



Ministry of
Transportation and
Communications

Memorandum

40116-15
CLUCRES No.

To: A. P. Watt (2)
Regional Structural Planning Engr.
Southwestern Region
London, Ontario

From: Soil Mechanics Section
Geotechnical Office
Downsview, Ontario

Attention:

Date: April 4, 1975

APR 11 1975

Our File Ref. W.P. 53-71-22

In Reply to

Subject:

FOUNDATION INVESTIGATION REPORT

for

Lynn River Bridge Widening
W.P. 53-71-02. Bridge Site 20-70
Hwy. 3, Simcoe
District 2, London

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

We believe that the factual data and recommendations contained therein will prove adequate for your design requirements. Should additional information be required, please do not hesitate to contact our Office.

K. G. SELBY
Supervising Engineer.

c.c. E. J. Orr
B. R. Davis
A. Wittenberg
L. E. Walker
B. J. Giroux
J. R. Roy
G. A. Wrong
P. Lewycky

Files
Record Services

J. Anderson)
A. Crowley) memo only

TABLE OF CONTENTS

1. INTRODUCTION
2. DESCRIPTION OF THE SITE AND FIELD WORK
3. SUBSOIL CONDITION
4. COMMENTS AND RECOMMENDATIONS
5. MISCELLANEOUS

FOUNDATION INVESTIGATION REPORT
for
Lynn River Bridge Widening
W.P. 53-71-02, Bridge Site 20-70
Hwy. 3, Simcoe
District 2, London

1. INTRODUCTION

A request for a foundation investigation, contained in a memo dated February 12, 1975, was received from Mr. D. Tyagi, Structural Planning Engineer of the Southwestern Region. The investigation was to provide recommendations for the design, and construction of the foundation of the abovementioned structure.

A field investigation to determine the subsoil conditions at the site was carried out by this Ser ion during the period March 4 to March 14, 1975. Presented in this report re results of the field work, together with our comments and recommendations concerning the structure foundation.

2. DESCRIPTION OF THE SITE & THE FIELD WORK

The bridge site is located on Hwy. 3 at the north side of the town of Simcoe, approximately 0.12 miles east of the junction of Hwy. 24. In this locale, the Lynn River is a shallow, meandering stream about 40 ft. wide, surrounded by rolling terrain which slopes gently in a westerly direction. The flood plain of the Lynn River on the north side of the bridge is quite heavily wooded; whereas, that on the south side of the bridge has been filled and retained by stonewalls, some 5 to 6 ft. high.

The existing bridge is a 40 ft. long, single span, concrete and steel girder bridge supported on piles (timber piles presumably). From the construction records, it is known that the bridge structure has already been widened, 5 ft. on each side, by means of cantilevering. Except for a crack on the north side of the west abutment, the bridge appears to be in good working condition. The approach embankments were constructed at a 1.5 (horizontal) to 1.0 (vertical) side slope, and have a maximum height of

about 13 ft. Other than some surfacial scouring, no major signs of distress were observed.

A C.P.R. track is located just east of the bridge. Its embankment, some 8 ft. high with a 2:1 side slope, was also found to be in good condition.

Three sampled boreholes were put down in the recent field work. Their locations are shown in Dwg. No.537102-A. BH 1 was advanced by wash-boring techniques; BH 2 & 3 by means of a hollow stem auger. All boreholes were terminated when refusal was met. Soil samples were recovered by means of a split spoon sampler, driven into the soil in accordance with the specifications of the Standard Penetration Test, and were subjected to visual examination in the field before being transferred to the laboratory. Results of the field work are summarized in the Borehole Record Sheets which accompany this report.

3. SUBSOIL CONDITION

The site is located in the physiographic region referred to as the Norfolk Sand Plain, where sand and silt, deposited as deltas in the glacial lakes Warren and Whittlesey, are generally the major soil deposits.

A description of the subsoil encountered in our boreholes is given below:

(A) FILL:

It was found to exist from ground surface to Elev. 685.0± (4 - 8 ft. in thickness). It comprises mainly of silty sand, with some gravel and pieces of wood. According to the 'N' values of the Standard Penetration Test, it has a loose relative density.

(B) MUCK:

A layer of muck, about 1 ft. in thickness, was found beneath the fill material.

(C) SAND:

Underlying the muck is a layer of dense, gravelly coarse sand. It extends to Elev. 670.5 in BH 1, and to Elev. 665.0 in BH 2 & 3. Its 'N' values range from 18 to 38 blows per foot, with an average of about 28 blows per foot, indicating a dense relative density.

(D) SILT:

The sand was found to be underlain by a deep deposit of silt, extending to Elev. 627.0± in BH 3, and to Elev. 630.0± in BH 1 & 2, about 36 - 40 ft. in thickness. It contains occasional layers of very fine sand and seams of clay. The 'N' values recorded in this deposit indicate a dense relative density.

(E) GLACIAL TILL:

It is a heterogeneous mixture of silt, with some sand, traces of clay and gravel, at least 6.5 ft. in thickness. The lower boundary of this deposit was not defined because all boreholes were terminated when auger refusal was met. The elevations where refusal were encountered are shown in the Borehole Record Sheets.

(F) GROUND WATER CONDITIONS:

Because of the high permeability of the sand, the ground water level, for practical purpose, may be assumed equal to the water level in the river, which was at Elev. 685.9±.

4. COMMENTS & RECOMMENDATIONS

The Lynn River Bridge on Hwy. 3 is to be widened by 11 ft. on each side. Its profile grade, as understood, would remain unchanged. The Soil Mechanics Section was requested to assess the foundation condition, as well as to provide design recommendations for the foundation of the structure. Furthermore, widening of the bridge would necessitate breaking of part of the stone retaining walls along the riverbanks, and construction of new ones later on to match the existing ones. This Section was also requested to comment on the construction of these stone walls.

Subsoil at the site, as described previously, consist of 4 to 8 ft. of loose silty sand fill, approximately 1 ft. of muck, 13 to 19 ft. of dense gravelly sand, 36 to 40 ft. of dense silt, and then 6 to 7 ft. of glacial silt till before refusals were met.

Based on our findings, the following recommendations are made:

(A) Foundation

Although the dense gravelly sand, existing between Elev. 685 to Elev. 665, is capable of supporting a safe load of 2.5 t.s.f., we do not think a spread footing is desirable because it would impose additional loads on the adjacent piles.

