

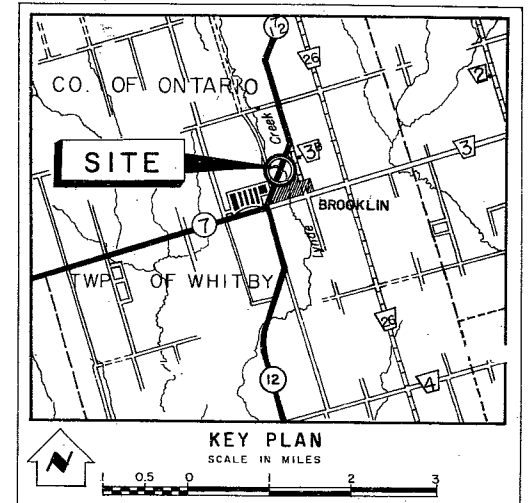
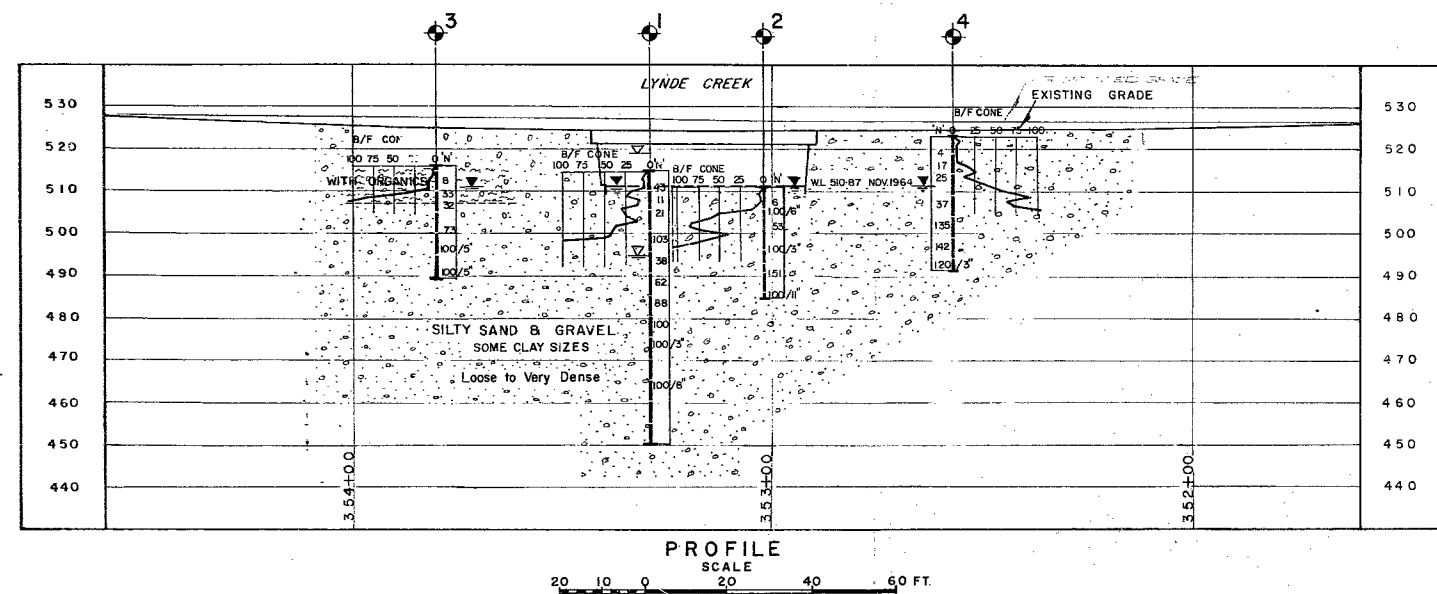
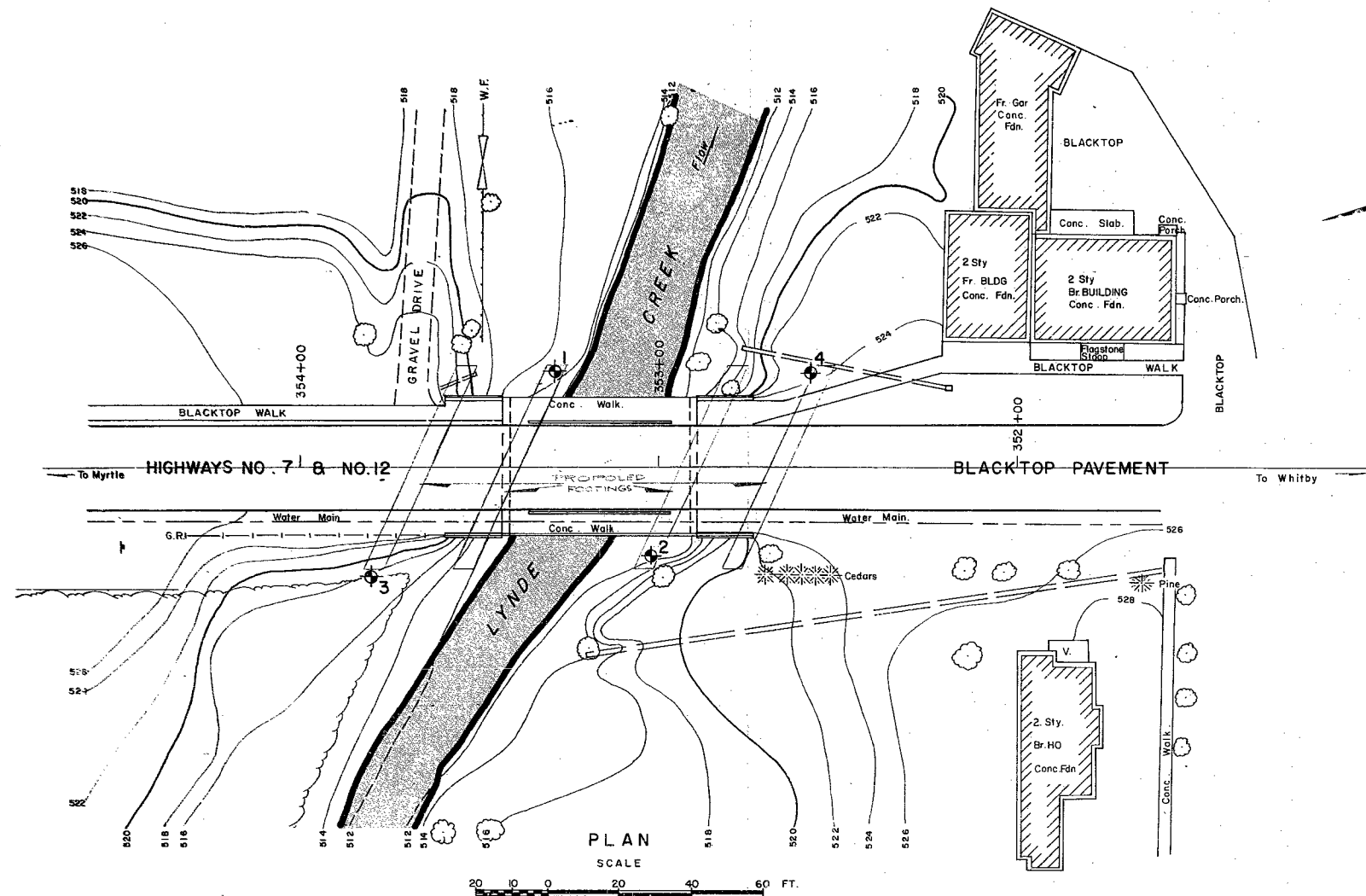
#65-F-117

