61, a detour may be placed on either side of the existing bridge. If a Bailey Bridge is used for a detour, the west end of it should be placed at least 20' from the edge of the existing creek as there is a wedge of soft organic material adjacent to the creek. The soil type is mapped as Brookston Loam at this location.

The existing pavement consists of concrete in fair condition at both locations. Transverse cracks are present 15' to 20' apart. The surface is slightly rough due to slab tilting and slight stepping. Where the pavement is to be widened approaching the proposed structures resurfacing with a 1 1/2" binder course and a 1 1/2" surface course will probably be required. On the widening, provision for a 24" depth of granular (6" G.B.C. "A" plus 18" sand cushion) will probably be required.

It is probable that the proposed structures will have to be supported on bearing piles as foundation soils are known to be poor in this area. The extent of treatment for structure support will be determined after foundation investigations have been carried out.

40J9 - 15

/2.

The closest known source of base and subbase is located 5 miles east of Chatham approximately 30 miles from the projects.

A. M. Batten
A. M. BATTEN,

FOR: J. E. ROY,
REGIONAL MATERIALS ENGINEER.

AMB:hp.

C.C. - G. A. Wong,
A. Starnac,
W. Zonnenberg,
A. M. Batten,
File (2).

MEMORANDUM

To: Mr. B. R. Davis,
Bridge Engineer,
Bridge Office,
Admin. Bldg.

From: Foundation Section,
Materials & Testing Office,
Room 107, Lab. Bldg.

ATTENTION: Mr. S. McCombie

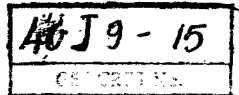
DATE: June 4, 1970.

OUR FILE REF.

IN REPLY TO

JUN 11 1970

SUBJECT:



FOUNDATION INVESTIGATION REPORT
For
Running Creek Bridge #3
3.6 Miles West of Wallaceburg
Highway #40
District No.1 (Chatham)
W.O. 70-11033 -- W.P. 7-64

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

We believe that the factual data and recommendations contained therein will prove adequate for your design requirements. Should additional information be required, please feel free to contact our Office.

AGS/hrd
Attach.

A. G. Stermac
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

cc: Messrs. B. R. Davis
H. A. Tregaskes
D. W. Farren
W. Zonnenberg
F. C. Brown
A. P. Watt (2)
J. Roy
R. A. Singh

Foundation Files
General Files

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FOUNDATION INVESTIGATION REPORT
For
Running Creek Bridge #3
3.6 Miles West of Wallaceburg
Highway #40
District No.1 (Chatham)
W.O. 70-11033 — W.P. 7-64

1. INTRODUCTION:

A request for a foundation investigation for a proposed new structure at the crossing of Running Creek No. 3 and Hwy. #40 was received from Mr. A. P. Watt, Regional Bridge Planning Engineer, in a memorandum dated April 16, 1970.

A field investigation was subsequently carried out by the Foundation Section to determine the subsoil conditions existing at the site. This report contains the results of this investigation and our recommendations pertaining to the design of the proposed structure foundations and approach embankments.

2. DESCRIPTION OF THE SITE:

The site of the proposed new structure is situated approximately 3.6 miles west of Wallaceburg west limits on Hwy. #40 Lot 1 and A Con. 2, Twp. of Gore of Chatham, Co. of Kent.

The surrounding area, with the exception of the north-west segment, is flat and cultivated farm land. The north-west corner is covered with water.

Physiographically, the site is located in the region referred to as the St. Clair Clay Plains.

3. FIELD AND LABORATORY INVESTIGATION PROCEDURES:

A total of two sampled boreholes and two dynamic cone

penetration tests was carried out during the course of the field work. Boring was achieved by means of a conventional diamond drilling equipment adapted for soil sampling purposes. During the field work, disturbed samples were obtained by means of a standard split-spoon sampler: the energy used in driving it conformed to the requirements of the standard penetration test.

Dynamic cone penetration tests were carried out adjacent to each borehole. Driving energy used to advance the cone was 350 ft.-lbs. per blow. 'Undisturbed' samples were recovered using 2-inch I.D. Shelby tubes which were pushed into the soil manually. Where possible, field vane tests were carried out at elevations 12 inches below sample depths.

Rock core samples were recovered from both boreholes using AXT rock coring equipment.

The locations and elevations of the borings are shown on Drawing No. 70-11033A, which accompanies this report.

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

- Atterberg limits
- Moisture content
- Grain size distribution
- Bulk density
- Undrained Shear strength

The test results are summarized on the record of borehole sheets contained in the Appendix of this report.

4. SOIL TYPES AND SOIL CONDITIONS:

4.1) General:

Generally uniform subsoil conditions were found to prevail over the site investigated. From ground level downward the following different soil types were encountered:

4.2) Fill Material:

This material was encountered in both boreholes from the existing roadway level to approximately el. 573. The material in the deposit consists of a mixture of clayey silt, sand, gravel and organics. The consistency may be described as firm.

4.3) Silty Sand to Sandy Silt:

This deposit was intersected in all borings and extends from immediately below the above-mentioned fill material down to el. 542 in borehole #1 and el. 547 in borehole #2.

The material in the deposit consists mainly of silt and sand with traces of gravel and clay. Standard penetration test 'N' values ranged from 2 to 17 blows per foot. The relative density of the deposit may be described as very loose to compact. The average moisture content is in the order of 26%. Typical grain-size distribution curves are included in the Appendix of this report (Fig. 1.).

4.4) Silty Clay with Traces of Sand:

This stratum was found to underlie the sandy silt to silty sand zone and extends to approximately el. 462. The material in the deposit consists of silty clay with traces of sand. A plot of plasticity index versus liquid limit (Fig. 2) shows the points to fall within the CI zone.

The consistency or undrained shear strength of the over-all deposit was found to range from soft to stiff. In general, the shear strength increases with depth, being in the order of 300 PSF immediately below the sandy silt to silty sand deposit and approximately 1000 PSF at or about el. 480.

Physical properties of the deposit as determined from field and laboratory tests, are as follows:-

Natural moisture content (%):	27 to 52
Plastic Limit (%):	19 to 25
Liquid Limit (%):	41 to 53
Unconfined shear strength (PSF):	364 to 731
Quick Triaxial shear strength (PSF):	248 to 784
Field vane test (PSF):	320 to 1400
Bulk density (PCF):	107 to 117
Sensitivity:	1.4 to 5.2

4.5) Sandy Till:

A very dense, sandy till with gravel and probably boulders was found beneath the silty clay zone. The estimated thickness of the deposit is in the order of 4 ft.

4.6) Shale Bedrock:

Bedrock at this site was found to consist of dark grey shale at el. 458.4 and el. 458.1 in BH #1 and BH #2 respectively. The extreme upper portion of the bedrock in BH #2 appears to be weathered.

5. GROUNDWATER CONDITIONS:

The following water levels were observed during the field work:

BH # 1 : El. 573.7

2 : El. 573.0

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General:

It is proposed to replace existing bridge #3 at the crossing of Running Creek and Hwy. #40. The proposed profile grade will be approximately 3 ft. higher than the existing grade. ~~Q~~ remains as is.

