

DOCUMENT MICROFILMING IDENTIFICATION

GEOCRES No. 4099-19

DIST. 3 REGION SOUTHWESTERN

W.P. No. 109-68-12

CONT. No. 74-53

W. O. No. 72-P-113

STR. SITE No. 35-410

HWY. No. HANLON EXPWY.

LOCATION HANLON EXPWY. AND
IMPERIAL AVENUE

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT. 16

REMARKS: DOCUMENTS TO BE UNFOLDED
BEFORE MICROFILMED

G.I.-30 SEPT. 1976

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO											
DESIGN SERVICES BRANCH				RECORD OF BOREHOLE No. 479-19				FOUNDATION OFFICE			
JOB 72-11113		LOCATION Co-ords. 15,819,218 N; 794,214 E.		GEOCRS No.		ORIGINATED BY PK		COMPILED BY PK		CHECKED BY	
W.P. 109-68-12		BORING DATE Nov. 6 & 9, 1972		BOREHOLE TYPE Hollow Stem Auger							
DATUM Geodetic											
SOIL PROFILE		SAMPLES		ELEV. SCALE		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT		REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. LOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	BLOWS/FOOT	PLASTIC LIMIT	WATER CONTENT	BULK DENSITY	
1067.2	Ground Level										
0.0	Topsoil										
0.5	Gravelly Sand		1	SS	15						
			2	SS	100/7						
1058.2	Dense to Very Dense		3	SS	76	1060					
9.0	Silt to sandy silt		4	SS	39						
1054.9	Dense		5	SS	100/9						
12.3	Sandy gravel with silt.		6	SS	61	1050					
1047.2	Dense to Very Dense		7	SS	11						
1045.7	Probable Bedrock		8	SS	100/4						
21.5	End of Borehole										

OFFICE REPORT ON SOIL EXPLORATION

20
15 10 5 0 % STRAIN AT FAILURE

DESIGN SERVICES BRANCH				RECORD OF BOREHOLE NO 2				FOUNDATION OFFICE			
JOB 72-11113		LOCATION Co-ords. 15,819,211 N; 794,205 E.		GEOLOGICAL No. 10P9-19		ORIGINATED BY PK					
W.P. 109-68-12		BORING DATE Nov. 6, 1972				COMPILED BY PK					
DATUM Goodetic		BOREHOLE TYPE Cone Test				CHECKED BY [Signature]					
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT				LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W _e		BULK DENSITY P.C.F.	
ELEV. DEPTH	DESCRIPTION	STRAT. PLT NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F. ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE		WATER CONTENT % W _p — W — W _L		REMARKS	
1066.0	Ground Level				1060						
1051.0					1050						
15.0	End of Cone Test										

OFFICE REPORT ON SOIL EXPLORATION

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15 ϕ 5 % STRAIN AT FAILURE
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[illegible]

OFFICE REPORT ON SOIL EXPLORATION

15 $\frac{20}{10}$ 5 % STRAIN AT FAILURE

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO												
DESIGN SERVICES BRANCH				RECORD OF BOREHOLE No 4				FOUNDATIONS OFFICE				
JOB 72-11113		LOCATION Co-ords. 819,151 N; 794,149 E.		GEOLOGICAL No. 40F9-19		ORIGINATED BY PK						
W.P. 109-68-12		BORING DATE Nov. 6 & 7, 1972				COMPILED BY PK						
DATUM Geodetic		BOREHOLE TYPE Hollow Stem Auger				CHECKED BY						
SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE			LIQUID LIMIT			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	25 50 75 100 125	W _p W _L	PLASTIC LIMIT	WATER CONTENT		
1066.1	Ground Level											
0.0	Topsoil											
0.5	Silt to sandy silt.		1	SS	6							
			2	SS	22							
			3	SS	19							
			4	SS	35							
	Loose to Very Dense		5	SS	11							
1051.1	boulder		6	SS	50.7							
15.0	silty sand with gravel		7	ACT	20							
	boulder		8	SS	77							
	Very Dense		9	SS	100.8							
1041.1	boulder		10	SS	100							
25.0	Bedrock Dolomite		11	RC	100							
			12	RC	94							
1034.6			13	RC	94							
31.5	End of Borehole											

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15 5 % STRAIN AT FAILURE
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MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO											
DESIGN SERVICES BRANCH				RECORD OF BOREHOLE No. 5 4099-19				FOUNDATIONS OFFICE			
JOB 72-11113		LOCATION Co-ords. 15,819,118 N; 794,093 E.		GEOCRES No.		ORIGINATED BY PK					
W.P. 109-68-12		BORING DATE Nov. 13, 1972				COMPILED BY					
DATUM Geodetic		BOREHOLE TYPE Cone Test				CHECKED BY					
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE				LIQUID LIMIT		BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT. NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	BLOWS / FOOT	PLASTIC LIMIT	WATER CONTENT			
1069.1	Ground Level										
0.0											
1061.1											
8.0	End of Cone Test				1060						

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15 5 % STRAIN AT FAILURE
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OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH				RECORD OF BOREHOLE NO 6				FOUNDATIONS OFFICE			
JOB <u>72-11113</u>		LOCATION <u>Co-ords. 15,819,107 N; 794,079 E.</u>		GEOLOGICAL No. <u>409919</u>		ORIGINATED BY <u>EK</u>					
W.P. <u>109-68-12</u>		BORING DATE <u>Nov. 13, 1972</u>		COMPILED BY <u>EK</u>		CHECKED BY <u>[Signature]</u>					
DATUM <u>Geodetic</u>		BOREHOLE TYPE <u>Cone Test</u>									
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT — W _L PLASTIC LIMIT — W _P WATER CONTENT — W					
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	BULK DENSITY				
1069.3	Ground Level										
0.0											
1053.9											
15.4	End of Cone Test										

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15 ϕ 5 % STRAIN AT FAILURE
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OFFICE REPORT ON SOIL EXPLORATION

OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO																									
DESIGN SERVICES BRANCH				RECORD OF BOREHOLE No 7				FOUNDATIONS OFFICE																	
JOB 72-11113		LOCATION Co-ords. 15,819,097 N; 794,068 E.		ORIGINATED BY PK																					
W.P. 109-68-12		BORING DATE November 13, 1972		COMPILED BY PK																					
DATUM Geodetic		BOREHOLE TYPE Hollow Stem Auger		CHECKED BY																					
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT		PLASTIC LIMIT		REMARKS															
EL. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	25	50	75	100	125	W _L	W _P	W _c	W _L	W _P	W _c	W _L	W _P	W _c	P.C.F.	GR	SA	SI	CL
1069.6	Ground Level																								
0.0	Topsoil		1	SS	14																				
0.5	Gravelly sand with silt.		2	SS	25																				
1060.6	Compact to Dense		3	SS	35																				
9.0	Silt to sandy silt, traces of clay.		4	SS	36																				
1053.6	Dense to Very Dense		5	SS	108																				
16.0	Gravelly sand with silt.		6	SS	66																				
1047.5	Dense to Very Dense		7	SS	41																				
22.1	End of Borehole Probable Bedrock		8	SS	100																				

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15 5 5 % STRAIN AT FAILURE
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MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO											
DESIGN SERVICES BRANCH						FOUNDATIONS OFFICE					
RECORD OF BOREHOLE NO 8 4099-19											
JOB 72-11113			LOCATION Co-ords. 15,819,268 N; 794,165 E.			ORIGINATED BY PK					
W.P. 109-68-12			BORING DATE Nov. 9, 1972			COMPILED BY PK					
DATUM Geodetic			BOREHOLE TYPE Cone Test			CHECKED BY					
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT		BULK DENSITY		REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	25 50 75 100 125	W _L	W _p	W	
1066.0	Ground Level										
0.0											
1054.1											
11.9	End of Cone Test										

OFFICE REPORT ON SOIL EXPLORATION

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15 5 % STRAIN AT FAILURE
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OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO																					
DESIGN SERVICES BRANCH						FOUNDATIONS OFFICE															
RECORD OF BOREHOLE NO 9409-19																					
GEOCRE No.																					
JOB 72-11113		LOCATION Co-ords. 15,819,258 N; 794,158 E				ORIGINATED BY PK															
W.P. 109-68-12		BORING DATE Nov. 9, 1972				COMPILED BY PK															
DATUM Geodetic		BOREHOLE TYPE Cone Test				CHECKED BY															
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT		PLASTIC LIMIT		WATER CONTENT											
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	25	50	75	100	125	W _p	W _L	W _p	W _L	W _p	W _L	W _p	W _L	BULK DENSITY	REMARKS
1066.2	Ground Level																				
0.0						1060															
1055.6	End of Cone Test					1050															
10.6																					

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15 5 % STRAIN AT FAILURE
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MINISTRY OF TRANSPORTATION AND COMMUNICATIONS - ONTARIO

DESIGN SERVICES BRANCH

RECORD OF BOREHOLE NO 10

FOUNDATIONS OFFICE

4089-19
GEOCRESS No.

JOB 72-11113

LOCATION Co-ords. 15,819,234 N; 794,157 E.