W.P. #23-65

HWY # 7 & 12

LYNDE CREEK

BROOKLIN



LEGEND			
	Bore Hole		
	Cone Penetration Hole		
	Bore & Cone Penetration Hole		
	Water Levels established at time of field investigation. Nov. 1965		
	Artesian Water Levels		
	ENCOUNTER		
NO.	ELEVATION	STATION	OFFSET
1	515.0	353 + 29	26.5' RT
2	511.0	353 + 02	24.5' LT
3	516.0	353 + 80	30.5' LT
4	523.0	352 + 58	26.0' RT

NOTE
 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.

DATE	BY	DESCRIPTION

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

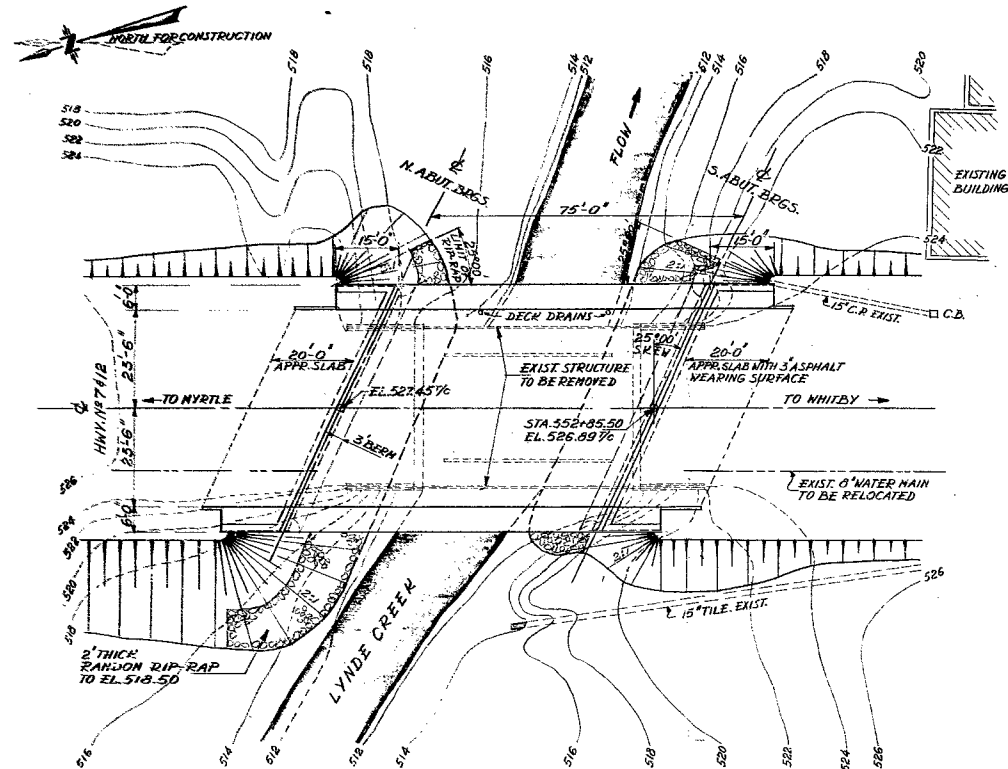
LYNDE CREEK

KING'S HIGHWAY NO. 7 & 12 DIST. NO. 6
 CO. ONTARIO
 TWP. WHITBY LOT 23 CON. VI.