The subsoil at the site beneath the existing approach fills was found to consist of an approximate 27 ft. to 30 ft. thick very loose to compact layer of granular type material, followed by an extensive deposit of soft to stiff silty clay, followed by a thin layer of very dense sandy till, followed by shale bedrock at approximately el. 458.

6.2) Structure Foundations:

Due to the presence of the very loose to compact sandy silt to silty sand material at foundation level, spread footings are not recommended. It is recommended therefore that the abutments and piers be supported on piles. Steel H-piles driven to bedrock appear to be the most suitable type of pile. The maximum allowable load for the particular steel section adopted may be assumed for design purposes. Scour protection should be provided for the river banks and approach fills.

Since the sandy silt to silty sand material is susceptible to conditions of unbalanced hydrostatic head, and is likely to 'boil' under such conditions, it is pointed out that a dewatering scheme which will prevent 'boiling' will be required if

excavations are carried out below the prevailing groundwater level.

6.3) Approach Embankments:

The strength of the underlying soil is such that no major stability problems are anticipated for the proposed 3 ft. fill height increase, constructed with 2:1 slopes. The fill should consist of well compacted acceptable material.

All organic soil should be removed and replaced with suitable granular fill for a width equal to the width of the approach embankments (toe to toe) at the following locations:

- (a) From 5 ft. west of the east pier footing to
20 ft. east of the east abutment footing.
- (b) From 5 ft. east of the west pier footing to
20 ft. west of the west abutment footing.

This applies also to organic soil which may exist under the existing fill. Outside of the above-mentioned limits excavation of organic soil should be according to recommendations of the Regional Materials Engineer.

Settlements will occur under the proposed approaches due to the weight of new fill added. These settlements are not anticipated to exceed about 6 inches over a long term period but differential settlements are expected to occur between the existing fill and the widened portions. For this reason it is recommended that a slight surcharge be added to the widened portions (i.e. 1½ - 2 ft.) and that final paving of the bridge approaches be delayed for as long a period as is possible.

7. MISCELLANEOUS:

The field investigation was carried out during the period April 27 to May 6, 1970, under the supervision of Mr. P. Payer, Project Foundation Engineer, who also prepared this report.

The equipment used was owned and operated by P.V.K. and Sons Drilling Company.

This report was reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

May 1970.

APPENDIX I

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 70-11033

LOCATION Sta. 272 + 40 18' Rt.

