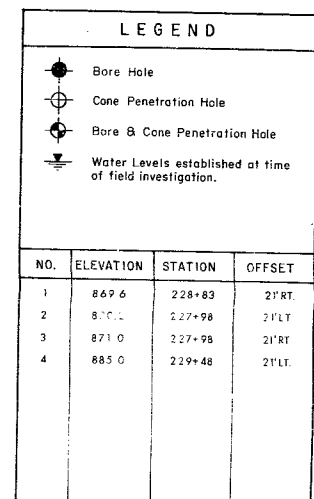


#67-F-8

W.P.# 152-63

Hwy. #4

LITTLE AUSABLE
RIVER



- NOTE -

The boundaries between soil strata have been established only at Sore Hole locations. Between Sore Holes the boundaries are assumed from geological evidence and may be subject to considerable error.

[illegible]

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

LITTLE AUSABLE RIVER

KING'S HIGHWAY NO. 4 PROPOSED REVISION DIST. NO. 2
CO. MIDDLESEX
TWP. BIDDULPH LOT 2 CON. II S.L.R.

BORE HOLE LOCATIONS & SOIL STRATA

SUBMD A.C.C.	CHECKED <i>WJ</i>	W.P. NO. 152-63	M.B.T. DRAWING NO. 67-F-8A
DRAWN B.S.	CHECKED <i>WJ</i>	JOB NO. 67-F-8	
DATE MARCH 6/67.		SITE NO	
APPROVED <i>A.P. Norman</i>	CONT. NO.		

REF. NO. E-4373-1

MEMORANDUM

TO: Mr. B. R. Davis,
Bridge Engineer,
Bridge Division.

FROM: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Attention: Mr. S. McCombie

DATE: March 7, 1967
MAR - 8 1967

OUR FILE REF.

IN REPLY TO:

SUBJECT:

FOUNDATION INVESTIGATION REPORT

For

Proposed Crossing

At Little Ausable River and Hwy. #4,
County of Middlesex, Twp. of Biddulph,
Lot 2, Con. II, District No. 2(London)
W.J. 67-F-8 -- W.P. 152-63

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/MdeF

Attach.

cc: Messrs. B. R. Davis (2)
H. A. Tregaskes
D. W. Farren
A. Gater
H. Dernier
A. P. Watt
J. Roy
B. A. Singh

Foundations Files
Gen. Files ✓

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

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 - 4.5) Sandy Silt to Silty Fine Sand with a Trace of Gravel.
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FOUNDATION INVESTIGATION REPORT
For

Proposed Crossing
At Little Ausable River and Hwy. #4,
County of Middlesex, Twp. of Biddulph,
Lot 2, Con. II, District No. 2(London).
W.J. 67-F-8 -- W.P. 152-63

1. INTRODUCTION:

A request to carry out a foundation investigation for the proposed new bridge at the crossing of Hwy. #4 and Little Ausable River, was received from Mr. A. P. Watt, Regional Bridge Location Engineer, in a memo dated January 12, 1967.

An investigation was subsequently carried out by this Section to determine the subsoil conditions existing at the site of the proposed bridge.

This report contains the results of our field and laboratory investigation, together with our recommendations for the foundations of the new structure.

2. DESCRIPTION OF SITE:

The site is located in the County of Middlesex, Twp. of Biddulph, Lot 2, Con. II, approximately 4.3 miles northwest of the junction of Hwy. 7. It is situated in the valley of the Little Ausable River. The valley bottom is approximately 100 feet below the surrounding flat to gently undulating countryside.

About 6 feet above the bottom of the valley is a flat terrace of sandy gravel. This has been worked as a gravel pit to the northeast of the existing bridge. Within the valley, only thorn and apple trees are growing. Above it, the land is used for general farming.

cont'd. /2 ...

2. DESCRIPTION OF SITE: (cont'd.) ...

The existing bridge is a 3-span, reinforced concrete structure having an amply supported bowstring girder for the main span and two shorter simple beam and slab approach spans. The concrete is in poor condition and shows a great deal of spalling. No signs of scour are evident at the existing footings.