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D. V.K.	CHECKED	W.P. NO. 23-65	M.S.T. DRAWING NO.
DRAWN J.N.	CHECKED	JOB NO. 65-F-117	65-F-117A
DATE JAN. 11, 1966		SITE NO. 22-113	BRIDGE DRAWING NO.
APPROVED		CONT. NO.	

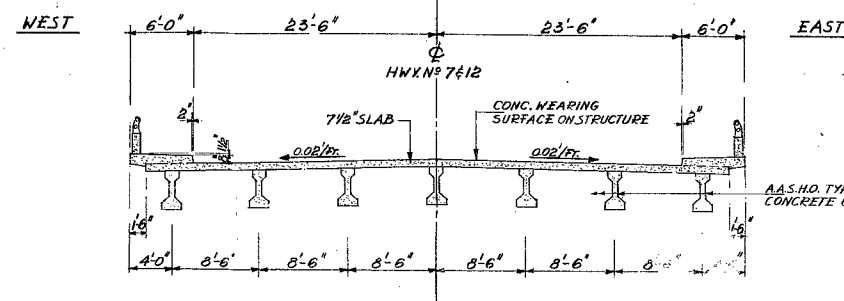
REF. NO: E-4714-1



PLAN

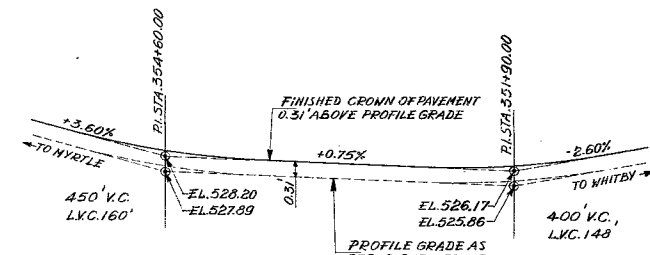
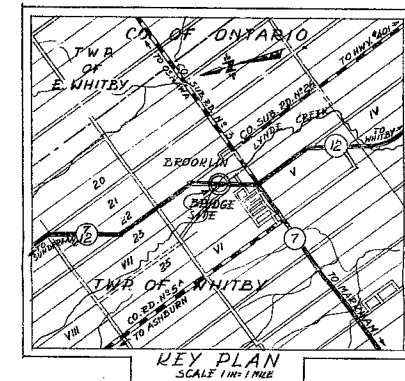
SCALE: 1"=20'-0"

NOTE: 7/8" DENOTES ELEVATIONS ARE SHOWN TO TOP OF CONCRETE WEARING SURFACE



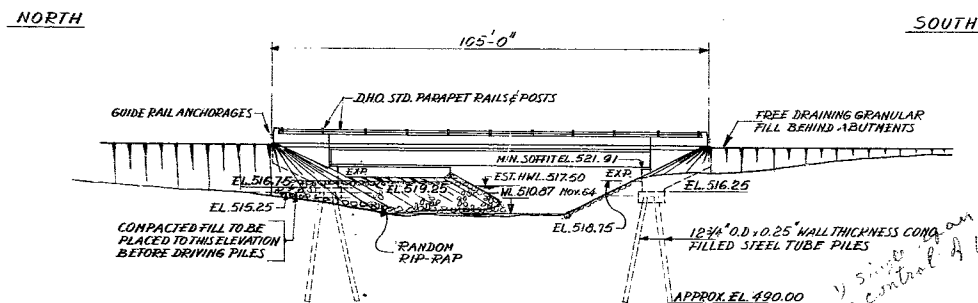
TYPICAL DECK SECTION

SCALE: 1/8"=1'-0"



PROFILE OF HWYN#7&12

NOT TO SCALE



ELEVATION

SCALE: 1"=20'-0"

25°00'00" SKEW

SIN. 0.4226183
COS. 0.9063078
TAN. 0.4663077
SEC. 1.1033779

GEODETIC B.M. H#923 ELEV. 539.397
BROOKLIN: ANGLICAN CHURCH, FRAME BUILDING
IMMEDIATELY EAST OF C.N.R. WEST STONE FOUNDATION WALL,
8 FEET 6 INCHES FROM SOUTHWEST CORNER AND IN FIRST
COURSE BELOW WOODWORK. BOLT SET HORIZONTALLY. PUBLICATION N#19

