

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

To: Mr. T. C. Kingsland, (2)
Regional Structural Planning Eng.
Eastern Region
Kingston, Ontario

FROM: Soil Mechanics Section
Geotechnical Office
Downsview, Ontario

ATTENTION:

DATE: December 12, 1974

OUR FILE REF.

IN REPLY TO

DEC 16 1974

SUBJECT:

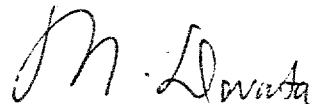
FOUNDATION INVESTIGATION REPORT
For
Proposed Replacement Structure at the
Crossing of Hwy. #34 (Curve Rev'n.)
and Delisle River
Twp. of Lochiel -- Co. of Glengarry
District No. 9 (Ottawa)
W.P. 28-73-01 --- Site 31-66

31 G-25
GEOCRE No.

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.

MD:mt



M. Devata
Supervising Engineer

cc: E. J. Orr
B. R. Davis
A. J. Percy
B. J. Giroux
E. R. Saint
G. A. Wrong
P. Lewycky

Files
Documents

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FOUNDATION INVESTIGATION REPORT
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1. INTRODUCTION:

The Soil Mechanics Section was requested to carry out an investigation at the aforementioned replacement structure crossing. The request was contained in a memo from the Eastern Region Bridge Section (Mr. T. C. Kingsland, Regional Bridge Planning Engineer), dated August 13, 1974. An investigation was subsequently carried out by the Soil Mechanics Section to determine the subsoil, bedrock and groundwater conditions at the site.

This report contains all the factual data obtained from this investigation, together with recommendations pertaining to the foundations of the proposed new structure, as well as the stability and settlement of the approach embankments.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The site is located on Hwy. #34, about 1.5 miles north of the Town of Alexandria, in the Township of Lochiel, County of Glengarry.

In the immediate vicinity of the site the terrain is gently undulating, predominantly agricultural in use with some deciduous cover. To the west of Hwy. #34 land is mainly used for farming purposes, whereas on the east side some residential lots with wooden frame houses and mobile homes are facing towards Hwy. #34. Behind those lots the land is used primarily for agricultural purposes.

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

Existing Hwy. #34, which has 2 paved lanes, is carried on an embankment which is about 5 to 12 feet above the surrounding terrain.

In the vicinity of the crossing, the Delisle River is approximately 40 feet wide and 2 feet deep (the water level elevation, under normal conditions, is about 244). The slopes of the banks of the river vary considerably, but they are generally quite gentle, the slope being about 3:1.

Physiographically, the site is situated in the region known as the 'Glengarry Till Plain'. In this area, the surface is undulating to rolling, consisting of long drumlinoidal ridges and a few well-formed drumlins together with intervening clay flats and swamps. The till has a loamy texture and contains a high proportion of limestone with admixture of materials derived from the Precambrian rocks to the north and from the Nepean sandstone at the base of the Rigaud mountain. The depth to bedrock is seldom over 100 feet and over much of the area the till is less than 25 feet in depth.

3. FIELD AND LABORATORY INVESTIGATION:

Four sampled boreholes each accompanied by a dynamic cone penetration test, were put down at this site.

The borings were advanced by means of a continuous flight auger machine (commercially known as CME 75, Muskeg Vehicle mounted) adapted for soil sampling purposes. This machine was equipped with hollow stem augers.

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

Disturbed samples were obtained at required intervals in a 2-inch O.D. split-spoon sampler, which was hammered into the soil. The method of driving the split-spoon sampler conformed to the specifications for the Standard Penetration Test. The same method was used to advance the dynamic cone penetration tests. In addition, samples of the cohesive stratum were obtained, where possible, in 2" I.D. Shelby tubes which were manually pushed into the soil. Bedrock was proven in all borings by obtaining BX size rock core samples.

The groundwater level conditions across the site were determined by recording the water levels in the open boreholes during the course of the investigation.

The locations and elevations of all the boreholes, together with estimated stratigraphical sections across the site, are shown on Drawing No. 287301-A. The surveying was carried out by personnel from the Kingston Regional Engineering Surveys Section. All elevations were referenced to a Geodetic datum.

All the samples were subjected to careful visual examination, both in the field and in the laboratory. Following this examination, laboratory testing was performed on selected samples to determine the engineering properties of the various soil types, namely:

- Natural Moisture Content
- Grain-size Distribution
- Atterberg Limits
- Undrained Shear Strength

The results of the laboratory testing are plotted on the Record of Borehole sheets and summarized on Figure #1 which is contained in the Appendix of this report.

4. SUBSOIL AND BEDROCK CONDITIONS:

4.1) General:

A glacial till deposit up to 8 feet thick underlain by limestone bedrock was encountered at this site. In certain locations the glacial till is overlain by fill material composed of a mixture of clayey silt with sand and gravel.

The boundaries between the various deposits, as determined in the boreholes, are shown on the accompanying borehole sheets. The stratigraphical sections shown on Drawing #287301-A, is based on this information.

From ground surface downwards the various soil types encountered are described as follows:

4.2) Fill Material:

Roadway fill material was encountered in those boreholes, namely - No. 1, 3 and 4, put down in close proximity to the existing Hwy. #34. This fill, which was between 5 and 12 feet in thickness, is composed of a mixture of clayey silt, sand and gravel. In Borehole No. 1 occasional localized pockets of organic material were observed in the lower portion of the deposit. Based on the 'N' Values, it is estimated that the fill material has been subjected to poor to moderate degree of compaction.

4.3) Glacial Till - Silty Sand with Gravel:

Directly underlying the roadway fill material, or immediately below the existing ground surface, is the deposit of glacial till, which varies from 5 feet (BH #4) to 8 feet (BH #2) in thickness. The glacial till is composed mainly of sand, silt with gravel and trace of clay. Grain-size distribution curves for samples of this deposit, obtained with 2" O.D sampling equipment, are shown in an envelope form on Figure #1.

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

4.3) Glacial Till - Silty Sand with Gravel (cont'd.):

The Standard Penetration Tests, carried out within the glacial till deposit, are plotted on the Record of Borehole Sheets. This testing gave 'N' values which vary from 11 to 53 blows per foot. Based on these values, the relative density of the glacial till ranges from compact to very dense.

4.4) Limestone Bedrock:

The shallow overburden deposits are directly underlain by bedrock, which was proven in all of the four boreholes by obtaining from 4 to 12 feet of BX size rock core samples. Over the site, the bedrock surface was found to vary between elevations 241 and 243.

The bedrock is limestone and shaley limestone with numerous, irregular shale seams and interbeds up to 1/2 inch in thickness. The upper 2 to 5 feet of the bedrock, excluding BH #4, is in a fractured and weathered condition. Below this depth the bedrock is generally sound.

5. GROUNDWATER CONDITIONS:

During the period of investigation, groundwater level observations were carried out in all the boreholes. The groundwater level in the open boreholes is at a depth of 3 to 9 feet below the existing ground surface. The depth corresponds to elevations between 253 and 247.