Physiographically, the area borders on the junction of the regions known as the "Horseshoe Moraines" and the "Stratford Till Plain". Locally, it is known as the "Lucan Moraine".

3. FIELD AND LABORATORY WORK:

Four sampled boreholes and eight dynamic cone penetration tests were carried out during the course of the field work. Boring was achieved by means of a conventional diamond drill adapted for soil sampling purposes. A driving energy of 350 ft.-lbs. per blow was used for the dynamic cone penetration tests.

Samples were recovered using a 2-inch O.D. split-spoon sampler driven according to the specifications of the Standard Penetration Test.

Samples were visually examined in the field and subsequently in the laboratory. Laboratory tests were carried out on selected samples to determine Atterberg Limits, grain-size distribution and natural moisture contents, where applicable.

The results of the laboratory and field tests are summarized in the Record of Borehole sheets which are contained in the appendix to this report.

The locations and elevations of the boreholes were determined by the South-Western Region, London, Engineering Surveys Division, and are given on Dwg. No. 67-F-8A, which is also contained in the report appendix.

cont'd. /3 ...

4. SUBSOIL CONDITIONS:

4.1) General:

The subsoil on the west side of the valley consists of a shallow surficial deposit of very dense silty sand and gravel overlying a hard deposit of clayey silt with some sand and gravel and occasional boulders. This latter deposit appears as the surficial layer on the west bank of the river to 7.5 ft. depth. Here, it is underlain by about 17 ft. of very dense sandy silt to silty fine sand with a trace of gravel. The lowest deposit encountered, was very dense silty sand and gravel.

On the east bank of the river, the surficial layer was very dense silty sand and gravel to a depth of 20 feet. This is underlain by very dense sandy silt to silty sand with a trace of gravel. The lowest deposit intersected, was also very dense silty sand and gravel.

Due to difficulties of access, it was not possible to drill a borehole at the proposed location of the west abutment. However, due to the fact that only very dense granular subsoil was encountered in boreholes No's 1 and 2 in the valley floor, it is considered that similar materials would be found at this location.

The boundaries between the different deposits are shown on the attached record of Borehole sheets.

The estimated stratigraphical profiles shown on Drawing No. 67-F-8A, are based upon this information. From ground level downwards, the different soil deposits are described as follows:

4.2) Silty Sand and Gravel:

This deposit was only intersected in borehole No. 4 where it was 5.0 ft. thick. It consisted of a very dense, well graded sand and gravel mixture. The 'N' value (No. of blows/ft. in the Standard Penetration Test) was 56 blows/ft.

cont'd. /4 ...

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

4.2) Silty Sand and Gravel: (cont'd.) ...

The grain-size distribution was found to be: gravel 47%, sand 40%, silt and clay 13%.

At the bottom of this deposit there appeared to be a layer of boulders and coarse gravel.

4.3) Clayey Silt with some Sand and Gravel and occasional Boulders:

This deposit was of hard consistency, having 'N' values which ranged from 38 blows/ft. to 100 blows/2". It is a glacial till and contains occasional boulders of limestone and greywacke.

In borehole No. 4, it is clayey silt to silt having very low plasticity, and has a low gravel content. However, in borehole No. 1, it is a true clayey silt with an appreciable gravel content.

The natural moisture content ranged from 6.6% to 13.7%.

The range of liquid limits and plastic limits was between 18.7% to 28.5% and 12.0% to 17.2%, respectively.

4.4) Silty Sand and Gravel:

This deposit was the surficial deposit in borehole No. 2 on the east bank of the river. It was a dense to very dense, well graded sand and gravel mixture, and may well be the same deposit as the surficial layer intersected on the west side of the valley. However, the clayey silt deposit was not intersected in this borehole.

The 'N' values ranged from 32 blows/ft. to 62/4". These 'N' values are, no doubt, high due to the high gravel content of this deposit. Difficulty was experienced in advancing the borehole due to occasional pieces of very coarse size gravel (3" size).