ORIGINATED BY PP

W.P. 7-6h

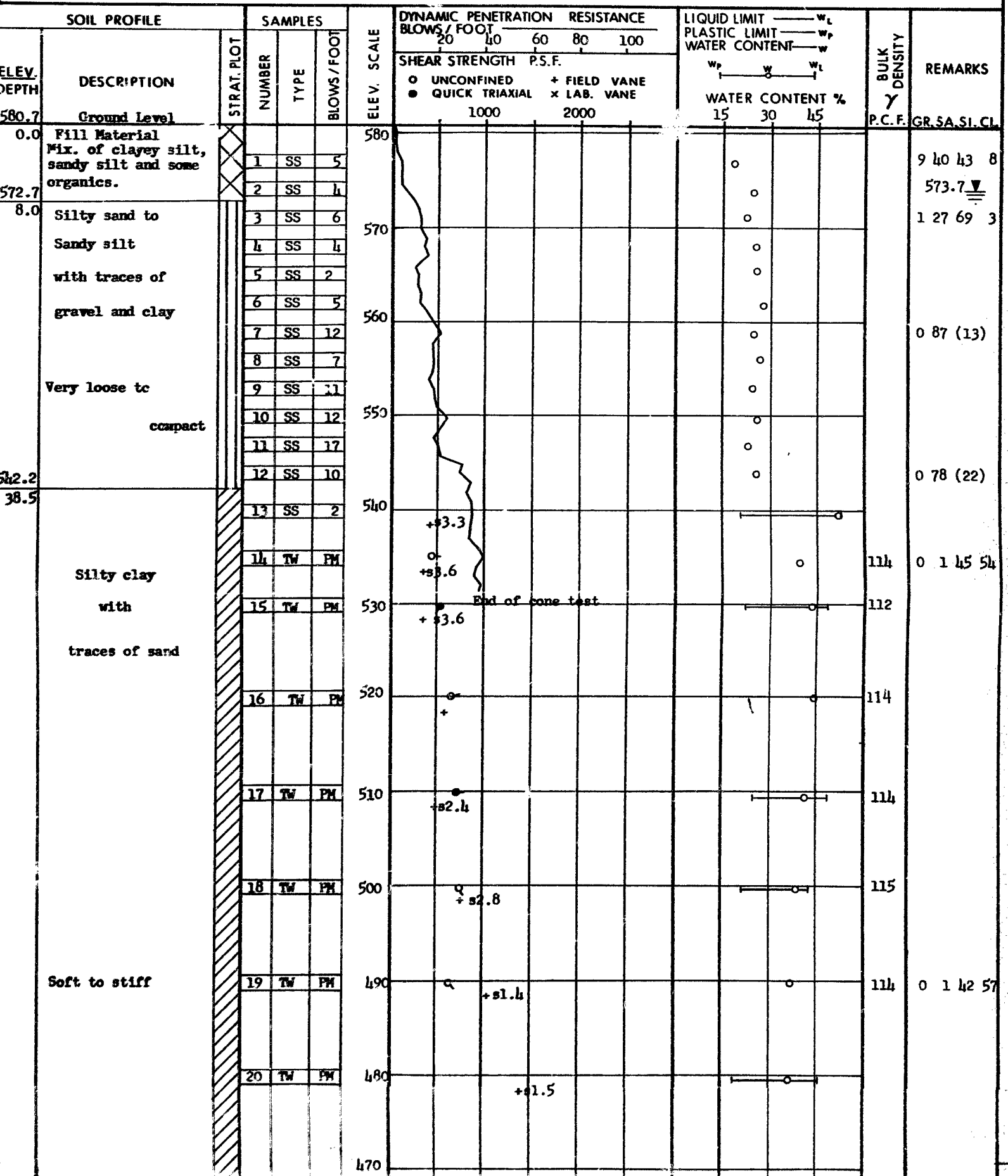
BORING DATE April 27 -30, 1970

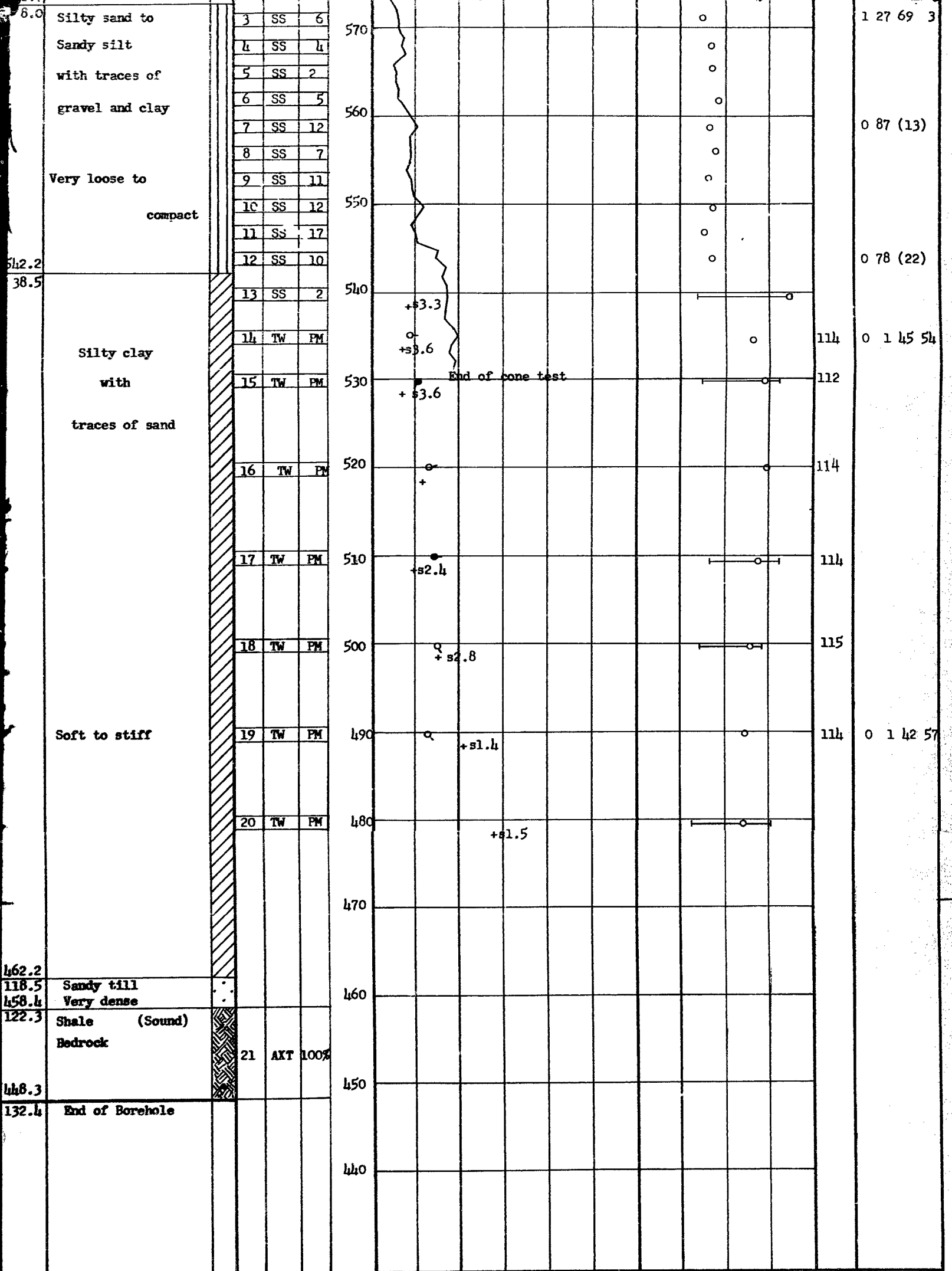
COMPILED BY PP

DATUM Geodetic

BOREHOLE TYPE Washbore-MX & BX Casing

CHECKED BY





DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

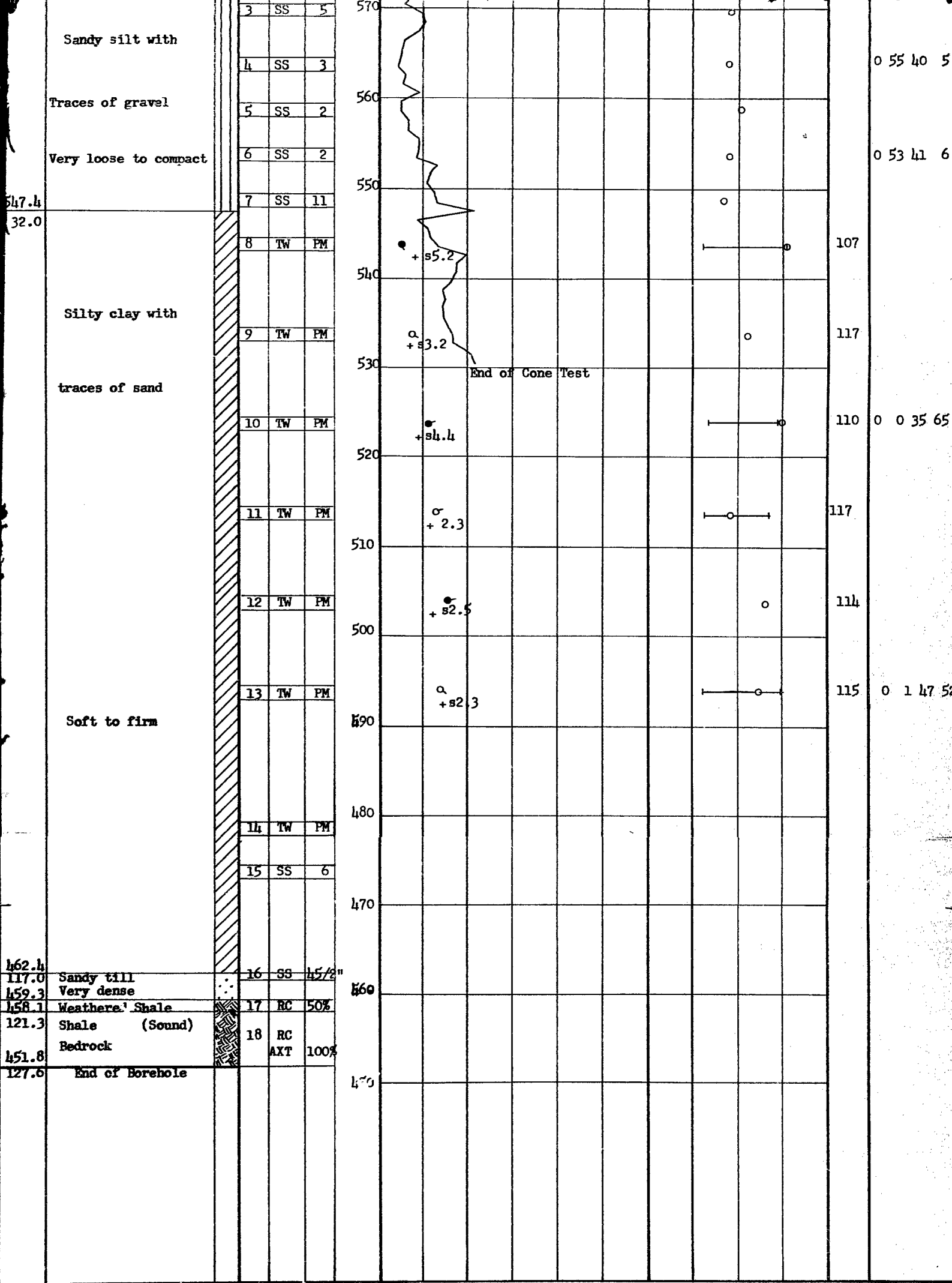
RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

