

MEMORANDUM

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

FROM: Bridge Division,
Downsview, Ontario.

DATE: January 9th, 1967.

OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 277-66, Etobicoke Ck, Replacement,
Dundas Street Interchange,
District #6.

Attached are two prints of a plan showing the proposed borehole layout in relation to the existing structure and two prints of the probable grade of the structure.

The present proposal at Etobicoke Creek is to replace the existing structure with three spans (50', 80', 50') at a minimum grade of 386.0. The exact centre line of the road is not yet determined, it will however probably be set up with the centre line located along the south rail of the existing structure. The borehole layout requested should give adequate coverage for another type of structure which might be used.

A set of prints (D-3199) for the existing structure have been ordered and will be forwarded to you as soon as possible.

JCMcA/cew
Attach.
cc R. Strain
A. Crowley

John C. McAllister
J. C. McAllister,
for W.S. Melnyshyn,
Regional Bridge Location Engineer.

MEMORANDUM

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

From: Bridge Division,
Downsview, Ontario.

Attention: Mr. A. Barsvary.

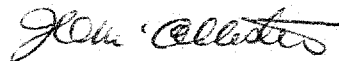
Date: June 29th, 1967.

Our File Ref.

In Reply To

Subject: Bridge #4,
Northbound Basket Weave,
W.P. 266-66, Site 37-725,
Dundas Interchange, Dist. #6.

Attached for your information is one copy of bridge
site plan #6918 for the above mentioned structure.



MB/cew
Attach.

J. C. McAllister,
for W. S. Melinyshyn,
Regional Bridge Location Engineer.

FILE : 66 - F - 103

SITE PLANS

Department of Highways Ontario

Copy for the information of

Mr. A. Stermac,
Principal Foundation Engineer

Mr. W. Melinyshyn,
Regional Bridge Location Engineer,
Central Region,
Administration Building

Bridge Division,
Downsview, Ontario

August 2, 1967

Bridge #4
Northbound Basket Weave
W.P. 266-66, Site No. 377-725
Dundas Interchange, District 6

Attached herewith are prints of the Preliminary Bridge Plan Drawing D-6199-P1 for the above-mentioned structure.

The estimated cost of the proposed structure is \$639,390. This cost includes tender, materials, engineering and sundry construction.

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

CSG:rd

C.S. Grebski,
Bridge Design Engineer

Attach.

c.c. S. McCombie
A. Stermac
R. Forrest
E. Cross

NO COMMENTS
7/2/67

L.K.B.

Agp

Mr. C. S. Grebski,
Bridge Design Engineer,
Bridge Division,
Admin. Bldg.

Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

August 18, 1967

Northbound Basket Weave,
W.P. 266-66, Site No. 377-725,
Dundas Interchange, District 6.

66-F-123

We have reviewed the Preliminary Bridge
Plan Drawing D-6199-P1 for the above mentioned
structure.

We have no comments.

H. G. Selby

KGS/MieF

K. G. Selby,
SUPERVISING FOUNDATION ENGR.
For:
A. G. Stermac,
PRINCIPAL FOUNDATION ENGR.

cc: Messrs. S. McCombie
W. S. Melinyshyn
Foundations Files
Gen. Files

8. DUNDAS STREET OVERPASS AT EAST MALL - (VICKERS ROAD):

(W.P. 279-64-5)

8.2) Recommendations:

A three-span structure is proposed above the future East Mall (existing Vickers Rd.). The design grade of Dundas St. will be around el. 418 - 419 ft.; consequently, the finished grade of the East Mall is estimated to be around el. 400 ft., some 13 - 14 ft. deeper than the existing ground level.

The entire structure may be supported on spread footings at a minimum depth of four ft. below finished grade of the proposed East Mall. Up to 4 t.s.f. design load may be assumed on the footing bases.

Footings for spill-through type abutments may be placed higher, but not above el. 406 ft. at the east abutment and not above el. 407 ft. at the west. A safe pressure of 4 t.s.f. may also be utilized at or below the suggested elevations.

Dewatering problems may be experienced in the footing excavations within the sandy silt to silty sand stratum.

9. NORTHBOUND BASKET-WEAVE JUST SOUTH OF BLOOR STREET:

(W.P. 266-66)

9.1) Soil Conditions:

Boreholes drilled at the site of the structure were numbered 13 - 16, inclusive.

Below a 3 - 4 ft. thick clayey and sandy, slightly organic silt fill, the cohesive glacial till was encountered. The consistency of the 4 - 8 ft. clayey silt stratum improves with depth, being very stiff at the top and hard beneath. From el. 412 - 419 ft. a very dense sandy silt to silty sand with some clay and gravel was observed extending to el. 375 - 387 ft. The total thickness of the deposit is about 40 ft. B.H.'s #15 and 16 were terminated in a second layer of clayey silt with sand, having hard consistency and containing large size boulders.

cont'd. /9 ...

9. NORTHBOUND BASKET-WEAVE JUST SOUTH OF BLOOR STREET: (cont'd.) ...
(W.P. 266-66)

9.1) Soil Conditions: (cont'd.) ...

The groundwater level in the boreholes was established at el. 411 - 412 ft., within the granular sandy silt to silty sand deposit.

The locations and elevations of the boreholes and also the soil profile, are presented on Drawing #66-F-103D.

9.2) Recommendations:

The estimated design grade of TR. NB. Coll. - 27 NB. will roughly be at el. 409 ft.; the grade of the basket-weave bridge at el. 427 - 432.5 ft.

The structure may be supported on spread footings, placed some four ft. below finished grade of TR. NB. Coll. - 27 NB. At this elevation (approx. el. 405 ft.) a safe bearing pressure of up to 4 t.s.f. is suggested for design purposes.

Footings for spill-through type abutments may be placed on higher elevations. The base of the footing of the north abutment should not, however, be higher than el. 419 ft., using a design load of 4 t.s.f. Placing the footing of the south abutment between el. 416 ft. and 420 ft., a safe load of 3 t.s.f. may be utilized; below el. 416 ft., up to 4 t.s.f. is recommended.

A dewatering scheme might be necessary for the footing excavations within the silty sand deposit.

10. SOUTHBOUND BASKET-WEAVE JUST SOUTH OF BLOOR STREET:

(W.P. 267-66)

10.1) Soil Conditions:

Soil information at this location is based on four boreholes numbered 17, 18, 19 and 20.

cont'd. /10 ...

16. TEMPORARY GRADE SEPARATION: (cont'd.) ...

Bridge #9 (W.P. 279-64-6)

16.2) Recommendations:

A multispan structure is contemplated for this temporary crossing. The exact number of spans and the design grade of Hwy. #27 detours are not yet available; hence, general recommendations are given only.

Spread footings below el. 406 ft. appear to be the most economical for the structure, ensuring a cover of min. four ft. above the base of the footings. A safe bearing capacity of 4 t.s.f. may be used for design purposes. Perched abutments may be supported on steel tube or steel H-piles, driven to approx. el. 390 - 395 ft. 12-3/4" x 1/4" steel tubes, or 12 BP at 53 steel H-piles driven to the above elevation, should support safe loads of 60 T/pile.

In lowering the footing excavations below el. 400 - 404 ft. into the silty sand stratum, dewatering problems may arise.

17. WESTBOUND BASKETWEAVE BRIDGE:

W.P. 266-66

17.1) Soil Conditions:

The description of the soils is based upon two boreholes (#67 and #68) driven near the proposed piers, also three additional borings (#65, 66 and 69) lowered at the locations of the proposed retaining walls, adjacent to the bridge. Two distinct strata were recognized in the boreholes, the upper layer being identified as a clayey silt with sand and traces of gravel. The deposit has slight plasticity, with plasticity indices of 7 - 10%. The overall hard consistency is evident by the high values of penetration resistance. The 12 - 14 ft. thick upper layer is underlain by fine sands and silty sands of a very dense relative density. This

cont'd. /18 ...