REVISIONS	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE DIVISION

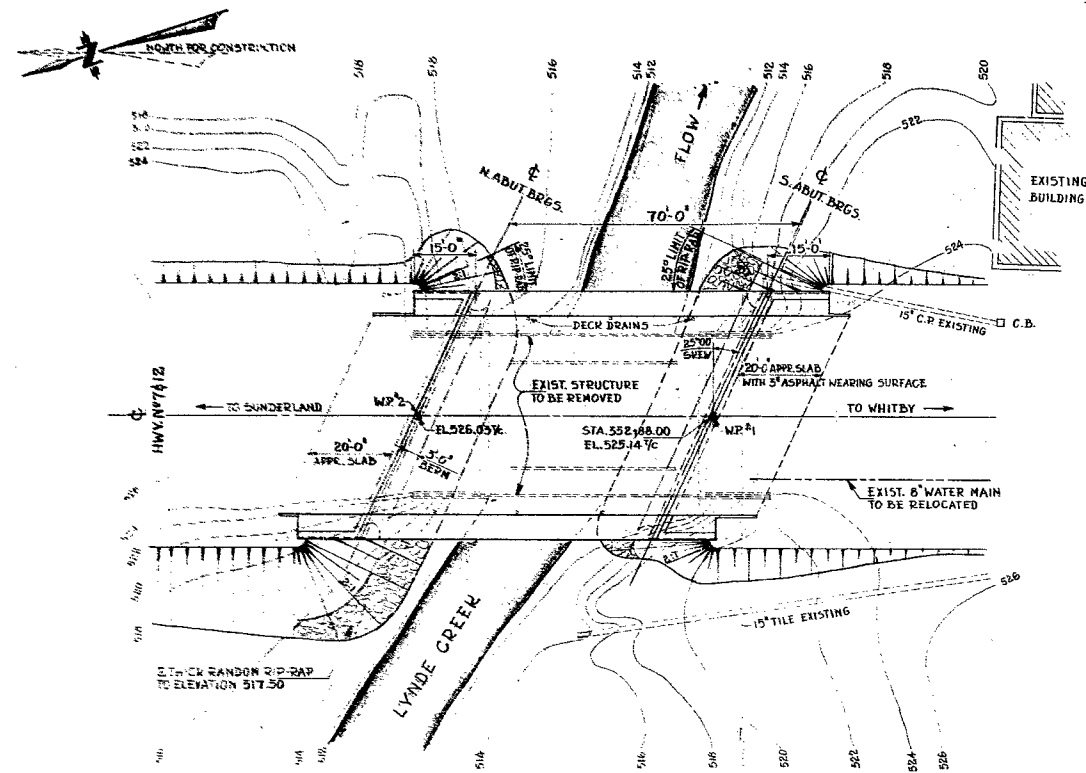
LYNDE CREEK BRIDGE IN BROOKLIN

KING'S HIGHWAY No. 7&12 DIST. No. 6
CO. ONTARIO
TWP. WHITBY LOT 23 CON. VI

PRELIMINARY PLAN

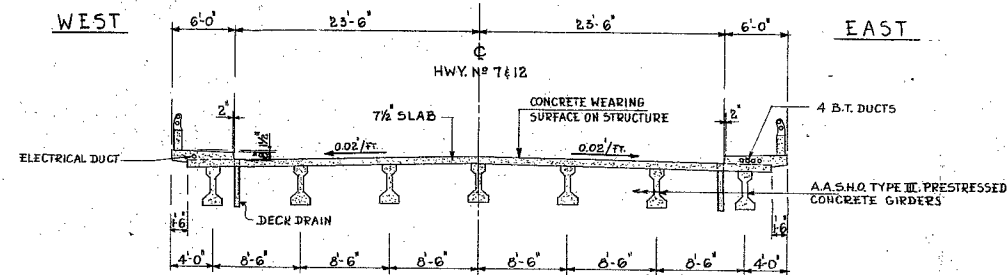
APPROVED:	SITE No. 22-113	W.P. No. 23-65
DESIGN	BRIDGE ENGINEER	CONTRACT
DRAWING	NO.	NO.
DATE	APRIL 66	DRAWING No. D-5886-P1



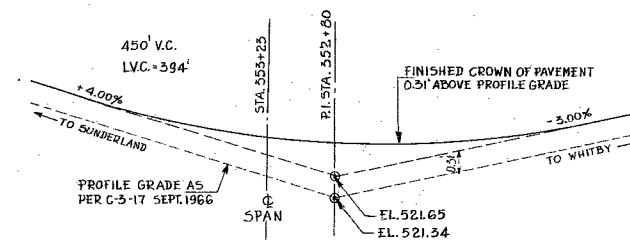


NOTE: 1/2\"/>

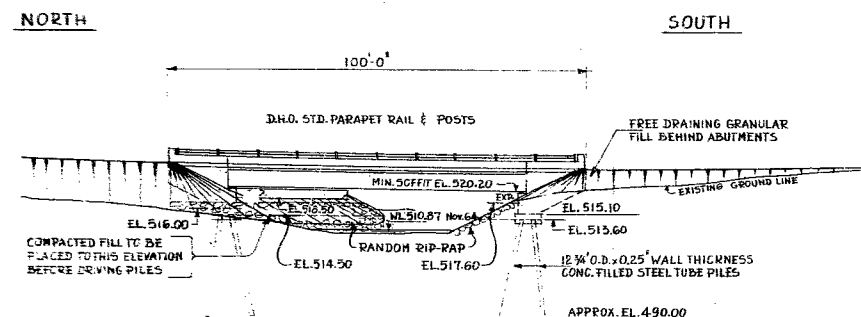
PLAN
SCALE: 1\"/>



TYPICAL DECK SECTION
SCALE: 1/8\"/>

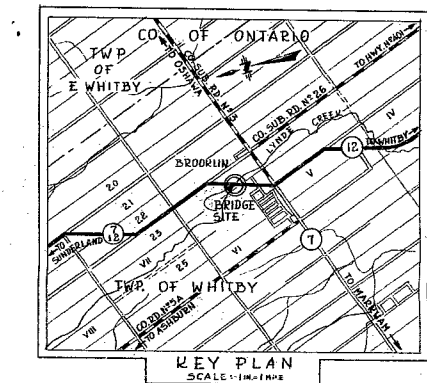


PROFILE OF HWY. NO. 7 & 12
NOT TO SCALE



ELEVATION
SCALE: 1\"/>

25°00'00\"/>



GEODETIC B.M. NO. 923 ELEV. 539.397
BROOKLIN: ANGLICAN CHURCH, FRAME BUILDING IMMEDIATELY EAST OF C.N.R.Y. WEST STONE FOUNDATION WALL, 8 FEET 6 INCHES FROM SOUTHWEST CORNER AND IN FIRST COURSE BELOW WOODWORK. BOLT SET HORIZONTALLY. PUBLICATION NO. 19

