



Design Services Branch,  
Downsview 464, Ontario.

October 19, 1972.

Telephone: 248-3282.

F. E. Johnston Drilling Co. Ltd.,  
P.O. Box 4134,  
Postal Station 'E',  
Ottawa 1, Ontario.

Dear Sirs:

This letter confirms our request of September 1, 1972, for the supply of a diamond drill together with all necessary equipment, as specified under the terms of our Contract Agreement, at Eganville, Ontario, on September 5, 1972.

Mobilization will be from Ottawa.

Our Project Number is W.O. 72-11105.

Yours truly,

*K. G. Selby,*

K. G. Selby,  
Supervising Foundations Eng.  
For: A. G. Sternac,  
Principal Foundations Eng.

KGS/ao

cc: W. W. Fry  
(Attn: Mrs. M. Andrews)

Foundations Files ✓  
Documents

MEMORANDUM

TO: Mr. T. C. Kingsland, (2) FROM: Foundations Office,  
Regional Structural Planning Eng., Design Services Branch,  
Eastern Region, West Bldg., Downsview,  
Kingston, Ontario.

ATTENTION: DATE: October 31, 1972.

OUR FILE REF.

IN REPLY TO NOV - 8 1972

SUBJECT:

31F-57

FOUNDATION INVESTIGATION REPORT

For

The Proposed Crossing at  
Constan Creek and Hwy. #41  
Lot 10, Con. 6

Twp. of Grattan, Co. of Renfrew  
District #10 (Bancroft)

W.O. 72-11105 -- W.P. 95-61-03

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.

AGS/ao  
Attach.

- cc: E. J. Orr
- B. R. Davis
- A. Rutka
- S. J. Markiewicz
- D. A. Osborne-White
- N. J. Giroux
- E. R. Saint
- G. A. Wrong
- B. A. Singh

*A. G. Sternac*  
A. G. Sternac,  
PRINCIPAL FOUNDATIONS ENGINEER.

Foundations Files ✓  
Documents

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FOUNDATION INVESTIGATION REPORT  
For  
The Proposed Crossing at  
Constan Creek and Hwy. #41  
Lot 10, Con. 6  
Twp. of Grattan, Co. of Renfrew  
District #10 (Bancroft)  
W.O. 72-11105 -- W.P. 95-61-03

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1. INTRODUCTION:

A request for a foundation investigation at the proposed crossing of Constan Creek and Hwy. #41 was received from Mr. T. C. Kingsland, Regional Structural Planning Engineer, in a memorandum dated August 30, 1972.

Following this request, a field investigation was carried out by the Foundations Office to determine the subsoil conditions existing at the site.

This report contains the results of this investigation together with our recommendations pertaining to the design of the proposed new structure foundations.

2. DESCRIPTION OF THE SITE:

The site of the proposed new structure over Constan Creek is located approximately 3.5 mi. north of Jct. Hwy. #41 and Hwy. #132, on Hwy. #41.

The surrounding terrain is rolling and grass covered.

The channel of Constan Creek is approximately 40 ft. wide and 8 ft. deep.

3. FIELD AND LABORATORY INVESTIGATION PROCEDURES:

A total of four sampled boreholes was carried out during the course of the field work. Boring was achieved by means of a conventional diamond drilling equipment adapted for soil sampling purposes. Two of the boreholes were put down in the creek bed for which the drilling rig was raft mounted. During the field work, disturbed samples were obtained by means of a standard split-spoon sampler; the energy used in driving it conformed to the requirements of the Standard Penetration Test. (350 ft.-lbs. per blow) BX and AXT rock coring equipments were used to advance the borings through the bouldery zones.

All boreholes were surveyed in the field by personnel from Bancroft (#10) District.

The locations and elevations of the borings are shown on Drawing No. 72-11105A which accompanies this report.

All samples were visually examined and classified at the site as well as in the laboratory. Following this inspection, laboratory tests were carried out on selected samples to determine the natural moisture content and grain-size distribution.

The test results are summarized on the Record of Borehole sheets contained in the Appendix of this report.

4. SOIL TYPES AND SOIL CONDITIONS:

4.1) General:

Apart from the fill material, generally uniform subsoil conditions were found to prevail over the site area.

The subsoil consists of a granular type deposit with boulders. The estimated stratigraphical profile is shown on Drawing 72-11105A.

A more detailed description of the subsoil with regard to soil types and soil properties follows.

4.2) Fill Material:

This material was encountered in B.H. #3 and #4 from

the existing ground level (elevation 642+) to an approximate depth of 10 ft. The material in the deposit consists of sand and gravel with occasional boulders. Standard Penetration Tests carried out within this zone indicate that the relative density is compact.

4.3) Sand and Gravel With Silt and Boulders:

This deposit was intersected in all borings and extends from immediately below the creek water level, or the above-mentioned fill material down to elevation 594+ where the borings were terminated.

The material in the deposit consists mainly of sand and gravel with silt and frequent boulder concentrations, with the following average proportions: gravel - 40%, sand - 48%, silt - 12%. Grain-size distribution curves are included in the Appendix of this report (Figure 1). The natural moisture content was found to vary between 5 and 13%. From approximate elevation 615 downward, rock coring techniques were used to advance the borehole due to the heavy boulder concentrations. Boulders up to 2 ft. in diameter were recovered. Based on the results of Standard Penetration Test the relative density ranges from loose to very dense.

5. GROUNDWATER CONDITIONS:

The groundwater level was found to be the same as the water level in the creek.

6. DISCUSSION AND RECOMMENDATIONS:

It is proposed to construct a new bridge at this location. The new centre-line will be coincident with the existing centre-line and the new grade will be some 2 ft. higher than the existing grade. The new structure will be built at a skew angle and will have a clear waterway of about 40 ft. Subsoil at the site consists of sand and gravel with silt and boulders.