17. WESTBOUND BASKETWEAVE BRIDGE: (cont'd.) ...

W.P. 266-66

17.1) Soil Conditions: (cont'd.) ...

generally non-plastic material was observed to the full depth of the exploration. The glacial origin of this stratum is emphasized by the non-uniform flat grain-size curves.

The groundwater table was established in the boreholes between 4.5 ft. - 14 ft. below general ground surface, corresponding to geodetic elevations of 404 - 413 ft.

The locations and elevations of the borings as well as the soil stratigraphy, are presented on Drawing #66-F-103L.

17.2) Recommendations:

The proposed bridge is assumed to be a three-span structure, and will carry the northbound collector road of Hwy. #27 over the two-lane transfer road. The finished design grade of the transfer road at the structure is going to be around el. 417.5 - 418.5 ft.

Spread footings are recommended for the abutments as well as for the piers. The elevations above which the base of the footings should not be placed, are listed below.

Footings of the -	Highest El. of Base of Footings (ft.)
South Abut.	412.0
South Pier	415.0
North Pier	417.0
North Abut.	420.0

cont'd. /19 ...

17. WESTBOUND BASKETWEAVE BRIDGE: (cont'd.) ...

W.P. 266-66

17.1) Recommendations: (cont'd.) ...

Regardless of the foregoing suggested elevations, a minimum of four ft. between finished grade and the bottom of footings, should be provided for frost protection. Safe pressures of 4 t.s.f. may be used on the footings for design purposes.

In the case of designing spill-through abutments, footings may be placed within the approach fills and supported on piles. It is assumed that safe loads of 70 Tons per pile may be achieved on 12-3/4" diam. steel tubes or 12 BP at 53 steel H-piles, driven to approx. el. 395 - 400 ft. at the south abutment and to approx. el. 410 - 415 ft. at the north.

No major dewatering problems are foreseen in the excavations within the upper clayey silt stratum, but within the lower sand and sandy silt deposit a dewatering scheme might be necessary.

18. MISCELLANEOUS:

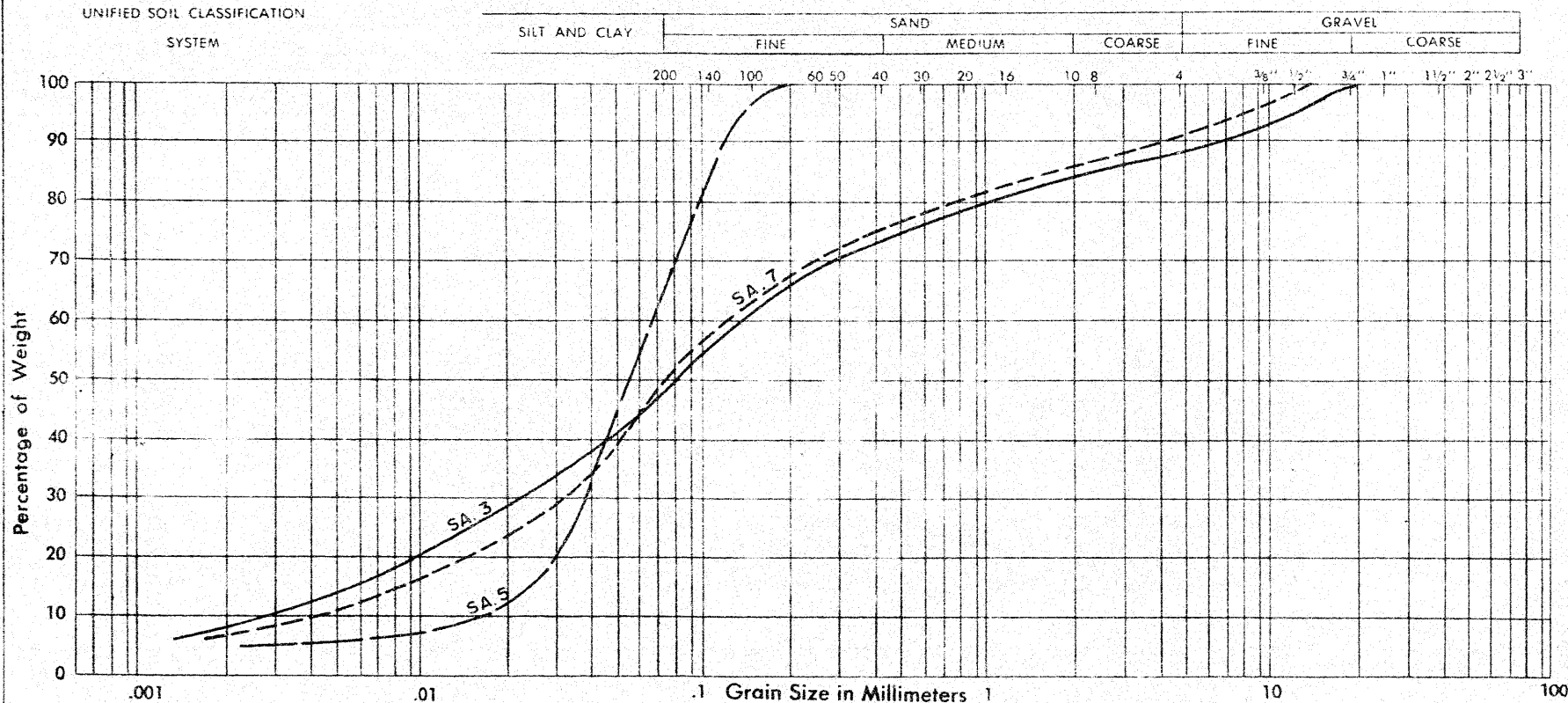
The recent field work during the period May 2 - 5, 1967, was supervised by Messrs. A. M. Seppala and A. Prakash, Project Foundation Engineers. Equipment used was owned and operated by Canadian Longyear Ltd., and Dominion Soil Investigation Ltd. of Toronto. This report was prepared by Mr. A. K. Barsvary, Senior Foundation Engineer, and reviewed by Mr. K. G. Selby, Supervising Foundation Engineer.

May 1967

DOMINION SOIL INVESTIGATION LIMITED

GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO. 6-12-13



PROJECT: W. J. 66-F-103
LOCATION: ETOBICOKE, ONTARIO

BOREHOLE NO.: 15
SAMPLE NO.: 3 5 7
DEPTH OF SAMPLE: 10' 20' 30'
ELEVATION OF SAMPLE: 417' 407' 397'

COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE Non Applicable

PLASTIC PROPERTIES:

LIQUID LIMITED % ==
PLASTIC LIMIT % == Non
PLASTICITY INDEX % == Plastic
MOISTURE CONTENT % ==
ACTIVITY ==

Classification of Sample and Group Symbol:

SAND and SILT with a trace of CLAY and GRAVEL	SANDY SILT with a trace of CLAY
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SA. 3 & 7 SM

SA. 5 SM

Enclosure No.