The average grain-size distribution was found to be: gravel 40%, sand 45%, silt and clay 15%.

cont'd. /5 ...

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

4.5) Sandy Silt to Silty Fine Sand with a Trace of Gravel:

This deposit was intersected at 7.5 ft. depth in borehole No. 1 and at 20.0 ft. depth in borehole No. 2. It was of very dense relative density, having 'N' values ranging from 49 blows/ft. to 100 blows/6 $\frac{1}{2}$ ". Reference should be made to the grain-size distribution curves contained in the report appendix, for details of the grading of this deposit.

4.6) Silty Sand and Gravel:

This was the lowest deposit intersected. It has a very dense relative density, having 'N' values of 30/1". It contains coarse gravel sizes.

5. GROUNDWATER CONDITIONS:

Groundwater level was found to correspond to the river level existing at the time of measurement. It should be noted that when the snow melted during a period of mild weather, the river level rose overnight, from El. 867.8 to El. 872.2.

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General:

It is proposed to construct a new bridge to carry Hwy. #4 over Little Ausable River. The presently proposed bridge is a three-span structure (65'-85'-65') with approach fills some 45 ft. above existing ground level.

Subsoil conditions at this site consist essentially of very dense granular deposits in the valley bottom, with very dense silty sand and gravel overlying a hard clayey silt till in the west side of the valley. These conditions are ideally suited for the use of spread footings at shallow depth. However, at the abutment locations, the approach fills are of appreciable depth and, therefore, perched abutments supported on piles, should be adopted. Detailed recommendations are made as follows:

cont'd. /6 ...

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

6.2) Piers:

The bridge piers may be supported on spread footings founded at or below the following elevations:

East Pier -- El. 865.0

West Pier -- El. 866.0

In any event, the footings should be deep enough to provide sufficient protection against frost penetration.

A safe bearing pressure of 4.0 tons/ft.² may be used for design purposes.

As excavation below groundwater level will be required for the construction of these footings, a dewatering scheme is essential. It is recommended that steel sheet piling should be used and left in place permanently as a protection against scour. The sheeting should be driven to a depth below the bottom of the excavation equal to the hydraulic head above it. The requirements for scour protection should be checked with the Hydrological Section of the D.H.O. It is anticipated that some difficulty may be experienced in driving steel sheet piling due to the presence of coarse gravel and occasional boulders.

6.3) Abutments:

It is recommended that the abutments should be constructed within the approach fills and supported on end-bearing steel tube piles driven to practical refusal. For the west abutment, the piles should be driven to an estimated tip elevation El. 880, and for the east abutment, to El. 860.

For 12-3/4" x 1/4" steel tube piles, a design load of 70 tons/pile may be used.

However, the driving of piles in the field during construction, should be controlled by the use of the Hiley Formula as per current D.H.O. Standards DD 1218 and DD 1219.

cont'd. /7 ...

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

6.3) Abutments: (cont'd.) ...

Difficulties have arisen in the past, when tube piles have been driven through compacted fill. It is believed that most of these difficulties have been due to the presence of cobbles or small boulders. For this reason, it is strongly recommended that all grain sizes larger than 3 inches, be screened out prior to placing this fill.

6.4) Approach Embankments:

No stability problems are anticipated for the construction of the approach fills if standard 2:1 side slopes are adopted. The approach embankments should be rip-rapped as a protection against scour up to the high water level.

7. SUMMARY:

A foundation investigation at the site of a proposed new structure at Hwy. #4 and Little Ausable River, is reported.

Subsoil at the site consists essentially, of very dense granular deposits in the bottom of the valley and very dense silty sand and gravel overlying a hard clayey silt till in the west side of the valley.

It is recommended that the bridge piers be supported on spread footings at shallow depth, and that the abutments should be constructed within the approach fills and supported on steel tube piles. Only small differential settlements are expected.

Procedures for construction and dewatering have been outlined in this report.

The requirements for protection against scour should be checked with the D.H.O. Hydrological Section.

cont'd. /8 ...

