(RM-110)

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. B. Davis,
Bridge Engineer,
Bridge Office,
Admin. Bldg.

From: Foundation Section
Materials and Testing Office,
Room 107, Lab. Bldg.

Attention: Mr. S. McCombie

Date: October 2, 1969

Our File Ref.

In reply to

Subject:

FOUNDATION INVESTIGATION REPORT
for
Proposed Overpass
Reconstructed Q.E.W. - Park Lawn Road
Borough of Etobicoke - Metropolitan Toronto
District 6 (Toronto)
W.J. 69-F-67 -- W.P. 314-65-05

Structure No. 4

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

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

A. G. Stermac
PRINCIPAL FOUNDATION ENGINEER

AGS/jm
Attach.
cc: Messrs. B. R. Lavis (2)
H. A. Tregaskis
D. W. Farren
G. K. Hunter (2)
F. C. Allen
W. S. Kolinyshyn
T. J. Kovich
B. A. Singh

Foundation Files
Gen. Files

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FOUNDATION INVESTIGATION REPORT
for
Proposed Overpass
Reconstructed Q.E.W. - Park Lawn Road
Borough of Etobicoke - Metropolitan Toronto
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W.J. 69-F-67 -- W.P. 314-65-05

1. INTRODUCTION:

It is proposed to reconstruct the Q.E.W. from the Gardiner Expressway easterly. In connection with this program, the Foundation Section was requested to carry out a subsurface investigation for the proposed Overpass which will replace the existing structure at the crossing of Park Lawn Road and the Q.E.W. The request was contained in a memo from the Bridge Division (Mr. W. Melinyshyn, Regional Bridge Location Engineer) dated August 11, 1969. Subsequently, an investigation to determine the subsoil conditions at the aforementioned site was carried out by this Section. The results of this investigation, together with our recommendations pertaining to the structure foundations and approaches, are contained in this report.

2. DESCRIPTION OF THE SITE AND GEOLOGY:

The site is located at the existing crossing of Park Lawn Road and the Q.E.W. in the Borough of Etobicoke, Metropolitan Toronto. At this site, the Eastbound and Westbound Lanes of the Q.E.W. are carried over Park Lawn Road by means of twin concrete structures, which are separated by a 40 ft. wide median. Between the twin structures, the median is retained by means of 2 ft. thick concrete retaining walls, located on either side of Park Lawn Road. In the vicinity of the existing crossing, Park Lawn Road is located in a cut which varies in depth from about 6 ft. north of the Q.E.W., to 12 ft. south of the Q.E.W. The ground surface at the site slopes in a southerly direction, the gradient becoming steeper south of the Q.E.W.

The site is located within the "Iroquois Plain" physiographic region which is characterized, in the area of the existing crossing, by a surficial deposit of fine grained soils

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

underlain by shale bedrock of the Meaford-Dundas formation, Ordovician Period.

3. FIELD AND LABORATORY WORK:

Four boreholes with accompanying dynamic cone penetration tests were carried out at the site by means of a diamond drill rig adapted for soil sampling purposes. Soil samples were obtained at specified depths by means of a 2 inch O.D. split-spoon sampler which was hammered into the soil in accordance with the specifications for the Standard Penetration Test. The same procedure was used to advance the dynamic cone penetration tests. Bedrock was proven at all the borehole locations by diamond core drilling in BXL size.

Surveying was carried out by personnel from the Central Region Engineering Surveys Section. The boreholes were initially located by reference to the existing structure; these locations were later referred to a coordinate system. All the elevations given in this report are referenced to a geodetic datum. The locations and elevations of the boreholes, together with an estimated stratigraphical profile and sections, are shown on Drawing 69-F-67A.

All soil and rock core samples were carefully examined in the field and subsequently in the laboratory following which, tests were carried out to determine the physical properties of the subsoil, namely:-

Natural Moisture Contents
Atterberg Limits
Grain size Distributions

The results of these tests are plotted on the Record of Borelog sheets and on Figure 1 in the Appendix to this report.

4. SUBSOIL CONDITIONS:

4.1) General:

The predominant stratum across the site is a clayey silt with random silt layers, ranging in thickness between 13

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SUBSOIL CONDITIONS (cont'd)

and 28 ft., and overlain by a surficial cover of fill material, 3 to 11 ft. in thickness. The clayey silt deposit is underlain by shale bedrock, encountered at the site at about elevation 272, i.e., at depths of 16 to 35 ft. below the ground surface.

4.2) Fill Material:

Fill material consisting of a clayey silt with sand and occasional gravel was encountered at all the borehole locations. The thickness of this material ranged from about 3 ft. at B.H.4 (shoulder of Park Lawn Rd.) to 11 ft. at B.H.2 (Median of the existing Q.E.W.). The Standard Penetration Test 'N' values in the fill material ranged between 12 and 47 blows/ft. indicating a stiff to hard consistency.

4.3) Clayey Silt with Random Layers of Silt:

Underlying the fill material, a deposit of clayey silt was encountered at all the borehole locations below elevations 287 - 296. The thickness of this deposit ranged between 13 and 28 ft. across the site. The upper 5 to 10 ft. of the deposit is of a mottled brown colour, the lower portions being generally grey.

The samples from this deposit ranged in composition from a clayey silt to silt with no visible distinct boundaries. Since the overall deposit is predominantly cohesive, the stratum can be described as a clayey silt with random layers of silt.

The results of laboratory tests on representative samples from this deposit are given below:

	Range	
	Clayey Silt - Silt Layers (above elev.275+)	Clayey Silt (below elev.275+)
Natural Moisture Content - %	12 - 16	13 - 24
Liquid Limit - %	18 - 21	28 - 29
Plastic Limit - %	15 - 17	18 - 20
Standard Penetration Resistance 'N' values - Blows/ft.	45 - 113	23 - 45

The Standard Penetration Resistance 'N' values varied randomly with depth. Based on these 'N' values, the consistency

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4. SUBSOIL CONDITIONS (cont'd)

of the deposit is estimated to be hard, becoming very stiff to hard below about elevation 275.

4.4) Shale Bedrock:

A grey to black shale bedrock with limestone interbeds was encountered at the site at depths ranging from about 16 ft. (B.H.4) to 35 ft. (B.H.1) below the ground surface, i.e., the surface of the bedrock is at approximately elevations 269 - 274. The upper few inches to 2 ft. of the shale bedrock is weathered and contains occasional clay seams some 2 to 4 inches thick. The limestone interbeds vary in thickness from about 2 inches to up to 15 inches. Core recoveries within the sound bedrock averaged 95 percent.

5. GROUND WATER CONDITIONS:

Water level observations were carried out during the period of this investigation in the open boreholes as well as in two sealed piezometers installed at the location of Borehole 4. One piezometer was installed within the shale bedrock at a depth of 20 ft. below the ground surface (tip elevation 269.6) and the other piezometer was installed in the clayey silt stratum above the bedrock at a depth of 13 ft. (tip elevation 276.6).

The observations in the open boreholes and piezometers indicate that the groundwater level is situated between elevations 281 and 286, i.e., some 7 to 15 ft. below the ground surface (Boreholes 2, 3 and 4). At the location of Borehole 1 (median of the existing Q.E.W.) the groundwater level is at a slightly higher elevation.

6. DISCUSSION AND RECOMMENDATIONS:

6.1) General:

It is proposed to replace the existing twin structures at the crossing of Park Lawn Road and the Q.E.W. with a three-span (40' - 70' - 40') Overpass. The centre line for the reconstructed Q.E.W. will be shifted northerly a distance of about 90 ft. from the existing alignment. The new Q.E.W. profile

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6. DISCUSSION AND RECOMMENDATIONS (cont'd)

grade will be at about elevation 311, requiring additional fills of in the order of 10 to 13 ft. in height at the approaches. The new structure will have a total deck width of about 140 ft. No changes in the existing alignment or grade of Park Lawn Road are contemplated at this crossing.

The investigation revealed that below a surficial cover of fill material of 3 to 11 ft. thickness, the natural overburden at the site consists of a clayey silt deposit with random layers of silt. This deposit is some 13 to 28 ft. in thickness and is directly underlain, at about elevation 272, by shale bedrock.