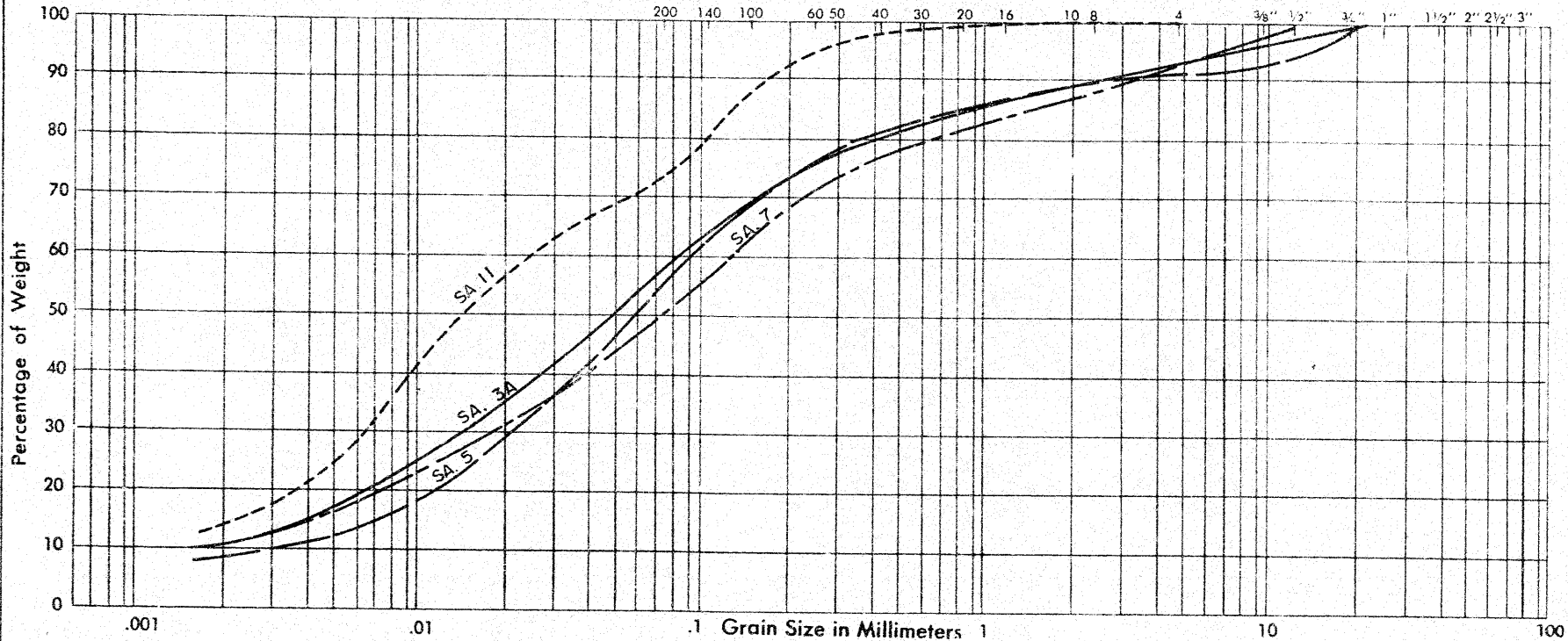
DOMINION SOIL INVESTIGATION LIMITED

GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO. 6 - 12 - 13

UNIFIED SOIL CLASSIFICATION
SYSTEM

SILT AND CLAY	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



PROJECT: W.J. 66 - F - 103

LOCATION: ETOBICOKE CREEK

BOREHOLE NO.: 1 6

SAMPLE NO.: 3A 5 7 11

DEPTH OF SAMPLE: 10' 15' 25' 45'

ELEVATION OF SAMPLE: 416.2' 411.2' 401.2' 381.2'

COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE

Non Applicable

Classification of Sample and Group Symbol:
SANDY SILT with some CLAY
and GRAVEL.

PLASTIC PROPERTIES:

LIQUID LIMIT	%	=	
PLASTIC LIMIT	%	=	Non
PLASTICITY INDEX	%	=	Plastic
MOISTURE CONTENT	%	=	
ACTIVITY	%	=	

SM - ML

Enclosure No.

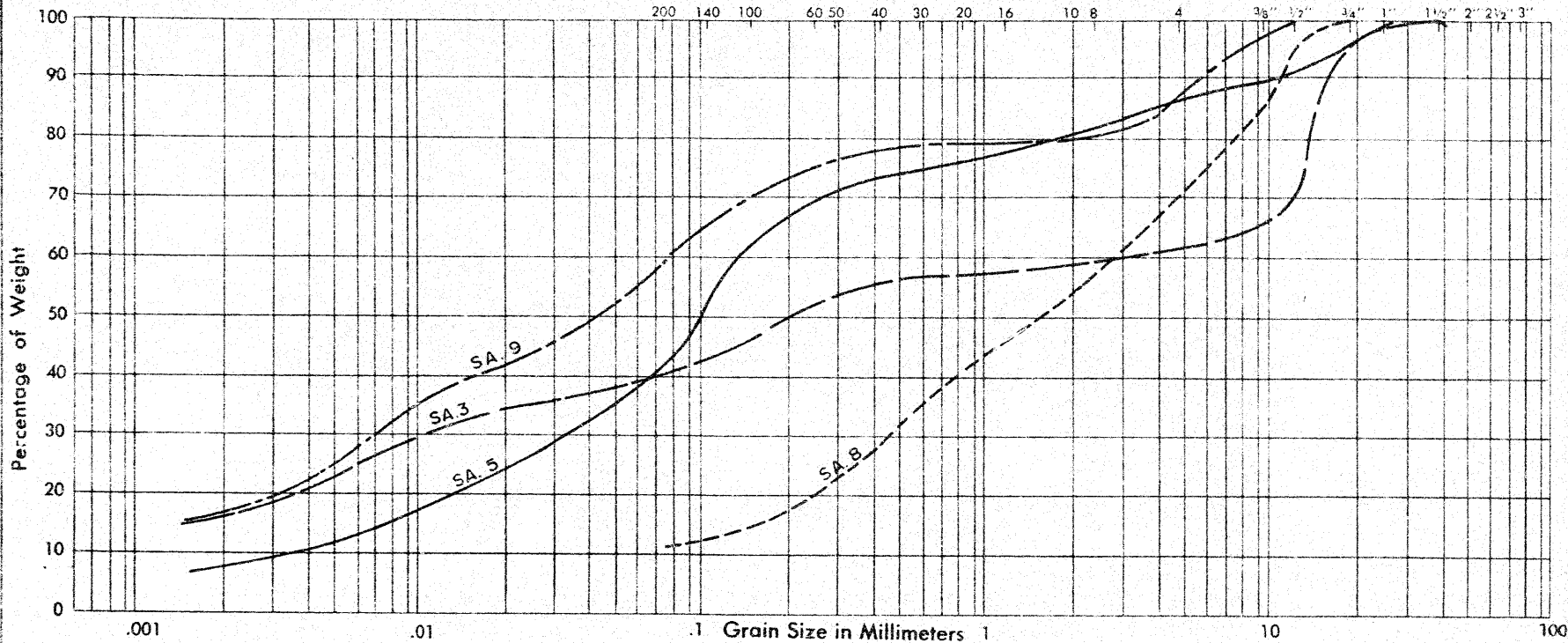
DOMINION SOIL INVESTIGATION LIMITED

GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO 6 - 12 - 13

UNIFIED SOIL CLASSIFICATION
SYSTEM

SILT AND CLAY	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



PROJECT: W.J. 66 - F - 103

LOCATION: ETOBICOKE, ONT.

BOREHOLE NO.: 17

SAMPLE NO.: 3 5 8 9

DEPTH OF SAMPLE: 10' 20' 35' 40'

ELEVATION OF SAMPLE: 417.0' 407.0' 392.0' 387.0'

SA. 8
COEFFICIENT OF UNIFORMITY 13.6
COEFFICIENT OF CURVATURE 1.0

PLASTIC PROPERTIES:

CL - ML

LIQUID LIMITED % = 25.1
PLASTIC LIMIT % = 19.7
PLASTICITY INDEX % = 5.4
MOISTURE CONTENT % = 15.4
ACTIVITY =

Classification of Sample and Group Symbol:

CLAYEY SILT with sand and gravel.	SILTY SAND with some gravel and a trace of clay.	GRAVELLY SAND with some silt.	WEATHERED SHALES
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SA.3 CL-ML SA.5 SM-GM SA.8 SW-GW SA.9

Enclosure No.