The new structure may be founded on spread footings with a design load of 3 t.s.f. at or below elevation 618.0. A

major dewatering problem exists due to the nature of the soil which is likely to 'boil' if subjected to a hydrostatic head. To overcome this problem the footings should be designed and constructed in the following way: Excavation should be carried out under water down to elevation 618.0. Tremie concrete should then be poured up to elevation 624.5. Normal type footings may then be constructed and the concrete poured in the dry. This method is based upon the assumption that the ground or river water level will not be higher than elevation 633 in which event the depth of tremie concrete will have to be increased.

No stability problems are anticipated for the proposed structure approaches provided standard 2:1 slopes are constructed.

7. MISCELLANEOUS:

The field investigation was carried out during the period of September 11 to 21, 1972, under the supervision of Mr. P. Payer, Project Foundations Engineer, who also prepared this report.

Equipment was owned and operated by F. E. Johnston Drilling Co. Ltd.

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

*P. Payer*  
P. Payer, P. Eng.



*K. G. Selby*  
K. G. Selby, P. Eng.

PP/ao  
Oct. 26, 1972.

APPENDIX I

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE NO 1

FOUNDATIONS OFFICE

JOB 72-11105  
 W.P. 95-61-03  
 DATUM Geodetic

LOCATION Sta. 236 + 36 21' Lt.  
 BORING DATE Sept. 12 & 13, 1972  
 BOREHOLE TYPE Washbore and Rock Coring

ORIGINATED BY PP  
 COMPILED BY PP  
 CHECKED BY

SOIL PROFILE		SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT $w_L$ PLASTIC LIMIT $w_p$ WATER CONTENT $w$			BULK DENSITY $\gamma$	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE		BLOWS/FOOT	SHEAR STRENGTH P.S.F.		WATER CONTENT %			
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE	$w_p$ — $w$ — $w_L$	10	20	30	
632.8	Water Level											
0.0	Water											
626.2	Ground Level											
6.6	Sand and gravel with occ. boulders.		1	SS	36							41 48 (11)
	Compact to Dense		2	SS	67/6"							33 49 (18)
			3	SS	74							
			4	SS	33							
607.8			5	SS	19 1/2"							
25.0	Boulders		6	AXT	14%							
			7	AXT	13%							
593.9			8	AXT	34%							
38.9	End of Borehole											

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 2

JOB 72-11105

LOCATION Sta. 236 + 50 19' Rt.

ORIGINATED BY PP

W.P. 95-61-03

BORING DATE Sept. 14 & 15, 1972

COMPILED BY PP

DATUM Geodetic

BOREHOLE TYPE Washboring & Rock Coring

CHECKED BY *PP*

SOIL PROFILE		STRAT. PLOT	SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT $w_L$ PLASTIC LIMIT $w_p$ WATER CONTENT $w$ $w_p \quad w \quad w_L$	BULK DENSITY $\gamma$ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION		NUMBER	TYPE	BLOWS/FOOT					
632.8	Water Level									
0.0	Water									
627.2	Ground Level									
5.6	Sand & gravel with silt. Loose to Dense	[Strat. Plot]	1	SS	12					
			2	SS	7	620				45 49 ( 6 )
			3	SS	19					
612.3			4	SS	13					29 53 (18)
20.5	Boulders	[Strat. Plot]	5	AXT	10%					
			6	AXT	24%	600				
			7	AXT	12%					
593.7	End of Borehole	[Strat. Plot]								
39.1						590				

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 3

JOB 72-11105

LOCATION Sta. 236 + 85 17' Lt.

ORIGINATED BY PP

W.P. 95-61-03

BORING DATE Sept. 18 & 19, 1972

COMPILED BY PP

DATUM Geodetic

BOREHOLE TYPE Washboring and Rock Coring

CHECKED BY [Signature]

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT	LIQUID LIMIT $w_L$ PLASTIC LIMIT $w_p$ WATER CONTENT $w$	SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	WATER CONTENT % 10 20 30	BULK DENSITY $\gamma$ P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT							
641.1	Ground Level											
0.0	Sand & gravel with occasional boulders. Compact	X	1	SS	28	640						
630.6	Fill Material	X	2	SS	20	630						V
10.5	Sand & gravel with some silt, occasional boulders.	o	3	SS	28	630						59 40 ( 2 )
	Compact	o	4	SS	26	620						41 52 ( 7 )
615.1	Boulders	o	5	SS	80%	610						
26.0		o	6	BX	80%	610						
		o	7	AXT	50%	610						
603.4		o	8	AXT	23%	610						
37.7	End of Borehole					600						

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH

FOUNDATIONS OFFICE

RECORD OF BOREHOLE NO 4

JOB 72-11105

LOCATION Sta. 236 + 04 16' Rt.