ORIGINATED BY PK

W.P. 109-68-12

BORING DATE Nov. 9, 1972

COMPILED BY PK

DATUM Geodetic

BOREHOLE TYPE Hollow Stem Auger

CHECKED BY

SOIL PROFILE		SAMPLES		ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT 25 50 75 100 125	LIQUID LIMIT w_L PLASTIC LIMIT w_p WATER CONTENT w w_p w w_L	BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLLOT	NUMBER	TYPE				
1066.5	Ground Level							
0.0	Topsoil							
1.0			1	SS	9			
	Silty sand, some gravel.		2	SS	10			
			3	SS	15			
			4	SS	22			
1050.9	Loose to Very Dense		5	SS	74			
15.6	Sand, traces of gravel.		6	SS	100			
	Boulder		7	SS	100			
1045.2	Very Dense		8	RC	26%			
21.3	Bedrock Dolomite		9	RC	97%			
1039.0								
27.5	End of Borehole							

15 ϕ 5 % STRAIN AT FAILURE

OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH				FOUNDATIONS OFFICE										
RECORD OF BOREHOLE NO 11				4079-19										
JOB 72-11113		LOCATION Co-ords. 15,819,198 N; 794,102 E.		GEOLOGIST		INITIATED BY PK								
W.P. 109-68-12		BORING DATE Nov. 13, 1972		COMPILED BY PK										
DATUM Geodetic		BOREHOLE TYPE Cone Test		CHECKED BY										
ELEV. DEPTH	SOIL PROFILE DESCRIPTION	STRAT. PLT. NUMBER	SAMPLES TYPE	BLOWS/FOOT	ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE					LIQUID LIMIT — w_L		BULK DENSITY	REMARKS
						BLOWS / FOOT					PLASTIC LIMIT — w_p			
						25	50	75	100	125				
						SHEAR STRENGTH P.S.F.								
						O UNCONFINED + FIELD VANE								
						• QUICK TRIAXIAL X LAB VANE								
						WATER CONTENT %								
1067.0	Ground Level													
0.0														
1052.5														
14.5	End of Cone Test													

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15 5 % STRAIN AT FAILURE
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OFFICE REPORT ON SOIL EXPLORATION

DESIGN SERVICES BRANCH		RECORD OF BOREHOLE NO 12		FOUNDATIONS OFFICE	
JOB 72-11113	LOCATION Co-ords. 15,819,154 N; 794,058 E.	ORIGINATED BY PK		COMPILED BY PK	
W.P. 109-68-12	BORING DATE Nov. 10, 1972	CHECKED BY			
DATUM Geodetic	BOREHOLE TYPE Hollow Stem Auger				

SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT		PLASTIC LIMIT		WATER CONTENT		BULK DENSITY		REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PROF.	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCAL.	25	50	75	100	125	W _p	W _L	W _p	W _L
1066.2	Ground Level														
0.0	Silty sand, traces of clay & gravel.		1	SS	31	1060									
			2	SS	7										
			3	SS	8										
	Loose to Dense		4	SS	18										
1053.2			5	SS	22										
13.0	Silt, some sand & clay		6	SS	30	1050									
1050.2	Compact		7	SS	100/8"										
16.0	Gravelly sand		8	SS	100/3"										
1044.2	Very Dense		9	RC	51%										
22.0	Bedrock Dolomite		10	RC	98%	1040									
1039.0															
27.2	End of Borehole														

OFFICE REPORT ON SOIL EXPLORATION

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15 5 % STRAIN AT FAILURE
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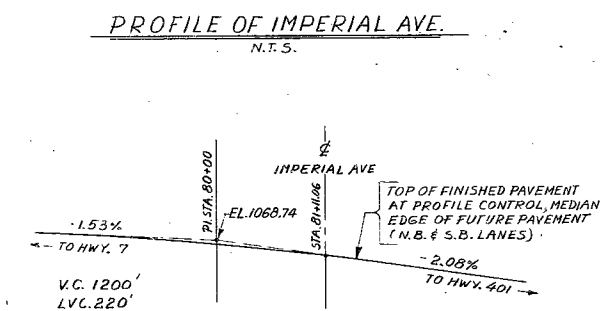
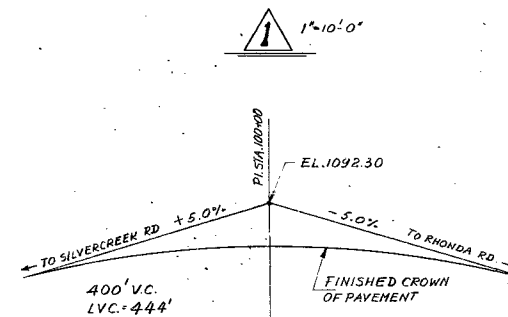
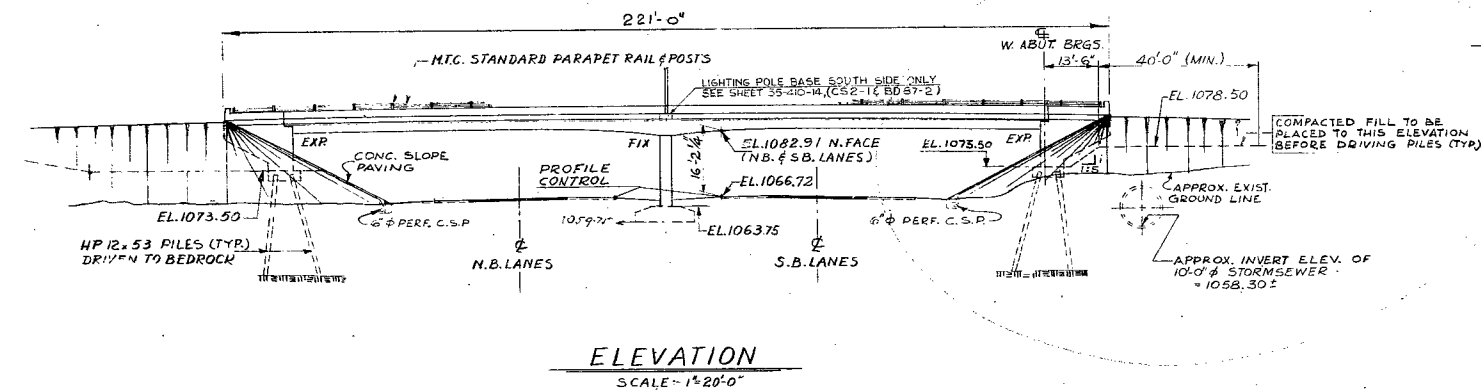
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15 ϕ 5 % STRAIN AT FAILURE
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OFFICE REPORT ON SOIL EXPLORATION

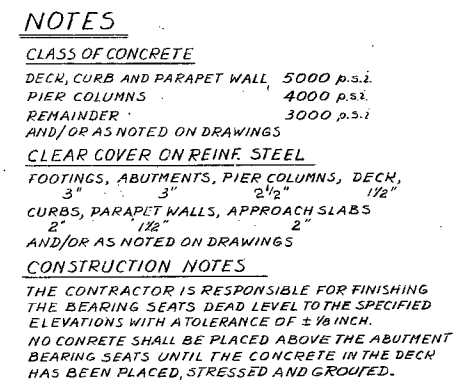
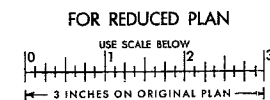
OFFICE REPORT ON SOIL EXPLORATION

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS-ONTARIO											
DESIGN SERVICES BRANCH				RECORD OF BOREHOLE NO 14 4099-19				FOUNDATIONS OFFICE			
JOB 72-11113		LOCATION Co-ords. 15,819,132 N; 794,032 E.		ORIGINATED BY PK							
W.P. 109-68-12		BORING DATE Nov. 13, 1972		COMPILED BY PK							
DATUM Geodetic		BOREHOLE TYPE Cone Test		CHECKED BY PK							
SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT		PLASTIC LIMIT		WATER CONTENT	
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS/FOOT	ELEV. SCALE	25	50	75	100	125
1069.7	Ground Level										
0.0											
1057.2											
12.5	End of Cone Test										

20
15
10
5
% STRAIN AT FAILURE



- ## LIST OF DRAWINGS
- | | | | |
|----|-----|---|----------------------------------|
| 35 | 410 | - | GENERAL LAYOUT |
| " | | - | BOREHOLE LOCATIONS & SOIL STRATA |
| " | | - | FOOTING REINFORCEMENT |
| " | | - | ABUTMENTS |
| " | | - | PIER DETAILS AND REINFORCING |
| " | | - | DECK LAYOUT & SCREED ELEVATIONS |
| " | | - | DECK REINFORCING |
| " | | - | CABLE DETAILS |
| " | | - | PARAPET WALL DETAILS |
| " | | - | STANDARD STEEL PARAPET RAIL |
| " | | - | DETAILS OF CONC. SLOPE PAVING |
| " | | - | 20 FOOT APPROACH SLAB |
| " | | - | STANDARD DETAILS I |
| " | | - | STANDARD DETAILS II |
| " | | - | EMBEDDED WORK LAYOUT AND DETAILS |
| " | | - | EMBEDDED WORK DETAILS |


[illegible]