7. SUMMARY: (cont'd.) ...

No stability problems are anticipated for the construction of the approach fills. The approach fills should be rip-rapped up to high water level.

8. MISCELLANEOUS:

The field work for this project was carried out during the period January 18 - 31, 1967, under the supervision of Mr. A. C. Calder, Project Foundation Engineer, who also prepared this report.

Equipment used was owned and operated by Canadian Longyear Limited.

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

March 1967

APPENDIX I.

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALE & TESTING DIVISION

JOB 67-F-8

LOCATION Sta. 228 + 83 21' R

ORIGINATED BY ACC

W.P. 152-63

BORING DATE January 18, 1967

COMPILED BY ACC

DATUM Geodetic

BOREHOLE TYPE Washboring, NX Casing, Cone

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT ——— WL		BULK DENSITY	REMARKS						
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	20 40 60 80 100	PLASTIC LIMIT ——— WP	WATER CONTENT ——— W			Wp ——— W ——— WL	P.C.F.				
869.6	GROUND LEVEL																	
0.0	Clayey silt with some sand & gravel & Occ. boulders.		1	SS	40	860												
862.1	Hard		2	SS	38													
7.5	Sandy silt to silty fine sand with a trace of gravel.	3	SS	49														
		4	SS	108														
	Very dense	5	SS	100/6 1/2"														
		6	SS	100/9 1/2"														
845.5	Silty sand & gravel	7	SS	30/1"														
25.2	End of borehole					840												

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

JOB 67-F-8

LOCATION Sta. 227 + 98 21' It.

ORIGINATED BY ACC

Y. P. 152-63

BORING DATE January 20-26, 1967

COMPILED BY ACC

DATUM Geodetic

BOREHOLE TYPE Washboring, NX Casing, Cone

CHECKED BY JK

[illegible]

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 3

FOUNDATION SECTION

JOB 67-F-8 LOCATION Sta. 227 + 98 21' R ORIGINATED BY ACC
W. P. 152-63 BORING DATE January 26, 1967 COMPILED BY ACC
DATUM Geodetic BOREHOLE TYPE Dynamic cone penetration test CHECKED BY AK

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 20 40 60 80 100	SHEAR STRENGTH P.S.F.	LIQUID LIMIT ——— w_L PLASTIC LIMIT ——— w_p WATER CONTENT ——— w w_p — w — w_L WATER CONTENT %	BULK DENSITY γ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT						
871.0 0.0	GROUND LEVEL					870					
861.5											
9.5	End of Cone test					860					

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 4

FOUNDATION SECTION

JOB 67-F-8

LOCATION Sta. 229 / 48 21' Lt.