ORIGINATED BY PP

W.P. 95-61-03

BORING DATE Sept. 20 & 21, 1972

COMPILED BY PP

DATUM Geodetic

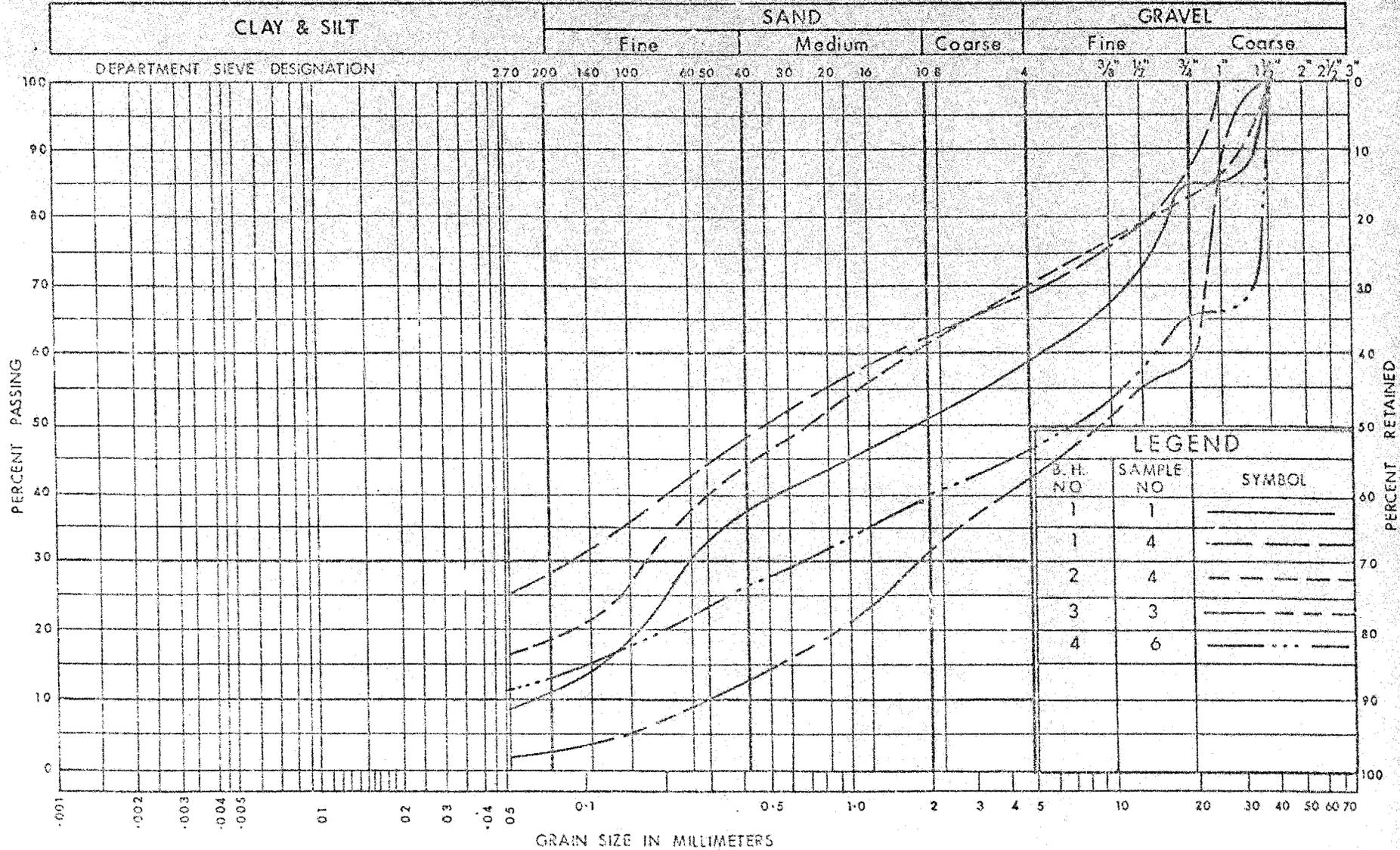
BOREHOLE TYPE Washboring and Rock Coring

CHECKED BY

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT $w_L$			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	PLASTIC LIMIT $w_p$	WATER CONTENT $w$			
							○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE		$w_p$	$w$	$w_L$		
									WATER CONTENT %				
									10	20	30		
642.3	Ground Level												
0.0	Sand & gravel with occasional boulders. Compact		1	SS	35.2"	61.0							
632.1	Fill Material		2	SS	14"								632.7
10.2	Sand and gravel with silt & boulders.		3	SS	20.7"	630							28 61 ( 11 )
	Compact to Very Dense		4	BX	40%								
			5	SS	24"	620							
			6	SS	58"								55 38 ( 12 )
			7	AXT	5%	610							
607.3			8	AXT	12%								
35.0	End of Borehole					600							

OFFICE REPORT ON SOIL EXPLORATION

### UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT  
OF  
TRANSPORTATION AND COMMUNICATIONS  
 DESIGN SERVICES  
BRANCH

## GRAIN SIZE DISTRIBUTION SAND & GRAVEL

W.P. No. 95-61-03  
JOB No. 72-11105  
FIGURE 1

## 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 <sub>u</sub>	UNCONFINED COMPRESSION	L.V.	LABORATORY VANE
Q	UNDRAINED TRIAXIAL	F.V.	FIELD VANE
Q <sub>cu</sub>	CONSOLIDATED UNDRAINED TRIAXIAL	C	CONSOLIDATION
Q <sub>d</sub>	DRAINED TRIAXIAL	S	SENSITIVITY

# ABBREVIATIONS USED IN THIS REPORT

## SOIL PROPERTIES

$\gamma$	UNIT WEIGHT OF SOIL (DULK DENSITY)
$\gamma_s$	UNIT WEIGHT OF SOLID PARTICLES
$\gamma_w$	UNIT WEIGHT OF WATER
$\gamma_d$	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
$\gamma'$	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
$\tau_f$	SHEAR STRENGTH
$c'$	EFFECTIVE COHESION INTERCEPT
$\phi'$	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
$c_u$	APPARENT COHESION
$\phi_u$	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
$\mu$	COEFFICIENT OF FRICTION
$S_t$	SENSITIVITY

## GENERAL

$\pi$	= 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
$\sigma$	NORMAL STRESS
$\sigma'$	NORMAL EFFECTIVE STRESS ( $\bar{\sigma}$ IS ALSO USED)
$\tau$	SHEAR STRESS
$\epsilon$	LINEAR STRAIN
$\gamma$	SHEAR STRAIN
$\nu$	POISSON'S RATIO ( $\mu$ IS ALSO USED)
E	MODULUS OF LINEAR DEFORMATION (YOUNG'S MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
$\eta$	COEFFICIENT OF VISCOSITY

## EARTH PRESSURE

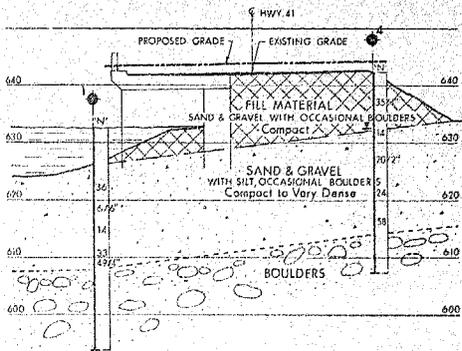
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
$\delta$	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
$K_0$	COEFFICIENT OF EARTH PRESSURE AT REST