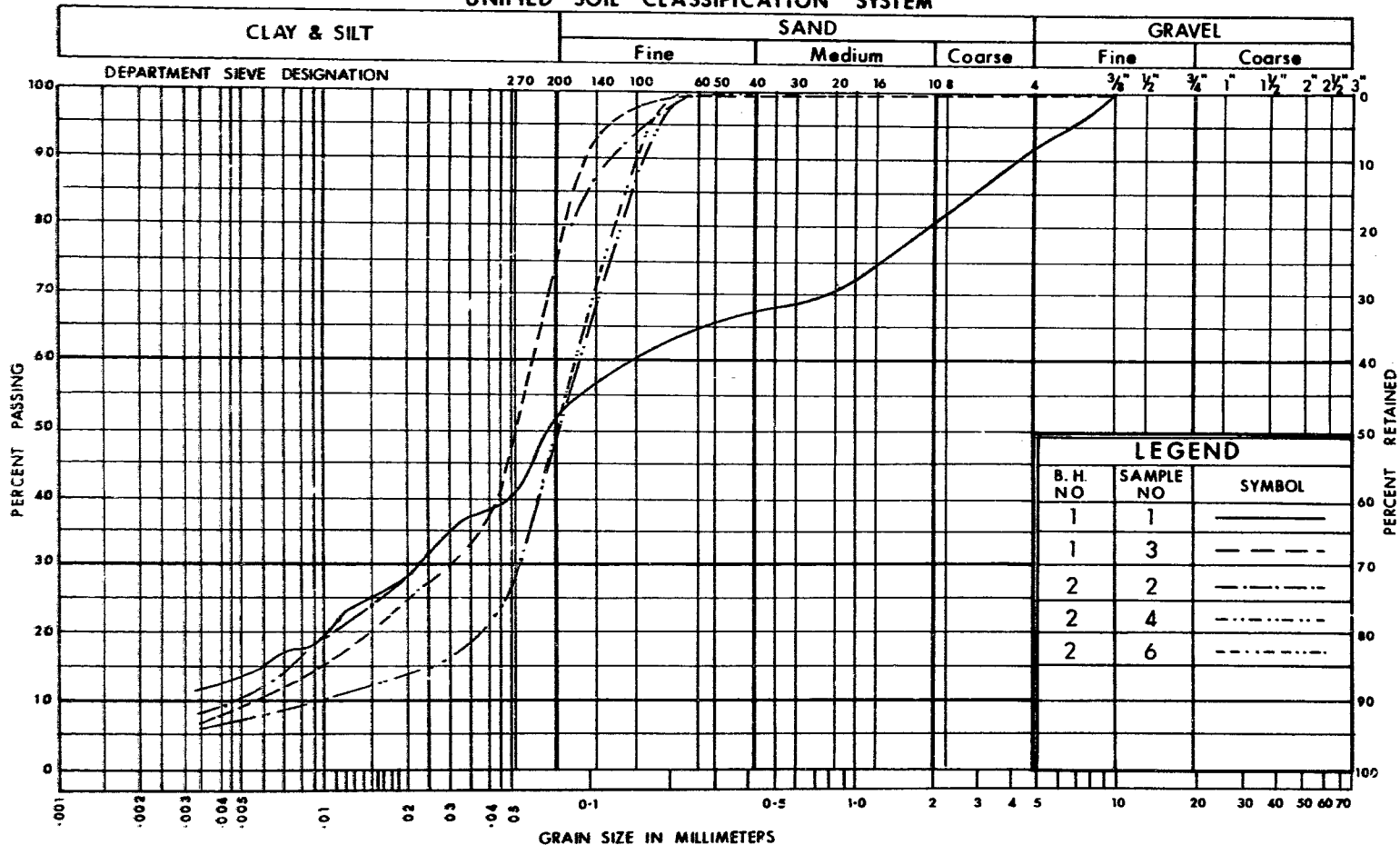
JOB	<u>70-11033</u>	LOCATION	<u>Sta. 271 + 53 26' Lt.</u>
W.P.	<u>7-64</u>	BORING DATE	<u>April 30, May 1 and 4, 1970</u>
DATUM	<u>Geodetic</u>	BOREHOLE TYPE	<u>Washbore-MX & BX Casing</u>

ORIGINATED BY _____ PP
COMPILED BY _____ PP
CHECKED BY _____

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT PLASTIC LIMIT WATER CONTENT			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	BLOWS / FOOT	20 40 60 80 100	W _p W _L	W _p W _L	W _p W _L		
579.4	Ground Level											
0.0	Fill Material											
573.7	Mix. of clayey silt, sandy silt and some organics.		1	SS	5							0 28 67 7
5.7	Silty sand to		2	SS	8							573.0
	Sandy silt with		3	SS	5							
	Traces of gravel		4	SS	3							0 55 40 5
	Very loose to compact		5	SS	2							
			6	SS	2							0 53 41 6
547.4			7	SS	11							
32.0			8	TW	PM							107
	Silty clay with		9	TW	PM							117
	traces of sand		10	TW	PM							110 0 0 35 65
			11	TW	PM							117
			12	TW	PM							114
	Soft to firm		13	TW	PM							115 0 1 47 52
			14	TW	PM							
			15	SS	6							