6.2) Structure Foundations:

The subsoil conditions at this site are favourable for the use of spread footing type foundations. Details are as follows:

6.2.1) Pier Footings:

The proposed piers may be founded on spread footings located within the clayey silt stratum at or below elevation 280 and designed for a safe allowable bearing pressure of up to 4 TSF. Since the existing grade of Park Lawn Road is at about elevation 284, a footing formation elevation of 280 or less will ensure a minimum of 4 ft. of soil cover above the base of the footings for frost protection purposes. Settlement of such pier footings should be negligible since the subsoil below about elevation 280 is relatively incompressible.

Some dewatering problems may be expected in the event that the footing excavations are carried out below the prevailing groundwater level in the clayey silt stratum. The sand seams and random silt layers within this stratum would probably be water bearing. A dewatering scheme will therefore be necessary.

6.2.2) Abutment Footings:

The proposed abutments may be 'perched' within the approach fills. These may be supported on spread footings founded

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6. DISCUSSION AND RECOMMENDATIONS (cont'd)

within a zone of well-compacted granular fill using a safe bearing pressure of 2 TSF. The fill material below the tops of the footings should consist of well-compacted G.B.C.Class 'A' material and should extend for a horizontal distance of at least 10 ft. from the footing edges in the plane of the footing tops. This portion of the fill should be built with side slopes of 2:1. The remainder of the fill should be completed to about profile grade for a distance of about 50 ft. behind the abutments before re-excavating for the abutment footings.

Alternatively, the abutments may be supported on end-bearing steel 'H' piles driven to the surface of the sound bedrock between elevations 266 (southern portion, east abutment footing) and 272 (northern portion, east abutment footing and also the west abutment footing). The allowable loads will depend on the pile section chosen. (e.g., 12 BP 73 piles may be designed for 90 Tons/pile).

No rock or bouldery fill should be placed within the plan limits of the piles. All pile caps should be provided with a minimum soil cover of 4 ft. for frost protection.

6.3) Approaches:

As discussed previously, some 10 to 13 ft. of fill will be required in order to achieve the proposed profile grade for the reconstructed Q.E.W. at this crossing. No stability problems are anticipated provided the new fill is properly compacted and suitably keyed into the existing fill material as per current D.H.O. methods.

Should it be necessary to construct cuts into the natural soil to accommodate the forward slopes of the approaches, these should be made with slopes no steeper than 2 horizontal to 1 vertical.

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7. MISCELLANEOUS:

The field work for this project was carried out by Mr. V. Korlu, Project Foundation Engineer, during the period of August 13 - 19, 1969.

The equipment used was owned and operated by Canadian Longyear.

This report was prepared by Mr. C. Mirza, Project Foundation Engineer.

The project was under the general supervision of Mr. M. Devata, Supervising Foundation Engineer, who also reviewed the report.

September, 1969.

APPENDIX 1

FORM 08-MT-126 (REV 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 1

FOUNDATION SECTION

JOB 69-F-67 LOCATION Co-ords. 183,050 N; 226,033 E. ORIGINATED BY VK
W P 314-65-05 BORING DATE August 13, 1969 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring-NX Casing; Cone CHECKED BY

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE
303.5	Ground Level					
0.0	Fill Material Clayey silt with sand & occ. gravel, coal, cinder		1	SS	24	300
296.0	Very stiff		2	SS	23	
7.0	Clayey silt with random layers of silt occ. fine sand seams		3	SS	54	
			4	SS	65	290
			5	SS	51	
	Hard to very stiff Mottled Brown-Grey		6	SS	64	
			7	SS	45	280
			8	SS	23	
268.7						270
34.8			9	SS	115/10"	
266.5	Weathered					
37.0	Shale Bedrock with limestone interbeds		10	BXL	90%	
262.5	Sound					
41.0	End of Borehole					260

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT
20 40 40 80 100

SHEAR STRENGTH PSF
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL ✓ LAB VANE

LIQUID LIMIT —— w_L
PLASTIC LIMIT —— w_P
WATER CONTENT —— w

WATER CONTENT %
10 20 30

BULK DENSITY γ PCF

REMARKS

GR SA SI CL

▼ 291.7

FORM OB-MT-26 (REV 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 2

FOUNDATION SECTION

JOB 69-F-67 LOCATION Co-ords. 183,009 N; 225,911 E. ORIGINATED BY VK
W.P 314-65-05 BORING DATE August 14, 1969 COMPILED BY CM
DATUM Geodetic BOREHOLE TYPE Washboring NX Casing; Cone CHECKED BY

SOIL PROFILE ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT 20 40 60 80 100	LIQUID LIMIT, PLASTIC LIMIT, WATER CONTENT % 10 20 30	BULK DENSITY PCF	REMARKS GR SA SI CL
300.6	Ground Level									
0.0	Fill Material Silt to clayey silt with some sand & occ. gravel. Very stiff - Hard or Compact		1	SS	17	300				
			2	SS	47					
289.6			3	SS	27	290				
11.0	Clayey silt with random layers of silt occ. fine sand seams		4	SS	56					0 6 86 8
			5	SS	113					▼ 285.6
	Hard		6	SS	49	280				
	Mottled Brown-Grey		7	SS	45					
271.6										
29.0	weathered		8	SS	~~100~~/3"	270				
	Shale Bedrock with limestone interbeds. Sound		9	BXL	100%					
266.3										
34.3	End of ABorehole									
						260				

DYNAMIC PENETRATION RESISTANCE
SHEAR STRENGTH PSF
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB. VANE

FORM OB-MT-126 (REV. 1969) OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 3

FOUNDATION SECTION

JOB 69-F-67 LOCATION Co-ords. 183,130 N; 225,760 E. ORIGINATED BY VK
W P 314-65-05 BORING DATE August 15, 1969 COMPILED BY
DATUM Geodetic BOREHOLE TYPE Washboring-NX Casing; Cone CHECKED BY

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS/FOOT 20 40 60 80 100 / SHEAR STRENGTH PSF ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	WATER CONTENT % 10 20 30	UNIT WEIGHT γ PCF	REMARKS GR SA SI CL
297.8	Ground Level								
0.0	Fill Material Clayey silt with sand & gravel. Stiff	1	SS	12					
292.8		2	SS	60	290				
5.0	Clayey silt with random layers of silt occ. fine sand seams	3	SS	143					
		4	SS	101					▼283.8
	Hard	5	SS	90	280				
	Mottled Brown-Grey	6	SS	45					
272.4		7		14/4"					13 33 37 17
25.4	Shale Bedrock with limestone interbeds. Sound	8	BXL	90%	270				
267.6									
30.2	End of Borehole				260				

REV 1969

OFFICE REPORT ON SOIL EXPLORATION

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING OFFICE

RECORD OF BOREHOLE No. 4

FOUNDATION SECTION

JOB 69-F-67 | LOCATION Co-ords. 183,160 N; 225,847 E. | ORIGINATED BY VK
WP 314-65-05 | BORING DATE August 18, 1969 | COMPILED BY CM
DATUM Geodetic | BOREHOLE TYPE Washboring-NX Casing; Core | CHECKED BY

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS/FOOT	ELEV SCALE
289.6 / 0.0	Ground Level					
286.6 / 3.0	Fill Material					
	Clayey silt with random layers of silt occ. fine sand seams		1	SS	64	
			2	SS	55	
	Hard		3	SS	49	280
			4	SS	56	
274.0 / 15.6	Mottled Brown-Grey weathered		5	SS	79/8"	
273.8 / 16.6	Shale Bedrock Sound		6	BXL	95%	270
268.8 / 20.8	End of Borehole					
						260

DYNAMIC PENETRATION RESISTANCE
BLOWS / FOOT
20 40 60 80 100

SHEAR STRENGTH PSF
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE

LIQUID LIMIT —— %
PLASTIC LIMIT —— %
WATER CONTENT —— %

WATER CONTENT %
10 20 30

BULK DENSITY
PCF

REMARKS

GR SA SI CL

282.8 ▽
▽ 281.0
0 6 84 10

Tip el. 276.6
1 29 59 1

Tip el. 269.6

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 :-

CONSISTENCY	'N' BLOWS / FT.	c LB. / SQ. FT.
VERY SOFT	0 - 2	0 - 250
SOFT	2 - 4	250 - 500
FIRM	4 - 8	500 - 1000
STIFF	8 - 15	1000 - 2000
VERY STIFF	15 - 30	2000 - 4000
HARD	> 30	> 4000