## 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

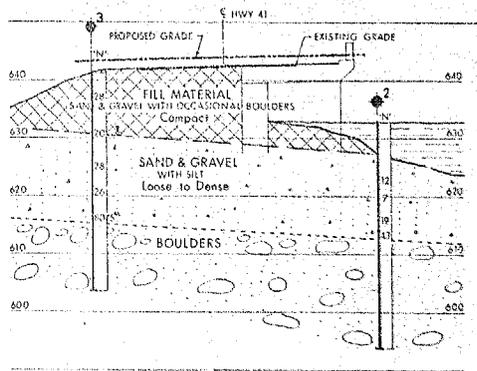
## SLOPES

H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
$\beta$	ANGLE OF SLOPE TO HORIZONTAL



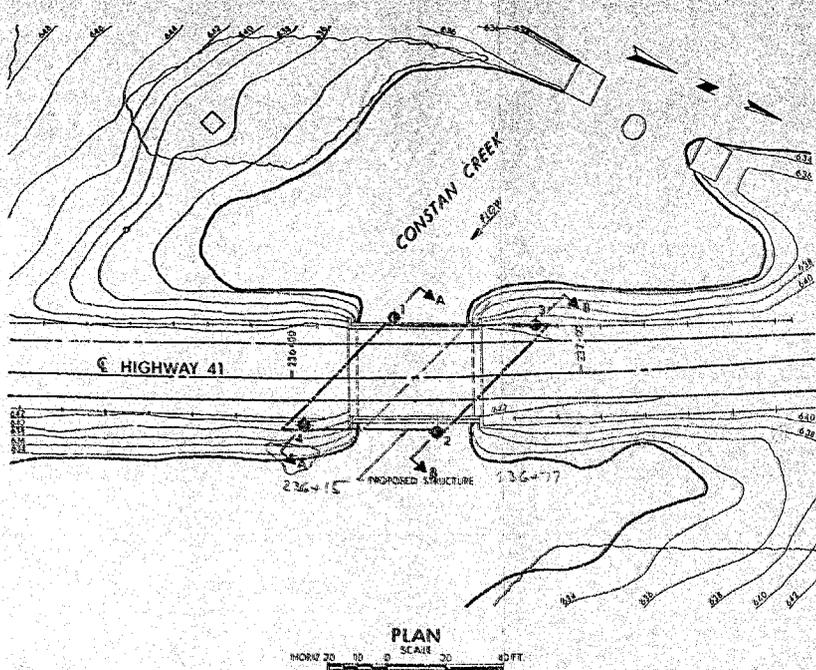
X-SECTION A-A

HORIZ. SCALE 1" = 20 FT  
VERT. SCALE 1" = 5 FT



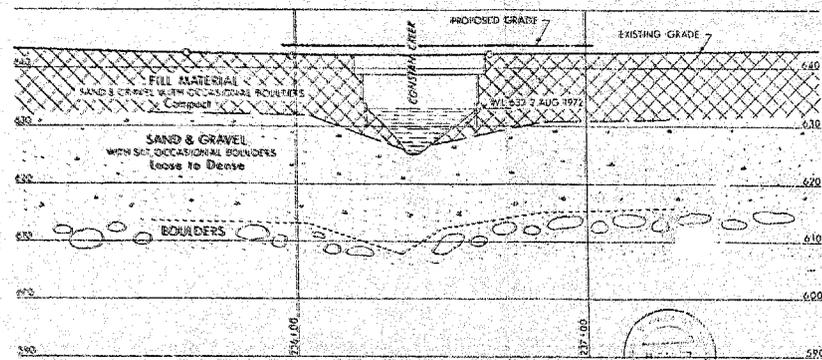
X-SECTION B-B

HORIZ. SCALE 1" = 20 FT  
VERT. SCALE 1" = 5 FT



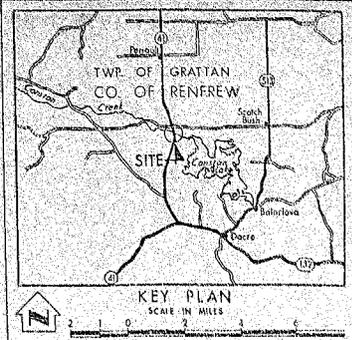
PLAN

SCALE 1" = 40 FT



PROFILE C-HIGHWAY 41

HORIZ. SCALE 1" = 20 FT  
VERT. SCALE 1" = 5 FT



LEGEND

- ⊕ Bore Hole
- ⊕ Conn Penetration Test
- ⊕ Bore Hole & Conn Test
- ↕ Water Levels established at time of field investigation Sept. 1972

NO.	ELEVATION	STATION	OFFSET
1	552.8	236+36	21' LT.
2	639.8	236+50	19' RT.
3	641.1	236+85	17' LT.
4	642.2	236+04	16' RT.

NOTE

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

REVISIONS	DATE	BY	DESCRIPTION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO  
DESIGN SERVICES, BRANCH - FOUNDATIONS OFFICE

CONSTAN CREEK

HIGHWAY NO. 41 DIST. NO. 10  
CO. RENFREW LOT 19 CON. 6  
TWP. GRATTAN

BORE HOLE LOCATIONS & SOIL STRATA

SUBM. NO. 72-11105 A  
DRAWN BY: W.D. NO. 22-11103  
DATE: NOV. 2, 1972  
APP. NO. 10225-1



MEMORANDUM

TO: T. C. Kingsland,  
Reg. Structural Planning Engineer,  
EASTERN REGION, Kingston.

FROM: Structural Office,  
West Bldg., DOWNSVIEW.

ATTENTION: DATE: January 11th, 1973.

OUR FILE REF. IN REPLY TO

SUBJECT: Constan Creek Bridge,  
3.4 Miles North of Hwy. #132,  
W.P.#95-61-03, Site #29-98,  
Hwy. #41, District #10.

72-11-105

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-29-98-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$77,000 which includes tender, materials, engineering, and sundry construction.

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



C. S. Grebski,  
Structural Design Engineer.

CSG:dp  
Attach.

- cc. B. R. Davis,  
W. D. Birch,  
A. E. McKim,  
A. Stermac (2), ✓  
J. Anderson,  
R. Forrest,  
M. Stoyanoff, plan only,  
W. McFarlane, plan only.

