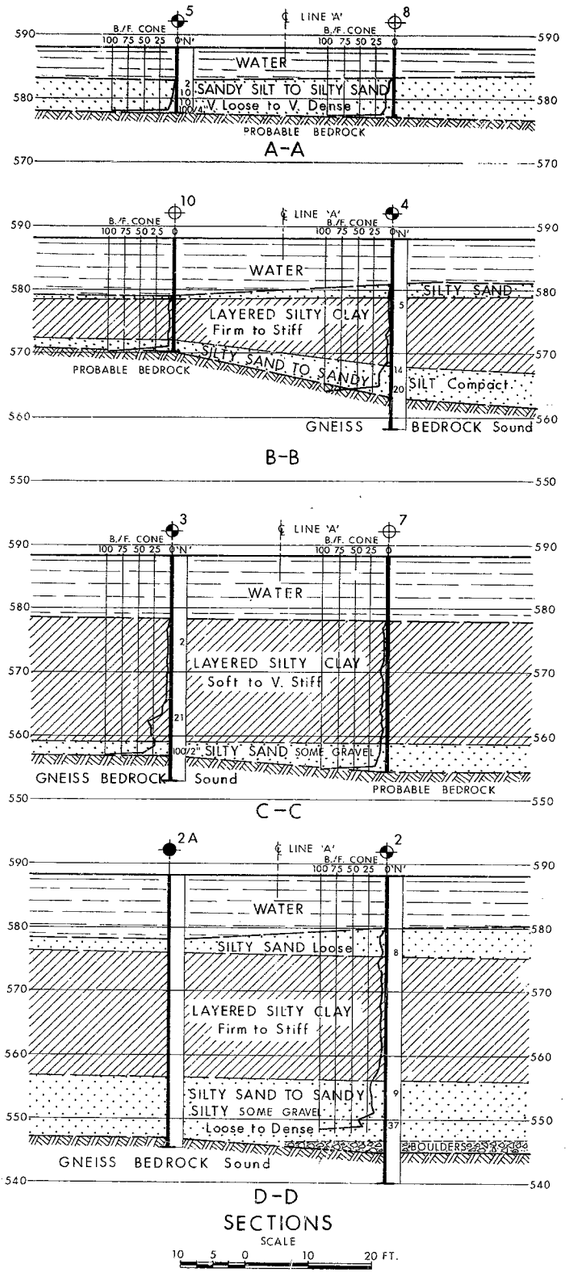
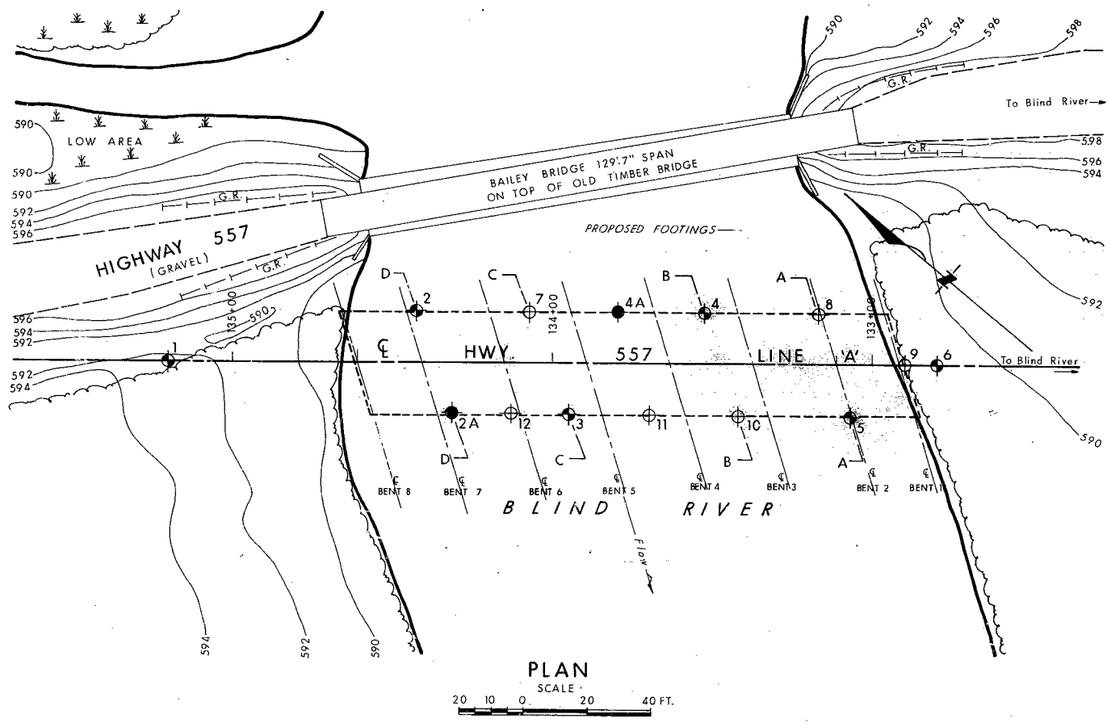
CONT. 73-84

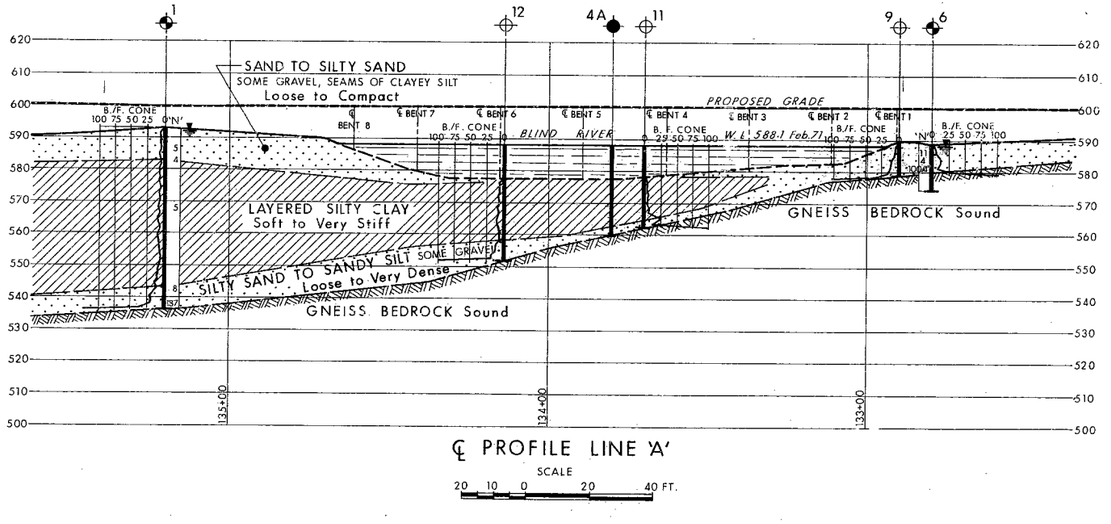
HWY. 557 &

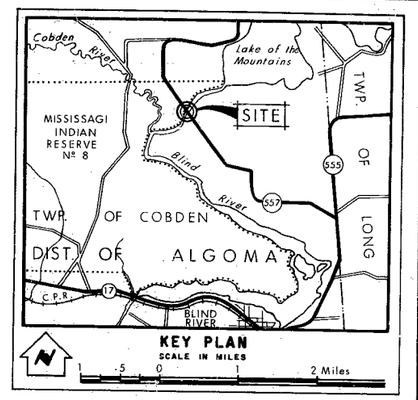
BLIND RIVER

41J-19









LEGEND

- Bore Hole
- Cone Penetration Hole
- Bore & Cone Penetration Hole
- Water Levels established at time of field investigation. Feb. 1971

NO.	ELEVATION	STATION	OFFSET
1	593.5	135+20	10' LT.
2	580.0	134+43	16' RT.
2A	578.0	134+31	16' LT.
3	578.3	133+95	16' LT.
4	581.0	133+53	16' RT.
4A	578.0	133+80	16' RT.
5	583.0	133+07	16' LT.
6	589.9	132+80	℄
7	578.0	134+07	16' RT.
8	583.5	133+17	16' RT.
9	589.0	132+90	℄
10	579.0	133+42	16' LT.
11	578.5	133+70	16' LT.
12	577.5	134+13	16' 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.

PRINT RECORD		
NO.	FOR	DATE

REVISIONS		
DATE	BY	DESCRIPTION

REF. NO. E-4497-1

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE - FOUNDATION SECTION

BLIND RIVER

KING'S HIGHWAY NO. 557 LINE 'A' DIST. NO. 8
Dist of ALGOMA MISSISSAGI INDIAN RESERVE
TWP. COBDEN LOT 4 CON. IV

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D. S.A.	CHECKED GM	W.P. NO. 202-66	M.B.T. DRAWING NO.
DRAWN GP	CHECKED AT	JOB NO. 71-11012	71-11012A
DATE March 16, 1971		SITE NO.	BRIDGE DRAWING NO.
APPROVED A.R. Thomas PRINCIPAL FOUNDATION ENGINEER		CONT. NO.	

GEOCRES NO. 41J-19

DEPARTMENT OF HIGHWAYS ONTARIO

73-84

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: March 24, 1971

Our File Ref.

In reply to APR 2 1971

41 J - 19

Subject:

FOUNDATION INVESTIGATION REPORT
For
Proposed Structure
At the
Crossing of Hwy. #557 (Line 'A')
And Blind River
District No. 17 (Sudbury)
W.O. 71-11012 -- W.P. 202-66-02
CONT. 73-84

BLIND RIV. BR, 3.7 mi N. OF Hwy 17

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.

A. G. Stermac
PRINCIPAL FOUNDATION ENGINEER

AGS/MdeP
Attach.
cc: Messrs. B. R. Davis
F. G. Allen
D. W. Farren
H. McArthur
J. M. Childs
J. C. McAllister (2)
E. R. Saint
B. J. Giroux
B. A. Singh

Foundations Files
Gen. Files

TABLE OF CONTENTS

FOUNDATION INVESTIGATION REPORT
For
Proposed Structure
At the
Crossing of Hwy. #557 (Line 'A')
And Blind River
District No. 17 (Sudbury)
W.O. 71-11012 -- W.P. 202-66-02

1. INTRODUCTION:

The Foundation Section was requested to carry out a subsurface investigation at the proposed structure crossing of Hwy. #557 (Line 'A') and Blind River, in Cobden Township, District of Algoma. This structure is to replace the existing one. The request was contained in a memo from Northern Regional Bridge Office (Mr. J. C. McAllister, Regional Bridge Planning Supervisor), dated February 4, 1971. Subsequently an investigation was carried out by this Section to determine the subsoil, bedrock and groundwater conditions at the site.

The factual information obtained from the investigation is presented in this report, together with our recommendations pertaining to the design of the structure foundations and related earthworks.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The site is located at the intersection of Hwy. #557 (Line 'A') and Blind River, about 2.5 miles west of Sec. Hwy. #555 and about 5 miles northwest of the Town of Blind River, in Cobden Township, District of Algoma. The ground surface in this area consists generally of a rolling topography. The area is heavily wooded with scattered cottages and cabins. West of the river is the Mississagi Indian Reserve. The river starts its flow from the Lake of the Mountains, which is directly north of the site.

2. DESCRIPTION OF THE SITE AND GEOLOGY: (cont'd.) ...

The river channel, at the crossing, is approximately 170 ft. wide and 15 ft. deep. The water level in the river, on February 17, 1971, was found to be at elevation 588 - i.e., it is some 10 feet deep. There is an existing structure at the crossing, the pertinent details of which will be discussed in Section #6.

Geologically, the area is in the Precambrian Shield, which consists of crystalline rocks over 1 billion years old. The area has been deeply buried in the earth's crust and the rocks have been highly metamorphosed or changed by intense heat and pressure. The characteristic bedrock belongs to the Gowganda formation, which is a peculiarly heterogeneous assemblage of conglomerates of various soils, greywacke, impure quartzite, and even a little silaceous limestone. The different rock types merge imperceptively into each other. Two major faults have been recorded to exist in this vicinity.