DENSENESS	'N' BLOWS / FT.
VERY LOOSE	0 - 4
LOOSE	4 - 10
COMPACT	10 - 30
DENSE	30 - 50
VERY DENSE	> 50

TYPE OF SAMPLE

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

P.H. SAMPLE ADVANCED HYDRAULICALLY

P.M. SAMPLE ADVANCED MANUALLY

SOIL TESTS

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

ABBREVIATIONS USED IN THIS REPORT

SOIL PROPERTIES

γ	UNIT WEIGHT OF SOIL (BULK DENSITY)
γ_s	UNIT WEIGHT OF SOLID PARTICLES
γ_w	UNIT WEIGHT OF WATER
γ_d	UNIT DRY WEIGHT OF SOIL (DRY DENSITY)
γ'	UNIT WEIGHT OF SUBMERGED SOIL
G	SPECIFIC GRAVITY OF SOLID PARTICLES $G = \frac{\gamma_s}{\gamma_w}$
e	VOID RATIO
n	POROSITY
w	WATER CONTENT
S_r	DEGREE OF SATURATION
w_L	LIQUID LIMIT
w_P	PLASTIC LIMIT
I_P	PLASTICITY INDEX
s	SHRINKAGE LIMIT
I_L	LIQUIDITY INDEX $= \frac{w - w_P}{I_P}$
I_C	CONSISTENCY INDEX $= \frac{w_L - w}{I_P}$
e_{max}	VOID RATIO IN LOOSEST STATE
e_{min}	VOID RATIO IN DENSEST STATE
I_D	DENSITY INDEX $= \frac{e_{max} - e}{e_{max} - e_{min}}$
	RELATIVE DENSITY D_r IS ALSO USED
h	HYDRAULIC HEAD OR POTENTIAL
q	RATE OF DISCHARGE
v	VELOCITY OF FLOW
i	HYDRAULIC GRADIENT
k	COEFFICIENT OF PERMEABILITY
j	SEEPAGE FORCE PER UNIT VOLUME
m_v	COEFFICIENT OF VOLUME CHANGE $= \frac{-\Delta e}{(1+e)\Delta \sigma'}$
c_v	COEFFICIENT OF CONSOLIDATION
C_c	COMPRESSION INDEX $= \frac{\Delta e}{\Delta \log_{10} \sigma'}$
T_v	TIME FACTOR $= \frac{c_v t}{d^2}$ (d, DRAINAGE PATH)
U	DEGREE OF CONSOLIDATION
τ_f	SHEAR STRENGTH
c'	EFFECTIVE COHESION INTERCEPT
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF EFFECTIVE STRESS $\tau_f = c' + \sigma' \tan \phi'$
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
	IN TERMS OF TOTAL STRESS $\tau_f = c_u + \sigma \tan \phi$
μ	COEFFICIENT OF FRICTION
S_t	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 (YOUNGS MODULUS)
G	MODULUS OF SHEAR DEFORMATION
K	MODULUS OF COMPRESSIBILITY
η	COEFFICIENT OF VISCOSITY

EARTH PRESSURE

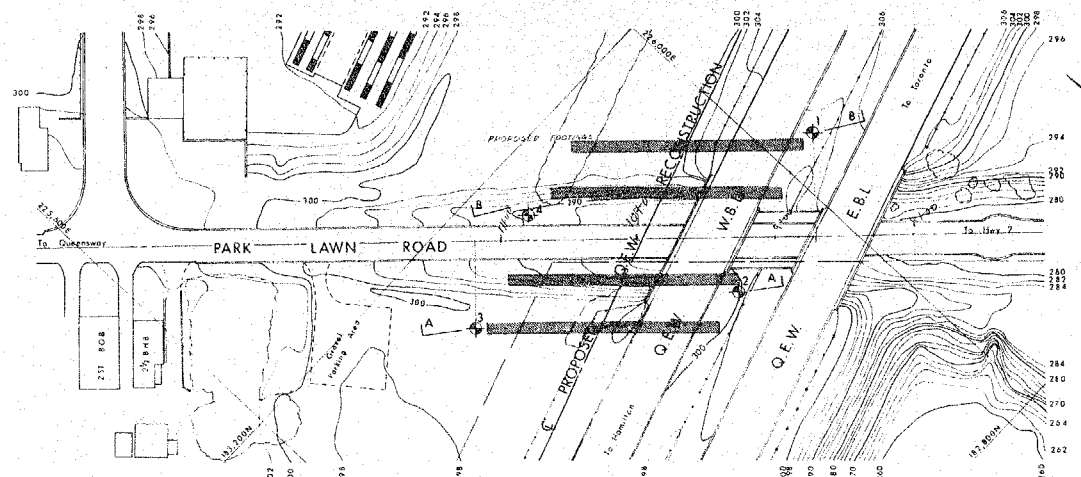
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_o	COEFFICIENT OF EARTH PRESSURE AT REST

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

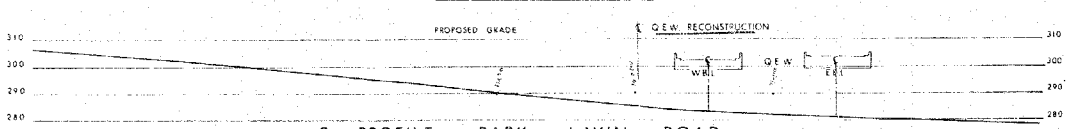
H	VERTICAL HEIGHT OF SLOPE
D	DEPTH BELOW TOE OF SLOPE TO HARD STRATUM
β	ANGLE OF SLOPE TO HORIZONTAL



PLAN

SCALE

40 20 0 40 80 120 FT.

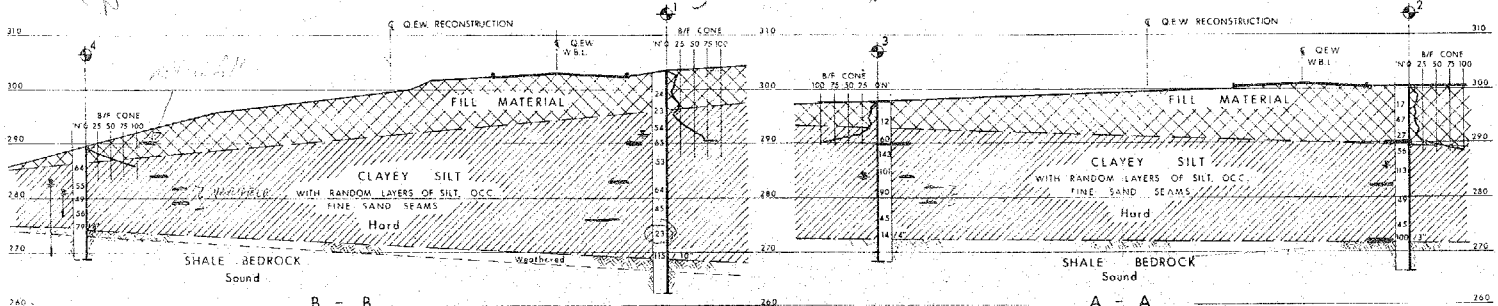


℄ PROFILE PARK LAWN ROAD

SCALE

HORIZ. 40 20 0 40 80 120 FT

VERT. 20 10 0 20 40 60 FT

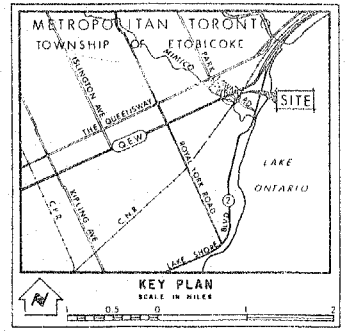


SECTIONS

SCALE

HORIZ. 20 10 0 20 40 60 FT.

VERT. 10 5 0 10 20 30 FT



KEY PLAN

SCALE IN MILES

1 0.5 0 1 2

LEGEND

- Bore Hole
- Cone Penetration Hole
- Bore & Cone Penetration Hole
- Water Levels established at time of field investigation. AUG 1969
- Piezometer

NO.	ELEVATION	CO ORDINATES NORTH	CO ORDINATES EAST
1	303.5	183,050	226,033
2	300.6	+ .009	225,911
3	297.8	+ .130	+ .760
4	289.6	+ .160	+ .847

- NOTE -

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

PRINT RECORD		
NO.	FOR	DATE

REVISIONS		
DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING OFFICE - FOUNDATION SECTION

PARK LAWN ROAD

KING'S HIGHWAY NO. Q.E.W. RECONSTRUCTION DIST. NO. 6

CO. METRO TORONTO

TWP. ETOBICOKE LOT CON.