6. DISCUSSION AND RECOMMENDATIONS:

6.1 General:

It is proposed to replace the existing structure with a new one at the crossing of Hwy. #34 (curve Rev'n) and Delisle River, in the Township of Lochiel and County of Glengarry. The present proposals are to construct a single span structure having a total length of 66 feet or alternatively the same span as the existing one which will be about 32 feet

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

6.1) General (cont'd.):

long. In either of these schemes the width of the structure will be 42 feet.

The new profile grade of Hwy. #34 in the vicinity of the structure will be raised by about a foot, and the grade will be at elev. 261.

The subsoil at this site consists of glacial till composed of silt and sand with gravel and trace of clay followed by limestone bedrock, the surface of which was encountered between elevations 241 and 243. In certain locations the glacial till is overlain by roadway fill up to 12 feet in thickness.

6.2) Structure Foundations:

Two schemes are being considered, namely:

- i.) Spill through type (62 ft. span), where abutments are 'perched' within the approach fills. Alternatively,
- ii) Closed-type of abutments (32 ft. span) in which case fills would be retained by the abutment walls in the longitudinal direction.

6.2.1) Spill through type Abutments:

The abutments, which will be perched within the approach fills can be supported on spread footings at or within the glacial till deposit using an allowable bearing pressure of 3.0 t.s.f. In this case a minimum of earth cover of 5 feet should be provided to the underside of the footing for frost protection purposes. The footing excavations will extend below the groundwater level in the area. Since the granular stratum is relatively pervious groundwater seepage can be expected into the excavations. Further, the base may 'boil' due to the unbalanced hydrostatic groundwater pressure existing in this stratum.

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

6.2.1) Spill through type abutments (cont'd.)

A dewatering scheme will, therefore, be required. One possibility would be to carry out the excavation from within a cofferdam composed of interlocking steel sheet piling. The piling should be driven to a depth below the base of the excavation equal to the unbalanced hydrostatic water pressure head existing above the base of the excavation. Alternatively the abutments can be supported on end bearing piles driven to bedrock. The allowable pile load would be dependent on the section chosen - for example, 12BP74 Steel 'H' piles may be designed for 95 tons/pile. It may be advantageous to locate the pile caps well above the prevailing water level and thereby minimize dewatering requirements for the construction of the abutment foundations.

6.2.2) Closed type abutments:

The river bed of the Delisle River will be at elev. 242 at the Hwy. #34 (Curve Rev'n) crossing. The bed-rock surface ranges from elev. 241 to elev. 243. It is therefore recommended that the closed abutments can be founded on spread footings at or below the bedrock surface. Since the upper 2 to 5 feet of the bedrock is fractured and weathered an allowable load of up to 5.0 t.s.f. can only be used in this zone. However, if larger loads are required then the footings should be extended to the sound bedrock with allowable load of up to 10 t.s.f.

The rigid walls of the abutments should be designed using a coefficient of earth pressure at rest (K_0) of 0.5 for the granular fill material placed behind the walls.

In order to relieve the buildup of excess hydrostatic pressure behind the abutment extension, suitable drainage measures should be provided. Backfill behind the wall should be carried out in accordance with current M.T.C. practices.

6. DISCUSSION AND RECOMMENDATION (cont'd):

6.3) Approach Embankments:

The existing approach embankments are to be widened by about 4 feet in a westerly direction and in addition up to one foot of fill will have to be placed above the present grade to accomplish this. No stability problems are anticipated provided i) standard 2:1 slopes are employed and ii) the widened portion of the embankment is keyed into the existing embankment. With regard to ii) it is recommended that the topsoil, along the existing west slope, be stripped and the new fill "keyed" into the existing slope in accordance with current M.T.C. practices.

The subsoil, beneath the widened portion of the approach embankments, will settle due to the imposed loading; this settlement should be of the order of one inch. The major portion of this settlement should be realized immediately after the completion of the fill placement.

7. MISCELLANEOUS:

The field work, performed during the period of November 7 to November 12, 1974, was carried out under the immediate supervision of Mr. T. Frost, Student Technician. This report was prepared by M. Devata, Supervising Engineer.

The equipment was owned and operated by Hawthorne Drilling Ltd., Ottawa.

MD:mt
Dec.11/74

M. Devata
M. Devata
Supervising Engineer



ENGINEERING SERVICES BRANCH-GEOTECHNICAL OFFICE-SOIL MECHANICS SECTION

RECORD OF BOREHOLE NO 1

W.P. 28-73-01 LOCATION Sta. 186 + 26.8 Offset 53.4' Lt. ORIGINATED BY TB
 DIST. 9 HWY. 34 BORING DATE November 7, 1974 COMPILED BY TF
 DATUM Geodetic BOREHOLE TYPE Auger & BX Rock Coring CHECKED BY M.S.

SOIL PROFILE			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		20	40	60	80	100	w_p	w	w_L		
253.8	Ground Level															
0.0	Clayey silt, some sand & organics. Fill		1	SS	8											
248.5	Soft to Firm		2	SS	10											
5.3	Silty sand & traces of gravel. (Glacial Till)		3	SS	22											
			4	SS	11											
240.8	Compact		5	SS	28											
13.0	Weathered		6	SS	29/											
235.6	Sound		7	RC	Rec 75%											
18.2	End of Borehole															
	Interbedded limestone & shaley limestone bedrock															

CHECKED BY N

20
15 ϕ 5 % STRAIN AT FAILURE
10

W.P. 28-73-01 LOCATION Sta. 184 + 94.5 offset 13' Rt. ORIGINATED BY TF
DIST. 9 HWY. 34 BORING DATE November 11, 1974 COMPILED BY TF
DATUM Geodetic BOREHOLE TYPE Auger & BX Coring CHECKED BY LL

15 ϕ 5 20 % STRAIN AT FAILURE
10

RECORD OF BOREHOLE NO 4

W.P. 28-73-01 LOCATION Sta. 186 + 16.0 offset 14.' Rt. ORIGINATED BY TF
 DIST. 9 HWY. 34 BORING DATE November 11, 12, 1974 COMPILED BY NT
 DATUM Geodetic BOREHOLE TYPE Auger & BX Coring CHECKED BY J. J.

SOIL PROFILE			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		20	40	60	80	100	w_p	w	w_L		
259.3	Ground Level															
0.0	Het. mix. of clayey silt, sand & gravel FILL		1	SS	c											
			2	SS	20											
			3	SS	*											
247.3	Firm to Very Stiff		4	SS	6											
12.0	Silty sand & trace of gravel. (Glac. Till)		5	SS	15											
242.3	Compact		6	SS	29											
17.0	Sound															
238.0	Interbedded Limestone & shaley limestone bedrock		7	RC	Rec-937	240										
21.3	End of Borehole															
						230										
	* Encountered obstical and moved borehole 4 ft. from the original location.															