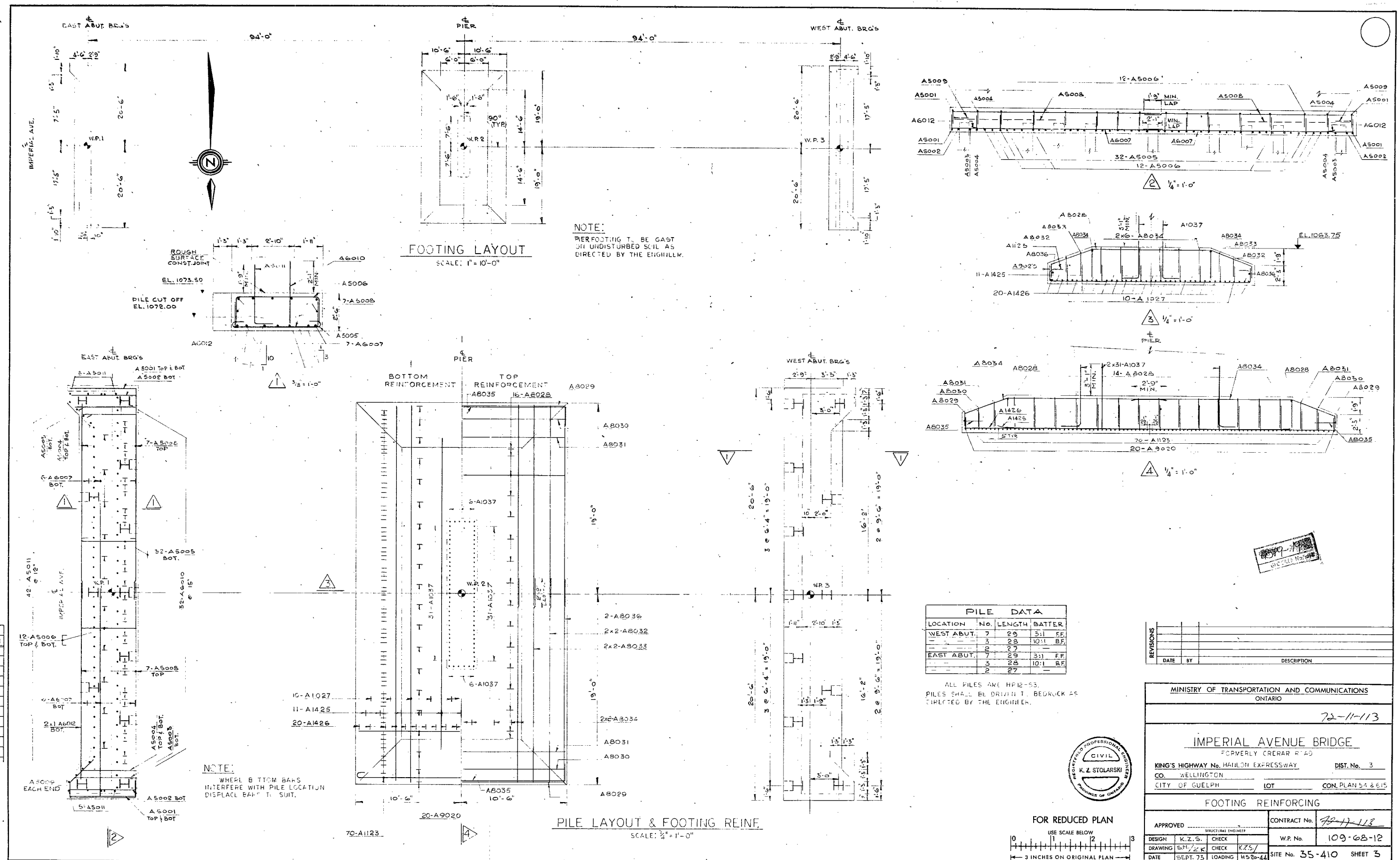
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO

IMPERIAL AVENUE BRIDGE
(FORMERLY CREAR ROAD)

KING'S HIGHWAY No. HANLON EXPRESSWAY DIST. No. 3
CO. WELLINGTON
CITY OF GUELPH LOT REG. PLAN 54615

GENERAL LAYOUT

APPROVED 			CONTRACT No.	
STRUCTURAL ENGINEER				
DESIGN	K.Z.E.	CHECK	J.L.K.	W.P. No. 109-68-12
DRAWING	J.Sz./S.M.	CHECK	K.Z.S.	
DATE	SEP. 23	LOADING	H520-44	SITE No. 35-410 SHEET 1

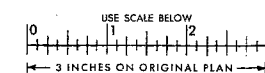


PILE DATA			
LOCATION	No.	LENGTH	BATTER
WEST ABUT.	7	29	3:1
—	3	28	10:1
—	2	27	—
EAST ABUT.	7	29	3:1
—	3	28	10:1
—	2	27	—

ALL PILES ARE HP12-53.
PILES SHALL BE DRIVEN TO BEDROCK AS
DIRECTED BY THE ENGINEER.



FOR REDUCED PLAN



REVISIONS			
DATE	BY	DESCRIPTION	

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS
ONTARIO

72-11-113

IMPERIAL AVENUE BRIDGE

FORMERLY CREER ROAD

KING'S HIGHWAY No. HAMILTON EXPRESSWAY DIST. No. 3
CO. WELLINGTON
CITY OF GUELPH LOT CON. PLAN 54 & 615

FOOTING REINFORCING

APPROVED _____ STRUCTURAL ENGINEER				CONTRACT No. <u>72-17-113</u>	
DESIGN	K.Z.S.	CHECK		W.P. No.	109-68-12
DRAWING	S.M./Z.K.	CHECK	K.Z.S./		
DATE	SEPT. 73	LOADING	H520-46	SITE No.	35-410 SHEET 3

72 F113 107-68-12 HANCOCK EXPWY & IMPERIAL AVE 4089-19
W.O. W.P. LOCATION GEOCRES NO.

• DATA ON FILE IN SOIL MECHANICS SECTION

REFER TO: CONTRACT 74-53

REMARKS _____

GEOCRES

INDEXING CARD FOR REPORTS NOT MICROFILMED

GI-20 AUG. 74

SUPERIMPOSED DOCUMENT MAY
APPEAR AS MULTI-FEED ON FILM

72-11113

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

To: Mr. A. Stermac
Principal Foundation Engineer
Foundation Office
West Bldg., Downsview

FROM: Structural Planning
Southwestern Region

ATTENTION:

DATE: October 6, 1972

OUR FILE REF

IN REPLY TO

SUBJECT: M.P. 109-68-12, Bridge Site 35-410
Imperial Avenue (formerly Crerar Rd.)
City of Guelph
Hanlon Expressway
District 3, Stratford

Would you kindly arrange to have a foundation investigation conducted at the above location.

I have enclosed two copies of the bridge site plan E-5338-1 with the probable footing locations marked in red for a 4 lane four span structure, in blue for a 4 lane two span structure and in purple for a 2 lane structure (two or four span). The City of Guelph still has to decide on a two or four lane facility.

I have also enclosed a Field Reconnaissance Report, pictures of Imperial Avenue at the site, a list of utility contacts and a plan showing utilities locations.

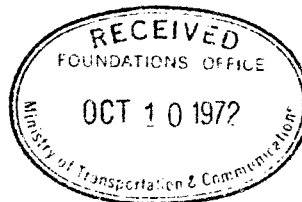
Would you please comment on the necessity of protective measures for the 4" gas main during construction. Relocation of this pipe is probably necessary.

S. Jants

S. Jants
Structural Planning Technician

SJ:sz
Enc.

cc A. Crowley
C. Grebski
J. Anderson



Original Due - Oct 27 1972



looking east on Imperial Avenue



looking east on Imperial Avenue



looking east on Imperial Avenue



looking west on Imperial Avenue

FIELD RECONNAISSANCE REPORT
REQUIRED BY FOUNDATION SECTION
FOR

FF-69
SEPT 1968

W.P. NO. 109-68-12 HIGHWAY NO. H.E. DISTRICT 3 SITE PLAN NO. E-5338-1 PROFILE NO. _____
RIVER CROSSING ☐ GRADE SEPERATION ☒ R.R.X. ☐ OTHER (SPECIFY) _____
ALTERNATE SCHEME (IF ANY) _____

EXISTING SITE CONDITIONS

DESCRIPTION:

TOPOGRAPHY: HILLY ☐ ROLLING ☐ VALLEY ☐ GULLIED ☐ FLAT ☐
VEGETATION: TREES ☐ BRUSH ☐ GRASS ☐ SWAMP ☐ FARM CROPS ☐ CLEARED ☐
SNOW COVER: 0"-6" ☐ 6"-12" ☐ >12" ☐
ROCK OUTCROP (SPECIFY LOCATIONS) _____

UNDERGROUND UTILITIES: UTILITY COMPANY _____ TELEPHONE NO. FOR DEFINITE LOCATION _____
1 Hydro line south side of Imperial Avenue (overhead)
2 Bell line north side of Imperial Avenue (overhead)
3 Gas Main
4 _____
5 See attached - utilities plan and listing of contacts

EXISTING STRUCTURE(S): N/A

FOUNDATIONS: SPREAD FOUNDATIONS ☐ SIZE _____ ELEVATION(S) _____
PILES ☐ TYPE _____ LENGTH(S) _____
DESIGN LOAD _____ TS.F. _____ TONS/PILE _____
CONDITION OF STRUCTURE _____

APPROACHES: CUT ☐ FILL ☐ SIDE SLOPES _____
BERMS YES ☐ NO ☐

OTHER OBSERVATIONS (USE BACK OF SHEET TO DESCRIBE ANY FAILURES IN AREA, PAST PERFORMANCE OF EXISTING APPROACHES & STRUCTURE, ETC.)

ACCESSIBILITY

IS STRUCTURE LOCATED ON D.H.O. RIGHT OF WAY? YES ☐ NO ☒ IF NO,
HAS PERMISSION BEEN OBTAINED TO ENTER PROPERTY? YES ☐ NO ☒ IF NO,
PROPERTY OWNER(S):

NAME ADDRESS TELEPHONE NO

1 _____
2 _____
3 _____
4 _____

WHO WILL OBTAIN NECESSARY PERMISSION? Foundation Office
HAS SITE BEEN SURVEYED & STAKED? YES ☒ NO ☐ IF YES, DATE OF MOST RECENT SURVEY February, 1969
WILL CLEARING BE NECESSARY TO ENTER SITE AREA? YES ☐ NO ☒
IS SITE ACCESSIBLE TO WHEELED VEHICLES? YES ☒ NO ☐

IF RIVER CROSSING: N/A

WILL A RAFT BE NECESSARY? YES ☐ NO ☐ IF YES, GIVE MAX. DEPTH OF WATER _____ FT
CURRENT: SWIFT ☐ MODERATE ☐ SLOW ☐

DRILLING OPERATIONS

NEAREST SOURCE OF WATER (GIVE HAULING DISTANCE, IF KNOWN) hydrant at Silvercreek Rd. &
ADDITIONAL INVESTIGATION REQUIRED FOR THE FOLLOWING PURPOSES: Imperial Avenue
ALTERNATE SCHEME YES ☐ NO ☐ IF YES, SPECIFY _____
HYDROLOGIC REASONS YES ☐ NO ☐ IF YES, SPECIFY (SCOUR, ETC.) _____

REMARKS

NEAREST AVAILABLE ACCOMODATION Guelph
OTHER COMMENTS: _____

DATE _____

REGIONAL BRIDGE LOCATION ENGINEER _____



10-11-113

Mr. F. E. Loscombe,
Reg. Super't of Eng. Surveys,
London Regional Office.

Mr. G. A. Baun,
Field Supervisor,
Engineering Surveys.