The bedrock in the immediate vicinity is generally overlain by geologically recent deposits of clays and silts of lacustrine origin.

3. FIELD AND LABORATORY WORK:

A total of 8 boreholes was carried out during the course of the field investigation; all were accompanied by a dynamic cone penetration test. In addition, five dynamic cone penetration tests were also carried out to delineate the subsoil and bedrock boundaries more accurately. The boreholes and the dynamic cone penetration tests were advanced by means of a diamond drill rig adapted for soil sampling purposes.

Samples of the overburden were obtained at required depths in a 2-inch O.D. split-spoon sampler which was hammered into the soil in accordance with the specifications for the Standard Penetration Test. The same method was used to advance

..... 3

3. FIELD AND LABORATORY WORK: (cont'd.) ...

the dynamic cone penetration tests. In addition, 2-inch I.D. Shelby tube samples were obtained in the cohesive stratum; the tubes were pushed manually into the soil. Field vane tests were carried out in order to determine the undrained shear strength of the subsoil.

Bedrock was proven by obtaining BX and AXT size rock core samples in 5 boreholes. During sampling and drilling operations, detailed logs of the boring were made; these logs contain a record of the drilling and sampling techniques used, together with the soil and bedrock types encountered.

The location and elevation of all the boreholes are shown on Drawing #71-11012A, together with a number of estimated stratigraphical sections across the site. Surveying at the site was carried out by the personnel from the Department of Highways, Sudbury District. The elevations given in this report are referred to a geodetic datum.

All samples were subjected to a careful visual examination in the field and subsequently in the laboratory. Following this examination, laboratory testing was carried out on selected representative samples to determine the following physical properties of the overburden:

Natural Moisture Content
Atterberg Limits
Bulk Density
Grain-Size Distribution
Undrained Shear Strength
Consolidation Characteristics

The results of these tests are plotted on the Record of Borelog sheets as well as on the figures in the Appendix.

..... 4

4. SUBSOIL AND BEDROCK CONDITIONS:

4.1) General:

The surficial deposit across the site is generally composed of a loose to compact silty sand to sandy silt varying from 1 to 10 feet in thickness. Beneath the river bed, as well as along the west bank, the granular deposit is underlain by a soft to very stiff layered silty clay stratum, which ranges from 11 to 39.5 feet in thickness. Where encountered, the cohesive stratum is underlain by a 2 to 11 foot thick deposit composed of a loose to very dense silty sand to sandy silt.

The overburden sequence is underlain by a sound metamorphic gneiss bedrock.

The boundaries of the various deposits are shown on the accompanying borelog sheets. Estimated stratigraphical sections across the site are shown on Drawing No. W.O. 71-11012A.

The various soil and bedrock types encountered are as follows:

4.2) Silty Sand to Sandy Silt - Upper Deposit:

A surficial deposit of loose to compact ('N' values 2 to 11 blows/ft.) silty sand to sandy silt with a trace to some gravel was encountered along the east and west river banks. This deposit extends out onto the river bed; it was not encountered, however, in the central deeper portion of the river channel. The thickness of the deposit varies from 1 to 10 feet. Occasional seams of clayey silt, up to 2" in thickness, are present throughout the deposit. Grain-size distribution testing was carried out on typical samples of this deposit. The results are plotted on Figure No. 1 in Appendix I.

4.3) Silty Clay (Layered):

Along the west bank of the river the surficial granular deposit is underlain by a layered silty clay stratum. This stratum extends out into the river channel; it is absent, however,

..... 5

4. SUBSOIL AND BEDROCK CONDITIONS: (cont'd.) ...

4.3) Silty Clay (Layered): (cont'd.) ...

along the east bank. Where encountered, the thickness of the cohesive stratum varies from 11 (B.H. #4) to 39.5 feet (B.H. #1); it generally increases in a westerly direction. The individual layers, which vary from 1/4 to 1 inch in thickness, are distinguished by colour, varying from red-brown to light grey to dark grey. The gradational composition of the individual layers is quite similar. Some clayey silt inclusions were encountered in B.H. #1.

The engineering properties of the layered silty clay stratum, which are plotted on the Record of Borelog sheets, are also summarized in tabular form as follows:

..... 6

4. SUBSOIL AND BEDROCK CONDITIONS: (cont'd.) ...

4.3) Silty Clay (Layered): (cont'd.) ...

			Range
Identity Tests:			
Bulk Density (p.c.f.)	(γ)		110 - 124
Liquid Limit (%)	(W_L)		20 - 45
Plastic Limit (%)	(W_P)		14 - 22
Natural Moisture Content (%)	(W)		25 - 49
Liquidity Index	(W_L)		1.0 - 1.5
Compressibility Characteristics:			
Initial Void Ratio	(e_o)	Two Tests	0.9 - 1.3
Compression Index	(C_c)	Two Tests	0.4 - 0.7
Degree of Preconsolidation (p.s.f.)	(P_c-P_o')	Two Tests	3,600
Undrained Shear Strength (p.s.f.)	(C_u)		
- Field Vanes			800 - 1,120
- Lab. Tests			437 - 935
Standard Penetration Resistance ('N') (blows/ft.)			2 - 21
Sensitivity	(S_t)		5.5 - 9.5

..... 7

4. SUBSOIL AND BEDROCK CONDITIONS: (cont'd.) ...

4.3) Silty Clay (Layered): (cont'd.) ...

The Atterberg limit test results, given in the table, are also summarized on the Plasticity Chart, Fig. #2. The testing indicates that the cohesive subsoil is inorganic with the plasticity generally in the intermediate range.

The field and laboratory undrained shear strength testing results indicate that the consistency of the clayey silt to silty clay varies from soft to stiff.

The consolidation characteristics of the subsoil were determined by carrying out three laboratory oedometer tests, the results of which are shown as Void Ratio vs. Pressure plots on Fig. #3. The results of these tests indicate that the cohesive stratum is preconsolidated by about 3,600 p.s.f. in excess of the existing overburden pressure.

4.4) Silty Sand to Sandy Silt - Lower Deposit:

The layered silty clay stratum, where encountered, is underlain by a deposit composed of a loose to very dense ('N' values between 8 and 187 blows/ft.) silty sand to sandy silt with a trace to some gravel. The thickness of this deposit varies randomly from 2 to 10 feet. At a few of the boring locations a bouldery zone is present near the base of the granular deposit. This zone is generally about 2 to 3 feet thick; the boulders encountered were up to 4 inches in size.

4.5) Bedrock:

Bedrock was established at B.H.'s 2, 2A, 3, 4 and 6 by obtaining up to 6.5 ft. of either AXT or BX size rock core samples. The bedrock was encountered at depths which vary from 9 feet to 57 feet below ground surface or the river bed - i.e., between elevations 581 and 537. As indicated on Drawing No. W.O. 71-11012A the surface of the bedrock dips in a westerly direction.

..... 8

4. SUBSOIL AND BEDROCK CONDITIONS: (cont'd.) ...

4.5) Bedrock: (cont'd.) ...

The bedrock is composed of a grey metamorphosed gneiss with inclusions of meta-greywacke and meta-arkose. The bedrock is sound as indicated by the high percentage of core recovered.

5. GROUNDWATER CONDITIONS:

In order to establish the groundwater level across the site, water level observations were carried out, during the period of field investigation, in the open boreholes. These observations indicated that the groundwater level, encountered along the banks of the river, varied from elevation 589 to 591, which is within 1 foot of the ground surface. The river water level, at the time of investigation, was found to be at elev. 588; the water is up to 10 feet deep at this location.

6. EXISTING STRUCTURE:

The existing structure is a steel and timber Bailey Bridge (single span 129.6 ft.), constructed on top of the old timber bridge foundations. The exact type of foundations used in either of the two structures is not known.

The profile grade of Hwy. #557, in the vicinity of the structure, varies from elevation 590 to 592. The heights of the existing east and west approach embankments are of the order of 8 and 6 feet, respectively. The slopes of the approaches in the transverse and longitudinal directions are of the order of 2:1.

In general, the approaches appear to be performing satisfactorily. The structure, however, is in a state of poor repair. Signs posted on either end of the bridge warn that the vehicular traffic over the structure is restricted to a 5-ton total capacity.

..... 9

7. DISCUSSION AND RECOMMENDATIONS:

7.1) General:

It is proposed to construct a new structure at the crossing of Hwy. #557 (Line 'A') and Blind River, approximately 60 ft. south of the existing bridge about 5 miles northwest of the Town of Blind River, in Cobden Township, District of Algoma. The present proposal calls for either a three-span (30'-50'-30') structure with capped steel pile piers and concrete beams, or timber trestle, six spans 22 ft. each with composite laminated timber concrete deck. In both cases, the width of the structure will be of the order of 32 ft. The proposed profile grade of Hwy. #557 (Line 'A') in the vicinity of the new structure, is at elev. 600. At this grade the maximum height of the approach fills will be of the order of 22 feet.

The surficial deposit across the site is composed of a 1 to 10-foot thick deposit of loose to compact silty sand to sandy silt. Beneath the river bed as well as along the west bank, the granular deposit is underlain by a soft to very stiff layered silty clay which ranges from 11 to 39.5 feet in thickness. Where encountered, the cohesive stratum is underlain by a 2 to 11-foot thick deposit of loose to very dense silty sand to sandy silt. The overburden sequence is underlain by a sound metamorphic gneiss bedrock which dips in a westerly direction across the site.

As mentioned elsewhere, two possible schemes may be considered at the crossing of Hwy. #557 (Line 'A') and Blind River, and the foundation recommendations pertaining to respective structure proposals will be discussed in detail in the sub-sections to follow.

7.2) Structure Foundations:

7.2.1) Three-span Structure (Scheme I):

Piers - (refer to B.H.'s #3, 4, 7 and 10) -

The piers can be founded on end-bearing piles driven to bedrock. For estimating purposes, it can be assumed that the

..... 10

7. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

7.2) Structure Foundations: (cont'd.) ...

7.2.1) Three-span Structure (Scheme I): (cont'd.) ...

Piers - (refer to B.H.'s #3, 4, 7 and 10) - (cont'd.) ...

pile tips for the east and west piers will be as follows:

East Pier	--	Elev. 563 - Elev. 570
West Pier	--	Elev. 554 - Elev. 557

Allowable loads will depend on the pile section chosen - (e.g., 12 BP 74 steel H-piles may be designed for 95 tons/pile).

East Abutment - (refer to B.H. #5) -

At the east abutment location sound bedrock is located at a shallow depth below ground surface - elev. 578. The closed-type abutment can, therefore, be supported on spread footing bearing on or within sound bedrock. If the footing is founded as recommended, an allowable bearing value of up to 20 t.s.f. can be used in design.

West Abutment - (refer to B.H.'s #2 and 2A) -

At the west abutment location the presence of soft cohesive and loose granular deposits extending some 35 ft. above the bedrock, precludes the economical use of a spread footing type of foundation at a shallow depth. It is recommended, therefore, that this abutment be supported on end-bearing piles driven to sound bedrock surface at approximate elev. 545. Allowable loads will depend on the pile section chosen (e.g., 12 BP 74 steel H-piles may be designed for 95 tons/pile).

In all cases, the base of the pile caps should be located at least 7 ft. below the lowest river water level in order to provide adequate frost cover. No bouldery or rock fill should be used in areas where piles are to be driven.

..... 11

7. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

7.2) Structure Foundations: (cont'd.) ...

7.2.1) Three-span Structure (Scheme I): (cont'd.) ...

A temporary dewatering scheme will be required to prevent water from the river flowing into pile cap excavations of the abutments located within the close proximity of the Blind River channel. A relatively impervious dyke located between the excavation and the river would be a suitable solution. This dyke could be composed of the locally available cohesive soil. Any minor seepage or surface run-off into the excavations could be controlled by pumping from sumps.