GRAIN SIZE DISTRIBUTION

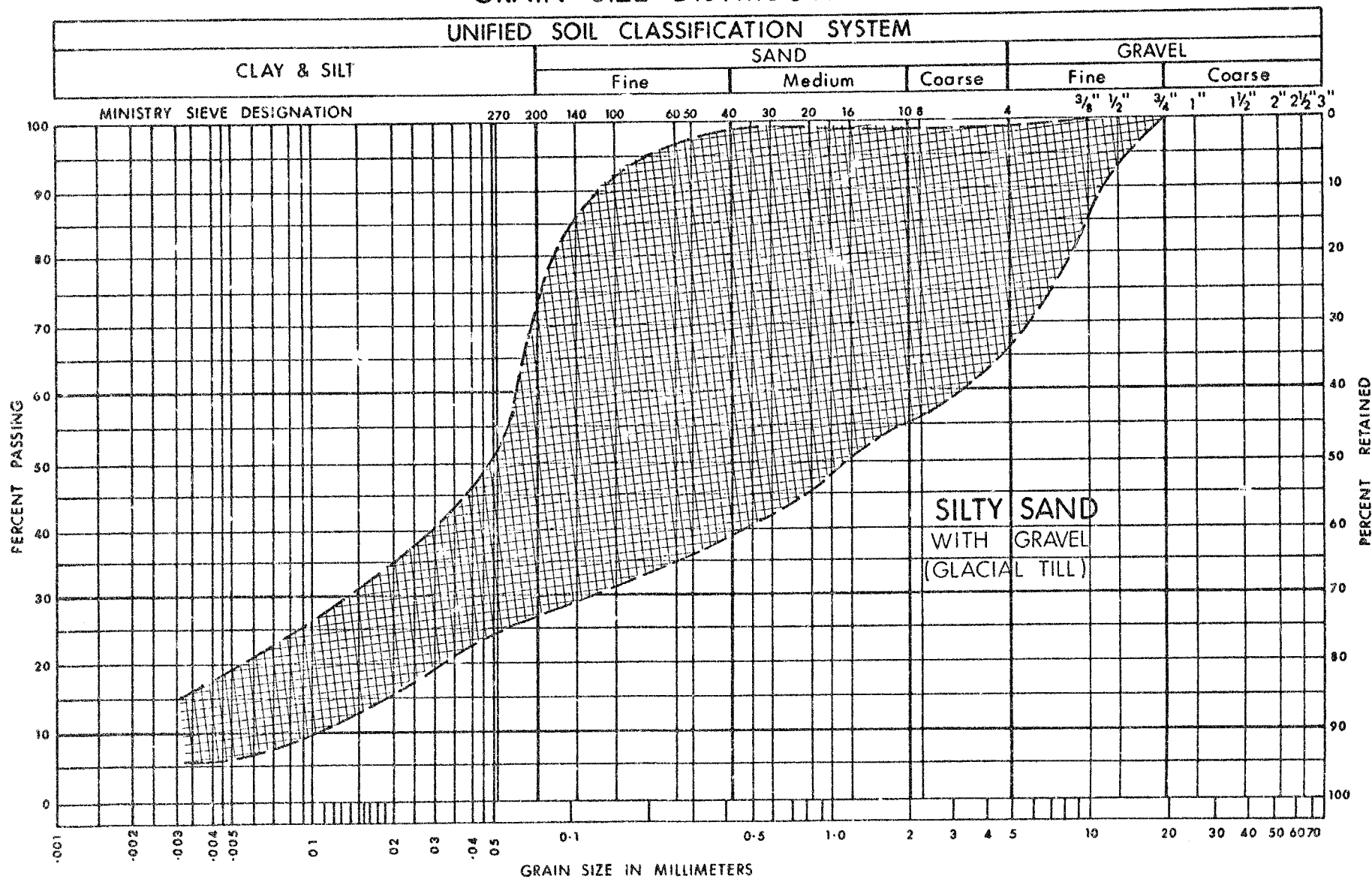


FIG. 1

ABBREVIATIONS & SYMBOLS USED IN THIS REPORTPENETRATION 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 TERM :-

<u>CONSISTENCY</u>	<u>c LB./SQ. 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
CIU	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_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

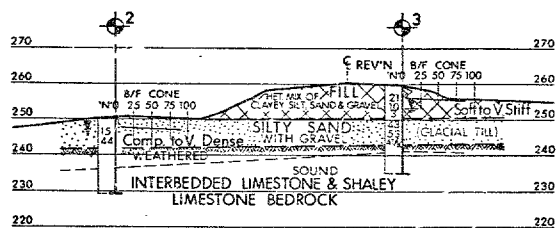
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_0	COEFFICIENT OF EARTH PRESSURE AT REST

FOUNDATIONS

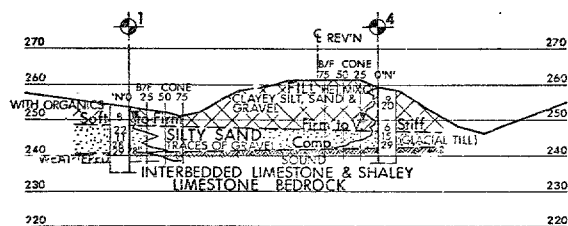
B	BREADTH OF FOUNDATION
L	LENGTH OF FOUNDATION
D	DEPTH OF FOUNDATION BENEATH GROUND
N	DIMENSIONLESS COEFFICIENT USED WITH A SUFFIX APPLYING TO SPECIFIC GRAVITY, DEPTH AND COHESION ETC. IN THE FORMULA FOR BEARING CAPACITY
k_s	MODULUS OF SUBGRADE REACTION