ORIGINATED BY ACC

W. P. 152-63

BORING DATE January 31, 1967

COMPILED BY ACC

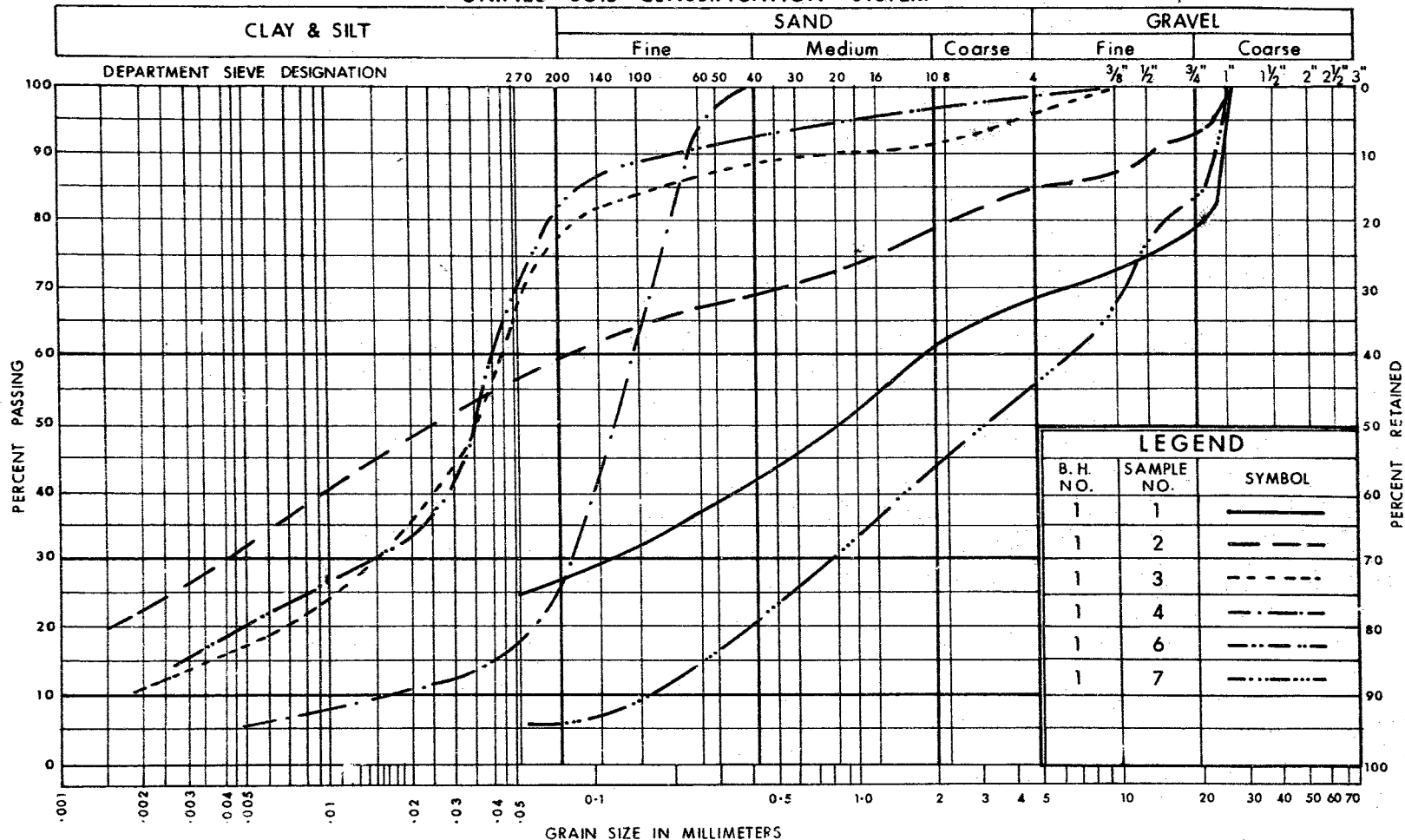
DATUM Geodetic

BOREHOLE TYPE Washboring, BX Casing, Cone

CHECKED BY

[illegible]