7.2.2) Timber Trestle (Scheme II):

As an alternative, a timber trestle, with six spans 22 feet each having a composite laminated timber concrete deck, may be considered at this crossing.

The bents for the timber trestle should be supported on end-bearing piles driven to the bedrock surface. Since the bedrock surface varies considerably over the general area, no attempt was made to estimate the pile tip elevations for the respective bents; however, these can be established by referring to Drawing #70-11012A. For piles driven to bedrock, a design load of 25 tons per #14 timber pile may be used. Due to the shallow depth to bedrock along the east side of the river channel pile bents should be located in such a manner that they will have minimum embedment of 10 ft. into the subsoil in order to provide adequate lateral support. If this cannot be achieved, it will be necessary to provide lateral and longitudinal bracings between the pile bents.

No bouldery or rock fill should be placed in areas where piles are to be driven.

..... 12

7. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

7.3) Approach Fills:

The proposed approach fills will be about 22 ft. above the river bed in the longitudinal direction and approximately 10 ft. above the existing ground in the transverse direction.

Stability analyses have been carried out in terms of total stresses by the use of the electronic computer. In this approach the stability is governed by the applied loads and by the stress-strain and undrained characteristics of the foundation and embankment soils. The following parameters were assumed for various soil strata.

Type of Soil	Bulk Density	Undrained Shear Strength (C_u)	ϕ
Embankment Fill	125 p.c.f.	-	30°
Subsoil			
i) Sand (upper)	125 p.c.f.	-	30°
ii) Clay	110 p.c.f.	800 p.s.f.	-
iii) Sand (lower)	125 p.c.f.	-	30°

The computations indicate that the proposed embankments will be stable both in the longitudinal and transverse directions with standard 2:1 slopes.

The earth embankments within the confines of the Blind River, should be protected against scour action of the river; this protection should extend above the maximum high water level recorded. It is understood that recommendations pertaining to this will be presented by the Hydrology Section.

The compressible cohesive stratum beneath the sand layer will undergo settlement due to consolidation, over a period of time, under the weight of the west approach fill. It is estimated that the magnitude of this settlement could be about 6 to 8 inches; it should be realized in a period of about 10 years. In our

..... 13

7. DISCUSSION AND RECOMMENDATIONS: (cont'd.) ...

7.3) Approach Fills: (cont'd.) ...

estimate, 50% of this settlement should occur within a period of about 3 years. At the east approach fill location, the subsoil is mainly sand and the settlements will be elastic in nature. These will be negligible and take place during construction of the approach fills.

8. MISCELLANEOUS:

The field work, performed between February 16 - 27, 1971, was supervised by Mr. S. Ahmad, Project Foundation Engineer, who also prepared this report.

The investigation was carried out under the general supervision of Mr. M. Devata, Supervising Foundation Engineer, who also reviewed this report.

The equipment used was provided and operated by Canadian Longyear Co. Ltd., Toronto.

March, 1971

APPENDIX I

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

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 135 + 20 o/s 10' Lt. Line A ORIGINATED BY SAA
W.P. 202-66-02 BORING DATE Feb. 26, 1971 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Diamond Drill - Washboring CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV SCALE
593.5	Ground Level					
592.5	Topsoil					
1.0	Sand to silty sand, occ. seams of clayey silt. Loose Brown		1	SS	5	590
583.0						
10.5	Layered silty clay with inclusions of clayey silt Firm Red-Brown, light Grey and Dark Grey		3	TW	PM	580
			4	TW	PM	570
			5	SS	5	
			6	TW	PM	560
			7	TW	PM	
			8	TW	PM	550
			9	TW	PM	
543.5						
50.0	Silty sand to sandy silt with some gravel Loose to Very Dense Grey		10	SS	8	540
536.5			11	SS	187	
57.0	Probable Bedrock End of Borehole					530

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100
SHEAR STRENGTH P.S.F. ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB. VANE
400 800 1200 1600 2000

+s7.0
+s6.7
+s8.0
+s8.8
+s8.8
s6.0
+s9.6

LIQUID LIMIT ——— w_L
PLASTIC LIMIT - - - w_P
WATER CONTENT ——— w
WATER CONTENT % 20 40 60

BULK DENSITY γ P.C.F.

BULK DENSITY	REMARKS	GR SA SI CL
	▽ 592.5 WL in open BH Feb.26/71	
		0 9 75 16
124		
107.5		0 0 40 60 0 0 53 47
111.5		
		7 33 58 2
		8 57 28 7

20
15 5 % STRAIN AT FAILURE
10

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 134 + 42 o/s 16' Rt. Line A ORIGINATED BY SAA
W.P. 202-66-02 BORING DATE Feb. 22/71 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Diamond Drill - Washboring CHECKED BY

ELEV. / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT
588.1	River Level				
580.0	Water				
0.0	Silty sand with seams of clayey silt up to				
575.5	2". Loose. Grey		1	SS	8
4.5	Layered silty clay				
	Firm to Stiff		2	TW	PM
			3	TW	PM
			4	TW	PM
	Red-brown, Light Grey				
	and Dark Grey		5	TW	PM
556.0					
24.0	Silty sand to sandy silt with some gravel		6	SS	9
	Loose to Dense				
	Grey		7	SS	37
545.0	Boulders up to 2" size		8	AXT	16%
35.0	Bedrock-Gneiss with inclusions of meta-greywacke & meta-arkose		9	AXT	85%
540.0	Sound				
40.0	End of Borehole				

ELEV. SCALE

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT 20 40 60 80 100

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE
400 800 1200 1600 2000

570 +s5.5 +s7.5
560 +s8.5 +s9.0
550 100/6"
540

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

w_P w w_L

WATER CONTENT %
20 40 60

BULK DENSITY γ P.C.F.
110

REMARKS
GR. SA. SI. CL.
7 11 79 3

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 71-11012 LOCATION Sta. 13¼ + 31 o/s 16' Lt. Line A ORIGINATED BY SAA

W.P. 202-66-02 BORING DATE February 22, 1971 COMPILED BY SAA

DATUM Geodetic BOREHOLE TYPE Diamond Drill Washboring CHECKED BY

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE
588.1	River Water Level					
	Water					580
578.0						
576.0	Probable Silty Sand					
2.0						
	Probable layered silty clay					570
	Firm to stiff					
	Red-brown, light grey and dark grey					560
557.0						
21.0	Probable silty sand to sandy silt. Loose to Dense					
	Grey					550
545.5	Bedrock - Sound		1	BX	75%	
32.5	End of Borehole					540

DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT

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

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

w_p w w_L

WATER CONTENT %

BULK DENSITY γ P.C.F.

REMARKS GR. SA. SI. CL.

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

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 133 + 95 o/s 16' Lt. Line A ORIGINATED BY SAA
W.P 202-66-02 BORING DATE Feb. 18, 1971 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Diamond Drill & Washboring CHECKED BY

ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV. SCALE
588.1	River Water Level					
	Water					580
578.3						
0.0	Layered silty clay					
	Soft to Very Stiff		1	SS	2	
			2	TW	PM	
	Red-brown, light grey		3	TW	PM	570
	and dark grey		4	TW	PM	
			5	SS	21	
559.3						560
557.1	Silty sand with some gravel		6	SS	100/2"	
21.2	Bedrock-Gneiss with		7	BX	80%	
552.6	incls. of meta-greywacke and meta-arkose. Sound					
25.5	End of Borehole					550

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT 20 40 60 80 100

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
400 800 1200 1600 2000

+ s5.5
+ s5.5
100/1"

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

WATER CONTENT %
20 40 60

BULK DENSITY γ P.C.F.

110

REMARKS
GR. SA. SI. CL.
0 0 40 60

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

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 133 + 53 16' Rt. Line A ORIGINATED BY SAA
W.P. 202-66-02 BORING DATE Feb. 24 - 25, 1971 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Diamond Drill - Washboring CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE
588.1	River Water Level					
	Water					
581.0						
0.0	Silty Sand Grey					580
572.0						
2.0	Layered silty clay		1	SS	5	
	Firm to Stiff		2	TW	PM	
	Red-brown, light grey and dark grey		3	TW	PM	570
568.0						
13.0	Silty sand to sandy silt.		4	SS	14	
563.0	Compact. Grey		5	SS	20	
18.0	Bedrock-Gneiss with inclusions of meta-greywacke & meta-arkose		6	AXT	90%	560
553.0	Sound					
33.0	End of Borehole					550

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT 20 40 60 80 100

SHEAR STRENGTH P.S.F.
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB. VANE
400 800 1200 1600 2000

+ s6.6
+ s8.7
100/10"

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

WATER CONTENT %
20 40 60

BULK DENSITY γ P.C.F.	REMARKS GR. SA. SI. CL.
111	0 0 50 50
	0 32 68 0

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

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4A

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 133 + 80 o/s 16' Rt. Line A ORIGINATED BY SAA

W.P. 200-66-02 BORING DATE February 24, 1971 COMPILED BY SAA

DATUM Geodetic BOREHOLE TYPE Diamond Drill - Washboring CHECKED BY

SOIL PROFILE			SAMPLES				DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT w_L / PLASTIC LIMIT w_p / WATER CONTENT w	BULK DENSITY γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F. ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB. VANE	w_p — w — w_L WATER CONTENT %	P.C.F.	GR. SA. SI. CL.
588.1	River Water Level									
	Water									
573.0						580				
0.0										
						570				
560.0										
28.0	Probable Bedrock End of Borehole					560				
						550				

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

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 5

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 133 + 07 o/s 10' Lt. Line A ORIGINATED BY SAA
W.P. 202-66-02 BORING DATE Feb. 17, 1971 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Diamond Drill - Washboring CHECKED BY

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (20 40 60 80 100) SHEAR STRENGTH P.S.F. ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB. VANE	LIQUID LIMIT w_L PLASTIC LIMIT w_P WATER CONTENT w WATER CONTENT % (20 40 60)	BULK DENSITY γ P.C.F.	REMARKS GR. SA. SI. CL.
588.1	River Water Level									
583.0	Water									
0.0	Sandy silt to silty sand Very Loose to Very Dense. Grey		1	SS	2	580				2 25 (73)
			2	SS	10					
577.7			3	SS	10					
			4	SS	100/4"		100/8"			
5.3	Probable Bedrock End of Borehole					570				

FORM OB-MT-126 (REV 1969)

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 6

FOUNDATION SECTION

JOB 71-12012 LOCATION Sta. 132 + 80 ℄ Hwy. 557 Line A ORIGINATED BY SAA

WP 202-66-02 BORING DATE February 16, 1971 COMPILED BY SAA

DATUM Geodetic BOREHOLE TYPE Diamond Drill - Washboring CHECKED BY

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE
588.5	Ground Surface					
0.0	Silty sand to sandy silt with some gravel, occ. seams of clayey silt. Loose to Compact. Grey		1	SS	11	
			2	SS	4	
580.6			3	SS	100/4"	580
7.3	Bedrock-Gneiss with inclusions of meta-greywacke & meta-arkose. Sound		4	AXT	96%	
574.0			5	AXT	90%	
15.9	End of Borehole					570

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT 20 40 60 80 100

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

100/2"

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

WATER CONTENT % 20 40 60

BULK DENSITY γ P.C.F

REMARKS

GR SA SI CL

588.5
0 9 76 15

0 82 (18)

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

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 7

FOUNDATION SECTION

JOB 72-11012 LOCATION Sta. 134 + 07 o/s 16' Rt. Line A ORIGINATED BY SAA
W.P 202-66-62 BORING DATE Feb. 6, 1971 COMPILED E SAA
DATUM Geodetic BOREHOLE TYPE Standard Penetration Test CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT 20 40 60 80 100 / SHEAR STRENGTH P.S.F. ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × 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.
588.1										
	Water									
578.0	River Bed Surface									
0.0	Layered silty clay Soft to Very Stiff Red-brown, light-grey and dark grey					570 560				
554.6	Probable silty sand with some gravel						100/5"			
23.4	End of Cone Test Probable Bedrock					550				