In our opinion, the widened portions of the bridge should be supported on either #14 timber piles or end-bearing H piles. In the case of timber piles, a safe load of 20 tons/pile can be assumed, if the piles are driven to Elev. 630 to have a 50 ft. embedded length.

Since differential settlements are anticipated, vertical expansion joints between the new and existing structures should be provided for that purpose.

If H piles are employed, they should be driven to at least Elev. 623.0±, and designed as end-bearing piles. The maximum allowable load for the particular section used may be assumed for design purposes, and the pile-driving in the field should be controlled by the Hiley Formula. The settlement of abutments supported on end-bearing H-piles would be negligible.

The pile caps should have at least 4 ft. of cover for frost protection. In our present case, this will necessitate excavation below water level, and hence a dewatering scheme will be required. One of the possible methods is sump-pump inside a coffer-dam of interlocking sheet-pilings, driven below the base of excavation to a depth equal to the height of the prevailing water level, which can be taken as that of the river.

(B) Approach Embankment

Although the embankment fill will be stable at a 1.5:1 side slope, for reasons of surfacial scouring, we think it should be constructed at a 2:1 slope and be properly sodded.

There may be some differential settlements between the new fill and the old fill. However, the amount is not expected to be large, and the situation should become stabilized in a short time.

The existing fill slopes should be benched in accordance with MTC Standard (DD-414) before new fill is placed.

(C) Stone Retaining Walls

The Lynn River Channel south of the bridge is being protected by relatively steep masonry walls. From observation, these walls appeared to be functioning satisfactorily. Therefore, similar walls can be constructed for shore protection. They can be founded approximately 1 ft. below the river bed, and backfilled with clean, granular material. It will be necessary to construct the wall and backfill simultaneously.

5. MISCELLANEOUS

The field work was undertaken during the period March 4 to March 14, 1975, under the supervision of Mr. B. Ly.

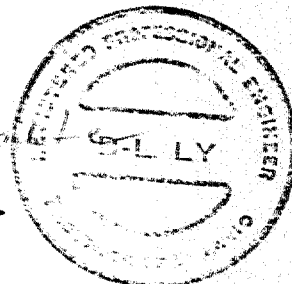
The equipment used was owned and operated by P.V.K. & Sons Ltd.

This report was prepared by Mr. B. Ly and reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

B. Ly
B. LY
Project Engineer.

for

K. G. Selby
K. G. SELBY
Supervising Engineer.



April 1975

RECORD OF BOREHOLE NO 1

W.P. 53-71-02

LOCATION STA: 106+87: 51' RT. OF C

ORIGINATED BY B.L.

DIST 2 HWY. 3

BORING DATE MARCH 5th, 1975

COMPILED BY B.L.

DATUM GEODETIC

BOREHOLE TYPE WASH-BORING WITH NX + BX CASINGS

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT — w_L PLASTIC LIMIT — w_p WATER CONTENT — w			UNIT WEIG./FT γ	REMARKS % GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	'N' VALUES		20 40 60 80 100					— w_p — w — w_L				
							SHEAR STRENGTH					— w_p — w — w_L				
							○ UNC. UNFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE					WATER CONTENT %				
690.5	GROUND LEVEL					690										
684.5	FILL: Silty sand Loose, some twigs and wood pieces		1	SS	2	685.9										
683.5	MULK		2	SS	3											
7.0	SAND: Dense Medium/Coarse, with numerous fine gravel		3	SS	24	680										
			4	SS	23											
670.5			5	SS	27	670										
20.0			6	SS	53											
			7	SS	45	660										
	Silt: Dense, with layers of very fine sand and seams of clay.		8	SS	25											
			9	SS	18	650										
			10	SS	22											
			11	SS	32	640										
			12	SS	36											
630.5	Glacial Till					630										
60.0	Silt with some sand trace of clay and gravel															
623.5	Dense		13	SS	16											
67.0	END OF BOREHOLE					620										
	NOTE: No further penetration @ 623.5 split spoon bouncing															

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO
ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 2

WP. 53-71-02 LOCATION STA: 106+32: 45' LT of E ORIGINATED BY BL
DIST. 2 HWY. 3 BORING DATE March 12th, 1975 COMPILED BY BL
DATUM GEODETIC BOREHOLE TYPE HOLLOW STEM AUGER CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER ELEV	DYNAMIC CONE PENETRATION RESISTANCE PLOT					LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT Y	REMARKS
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	VALUES		20	40	60	100		w_p	w	w_L		
689.0	GROUND LEVEL															
685.0	FILL: Silty sand, loose, some stones		1	SS	2	685.0										
684.0	CLAY		2	SS	19											
5.0	Sand: Dense Coarse/medium with numerous fine gravel.		3	SS	16	680										
			4	SS	24											
			5	SS	38	670										
665.0																
24.0	Silt: Dense with layers of very fine sand and seams of clay.		6	SS	28	660										
			7	SS	24											
			8	SS	28	650										
			9	SS	28											
			10	SS	23	640										
			11	SS	32											
629.0			12	SS	17	630										
60.0	Glacial Till: silt with some sand, trace of clay and gravel.		13	SS	29											
622.5	Dense															
66.5	End of Borehole NB: No further penetration @ 622.5 Auger grinding and split spoon bouncing					620										

RECORD OF BOREHOLE NO 3

W.P. 53-71-02

LOCATION STA: 106+16: 56° RT of C

ORIGINATED BY BL

DIST. 2 HWY. 3

BORING DATE March 14th, 1975

COMPILED BY BL

DATUM GEODETIC

BOREHOLE TYPE FOLLOW STEY AUGER

CHECKED BY

SOIL PRO			SAMPLES			GROUND WATER ELEV.	DYNAMIC CONE PENETRATION RESISTANCE PLOT				LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w			UNIT WEIGHT γ	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES		30	40	60	100	w_p	w	w_L		
693.5	GROUND LEVEL														GR SA SI CL
0.0	FILL: Silty sand: Loose and medium					690									
685.0			1	SS	6	686.0									
684.0	ROCK														
9.5	Sand: Dense, Medium/coarse, with numerous fine gravel.		2	SS	24										
			3	SS	22	680									
						670									
665.0															
28.5	Silt: Dense, with layers of very fine sand and seams of clay.		4	SS	26										
			5	SS	13	660									
			6	SS	35										
			7	SS	29	650									
						640									
			8	SS	20										
						630									
627.5			9	SS	14										
66.0	Glacial Till: silt with some sand, trace of clay and gravel														
621.5	Dense														
72.0	End of Borehole NB: No further penetration @ 621.5 Auger grinding, and split spoon bouncing					620									