Comments

Design is not as recommended in the Foundation Report but is nevertheless feasible insofar as foundations are concerned.

K. L. Gully  
Feb. 12th 1973

RECEIVED  
FOUNDATIONS OFFICE  
JAN 11 1973  
Ministry of Transportation & Communications



A. Stermac,  
Principal Foundation Engineer,  
Room 107, West Building.

Structural Office,  
West Bldg., Downsview.

March 6th, 1973.

Constan Creek Bridge,  
3.4 Miles North of Hwy. #132,  
W.P.#95-61-03, Site #29-98,  
Hwy. #41, District #10.

72-11-105

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:dp  
Attach.

C.S. Grebski,  
Structural Design Engineer.

cc. Foundation Office.

No comments :-

K. L. Silby



*Copy to Structural Office  
17 April 73*



Structural Office,  
West Bldg., Downsview.

March 6th, 1973.

A. Steinar,  
Principal Foundation Engineer,  
Room 107, West Building.

Donatien Creek Bridge,  
2.4 Miles North of Hwy. #132,  
W.P. #88-61-01, Site #10-02,  
Hwy. #41, District #10.

Attached herewith we are submitting the final bridge  
plans which show the foundation design for this structure.  
Kindly give us your comments at your earliest convenience

C.S. Grzeski,  
Structural Design Engineer.

6:50  
rca.

Foundation Office.

K. J. Baker



FOUNDATIONS OFFICE

REVIEW OF DESIGN DRAWINGS:

W.P. .... 95-61-03 .....

W.O. .... 72-11105 .....

Foundation Report By: ..... PP .....

Review of Design Drawings By: ..... PP .....

Design Drawing No.'s: ..... Not shown .....

- 1. Does footing design comply with our report or subsequent memos? No
- 2. If answer to 1. is No, is present design acceptable? YES
- 3. Has sufficient field work been done? YES
- 4. Are estimated pile lengths shown on Drawings correct? If not, make a new list. (SEE BELOW)
- 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. (1.5:1) O.K.
- 7. Do you anticipate any construction problems? i.e., dewatering, stability of temporary slopes or excavations. YES, (PILE DRIVING)
- 8. Summarize your comments; on separate sheet if necessary.

DUE TO THE BOULDERY SUBSOIL CONDITIONS (FROM EL. 615±) IT IS POSSIBLE THAT THE 'H' PILES WILL MEET REFUSAL AT HIGHER ELEVATION(S), ~~WHICH~~ WHICH WOULD RESULT IN SHORTER PILE LENGTHS.

Drawings Received .. MARCH 21: ..... 19.73 .....

Reviewed .. MARCH 23: ..... 19.73 .....

Signed ..... P. Payne .....



*MURPHY*



Y T I P O I H ES. A STVJ I AM HIRN M  
BANC I D A O WHITE BIR

MINI FOR  
E LAINT WARE I  
W KOKAY ENG AUDIT  
A BILLING REC DIRECTOR

R FOREST PROGRAM OFFICE  
T KINGSLAND STRUCTURAL PLANNING

TORD I TO:  
Y STYONPT STRUCTURAL CONTROL ENGR  
O STERNAC TWINNAL FOUNDATION ENGR

B KOGARIFRAY PROGRAM OFFICE  
DOWN I I TO:

A S KOKIN CONST OFFICE  
O SINCOW ESTIMATING OFFICE

TORD I - K BARBI STRUCTURAL PLANNING

26 WP 02-02-01 ETC WYYS 41 AND 128, CORNWALLER BOUT-ERLY

DISTRICT 10 BANCROFT

PLEASE BE ADVISED THAT A REGIONAL REVIEW CONTRACT REVIEW WILL BE HELD

FOR THIS PROJECT ON THE FOLLOWING:

DATE - MAY 17, 1973

TIME - 10.00 AM

PLACE - BANCROFT & KINGSTON REGIONAL OFFICE

O X TRIPS SYSTEM DESIGN

*Wally Bly*

*43-11-102-5*

*Handwritten notes at bottom left, including 'Date received' and other illegible text.*

A. STERNA

Mr. K.G. Bassi,  
Reg. Structural Design Engineer,  
Structural Design Section,  
West Building.

Hydrology Office.

September 27, 1973.

Your query of Sept. 26/73

Constan Creek at Hwy. 41  
WP 95-61-03 Site 29-98 BW 1805  
District #10

---

Since a piled foundation is not feasible, we recommend in view of the highly scourable subsoil material the following.

Spread footings on rock-fill (with negligible fine material) at any practical elevation leaving a rockfill and riprap protected waterway area of 350 sq. ft. measured perpendicular to the flow direction and below elev. 636.

If the streambed is not rockfill it should be excavated, have riprap protection, but not be higher than elev. 625. Banks and fill, where not consisting of rockfill, should have riprap protection as recommended in the original hydrology report.

We trust these recommendations present a feasible alternative to the originally proposed piled foundation.

K. B. Jorne  
Special Projects Engineer.  
for J. D. Harris  
Principal Hydrology Engineer.

KBJ/ec  
cc. T. C. Kingsland



A. 2787

Hydrology Office.

Mr. M. G. Bassel,  
Supt. Structural Design Division,  
West Building.

September 27, 1973.

Your query of Sept. 26/73

Constant Creek at Hwy. 41  
W.P. 41-41-41 211 22-98 211 22-98  
District 211

Since a piled foundation is not feasible, we recommend in view of the  
highly erodible soil material the following.

Spread footings on rock fill (with negligible fine material) at any  
practical elevation leaving a rockfill and riprap protected waterway  
area of 100 sq. ft. measured perpendicular to the flow direction  
and below elev. 636.

If the streambed is not rockfill it should be excavated, have riprap  
protection, but not be higher than elev. 636. Banks and fill, where  
the existing of rockfill, should have riprap protection as  
recommended in the original hydrology report.

It is felt these recommendations present a feasible alternative to  
the originally proposed piled foundation.