BORE HOLE LOCATIONS & SOIL STRATA

SUBM'D. C.M.	CHECKED	W.P. NO. 314-65-5	M.B.T. DRAWING NO. 69-F-67A
DRAWN A.N.	CHECKED	JOB NO. 69-F-67	
DATE OCT. 2 1969	SITE NO.		BRIDGE DRAWING NO.
APPROVED C.G. Eastman PROVINCIAL FOUNDATIONS ENGINEER	CONT. NO.		

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

69-F-67

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

From: W.S. Melinyshyn,
Bridge Office.

Date: August 11th, 1969.

Our File Ref.

In Reply To

Subject: Park Lawn Road Overpass,
C.P. 314-65-5, Site 37-204,
District 6, Hwy. E.B.W.

The attached marked up partial print, B-30-68, details the approximate location of the proposed footing for the above detailed structure. Also enclosed are prints taken from the Functional Planning Report showing the proposed grade.

Would you kindly arrange to have a foundation investigation of sufficient magnitude to allow the Bridge Office to proceed with the structure design.

JR/cew
Encl.
cc E. Cross

J. Robertson,
BRIDGE LOCATION SUPERVISOR,
for:
W.S. Melinyshyn,
REGIONAL BRIDGE LOCATION ENGINEER.

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

TO: Mr. A. Stermac,
Principal Foundation Engineer,
Room 107, Lab. Bldg.

FROM: C.S. Grebski,
Bridge Office

ATTENTION:

DATE: March 31, 1971

OUR FILE REF.

IN REPLY TO

SUBJECT: Park Lawn Road Overpass - Bridge #4
W.P. 314-65-05, Site No. 37-244
Q.E.W., District No. 6

69-F-67

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.

C.S. Grebski,
Bridge Design Engineer

CSG:rd

Attach.

c.c. Foundation Office

No comments
P.T.D.
April 5/71

April 7/71 No comments.
M. Devata
April 5th 1971

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

69-F-67

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

From: W.S. Melinyshyn,
Bridge Office.

Date: August 11th, 1969.

Our File Ref.

In reply to

Subject: Park Lawn Road Overpass,
W.P. 31-66-3, Site 37-204,
District 6, Hwy. Q.E.W.

The attached marked up partial print, B-30-68, details the approximate location of the proposed footing for the above detailed structure. Also enclosed are prints taken from the Functional Planning Report showing the proposed grade.

Would you kindly arrange to have a foundation investigation of sufficient magnitude to allow the Bridge Office to proceed with the structure design.

JR/cew
Encl.
cc E. Cross

J. Robertson,
BRIDGE LOCATION SUPERVISOR,
for:
W.S. Melinyshyn,
REGIONAL BRIDGE LOCATION ENGINEER.

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69F67 SITE Lake Huron - W&W BOREHOLE No. 1 GROUND ELEVA

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCR
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE											
				GRAVEL	SAND	SILT & CLAY									
1	3-4½	½"	angul	1	30	69	low	dull	slow	low	Earthy	Brown to Black		Firm	clayey silt with sand TrGr
2	6-7½	⅜"	-	0	25	75	low	dull	"	low	org to Earthy	Black to Brown		"	Fibry with Silt material - clayey Silt - mottled
3	9-10½	#100	-	0	Tr	100	low	dull	"	"	Earthy	Light Brown		"	clayey silt with little fine sand fine sand
4	12-13½	-		0	0	100	"	"	"	"	"	mottled Brown	"	Stiff	Clayey silt to laminated
5	15-16½	-	-	0	0	100	"	"	"	"	"	Grey Brown	"	Stiff	" "
6	20-21½	-	-	0	0	100	"	"	slow to Medium	"	"	Grey	"	"	clayey silt to silt
7	25-26½	100	-	0	10	90	-		"	"	"	"	"	"	" " " " " wi
8	30-31½	-	-	0	0	100	Layered	shiny	none	low	"	"	"	Firm-Stiff	clayey silt ~~or~~ silty cla
9	35-36														WEATHERED SHALE with

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

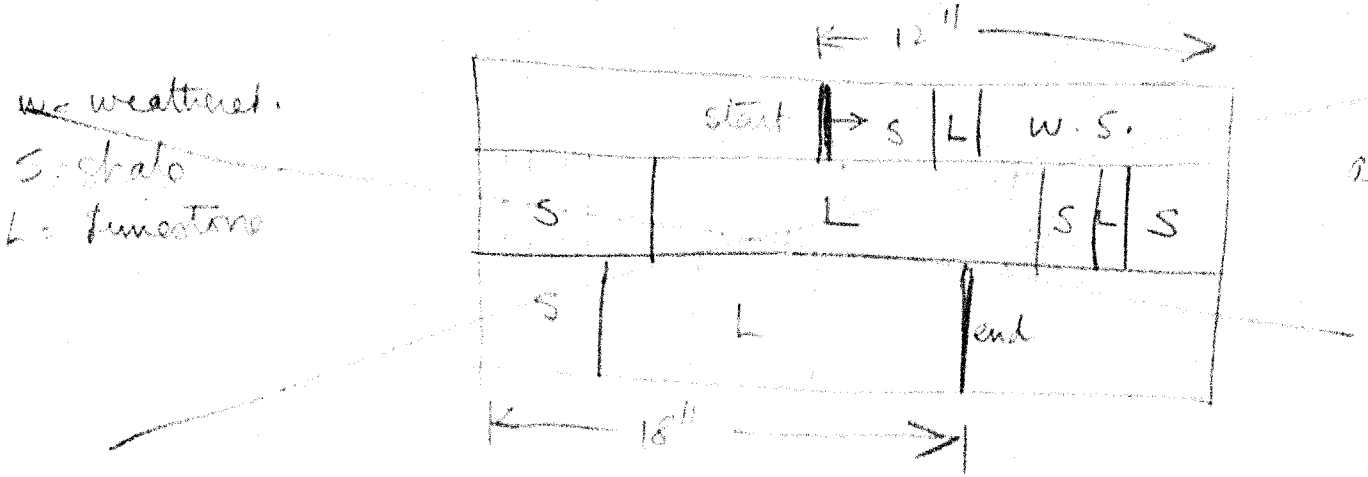
SITE Park Lawn - [illegible] BOREHOLE No. 1 GROUND ELEVATION ______

STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
[illegible]w	dull	slow	low	Earthy	Brown to Black	[illegible]	Firm	clayey [illegible] with sand [illegible] FILL MATERIAL	CL
[illegible]w	dull	"	low	Org. to Earthy	Black with Brown		"	[illegible] with fill material. clayey silt – mottled grey to sand	CL ML
[illegible]w	dull	"	"	Earthy	light Brown	"	"	clayey [illegible] with [illegible] fine sand partings; occ. fine sand seams.	CL ML
[illegible]	"	"	"	"	mottled Brown	"	Stiff	Clayey [illegible] partings.	CL-ML
[illegible]	"	"	"	"	Brown Grey	"	Stiff	" "	CL-ML
[illegible]	"	slow to Quick	"	"	Grey	"	"	clayey silt to silt	CL-ML
[illegible]	"	"	"	"	"	"	"	" " " " w/ fine sand seams	CL-ML
[illegible]ed	shiny	none	low	"	"	"	Firm-Stiff	clayey silt ~~to~~ or silty clay.	CL-CI
								WEATHERED SHALE WITH CLAY SEAMS	

ARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

Rock core

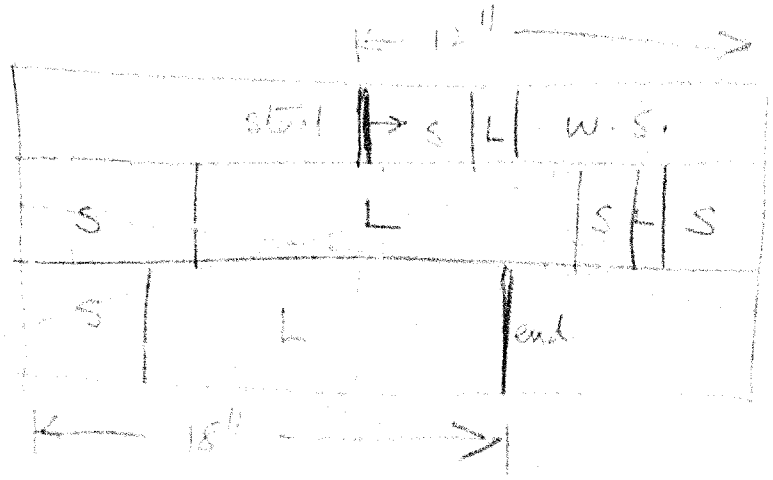
BXL 36'-41'



alternating

back case

DXL 36 x 41



alternating side to side

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69F67 SITE Fort Lawrence - QEW BOREHOLE No. 2 GROUND ELEVAT