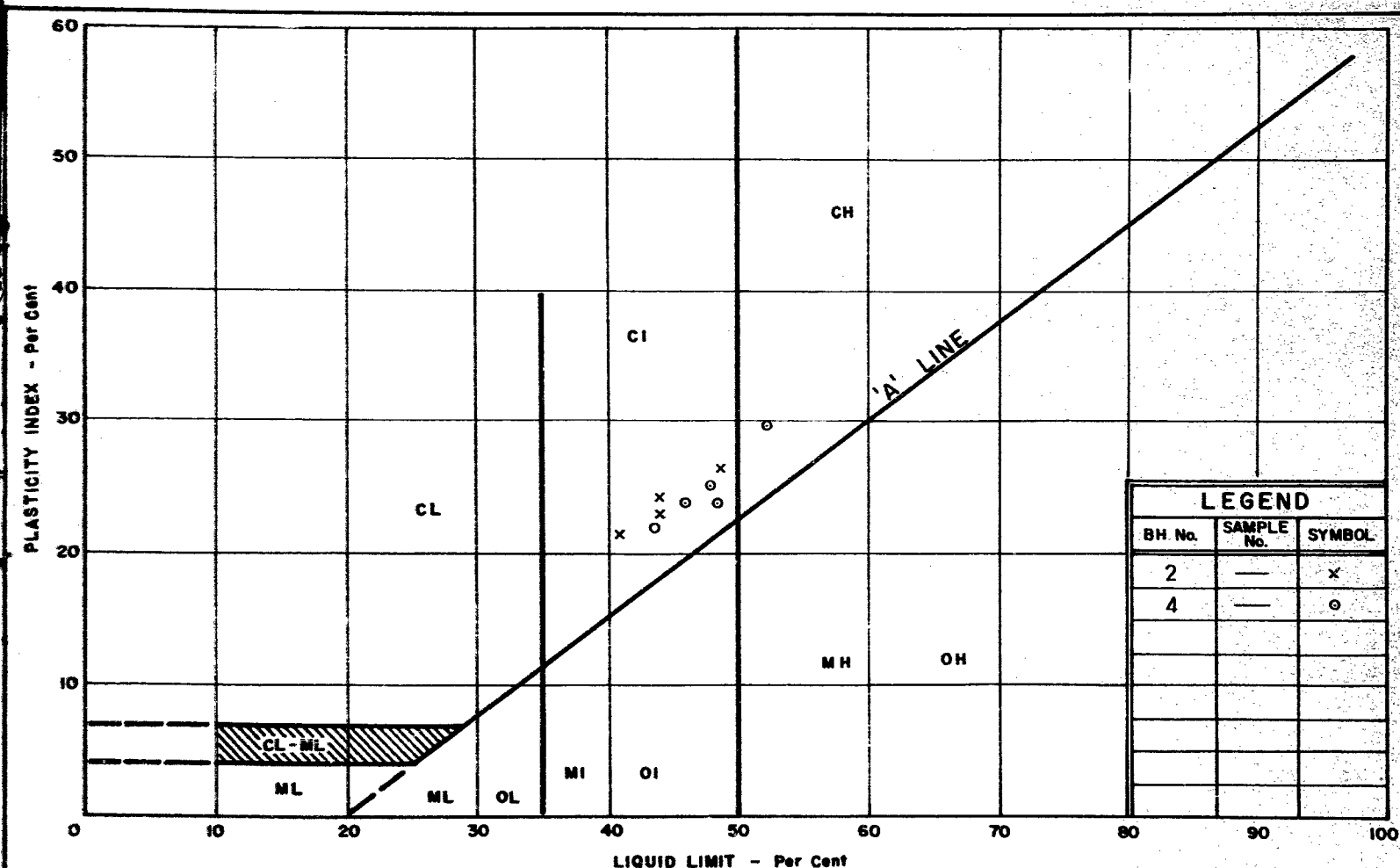
UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

GRAIN SIZE DISTRIBUTION
SANDY SILT To SILTY SAND

W.P. No. 7-64-00
JOB No: 70-11033
FIG. 1



LEGEND		
BH. No.	SAMPLE No.	SYMBOL
2	—	x
4	—	o



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

PLASTICITY CHART

SILTY CLAY

W.P. No. 7-64-00

JOB No. 70-11033

FIG. 2

ABBREVIATIONS USED IN THIS REPORT

PENETRATION RESISTANCE

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

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

DESCRIPTION OF SOIL

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

<u>CONSISTENCY</u>	<u>'N' BLOWS/FT.</u>	<u>c LB./SQ. FT.</u>	<u>DENSENESS</u>	<u>'N' BLOWS/FT.</u>
VERY SOFT	0 - 2	0 - 250	VERY LOOSE	0 - 4
SOFT	2 - 4	250 - 500	LOOSE	4 - 10
FIRM	4 - 8	500 - 1000	COMPACT	10 - 30
STIFF	8 - 15	1000 - 2000	DENSE	30 - 50
VERY STIFF	15 - 30	2000 - 4000	VERY DENSE	> 50
HARD	> 30	> 4000		

TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.B.	SCRAPER BUCKET SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE
S.T.	SLOTTED TUBE SAMPLE		
	P.H. SAMPLE ADVANCED HYDRAULICALLY		
	P.M. SAMPLE ADVANCED MANUALLY		

SOIL TESTS

Qu	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Qcu	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Qd	DRAINED TRIAXIAL	S	SENSITIVITY

ABBREVIATIONS USED IN THIS REPORT

SOIL PROPERTIES

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

GENERAL

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

STRESS AND STRAIN

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

EARTH PRESSURE

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

FOUNDATIONS

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

SLOPES

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

23 2:42

DOWN LOND 14 SEPTEMBER 23/70 2 45 PM

A STERMAC PRINCIPAL FOUNDATION ENGINEER

RE WP 7-64 BRIDGE SITE 13-3 RUNNING CREEK BRIDGE 3.

HAVE NOT RECEIVED A REPLY TO MY MEMO DATED AUGUST 26/70 MAY WE PLEASE

HAVE YOUR COMMENTS IN REGARD TO THE USE OF SHEET PILING FOR DEWATERING
THE FOOTING AREAS

S JANTS BRIDGE PLANNING SW REGION

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A P WATT REG BRIDGE PLNG ENGR

RE WP7-64 BRIDGE SITE 13-3 RUNNING CREEK BRIDGE NO.3

RE YOUR T T SEPT 23/70

THIS QUESTION HAS BEEN DISCUSSED WITH J KEEN AND IS STRICTLY
A CONTRACTORS RESPONSIBILITY IN THIS PROJECT HENCE NO DETAILS
ARE SHOWN ON PRELIMINARY PLANS FOUNDATION REPORT CONTAINS
SUFFICIENT INFORMATION FOR A CONTRACTOR TO DESIGN AN ADEQUATE
DEWATERING SCHEME ONE METHOD COULD BE TO USE SHEETING

K J SELBY SUPVR FOUNDATION ENGR
FOR

A G STERMAC MAT AND TEST OFFC

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Department of Highways Ontario

Copy for the information of

Mr. A. Stermac, Principal Foundation Engineer,
Room 107, Lab. Bldg.

Mr. A.P. Watt,
Reg. Bridge Planning Engineer,
London Regional Office,
London, Ontario

C.S. Grebski,
Bridge Office

October 19, 1970

Running Creek Bridge #3
3.6 Mi. W. of Wallaceburg W. Limits
W.P. 7-64-00, Site 13-3
Highway 40, District No. 1

70-110 33

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-6854-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$75,000. This cost includes tender, materials, engineering and sundry construction but does not include the cost of removal of the existing structure.

Any comments or revisions you may have should be submitted within three weeks.

CSG:rd

C.S. Grebski,
Bridge Design Engineer

Attach.

c.c. S. McCombie
A. Stermac (2)
J. Anderson
A. Crowley

No COMMENTS

ODT 21/70

J.P.

10/21/70

MEMORANDUM

TO: Mr. A. Stermac,
Principal Foundation Engineer,
Room 107, Lab. Bldg.

FROM: C.S. Grebski,
Bridge Office

ATTENTION:

DATE: February 9, 1971

OUR FILE REF.

IN REPLY TO

SUBJECT: Running Creek Bridge #3
3.6 Mi. W. of Wallaceburg W. Limits
W.P. 7-64-00, Site No. 13-3
Highway 40, District No. 1

70-11-0 33

Attached herewith we are submitting the final
bridge drawings which show the foundation design for
this structure.

Kindly give us your comments at your earliest
convenience.