REVISIONS	DATE	BY	DESCRIPTION
DEC/66	J.52		THIS DRAWG. SUPERSEDES PREVIOUS DESIGN DRAWINGS D-5886. DESIGN REVISED TO SUIT GRADE LOWERING SEPT./66

DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION			
LYNDE CREEK BRIDGE IN BROOKLIN			
KING'S HIGHWAY No. 7 & 12		DIST. No. 6	
CO. ONTARIO			
TWP. WHITBY		LOT 23 CON. VI	
PRELIMINARY PLAN			
APPROVED		SITE No. 22-115 W.P. No. 23-65	
DESIGN K. G. D. CHECK		CONTRACT No.	
DRAWING J. 52. CHECK		DRAWING No.	
DATE DEC. 1966		LOADING H520-44	



CC: GEN. FILES 23-71-01

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. B. R. Davis,
Bridge Engineer,
Bridge Division.
Attention: Mr. S. McCombie

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

Date: January 11, 1966

Our File Ref.

In Reply To

Subject:

JAN 14 1966

FOUNDATION INVESTIGATION REPORT
For
New Bridge at the Crossing of Lynde
Creek & Hwy's #7 & #12 in Brooklin,
Lot 23, Con. 6, Twp. of Whitby, Co.
of Ontario, District #6 (Toronto).
W.J. 65-F-117 -- W.P. 23-65

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

We believe that you will find the factual data and recommendations contained therein, adequate for your design requirements.

Should you require additional information, please feel free to contact our Office.

AGS/MleF
Attach.

cc: Messrs. B. R. Davis (2)
H. A. Tregaskes
D. W. Farren
G. K. Hunter (2)
J. C. Thatcher
T. J. Kovich
A. Watt

Foundations Office
Gen. Files ✓

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

TABLE OF CONTENTS

1. INTRODUCTION.
 2. DESCRIPTION OF SITE.
 3. DESCRIPTION OF FIELD AND LABORATORY WORK.
 4. SUBSOIL CONDITIONS.
 5. GROUND WATER CONDITIONS.
 6. DISCUSSION AND RECOMMENDATIONS.
 7. SUMMARY.
 8. MISCELLANEOUS.
-

FOUNDATION INVESTIGATION REPORT
For
New Bridge at the Crossing of Lynde
Creek & Hwy's #7 & #12 in Brooklin,
Lot 23, Con. 6, Twp. of Whitby, Co.
of Ontario, District #6 (Toronto).
W.J. 65-F-117 -- W.P. 23-65

1. INTRODUCTION:

At the request of the Bridge Location Section (memo dated October 18, 1965, from Mr. J. B. Curtis), a foundation investigation was carried out at this site. Presented in this report are the field and laboratory investigations, together with recommendations pertaining to the foundations for the proposed new structure.

2. DESCRIPTION OF SITE:

The Lynde Creek flows from east to west about 1/2 mile north of Hwy's 7 and 12 intersection in Brooklin. The topography of the area is hilly. The site is in the physiographic region referred to as the "South Slope". It is the southern slope of the interlobate moraine. The streams flow rapidly, cutting sharp valleys in the till.

3. DESCRIPTION OF FIELD AND LABORATORY WORK:

The field work was carried out by drilling four boreholes with adjacent dynamic cone penetration tests. In granular soils, sampling was achieved by means of a split-spoon sampler, dimensions of which and the energy used in driving it, conform with the Standard Penetration Test requirements. In very dense, bouldery layers, BX and also AX casings were drilled down by means of diamond casing shoe. The disturbed samples were brought to the laboratory, visually examined, and those selected were tested for moisture content and grain size distribution.

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

The locations of the boreholes and their elevations are shown on Drawing No. 65-F-117A.

4. SUBSOIL CONDITIONS:

Subsoil at the site generally consists of an extensive deposit of glacial origin, extending at least 65 ft. below ground surface. The deposit is comprised of a mixture of silty sand and gravel in varied proportions. The upper 8 ft. in B.H. #1 contains traces of organics and has a loose to compact relative density. Occasional boulders were observed within this deposit below elev. 456.0. Standard Penetration values for the overall deposit ranged from 4 blows/ft. to 100 blows/3". From these values, it is estimated that the relative density of the deposit varies from loose to very dense.

Typical grain size distribution curves from samples of this stratum are shown in Appendix I of this report.

5. GROUND WATER CONDITIONS:

The water level of Lynde Creek at the proposed crossing was at elev. 511.0 which corresponds to the water levels in the boreholes.

An artesian water condition was observed in B.H. #1 at approximate elev. 495 (20 ft. below ground surface), and the measured artesian head was 4 ft. above the existing ground level.

6. DISCUSSION AND RECOMMENDATIONS:

It is proposed to construct a new structure at this location to carry Hwy's 7 and 12 over Lynde Creek in the Town of Brooklin. At present, a three-span (25'-50'-25') bridge having a width of 57 ft.

cont'd. /3

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

is contemplated. The new bridge will replace the existing single-span structure. The centre-line will be the same as the existing one, and the new profile grade will be some 2 ft. higher.

Subsoil at the site consists of an extensive deposit of loose to very dense silty sand and gravel extending at least 65 ft. below ground surface. This deposit is competent to provide an adequate bearing capacity for an economical spread footing design. The new structure pier footings should, therefore, be supported on spread footings at or below elev. 506.0, using a design load of 3 t.s.f.

A dewatering scheme will be necessary as the excavations for the proposed footings will be carried out below the creek water level. If steel sheeting is used in a dewatering scheme, this should be driven to a depth below the excavation bottom equal to the height of water above it. Artesian conditions were observed at or below elev. 495.0 during the time of investigation. In view of this, sheet piling should not be driven beyond elev. 497.0.