P. J. Rule

November 17, 1972.

W. P. 109-68-12, Hanton Expressway, Job 104-72
Guelph - From Waterloo Ave. northerly to Woodlawn
Road - structure at Imperial Ave. (borehole location)
Township: City of Guelph; County: Wellington
District No. 3 - Stratford
Party Chief: G. Telford

Please be advised that the request from P. Korgemagi, Foundation Section,
Head Office, November 1, 1972, was completed November 13, 1972 and the field data is
now in the Engineering Surveys drafting office.

14 borehole locations were laid out in the field as per directions by
P. Korgemagi, engineer in charge. A ground elevation was established at each location as
well as a plus and offset to the boreholes.

A copy of the field notes was given to the engineer in charge and duplicate
set of notes forwarded to the office. We furnished our own plans and profiles for this request
from information supplied by Systems Design (London).

Information being submitted is as follows:

1 field book containing borehole locations (Imperial Road)

NOTE: please forward plans and field notes of G. Telford's survey of Imperial Ave. in
July, 1972 to Systems Design office.

G. A. Baun,
Field Supervisor.

GAB:ww

c.c. Mr. P. Korgemagi,
Mr. A. Crowley.

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. A. P. Watt,
Reg. Bridge-Planning Engineer,
Southwestern Region,
London, Ontario.

FROM: Foundations Office,
Design Services Branch,
West Bldg., Downsview.

ATTENTION:

DATE: January 5, 1973.

OUR FILE REF.

IN REPLY TO

SUBJECT:

*Imperial Avenue,
City of Guelph
Hanlon Expressway, Site #35-410
W.P. 109-86-12 W.O. 72-11113
District # 2 (Stratford)*

The Foundations Office have recently completed a field investigation at the site of the above-mentioned project. The following paragraphs contain a summary of subsoil conditions and our recommendations relating to the design of the proposed structure foundations and embankments. Our complete report will be forwarded to you at the earliest possible time, but the recommendations given here should be regarded as final. Design work on the structure and embankments may therefore be proceeded with, without further delay. If queries arise you are requested to contact this Office by telephone.

1. Subsoil Conditions:

The subsoil in general consists of loose to very dense silt to silty sand, and compact to very dense sand to sandy gravel deposits overlying bedrock. Occasional boulders were encountered at some locations. The ground elevation varies between 1066 and 1070, and the bedrock surface varies between elevation 1044 (centre pier) and 1047.5 (abutments). The natural groundwater level is at elevation 1062.0.

2. Discussion and Recommendations:

i) General

It is proposed to construct an underpass at the crossing of Hanlon Expressway and Imperial Avenue in the City of Guelph. The structure may be a two lane or four lane and may consist of two or four spans.

The maximum height of the embankment is 22 feet.

January 5, 1973.

ii) Structure Foundations

The proposed structure may be supported on spread footings founded in original ground at or below the following elevations.

East Abutment	Elev. 1060
Piers	Elev. 1060
West Abutment	Elev. 1062

A safe bearing pressure of 2.5 t.s.f. may be used for design purposes.

As an alternative the abutments may be constructed within the approach fills and supported on fully compacted granular material as shown on the accompanying sketch on Fig. 1. In this case a safe bearing pressure of 2.5 t.s.f. may be used for design purposes.

As a further alternative the whole or part of the structure may be supported on end bearing piles driven to bedrock. Because of the presence of boulders, it is believed that steel H piles would be the most suitable type of piles. For design purposes the maximum allowable design load may be used for the particular section used.

The structure should be designed to accomodate maximum differential settlements between footings of 1 inch unless completely supported on end bearing piles.

iii) Miscellaneous

A dewatering scheme will be necessary to carry out excavation below the water level and to pour concrete in the dry.

All footings or pile caps must have a minimum of 4 feet of earth cover for frost protection.

A friction coefficient of 0.55 may be assumed for computations of sliding resistance for abutments founded on spread footings in the original soil or on fully compacted granular fill as per Fig. 1.

No bouldery fill should be placed at location where piles are to be driven. Maximum grain size should be limited to 3 inches in these zones.

No stability problems are anticipated for 2:1 forward and side slopes.

January 5, 1973.

The 4 inch gas main should be relocated outside the area of construction.

AP/ck

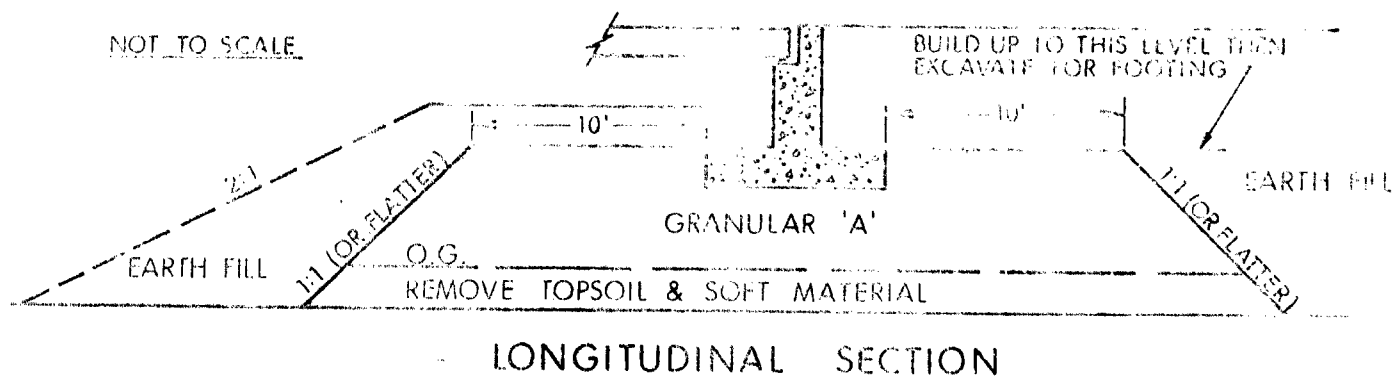
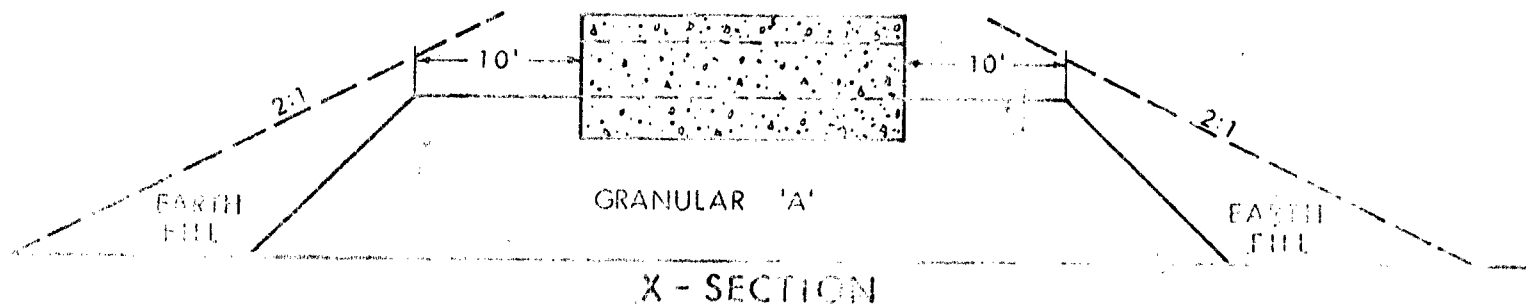
A. Prakash,
Senior Foundations Engineer.
For:
K. G. Selby,
Supervising Foundations Engineer.

AP/ck
Attch:

c.c. B. R. Davis
 J. L. Keen
 A. McConnell
 J. R. Roy
 J. G. Forster
 A. Crowley

Foundations Files
Documents

ABUTMENT ON COMPACTED FILL SHOWING GRANULAR 'A' CORE



NOTES

- 1 - REMOVE TOPSOIL &/OR SOFT SUBSOIL UNDER AREA OF COMPACTED GRANULAR 'A'.
- 2 - PLACE GRANULAR 'A' TO TOP OF FOOTING LEVEL, COMPACTED ACCORDING TO CURRENT M.T.C. STANDARDS.
- 3 - EXCAVATE COMPACTED GRANULAR 'A' MATERIAL FOR FOOTING.

W.O. 72-11113

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. A. P. Watt, (2)
Regional Structural Planning Eng.,
Southwestern Region,
London, Ontario.

FROM: Foundations Office,
Design Services Branch,
West Bldg., Downsview.

ATTENTION: Mr. S. Jants,
Structural Planning Technician.

DATE: January 30, 1973.

OUR FILE REF. IN REPLY TO FEB - 5 1973

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For
The Proposed Bridge at Imperial
Road and Hanlon Expressway
City of Guelph, District 3, Stratford
W.O. 72-11113 -- W.P. 109-68-12

RECORDED
4089-19

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
A. Wittenberg
W. D. Neilipovitz
B. J. Giroux
J. R. Roy
G. A. Wrong
B. A. Singh

Foundations Files
Documents

A.G. Stermac
A.G. Stermac,
PRINCIPAL FOUNDATIONS ENGINEER.

Georgio

4089-19

Cent 761-53

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2. *DESCRIPTION OF SITE.*
3. *FIELD WORK AND LABORATORY INVESTIGATIONS.*
4. *SUBSOIL CONDITIONS.*
 - 4.1) *General.*
 - 4.2) *Silt to Silty Sand with Some Gravel.*
 - 4.3) *Sand to Sandy Gravel with Silt and Traces of Clay.*
5. *DISCUSSION AND RECOMMENDATIONS.*
 - 5.1) *General.*
 - 5.2) *Structure Foundations.*
6. *MISCELLANEOUS.*

FOUNDATION INVESTIGATION REPORT
For
The Proposed Bridge at Imperial
Road and Hanlon Expressway
City of Guelph, District 3, Stratford
W.O. 72-11113 -- W.P. 109-68-12

1. INTRODUCTION:

A foundation investigation was requested at the proposed Bridge Site 35-410, Imperial Road and Hanlon Expressway by Mr. S. Jants, Structural Planning Technician, Southwestern Region, in a memo dated October 6, 1972. Subsequently, field and laboratory investigations were implemented by this Office, in order to determine subsoil and groundwater conditions prevailing at the proposed footing locations.