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION: LARGEST GRAIN SIZE	GRAIN SIZE DISTRIBUTION: SHAPE	PERCENTAGE: GRAVEL	PERCENTAGE: SAND	PERCENTAGE: SILT & CLAY	DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIP
1	3-4½	#10	—	0	10	90	med	dull	slow	low	Earthy	Brown	Sl.	Soft to Firm	SILT Tr Sand & clay
2	6½-7½	½"	angular	3	7	90	low	"	slow	"	"	Yellow Brn	"	Firm	clayey SILT, occ gravel
3	9-10½	¾"	angul	5	5	90	low	"	"	"	"	"	"	—	" " "
4	12-13½	#100	—	0	Tr	100	"	"	Slow-Quick			Mott Brn	"		SILT, Fine Sand seam Lr clayey SILT
5	15-16½								Quick Slow						clayey SILT occ fine
6	20-21½	1"	sub angul	1	5	94	low	dull	slow	low	Earthy	Mott Yellow Grey	"	"	clayey SILT w/ fine Sand Tr. Gravel
7	25-26½	—	—	0	0	100	"	"	"	med	"	Grey	"	stiff	clayey SILT
8	~~27½~~ ?														WEATHERED

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH

REMARKS:- clayey SILT - horizontally laminated 1/8" thick

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

SITE Park Lawn - QEW BOREHOLE No. 2 GROUND ELEVATION

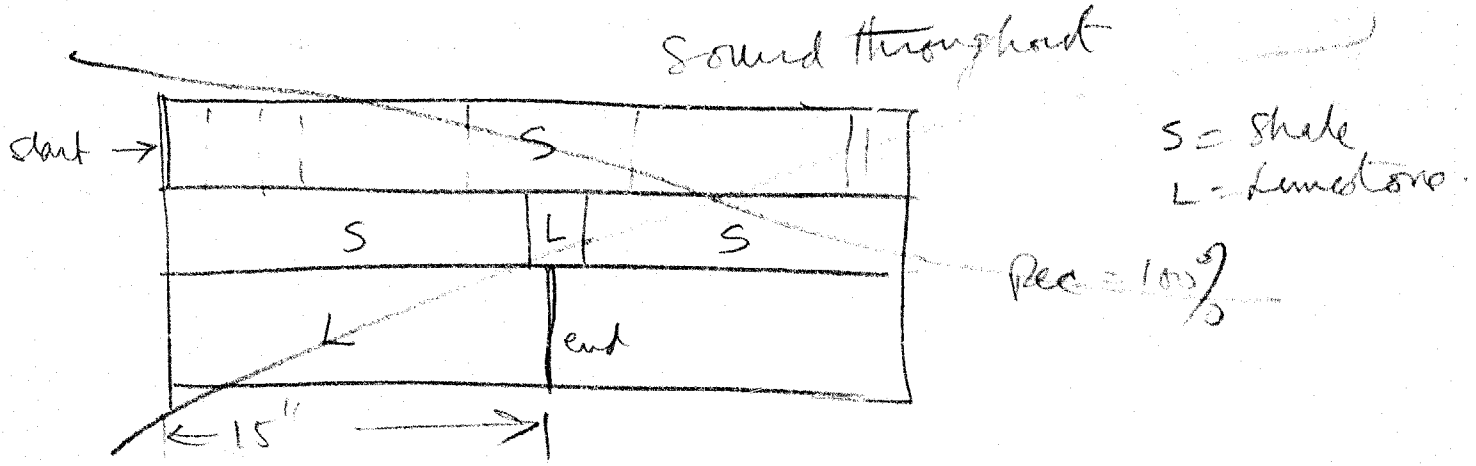
N TAGE SILT & CLAY	DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
90	med	dull	Quick	low	Earthy	Brown	Sl.	Soft to Firm	SILT Tr. Sand & clay	ML
90	low	"	Slow	"	"	mottled Br	"	Firm	clayey SILT, occ gravel FILL MAT'L ?	ML
90	low	"	"	"	"	"	"	-	" " " "	ML
100	"	"	Slow - Quick			Mott Br	"		SILT, Fine sand seams & pockets. Lr clayey SILT	CL or ML
			drilling slow						clayey SILT occ fine sand	CL - ML
94	low	dull	slow	low	Earthy	Mott Br - Grey	"	"	clayey SILT w/ fine Sand seams Tr. Gravel.	CL - ML
100	"	"	"	Med	"	Grey	"	stiff	clayey SILT	CL - ML
									WEATHERED SHALE	

ST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

clayey SILT w horizontally laminated 1/2" thick laminae.

Rock Core BXL

29-34



DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69F67 SITE Park Road Q(W) BOREHOLE No. 3 GROUND EL

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION						DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH D
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	3-4½	¼"	any	15	15	70	—	dull	slow slow	—	org	brown	strong	—	FILL MATERIAL	
2	6-7½	—	—	0	0	100		dull	slow	low	Earthy	Mott. brown	"	Firm to stiff	clayey SILT	me
3	9-10½	—	—	0	0	100	—	"	"	low	"	" Rdsh Grey	"	"	"	"
4	12-13½	—	—	0	Tr	100	—	"	"	"	"	Grey	"	"	clayey SILT	+
5	15-16½	—	—												do	
6	20-21	—	—	0	0	100	—			do					clayey SILT	
7	25-26	½"	sub round	20	10	70	med	shiny	none	med	Earthy	Grey	stn.	stiff	GLACIAL TILL — Rdsh ↔ clayey sil to silty cl	

NOTES:— VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES R

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

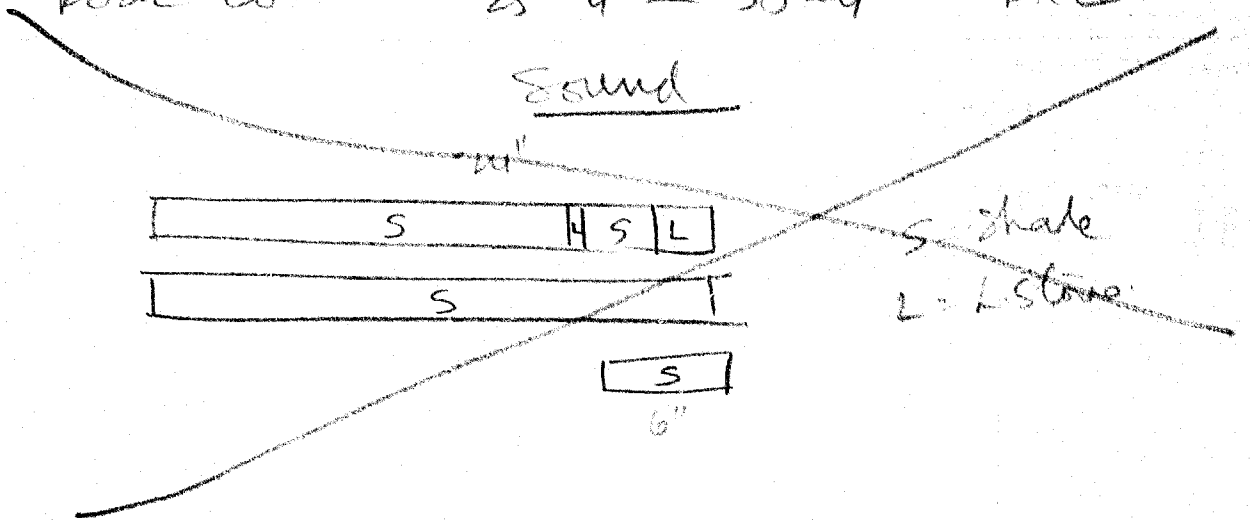
VISUAL CLASSIFICATION SHEET

SITE Park Lawn QEW BOREHOLE No. 3 GROUND ELEVATION

	DRY STRENGTH	SHINE	DILATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
	–	dull	slow to none	–	org	Brown	strong	–	FILL MATERIAL – clayey silt w/ sand & occ gravel	
		dull	slow	low	Earthy	Mott. Brown	"	firm to stiff	clayey SILT, occ. f. sand seams.	CL-ML
	–	"	"	low	"	Bdry Gray	"	"	" "	"
	–	"	"	"	"	Grey	"	"	clayey SILT to SILT	CL-ML
								ditto		
	–			ditto					clayey SILT	CL-ML
	med	shiny	none	med	Earthy	Grey	str.	stiff	GLACIAL TILL – Bdry w/ weathered shale ↔ clayey silt to silty clay w/ gravel, some sand	CL-CI.

BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

Rock core. 25'-4" — 30'-4" BXL.



DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

VISUAL CLASSIFICATION SHEET

PROJECT 69F 67 SITE PACK LAKE DEV BOREHOLE No. 4 GROUND ELEV

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESC
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE GRAVEL	PERCENTAGE SAND	PERCENTAGE SILT & CLAY									
1	3-4½	~~0~~	—	0	5	95	low	dull	slow	hard	brittle	Grey	—	stiff	clayey SILT Root
2	6-7½	—	—	0	0	100	"	"	quick slow	"	"	Grey with mott.	"	"	clayey SILT to SILT
3	9-10½	—	—	0	10	90	"	"	"	"	"	Grey	"	"	" "
4	12-13½	—	—	0	5	95	"	"	"	"	"	"	"	"	" "
5	15-16														WEATHERED SHALE silty Cla

NOTES:- VISUAL CLASSIFICATION MUST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REAC

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING DIVISION

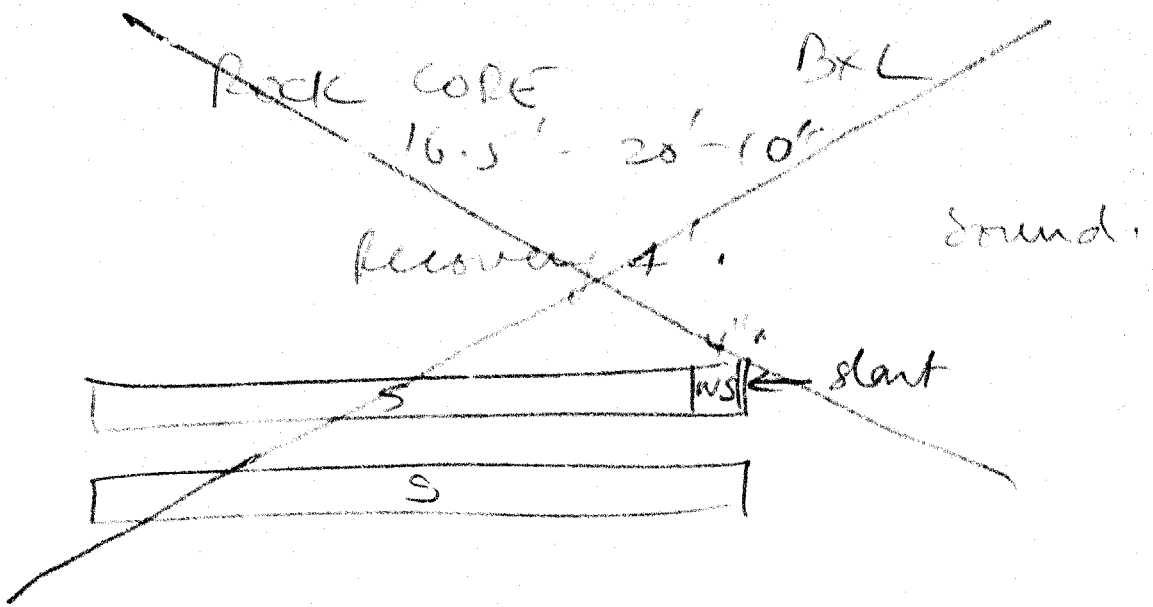
VISUAL CLASSIFICATION SHEET

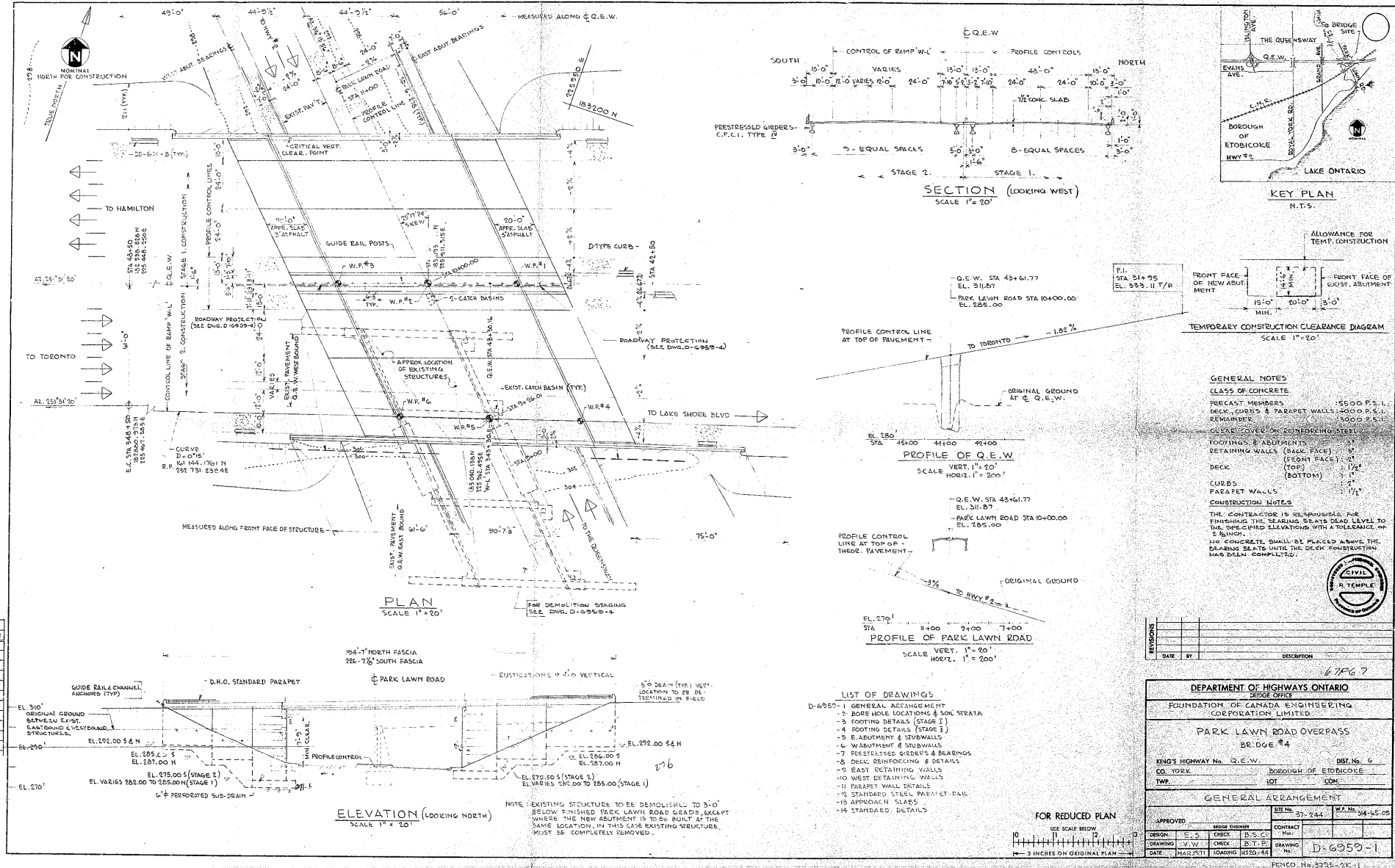
SITE PARK LAWN - QEW BOREHOLE No. 4 GROUND ELEVATION ______

...ION ...ENTAGE SAND	SILT & CLAY	DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
5	95	low	dull	slow	med	Earthy	Grey	stn	stiff	clayey SILT - [illegible] bdry of mottled [illegible] br. fine sand & silt.	CL ML
	100	"	"	Quick to slow	"	"	Grey & mot.	"	"	clayey SILT to SILT	CL ML
10	90	"	"	"	"	"	Grey	"	"	" " occ. f. sand seams.	
5	95	"	"	"	"	"	"	"	"	" "	
										WEATHERED SHALE bdry w/ silty clay Till.	