The proposed abutments may be constructed within the approach fills and supported on end-bearing steel tube piles driven to practical refusal in the very dense silty sand and gravel. For example, displacement type piles, 12 in. in diameter, driven to an estimated tip elev. 490 or below, should provide a design load of 60 tons per pile. 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.

No stability problems are anticipated for the proposed approach fills with standard 2:1 slopes.

7. SUMMARY:

A foundation investigation at the site of the proposed bridge on Hwy's 7 and 12 and Lynde Creek is reported.

cont'd. /4 ...

7. SUMMARY: (cont'd.)

Subsoil consists of an extensive deposit of loose to very dense silty sand and gravel.

Recommendations for the structure piers and abutments are as follows:

1) Piers on spread footings at or below elev. 506 with a safe bearing pressure of 3 t.s.f. A dewatering scheme will be required for the construction of pier footings.

2) Abutments on end-bearing displacement type piles driven to an estimated tip elev. 590 or below, with a safe design load of 60 tons per pile.

No stability problems are anticipated for the proposed approach fills.

8. MISCELLANEOUS:

The field work, performed during period October 28, 1965 to November 16, 1965, together with the preparation of this report, was undertaken by Mr. V. Korlu, Project Foundation Engineer. The investigation was carried out under the general supervision of Mr. M. Devata, Senior Foundation Engineer, who reviewed this report.

Equipment used was owned and operated by Canadian Longyear Limited.

January 1966

APPENDIX I

RECORD OF BOREHOLE NO. 1

FOUNDATION SECTION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

JOB 65-F-117

LOCATION Lynde Crk & Hwy 12, Sta. 353+29 26 1/2' Rt. 6

ORIGINATED BY V.K.

W. P. 23-65

BORING DATE Oct. 29, 1965.

COMPILED BY J.K.

DATUM Geodetic

BOREHOLE TYPE Drive casing & wash.

CHECKED BY _____ M.D.

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W		BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	20 40 60 80 100	WP ——— W ——— WL	WATER CONTENT % 10 20 30		
515.0	Groundlevel										
0.0	Silty sand and gravel - some clay sizes. Compact to very dense. (Till-like)		1	SS	43	510					
			2	SS	11						
			3	SS	21						
			4	SS	103	500					
			5	SS	38						
			6	SS	62	490					
			7	SS	88						
			8	SS	100	480					
			9	SS	100						
					for 3"	470					
			10	SS	100						
					for 8"	460					
456.0											
59.0	Boulders - Max. 18" diam.		11	AXT	-	450					
450.0											
65.0	End of borehole.					440					

RECORD OF BOREHOLE NO. 2

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 65-F-117

LOCATION Lynde Crk & Hwy 12, Sta. 353+02 24 1/2' Lt. E

ORIGINATED BY V.K.

W. P. 23-65

BORING DATE Nov. 9, 1965.

COMPILED BY V.K.

DATUM Geodetic

BOREHOLE TYPE Drive casing & wash.

CHECKED BY M.D. [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	Liquid Limit ——— WL	Plastic Limit ——— WP	WATER CONTENT % WP W WL	BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		20 40 60 80 100					
511.0	Groundlevel					510						WL Elev. ▼ 511.0
	Silty sand and gravel - Loose to very dense, grey, (Till-like).		1	SS	6							gr 53% Sa 43% Si & Cl 4%
			2	SS	100							
					for 6"							
			3	SS	53	500						Gr 10% Sa 48% Si 33% Cl 6%
			4	SS	100							
					for 3"							
			5	SS	151	490						
474.5			6	SS	120							
26.5	End of borehole.					480						