SLOPES

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

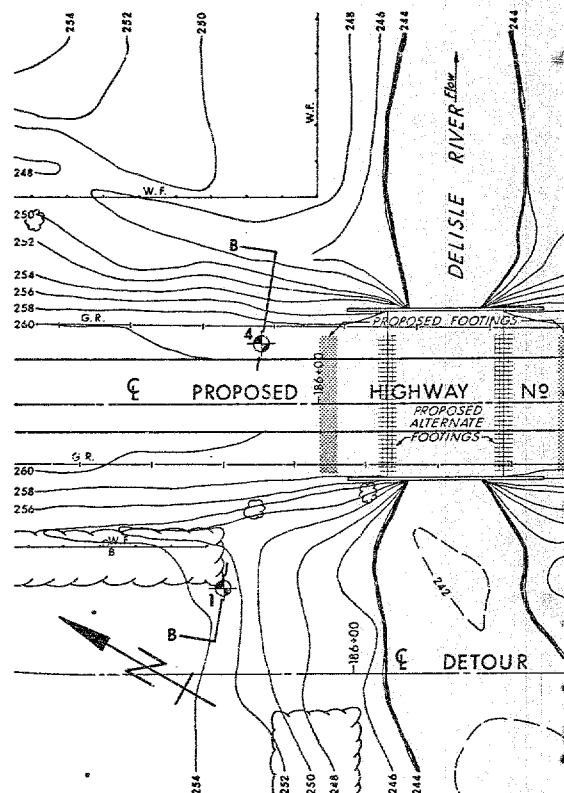


A-A



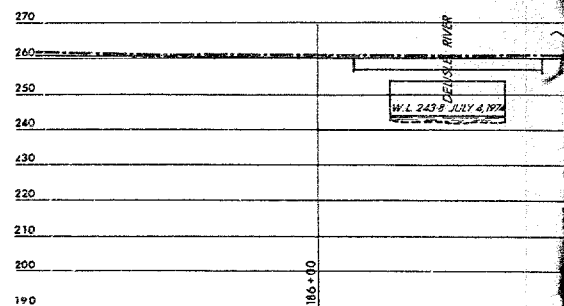
B-B
SECTIONS

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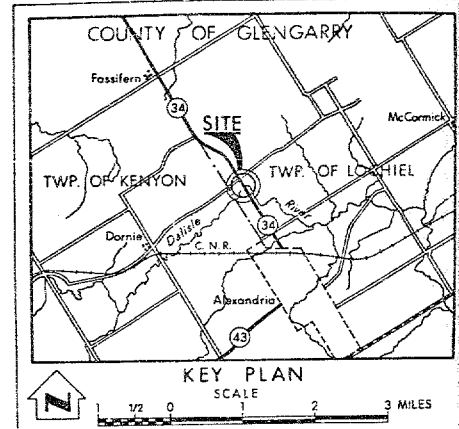
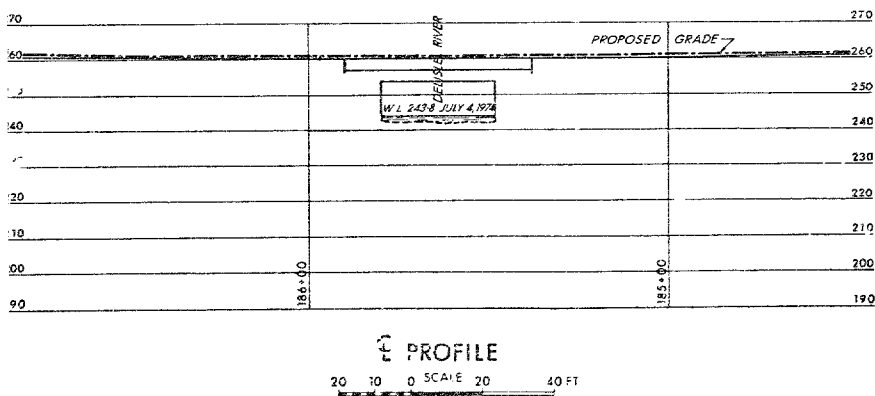
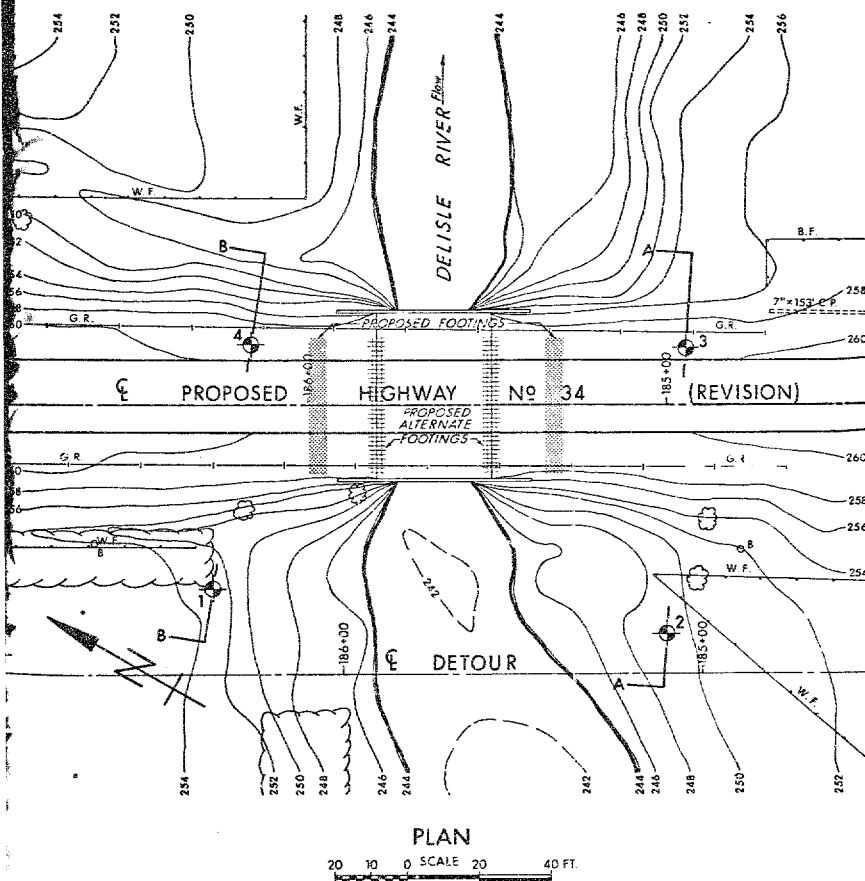
PLAN

20 10 0 SCALE 20 40



PROFILE

20 10 0 SCALE 20



LEGEND			
	Bore Hole		
	Dynamic Cone Penetration Resistance Test		
	Bore Hole & Cone Test		
	Water Levels established at time of field investigation, NOV. 12, 1974.		
NO.	ELEVATION	STATION	OFFSET
1	253.8	186+20	53.4 LT.
2	250.1	185+00	66.0 LT.
3	259.5	184+94	13.0 RT.
4	259.3	186+16	14.0 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.

NOTE FOR CONTRACT DOCUMENT

The complete foundation investigation report for this structure may be examined at the Structural Office and Foundations Office, Downsview, and at the Ottawa District Office.

REVISIONS	DATE	BY	DESCRIPTION

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

DELISLE RIVER

HIGHWAY NO 34 (REVISION) DIST NO 9
CO GLENGARRY
TWP LOCHIEL LOT 37 & 38 CON 3

BORE HOLE LOCATIONS & SOIL STRATA

SUBMD T.F. CHECKED	WP NO 28-73-01	DRAWING NO 287301-A
DRAWN N.T. CHECKED	WP NO	
DATE 3 DEC 1974	SITE NO 31-66	BRIDGE DRAWING NO
APPROVED	CONT NO	

MEMORANDUM

TO: Mr. M. Devata,
Supervising Foundations Engineer,
Soil Mechanics Office,
Downsview, Ontario.

FROM: Structural Planning Office,
Kingston, Ontario.

ATTENTION:

DATE: 13 August 1974.

OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 28-73-01, Site 31-66
Delisle River Bridge
(Approx. 1.5 miles north of Alexandria)
Lots 37 & 38, Concession III, Twp. of Lochiel
Highway 34, District 9 - Ottawa

We are sending you herewith two prints of structure Site Plan E-5260-1 on which we have marked in red the proposed location of the replacement structure. Also enclosed are two copies of your Field Reconnaissance Report.