...ST BY CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

FF 22


Rock core
16.5' - 20'-10"
B x L
ground.
slant
WS
S
S



LIST OF DRAWINGS

D-6959-1 GENERAL ARRANGEMENT
-2 BORE HOLE LOCATIONS & SOIL STRATA
-3 FOOTING DETAILS (STAGE 1)
-4 FOOTING DETAILS (STAGE 2)
-5 E. ABUTMENT & STUBWALLS
-6 W. ABUTMENT & STUBWALLS
-7 PRESTRESSED GIRDERS & BEARINGS
-8 DECK REINFORCING & DETAILS
-9 EAST RETAINING WALLS
-10 WEST RETAINING WALLS
-11 PARAPET WALL DETAILS
-12 STANDARD STEEL PARAPET RAIL
-13 APPROACH SLABS
-14 STANDARD DETAILS

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

PRINT RECORD		
No.	FOR	DATE

REVISIONS			
DATE	BY	DESCRIPTION	

67P67

DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE OFFICE
FOUNDATION OF CANADA ENGINEERING CORPORATION LIMITED

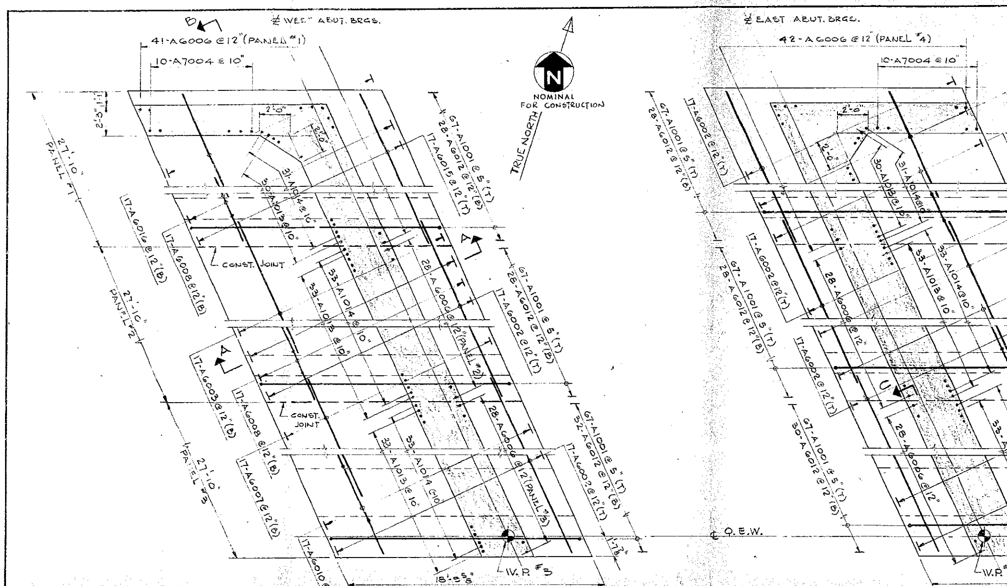
PARK LAWN ROAD OVERPASS
BRIDGE #4

KING'S HIGHWAY No. Q.E.W. DIST. No. 6
CO. YORK BOROUGH OF ETOBICOKE
TWP. LOT CON.

GENERAL ARRANGEMENT

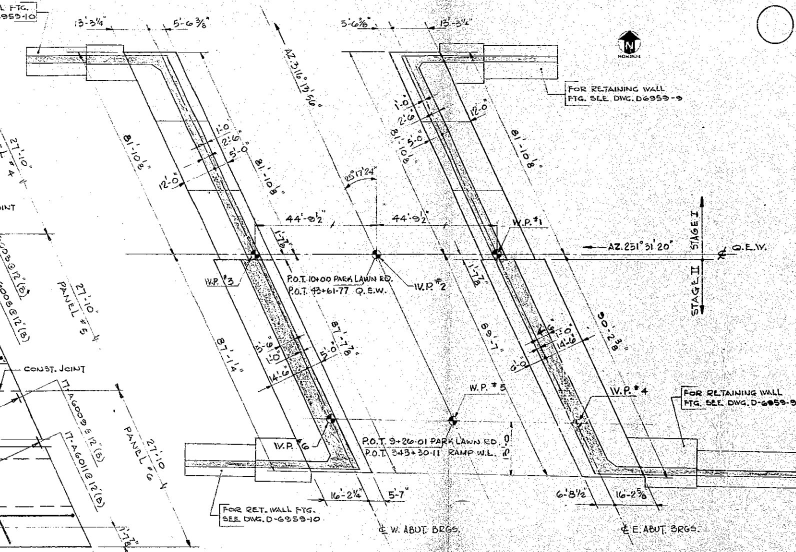
				SITE No.	37-244	W.P. No.	314-65-05
APPROVED		BRIDGE ENGINEER		CONTRACT No.			
DESIGN	E.S.	CHECK	B.S.C.				
DRAWING	V.W.	CHECK	B.T.P.	DRAWING No.	D-6959-1		
DATE	MAR 1971	LOADING	H20-44				

FENCO No. 3335-25-1



REINFORCING OF FOOTING (STAGE I)

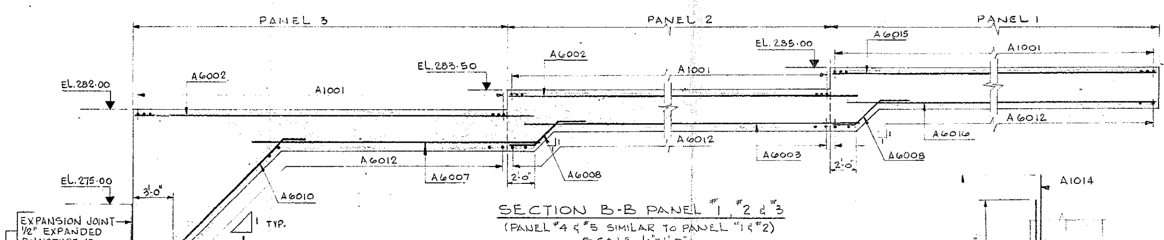
SCALE: 1/4" = 1'-0"



FOOTING LAYOUT

SCALE: 1" = 20'

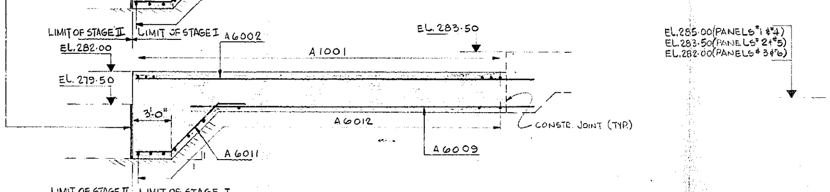
DESCRIPTION	STATION	CO-ORDINATES	
		NORTH	EAST
WP #1	43+16.98 Q.E.W.	183107.764	225953.797
WP #2	43+61.77 Q.E.W.	183093.568	225911.315
WP #3	44+06.56 Q.E.W.	183079.372	225868.833
WP #4	342+84.84 RAMP W.L.	183053.477	226005.797
WP #5	343+30.11 RAMP W.L.	183040.138	225962.495
WP #6	343+75.42 RAMP W.L.	183026.726	225919.261



SECTION B-B PANEL #1, #2 & #3

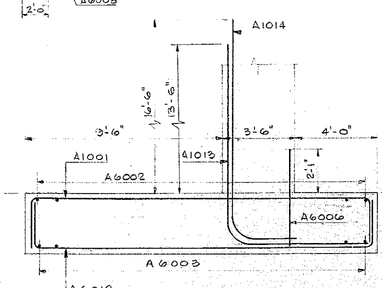
(PANEL #4 & #5 SIMILAR TO PANEL #1 & #2)

SCALE 1/4" = 1'-0"



SECTION C-C PANEL #6

SCALE 1/4" = 1'-0"



SECTION A-A

SCALE: 3/8" = 1'-0"

PRINT RECORD		
No.	FOR	DATE

REVISIONS		
DATE	BY	DESCRIPTION

FOR REDUCED PLAN

USE SCALE BELOW

0 1 2 3

3 INCHES ON ORIGINAL PLAN

69-F-67

DEPARTMENT OF HIGHWAYS ONTARIO

BRIDGE OFFICE

FOUNDATION OF CANADA ENGINEERING CORPORATION LIMITED

PARK LAWN RD. OVERPASS

BRIDGE #4

KING'S HIGHWAY No. Q.E.W. DIST. No. 6

CO. YORK BOROUGH OF ETOBICOKE

TWP. LOT CON.