Presented in this report are the results of the above investigations, together with recommendations concerning the structure foundations.

2. DESCRIPTION OF SITE:

At the time of the investigation Imperial Rd. was a two lane road passing through a field which is the right of way for the Hanlon Expressway. To the east is the right of way for Ontario Hydro power lines. Immediately to the north-west the land rises some 10 feet and a new subdivision has been built. To the south-west there are two houses and the area is well treed. The general area is gently rolling. Boulders of up to 2 sq. ft. were found over the area giving a good indication of the subsoil conditions.

This bridge site is in the physiographic region known as the Guelph Drumlin Field. The general land form pattern of this area consists of drumlins or groups of drumlins fringed by gravel terraces and separated by swampy valleys.

3. FIELD WORK AND LABORATORY INVESTIGATIONS:

The field work consisted of five sampled boreholes and fourteen dynamic cone tests, five of the cone tests being adjacent to the boreholes. The drilling was done by a Bombardier mounted C.M.E. equipped with hollow stem augers. Split spoon samples were taken at regular intervals. Standard penetration tests were conducted using conventional means and the penetration "N" values recorded. All the field and laboratory test results are recorded on the accompanying borelog sheets.

Soil samples were identified in the field and again upon arrival in the laboratory. Laboratory tests to determine moisture contents, grain size, and Atterberg limits were carried out on representative samples.

The groundwater levels across the site were determined by recording the groundwater level in the open boreholes over the period of the investigation.

The locations and elevations of the boreholes as well as a stratigraphical profiles are plotted on drawing 72-11113A attached at the end of this report. The surveying of the site was carried out by personnel from the Southwestern Region, Engineering Surveys Office.

4. SUBSOIL CONDITIONS:

4.1) General:

The subsoil in general consists of loose to very dense silt to silty sand, and compact to very dense sand to sandy gravel deposits overlying a dolomitic bedrock. Occasional boulders were encountered at some elevations. The ground elevation varies between 1066 and 1070, and the bedrock surface varies between

1044 (center pier) and 1047.5 (abutments). The natural groundwater level is at elevation 1062.0.

4.2) Silt to Silty Sand With Some Gravel:

This deposit was the first layer encountered in B.H.'s #4, 10 and 12. In B.H.'s 1 and 7 this deposit was overlain by a layer of sandy gravel. The silt to silty sand layer varied in thickness from 13 to 25 feet between the elevations of 1066 and 1041 ft. The relative density may be described as loose to very dense. Grain size analyses yielded results that indicated that gravel represented 0 to 19% of the material, sand 6 to 80%, silt 11 to 88%, and clay 1 to 11%. Moisture content of this stratum was measured to be between 10 and 29%. A typical grain size envelope is included in the Appendix as Fig. 2.

4.3) Sand to Sandy Gravel With Silt and Traces of Clay:

This deposit was encountered first in B.H.'s #1 and 7. In these two boreholes the sandy gravel was split by a layer of silt to sandy silt. The first layer of sandy gravel was about 9 ft. thick and the second layer was about 6 to 8 feet thick. The 'N' values within the sandy gravel were measured to be between 14 and more than a 100 blows per foot corresponding to a compact to very dense relative density. Grain size analyses indicates that the composition of the layer is 39 to 64% gravel, 29 to 51% sand, 7 to 41% silt, and 1 to 7% clay. The natural moisture content was calculated to be between 5.5 to 12%. A typical grain size envelope is included in the Appendix as Fig. 3.

5. DISCUSSION AND RECOMMENDATIONS:

5.1) General:

It is proposed to construct an underpass at the crossing of Hanlon Expressway and Imperial Avenue in the City of Guelph. The structure may be two lane or four lane and may consist of

two or four spans.

The maximum height of the embankment is 22 feet.

5.2) Structure Foundations:

The proposed structure may be supported on spread footings founded in original ground at or below the following elevations.

East Abutment	Elev. 1060
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A safe bearing pressure of 2.5 t.s.f. may be used for design purposes.

As an alternative the abutments may be constructed within the approach fills and supported on fully compacted granular material as shown on the accompanying sketch on Fig. 1. In this case a safe bearing pressure of 2.5 t.s.f. may be used for design purposes.

As a further alternative the whole or part of the structure may be supported on end bearing piles driven to bedrock. Because of the presence of boulders, it is believed that steel H piles would be the most suitable type of piles. For design purposes the maximum allowable design load may be used for the particular section used.

The structure should be designed to accommodate maximum differential settlements between footings of 1 inch unless completely supported on end bearing piles.

A dewatering scheme will be necessary to carry out excavation below the water level and to pour concrete in the dry.

All footings or pile caps must have a minimum of 4 feet of earth cover for frost protection.

A friction coefficient of 0.55 may be assumed for computations of sliding resistance for abutments founded on spread footings in the original soil or on fully compacted granular fill as per Fig. 1.

No bouldery fill should be placed at location where piles are to be driven. Maximum grain size should be limited to 3 inches in these zones.

No stability problems are anticipated for 2:1 forward and side slopes.


The 4 inch gas main should be relocated outside the area of construction.

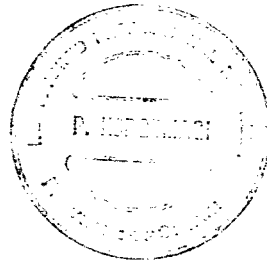
6. MISCELLANEOUS:


The field work for this job was carried out during November 6 to 13, 1972, and was supervised by Mr. P. Korgemagi.

The equipment used was owned and operated by P.V.K. and Sons Drilling Ltd., Burford, Ontario.

This report was written by Mr. P. Korgemagi, Project Foundations Engineer, and reviewed by Mr. K. G. Selby, Supervising Foundations Engineer.


P. Korgemagi, P. Eng.




K. G. Selby, P. Eng.

PK/ao

Jan. 26, 1973.

APPENDIX I

OVERSIZES DRAWINGS

RECORD OF BOREHOLE # 1

2

3

4

5

6

7

8

9

10

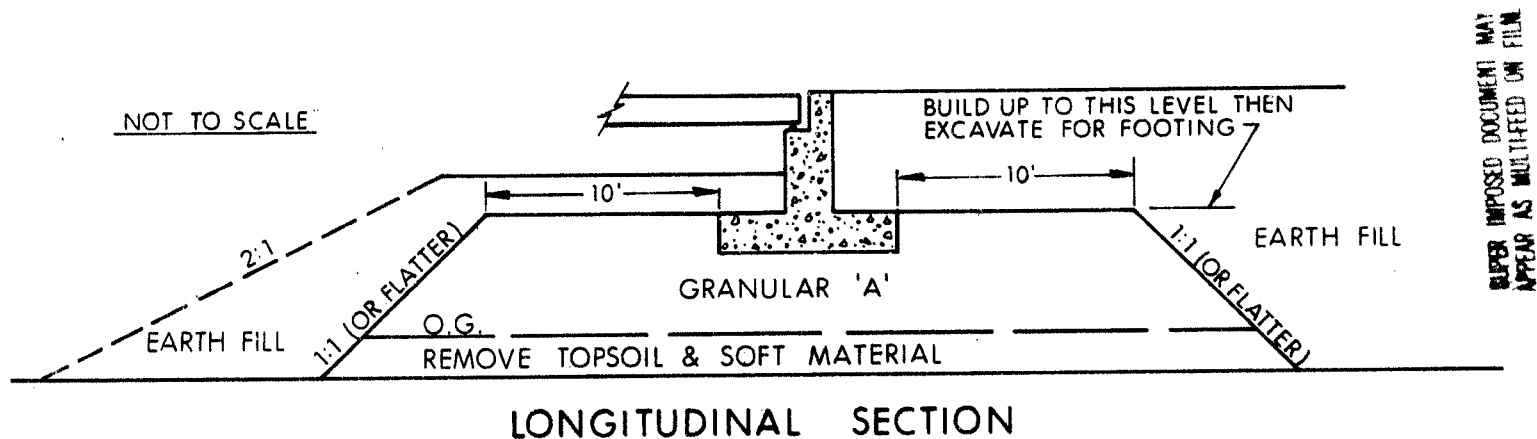
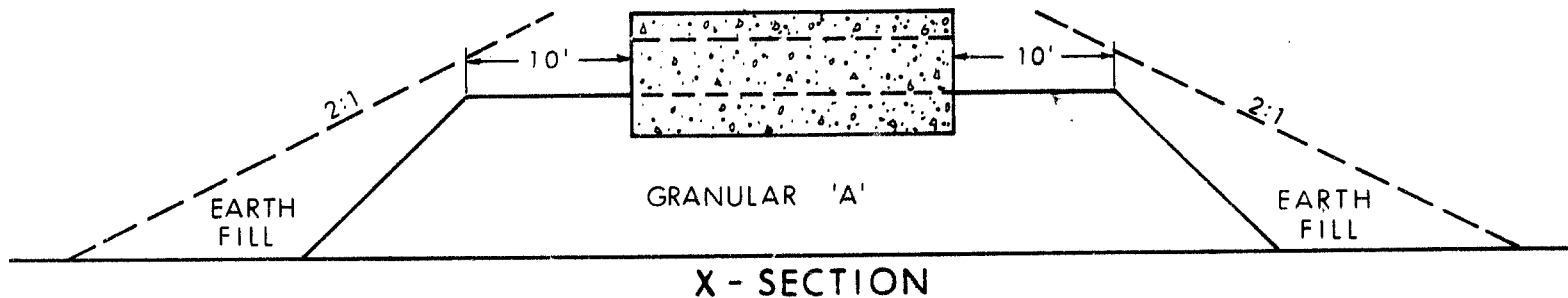
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12