We would be pleased if you will make arrangements for the necessary foundation investigation and to have your report, the scheduled date for which is December 11, 1974.



For: A. Van Dalen
T. C. Kingsland
Regional Structural Planning Engineer

AV/TCK/hl
encls.

c.c. H. Chyc
R. Forrest
C. S. Grebski - Att. K. Bassi (+Plan)



Telephone: (416) 248-3282.

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

November 13th, 1974.

Hawthorne Drilling Ltd.,
P.O. Box 4218,
Station 'E', Hawthorne Road,
OTTAWA, Ontario. K1S 5A7

Dear Sirs:

This letter confirms our request by telephone of October 31st, 1974, for the supply of a Type II Auger Drilling Machine (Item No. 5.2.I), together with all necessary equipment, as per your Tender for Supply Contract S-74-2110, at Alexandria, Ontario on November 5th, 1974.

Mobilization will be from Ottawa, Ontario.

Our Project Number is W.P. 28-73-01.

Yours truly,

M. Devata
M. Devata,
Supervising Engineer.

MD/mj
c.c. W.W. Fry
(ATTN: Mrs. M. Porter)

Files (2)
Documents

MD: where is the estimate sheet for Hawthorne?

C.M: It is in the file. Com 1!

Len



Memorandum

To: Mr. T. C. Kingsland,
Reg. Structural Planning Eng.,
Eastern Region, Kingston.

From: Structural Office,
West Building, Downsview.

Attention:

Date: March 18, 1975.

Our File Ref.

In Reply to

Subject: Delisle River Bridge,
1.6 Miles North of Highway 43,
W. P. 28-73-01, Site 31-66,
Highway 34, District 9.


Attached herewith are prints of the detailed Preliminary Bridge Plan Drawing 31-66-P1 of the above-mentioned structure.

The estimated cost of the proposed structure is \$95,000 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
Encls.


C. S. Grebski,
Structural Design Engineer.

c.c. B. R. Davis
W. D. Birch
A. E. McKim
K. G. Bassi
M. Stoyanoff
C. Mirza
J. Harris
J. Anderson
R. Forrest
S. Edwards

*P.S. A temporary stream diversion may
be required for the construction of foundations
on bedrock.*

*M. D.
April 15/75*



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: June 4, 1975.

Our File Ref.

In Reply to

Subject: Delisle River Bridge,
W.P. # 8-73-01 Site # 31-66
Highway # 34 District # 9

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/cf

C. S. Grebski,
Structural Design Engineer.

A temporary stream diversion may be necessary for constructing foundations on bedrock.

H. Shah June 19, 1975

M. A. ...
June 19, 1975





Memorandum

To: Messrs. A. E. McKim,
~~C. Mirza~~
E. Van Beilen,
C. S. Grebski,
Attention: J. Harris,
K. Bassi.

From: Structural Office,
West Building.

Date: December 10, 1976.

Our File Ref.

In Reply to

Subject: (a) Madawaska River Bridge at Griffith,
Highway 41, District 10,
Site 29-111, W.P. 127-73-02.

(b) Rosedale Creek Bridge Widening,
Highway 43, District 8,
Site 15-120, W.P. 827-73-02.

*— pile changed back to 36' by
M.D.*

(c) Wilberforce Bridge,
Highway 648, District 10,
Site 40-52, W.P. 76-73-01.

28-73-01

A meeting of the Structural Review Committee is to be held on December 15th, 1976, at 9:30 a.m., in Boardroom B of the West Building to review the above mentioned projects.

Please arrange for yourself or your representative to attend.

MS/im

M. Stoyanoff
M. Stoyanoff,
Structural Contract Engineer.

c.c. J. B. Wilkes



STIDWILL & ASSOCIATES LIMITED

CONSULTING CIVIL ENGINEERS

L. P. STIDWILL

ONTARIO LAND SURVEYOR

CORNWALL, ONTARIO

L. P. STIDWILL, B.Sc., O.L.S.
L. G. SMITH, B.Sc., O.L.S.
G. B. MULHERN

107-109 SYDNEY ST.
P.O. BOX 1001
K6H 5V1
TEL 932-7424

March 28, 1977

Mr. Tom Kingsland
Design Office
Ministry of Transportation & Communications
Postal Bag 4000
Kingston, Ontario

Dear Mr. Kingsland:

W.P. 28-73-01 Cont. 77-08.

Re: Highway Bridge North of
Alexandria, across the
Delisle river

Following a telephone conversation with your Mr. Harold Alguire, with regard to the bottom depth in the River under the new bridge, it is our opinion that a river - bottom elevation of 242.00 (Geod.) would be sufficient to give the upstream farmlands the drainage they need, provided that this bottom under the bridge be no less than 20 feet in width.

Trusting that this information may be helpful to you, I remain

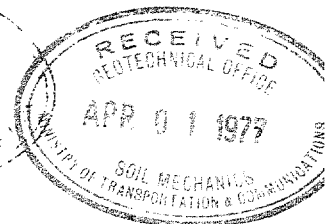
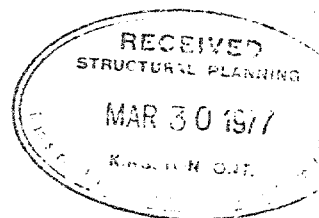
yours very truly,

STIDWILL & ASSOCIATES LIMITED

KM/jh

cc: Township of Kenyon.
File # 4 (1969 on the
Delisle River

.....
Drainage Supervisor



Mr. R. W. Franks
Manager, Construction Office
Kingston, Ontario

Structural Section
Kingston, Ontario

March 30, 1977

W.P. 28-73-01, Contract 77-08
Delisle River Bridge, Site 31-66
Highway #34, District #9, Ottawa

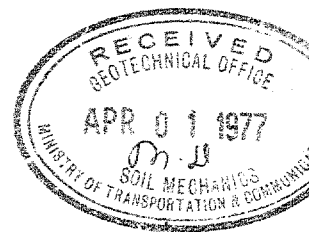
Enclosed please find a copy of a letter from Stidwill & Associates Ltd., Consulting Engineers, dated March 28, 1977, regarding deepening of the river bed under the proposed new structure. The deepening is required to provide drainage for upstream farmlands and it is understood that some dredging has been carried out in the upstream reach of the river.

Interpolation of bedrock elevations from the Foundation investigation would indicate that the bedrock elevations at the river would range from Ele. 242.0 to 242.6 so quite possibly the required bottom elevation of 242.0 can be achieved by merely removing the overburden.

Attached is a copy of Drawing 31-66, Sheet 3 on which the proposed deepening is shown in red.

This office has no objection to the proposed deepening but solicit by means of this memorandum any comment the Structural Office, Hydrology Office or the Soils Mechanics Office may have.

It is assumed that any costs involving this additional work will be borne by the requesting authority.