FOOTING DETAILS (STAGE I)

SITE No. 37-244 W.P. No. 314-65-05

APPROVED ______ BRIDGE ENGINEER

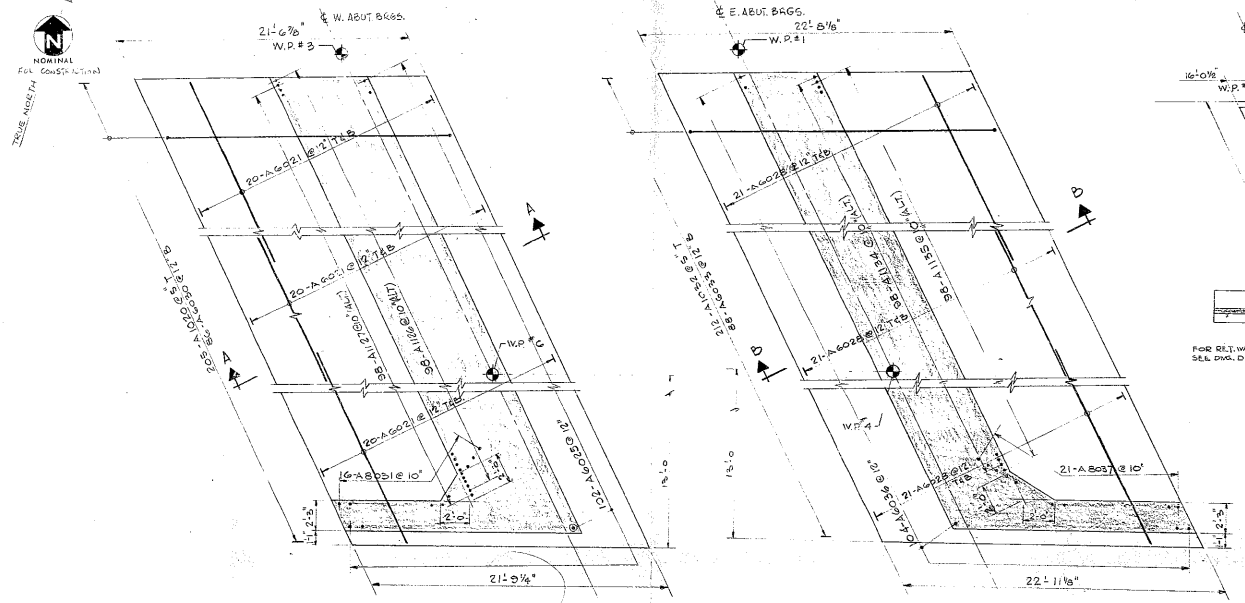
CONTRACT Nos.

DESIGN	B.G.	CHECK	B.S.C.
DRAWING	M.C.Z.	CHECK	E.S.
DATE	MAR. 71	LOADING	HS20-44

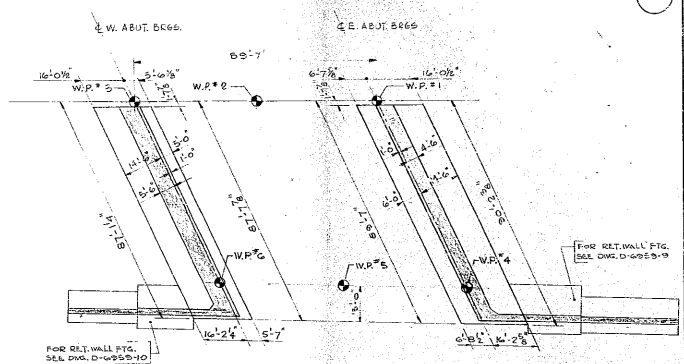
DRAWING No. D-6959-3

FENCO No. 3793-2K-3

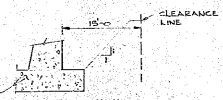
CIVIL R. TEMPLE



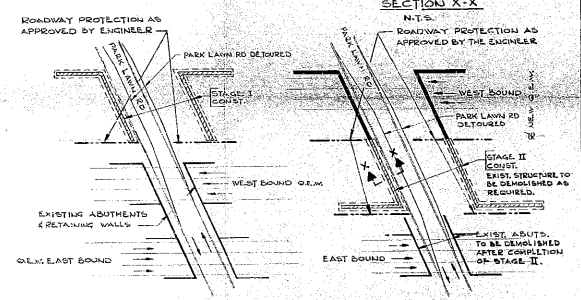
REINFORCING OF FOOTING
STAGE II
SCALE: 1/4" = 1'-0"



FOOTING LAYOUT
STAGE II
SCALE: 1" = 20'

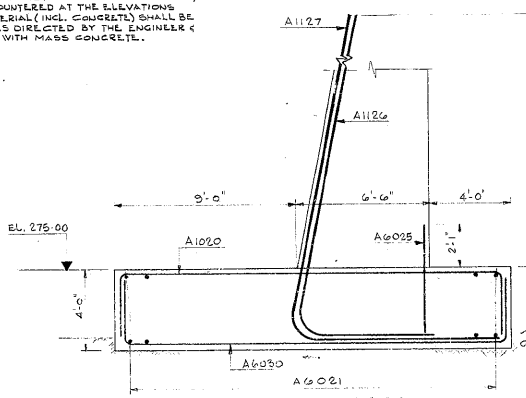


SECTION X-X
N.T.S.

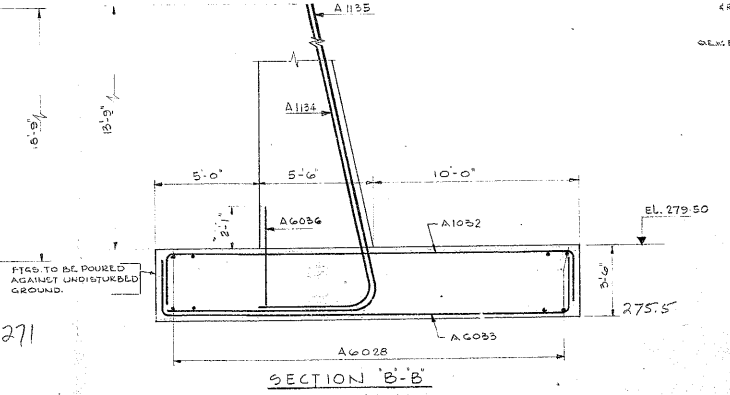


SUGGESTED ROADWAY PROTECTION DURING CONSTRUCTION
SCALE: 1" = 50'

NOTE: WEST ABUT. FTG.
FOOTING SHALL BE FOUNDED ON SOLID ROCK, IF NOT ENCOUNTERED AT THE ELEVATIONS SHOWN, MATERIAL (INCL. CONCRETE) SHALL BE REMOVED AS DIRECTED BY THE ENGINEER & REPLACED WITH MASS CONCRETE.



SECTION "A"-"A"
SCALE: 3/8" = 1'-0"



FTGS. TO BE POURED AGAINST UNDISTURBED GROUND.

SECTION "B"-"B"
SCALE: 3/8" = 1'-0"

PRINT RECORD		
No.	FOR	DATE

REVISIONS		
DATE	BY	DESCRIPTION

69-F-67

DEPARTMENT OF HIGHWAYS ONTARIO
BRIDGE OFFICE

FOUNDATION OF CANADA ENGINEERING CORPORATION LIMITED

PARK LAWN ROAD OVERPASS
BRIDGE #4

KING'S HIGHWAY No. Q.E.W. — DIST. No. 6
CO. YORK — BOROUGH OF ETOBICOKE
TWP. — LOT — CON.

FOOTING DETAILS (STAGE II)

APPROVED	BRIDGE ENGINEER			SITE No. 37-244	W.P. No. 314-65-05
				CONTRACT Nos.	
DESIGN	B.G.	CHECK	B.S.C.		
DRAWING	M.C.Z.	CHECK	E.S.	DRAWING No.	D-6959-4
DATE	MAY '71	LOADING	H-S20-44		

CIVIL — R. TEMPLE — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

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

3795-24-4