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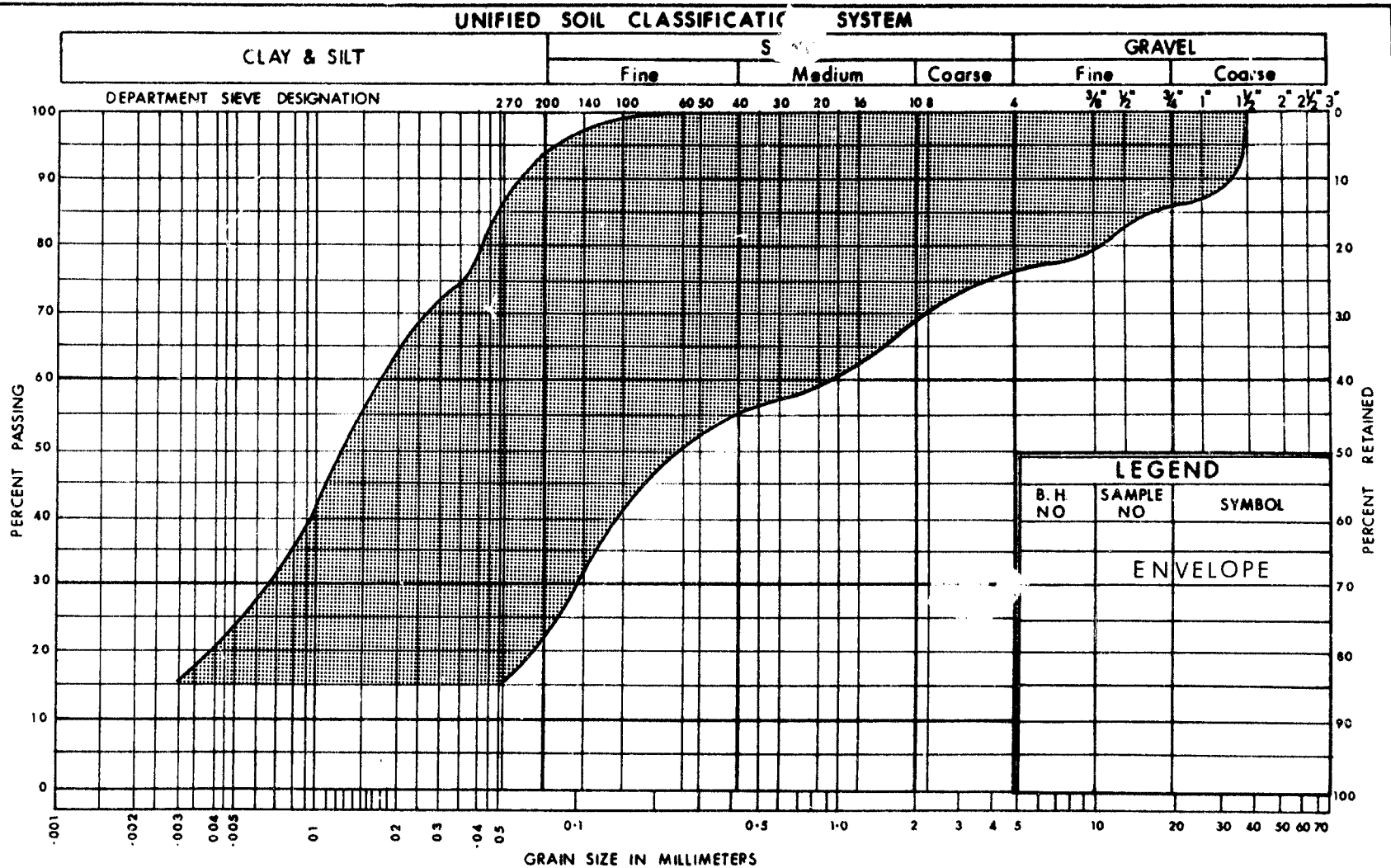
14

ABUTMENT ON COMPACTED FILL SHOWING GRANULAR 'A' CORE



NOTES

- 1 - REMOVE TOPSOIL & /OR SOFT SUBSOIL UNDER AREA OF COMPACTED GRANULAR 'A'.
- 2 - PLACE GRANULAR 'A' TO TOP OF FOOTING LEVEL, COMPACTED ACCORDING TO CURRENT M.T.C. STANDARDS.
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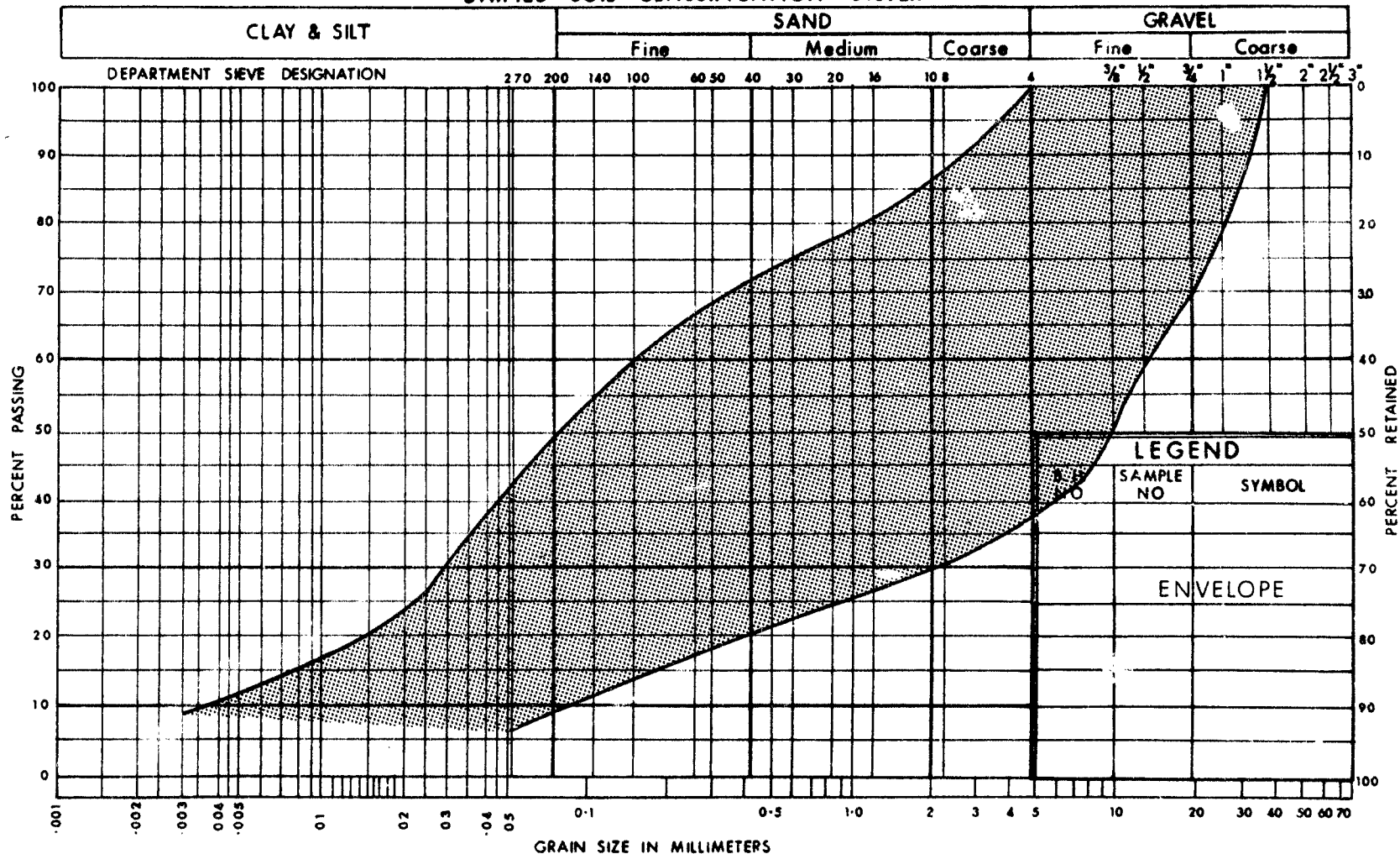


ONTARIO

GRAIN SIZE DISTRIBUTION
SILT TO SILTY SAND
WITH SOME GRAVEL

FIG. No 2

UNIFIED SOIL CLASSIFICATION SYSTEM



DEPARTMENT
OF
TRANSPORTATION AND COMMUNICATIONS



DESIGN SERVICES
BRANCH

GRAIN SIZE DISTRIBUTION
SAND TO SANDY GRAVEL
WITH SILT AND TRACES OF CLAY

W.P. No. 109-68-12

JOB No. 72-11113

FIG No. 3

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 TERMS :-

<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
CU	CONSOLIDATED ISOTROPIC UNDRAINED TRIAXIAL	C	CONSOLIDATION
CD	" " 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
ϕ'	EFFECTIVE ANGLE OF SHEARING RESISTANCE, OR FRICTION
c_u	APPARENT COHESION
ϕ_u	APPARENT ANGLE OF SHEARING RESISTANCE, OR FRICTION
μ	COEFFICIENT OF FRICTION
S_t	SENSITIVITY

GENERAL

π	= 3.1416
e	BASE OF NATURAL LOGARITHMS 2.7183
$\log_e a$ 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