J. D. Harris  
Principal Hydrology Engineer

Mr. M. G. Bassel



REGISTERED MAIL

Sent to Smiths Construction Co. Arnprior Ltd  
by Looby Builders [Dublin] Limited



ONTARIO

~~DEPARTMENT OF HIGHWAYS~~  
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

NOTIFICATION OF INTENT TO CLAIM

CHIEF ENGINEER,

~~DEPARTMENT OF HIGHWAYS, ONTARIO~~  
MINISTRY OF TRANSPORTATION & COMMUNICATIONS, ONTARIO

Date 27th September 1973

Against Contract No. 73-92

District BANCROFT, Ontario

Location Hwy. #41, Constan Creek Bridge

Sub-Contractor LOOBY BUILDERS [DUBLIN] LIMITED

Prime Contractor: SMITHS CONSTRUCTION

DUBLIN, Ontario, NOK LEO

COMPANY ARNPRIOR LIMITED

In accordance with Paragraph 2, Sub-section 104-1 of Section 104 "Control of the Work" of the "General Conditions of the Contract" D.H.O. Form 100, I/We declare my/our intention to file a claim against the above contract due to the following (Give complete details, attaching separate sheets if necessary.)

For all costs resulting from the revised design of structure foundations on the Constan Creek Bridge.

Notice to Smiths Construction Company Arnprior Limited

Please notify the Chief Engineer immediately in writing of this Notification of Intent to Claim.

NOTE: Contractor must give this notice to the Chief Engineer and District Engineer within 7 days of his date of commencement on the work out of which this claim arises—Refer—Section 104-1 "General Conditions of the Contract" D.H.O. Form #100 Revised April 1st, 1958.

LOOBY BUILDERS [DUBLIN] LIMITED

Signed *Looby* Sec.-Treasurer  
Contractor or Authorized Representative.

TO BE MADE IN QUADRUPPLICATE BY THE CONTRACTOR.  
ONE COPY SENT TO DISTRICT ENGINEER—TWO COPIES SENT TO CHIEF ENGINEER.

Mr. D.A.O. White,  
District Engineer,  
Bancroft.

Construction office,  
Third Floor, Central Bldg.

October 1, 1973.

Contract 73-92, Constan Creek Bridge,  
Site 29-98, Highway 41, District 10.

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To confirm my telephone conversation with Mr. Delyea last Thursday, the following changes are to be made on this structure.

The piles are to be deleted and the footings placed on 3' thick tremie seal. This seal should be 6 inches larger all round than the footing.

The trenches are to be backfilled to underside of tremie with a self consolidating crushed rock with a maximum size of 6 inches.

No. 6 bars at 12" cts. 20 feet long are to be placed in the tremie over the trenches, with No. 5 bars at 24" cts. to form a mat.

The stream bed is to consist of 2' thick random riprap below elevation 625, this riprap to extend 20 feet up and downstream from the limits of the structure.

AEM/JC

A.E. McKim,  
Asst. Construction Engineer.

c.c. G. Martens  
K. Bassi  
A.G. Sternac ✓



Construction Office,  
Third Floor, Central Bldg.

Mr. D.A. White,  
District Engineer,  
Baltimore.

October 1, 1973.

Contract 73-03, Central Creek Bridge,  
Site 73-03, Highway 41, District 10.

To continue by telephone conversation with Mr. DeJoy last  
Thursday, the following changes are to be made on this  
drawing.

As piles are to be delayed and the footing placed on 7'  
thick concrete seal. This seal should be 8 inches larger  
all round than the footing.

The trenches are to be backfilled to underside of concrete  
with a self consolidating crushed rock with a maximum size  
3/4 inch.

0.6 bars at 12" c/c. 10 feet long are to be placed in  
the trench over the trench, with No. 5 bars at 24" c/c.  
to form a seal.

The stream bed is to consist of 2' thick random riprap  
below elevation 225. This riprap to extend 10 feet up and  
overstream from the limits of the structure.



A.E. Wolfe,  
Asst. Construction Engineer.

AMW/30

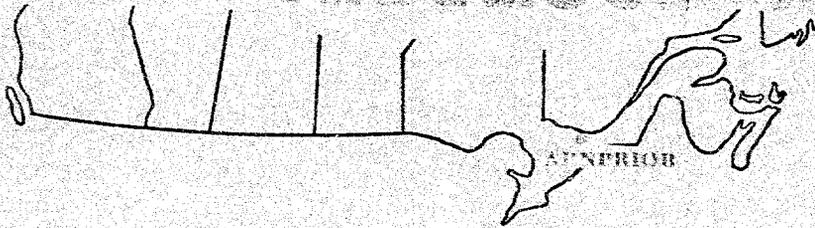
D. C. Williams  
K. B. Bland  
A. C. Berman



CRUSHING  
FLOATING  
GRADING

ROAD BUILDERS  
ASPHALT PAVING  
EQUIPMENT RENTALS

# SMITHS CONSTRUCTION CO.



HIGHWAY 17, ARNPRIOR, ONTARIO, PHONE 623-3144

Arnprior, Ontario  
October 1, 1973

Ministry of Transportation and Communications  
Box 300  
Bancroft, Ontario  
K0L 1C0

Attention: Mr. D.A.O. White, P.Eng.  
District Engineer

RE: M.T.C. Contract 73-92  
Hwy. 41 and 132  
Constan Creek Bridge

Dear Sir:

Attached please find "Notification of Intent To Claim" as filed by the M.T.C. approved Sub-Contractor, Looby Builders (Dublin) Limited.

We remain,

Yours very truly,

SMITHS CONSTRUCTION COMPANY  
ARNPRIOR LIMITED

Per: N. Smith  
Secretary-Treasurer

NS:sm  
Encls.

CONST.	FILE	
MUNICIP.	FILE	
SERVICES	FILE	
PERMITS	FILE	
ENG. OFFICE	FILE	
SAFETY SUP.	FILE	

RECEIVED

OCT 3 - 1973

Ministry of Transportation and Communications  
DISTRICT NO. 18  
BANCROFT

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. J.W. MacDougall,  
Claims Engineer,  
Ministry of Transportation and  
Communications,  
DOWNSVIEW 464, Ontario.