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

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 8

FOUNDATION SECTION

JOB 71-21732 LOCATION Sta. 133 + 17 o/s 16' Rt. Line A ORIGINATED BY SAA
W.P 306-76-02 BORING DATE February 17, 1971 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Standard Penetration Test CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT (20 40 60 80 100) SHEAR STRENGTH P.S.F. ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × 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.
588.1										
583.5	Water River Bed Surface									
0.0						580				
577.3							100/2"			
6.2	End of Cone Test Probable Bedrock					570				

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

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 9

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 132 + 90 ℄ Hwy. 557 Line A ORIGINATED BY SAA
W P 202-66-02 BORING DATE Feb. 17/71 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Standard Penetration Test CHECKED BY

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	BLOWS / FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100 — SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × 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.
589.0	Ground Surface									
						580				
578.7										
11.3	End of Cone Test Probable Bedrock						100/4"			
						570				

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

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 10

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 133 + 42 o/s 16' Lt. Line A ORIGINATED BY SAA

W.P. 202-66 - C-2 BORING DATE February 18, 1971 COMPILED BY SAA

DATUM Geodetic BOREHOLE TYPE Standard Penetration Test CHECKED BY

ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT / SHEAR STRENGTH P.S.F. (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × 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.
	Water									
579.0	River Bed Surface									
0.0	Probable layered silty clay									
	Firm									
572.0										
570.1	Probable Silty Sand					570	00/11"			
8.9	End of Cone Test Probable Bedrock					560				

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

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 11

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 133 + 70 o/s 16' Lt. Line A ORIGINATED BY SAA
W.P 202-66-02 BORING DATE Feb. 18, 1971 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Standard Penetration Test CHECKED BY

SOIL PROFILE ELEV. / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT 20 40 60 80 100 / SHEAR STRENGTH PSF ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × 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.
	Water									
578.5	River Bed Surface									
						570				
563.2										
15.3	End of Cone Test Probable Bedrock					560	100/3"			

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

DEPARTMENT OF HIGHWAYS- ONTARIO
MATERIALS & TESTING OFFICE

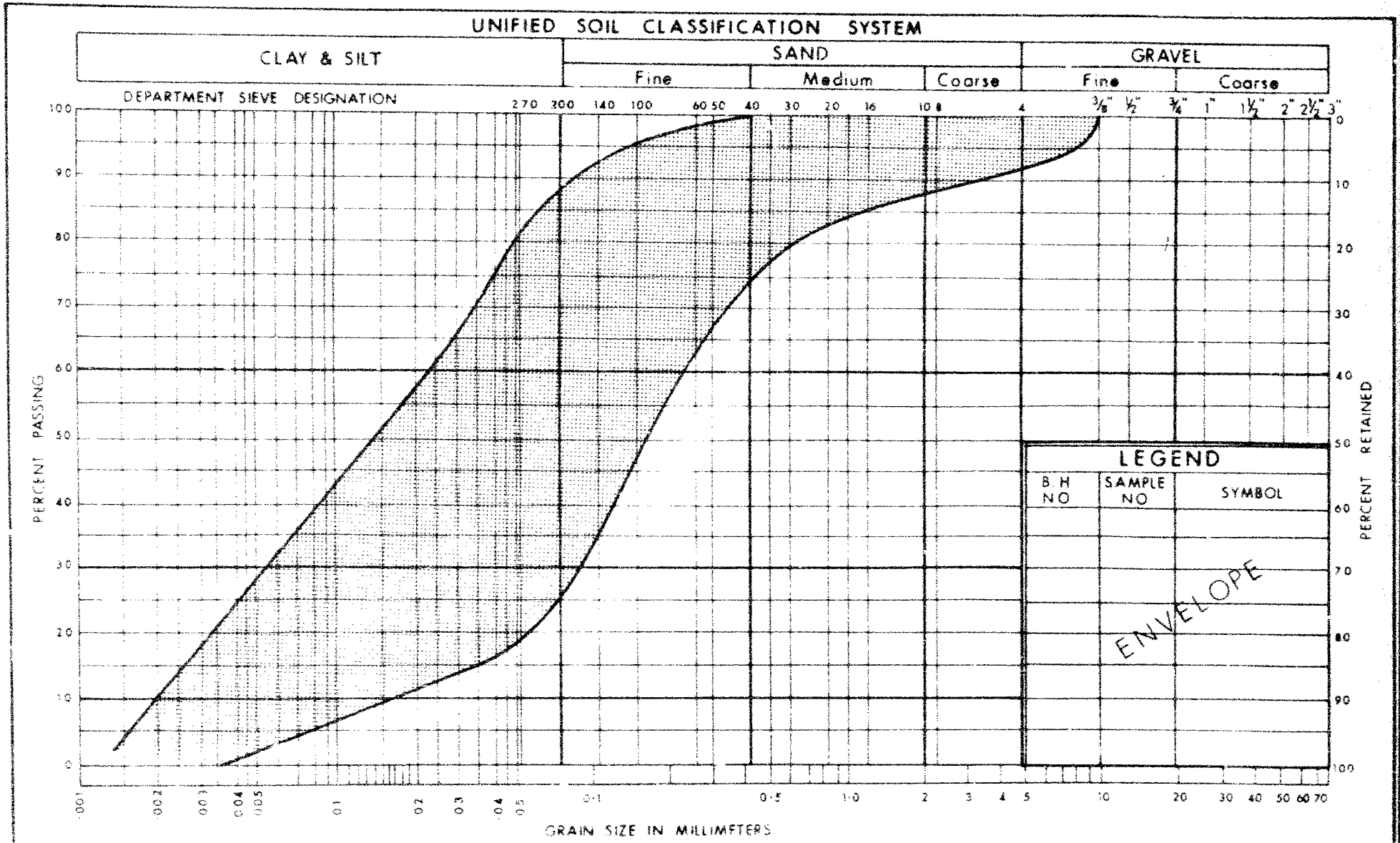
RECORD OF BOREHOLE No. 12

FOUNDATION SECTION

JOB 71-11012 LOCATION Sta. 134 + 13 o/s 16' Lt. Line A ORIGINATED BY SAA
W.P. 202-06-02 BORING DATE Feb. 20, 1971 COMPILED BY SAA
DATUM Geodetic BOREHOLE TYPE Standard Penetration Test CHECKED BY

ELEV. / DEPTH	DESCRIPTION	STRAT. PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT (20 40 60 80 100) / SHEAR STRENGTH P.S.F. (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × 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.
	Water									
577.5	River Bed Surface									
						570				
						560				
552.2										
25.3	End of Cone Test Probable Bedrock					550	100/4"			

FORM 08 MT - 1
REV. APR 1965



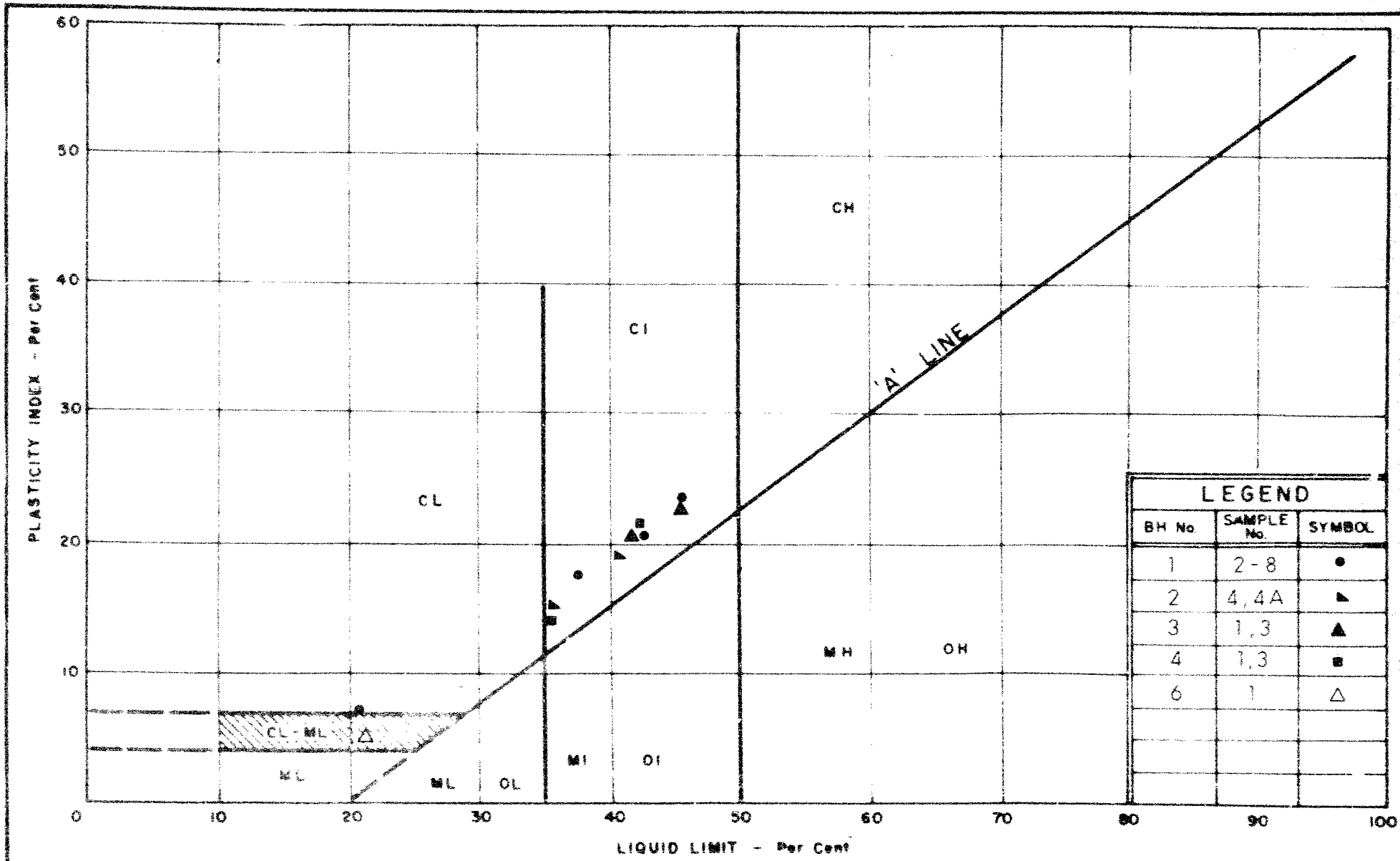
DEPARTMENT OF HIGHWAYS
MATERIALS and TESTING DIVISION