UNIFIED SOIL CLASSIFICATION SYSTEM



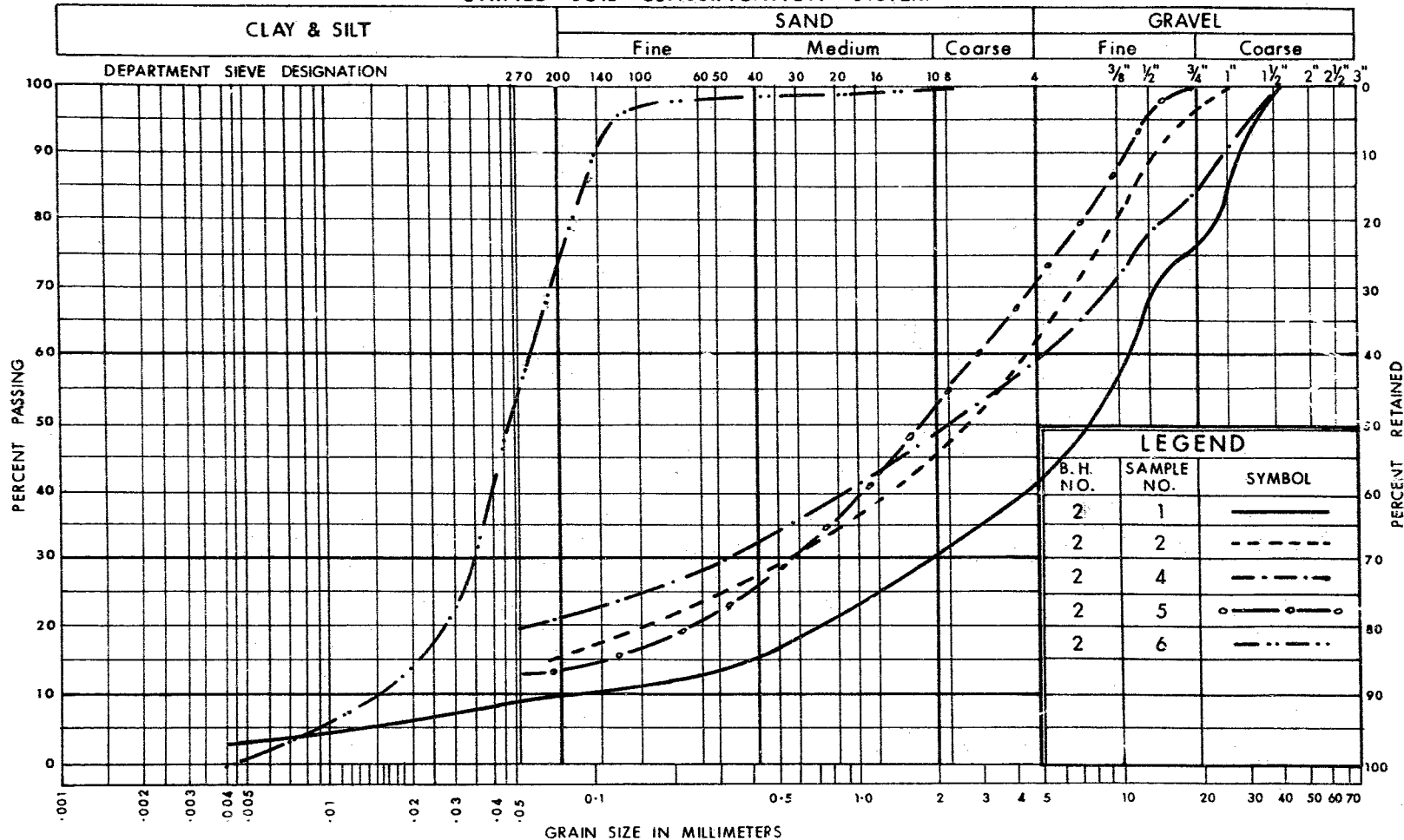
DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

GRAIN SIZE DISTRIBUTION

W.P. No. 152-63

JOB No. 67-F-8

UNIFIED SOIL CLASSIFICATION SYSTEM



GRAIN SIZE DISTRIBUTION



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

W.P. No. 152 - 63

JOB No. 67 - F - 8

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

Q _u	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Q _{cu}	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Q _d	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_r	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
σ'	NORMAL EFFECTIVE STRESS ($\bar{\sigma}$ IS ALSO USED)
τ	SHEAR STRESS
ϵ	LINEAR STRAIN
γ	SHEAR STRAIN
ν	POISSON'S RATIO (μ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
η	COEFFICIENT OF VISCOSITY

EARTH PRESSURE

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

FOUNDATIONS

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

SLOPES

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

MEMORANDUM

To: Mr. A. G. Stermac,
Principal Foundations Engineer,
Materials and Testing Division,
Downsview.

From: Materials and Testing,
London.

Date: January 3, 1967.

Our File Ref.