ABBREVIATIONS & SYMBOLS USED IN THIS REPORT

PENETRATION RESISTANCE

'N'-STANDARD PENETRATION RESISTANCE - 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>LB/50 FT</u>	<u>DENSENESS</u>	<u>'N' BLOWS / FT.</u>
VERY SOFT	0 - 250	VERY LOOSE	0 - 4
SOFT	250 - 500	LOOSE	4 - 10
FIRM	500 - 1000	COMPACT	10 - 30
STIFF	1000 - 2000	DENSE	30 - 50
VERY STIFF	2000 - 4000	VERY DENSE	> 50
HARD	> 4000		

TERMS TO BE USED IN DESCRIBING SOILS:-

TRACE < 10% , SOME 10-25% , WITH 25-40% , > 40% SILTY, SANDY, GRAVELLY, CLAYEY ETC.

TYPE OF SAMPLE

S.S.	SPLIT SPOON	T.W.	THINWALL OPEN
W.S.	WASHED SAMPLE	T.P.	THINWALL PISTON
S.T.	SLOTTED TUBE SAMPLE	O.S.	OESTERBERG SAMPLE
A.S.	AUGER SAMPLE	F.S.	FOIL SAMPLE
C.S.	CHUNK SAMPLE	R.C.	ROCK CORE

P.H. SAMPLE ADVANCED HYDRAULICALLY

P.M. SAMPLE ADVANCED MANUALLY

SOIL TESTS

U	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
UU	UNCONSOLIDATED UNDRAINED TRIAXIAL	F.V.	FIELD VANE
CU	CONSOLIDATED ISOTROPIC UNDRAINED TRIAXIAL	C	CONSOLIDATION
CID	" " DRAINED "	S	SENSITIVITY
CAU	" " ANISOTROPIC UNDRAINED "		
CAD	" " DRAINED "		

ABBREVIATIONS & SYMBOLS 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
w_s	SHRINKAGE LIMIT
I_L	LIQUIDITY INDEX $= \frac{w - w_p}{I_p}$
I_C	CONSISTENCY INDEX $= \frac{w_L - w}{I_p}$
e_{max}	VOID RATIO IN LOOSEST STATE
e_{min}	VOID RATIO IN DENSEST STATE
I_D	DENSITY INDEX $= \frac{e_{max} - e}{e_{max} - e_{min}}$
	RELATIVE DENSITY D_r IS ALSO USED
h	HYDRAULIC HEAD OR POTENTIAL
Q	RATE OF DISCHARGE
v	VELOCITY OF FLOW
i	HYDRAULIC GRADIENT
k	COEFFICIENT OF PERMEABILITY
j	SEEPAGE FORCE PER UNIT VOLUME
m_v	COEFFICIENT OF VOLUME CHANGE $= \frac{-\Delta e}{(1+e)\Delta\sigma}$
c_v	COEFFICIENT OF CONSOLIDATION
C_c	COMPRESSION INDEX $= \frac{\Delta e}{\Delta \log_{10} \sigma}$
T_v	TIME FACTOR $= \frac{c_v t}{d^2}$ (d, DRAINAGE PATH)
U	DEGREE OF CONSOLIDATION
τ_f	SHEAR STRENGTH
c'	EFFECTIVE COHESION INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
μ	COEFFICIENT OF FRICTION
S_t	SENSITIVITY

GENERAL

π	≈ 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e \sigma$ OR $\ln \sigma$	NATURAL LOGARITHM OF σ
$\log_{10} \sigma$ OR $\log \sigma$	LOGARITHM OF σ 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

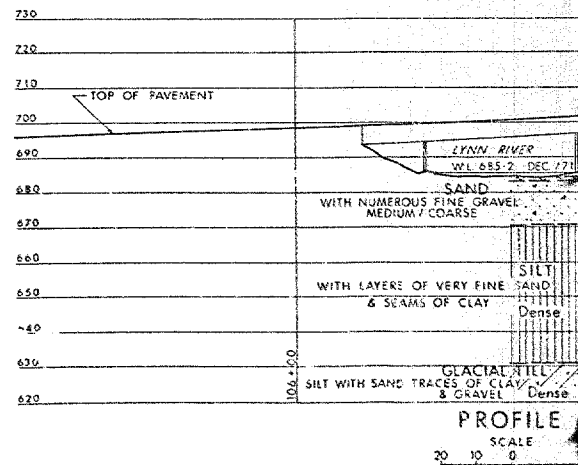
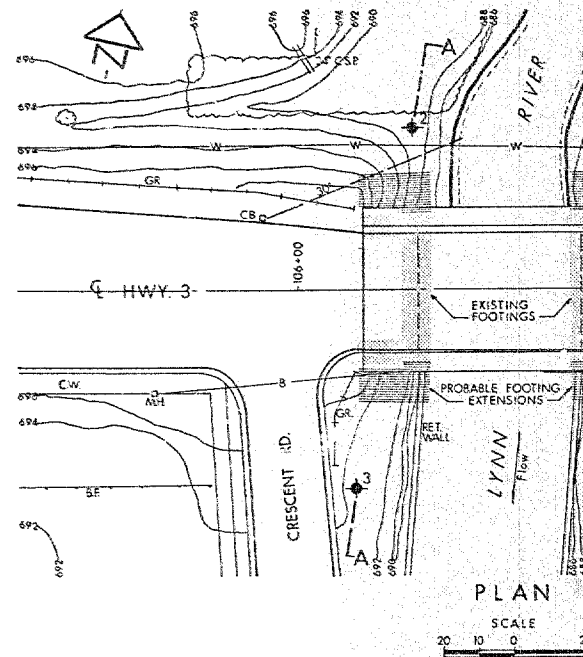
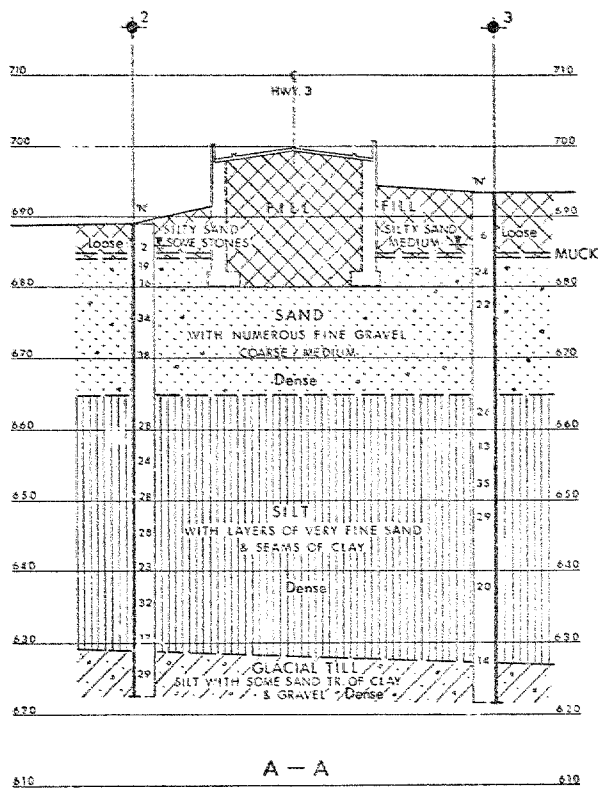
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_0	COEFFICIENT OF EARTH PRESSURE AT REST