GRAIN SIZE DISTRIBUTION

SILTY SAND TO SANDY SILT
TRACE OF GRAVEL

W P No. 202-80-02
JOB No. 71-11012
FIG. NO. 1

FORM OB-MT 2
REVISED JULY, 1966



DEPARTMENT OF HIGHWAYS
MATERIALS and TESTING DIVISION

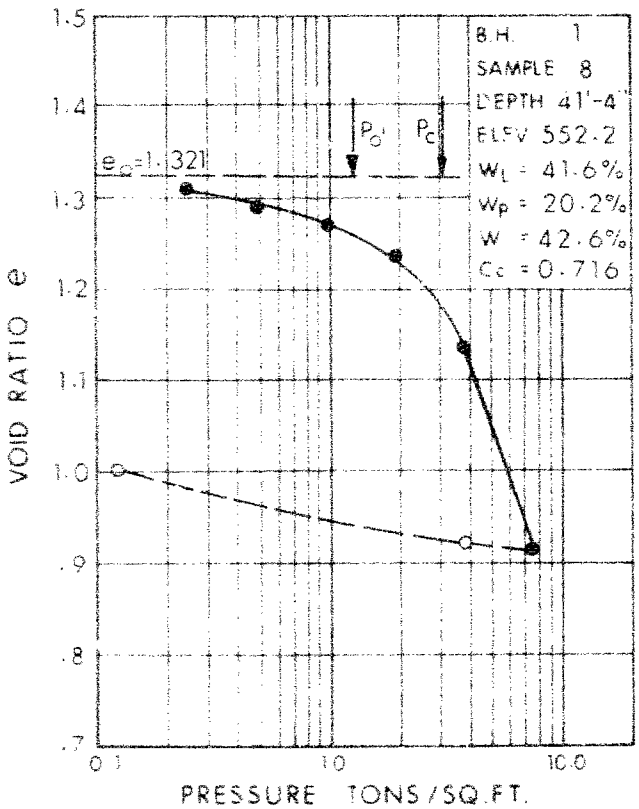
PLASTICITY CHART

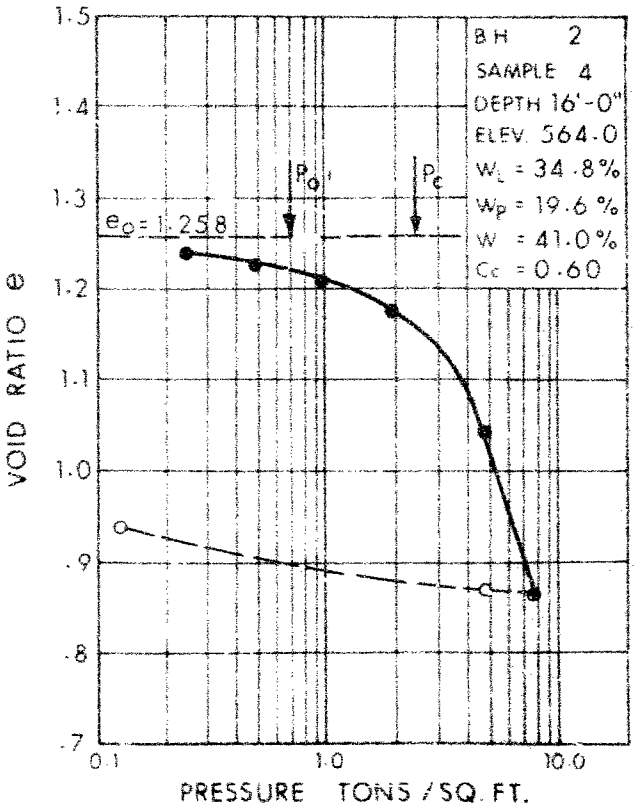
LAYERED SILTY CLAY

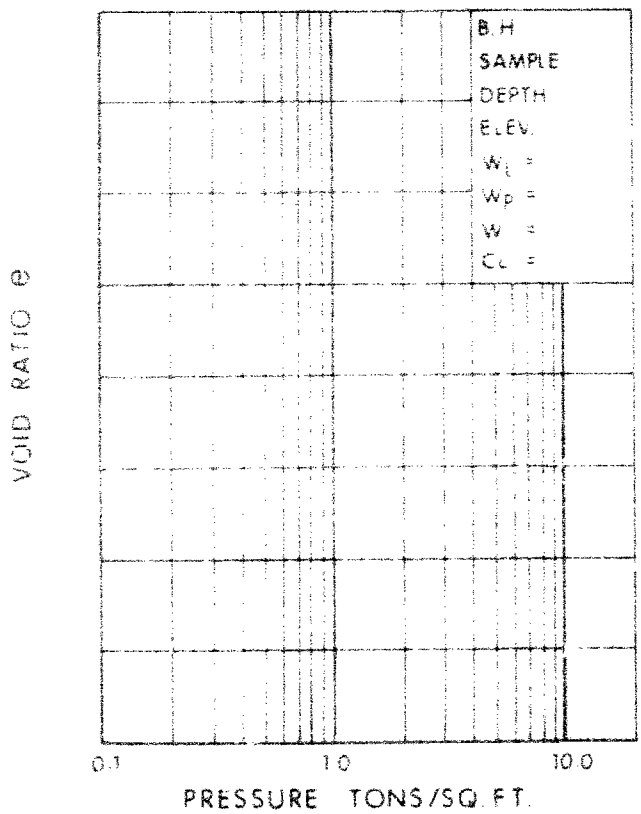
W.P. No. 202-66-02
JOB No. 71-11012
FIG. NO. 2

VOID RATIO – PRESSURE CURVES

JOB NO. 71-11012







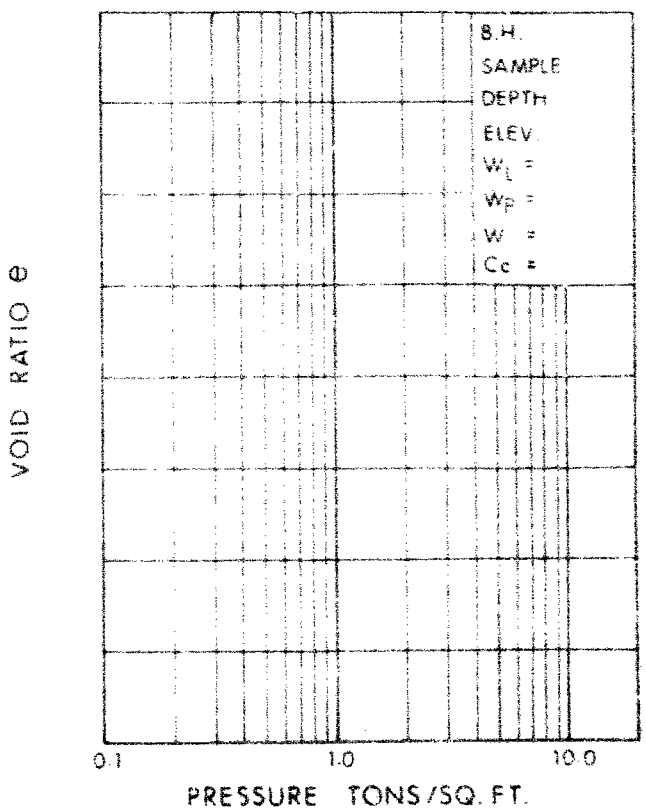


FIG. 3

SUMMARY OF PILE DRIVING RECORDS

W.O. 11-11012 W.P. 202-66 CONT. 73-84 DIST. 18

SITE BLIND RIVER

DATE DRIVEN SEPT. 25 - OCT 9/73 WEIGHT OF ANVIL 1300 lb

HAMMER TYPE DROP HAMMER WEIGHT 2800 lb ENERGY 28 000 FT/lb

LOCATION OF PILES	PILE				ESTIMATED TIP EL. (ft.)	DIFFERENCE Longer(+) Shorter(-) Than Estimated (ft.)	REMARKS
	TYPE	NO.	LENGTH (ft.)	TIP EL. (ft.)			
BENT # 1	No 1 CREOSOTE TIMBER	2	19.5	579.4	581	- 1.4	
-"- 2	-"-	6	21.6	577.2	578	+ 0.8	
-"- 3	-"-	6	34.8	564.0	570	+ 6	TO BEDROCK
-"- 4	-"-	4	41.0	557.1	563	+ 5.9	DRIVEN
-"- 7	-"-	4	53.3	544.8	545	+ 0.2	
-"- 8	-"-	4	56.3	543.7	545	- 1.7	

OVER

Form OR-ML-585
300 Pads — 61-6025

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION
FOUNDATION SECTION

302-66-52
11-11012

1.

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 5 CONTRACT NO. 73381 STRUCTURE BLIND RIVER

CONTRACTOR BAILEY CONSTRUCTION DESIGN LOAD OF PILE

HAMMER DETAILS: TYPE Drop Hammer WEIGHT 2800 LB HEIGHT OF FALL OR ENERGY 10'
WOODEN CUSHION ON STEEL

TYPE OF ANVIL OR CAP BOLTED HELMET WEIGHT OF ANVIL OR CAP 1300 LB

PILE DETAILS N°14 CREOSOTE TIMBER PILE 45.0

PILE NO. 4 LOCATION BENT N°4 STA 13346'2 DATE DRIVEN SEPT 26/73

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.
45.0	1			26	13		51			76	
	2	1		27	11		52			77	
	3	1		28	11		53			78	
	4	1		29	12		54			79	
	5	1		30	10		55			80	
	6	1		31	11		56			81	
	7	1		32	12		57			82	
	8	1		33	16		58			83	
	9	1		34			59			84	
	10	2		35			60			85	
	11	2		36			61			86	
	12	2		37			62			87	
	13	1		38			63			88	
	14	2		39			64			89	
	15	3		40			65			90	
	16	3		41			66			91	
	17	3		42			67			92	
	18	3		43			68			93	
	19	3		44			69			94	
	20	4		45			70			95	
	21	4		46			71			96	
	22	4		47			72			97	
	23	5		48			73			98	
	24	5		49			74			99	
	25	5		50			75			100	

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH						9
MEASURED REBOUND IN INCHES						

FINAL LENGTH OF PILE 41.0 FINAL CUT OFF ELEVATION 598.14

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER
MATERIALS & RESEARCH DIVISION
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS
TORONTO, ONTARIO

SIGNED D.R. Cameron
NAME (PRINT) D.R. CAMERON
DATE SEPT. 26/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12¾" O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12¾" x ½" steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

OVER

Form OB-ML-285
300 Pads — 61-8025

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION
FOUNDATION SECTION

2

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 13 CONTRACT NO. 73-84 STRUCTURE BLIND RIVER

CONTRACTOR BAILEY CONSTRUCTION DESIGN LOAD OF PILE

HAMMER DETAILS: TYPE DROP HAMMER WEIGHT 2800 lb. HEIGHT OF FALL OR ENERGY 10'

TYPE OF ANVIL OR CAP WOODEN CUSHION ON STEEL WEIGHT OF ANVIL OR CAP 1300 LB.

PILE DETAILS N° 14 CREOSOTE PILE

PILE NO. 6 LOCATION ABUT N° 3 STA 133+36 DATE DRIVEN Sept 27/73

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.
10	1	4	17	26	17		51			76	
20	2	1		27	10 IN 6"		52			77	
30	3	4		28	NOT TO BED		53			78	
40	4	4		29		ROCK	54			79	
50	5	4		30			55			80	
60	6	5		31			56			81	
70	7	7		32			57			82	
80	8	6		33			58			83	
90	9	7		34			59			84	
100	10	7		35			60			85	
110	11	8		36			61			86	
120	12	6		37			62			87	
130	13	7		38			63			88	
140	14	6		39			64			89	
150	15	5		40			65			90	
160	16	10		41			66			91	
170	17	10		42			67			92	
180	18	10		43			68			93	
190	19	5		44			69			94	
200	20	6		45			70			95	
210	21	5		46			71			96	
220	22	5		47			72			97	
230	23	8		48			73			98	
240	24	14		49			74			99	
250	25	13		50			75			100	

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH						10
MEASURED REBOUND IN INCHES						

FINAL LENGTH OF PILE 34.8 FINAL CUT OFF ELEVATION 598.81

REPORT TO BE SENT TO:- PRINCIPAL FOUNDATION ENGINEER
MATERIALS & RESEARCH DIVISION
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS
TORONTO, ONTARIO

SIGNED D.R. Cameron
NAME (PRIN.) D.R. CAMERON
DATE Sept 27/73
ATTACH SKETCH OF PILE NUMBERING SYSTEM

Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12¾" O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12¾" x ½" steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

OVER

3

Form OB-MIL-285
300 Pads — 61-6025

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION
FOUNDATION SECTION

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 18 CONTRACT NO. 73 B4 STRUCTURE Bund River

CONTRACTOR Bailey Construction DESIGN LOAD OF PILE

HAMMER DETAILS: TYPE Drop Hammer WEIGHT 2800 lb HEIGHT OF FALL OR ENERGY 10'

TYPE OF ANVIL OR CAP Wood on Steel WEIGHT OF ANVIL OR CAP 1300 LB.

PILE DETAILS No 1 Creosote Timber Pile Spec.