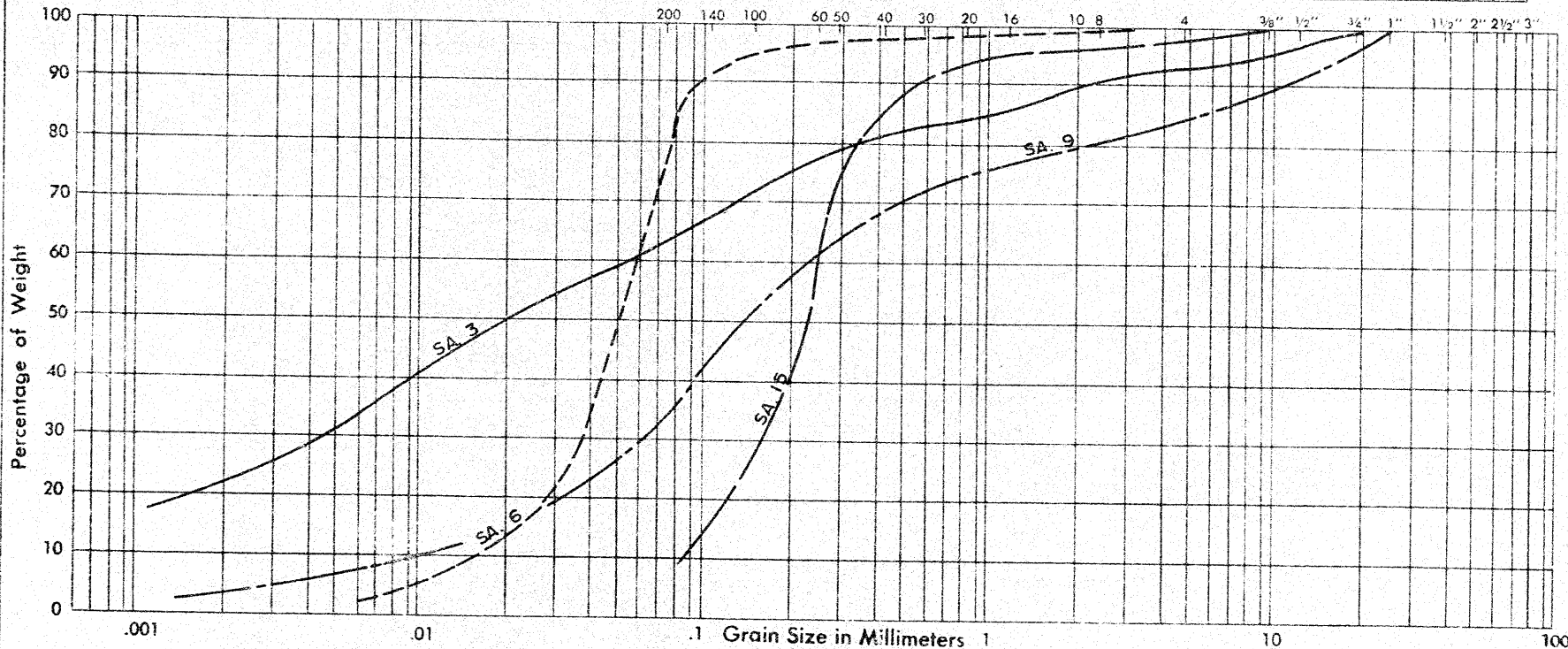
DOMINION SOIL INVESTIGATION LIMITED

GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO. 6-12-13

UNIFIED SOIL CLASSIFICATION
SYSTEM

SILT AND CLAY	SAND			GRAVEL	
	FINE	MEDIUM	COARSE	FINE	COARSE



PROJECT: W.J. 66-F-103

LOCATION: ETOBICOKE, ONT.

BOREHOLE NO.: 14

SAMPLE NO.: 3 5 6 9

DEPTH OF SAMPLE: 10' 20' 25' 40'

ELEVATION OF SAMPLE: 417.2' 407.2' 402.2' 387.2'

COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE

S A. 5
3
1.4

PLASTIC PROPERTIES:

CL

LIQUID LIMITED % = 29.0
PLASTIC LIMIT % = 17.3
PLASTICITY INDEX % = 11.7
MOISTURE CONTENT % = 13.7
ACTIVITY =

Classification of Sample and Group Symbol:

CLAYEY SILT with sand and trace of gravel.	SAND with trace of silt and gravel.	SANDY SILT	SILTY SAND with gravel and trace of clay.
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SA.3 CL SA.5 SP SA.6 ML SA.9 GM-SM

Enclosure No.

OUR REFERENCE NO. 6-12-13
Your Ref. No. W. J. 66-F-103

W. J. 66 - F - 103
CLIENT O. H. O.

PROJECT FROM N. OF C.P.R. O'HEAD TO N. OF BLOOR ST.

METHOD OF BORING. AUGERING

DIAMETER OF BOREHOLE 3 1/2"

LOCATION: 186,160 N; 206,910 E.

DATE. JAN. 17-18 1967.

DATUM ELEVATION: G. S. C.

W. P. 275 - 64 - 2

ENCLOSURE NO.

ELEVATION ft.	DEPTH ft.	STRATIFICATION DESCRIPTION	SYMBOL	SAMPLES	PENETRATION RESISTANCE blows per foot	CONSISTENCY water content % _w	REMARKS
				NUMBER TYPE ADVANCEMENT OF SAMPLER	20 40 60 80 100	W _p W W _L	
					SHEAR STRENGTH lbs./sq ft.	210 40 60 80	
425.4	0	GROUND SURFACE					
		SANDY SILT (FILL) Organic					
	3-7			1 SS 16			
420	5	CLAYEY SILT with sand V.Stiff Hard (Glacial Till)		2 SS 28			
419		Brown					
415	10			3 SS 96			
	-13						W.L. ELI. 412' JAN. 23, 1967
410	15	SILTY SAND with some clay and gravel. (Glacial Till)		4 SS 70/6"			
405	20	Very Dense Grey		5 SS 70/3"			10 51 32 7
400	25			6 SS 75/6"			
	27						
395	30	SANDY SILT with trace of gravel and clay (Glacial Till)		7 SS 70			
390	35	Very Dense		8 SS 80/6"			4 37 53 6
	40						
385	40			9 SS 80/4"			
	45						
380	46	SANDY GRAVEL with some silt and a trace of clay. (Glacial Till)		10 SS 90/6"			
	50	Very Dense					
375	50.3	END OF BOREHOLE		11 SS 100/4"			42 35 20 3
							GR. SA SI CL — per cent —

VERTICAL SCALE 1 IN TO 5 FT

DOMINION SOIL INVESTIGATION LIMITED

MADE V. G. H. CHD

GEOTECHNICAL DATA SHEET FOR BOREHOLE ... 14.

OUR REFERENCE NO. 6-12-13

Your Ref. No. W.J. 66-F-103

CLIENT: D. H. O.

PROJECT: FROM N. OF C.P.R. O'HEAD TO N. OF BLOOR ST.

LOCATION: 186,055 N.; 206,920 E.

DATUM ELEVATION: G. S. C.