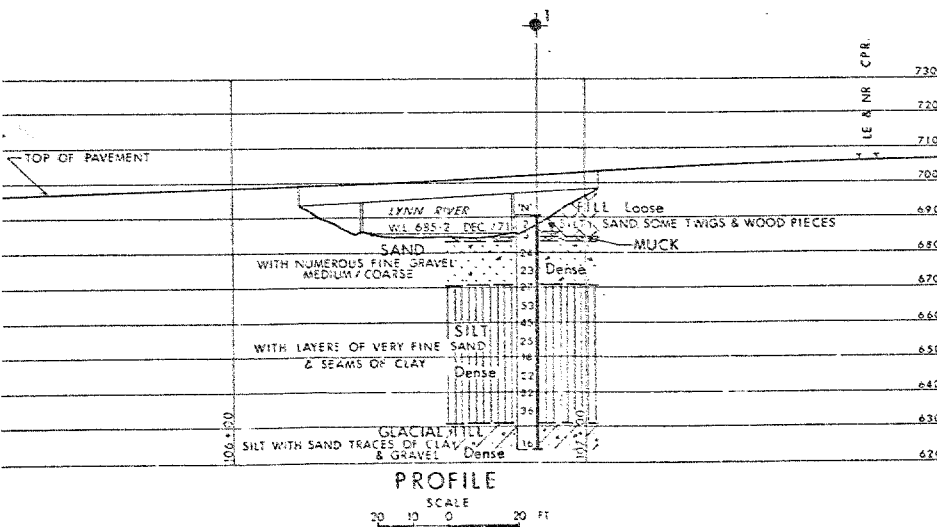
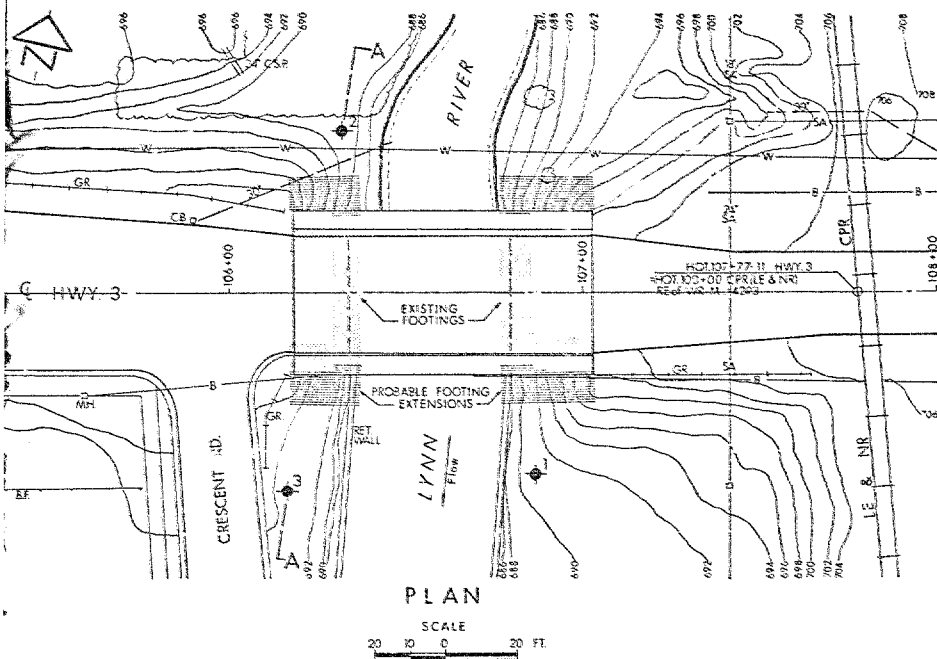
FOUNDATIONS

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

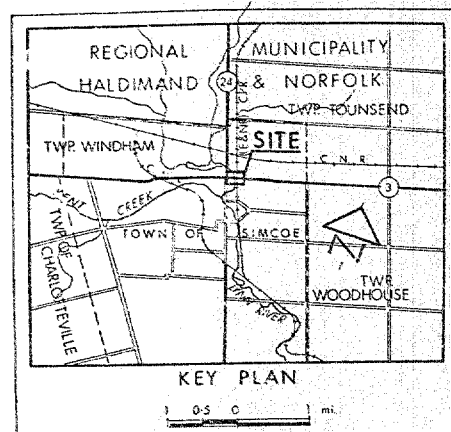
SLOPES

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





REF NO. E-5360-1 OCT. 1974



LEGEND			
	Bore Hole		
	Dynamic Cone Penetration Resistance Test		
	Bore Hole & Cone Test		
	Water Levels established at time of field investigation MAR. 1975		
NO.	ELEVATION	STATION	OFFSET
1	690.5	106+87	51' RT.
2	689.0	106+32	46' LT.
3	693.5	106+16	56' RT.

NOTE: FOR CONTRACT DOCUMENTS
The complete foundation investigation report for this structure may be examined at the Structural Office and Foundations Office, Downsview, and at the LONDON District Office.