C.S. Grebski,
Bridge Design Engineer

CSG:rd

Attach.

c.c. Foundation Office

No comments

40 J 9 - 15

3 MAR 71



✓

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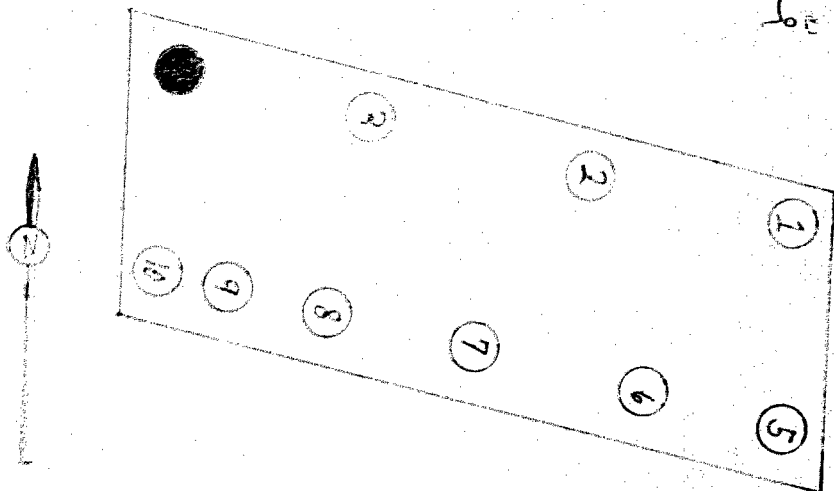
HAMMER TYPE 3 - 225 WEIGHT 6.800 LBS ENERGY 21.000 FT. LBS.

[illegible]

RUNNING CREEK BRIDGE #3

NORTH ABUTMENT FIG.

Job 70-11033



Pile #9 driven vertically

1002

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 1 CONTRACT NO. 72-15 STRUCTURE RUNNING CREEK BRIDGE #3
 CONTRACTOR BERMINGHAM PILE DRIVERS DESIGN LOAD OF PILE 70 TON
 HAMMER DETAILS: TYPE B 225 BERMINGHAM WEIGHT 6,800 LB HEIGHT OF FALL OR ENERGY 25,000 FT-LB
 TYPE OF ANVIL OR CAP BOX ANVIL WEIGHT OF ANVIL OR CAP 1,100 LB
 PILE DETAILS 12 BP 53 STEEL "H" PILES
 PILE NO. 4 LOCATION NORTH ABUTMENT F.T.G. DATE DRIVEN JULY 17th 1972

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.
40'	1	0	40'	26	4	79'	51	5	110'	76	5
"	2	0	"	27	4	"	52	4	"	77	6
"	3	0	"	28	4	"	53	4	"	78	6
"	4	0	"	29	5	"	54	4	"	79	5
"	5	0	"	30	5	"	55	4	"	80	5
"	6	1	"	31	6	"	56	4	"	81	6
"	7	0	"	32	5	"	57	4	"	82	5
"	8	1	"	33	7	"	58	3	"	83	5
"	9	0	"	34	6	"	59	3	"	84	5
"	10	1	"	35	6	"	60	4	"	85	5
"	11	1	"	36	5	"	61	4	"	86	5
"	12	1	29'	37	6	"	62	4	"	87	5
"	13	2	"	38	6	"	63	4	"	88	4
"	14	2	"	39	5	"	64	3	"	89	5
"	15	3	"	40	4	"	65	4	"	90	4
"	16	3	"	41	5	"	66	4	"	91	5
"	17	3	"	42	5	"	67	4	"	92	4
"	18	3	"	43	5	"	68	4	"	93	4
"	19	3	"	44	5	"	69	4	"	94	5
"	20	3	"	45	5	"	70	4	"	95	5
"	21	3	"	46	3	"	71	4	"	96	4
"	22	3	"	47	3	"	72	4	"	97	5
"	23	3	"	48	4	"	73	4	"	98	5
"	24	3	"	49	4	"	74	4	"	99	5
"	25	3	"	50	4	"	75	7	"	100	5

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH						
MEASURED REBOUND IN INCHES <u>EXTRINSIC PILE</u>						
FINAL LENGTH OF PILE <u>110' 10"</u>	FINAL CUT OFF ELEVATION <u>572.00</u>					

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER
 MATERIALS & TESTING DIVISION
 DEPARTMENT OF HIGHWAYS
 DOWNSVIEW, ONTARIO

SIGNED M. J. Murphy
 NAME (PRINT) M. J. MURPHY
 DATE JULY 17th 1972

ATTACH SKETCH OF PILE NUMBERING SYSTEM

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 1 CONTRACT NO. 72-15 STRUCTURE RUNNING CROSS BRIDGE #3
 CONTRACTOR BERMINGHAM PILE DRIVERS DESIGN LOAD OF PILE 70 TON
 HAMMER DETAILS: TYPE B-225 BERMINGHAM HAMMER WEIGHT 6800 LB HEIGHT OF FALL OR ENERGY 25,000 FT/LB
 TYPE OF ANVIL OR CAP BOX ANVIL WEIGHT OF ANVIL OR CAP 1,100 LBS
 PILE DETAILS 12 AC 53 STEEL H PILES
 PILE NO. 4 LOCATION NORTH MAINTENT FTG. DATE DRIVEN JUL 17 1972

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.
119	101	5		26			51			76	
"	102	4		27			52			77	
"	103	5		28			53			78	
"	104	5		29			54			79	
"	105	5		30			55			80	
"	106	14		31			56			81	
"	107	16		32			57			82	
"	108	16		33			58			83	
"	109	24		34			59			84	
"	110	57		35			60			85	
	111			36			61			86	
	112			37			62			87	
	113			38			63			88	
	114			39			64			89	
	115			40			65			90	
	116			41			66			91	
	117			42			67			92	
	118			43			68			93	
	119			44			69			94	
	120			45			70			95	
	121			46			71			96	
	122			47			72			97	
	123			48			73			98	
	124			49			74			99	
	125			50			75			100	

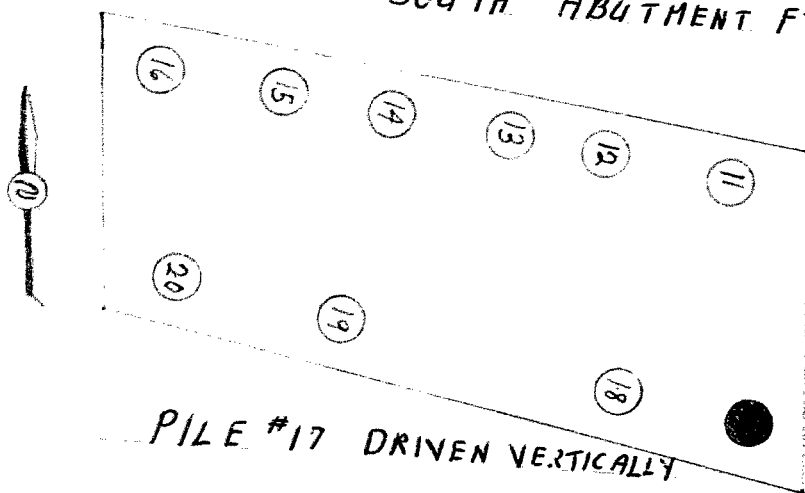
DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH						
MEASURED REBOUND IN INCHES <u>Vertical Pile</u>						
FINAL LENGTH OF PILE <u>110'10"</u>	FINAL CUT OFF ELEVATION <u>572.00</u>					

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER
 MATERIALS & TESTING DIVISION
 DEPARTMENT OF HIGHWAYS
 DOWNSVIEW, ONTARIO

SIGNED M. L. Murphy
 NAME (PRINT) M. L. MURPHY
 DATE JUL 17 1972

ATTACH SKETCH OF PILE NUMBERING SYSTEM

RUNNING CREEK BRIDGE#3
SOUTH ABUTMENT FTG.