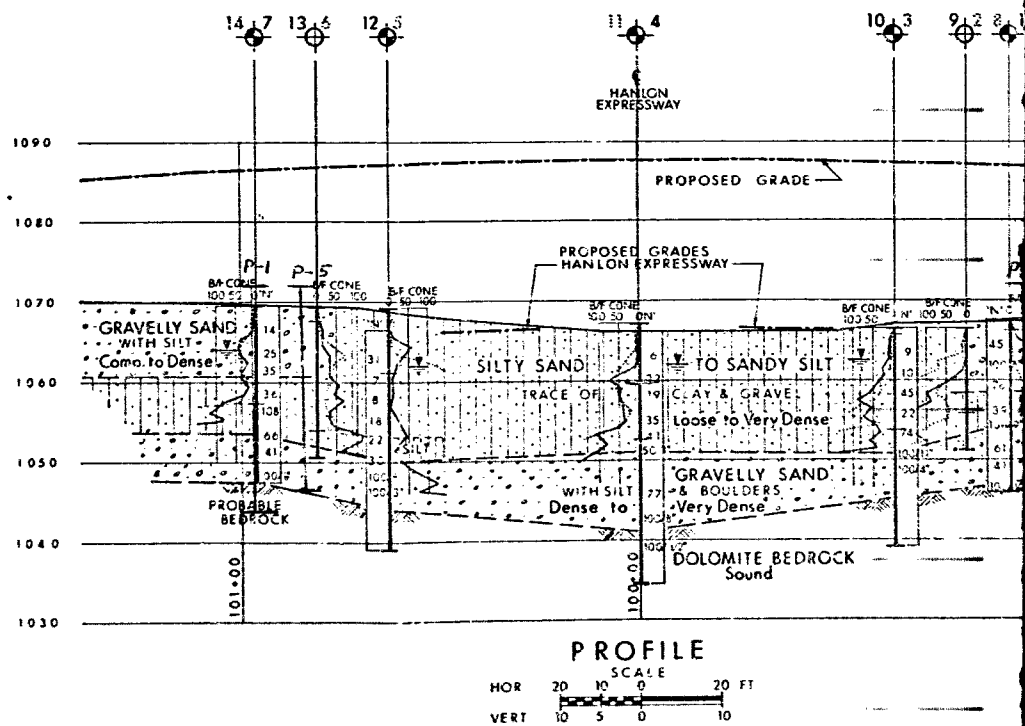
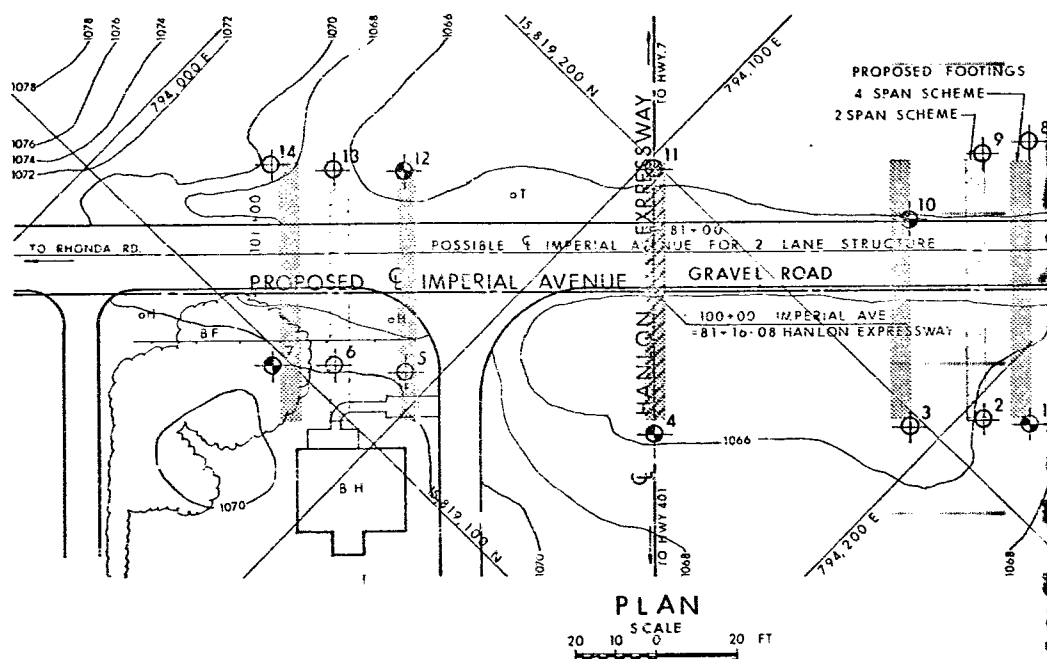
d	DISTANCE FROM TOP OF WALL TO POINT OF APPLICATION OF PRESSURE
δ	ANGLE OF WALL FRICTION
K	DIMENSIONLESS COEFFICIENT TO BE USED WITH VARIOUS SUFFIXES IN EXPRESSIONS REFERRING TO NORMAL STRESS ON WALLS
K_o	COEFFICIENT OF EARTH PRESSURE AT REST

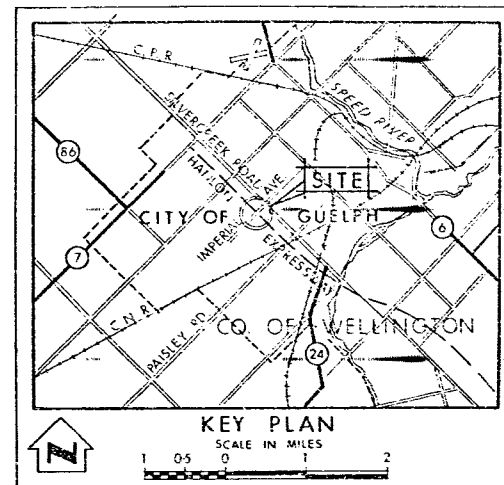
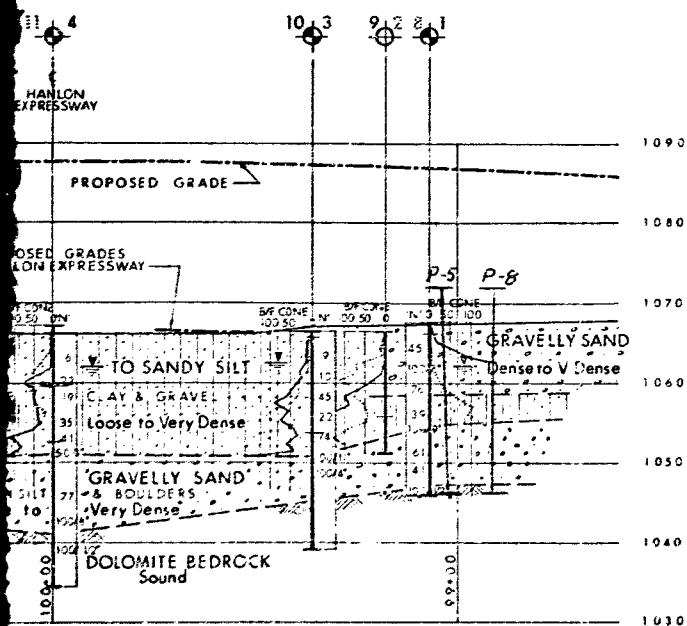
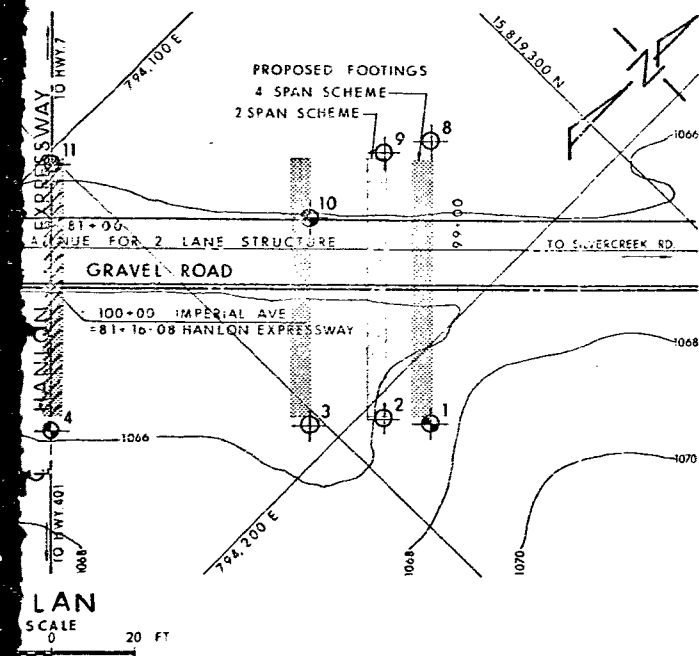
FOUNDATIONS

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





LEGEND

- Bore Hole
- Cone Penetration Test
- Bore Hole & Cone Test
- Water Levels established at time of field investigation Nov. 1972

NO.	ELEVATION	CO-ORDINATES	
		NORTH	EAST
1	1067.2	15,819,218	794,214
2	1066.0	15,819,211	794,205
3	1065.4	15,819,197	794,193
4	1066.1	15,819,151	794,149
5	1069.1	15,819,118	794,093
6	1069.3	15,819,107	794,079
7	1069.6	15,819,097	794,068
8	1066.0	15,819,268	794,165
9	1066.2	15,819,258	794,158
10	1066.5	15,819,234	794,157
11	1067.0	15,819,198	794,102
12	1066.2	15,819,154	794,058
13	1067.5	15,819,142	794,044
14	1069.7	15,819,132	794,032

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

IMPERIAL AVENUE

HIGHWAY NO. HANLON EXPRESSWAY DIST. NO. 3
CO. WELLINGTON CITY OF GUELPH
TWP. LOT 45 & 46 CON.

BORE HOLE LOCATIONS & SOIL STRATA

SUBMIT P.K.	CHECKED	W.P.N.O. 139-68-12	DRAWING NO.
DRAWN O.L.J.	CHECKED	W.O.N.O. 72-11113	72-11113A
DATE 25 JAN 1973	SITE NO.	BRIDGE DRAWING NO.	
APPROVED	CONT. NO.		



REF E-5338-1

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. A. Watt,
Reg. Structural Planning Engineer,
Southwestern Region, London.

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

ATTENTION:

DATE: March 23, 1973.

OUR FILE REF.

IN REPLY TO

SUBJECT:

Imperial Avenue Bridge,
(Formerly Crerar Road),
W.P. 109-68-12, Site 35-410,
Hanlon Expressway, District #3.

72-11-113

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-35-410-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$222,000 which includes tender, materials, engineering, and sundry construction.

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

CSG/js
Attach.