A. Van der Lin
for: T. Kingsland
Head, Structural Section

AV:TCK:sh

c.c. K. Bossi (Encl.)

M. Devoto (Encl.) ✓

J. D. Harris (Encl.)

H. Alquire (Encl.)

Return with
your comm
by 7th April / 77
M.H.

T.C. Kingsland
Regional Structural Planning Engineer
Regional Structural Planning Office
Eastern Region, Kingston

Soil Mechanics Section
Engineering Materials Office
West Building, Downsview

77 04 05

Re: W.P. 28-73-01, Contract #77-08
Delisle River Bridge, Site 31-66
Hwy. 34, District 9, Ottawa

We have reviewed the information you supplied with regard to the deepening of the river bed under the new structure. We have no objection to the proposed deepening as shown in Drawing 31-66, Sheet 3.

B. Ly

B. Ly
Senior Engineer

For: M. Devata
Supervising Engineer

BL/lf

cc: K. Bassi
J.D. Harris
R.W. Franks

Files ✓
Record Services



S/H

Memorandum

To: D. E. McFarlane, Manager
Environmental Office
3rd Floor, West Tower
Downsview, Ontario

From: Environmental Office
Kingston, Ontario

Attention:

Date: June 21, 1977

Our File Ref.

In Reply to

Subject: Contract 77-08, Highway 34
1.6 Miles North of Highway 34 at Alexandria
District 9, Ottawa
(W.P. 28-73-01)

Attached please find two copies of an Addendum to the Environmental Status Statement for the above project. The E.S.S. was submitted to the Ministry of the Environment on January 7, 1977.

As the work described in this Addendum is in progress, would you please forward the Addendum as soon as possible.

Thank you for your assistance.

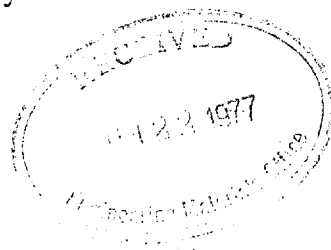
W.T. Beckett

W. T. Beckett
Environmental Planner
Eastern Region

meb
Att'ts

Distribution:

J. B. Wilkes	J. Childs
R. S. Pillar	R. Franks
P. J. Harvey	P. Kinnear
A. G. Stermac ✓	G. Ricker
H. Spence	D. B. Thomas
W. G. Wigle	P & D Library
T. C. Kingsland	



DOCUMENT MICROFILMING IDENTIFICATION

G.I.F-30 SEPT. 1976

GEOCRES No. 31G-25

DIST. 9 REGION EASTERN

W.P. No. 28-73-01

CONT. No. 77-08

W. O. No. _____

STR. SITE No. 31-06

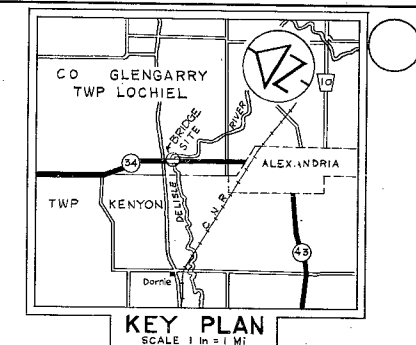
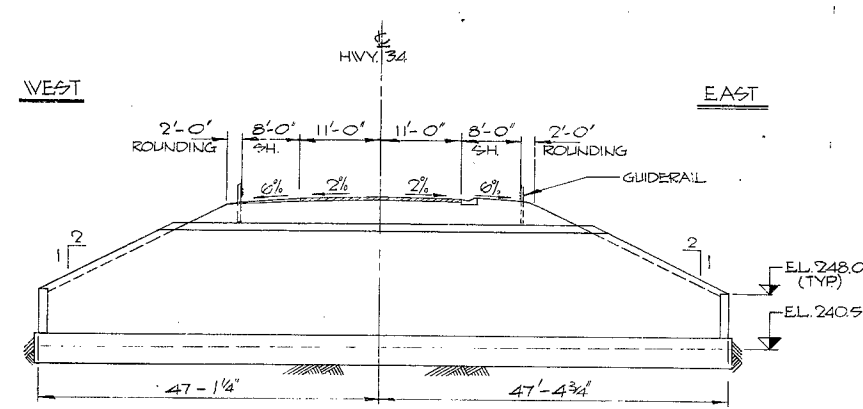
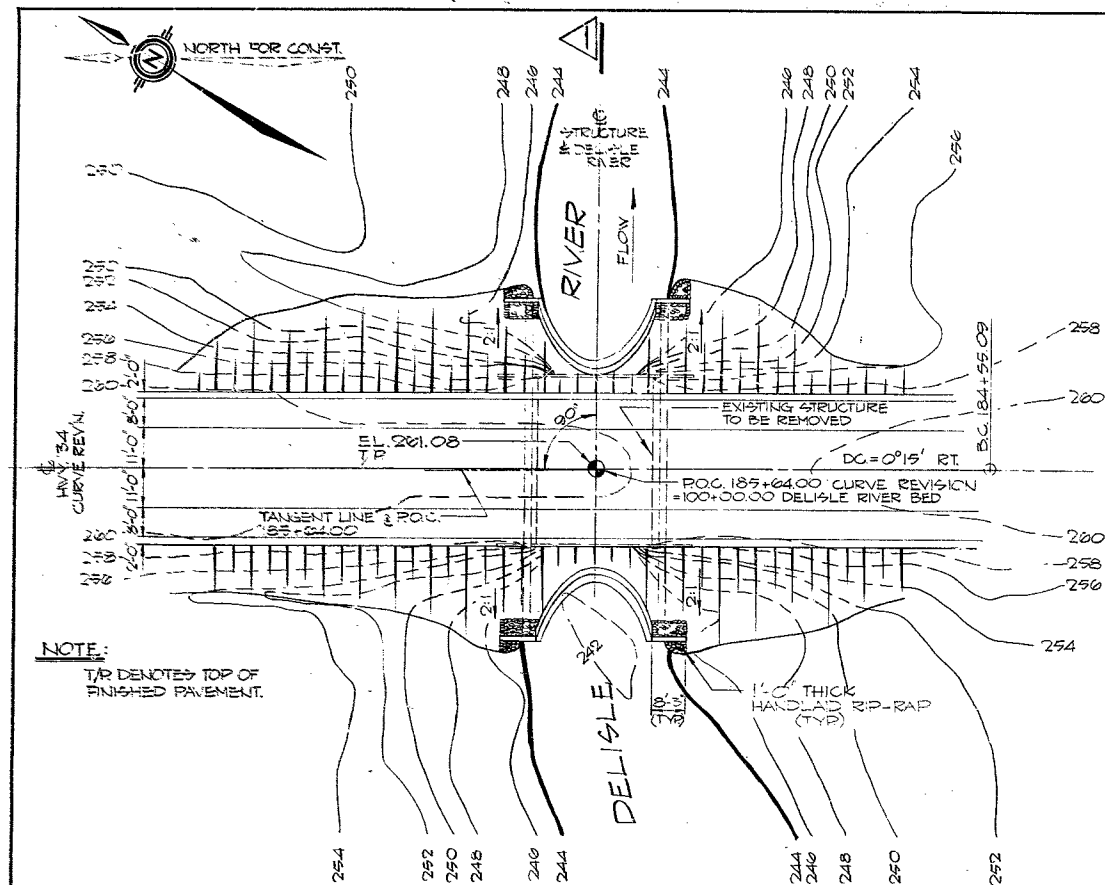
HWY. No. 34