— NOTE —
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

REVISED	DATE	BY	DESCRIPTION
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS—ONTARIO ENGINEERING SERVICES BRANCH—GEOTECHNICAL OFFICE—SOIL MECHANICS SECTION			
LYNN RIVER			
HIGHWAY NO. 3		DIST NO. 2	
REG. MUNICIPALITY HALDIMAND & NORFOLK		TOWN OF SIMCOE	
DRAWN BY CHICKED		APPROVED	
DATE 24 MAR. 1975		SITE NO.	
APPROVED		CONT NO.	
SUBMD & L		WR NO 53-71-02	
DRAWN BY CHICKED		APPROVED	
DATE 24 MAR. 1975		SITE NO.	
APPROVED		CONT NO.	
BORE HOLE LOCATIONS & SOIL STRATA		DRAWING NO. 537102-A	
SUBMD & L		WR NO 53-71-02	
DRAWN BY CHICKED		APPROVED	
DATE 24 MAR. 1975		SITE NO.	
APPROVED		CONT NO.	

Telephone (416) 243-3282

Soil Mechanics Section
Geotechnical Office
West Building
1201 Wilson Avenue
DOWNSVIEW, Ontario M3M 1J8

April 7th, 1975

P.V.A. & Sons Drilling Ltd.
R.R. #4
Brantford, Ontario
N3T 5L7

Dear Sirs:

This letter confirms our request by telephone by Mr. B. Ly, of March 12th, 1975 for the supply of a Type II Auger, M.V. Mounted W.H.S.A. (Item No. 5.2 (F)), together with all necessary equipment, as per your Tender for Supply Contract S-74-2115, at Simcoe, Ontario on March 12th, 1975.

Mobilization will be from Burford.

Our Project Number is W.P. 53-71-92.

Yours truly,

K. G. Selby
Supervising Engineer

cc: W.W. Fry
(ATTN: V. Di Marco)

Files (2)
Record Services

KGS/sah



Memorandum

To: Mr. A. P. Watt,
Reg. Structural Planning Eng.,
Southwestern Region,
London, Ontario.

From: Structural Office,
West Building, Downsview.

Attention:

Date: October 9, 1975.

Our File Ref.

In Reply to

Subject:

Widening of Lynn River Bridge,
W.P. 53-71-02, Site 20-70,
Highway 3, District #2.


Attached herewith are prints of the Preliminary Bridge Plan Drawing 20-70-P1 for the above-mentioned structure.

The estimated cost of the proposed widening of the structure is \$161,000.00 which includes tender, materials, engineering and sundry construction.

We have sent a copy of the Preliminary Plan to the Hydrology Office for their comments.

Any comments or revisions you may have should be submitted at your earliest convenience.

CSG/cf
Attch.


C. S. Grebski,
Structural Design Engineer.

c.c. B. Davis
W. Birch
A. McKim
J. Keen
M. Stoyanoff
J. Harris
✓ E. Mirza
J. Anderson
A. Crowley
S. Edwards

No comments

B. Ly. Oct 20, '75





Ministry of
Transportation and
Communications

Memorandum

To: Mr. C. Mirza,
Head, Soil Mechanics Section,
West Building, Downsview.

From: Structural Office,
West Building, Downsview.

Attention:

Date: April 15, 1976.

Our File Ref.

In Reply to

Subject:

Lynn River Bridge Widening,
W.P. # 53-71-02 Site # 20-70
Highway # 3 District # 2

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.

CSG/ci

C. S. Grebski,
Structural Design Engineer.

finalized
Revised
April 76

For comments, see memo of May 10, 1976.
B. Ly





Ministry of
Transportation and
Communications

Memorandum

To: Mr. A. Wittenberg,
Regional Manager,
Reg. Planning and Design Office,
Southwestern Region, London.

From: Structural Office,
West Building,
Downsview, Ontario.

Attention:

Date: May 4, 1976.

Our File Ref.

In Reply to

Subject: W.P. 53-71-02, Site 20-70
Widening of Lynn River Bridge
Highway 3, District 2

Please find enclosed two sets of prints of drawings 20-70-1,-3 to -11 for your use.


One print of drawing 20-70-1 is being forwarded to the Systems Design Project Review Section.

One set of prints is also being forwarded to the following:

Estimating Section
Regional Structural Planning
Assistant Construction Engineer (Structures)
District Office
Structural Maintenance Engineer
Soil Mechanics Section

The D4 and Special Provisions were mailed to you previously.

NZ/ac
Encl.


N. Zoltay,
Structural Contract
Specifications Engineer.

C.C. J. Wear
B. Giroux
A.P. Watt
A.E. McKim
D.P. Collins
W. Birch
C. Mirza
A. Crowley
J. Anderson





Memorandum

To: Mr. A. Wittenberg,
Regional Manager,
Reg. Planning and Design Office,
Southwestern Region, London.

From: Structural Office,
West Building,
Downsview, Ontario.

Attention:

Date: May 4, 1976.

Our File Ref.

In Reply to

Subject:

W.P. 53-71-02, Site 20-70
Widening of Lynn River Bridge
Highway 3, District 2

Please add the following to the List of Materials
Supplied by MTC in the Bridge D4:

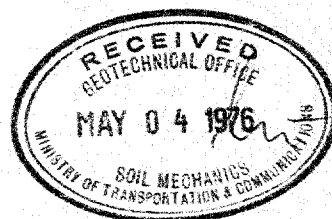
"Timber Piles - treated - No. 14 Size

37 pieces, each 55 feet long".

N. Zoltay,
Structural Contract
Specifications Engineer.

NZ/ac

c.c. J. Keen
J. Wear
D.P. Collins
K.C. Howe
B. Giroux
A.E. MCKim
A.P. Watt
W. Birch
C. Mirza ✓



→ KGS

Mr. C.S. Grebski
Structural Design Engineer
Structural Design Section
West Building, Downsview

Soil Mechanics Section
Geotechnical Office
West Building, Downsview

May 10, 1976

Lynn River Bridge Widening
W.P. 53-71-02, Site No. 20-70
Hwy. 3, District 2, London

We have reviewed the final design drawings (Dwg. No. 20-70-1 & 3) of this project. Our comments are as follows:

After having re-appraised the subsoil conditions, we feel the capacity of the 55 ft. long treated #14 timber piles can be increased from 20 tons per pile to 25 tons per pile and the pile driving should be controlled by Hiley formula (MTC Standard SS-3-11).