FOUNDATION SECTION

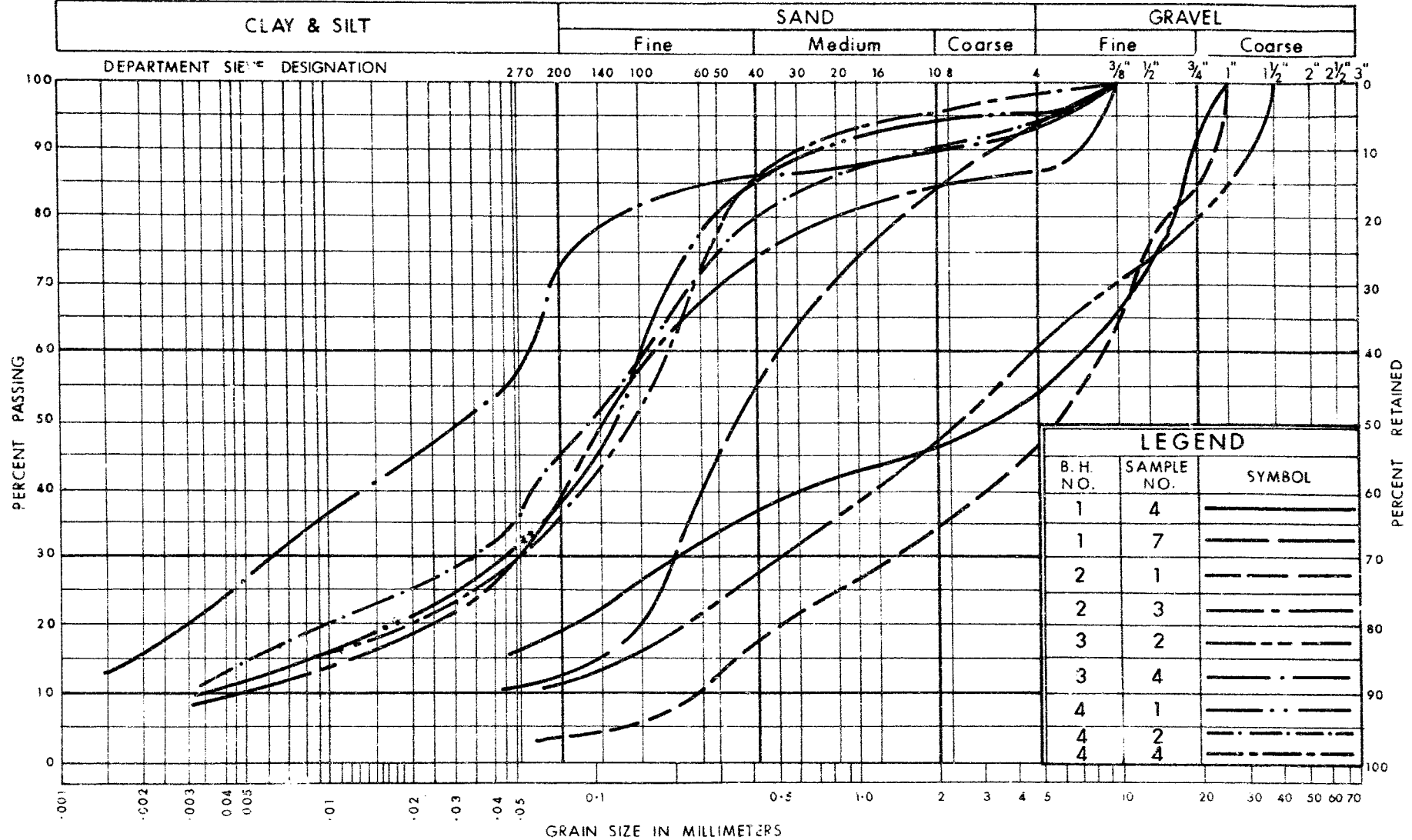
CHECKED BY _____ M.D. *[Signature]*

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT ——— WL		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT		20 40 60 80 100	PLASTIC LIMIT ——— WP	WATER CONTENT ——— W		
							SHEAR STRENGTH P.S.F.	WP W WL			
								WATER CONTENT % 10 20 30			
516.0	Groundlevel										
0.0	(Trace organics)- Loose to dense. Brown.	0.0	1	SS	8	510					
		0.0	2	SS	33						
		0.0	3	SS	32						
		0.0									
	Silty sand and gravel, dense to very dense. (Till-like)	0.0	4	SS	73	500					
		0.0									
		0.0	5	SS	100						
		0.0			for 5"						
489.5		0.0	6	SS	100	490					
26.5	End of borehole.				for 5"						
						480					

FOUNDATION SECTION

CHECKED BY M.D.

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT OF HIGHWAYS
MATERIALS and
TESTING
DIVISION

ONTARIO

GRAIN SIZE DISTRIBUTION

W.P. No. 23-65

JOB No. 65-F-117

ABBREVIATIONS USED IN THIS REPORT

PENETRATION RESISTANCE

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

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

DESCRIPTION OF SOIL

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

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

TYPE OF SAMPLE

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

SOIL TESTS

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

ABBREVIATIONS USED IN THIS REPORT

SOIL PROPERTIES

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

Mr. J. C. Thatcher,
District Engineer,
District #6 (Toronto),
Central Bldg.

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

Attn: Mr. R. L. Illingworth,
Project Manager.

February 3, 1966

Your Memo -- Jan. 31/66

New Structure at the Crossing of
Lynde Creek and Hwy's 7 and 12
in Brooklin, District #6 (Toronto).
W.J. 65-F-117 -- W.P. 23-65

Further to your memo dated January 31, 1966, we would like to make the following comments:

1) In the case of Black River Bridge at Sutton - (Contract 63-184), it was necessary to advance the piles beyond 'practical refusal' for scour protection purposes. There was no bearing capacity problem, and the required design load could have been achieved at a much higher elevation.

2) At the site in question, there is no scour problem at the abutment location and, in consequence, the piles are only required to penetrate for a sufficient distance to achieve the required bearing capacity of 60 tons per pile. Our foundation report has indicated that the necessary design load will be achieved with a penetration of less than 25 ft. into original ground.

3) The boulders are encountered some 30 ft. below the estimated pile tip elevation and, consequently, will not affect the driving of piles.

MD/MdeP

cc: Foundations Office ✓
Gen. Files

M. Devata

M. Devata,
SENIOR FOUNDATION ENGINEER
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

MEMORANDUM

TO: Mr. A. G. Stermac, Principal
Foundation Engineer.

FROM: R. L. Illingworth,
Project Manager.

DATE: January 31, 1966.

OUR FILE REF.

IN REPLY TO

SUBJECT:

Foundation Investigation Report for
New Bridge at the Crossing of Lynde
Creek & Hwy's #7 & #12 in Brooklin,
Lot 23, Con. 6, Twp. of Whitby, Co.
of Ontario, District #6 (Toronto)1
W.P. 23-65, W.J. 65-F-117.

In the above report you state that the subsoil consists of an extensive deposit of silty sand and gravel and you recommended for the abutments, that a displacement type of pile be driven. I wish to bring to your attention the difficulty encountered on the Black Creek Bridge, Contract 63-184, where this type of pile was driven and gravel was encountered. In this case, even with persistent jetting, the piles could only be driven to a maximum depth of 14 feet.

You also state in your report that occasional boulders were observed. If this is the case, then serious problems could occur in driving this type of pile.

For your information and consideration.