METHOD OF BORING: AUGERING

DIAMETER OF BOREHOLE 3 1/2"

DATE JAN. 18-19, 1967

W.P. 275-64-2

ENCLOSURE NO.

ELEVATION ft.	DEPTH ft.	STRATIFICATION DESCRIPTION	STRATIFICATION SYMBOL	SAMPLES			PENETRATION RESISTANCE blows per foot					CONSISTENCY water content %				REMARKS
				NUMBER	TYPE	2-1/8 Advance of Sampler	2.0	4.0	6.0	8.0	10.0	W P	W	W L		
427.2	0	GROUND SURFACE														
425	4.0	Organic Silt FILL		1	S.S.	33										
420	5	CLAYEY SILT with sand V. Stiff and traces Hard of gravel. (Glacial Till) Brown		2	S.S.	24										
415	11.0	SANDY SILT (Glacial Till) Very Dense Grey		3	S.S.	90										
410	15			4	S.S.	75/6"										
405	19.0	SAND with trace of silt and gravel. Very Dense		5	S.S.	80/5"										
400	21.5	SANDY SILT (Glacial Till) Very Dense		6	S.S.	75/4"										
395	28.0	SILTY SAND with gravel and trace cobbles of clay. (Glacial Till) Very Dense		7	S.S.	80/4"										
390	35			8	S.S.	75/6"										
385	40			9	S.S.	90/3"										
380	45	Clayey Silt seam END OF BOREHOLE		10	S.S.	100/6"										

WL El. 412.6'
JAN. 20, 1967

GR SA SI CL

— per cent —

GEOTECHNICAL DATA SHEET FOR BOREHOLE .15..

OUR REFERENCE NO. 6 - 12 - 13
Your Ref. No. W.J. 66 - F - 103

CLIENT: D. H. O.

PROJECT: FROM N. OF C.P.R. O'HEAD TO N. OF BLOOR ST.

LOCATION: 185,905 N. ; 206,955 E.

DATUM ELEVATION: G. S. C.

METHOD OF BORING AUGERING

DIAMETER OF BOREHOLE 3 1/2"

DATE: JAN. 19, 1967

W.P. 275 - 64 - 2

ENCLOSURE NO.

ELEVATION ft.	DEPTH ft.	STRATIFICATION DESCRIPTION	STRATIFICATION SYMBOL	SAMPLES			PENETRATION RESISTANCE		CONSISTENCY		REMARKS
				NUMBER	TYPE	NO. of Advancement of Sampler	blows per foot	SHEAR STRENGTH lbs/sq ft	water content % WP W WL		
427.0	0	GROUND SURFACE									
425	15	CLAYEY SILT with sand and trace of gravel. V Stiff Hard (Weathered Till) Mottled Brown		1	S.S.	18					
420	8.0			2	S.S.	32					
415	10	SAND and SILT with some gravel and a trace of clay		3	S.S.	100/5					12 40 40 8
410	15	Boulders Brown Grey (Glacial Till) Very Dense		4	S.S.	100/4					W.L. El. 412.0' JAN. 20, 1967
405	20			5	S.S.	110					0 32 64 4
400	25	SANDY SILT with trace of clay and gravel (Glacial Till) Very Dense		6	S.S.	100/6					
395	30			7	S.S.	100/4					9 40 44 7
390	35			8	S.S.	100/4					
385	40	CLAYEY SILT with sand (Glacial Till) Hard Boulder		9	S.S.	100/2					
380	45.2	END OF BOREHOLE									
	50										GR SA SI CL — per cent —

VERTICAL SCALE: 1 IN TO 5 FT

DOMINION SOIL INVESTIGATION LIMITED

MADE D. A. M. CHD-1

GEOTECHNICAL DATA SHEET FOR BOREHOLE . . 16 . . .

OUR REFERENCE NO. 6-12-13
Your Ref. No. W. J. 66 - F-103

CLIENT: D. H. O.
PROJECT: FROM N. C.P.R. OVERHEAD TO N. OF BLOOR ST.
LOCATION: 185, 775 N.; 206, 935 E.
DATUM ELEVATION: G. S. C.

METHOD OF BORING: AUGERING
DIAMETER OF BOREHOLE: 3 1/2"
DATE: JAN. 16-17, 1967.
W. P. 275-64-2

ENCLOSURE NO.

ELEVATION ft.	DEPTH ft.	STRATIFICATION DESCRIPTION	STRATIFICATION SYMBOL	SAMPLES			PENETRATION RESISTANCE blows per foot				CONSISTENCY water content %				REMARKS
				NUMBER	TYPE	N- or Adjustment of Sampler	20	40	60	80	100	WP	W	WL	
426.2	0	GROUND SURFACE													
425		Clayey Silt FILL Firm													
422.7	3.5	CLAYEY SILT with sand and a trace of gravel. (Weathered Till) Hard, Brown		1	SS	8									
420	5			2	SS	31									
418.2	8.0	Brown Grey		3	SS	70/4"									
415	10			4	SS	60/3"									
410	15	SANDY SILT with some gravel and clay. (Glacial Till) Very Dense layered		5	SS	80/6"									
405	20			6	SS	70/6"									
400	25			7	SS	70/6"									
395	30			8	SS	100/5"									
390	35			9	SS	80/5"									
385	40			10	SS	90/5"									
380	45			11	SS	80/5"									
377.2	49.0	CLAYEY SILT with shale fragments (Glacial Till) Hard		12	SS	100/4"									
375	50.3	END OF BOREHOLE													

VERTICAL SCALE: 1 IN. TO 5 FT.

DOMINION SOIL INVESTIGATION LIMITED

MADE: V. G. H. CHD

DEPARTMENT OF HIGHWAYS - ONTARIO
MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 65

FOUNDATION SECTION

JOB 67-F-37 LOCATION Hwy. 27 & Dundas St. 184,885 N. 207,285 E. ORIGINATED BY AMS
W.P. 275-64-2 BORING DATE May 3, 1967 COMPILED BY AKB
DATUM Geodetic BOREHOLE TYPE Washboring, BX Casing CHECKED BY AKB

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS / FOOT		SHEAR STRENGTH P.S.F.		WP	W	WL		
18.2	GROUND LEVEL												
0.0	Clayey silt with sand & traces of gravel.												
	Hard.		1	SS	83								
						410							
			2	SS	66								
405.2													
13.0	Silty sand with gravel.												
401.7	Very dense.		3	SS	75/5"								
16.5	End of Borehole					400							

WL 6 4.5"
= 1.413.7

Dr. 20, Sa. 49
61.31, Cl. 0

DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 66

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 67-F-37

LOCATION Hwy. 27 & Dundas St., 184,870 N., 207,240 E.