PILE NO. 6 LOCATION Bent No 2 Sta 133+10 DATE DRIVEN Sept. 28/73

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.
21.9	1			26			51			76	
	2	3		27			52			77	
	3	8		28			53			78	
	4	8		29			54			79	
	5	7		30			55			80	
	6	10		31			56			81	
	7	10		32			57			82	
	8	9		33			58			83	
	9	7		34			59			84	
	10	7		35			60			85	
	11	8		36			61			86	
	12	7		37			62			87	
	13	13		38			63			88	
	14	16 12 6"		39			64			89	
	15	Driven To		40			65			90	
	16	Bed Rock		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						16
MEASURED REBOUND IN INCHES						

FINAL LENGTH OF PILE 21.9 FINAL CUT OFF ELEVATION 598.83

REPORT TO BE SENT TO:- PRINCIPAL FOUNDATION ENGINEER
MATERIALS & RESEARCH DIVISION
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS
TORONTO, ONTARIO

SIGNED D.R. Cameron
NAME (PRINT) D. P. CAMERON
DATE Sept. 28/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12¾" O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12¾" x ½" steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

OVER

4

Form OB-ME-285
500 Pads — 51-6025

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION
FOUNDATION SECTION

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 18 CONTRACT NO. 73-84 STRUCTURE BLIND RIVER

CONTRACTOR BAILEY CONSTRUCTION DESIGN LOAD OF PILE

HAMMER DETAILS: TYPE DROP HAMMER WEIGHT 2800 LB HEIGHT OF FALL OR ENERGY 10'

TYPE OF ANVIL OR CAP STEEL WEIGHT OF ANVIL OR CAP 1300 LB.

PILE DETAILS No 14 CREOSOTE TIMBER PILE

PILE NO. 2 LOCATION BENT No 1 STA 132+89 DATE DRIVEN SEPT 28/73

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.
25 3	1	1		26			51			76	
	2	3		27			52			77	
	3	7		28			53			78	
	4	6		29			54			79	
	5	9		30			55			80	
	6	7		31			56			81	
	7	10		32			57			82	
	8	12		33			58			83	
	9	10		34			59			84	
	10	8		35			60			85	
	11	10		36			61			86	
	12	20		37			62			87	
	13			38			63			88	
	14	3 BLOWS TO 1"		39			64			89	
	15	PENETRATION		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						20
MEASURED REBOUND IN INCHES						

FINAL LENGTH OF PILE 19.5 FINAL CUT OFF ELEVATION 588.86

REPORT TO BE SENT TO:- PRINCIPAL FOUNDATION ENGINEER
MATERIALS & RESEARCH DIVISION
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS
TORONTO, ONTARIO

SIGNED D.R. Cameron
NAME (PRINT) D. R. CAMERON
DATE SEPT. 28/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12¾" O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12¾" x ½" steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

OVER

5

Form OR-ML-235
(4 Pads — 03-6025)

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION
FOUNDATION SECTION

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 18 CONTRACT NO. 73-84 STRUCTURE BLIND RIVER

CONTRACTOR BAILEY CONSTRUCTION DESIGN LOAD OF PILE

HAMMER DETAILS: TYPE DROP HAMMER WEIGHT 2805 LB HEIGHT OF FALL OR ENERGY 10'

TYPE OF ANVIL OR CAP WOODEN CUSHION ON STEEL WEIGHT OF ANVIL OR CAP 1300 LB.

PILE DETAILS N°14 CREOSOTE TIMBER PILES

PILE NO. 5 LOCATION BENT N°3 - SPAN 133+88 DATE DRIVEN OCT. 4/73

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.
45.1	1	- HEIGHT OF DROP		26	10	8'	51			76	
	2	-		27	11		52			77	
	3	5	2	28	15		53			78	
	4	6	3	29	13		54			79	
	5	6	3	30	17		55			80	
	6	8	3	31	18	8'	56	REDRIVING TO BED ROCK		81	
	7	5	4	32	15	10'	57	3.9' BELOW CUT OFF		82	
	8	6	4	33	14		58			83	
	9	5	5	34	17		59			84	
	10	5		35	24	10'	60			85	
	11	5		36	39	6 BLOWS TO 1" REFUSAL				86	
	12	5	5	37			62			87	
	13	5	6	38			63			88	
	14	5	6	39			64			89	
	15	5	7	40			65			90	
	16	5		41			66			91	
	17	5		42			67			92	
	18	5		43			68			93	
	19	5		44			69			94	
	20	6		45			70			95	
	21	6	8	46			71			96	
	22	6		47			72			97	
	23	5		48			73			98	
	24	6		49			74			99	
	25	6	8	50			75			100	

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	6 BLOWS TO 1 INCH = REFUSAL					
MEASURED REBOUND IN INCHES						
FINAL LENGTH OF PILE		FINAL CUT OFF ELEVATION		598.85		

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER
MATERIALS & RESEARCH DIVISION
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS
TORONTO, ONTARIO

SIGNED D.R. Cameron

NAME (PRINT) D. R. CAMERON

DATE OCT. 4/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12¾" O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12¾" x ½" steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

OVER

6

Form OB-ML-285
300 Pads — 61-6025

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION
FOUNDATION SECTION

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 18 CONTRACT NO. 73-64 STRUCTURE Blind River Hwy 557

CONTRACTOR [illegible] DESIGN LOAD OF PILE Bed Rock

HAMMER DETAILS: TYPE Drop WEIGHT 2 Ton HEIGHT OF FALL OR ENERGY 11

TYPE OF ANVIL OR CAP [illegible] WEIGHT OF ANVIL OR CAP [illegible]

PILE DETAILS Concrete F.R

PILE NO. 2 LOCATION West Pier DATE DRIVEN Oct 4/73

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

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	7	7	6			
MEASURED REBOUND IN INCHES						

FINAL LENGTH OF PILE FINAL CUT OFF ELEVATION 598.13

REPORT TO BE SENT TO:- PRINCIPAL FOUNDATION ENGINEER
MATERIALS & RESEARCH DIVISION
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS
TORONTO, ONTARIO

SIGNED R H Beemer
NAME (PRINT) R H BEEMER
DATE Oct 7/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12¾" O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12¾" x ½" steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

OVER

Form OB-ML-285
300 Pads — 61-6025

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION
FOUNDATION SECTION

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 1 CONTRACT NO. 73 81 STRUCTURE Blind River Hwy 557

CONTRACTOR Bailey Construction DESIGN LOAD OF PILE [illegible]

HAMMER DETAILS: TYPE Diesel WEIGHT 2 [illegible] HEIGHT OF FALL OR ENERGY 11

TYPE OF ANVIL OR CAP [illegible] WEIGHT OF ANVIL OR CAP 13 [illegible]

PILE DETAILS [illegible] Fin Barrel 1/16

PILE NO. 1 LOCATION Bent 3 Ballard 1/6 DATE DRIVEN Oct 3/73

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

FINAL LENGTH OF PILE 54.0 FINAL CUT OFF ELEVATION 592.07

REPORT TO BE SENT TO: - PRINCIPAL FOUNDATION ENGINEER
MATERIALS & RESEARCH DIVISION
DEPARTMEN OF HIGHWAYS
PARLIAMENT BUILDINGS
TORONTO, ONTARIO

SIGNED [signature]
NAME (PRINT) R H Beecher
DATE Oct 7/73

ATTACH SKETCH OF PILE NUMBERING SYSTEM

Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

Pile Details must include type, dimensions and weight per foot, details of shoe, and slope or batter: e.g. 12¾" O.D. steel tube x 0.251" @ [illegible] lbs. per ft. Vertical. 12¾" x ⅜" steel [illegible] shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.

OVER

Form OB-ML-285
300 Pads — 61-6025

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & RESEARCH DIVISION
FOUNDATION SECTION

BRIDGE CONSTRUCTION - PILE DRIVING RECORD

DISTRICT NO. 18 CONTRACT NO. 73-24 STRUCTURE Blind River Hwy 557

CONTRACTOR Bailey Const DESIGN LOAD OF PILE To Bed Rock

HAMMER DETAILS: TYPE Drop WEIGHT 2600 HEIGHT OF FALL OR ENERGY 11'

TYPE OF ANVIL OR CAP Steel Cap Wood Fill WEIGHT OF ANVIL OR CAP 1300

PILE DETAILS 14" Creosote Timber Jackpine (60' lgth)

PILE NO. 4 LOCATION Bent # 8 DATE DRIVEN Oct 10/73

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.
609	1	4	60	26	5		51			76	
	2	3		27	5		52			77	
	3	5		28	5		53			78	
	4	5		29	5		54			79	
	5	5		30	5		55			80	
	6	5		31	6		56			81	
	7	5		32	6		57			82	
	8	5		33	6		58			83	
	9	4		34	6		59			84	
	10	3		35	8		60			85	
	11	3		36	10		61			86	
	12	3		37	22		62			87	
	13	3		38	24		63			88	
	14	3		39	24		64			89	
	15	3		40	30		65			90	
	16	4		41	36		66			91	
	17	4		42	20		67			92	
	18	4		43	24		68			93	
	19	4		44	14		69			94	
	20	4		45	52		70			95	
	21	4		46			71			96	
	22	4		47			72			97	
	23	4		48			73			98	
	24	4		49			74			99	
	25	4		50			75			100	

DETAILS FOR FINAL SIX INCHES OF PENETRATION	1	2	3	4	5	6
BLOWS PER INCH	Last 6 inches	7-7 Blows / Inch			Hammer Refusal	
MEASURED REBOUND IN INCHES						
FINAL LENGTH OF PILE 54.3		FINAL CUT OFF ELEVATION 592.04				

REPORT TO BE SENT TO:- PRINCIPAL FOUNDATION ENGINEER
MATERIALS & RESEARCH DIVISION
DEPARTMENT OF HIGHWAYS
PARLIAMENT BUILDINGS
TORONTO, ONTARIO

SIGNED R H Geemel
NAME (PRINT) R.H. GEEMEL
DATE Oct. 12/73
ATTACH SKETCH OF PILE NUMBERING SYSTEM

Notes:-

In general this form should be completed for every tenth pile in a group, but at least one is required for every pier and abutment.

Piles driven vertically should be selected where possible.

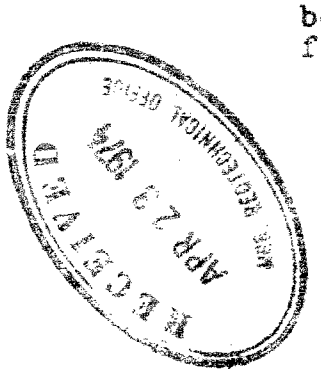
Pile Details must include type, dimensions and weight per foot, details of shoe, and slope of batter: e.g. 12¾" O.D. steel tube x 0.251" @ 33 lbs. per ft. Vertical. 12¾" x ½" steel plate shoe.

Details for the final six inches of penetration must be completed for all piles except in the case of an end bearing pile driven to bedrock. Final length of pile, and final cut off elevation must always be given.

The total length being driven is the full length of the pile and remains unchanged until a length is cut off or spliced on.

The penetration in blows per foot must be recorded for every foot of penetration of the pile.

Measured rebounds recorded on this form must be the average for each individual inch for the final six inches of penetration.