FROM: District #10-Bancroft.

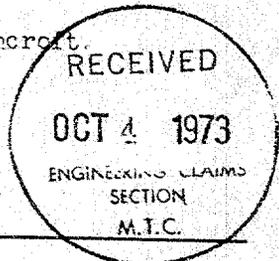
ATTENTION:

DATE:

October 3, 1973.

OUR FILE REF.

IN REPLY TO



SUBJECT: Contract 73-92, Highways 41 & 132,  
Structure at Constan Creek.

Attached is a letter we have received from Smiths Const. Co. Armprior Limited, together with copies 1 & 2 of "Notification of Intent to Claim" submitted by Smiths' Sub-Contractor on this structure, Looby Builders (Dublin) Limited.

They are claiming<sup>"</sup> for all costs resulting from the revised design of structure foundations on the Constan Creek Bridge."

The following is for your information:

On the completion of the excavation of footings for this structure, our Foundations Office established that the underlying material was too bouldery to permit the driving of H Piles.

In view of this, the foundation was changed. The piles were deleted and the excavation deepened to provide a 3 foot thick Tremie Seal under the footing.

The sub-contractor was delayed while the foundations, as shown in the contract drawings, were reviewed and, subsequently, redesigned by this Ministry.

Fortunately, the pile driving equipment never arrived on the site.

D.A.C. White,  
District Engineer.

DAOW/es - Attach.  
c.c. J.E. Callaghan, Director, Construction Branch.

Mr. Davis  
Mr. Stermac

( 72-11105 )

Mr. L. R. Eadie,  
Executive Director,  
Operations Division.

J. W. MacDougall,  
Claims Engineer.

October 5, 1973.

Re: Claim on Contract 73-92  
Smiths Construction Company  
Araprior Limited  
Bancroft District

Attached please find for your information, copy of  
Notification of Intent to Claim dated September 27, 1973 from  
Looby Builders (Dublin) Limited regarding the above contract.

ORIGINAL SIGNED  
BY  
J. W. MacDOUGALL

J. W. MacDougall,  
Claims Engineer.

JWM:dk  
Attach.

- c.c. - J. E. Wilkes
- C. R. Wilmot ✓
- P. D. Billings
- A. C. Lennox
- J. M. Crannie
- D. A. O. White