ORIGINATED BY AMS

W. P. 275-64-2

BORING DATE May 3, 1967

COMPILED BY AMS

DATUM Geodetic

BOREHOLE TYPE Cont. Flight Auger

CHECKED BY

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT			LIQUID LIMIT ——— WL PLASTIC LIMIT ——— WP WATER CONTENT ——— W			BULK DENSITY P.C.F.	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	SHEAR STRENGTH P.S.F.			WATER CONTENT % 10 20 30				
418.6	GROUND LEVEL												
0.0	Clayey silt with sand & traces of gravel. Hard.		1	SS	47								
			2	SS	84								
405.6	Sandy silt with gravel.		3	SS	113								
13.0	Very Dense.		4	SS	125/8.5"								
397.1	End of Borehole												
21.5													

DEPARTMENT OF HIGHWAYS - ONTARIO

RECORD OF BOREHOLE NO. 67

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 66-F-103 LOCATION Hwy. 27 & Dundas St. 184,980 N. 207,203 E. ORIGINATED BY AMS
W.P. 275-64-2 BORING DATE May 2, 1967 COMPILED BY KAL
DATUM Geodetic BOREHOLE TYPE Flight Auger CHECKED BY KL

SOIL PROFILE			SAMPLES			ELEV. SCALE	DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL			BULK DENSITY	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	BLOWS / FOOT		BLOWS / FOOT	SHEAR STRENGTH P.S.F.	PLASTIC LIMIT — WP	WATER CONTENT — W	WATER CONTENT %		
422.9	GROUND LEVEL												
0.0	Clayey silt with sand & traces of gravel. Hard.		1	SS	47								
			2	SS	100/6"								
409.9						410							
13.0	Fine sand with traces of silt. Very dense.		3	SS	100/3"								
402.1			4	SS	100/3 1/2"								
20.8	End of Borehole					400							

DEPARTMENT OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

RECORD OF BOREHOLE NO. 68

FOUNDATION SECTION

JOB 66-F-103 LOCATION Hwy. 27 & Dundas St. 185,228 N. 207,141 E. ORIGINATED BY AMS
W.P. 275-64-2 BORING DATE May 2, 1967 COMPILED BY BG
DATUM Geodetic BOREHOLE TYPE Washboring BX Casing CHECKED BY SK

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE		LIQUID LIMIT — WL PLASTIC LIMIT — WP WATER CONTENT — W			SULK DENSITY P.C.F.	REMARKS	
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	BLOWS / FOOT	Wp	W	WL			
424.0													
0.0	Clayey silt with sand & traces of gravel. Hard.												
			1	SS	80								Gr. 5, Sa. 31 Si. 50, Cl. 14
			2	SS	50/2"								
410.0													
14.0	Fine sand with traces of silt. Very dense.												
			3	SS	100/8"								
			4	SS	75/4"								Gr. 1, Sa. 89 Si. 1, Cl. 10
498.8													
25.2	End of Borehole		5	SS	100/2"								

FOUNDATION SECTION

ORIGINATED BY AMS

COMPILED BY AMS

CHECKED BY *[Signature]*

SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE BLOWS / FOOT		LIQUID LIMIT ———— w_L PLASTIC LIMIT ———— w_p WATER CONTENT ———— w		BULK DENSITY ρ_c	REMARKS
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	BLOWS / FOOT	ELEV. SCALE	SHEAR STRENGTH P.S.F.		WATER CONTENT % 10 20 30		
426.6	GROUND LEVEL										
0.0	Clayey silt with sand and traces of gravel. Hard.		1	SS	58	420					
14.6			2	SS	100/4"						
12.0	Sandy silt with gravel. Very dense.		3	SS	100/2.5"	410					
405.1			4	SS	100/2"						
21.5	End of Borehole										

$w_L @ 15'$
 $= El. 411.6$
 $Gr. 4, Sa. 38$
 $61.57, Cl. 1$

MEMORANDUM

To: Mr. C. S. Grebski,
Bridge Design Engineer,
Bridge Division,
Admin. Bldg.

From: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Date: July 10, 1968

Our File Ref

In Reply To

SUBJECT:

Hwy. #27 and Dundas St. Interchange
and C.P.R. Overhead North of Q.E.W.
and Hwy. #27 Interchange.
W.J. 65-P-104 and W.J. 66-P-103,
District No. 6 (Toronto).

We have reviewed your designs for the proposed bridges of the above interchange and our comments pertaining to footings are as follows:

Bridge #1 and #2 (W.P. 279-64-1 and 279-64-4)

No comments.

Bridge #3 (W.P. 37-65)

No comments concerning spread footings beneath the piers. It is suggested, however, that - in view of recent experiences at the site of Hwy. #401 & #27 - pile lengths be provided for the abutments according to the Table below:

Location	No.	Piles Supplied	Type	Design Load
East Abutment	20	33 Ft.	12 BP @ 53	70 T/Pile
West Abutment	20	22 Ft.		

The above pile lengths include a one-ft. allowance for cutting off buckled ends.

Bridge #4 (W.P. 266-66)

No comments.

Bridge #5 (W.P. 267-66)

No comments.

W.P. 275-04-2
66-5-103
R. A. Storrado,
Principal Foundation Engineer,
Room 107, 400, Building.

Bridge Division,
Downsview, Ontario.

Attention: R. A. Selby

September 30, 1965.

Preliminary Foundation Investigation
for Bridge Structures on Highway #27
Between Q.E.W. and Lionview Side Rd.
S.P. 275-04-2 District # 6.

This is an extension of the preliminary foundation
investigation of the intersection of Q.E.W. and Highway 27
etc.

Confirming our telephone conversation with Mr. Selby of
September 30, this investigation should include 4 structures at
Highway 5 (Ludgas Street) and one each at Alder St.,
Brimant Crpe Road, and Pat Kurl Road.

It was agreed upon that the only available information at
this time, namely the Functional Planning Report, will be
sufficient for this preliminary investigation.

Krd/kp
c.c. R. McCabe
A. Forrest

C. J. Jones,
for J. J. Curtis,
Regional Bridge Location Engineer.

DEFECTIVE NEGATIVE OUT OF
CONDITION OF ORIGINAL DOCUMENT

FOUNDATION INVESTIGATION REPORT
For
The Proposed Dundas St. and Hwy. #27
Interchange and Bloor St. Underpass,
Hwy. #27 -- District #6 (Toronto)
W.J. 66-F-103 -- W.P. 275-64-2

1. INTRODUCTION:

A memo by the Regional Bridge Location Engineer, Mr. W. S. Melnyshyn, dated December 8, 1966, was received by this Section, requesting a foundation investigation at the site of the proposed Hwy. #27 and Dundas Street interchange and Bloor Street underpass.

The request calls for investigations at the site of seven structures, all of which are delineated in Contract #5, which in turn, is part of the several contracts covering the proposed improvement of Hwy. #27.

A limited scale field investigation, containing some 7 boreholes, was already carried out at the site by the Foundation Section in 1965, and some of these boreholes are also incorporated in this report. The recent field work as well as the laboratory testing and the compilation of the geotechnical data sheets, were performed by Dominion Soil Investigation Ltd.

Presented in this report are the results of this investigation, together with recommendations pertaining to the foundations of the structures.

In the first part of the report, a general description of the site and subsoil conditions are given; the second part deals with each individual structure separately, presenting a short description of the soils and detailed recommendations for the footings.

PART ONE

2. DESCRIPTION OF THE SITE:

Contract #5 covers the section of Hwy. #27 from north of the C.P.R. overhead to north of Bloor Street. The vicinity of the existing highway is generally flat, urban development with residential and light industrial buildings.

The area belongs to the "Iroquois Plain" physiographic region, formed by undulating till plains above the lowland, bordering Lake Ontario. This low-lying terrain was inundated by a body of water known as Lake Iroquois in late Pleistocene times. At this portion of the region, some alluvial terrace lands may be found behind huge baymouth bars.

3. FIELD AND LABORATORY INVESTIGATION PROCEDURE:

Thirty-seven boreholes, and adjacent to the holes, 37 cone penetration tests were carried out at the site of the seven proposed structures, during the recent field investigation.

The general layout of the site, showing the proposed structures, may be seen on attached Drawing #66-P-103A.

The borings were carried out by means of two conventional diamond core rigs adapted for soil sampling purposes, and two continuous flight augers. 2-in. O.D. split-spoon samplers were used to recover soil samples. The number of hammer blows necessary to advance the sampler one foot under an impact of 350 ft.-lbs. was recorded as the standard penetration 'N' value.

cont'd. /3 ...