FIELD RECONNAISSANCE REPORT
REQUIRED BY FOUNDATION SECTION
FOR

70-11-012

FF-69
SEPT. 1968

W.P. NO. 202-66-02 HIGHWAY NO. 557 DISTRICT 17 SITE PLAN NO. E4497-1 PROFILE NO. _____
RIVER CROSSING ☒ GRADE SEPERATION ☐ R.R.X. ☐ OTHER (SPECIFY) _____
ALTERNATE SCHEME (IF ANY) none

EXISTING SITE CONDITIONS

DESCRIPTION:

TOPOGRAPHY: HILLY ☐ ROLLING ☒ VALLEY ☐ GULLIED ☐ FLAT ☐
VEGETATION: TREES ☒ BRUSH ☒ GRASS ☐ SWAMP ☐ FARM CROPS ☐ CLEARED ☐
SNOW COVER: 0"-6" ☐ 6"-12" ☐ >12" ☒
ROCK OUTCROP (SPECIFY LOCATIONS) _____

UNDERGROUND UTILITIES: UTILITY COMPANY TELEPHONE NO. FOR DEFINITE LOCATION

1 _____
2 _____
3 _____
4 _____
5 _____

EXISTING STRUCTURE(S):

FOUNDATIONS: SPREAD FOUNDATIONS ☐ SIZE _____ ELEVATION(S) _____
PILES ☒ TYPE Timber LENGTH(S) not known
DESIGN LOAD _____ (S.S.) _____ TONS/PILE
CONDITION OF STRUCTURE poor Bailey Reinforced

APPROACHES: CUT ☐ FILL ☒ SIDE SLOPES $1\frac{1}{2}$:1
BERMS YES ☐ NO ☒

OTHER OBSERVATIONS (USE BACK OF SHEET TO DESCRIBE ANY FAILURES IN AREA, PAST PERFORMANCE OF EXISTING APPROACHES & STRUCTURE, ETC.)

ACCESSIBILITY

IS STRUCTURE LOCATED ON D.H.O. RIGHT OF WAY? YES ☐ NO ☒ IF NO,
HAS PERMISSION BEEN OBTAINED TO ENTER PROPERTY? YES ☐ NO ☒ IF NO,
PROPERTY OWNER(S):

	NAME	ADDRESS	TELEPHONE NO.
1	W. Mallette	S.E. of crossing	
2			
3			
4			

WHO WILL OBTAIN NECESSARY PERMISSION? Foundation Project Eng.
HAS SITE BEEN SURVEYED & STAKED? YES ☐ NO ☐ IF YES, DATE OF MOST RECENT SURVEY January, 1969
WILL CLEARING BE NECESSARY TO ENTER SITE AREA? YES ☒ NO ☐ on west side
IS SITE ACCESSIBLE TO WHEELED VEHICLES? YES ☒ NO ☐

IF RIVER CROSSING:
WILL A RAFT BE NECESSARY? YES ☒ NO ☐ if ice not thick enough IF YES, GIVE MAX. DEPTH OF WATER 9/10' FT.
CURRENT: SWIFT ☐ MODERATE ☐ SLOW ☒

DRILLING OPERATIONS

NEAREST SOURCE OF WATER (GIVE HAULING DISTANCE, IF KNOWN) at site
ADDITIONAL INVESTIGATION REQUIRED FOR THE FOLLOWING PURPOSES:
ALTERNATE SCHEME: YES ☐ NO ☒ IF YES, SPECIFY _____
HYDROLOGIC REASONS: YES ☐ NO ☐ IF YES, SPECIFY (SCOUR, ETC.) holes necessary in river to determine bed material

REMARKS

NEAREST AVAILABLE ACCOMODATION: Blind River
OTHER COMMENTS: It is most unlikely that survey stakes from 1969 are still in place. New Line 'A' can be located relative to existing structure

DATE February 3/71
REGIONAL BRIDGE LOCATION ENGINEER J. C. McAllister

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. Stermac
Principal Foundation Engineer
Materials & Testing, Downsview

From: Bridge Planning
North Bay

Date: February 4, 1971

Our File Ref.

In reply to

Subject: WP 202-66-02 BS 38-238
Blind River Bridge
Sec. Rd. 557, Distr. #17

78-11-012

The above structure has been programmed for replacement and will require a foundation investigation.

Attached are two prints of site plan E4497-1 showing the proposed revision line and grade and the probable limits of the structure.

Two types of structure have been considered for this crossing:

(a) Three spans, 30'/50'/30', with capped steel pile piers and concrete beams.

(b) Timber pile bents, six spans 22' each with composite laminated timber concrete deck.

The latter would seem more feasible because of economy and location.

Should you require any further information please do not hesitate to call.

J. C. McAllister
Regional Bridge
Planning Supervisor

JCMcA/pc
c. c. - R. Murphy

BLIND RIVER OVERPASS MAR 4,1971 71-11012 RUN DATE MAR 05, 1971

SLICES	X-INIT.	Y-INIT.	DELX	DELY	TANG. S.L.	INCR.	NO. P	TENSION CRACK	NO. PTS.≯-X<	NO. PTS.≯&X<	CUT-OFF≯-X<	CUT-OFF≯&X<
25	15	-15	4.0	4.0	22.0	5.0	8	3.00	1	2	-100.0	300.0

X COORD	Y COORD	X COORD	Y COORD	X COORD	Y COORD	X COORD	Y COORD	X COORD	Y COORD	X COORD	Y COORD
-100.00	0.0	20.00	10.00	300.00	10.00						

SECTIONAL DETAILS

SECTION	X COORD	SOIL TYPE	Y COORD	WATER TABLE
1	-100.00	1	0.0	13.00
1		2	10.00	
1		3	13.00	
1		4	20.00	
2	20.00	1	0.0	13.00
2		2	10.00	
2		3	13.00	
2		4	20.00	
3	300.00	1	0.0	13.00
3		2	10.00	
3		3	13.00	
3		4	20.00	

SOIL PROPERTIES

SOIL TYPE	COHESION	PHI	BULK DENSITY	SUBMERGED DENSITY
1	0.	30.0	120.0	58.0
2	0.	30.0	120.0	58.0
3	0.	30.0	58.0	58.0
4	300.	0.0	48.0	48.0

CRITICAL CIRCLE

RADIUS	XC	YC	F. OF S.
19.00	15.00	1.00	1.979
23.00	15.00	-3.00	1.988
23.00	19.00	-3.00	2.042
27.00	19.00	-7.00	2.076
27.00	15.00	-3.00	2.087
19.00	11.00	1.00	2.094
23.00	11.00	-3.00	2.124
31.00	19.00	-11.00	2.146
31.00	15.00	-11.00	2.178
27.00	11.00	-7.00	2.211

BLIND RI BR (LONGITUDINAL) MAR 16/71 71-11012 RUN DATE MAR 17, 1971

SLICES	X-INIT.	Y-INIT.	DEL X	DEL Y	TANG.	R.L.	INCR.	NO. R	TENSION CRACK	NO. PTS.%-X<	NO. PTS.%&X<	CUT-OFF%-X<	CUT-OFF%&X<
20	25	-5	4.0	4.0	20.0		4.0	5	7.00	1	2	-100.0	300.0

X COORD	Y COORD	X COORD	Y COORD	X COORD	Y COORD	X COORD	Y COORD	X COORD	Y COORD	X COORD	Y COORD
-100.00	0.0	40.00	20.00	300.00	20.00						

SECTIONAL DETAILS

SECTION	X COORD	SOIL TYPE	Y COORD	WATER TABLE
1	-100.00	1	0.0	10.00
1		2	10.00	
1		3	20.00	
1		4	60.00	
2	40.00	1	0.0	10.00
2		2	10.00	
2		3	20.00	
2		4	36.00	
3	120.00	1	0.0	10.00
3		2	10.00	
3		3	20.00	
3		4	20.00	
4	300.00	1	0.0	10.00
4		2	10.00	
4		3	20.00	
4		4	20.00	

Longitudinal direction

SOIL PROPERTIES

SOIL TYPE	COHESION	PHI	BULK DENSITY	SUBMERGED DENSITY
1	0.	30.0	125.0	62.0
2	0.	30.0	62.0	62.0
3	800.	0.0	48.0	48.0
4	0.	30.0	62.0	62.0

CRITICAL CIRCLE

RADIUS	XC	YC	F. OF S.
41.00	29.00	-21.00	1.284
33.00	25.00	-13.00	1.287
25.00	21.00	-5.00	1.308
45.00	29.00	-25.00	1.330
37.00	25.00	-17.00	1.336
29.00	21.00	-9.00	1.353
41.00	25.00	-21.00	1.390
21.00	17.00	-1.00	1.409
33.00	21.00	-13.00	1.410
45.00	25.00	-25.00	1.448

Department of Highways Ontario
Copy for the information of

A. Stermac

~~J.C. McAllister,~~
Reg. Bridge Planning Supervisor,
North Bay Regional Office.

Structural Office,
West Building,
Downsview.

November 12, 1971.

Blind River Bridge,
Mississagi Indian Reserve,
W.P. #282-66, 02 Site #38-238,
<u>Hwy. No. 557, District No. 17.</u> 71-11-012

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-7033-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is $80,000.00 which includes tender, materials, engineering and sundry construction.

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

C.S. Grebski,
Structural Design Engineer.

CSG:sr
Attach.

c.c. A. McKim
B. Davis
A. Stermac (2)
J. Anderson
R. Murphy.

[illegible]

V. Koela
[illegible]

M. Donata
Nov 22/71

DEPARTMENT OF [redacted]ANSPORTATION AND COM[redacted]UNICATIONS

MEMORANDUM

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

FROM: Structural Office,
West Bldg., Downsview.

ATTENTION:

DATE: January 24, 1972.

OUR FILE REF.

IN REPLY TO

SUBJECT:

Re: Blind River Bridge,
W.P. #202-66-02, Site 38-238,
Hwy. No. 557, District #17.

71-11-012

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,
Structural Design Engineer.

CSG/sr

c.c. Foundation Office

Pile lengths are not detailed on the final bridge drawings

Do Not [illegible]

N. Donata
Jan 28/72

J.W

202-66-02

71-11012

Foundation Report by: SHAHEEN AHMAD

Review of Design Drawings by: SHAHEEN AHMAD

Design Drawing No.'s.: 39-238-1

1. Does footing design comply with our report or subsequent memos? YES

2. If answer to 1. is No, is present design acceptable? N/A

3. Has sufficient field work been done? YES

4. Are estimated pile lengths shown on Drawings correct? N/A PILE LENGTHS ARE NOT GIVEN. ONLY TOLD TO DRIVE TO BEDROCK.
If not, make a new list.

5. If excavation of unsuitable soil is recommended, is this shown on Drawings? N/A

6. Are approaches designed in accordance with our report? Check slopes and berm lengths. YES

7. Do you anticipate any construction problems? i.e. dewatering, stability of temporary slopes or excavations. No.

8. Summarize your comments; on separate sheet if necessary.

It Appears that line 'A' has been adopted, but pile cut-off elevation for all other lines are shown.

Test O.K.

Drawings received JANUARY 26, 1972

Returned JANUARY 26, 1972

Shaheen Ahmad

ONTARIO

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

MINISTER: HONOURABLE GORDON CARTON, Q.C. DEPUTY MINISTER: A.T.C. McNAB

PARLIAMENTARY ASSISTANT: WILLIAM NEWMAN, M.P.P.

P. O. Box 500
Sault Ste. Marie, Ontario
P6A 5M6
October 10th, 1973

CM 73-84

Bailey Construction Co. Ltd.
P. O. Box 700
ORILLIA, Ontario

73-84

38-238

ATTENTION: J. F. Alexander
President

Dear Sir:

Contract 73-84
RE: Blind River Bridge, Hwy. 557
District 18 - SAULT STE. MARIE

At the present date, we require splicing on six piles on the above-noted Contract.

This consists of five piles which were driven to bedrock and below original cut-off elevation and one pile broken during unloading operations.

We will be supplying the tubular steel for splicing, and the cut-offs from the remaining piles will be used for the required extensions.

Would you please submit, at your earliest convenience, a quotation for splicing piles, in units of "each".

This work will include the following:

(1) Cutting, shaping, and nibbing down the wooden piles at the top and bottom ends for the fitting of the tubular steel splice.

(2) Cutting the tubular steel into 6' lengths for splicing.

(3) The additional wire reps at the wood shoulder projections at either end of the tubular steel splice.