SUPER IMPOSED DOCUMENT MAY
APPEAR AS MULTI-FEED ON FILM

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 1 CONTRACT NO. 72-15 STRUCTURE RUNNING CREEK BRIDGE #3CONTRACTOR BIRMINGHAM PILE DRIVERS DESIGN LOAD OF PILE 70 TONHAMMER DETAILS: TYPE B 225 BIRMINGHAM WEIGHT 6,800 LBS HEIGHT OF FALL OR ENERGY 25,000 FT/LBSTYPE OF ANVIL OR CAP Box Anvil WEIGHT OF ANVIL OR CAP 1,100 LBSPILE DETAILS 12 BP 53 STEEL H-PilesPILE NO. 17 LOCATION SOUTH ABUTMENT FIG. DATE DRIVEN July 18th / 72

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS/FT.
40	1	0	40	26	10	80	51	4	115	76	5
"	2	0	"	27	10	"	52	4	"	77	6
"	3	0	"	28	9	"	53	4	"	78	7
"	4	0	"	29	8	"	54	5	"	79	7
"	5	0	"	30	6	"	55	5	"	80	7
"	6	1	"	31	6	"	56	5	"	81	7
"	7	1	"	32	6	"	57	5	"	82	8
"	8	1	"	33	6	"	58	5	"	83	7
"	9	2	"	34	5	"	59	6	"	84	7
"	10	4	"	35	5	"	60	6	"	85	6
"	11	4	80	36	6	"	61	5	"	86	7
"	12	4	"	37	6	"	62	5	"	87	7
"	13	5	"	38	5	"	63	5	"	88	7
"	14	6	"	39	6	"	64	5	"	89	6
"	15	7	"	40	5	"	65	6	"	90	6
"	16	7	"	41	5	"	66	5	"	91	6
"	17	8	"	42	4	"	67	5	"	92	7
"	18	9	"	43	5	"	68	5	"	93	6
"	19	10	"	44	4	"	69	6	"	94	7
"	20	12	"	45	5	"	70	5	"	95	6
"	21	11	"	46	4	"	71	5	"	96	6
"	22	11	"	47	5	"	72	5	"	97	6
"	23	12	"	48	5	"	73	5	"	98	7
"	24	12	"	49	5	"	74	5	"	99	6
"	25	11	"	50	5	"	75	5	"	100	6

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH						
MEASURED REBOUND IN INCHES <u>VERTICAL PILE</u>						
FINAL LENGTH OF PILE <u>110' 3"</u>	FINAL CUT OFF ELEVATION <u>572.00</u>					

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER
MATERIALS & TESTING DIVISION
DEPARTMENT OF HIGHWAYS
DOWNSVIEW, ONTARIOSIGNED M. L. MurphyNAME (PRINT) M. L. MURPHYDATE July 18th / 72

ATTACH SKETCH OF PILE NUMBERING SYSTEM

72
110.2
401.0

BRIDGE CONSTRUCTION — PILE DRIVING RECORD

DISTRICT NO. 1 CONTRACT NO. 72-15 STRUCTURE RUNNING CREEK BRIDGE #3CONTRACTOR BERMINEHAMMER PILE DRIVING DESIGN LOAD OF PILE 70 TONHAMMER DETAILS: TYPE B225 BERMINEHAMMER WEIGHT 6800 LB HEIGHT OF FALL OR ENERGY 25.000 FT/LBTYPE OF ANVIL OR CAP Box Anvil WEIGHT OF ANVIL OR CAP 1100 LBPILE DETAILS 12 BP 53 STEEL H" PILESPILE NO. 17 LOCATION SOUTH ABUTMENT FRG DATE DRIVEN JULY 18th 1972

TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.	TOTAL LENGTH BEING DRIVEN	LENGTH IN GROUND	PENETRATION BLOWS / FT.
115	101	7		26			51			76	
	102	6		27			52			77	
	103	6		28			53			78	
	104	6		29			54			79	
	105	6		30			55			80	
	106	6		31			56			81	
	107	6		32			57			82	
	108	7		33			58			83	
	109	13		34			59			84	
	110	15		35			60			85	
	11			36			61			86	
	12			37			62			87	
	13			38			63			88	
	14			39			64			89	
	15			40			65			90	
	16			41			66			91	
	17			42			67			92	
	18			43			68			93	
	19			44			69			94	
	20			45			70			95	
	21			46			71			96	
	22			47			72			97	
	23			48			73			98	
	24			49			74			99	
	25			50			75			100	

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH						
MEASURED REBOUND IN INCHES <u>Vertical Pile</u>						
FINAL LENGTH OF PILE <u>110'9"</u>	FINAL CUT OFF ELEVATION <u>572.00</u>					

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER
MATERIALS & TESTING DIVISION
DEPARTMENT OF HIGHWAYS
DOWNSVIEW, ONTARIOSIGNED M. J. MurphyNAME (PRINT) M. J. MurphyDATE JULY 18th 1972

ATTACH SKETCH OF PILE NUMBERING SYSTEM

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE

VISUAL CLASSIFICATION SHEET

PROJECT 70-F-33 SITE WALLACE BUNG BOREHOLE No. 1 GROUND ELEVATION

SAMPLE NO.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE											
				GRAVEL	SAND	SILT & CLAY									
1	3.0-4.5	1 1/2"	SUB ROUNDED	15	50	35	LOW	SLIGHT	NIL	SLIGHT	NONE	BROWN	SLIGHT TO STRONG	LOOSE	SILTY SAND, TRACES OF SOME GRAVEL.
2	6.0-7.5	#100	/	/	25	75	LOW	DULL	SLOW	SLIGHT	ORGANIC	BROWN + BLACK	STRONG	SOFT	CLAYEY SILT, SLIGHTLY SMALL BLACK SEAMS.
3	9.0-10.5	#100	/	/	60	40	LOW	SLIGHT	FAST	SLIGHT	EARTHY	BROWN	STRONG	LOOSE	SILTY SAND,
4	12.0-13.5	#100	/	/	55	45	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	BROWN + GREY	STRONG	VERY LOOSE	SILTY SAND, ORGANIC
5	15.0-16.5	#100	/	/	30	70	LOW	SLIGHT	FAST	SLIGHT	EARTHY	BROWN	VERY STRONG	VERY SOFT	CANDY SILT
6	18.0-19.5	#10	/	/	65	35	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	BROWN + GREY	STRONG	LOOSE	SILTY SAND, ORGANIC COARSER SAND
7	21.0-22.5	#50	/	/	95	5	LOW	DULL	FAST	NIL	ORGANIC	GREY	VERY STRONG	COMPACT	SAND, ORGANIC, TRACE OF
8	24.0-25.5	#50	/	/	75	25	LOW	DULL	FAST	SLIGHT	ORGANIC	GREY	STRONG	COMPACT	SILTY SAND, ORGANIC.
9	27.0-28.5	#100	/	/	60	40	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY	STRONG	COMPACT	SILTY SAND, ORGANIC