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

Soil samples were visually examined and identified upon recovery and again in the laboratory. Laboratory tests of natural moisture content, Atterberg limits and grain-size distribution, were performed on representative soil specimens. The results of the laboratory and field tests are compiled on the geotechnical data sheets accompanying this report, together with the grain-size distribution curves.

4. GENERAL SOIL CONDITIONS:

The overburden within the entire area investigated was found to be a heterogeneous mixture of glacial till. Due to the nature of such glacial drifts, the classification of the various strata based on the individual samples, could sometimes be misleading. From the practical point of view, two main bodies of the glacial overburden may be differentiated. The coarse-grained portion was variously identified as silty sand to sandy silt, fine sand, silt, gravelly sand, etc. The fine-grained or cohesive portion is a clayey silt with some gravel and sand. At a few locations the uppermost ten-ft. zone exhibited firm to stiff consistency or loose to compact relative density. Otherwise, the deposit was found to be very dense or hard, corresponding to Standard Penetration 'N' values of much in excess of 100 blows/ft.

In order to ascertain the depth of the overburden, several boreholes were advanced into the bedrock. The bedrock was identified to be shale with intermittent limestone, the upper, approx. 3 - 10 ft. thickness of which was usually badly weathered. The surface of the weathered bedrock lies around el. 367 - 370 ft. The sound rock commences at el. 357 - 356 ft. Some 5 - 7 ft. depth of the sound rock was proved in a few locations by diamond drilling. The bedrock at the proposed crossing at Etobicoke Creek was observed to be somewhat lower.

cont'd. / 4 ...

PART TWO

5. GENERAL REMARKS ABOUT FOUNDATIONS:

5.1) Subsoil within the entire site investigated appears to exhibit sufficient strength for spread type foundations at relatively shallow depths. A four-ft. cover should be maintained above the base of the footings for frost protection.

5.2) Where perched abutments are supported on steel tube piles, it should be specified that no bouldery fill be placed at the locations of the footings. The working load on the piles must be checked during pile driving by means of the Hiley formula - (D.H.O. Standards DD 1218 and 1219).

5.3) Due to the high groundwater levels and the presence of the sandy silt to silty sand stratum, dewatering schemes for the footing excavations within this granular layer are likely to be necessary. Interlocking sheet piles, caissons, or well-point dewatering system, may be used. Sheet-piles or caissons should be lowered to a depth below the base of the excavation equal to the height of water above it, to prevent quick conditions of the soil.

5.4) No stability problems are foreseen for the approach fills and cuts with 2 horizontal to 1 vertical slopes.

6. HWY. #27 OVERPASS AT DUNDAS STREET:

(W.P. 279-64-1)

6.1) Soil Conditions:

Some 8 boreholes were drilled at the site of the proposed structure during the recent field investigation, and they were numbered from 25 to 32, inclusive. Two borings numbered 1 and 2, drilled in October 1965, are also incorporated in the stratigraphy. Predominantly silty sand to sandy silt with some gravel and clay material was recovered by the samples. The granular type glacial deposit exhibited very dense relative density in almost every

cont'd. /5...

TABLE OF CONTENTS

PART ONE

1. INTRODUCTION.
2. DESCRIPTION OF THE SITE.
3. FIELD AND LABORATORY INVESTIGATION PROCEDURE.
4. GENERAL SOIL CONDITIONS.

PART TWO

5. GENERAL REMARKS ABOUT FOUNDATIONS.
6. HWY. #27 OVERPASS AT DUNDAS STREET (W.P. 279-64-1).
- Soil Conditions and Recommendations -
7. DUNDAS STREET UNDERPASS AT WEST MALL (W.P. 279-64-2).
- Soil Conditions and Recommendations -
8. DUNDAS STREET OVERPASS AT EAST MALL (Vickers Rd.) (W.P. 279-64-5).
- Soil Conditions and Recommendations -
9. NORTHBOUND BASKET-WEAVE JUST SOUTH OF BLOOR ST. (W.P. 266-66).
- Soil Conditions and Recommendations -
10. SOUTHBOUND BASKET-WEAVE JUST SOUTH OF BLOOR ST. (W.P. 267-66).
- Soil Conditions and Recommendations -
11. HWY. #27 UNDERPASS AT BLOOR STREET (W.P. 37-65).
- Soil Conditions and Recommendations -
12. ETOBICOKE CREEK BRIDGE ON DUNDAS STREET (W.P. 277-66).
- Soil Conditions and Recommendations -

13. SUMMARY.

14. MISCELLANEOUS.

cc: GEN. FILE

23-6783

DEPARTMENT OF HIGHWAYS ONTARIO

MEMORANDUM

To: Mr. R. R. Davis,
Bridge Engineer,
Bridge Division,
Admin. Bldg.
Attention: Mr. S. McCombie

FROM: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

DATE: February 21, 1967

Our File Ref.

In Reply To:

FEB 28 1967

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For

The Proposed Dundas St. and Hwy. #27
Interchange and Bloor St. Underpass,
Hwy. #27 -- District #6 (Toronto)

W.J. 66-P-103 -- W.P. 375-442

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

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

ACS/KdeF

Attach.

cc: Messrs. S. R. Davis (2)
H. A. Tregaskes
D. M. Farren
G. K. Hunter (2)
P. Allen
W. S. Melinyshyn
T. J. Kovich
B. A. Singh

Foundations Files
Gen. Files

Alstermacy
A. G. Sternac
PRINCIPAL FOUNDATION ENGINEER

MEMORANDUM

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

From: Bridge Division,
Downsview, Ontario.

Date: November 24, 1966.

Our File Ref.

IN REPLY TO

Subject: W.P. 275-64-2, Contract #5,
Dundas and Hwy. #27 Interchange and Bloor St. Underpass,
District No. 6.

This will confirm my verbal request for foundation investigation to be carried out for the structures within the Dundas interchange and the Bloor St. Underpass as delineated in Contract #5.

I have approached the consultants for drawings (100' scale) of this interchange and have been promised them by 30th Nov. 1966. Three copies will be forwarded to you as soon as mark up is completed.

The contract schedule of November 16, 1966 calls for a foundation report by 1st March 1966. In view of the work already done here and the reasonable time available consideration should be given to completing an individual report for each structure prior to preliminary structure plans within a few days after 1st December, 1966 we can supply you with borehole locations for the proposed structures. I trust you will give this your consideration.

J. C. McAllister

JCMcA/im
cc. A. Crowley

J. C. McAllister,
for W. Melnyshyn,
Regional Bridge Location Engineer.

MEMORANDUM

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

FROM: Bridge Division,
Downsview, Ontario.

DATE: December 8th, 1966.

Our File Ref.

IN REPLY TO

SUBJECT: W.P. 275-64-2, Contract #5,
Dundas and Hwy. #27 Interchange
and Bloor Street Underpass,
Hwy. #27, District #6.

Attached are three prints of 100' schematic drawing of the proposed interchange at Dundas Street marked up to show the approximate location of bridge footings as promised in my memo of 24th November, 1966.

You will notice that the layout of the proposed structures differs somewhat from the structures indicated on Mr. Strain's program dated 16th, November 1966. Dundas Street at the west mall has been combined with S.B. ramp of Hwy. #27 under West Mall. (i.e. W.P. 279-64-2 and -3 are combined). Also a grade separation is now called for East of Hwy. #27 on Dundas Street as shown on the plan.

Mr. Strain will be revising his program in the near future. When it is available a copy will be forwarded to you.

The alignment for the widening or replacement is not yet decided. When it is, a layout will be forwarded to you for investigation.

JCM/cew
Attach.