01-30 SEPT. 1976

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 31F-57

DIST. 10 REGION EASTERN

W.P. No. 95-61-03

CONT. No. 73-92

W. O. No. 72-11105

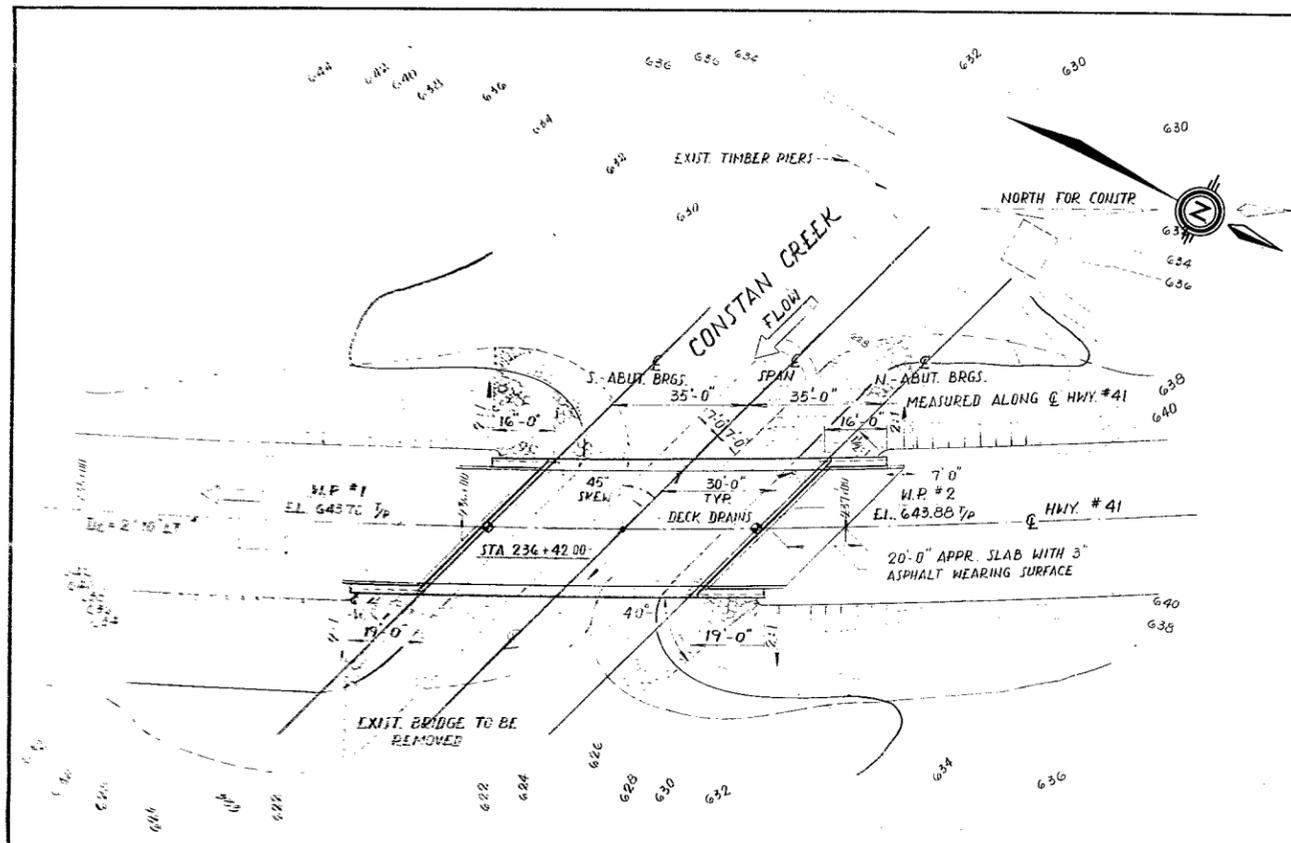
STR. SITE No. 29-098

HWY. No. 41

LOCATION CONSTAN CREEK + HWY. 41  
BRIDGE

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 2

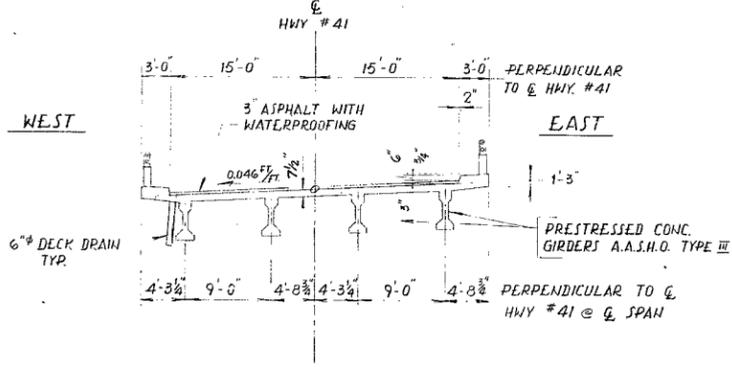
REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



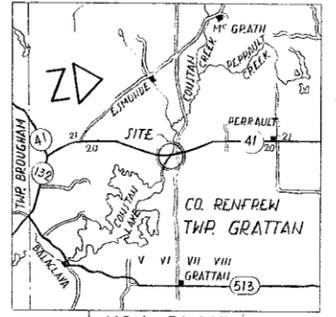
**PLAN**  
SCALE: 1" = 20'-0"

**NOTE**  
W.P. DENOTES WORKING POINT  
TP DENOTES TOP OF PAVEMENT

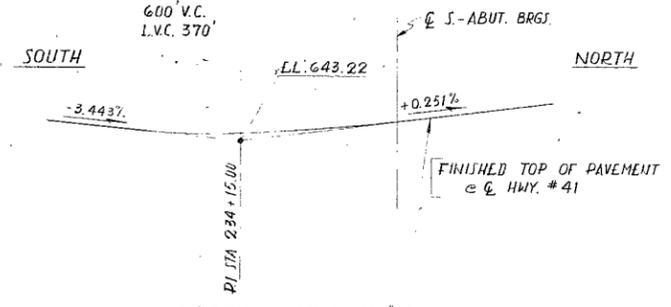
SKEW - 45°  
SIN. - 0.707107  
COS. - 0.707107  
TAN. - 1.000000  
SEC. - 1.414214



**TYP. DECK SECTION**  
SCALE: 1/8" = 1'-0"



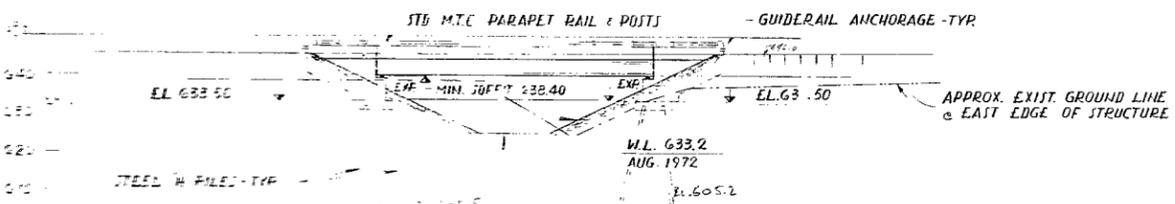
**REFERENCE BENCH MARK**  
B.M. 649.82  
GEODEIC DATUM  
N 2 VI IN W. ROOT OF 1 1/2 ELM  
80'0 RT. 231+22



**PROFILE OF HWY #41**  
N.T.S.

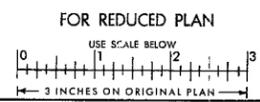
**NOTES**

- CLASS OF CONCRETE**
- PRESTRESSED GIRDERS - 5000 P.S.I.
- REMAINDER - 3000 P.S.I.
- CLEAR COVER ON REINF. STEEL**
- FOOTINGS & ABUTMENTS 3"
- CURBS & APPROACH SLABS 2"
- TOP OF DECK 1 1/2", BOT 1"
- PARAPET WALLS 1 1/2"
- CONSTRUCTION NOTES**
- THE CONTRACTOR IS RESPONSIBLE FOR FINISHING THE BEARING SEATS TO THE SPECIFIED ELEVATIONS WITH A TOLERANCE OF ± 1/8".
- NO CONCRETE SHALL BE PLACED ABOVE THE ABUTMENT BEARING SEATS UNTIL THE CONCRETE IN THE DECK HAS BEEN PLACED.



**ELEVATION**  
SCALE: 1" = 20'-0"

- LIST OF DRAWINGS**
- SHEET 1 GENERAL LAYOUT
  - 2 BORE HOLE LOCATIONS & SOIL STRATA
  - 3 FOUNDATION LAYOUT & REINF.
  - 4 ABUTMENTS
  - 5 WINGWALLS
  - 6 PRESTRESSED GIRDERS & BEARINGS
  - 7 DECK
  - 8 PARAPET WALL DETAILS
  - 9 STANDARD STEEL PARAPET RAIL
  - 10 20 FOOT APPROACH SLAB
  - 11 STANDARD DETAILS I
  - SHEET 12 STANDARD DETAILS II



REVISIONS		DATE		BY	DESCRIPTION

DEPARTMENT OF TRANSPORTATION AND COMMUNICATIONS  
ONTARIO

72-4-105

**CONSTAN CREEK BRIDGE**  
(3.4 MILES NORTH OF HWY. 132)

KING'S HIGHWAY No. 41 DIST. No. 10  
CO. RENFREW  
TWP. GRATTAN LOT 19 CON. VI

**- GENERAL LAYOUT -**

APPROVED	STRUCTURAL ENGINEER	CONTRACTOR
DESIGN H. K. J.	CHECK A. A.	W.P. NO. 95-61-03
DRAWING A. A.	CHECK F. L. B.	SITE NO. 29-98 SHEET 1
DATE FEB. 73	LOADING WJ 20-44	