LOCATION DELISCE RIVER AND

HWY 34

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 2

REMARKS: Documents to be unfolded
before microfilmed



B.M. 268.32
GEODETIC DATUM
N & W. IN N. ROOT OF 0.6' A5H
88' LT. 189+86
G.B.M. 97 ELEV. 268.529
C.P. RY. LARGE BOULDER, 1 MILE EAST OF STATION, 15 FEET SOUTH OF NORTHERLY LIMIT OF RIGHT-OF-WAY AND AT ELEVENTH POLE, WEST OF MILE POST 48 FROM MONTREAL, WEST, IMMEDIATELY WEST OF A PRIVATE CROSSING, BOLT IN SOUTH FACE OF BOULDER.

GENERAL NOTES:
CLASS OF CONCRETE, FOOTINGS — 3000 P.S.I.
REMAINDER — 4000 P.S.I.
CLEAR COVER TO REINFORCING STEEL — 3"

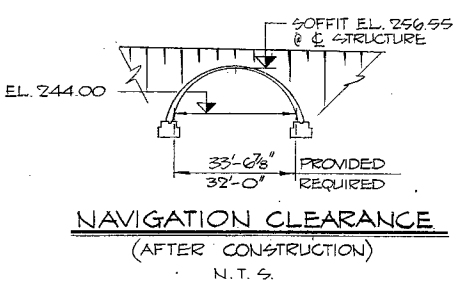
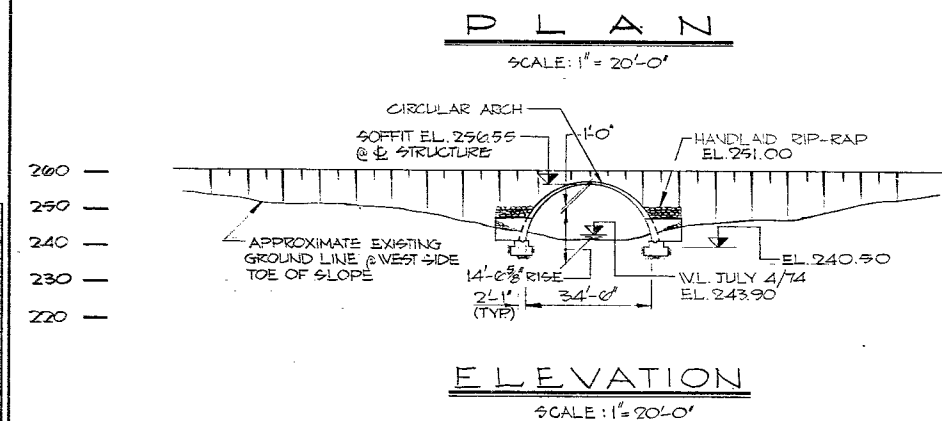
CONSTRUCTION NOTES:
BACKFILL TO BE PLACED AND COMPACTED AT BOTH SIDES OF STRUCTURE SIMULTANEOUSLY AND IN NO CASE SHALL THE DIFFERENCE IN LEVELS BE MORE THAN 1'-0"

CONCRETE QUANTITIES
CONCRETE QUANTITIES ARE LISTED BELOW FOR THE APPROPRIATE CONCRETE LUMP SUM TENDER ITEM.
CONCRETE IN BRIDGE 101 C.Y. 4000 P.S.I.

CURVE DATA

Δ	0° 51' 30"
D	0° 15'
R	22918.31'
L	171.67'
T	343.33'
E	0.64'

- LIST OF DRAWINGS
- 1 GENERAL LAYOUT.
 - 2 BORE HOLE LOCATIONS & SOIL STRATA.
 - 3 LAYOUT & DIMENSIONS.
 - 4 REINFORCING & STANDARD DETAILS.



FOR REDUCED PLAN
USE SCALE BELOW
10 11 12 13
3 INCHES ON ORIGINAL PLAN

316-25
GEODETIC No.

REVISIONS	DATE	BY	DESCRIPTION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO

DELISLE RIVER BRIDGE
(1.6 MILES NORTH OF HIGHWAY 43)

KING'S HIGHWAY No. 34 DIST. No. 9

CO. GLENGARRY

TWP. LOCHIEL LOT 37 & 38 CON. III

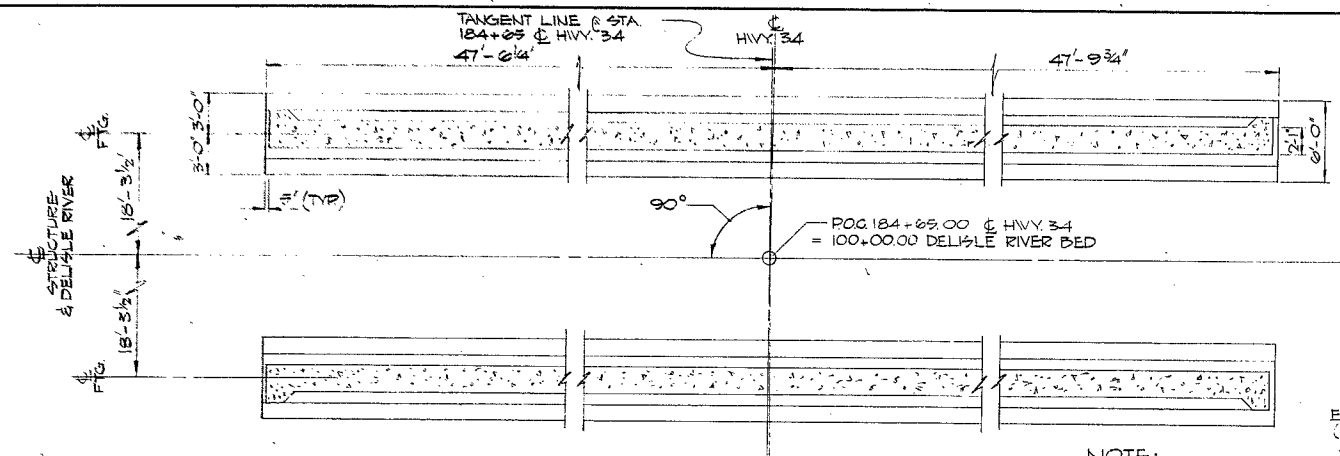
GENERAL LAYOUT

APPROVED [Signature] CONTRACT No. []