C. S. Grebski
C. S. Grebski
Structural Design Engineer

c.c. B. R. Davis
A. E. McKim
W. D. Birchr
A. Stermac ✓
J. Anderson
A. Crowley
W. McFarlane
M. Stoyanoff

MINISTRY OF TRANSPORTATION AND COMMUNICATIONS, ONTARIO

MEMORANDUM

TO: Mr. A. Stermac
Principal Foundation Engineer
Rm. 107, West Bldg.

W.D. 72-11-113
FROM:

Structural Office
West Bldg.

ATTENTION:

DATE: October 1, 1973

OUR FILE REF.

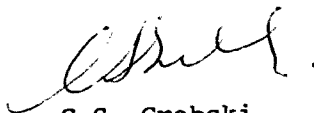
IN REPLY TO

SUBJECT:

Imperial Avenue Bridge
Hamlon Expwy.
WP 109-68-12, Site 35-410
Hamlon Expwy., District 3

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
Structural Design Engineer

CSG:AMF

Attached.

c.c. Foundation Office

*Draw 72-11134
Reviewed and sent to
Structure Office 5 Nov. 73
JHC*

MEMORANDUM

To: Mr. K. Selby,
Foundations Section,
Geotechnical Office,
West Bldg.

FROM: Structural Office,
West Bldg.,
Downsview, Ontario.

ATTENTION:

DATE: July 11, 1974.

OUR FILE REF.

IN REPLY TO

SUBJECT: Imperial Avenue Bridge,
W.P. 109-68-12, Site 35-410,
Hanon Expressway,
Dist. No. 3, Stratford.

The cover over the storm sewer behind the west abutment has been increased to 10 feet at the time of driving the abutment piles. As the pile driver could be located immediately over the sewer at the time of driving the abutment piles, do you envisage any damage to the sewer occurring from the load and vibration caused by the pile driver? The closest pile to the sewer is about 14 feet away from the edge of the sewer.

J. L. Keen

J. L. Keen,
Reg. Str. Des. Eng.

CC: E. Pritchard (S.W. Region, Systems Des.)

No problems
Advise
Mr. Keen by phone
K. L. Selby



Mr. J.R. Wear,
Project Review Engineer,
Systems Design Office,
East Building, Downsview.

Soil Mechanics Section,
Geotechnical Office,
West Building, Downsview.

July 17th, 1974.

RE: Imperial Avenue Bridge,
Huron Expressway,
City of Guelph,
District #3 (Stratford),
W.O. 73-11113,
W.P. 109-68-12, Site 35-410.

In view of the subsoil conditions at this location, we suggest that the following sentence should be added to the item of 'Dewatering' in the Special Provisions for the above project:

"The Subsoil is likely to 'boil' under an unbalanced hydrostatic head."

A. Prakash,
Senior Engineer,
For: K.G. Selby,
Supervising Engineer.

AP/mj
C.C. J.L. Keen
Documents
Files

SUMMARY OF PILE DRIVING RECORDS

W.O. 72-11113 W.P. 109-68-12 CONT. 74-53 DIST. 3

SITE IMPERIAL RD. & HANLON EXPRESSWAY - CITY OF GUELPH

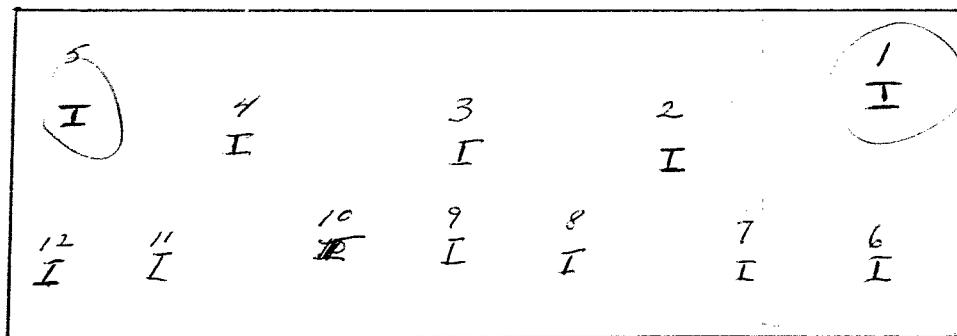
DATE DRIVEN DEC. 11-12, 1974 WEIGHT OF ANVIL 500 lb

HAMMER TYPE D-12 WEIGHT 2750 lb ENERGY 22500 FT/LB.

[illegible]

WEST ABUT FTG IMP. A STRUCTURE PILE # SYSTEM.

Full length
C.P. 100' 60' - 12
12



W. A. Hanks

VISUAL CLASSIFICATION SHEET

PK

PROJECT 72-1113 SITE BOREHOLE No. 1 GROUND ELEVATION

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	2'-6" 4'	1/2"	ANG	60	30	10						Brown			SANDY GRAVEL TRACES OF SILT	
2	5'-6" 6'	"	"	"	"	"						"			"	
3	7'-6" 9'	"	"	"	"	"						"			"	
4	10'-6" 11'-6"				10	90			QUICK	SLIGHT		GREYISH BROWN			SILT TRACES OF GRAVEL	
5	12'-6" 13'-9"	1"	ANG	90		10						Light Brown			GRAVEL TRACES OF SILT	
6	15'-6" 17'-6"	1"	"	60	30	20						Brown			SANDY GRAVEL TRACES OF SILT	
7	17'-6" 19'	"	"	"	"	"						"			"	
8	21'-6" 23'	1"	"												GRAVEL	

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

REMARKS:-

VISUAL CLASSIFICATION SHEET

PROJECT D-11113 SITE _____ BOREHOLE No. 4 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	2' to 3' 2"		-		40	60						DARK TO LIGHT BROWN			ORGANIC SILT TO SANDY SILT	
2	5' to 6' 6"		-		70	30			Quick			BROWN			FINE SAND. SOME SILT	
3	7' 6" to 9'				"	"			"			"			"	
4A	10' to 11' 6"				"	"			"			"			"	
4B	"				"	"			"			"			"	
5	12' 6" to 14'				"	"			"			"			"	
6	15' to 17'				30	40	30					BROWN			SAND SOME GRAVEL & SILT	
7	ROCK CORE															
8	20' to 21' 6"	1"	SUB AVG		30	60	10					BROWN			GRAVELLY SAND.	

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

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 22-11113 SITE _____ BOREHOLE No. 4 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	23 1/2 24 1/2	1"	ANG	30	60	10						Light Green			GRAVELLY SAND.	
10	27 1/2				80	20			Quick						FINE SAND TO SILT	

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

REMARKS:-

VISUAL CLASSIFICATION SHEET

PROJECT 22-11112 SITE _____ BOREHOLE No. 7 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	5' 10"	1"	ANG	10	40	50						Light Brown			ORGANIC SILT TO SAND	
2	5' 10" 6' 6"	2"	Round	10	50	10						Brown			GRAVELLY SAND	
3	7' 8' 6"	"	"	"	"	"						"			"	
4	10' 10" 6"				50	50			Quick			Brown			SANDY SILT TO SILTY SAND	
5	12' 10" 6"				60	40						Brown			FINE SAND SOME SILT	
6	16' 10" 6"				50	50			Quick			Brown			SANDY SILT TO SILTY SAND	
7	20' 10" 1"	1"	ANG	30	40	30						Light Brown			GRAVELLY SAND SOME SILT	
8	24' 10" 1"				50	50						Light Brown			SANDY SILT TO SILTY SAND	

NOTES:— VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:—

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 72-1113 SITE _____ BOREHOLE No. 10 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION			DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE										
				GRAVEL	SAND	SILT & CLAY								
1	2'-6" 4'				50	50			ORGANIC	DARK BROWN			CLAYEY SILT ^{ORGANIC} TO SANDY SILT	
2	5'-6" 6'-6"	1"	SUB ANG	20	70	10				"			SAND SOME SILT & GRAVEL	
3	7'-6" 9'	1/2"	SUB ROUND							"			"	
4	10'-6" 11'-6"				50	50	Slow			Brown			FINE SAND & SILT	
5	12'-6" 14'				50	20				Brown			SAND SOME SILT	
6	15'-6" 16'-6"			50	20	20				GREYISH Brown			CLAYEY SILT WITH GRAVEL & SAND	
7	17'-6" 18'-4"				80	20				Brown			SAND SOME SILT	

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

REMARKS:-

DEPARTMENT OF HIGHWAYS — ONTARIO
MATERIALS AND TESTING OFFICE
VISUAL CLASSIFICATION SHEET

PROJECT 72-1113 SITE _____ BOREHOLE No. 12 GROUND ELEVATION _____

SAMPLE No.	DEPTH	GRAIN SIZE DISTRIBUTION					DRY STRENGTH	SHINE	DIALATANCY	TOUGHNESS	ODOR	COLOUR	ACID TEST	CONSISTENCY OR UNDRAINED SHEAR STRENGTH	CLASSIFICATION WITH DESCRIPTION	SYMBOL
		LARGEST GRAIN SIZE	SHAPE	PERCENTAGE												
				GRAVEL	SAND	SILT & CLAY										
1	2 1/2' to 8'	1 1/2"	SUB ANG	40	40	10						DARK Brown			GRAVELLY SAND	
2	6' to 6' 6"	"	"	"	"	"						"			"	
3	7' 6" to 9'	"	"	"	"	"						"			"	
4	10' to 11' 6"	"	"	"	"	"						"			"	
5	12' 6" to 14'				60	40						Brown			FINE SAND SOME SILT	
6	15' to 16' 6"				50	50						"			FINE SAND TO SILT	
7	17' 6" to 18' 6"	1/2"	SUB ROUND	50	40	30						"			SAND SOME GRAVEL + SILT	
8	20' to 20' 3"	1 1/2"	SUB ANG	50	30	20						"			GRAVELLY SAND	

NOTES:— VISUAL CLASSIFICATION MUST BE CARRIED OUT ON ALL SAMPLES BY THE ENGINEER AS SOON AS POSSIBLE AFTER THE SAMPLES REACH THE LABORATORY.

REMARKS:—

OVERSIZED DRAWINGS

General Layout
footings reinforcing