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

SITE JALLACEBURG

BOREHOLE No. 1

GROUND ELEVATION _____

ION	ENTAGE		DRY STRENGTH	SHINE	DIALTANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
	SAND	SILT & CLAY										
50	35		LOW	SLIGHT	NIL	SLIGHT	NONE	BROWN	SLIGHT TO STRONG	LOOSE	SILTY SAND, TRACES OF CLAY, SOME GRAVEL.	SM = SF
25	75		LOW	DULL	SLOW	SLIGHT	ORGANIC	BROWN + BLACK	STRONG	SOFT	CLAYEY SILT, SLIGHTLY ORGANIC SMALL BLACK SEAMS.	CL
60	40		LOW	SLIGHT	FAST	SLIGHT	EARTHY	BROWN	STRONG	LOOSE	SILTY SAND,	SM
55	45		LOW	SLIGHT	FAST	SLIGHT	ORGANIC	BROWN + GREY	STRONG	VERY LOOSE	SILTY SAND, ORGANIC	SM.
30	70		LOW	SLIGHT	FAST	SLIGHT	EARTHY	BROWN	VERY STRONG	VERY SOFT	SANDY SILT	ML
65	35		LOW	SLIGHT	FAST	SLIGHT	ORGANIC	BROWN + GREY	STRONG	LOOSE	SILTY SAND, ORGANIC COMPACT SAND	SM
75	5		LOW	DULL	FAST	NIL	ORGANIC	GREY	VERY STRONG	COMPACT	SAND, ORGANIC, TRACE OF SILT.	SU
75	25		LOW	DULL	FAST	SLIGHT	ORGANIC	GREY	VERY STRONG	COMPACT	SILTY SAND, ORGANIC.	SM
60	40		LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY	STRONG	COMPACT	SILTY SAND, ORGANIC	SM

MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 10-F-33 SITE WALLACEBURG BOREHOLE No. 1 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE											
				GRAVEL	SAND	SILT & CLAY									
10	30.0-31.5	# 50	/	/	60	40	LOW	DULL	FAST	SLIGHT	ORGANIC	GREY	STRONG	COMPACT	SILTY SAND, ORGANIC
11	33.0-34.5	# 100	/	/	80	20	LOW	DULL	FAST	SLIGHT	EARTHY	GREY	STRONG	COMPACT	SILTY SAND.
12	36.0-37.5	# 50	/	/	60	40	LOW	DULL	FAST	SLIGHT	ORGANIC	GREY	STRONG	LOOSE	SILTY SAND
13	40.0-41.5	# 200	/	/		100	HIGH	SLIGHT	NONE	HIGH	EARTHY	BROWN	SLIGHT	VERY SOFT	SILTY CLAY

NOTES:— VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

SITE CALLAGHERBURG

BOREHOLE No. 1

GROUND ELEVATION _____

DEPTH IN METERS	PERCENTAGE SAND SILT & CLAY	DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
0	40	LOW	DULL	FAST	SLIGHT	ORGANIC	GREY	STRONG	COMPACT	SILTY SAND, ORGANIC	SM
0	20	LOW	DULL	FAST	SLIGHT	EARTHY	GREY	STRONG	COMPACT	SILTY SAND	SM
0	40	LOW	DULL	FAST	SLIGHT	ORGANIC	GREY	STRONG	LOOSE	SILTY SAND	SM
1	100	HIGH	SLIGHT	NONE	HIGH	EARTHY	BROWN	SLIGHT	VERY SOFT	SILTY CLAY	CH

MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 70-F-23 SITE WALLACEBURG BOREHOLE No. 2 GROUND ELEVATION

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE											
				GRAVEL	SAND	SILT & CLAY									
1	2.0-4.5	100	/	/	5	95	LOW	DULL	SLOW	MEDIUM	NONE	GREY + BLACK	SLIGHT	FIRM	MIXTURE ORGANIC TOPSOIL AND TRACE OF SAND
2	6.0-7.5	50	/	/	5	35	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY-BROWN	STRONG	LOOSE	SILTY SAND, TRACE OF UNORGANICS
3	9.0-10.5	80	/	/	55	45	LOW	DULL	FAST	SLIGHT	ORGANIC	GREY	STRONG	LOOSE	SAME AS ABOVE
4	15.0-16.5	80	/	/	60	40	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY	STRONG	VERY LOOSE	SILTY SAND, ORGANIC, (S)
5	20.0-21.5	80	/	/	65	35	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY	STRONG	LOOSE	SAME AS ABOVE
6	25.0-26.5	80	/	/	70	30	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY	STRONG	LOOSE	SAME AS ABOVE
7	29.0-31.5	80	/	/	60	40	LOW	SLIGHT	FAST	SLIGHT	NONE	GREY	STRONG	DENSE	SILTY SAND

NOTES:- VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE SURFACE

REMARKS:-

VISUAL CLASSIFICATION SHEET

3 SITE WALLACEBURG BOREHOLE No. 2 GROUND ELEVATION

PERCENTAGE		DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
SAND	SILT & CLAY										
0	95	LOW	DULL	FAST	SLIGHT	NOISE	GREY BLACK	SLIGHT	FIRM	MIXTURE ORGANIC TOPSOIL AND CLAYEY SILT TRACE OF SAND	CI
5	95	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY- BLACK	STRONG	LOOSE	SILTY SAND, TRACE OF UNDECAYED ORGANICS	SF
5	45	LOW	DULL	FAST	SLIGHT	ORGANIC	GREY	STRONG	LOOSE	SAME AS ABOVE	SF
60	40	LOW	SLIGHT	FAST	SLIGHT	NOISE	GREY	STRONG	VERY LOOSE	SILTY SAND, ORGANIC (SOME UNDECAYED)	SF
5	35	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY	STRONG	LOOSE	SAME AS ABOVE	SF
70	20	LOW	SLIGHT	FAST	SLIGHT	ORGANIC	GREY	STRONG	LOOSE	SAME AS ABOVE	SF
60	40	LOW	SLIGHT	FAST	SLIGHT	NOISE	GREY	STRONG	LOOSE	SILTY SAND	SF

MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.