A dewatering scheme will be required for pouring the pile caps, as mentioned in our foundation report.

B. Ly
Project Engineer

For: K.G. Selby
Supervising Engineer

cc: Files
Record Services



Memorandum

To: Mr. A. Wittenberg,
Regional Manager,
Reg. Planning and Design Office,
Southwestern Region, London.

From: Structural Office,
West Building,
Downsview, Ontario.

Attention:

Date: May 28, 1976.

Our File Ref.

In Reply to

Subject:

W.P. 53-71-02, Site 20-70
Widening of Lynn River Bridge
Highway 3, District 2

Please add the following Special SP to the
bridge part of the contract documents.

"Driving Timber Piles

As part of the work to be performed at the
contract price for the above tender item, the
Contractor shall supply and place protection
for the pile heads as shown on the contract
drawings.

Section 903.12 MTC Form 903 is amended in that
the exposed surfaces of the pile cut-off shall be
treated with 3 brush coats of hot creosoted oil".

Add the notation of SP to the applicable tender item.

Change the drawing numbers to read:

" 20-70-1 to -12 inclusive and Reinforcing Steel
Schedule and D-3468-1 and -2".

N. Zoltay,
Structural Contract
Specifications Engineer.

NZ/ac

c.c. J. Keen
J. Wear
D.P. Collins
R.C. Howe
W. Birch
B. Giroux
C. Mirza ✓
A.E. McKim
A.P. Watt



K65

Mr. C.S. Grebski
Structural Design Engineer
Structural Design Section
West Building, Downsview

Mr. J.L. Keen

Soil Mechanics Section
Geotechnical Office
West Building, Downsview

November 24, 1976

Re: Lynn River Bridge Widening
W.P. 53-71-02, Site No. 20-70
Hwy. 3, District 2, London

Further to our memorandum dated May 10, 1976 we have again reviewed the piling requirements for the above mentioned project. We are now of the opinion that the lengths supplied should be 45 feet rather than the 55 foot lengths originally approved by us. The design load should be as recommended in our May 10th memorandum, i.e. 25 tons/pile.

K.G. Selby
Supervising Engineer

cc: K. Lutcka
M. Stoyanof
Files
Record Services

KGS/gs

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRE'S No. 4016-15

DIST. 2 REGION SOUTH WESTERN

W.P. No. 53-71-92

CONT. No. 77-23

W. O. No. _____

STR. SITE No. 20-70

HWY. No. 3

LOCATION LYNN RIVER BRIDGE

WIDENING

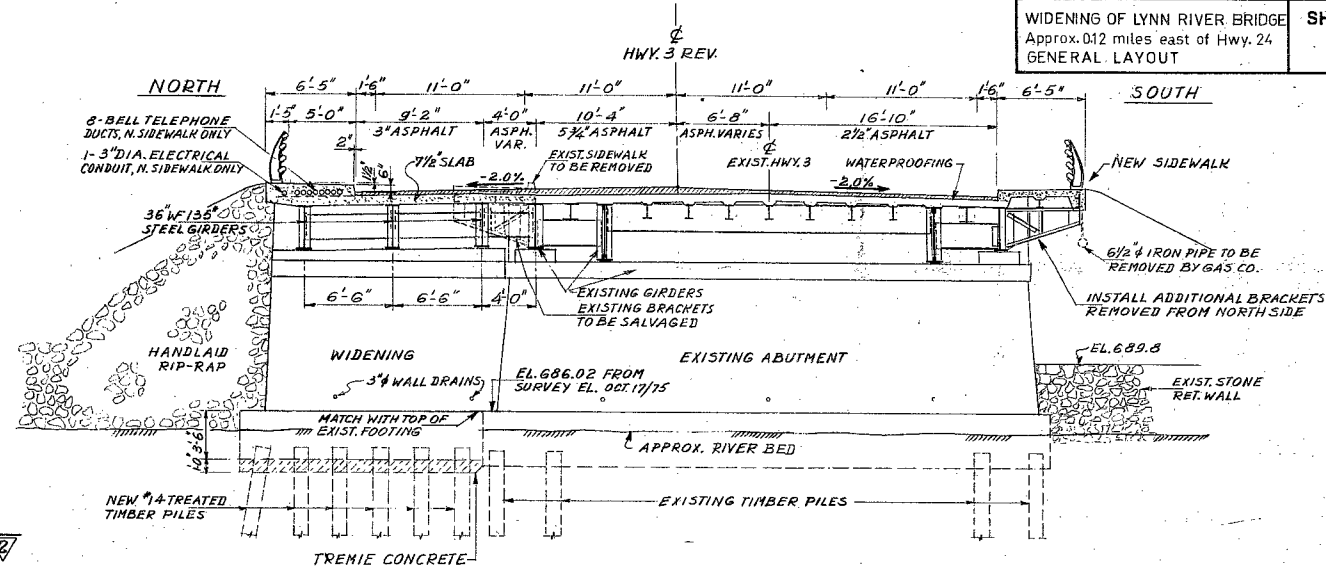
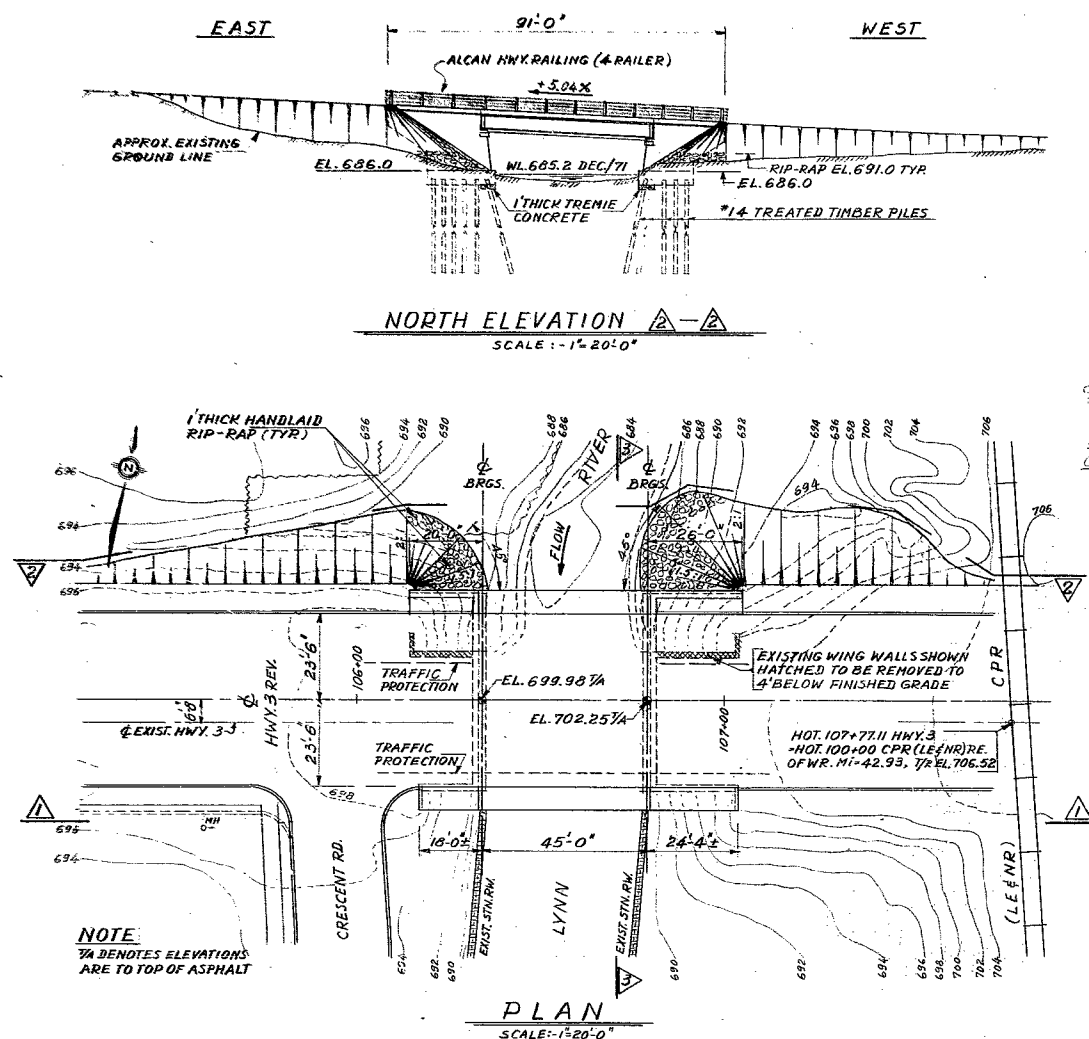
OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 2