DESIGN K.F.P. CHECK P.R. W.P. No. 28-73-01

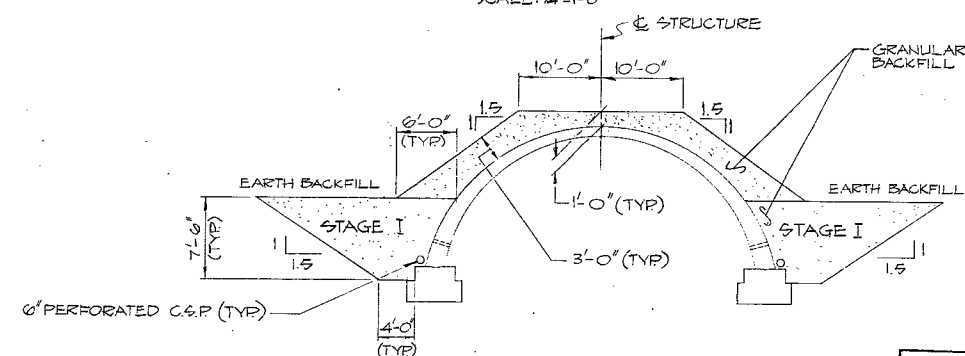
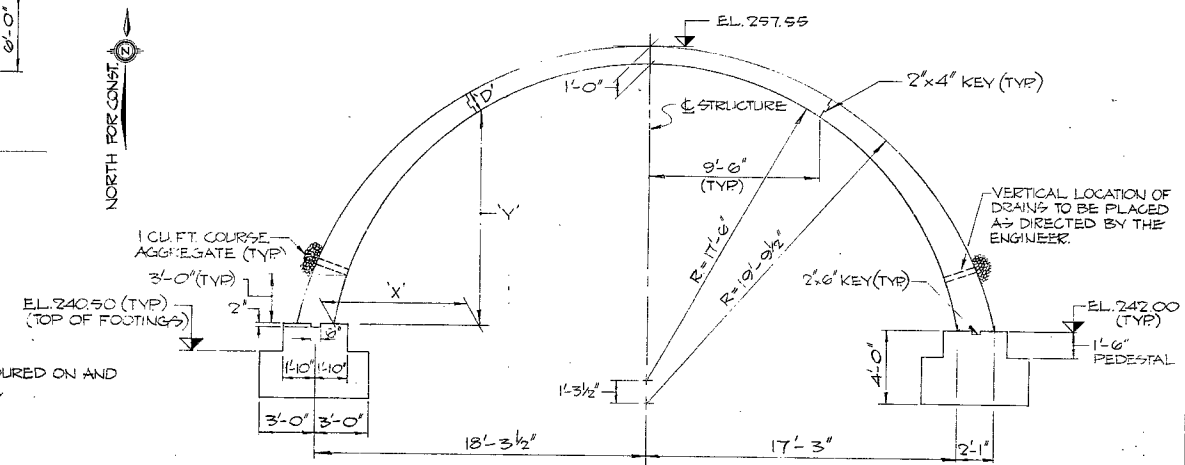
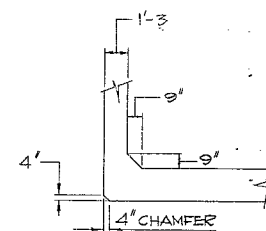
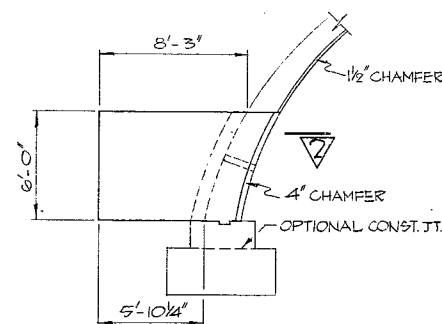
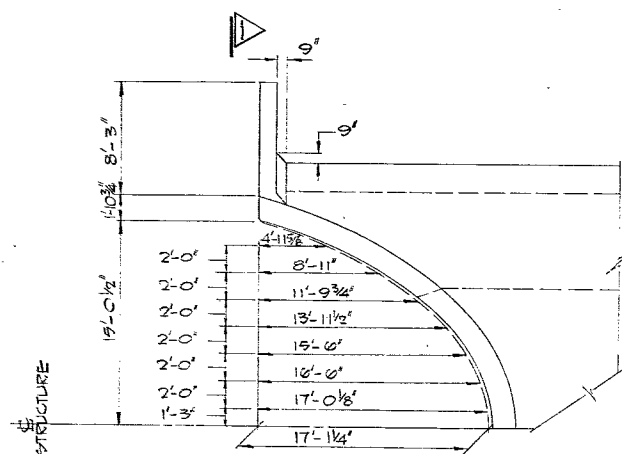
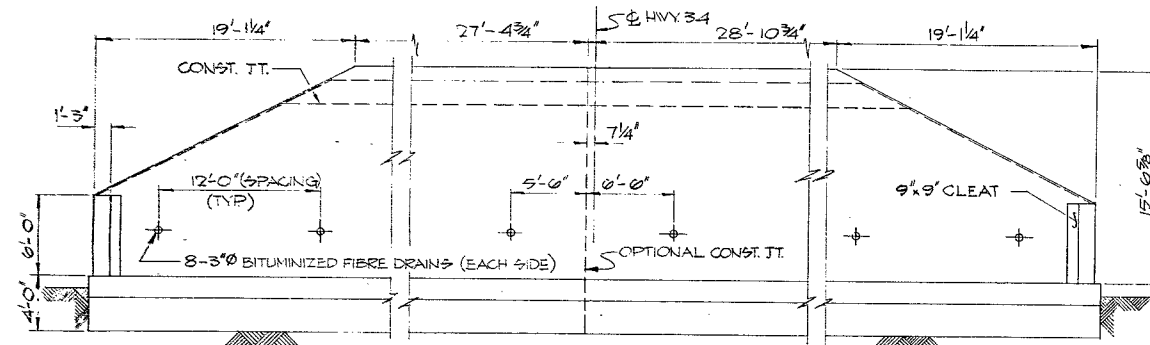
DRAWING T.S.L. CHECK K.P.

DATE MAY, 1979 LOADING 1920-44 SITE No. 31-00 SHEET 1



NOTE:

FOOTINGS TO BE POURED ON AND AGAINST BEDROCK



316-25
GEOCRES No.

NOTE :

THIS DWG. TO BE READ IN
CONJUNCTION WITH SHEET 4.

[illegible]

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO

ONTARIO

DELISLE RIVER BRIDGE

(1.6 MILES NORTH OF HIGHWAY 43)

KING'S HIGHWAY No. 34

DIST. No. 5

CO. GLENGARRY


TWP. LOCHIEL

LOT 37 & 38 CON. III

LAYOUT & DIMENSIONS

APPROVED

CONTRACT No.

APPROVED:  STRUCTURAL ENGINEER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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DESIGN	K. F.	CHECK	
DRAWING	T. B.	CHECK	

	W.P. No.
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DATE	MAY '75	LOADING	H5
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SITE No. 31-

SITE No. 31-00 SHEET