.....Continued

Bailey Constuction Co. Ltd. October 10th, 1973

(4) The drilling of 3/4" ϕ holes (six per splice) for spiking through the steel into the pile and pre-drilling of matching 1/2" holes in the pile to avoid splitting.

(5) Any necessary hot creosoting required at the splices.

(6) The application of coppers bitumastic paint supplied by H.T.C.

(7) Any ancillary tools and equipment, including pile driver, which is required to satisfactorily complete the splicing operation to the satisfaction of the engineer, and in accordance with the contract specifications.

A sketch regarding splicing details will be forwarded at a later date.

Total pile lengths in place, including lengths of splice, will be paid by unit under Item 18 of the Contract.

Yours truly,

C. D. McLure
Construction Supervisor

for D. Aspinwall
District Construction Engineer

CDMcL//tu

FORM 58-P-3 REVISED
71-4825

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS

C 2096

PURCHASING REQUISITION

TO – PURCHASING OFFICE

SHIP TO: Bailey Construction Co. Ltd. (NAME) AT: M.T.C. Yard in Blind River (DELIVERY POINT)

SHIP VIA Truck

CONTRACT NO. OR PROJECT NO. 73-84 REQUIRED FOR HIGHWAY NO. 557

W.O. NO. W.P. 202-66-02 TYPE OF WORK Blind River Bridge Site # 38-238

QUANTITY	UNITS	DESCRIPTION	THIS COLUMN FOR USE OF PURCHASING OFFICE
Supply and deliver Steel Tube Piling for Blind River Bridge as follows:			
20	Lin.ft.	14" O.D. with a ~~xxxx~~ nominal minimum wall ~~thickness of 0.250", to be supplied as follows:~~	
		~~1 pc. 20 feet long~~	
		~~Pile shall conform to the A.S.T.M. Specification~~	
		~~A252-6) for Grade 2 welded and seamless steel pipe~~ piles	
Delivery: Urgently required, ship as soon as possible.			
Confirming verbal order from Mr. K.C. Howe, to Mr. H.B. Sheppard ~~on October 9, 1973.~~			

THIS SECTION FOR PURCHASING OFFICE USE ONLY

FEDERAL SALES TAX	ONT. RETAIL SALES TAX	TERMS	F.O.B.	DELIVERY	REFERENCE

PURCHASING OFFICE USE ONLY

APPROVED

ORDER FROM ~~Cappco Pipe Piling Ltd.~~

ADDRESS

ORDERED BY

ORDER NO. DATE

DISTRICT OR SECTION ~~#18, Sault Ste. Marie~~

DATE ~~October 9~~ OCT 11 1973 1973

SIGNATURE DISTR. ENG. OR AUTHORIZED EMPLOYEE G.E. French

NOTE. WHERE NECESSARY, THIS REQUISITION SHOULD BE ACCOMPANIED BY NOT LESS THAN THREE BIDS FROM LOCAL DEALERS.

J. Kuprevicius C.C.

C. C. %

SETTLEMENT COMPUTATIONS

Settlement after 1 year

$U_v = 1.13\sqrt{T_v}$ $\quad T = \frac{d^2 T_v}{c_v}$ $\quad \therefore T_v = \frac{t\, c_v}{d^2}$

$= \frac{1 \times 365 \times 24 \times 60 \times 0.049}{40 \times 40 \times 144} = .112$

$U_v = 1.13\sqrt{.112} = 1.13 \times 0.335 = 37.8\%$

settlement after 1 year $= 0.378 \times 8 = 3''$

after 3 years $T_v = \frac{3 \times 365 \times 24 \times 60 \times 0.049}{40 \times 40 \times 144} = .336$

$U_v = 1.13\sqrt{.336} = 1.13 \times 0.582 = .658$

Settlement $= 0.658 \times 8 = 5.25''$

after 6 years $T_v = .672$ $\quad \therefore U_v = 1.13\sqrt{.672} = 1.13 \times 0.82$

$= 0.925$

$\therefore$ Settlement $= 0.925 \times 8 = 7.4$ inches

SETTLEMENT COMPUTATIONS

LAYER	DEPTH OF LAYER	DEPTH TO CENTRE OF LAYER	THICKNESS OF LAYER	INITIAL PRESSURE	PRESSURE DUE TO LOAD	e_1	e_2	$\frac{e_1 - e_2}{1+e_1}$	Settlement
1	10 - 23	17	13	0.7165	0.575	1.220	1.200	0.009	.117
2	23 - 36	30	13	1.0285	0.500	1.210	1.192	0.0082	.107
3	36 - 50	42	14	1.3165	0.425	1.258	1.186	0.032	0.440

.664 ft

= 8 inches.

After applying for Bjerrum - Skempton Correction for a preconsolidated soil Settlement is about 6 inches

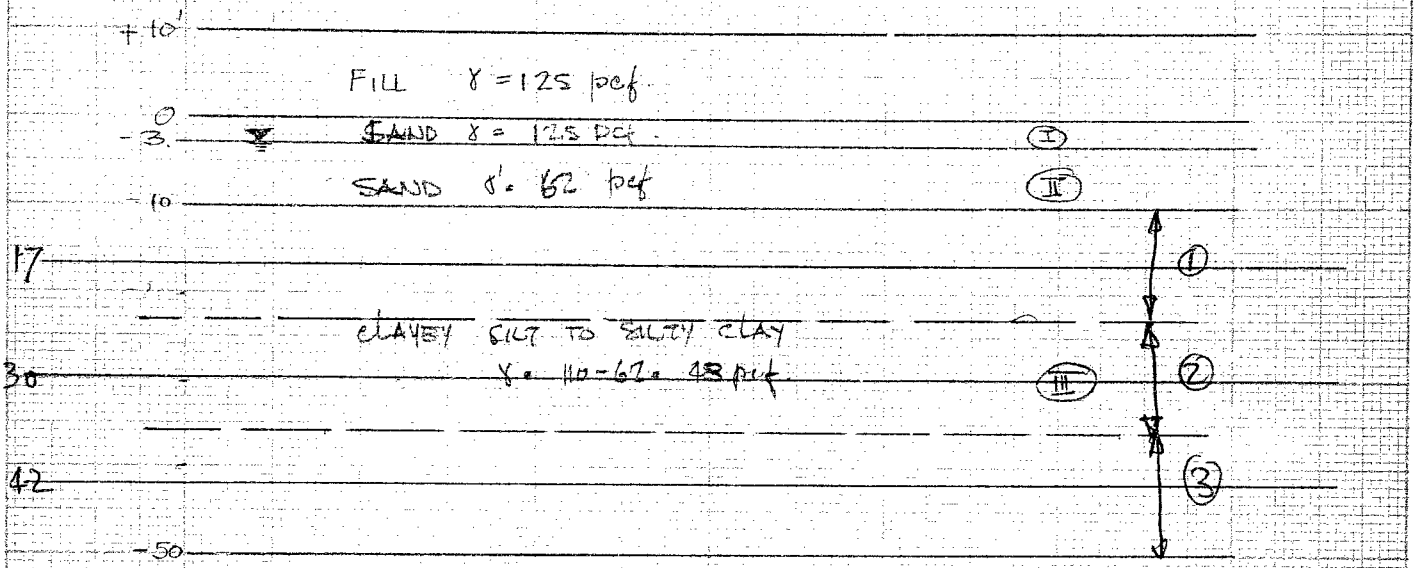
$T_v = 0.848$

$C_v = 0.049$ sq ins/min

$d = 40$ feet.

$T_v = \frac{c_v t}{d^2}$

$\therefore t = \frac{d^2 T_v}{C_v} = \frac{40 \times 40 \times 848 \times 144 \times 100}{0.049 \times 60 \times 24 \times 12} = 3260 - 9$ YRS.


+10'
FILL γ = 125 pcf
0
-3
SAND γ = 125 pcf
I
SAND γ = 62 pcf
II
-10
17
CLAYEY SILT TO SILTY CLAY
γ = 110-62 = 48 pcf
III
30
42
-50
1
2
3

DEPARTMENT OF HIGHWAYS — ONTARIO

MATERIALS AND TESTING OFFICE

VISUAL CLASSIFICATION SHEET

PROJECT 71-11012 SITE Hwy 557 & Blind River 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	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	5'-0" 6'-6"	-	-		100	-	Low	Dull	Quick		Earthy	Grey	Slow	Loose	Uniform Sand	SW
2	10'-0" 11'-6"	-	-	-	-	100	Med	Dull	Slow		"	"	"	Soft	Clayey silt to silt	CL-ML
5	25'-0" 26'-6"	-	-	-	-	100	Med	"	Medium		"	"	"	Loose	Silt to clayey silt	ML-CL
10	50'-0" 51'-6"	-	-	-	-	100	"	"	"		"	"	"	"	Silt	ML
11	55'-0" 56'-6"	-	-	5	60	35	Low	"	Quick		"	"	"	V. Dense	~~Sand~~ Silty sand with some gravel.	SW

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

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO

MATERIALS AND TESTING OFFICE

VISUAL CLASSIFICATION SHEET

PROJECT 71-11012 SITE _____ 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	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	3'-0" 4'-6"	-	-		65	35	Low	Dull	Quick	-	Earthy	Grey			SILTY SAND.	SF
7	30'-0" 31'-6"	1/8	SUB ROUNDED	3	15	72	"	"	"		"	Grey			SANDY SILT WITH TRACE OF GRAVEL	ML
8	35'-0" 36'-6"	1½"	BOULDER									RED & GREY			BOULDERS	

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

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO

MATERIALS AND TESTING OFFICE

VISUAL CLASSIFICATION SHEET

PROJECT 71-11012 SITE Hwy 557 E Blind River BOREHOLE No. 3 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	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	3-0" 4'6"	-	-	-	-	100	High	Dull	Slow	—	Earthy	Grey	Slow		CLAYEY SILT	CL
5	15-0 16½'	-	-	-	35	65	Low	Dull	Quick		"	"	"		SANDY SILT	ML
6	20-0 21-0"	-	-	30	50	20	Low	"	"		"	"	"		SAND & GRAVEL	

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

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO

MATERIALS AND TESTING OFFICE

VISUAL CLASSIFICATION SHEET

PROJECT 71-11012 SITE Hwy 557 & 3 Und BOREHOLE No. 4 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	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	3-4½		—			100	High	Dull	Slow		Earthy	Grey	Slow		Clayey Silt	CL
4	12'3½		—			100	Low	"	Quick		"	"	"		Silt	ML

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

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO

MATERIALS AND TESTING OFFICE

VISUAL CLASSIFICATION SHEET

PROJECT 71-11012 SITE HWY 557 & BLIND RIVER BOREHOLE No. 5 GROUND ELEVATION

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	0-2'	–	–		85	15	LOW	DULL	QUICK		EARTH ORG.	GREY			UNIFORM SAND, TRACE OF ORGANIC	SU
2	2-3½'	–	–	–	–	100	"	"	"		EARTHY	"			SILT	ML
3	3½-5'	–	–	–	–	100	"	"	"		"	"			SILT	

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

REMARKS:–

DEPARTMENT OF HIGHWAYS — ONTARIO

MATERIALS AND TESTING OFFICE

VISUAL CLASSIFICATION SHEET

PROJECT 71-1101 2 SITE Hwy 557 & Blind River BOREHOLE No. 6 GROUND ELEVATION

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION: LARGEST GRAIN SIZE	SHAPE	PERCENTAGE: GRAVEL	SAND	SILT & CLAY	DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
1	3'-0" 3'-6"	-	-	-	20	80	Low	Dull	Quick	-	Earthy	Grey Brown			SILT TO SANDY SILT	ML
1A	3'-0" 4'-6"	-	-	-	80	20	"	"	"		"	Grey Brown			SAND WITH SOME SILT	SM
2	6'-0" 7'-6"				85	15	"	"	"		"	"			UNIFORM SAND	SP
3	9'-0" 9'-4"				85	15	"	"	"		"	"			SAND WITH SOME GRAVEL	SW

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

REMARKS:—