REMARKS: Documents to be unfolded before
microfilming

DISTRICT No 2
CONT No
WP No 53-71-02

WIDENING OF LYNN RIVER BRIDGE
Approx. 0.12 miles east of Hwy. 24
GENERAL LAYOUT

SHEET



SEQUENCE OF CONSTRUCTION

1. INSTALL TRAFFIC PROTECTION ON NORTH SIDE
2. WIDEN STRUCTURE ON NORTH SIDE
3. INSTALL TRAFFIC PROTECTION AND RECONSTRUCT SOUTH SIDEWALK.
4. CLEAN AND PAINT STRUCTURAL STEEL (EXIST & NEW)

NOTES

CLASS OF CONCRETE
DECK AND SIDEWALKS ----- 4000 psi.
REMAINDER ----- 3000 psi.

CLEAR COVER ON REINFORCING STEEL
FOOTINGS 3", ABUTMENTS 3", WINGWALLS 3", DECK TOP 2",
DECK BOTTOM 1", SIDEWALKS 2".

CONSTRUCTION NOTES
THE CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS DEAD LEVEL TO THE SPECIFIED ELEVATIONS WITH A TOLERANCE OF $\pm \frac{1}{8}$ INCH.
NO CONCRETE SHALL BE PLACED ABOVE THE ABUTMENT BEARING SEATS UNTIL THE CONCRETE IN DECK HAS BEEN PLACED.

LIST OF DRAWINGS

- 20-70-1 GENERAL LAYOUT
- 20-70-2 BORE HOLE LOCATIONS & SOILS STRATA
- 20-70-3 FOOTINGS
- 20-70-4 ABUTMENTS
- 20-70-5 WING WALLS AND NORTH SIDEWALKS
- 20-70-6 STRUCTURAL STEEL
- 20-70-7 DECK
- 20-70-8 SOUTH SIDEWALK REPLACEMENT
- 20-70-9 ALUMINUM HIGHWAY RAILING
- 20-70-10 STANDARD DETAILS I.
- 20-70-11 STANDARD DETAILS II.
- 20-70-12 BRIDGE ELECTRICAL DETAILS - TYPE I

CONCRETE QUANTITIES

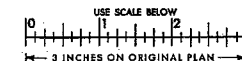
CONCRETE QUANTITIES ARE LISTED BELOW FOR THE APPROPRIATE CONCRETE LUMP SUM TENDER ITEMS:

- 1. CONCRETE IN ABUTMENTS AND WINGWALLS ----- 86 cu. yd.
- 2. CONCRETE IN DECK ----- 46 cu. yd.
- 3. WEIGHT OF STRUCTURAL STEEL ----- 12.5 TONS



401 16-15
GEODESIC No.