J. C. McAllister
J. C. McAllister,
for W. S. Melnyshyn,
Regional Bridge Location Engineer.

Contract 5 (Dundas)

273-64-2	GDGB Pav.	From N. of C. P. R. O'Head to N. of Bloor St.
W. P. 270-64-1	Struct.	Hwy. 27 O'Pass at Dundas St.
W. P. 270-64-2	Struct.	Dundas St. U'Pass at West Mall and S. Bd. ramp at Highway 27
W. P. 270-64-5	Struct.	Dundas St. O'Pass at E. Mall.
W. P. 256-66	Struct.	N. Bd. Basketweave just S. of Bloor St.
W. P. 267-66	Struct.	S. Bd. Basketweave just S. of Bloor St.
W. P. 37-65	Struct.	Hwy. 27 U'Pass at Bloor St.
W. P. 277-66	Struct.	Replacing present Etobicoke Creek Bridge on Dundas Street just W. of Hwy. 27.

Program

Start Construction		Expend. 1968	2,500,000
Comp. Construction	Nov. 15/70	Expend. 1969	2,500,000
		Expend. 1970	1,500,000
		Total Value	\$ 6,500,000

Pre-Engineering Schedule

	Comp. Date
Planning	Comp.
Struct. Geometries	Feb. 15/67
Foundation Report	Mar. 1/67
Preliminary Property Request	Jan. 13/67
Soils Report	Feb. 15/67
Final Property Request	Apr. 12/67
Bridge-Comp. D4 & Plans	Sept. 13/67
Consultants - Comp. D4 & Plans	Oct. 25/67
Regional RDO	Dec. 6/67
Final Office RDO	Jan. 17/68
Property Acquired	Feb. 23/68
Advertise	Apr. 10/68
Bidder	May 23/68

MEMORANDUM

Mr. B. R. Davis,
Bridge Engineer,
Bridge Division,
Admin. Bldg.

FROM: Foundation Section,
Materials & Testing Div.,
Room 107, Lab. Bldg.

Attention: Mr. S. McCorbie

DATE: May 26, 1967

Our File No.

IN REPLY TO

MAY 31 1967

SUBJECT:

FOUNDATION INVESTIGATION REPORT
For

The Proposed Bridge #2, Bridge #9,
And W.B. Basketweave,
Hwy. #27 and Dundas St. Interchange,
District #6 (Toronto).

W.J. 66-F-103 -- W.P. 275-64-2

In a memo dated April 25, 1967, Mr. W. S. Melnychyn, Regional Bridge Location Engineer, requested foundation investigations at the sites of three bridges. These structures belong to the proposed Hwy. #27 and Dundas St. interchange, but were recently changed or added; consequently, they were not included in our original Foundation Report W.J. 66-F-103.

Supplementary field and laboratory investigations were therefore undertaken by this Section to enable us to give recommendations for the requested structure foundations.

Attached, we are forwarding to you, our foundation reports for the above bridges, namely: Bridge #2 (W.P. 279-64-1), Westbound Basketweave (W.P. 266-66), and Bridge #9 (W.P. 279-64-3). Please insert these pages and drawings into your copy(s) of the original report W.J. 66-F-103.

Your attention is called to the section entitled: "General Remarks about Foundations" - Part Two (2), page four (4) of the original report. Suggestions given under this heading are valid for the foundations of the bridges sent to you hereby.

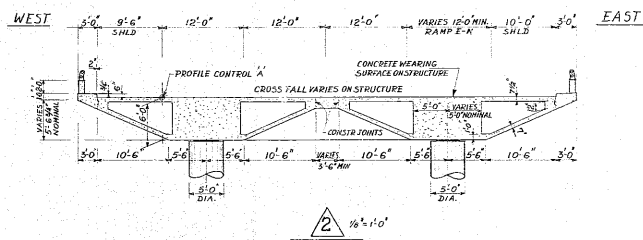
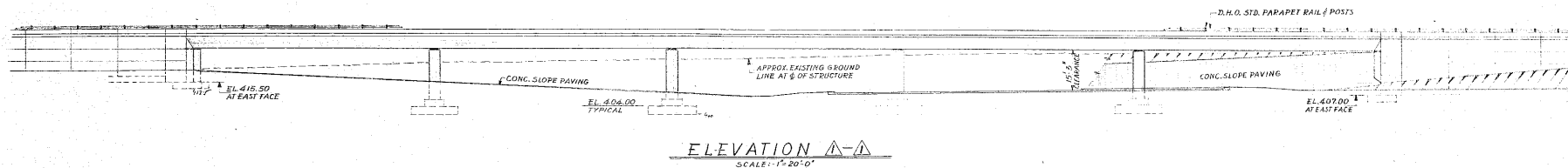
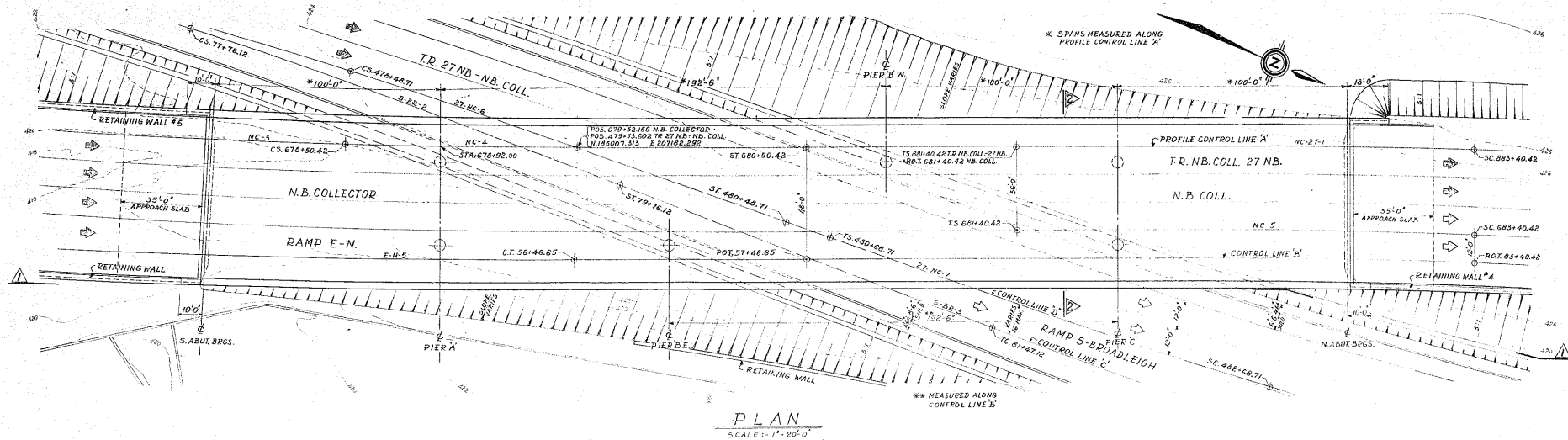
AGS/XdeF

Attach.

cc: Messrs. B. R. Davis (2)
H. A. Trageskes
D. W. Peirson
G. K. Hunter (2)
F. Allen
W. S. Melnychyn
T. J. Kovick
B. A. Singh

A. G. Sternac
PRINCIPAL FOUNDATION ENGINEER

Foundations Files
Gen. Files ✓



REVISIONS	DATE	BY	DESCRIPTION

DEPARTMENT OF HIGHWAYS ONTARIO BRIDGE DIVISION			
66-2-193			
BRIDGE #4 NORTHBOUND BASKET WEAVE			
KING'S HIGHWAY No. DUNDAS INTERCHANGE		DIST. No. 6	
CO. YORK			
TWP. ETOBICOKE			
PRELIMINARY PLAN			
APPROVED		SITE No. 577-725	
DESIGN		CONTRACT	
DRAWING			
DATE			