IN REPLY TO

SUBJECT: - W. P. 152-63, Proposed Little Ausable River Bridge,
Highway #4, 4.3 Miles Northwest of Highway #7. 67-8-8

While carrying out the soils power auger investigation for the proposed reconstruction from Lucan to Clandeboye it was not possible to penetrate to subgrade in the cut section south of the proposed structure between Station 220 and Station 222. ²²⁰⁺⁷⁶ The power auger penetrated to approximately 10' below ground level where either a layer of boulders or a seam of rock seems to exist in view of the fact that the existing road cut on the east side of the revision is excavated lower than this seam. No visible signs of the rock layer are present on the existing cut slope.

We would appreciate it if you would place an approximate 20' deep hole in the centre of this area when carrying out the foundation investigation for the forementioned proposed structure in order that a core of the rock layer can be obtained.

If the Project Engineer will contact this office, we will locate the borehole and examine the core when the investigation is carried out.

A. M. Batten
A. M. BATTEN,

FOR: J. R. ROY, ⁴⁵⁷⁻⁵⁴⁰⁰
REGIONAL MATERIALS ENGINEER.

AMB:hp.

C.C. - File

Hwy. 401 & Keele St.
Downsview, Ontario

Materials and Testing Division

January 17, 1967

Canadian Longyear Limited
35 Brydon Drive
Rexdale, Ontario

Attention: Mr. C. Mason

Dear Sirs:

This is to confirm our request of January 12, 1967 for the supply of one Diamond Drill, together with all necessary equipment, as specified under the terms of our Contract Agreement, at Lucan, Ontario, on Tuesday, January 17, 1967.

This project bears job number 67-P-8.

Yours truly,

K. G. Selby

KGS:nt

K. G. Selby
Supervising Foundation Engr.

cc: Messrs. H. Konings
H. Szymanski ✓

for: A. G. Sternac
Principal Foundation Engr.

Foundations Office
General Files

MEMORANDUM

67-E-8

To: Mr. A. G. Stermac
Principal Foundation Engineer
Lab Building
DOWNS VIEW

FROM: A. P. Watt

DATE: January 12, 1967

OUR FILE REF.

IN REPLY TO *Received Jan 13, 1967*

SUBJECT: W.P. 152-63, Bridge Site 19-69,
Little Ausable River Bridge,
4.3 miles northwest of Hwy. 7,
Highway 4,
District 2, London.

Would you kindly arrange to have a foundation investigation conducted at the above location. I have enclosed two copies of the bridge site plan E-4393-1 with the probable footing location marked in red. The stability of the approaches should be investigated particularly the east approach.

Accommodations can be found at the Green Valley Motel, Lucan located approximately $\frac{1}{2}$ mile east of the junction of Hwy. 4 and 7 on Highway 7.

Apw

A. P. WATT
REGIONAL BRIDGE LOCATION ENGINEER

APW:gf
Encl.

c.c. Mr. S. McCombie
Mr. R. Forrest
Mr. A. Crowley

Department of Highways Ontario

Copy for the information of

Mr. A. Stermac,
Principal Foundation Engineer

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

Bridge Division,
Downsview, Ontario

September 1, 1967

Little Ausable River Bridge
4.3 Miles Northwest of Jct. Hwy. 7
W.P. 152-63, Site No. 19-69
Highway 4, District No. 2

Attached herewith are prints of the Preliminary Bridge Plan
Drawing B-6194-F1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$125,000.
This cost includes tender, materials, engineering and sundry
construction.

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

CSG:rd
Attach.

C.S. Grebaki,
Bridge Design Engineer

c.c. B. McCombie
A. Stermac
R. Forrest
E. Cross

Mr. C. S. Grebski,
Bridge Design Engineer,
Bridge Division,
Admin. Bldg.

Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

September 8, 1967

Little Ausable River Bridge,
4.2 Miles Northwest of Jet. Hwy. #7,
W.P. 152-63, Site No. 19-69,
Hwy. 4, District No. 2 (London).

67-F-8

We have reviewed Preliminary Bridge Plan
Drawing D-6194-P1 for the above structure.

We have no comments.

KGS/MdeP

H. G. Selby
K. G. Selby,
SUPERVISING FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

cc: Messrs. S. McCombie
A. P. Watt

Foundations Files
Gen. Files