FOR REDUCED PLAN



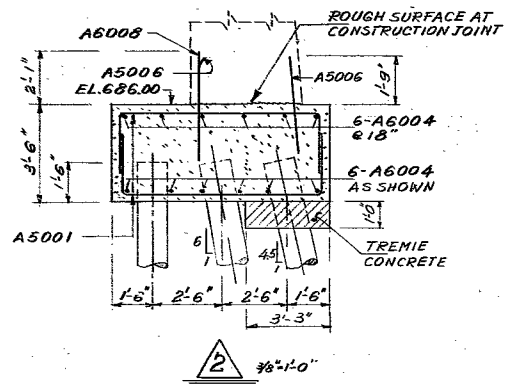
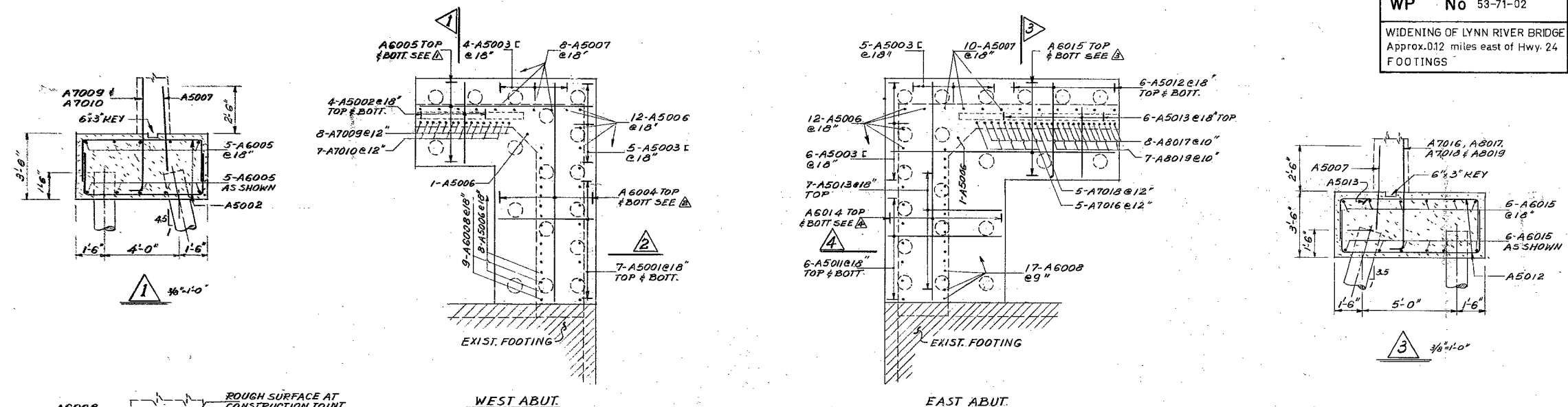
REVISIONS	DATE	BY	DESCRIPTION
1			DESIGN J. S. CHECK F.C. LOADING HS 20-44 DATE MAR/76
2			DRAWING J. S. CHECK F.C. SITE No 20-70 DWG-1

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS ONTARIO 08-58-15 4-75

DISTRICT No 2
CONT No
WP No 53-71-02

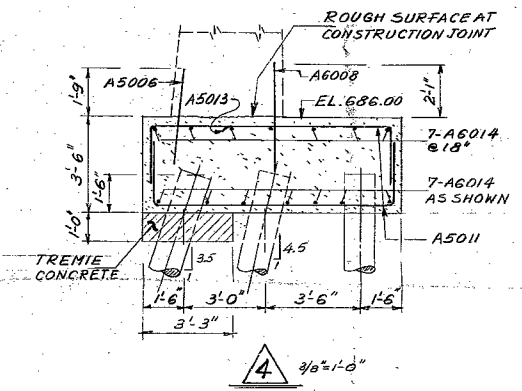
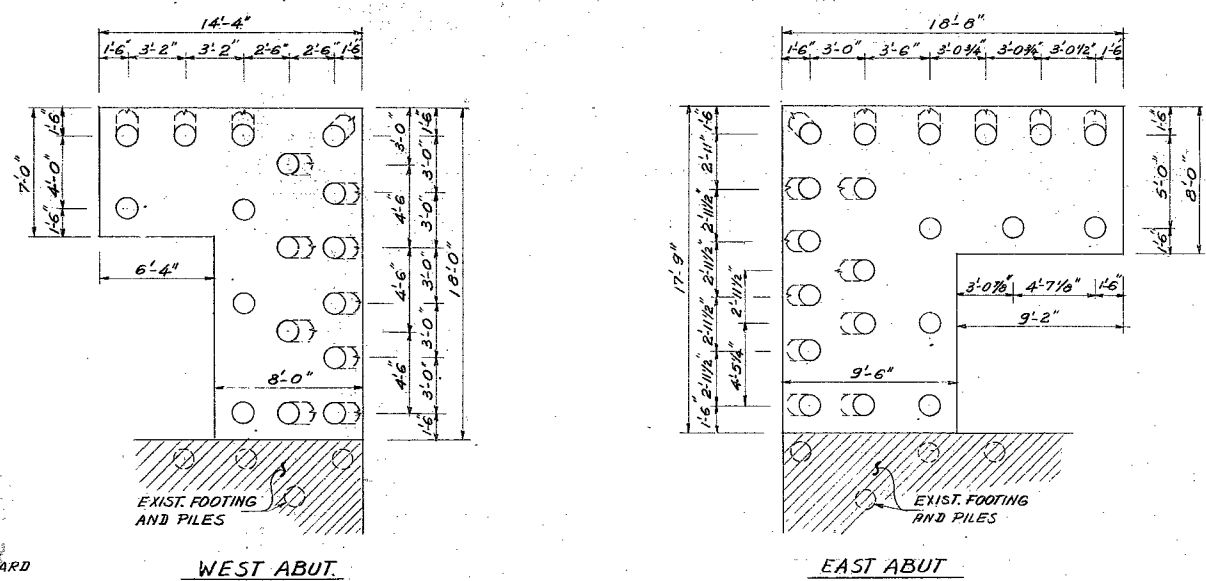
WIDENING OF LYNN RIVER BRIDGE
Approx. 0.12 miles east of Hwy. 24
FOOTINGS

SHEET



PILES SUPPLIED			
LOCATION	No	LENGTH	TYPE
WEST ABUT.	17	45'-0"	*14-TREATED
EAST ABUT.	20	45'-0"	TIMBER PILES

- NOTES
- DESIGN LOAD 25 TONS / PILE
 - SPACINGS OF PILES ARE MEASURED AT UNDERSIDE OF FOOTINGS (TOP OF TREMIE CONC.)
 - PILES TO BE TREATED
 - PILING - CREOSOTE - 8% C.F. RETENTION
 - PILE CUT OFF EL. 684.00 TYPICAL
 - PILES TO BE DRIVEN IN ACCORDANCE WITH STANDARD SS3-II USING DESIGN LOAD 25 TONS / PILE



NOTE
THIS DRAWING SHALL BE READ IN CONJUNCTION WITH DRAWINGS 20-70-4 & 5



FOR REDUCED PLAN
USE SCALE BELOW
0 1 2 3
3 INCHES ON ORIGINAL PLAN

REVISIONS	DATE	BY	DESCRIPTION

DESIGN J. S2 CHECK F.C. LOADING HS20-44 DATE MAR/76
DRAWING J. S2 CHECK F.C. SITE No 20-70 DWG 3