R. L. Illingworth,
Project Manager.

RLI:pb
c.c.Z.Bumbulis.

Mr. J. C. Thatcher,
District Engineer,
District #6 (Toronto),
Central Bldg.

Attn: Mr. R. L. Illingworth,
Project Manager.

*Re: New Structure
Crossing of Lynde Creek
Hwy 7 & 12*
Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

February 3, 1966

Your Memo -- Jan. 31/66

New Structure at the Crossing of
Lynde Creek and Hwy's 7 and 12
in Brooklin, District #6 (Toronto).
W.J. 65-F-117 -- W.P. 23-65

Further to your memo dated January 31, 1966, we would like to make the following comments:

1) In the case of Black River Bridge at Sutton - (Contract 63-184), it was necessary to advance the piles beyond 'practical refusal' for scour protection purposes. There was no bearing capacity problem, and the required design load could have been achieved at a much higher elevation.

2) At the site in question, there is no scour problem at the abutment location and, in consequence, the piles are only required to penetrate for a sufficient distance to achieve the required bearing capacity of 60 tons per pile. Our foundation report has indicated that the necessary design load will be achieved with a penetration of less than 25 ft. into original ground.

3) The boulders are encountered some 30 ft. below the estimated pile tip elevation and, consequently, will not affect the driving of piles.

MD/MdeF

cc: Foundations Office
Gen. Files ✓

M. Devata

M. Devata,
SENIOR FOUNDATION ENGINEER
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGINEER

OK

MEMORANDUM

To: Mr. M. Devata,
Sr. Foundation Engineer,
Room 107, Lab. Bldg.

FROM: Bridge Division,
Downsview, Ontario.

DATE: February 3, 1966.

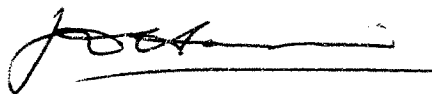
OUR FILE REF.

IN REPLY TO

SUBJECT: Lynde Creek at Brooklin,
Hwy. 7/12, W.P. 23-65,
Site No. 22-113, BW 1215,
District No. 6

This is to confirm that I anticipate no scour problem if the piles for a spillthrough abutment are driven to only 10' below stream bed elevation.

JDH/ag


J. D. Harris,
Bridge Hydrology Engineer.

MEMORANDUM

To: Mr. A. G. Stermac,
Principal Foundation Engineer,
Room 107,
Lab. Building.

FROM: Bridge Division,
Downsview, Ontario.

DATE: May 11th, 1966.

OUR FILE REF.

IN REPLY TO:

SUBJECT: W.P. #23-65, Hwy. #7 & 12,
Site #22-113, District #6,
Lynde Creek Bridge in Brooklin.

Herewith one print of the preliminary drawing
D-5886-P1 for the above structure. The recommenda-
tions of the foundation report have been followed.

JFW/cew

J.F. Walshe
J.F. Walshe,
for W. Melinyshyn,
Regional Bridge Location Engineer.

Mr. S. McCombie,
Bridge Planning Engr.,
Bridge Division.

Attn: Mr. W. Melinyshyn,
Regional Bridge Location
Engr.

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

May 18, 1966

Lynde Creek Bridge in Brooklin,
Hwy. 7 & 12, W.P. 23-65, W.J. 65-F-117,
District 6 (Toronto).

We have reviewed the preliminary drawing
D-5886-P1 for the above structure, and it appears that
the designer has complied with the recommendations
contained in the foundation report.

MD/MdeF

M. Devata

M. Devata,
SENIOR FOUNDATION ENGR.

For:

A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

cc: Foundations Office ✓
Gen. Files

W. S. Melinyshyn
Regional Bridge Location Engr.
Bridge Division

Foundation Section
Materials & Testing Section

Attn: J. C. McAllister

December 30, 1966

W.P. 23-65, Lynde Ck. in Brooklin
Hwy. #7 and 12, District #6

We have reviewed the preliminary drawing D-6098 P1 for the above structure, and it appears that the designer has complied with the recommendations contained in the foundation report.

We have no further comments.

AGS:mt

A. G. Stermac
Principal Foundation Engineer

cc: Foundation Files
General Files

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. A. G. Stermac,
Principal Foundation Engineer,
Room 107,
Lab. Building.

From: Bridge Division,
Downsview, Ontario.

Date: December 28th, 1966.

Our File Ref.

In Reply To

Subject: W.P. 23-65, Lynde Ck. in Brooklin,
Hwy. #7 and 12, District #6.

Attached for your approval is one print of Preliminary Plan D-6098 F1 for the above structure. This is basically the same design as previously issued but at a lower grade, which was issued on 26th September, 1966.

J.C. McAllister

JCMcA/cew
Attach.

J.C. McAllister,
for W. S. Melinyshyn,
Regional Bridge Location Engineer.

No comments!
Dec 29/66 ags

*Lynde Creek Bridge
in Brooklin.*

Mr. S. McCombie,
Bridge Planning Engr.,
Bridge Division.

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

Attn: Mr. W. Melinyshyn,
Regional Bridge Location
Engr.

May 18, 1966

Lynde Creek Bridge in Brooklin,
Hwy. 7 & 12, W.P. 23-65, W.J. 65-P-117,
District 6 (Toronto).

We have reviewed the preliminary drawing
D-5886-P1 for the above structure, and it appears that
the designer has complied with the recommendations
contained in the foundation report.

MD/MdeP

M. Devata

M. Devata,
SENIOR FOUNDATION ENGR.
For:
A. G. Sternac,
PRINCIPAL FOUNDATION ENGR.

cc: Foundations Office
Gen. Files ✓