

SUPPLEMENTARY  
FOUNDATION INVESTIGATION REPORT

For  
D.R.W. and Hwy. #22 Interchange,  
Twp. of Etobicoke, County of York,  
District #6 (Toronto).  
W.P. 275-64-1 and W.P. 275-64-4  
W.J. 65-P-104

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INTRODUCTION:

Since the original foundation investigation report for the above mentioned interchange was prepared, we have received the preliminary plans for the individual structures involved which show the exact locations of each. We have reviewed these plans with respect to the available soil information, and as a result of this review, we arranged for more borings to be carried out in the field to obtain additional information.

Field work, laboratory work, and the preparation of the Record of Borehole sheets, for the additional borings, were undertaken by Dominion Soil Investigation Ltd. at our request and according to a program decided upon by us.

The following pages contain a description of the subsurface conditions prevailing at each structure location, together with our final recommendations for the structure foundations.

This report was prepared by Mr. A. Sarvary, Senior Foundation Engineer, under the general supervision of Mr. K. G. Selby, Supervising Foundation Engineer.

cont'd. /2 ...



STRUCTURE #17 - W.P. 36-65-1 -

1. Soil Conditions:

A total of 10 boreholes and adjacent to the boreholes, 10 dynamic cone penetration tests, was carried out at the site of the proposed bridges. Boreholes #177, 178, 180, and 15, were placed at or near the future west abutments, whereas holes #176, 175, 174, 173, and 172, were lowered in the vicinity of the proposed east abutments.

The overburden at the site may be divided into three strata. A somewhat mixed fill consisting of sand, silty sand and clayey silt, forms the upper layer in most of the boreholes, having loose to compact relative density. Some organic matter was observed within the fill. At the northern portion of the area investigated, the fill material was not present.

A silty sand to fine sand deposit was encountered below the fill, and also right below ground level at the northern half of the area, extending down to el. 359 - 362 ft. Underlying the sand, a 5 - 10 ft. thick, hard and very dense glacial till was found. The heterogeneous stratum was identified to be sandy silt, silty sand and clayey silt, depending upon the grain-size distributions.

Shale bedrock with limestone bands was found around el. 352 - 355 ft. The upper 3 - 5 ft. depth of the rock was weathered to a considerable degree. The groundwater level was established around el. 361 - 363 ft.

The locations and elevations of the boreholes as well as the soil stratigraphy along the abutments, are shown on Drawing No. 65-F-104W.

2. Recommendations:

Bridge #17 consists of two structures, both being designed as single-span overpasses with closed type abutments. The grade elevation of the East Mall below the bridges will roughly, be 354 ft.

cont'd. /37...



STRUCTURE #17 - W.P. 36-65-1 - (cont'd.) ...

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

Soil conditions at the site were found to be favourable to support the structures on spread footings. It is assumed that by placing the footings at or below el. 350 ft., they will be on the weathered portion of the bedrock. The bearing capacity of the rock is estimated to be 10 t.s.f.; however, it is recommended that in encountering excessively weathered or disintegrated rock surface at the proposed footing depth, this should be excavated. In such a case, or in case of an uneven rock surface, provision should be made for placing mass concrete below the footings.

It is believed that no major dewatering scheme will be necessary for the excavations.



DEPARTMENT OF HIGHWAYS - ONTARIO

# RECORD OF BOREHOLE NO. 15

FOUNDATION SECTION

MATERIALS & TESTING DIVISION

JOB 65-F-104

LOCATION 178,926 N 210,305 E

ORIGINATED BY P.Mc

W P 275-64-1

BORING DATE Oct. 1, 1965.

COMPILED BY H.S.

DATUM G.S.C.

BOREHOLE TYPE Washboring - BX Casing.

CHECKED BY LL

| SOIL PROFILE  |   |             | SAMPLES |      |              | ELEV SCALE | DYNAMIC PENETRATION RESISTANCE<br>BLOWS / FOOT |    |    |     |     | LIQUID LIMIT — WL<br>PLASTIC LIMIT — WP<br>WATER CONTENT — W |   |    | BULK DENSITY<br>P.C.F. | REMARKS |
|---------------|---|-------------|---------|------|--------------|------------|--|----|----|-----|-----|--|---|----|------------------------|---------|
| ELEV<br>DEPTH | DESCRIPTION   | STRAT. PLOT | NUMBER  | TYPE | BLOWS / FOOT |            | 25   | 50 | 75 | 100 | 125 | WP   | W | WL |                        |         |
| 368.2         | Groundlevel   |             |         |      |              |            |  |    |    |     |     |  |   |    |                        |         |
| 0.4           | Topsoil   |             |         |      |              |            |  |    |    |     |     |  |   |    |                        |         |
|               | Silty Sand  |             | 1       | SS   | 27           |            |  |    |    |     |     |  |   |    |                        |         |
|               | Compact   |             |         |      |              |            |  |    |    |     |     |  |   |    |                        |         |
| 362.2         |   |             | 2       | SS   | 41           |            |  |    |    |     |     |  |   |    |                        |         |
| 6.0           |   |             |         |      |              |            |  |    |    |     |     |  |   |    |                        |         |
|               | Clayey silt with sand & gravel.<br>(Glacial Till)<br>Dense to v. dense<br>(with fragment of shale<br>below elev. 355.4) |             | 3       | SS   | 87           |            |  |    |    |     |     |  |   |    |                        |         |
|               |   |             | 4       | SS   | 50 for 4"    |            |  |    |    |     |     |  |   |    |                        |         |
|               |   |             | 5       | RC   | 100%         |            |  |    |    |     |     |  |   |    |                        |         |
| 352.2         |   |             |         |      |              |            |  |    |    |     |     |  |   |    |                        |         |
| 16.0          | Shaley limestone  |             | 6       | RC   | 96%          |            |  |    |    |     |     |  |   |    |                        |         |
|               |   |             |         |      |              |            |  |    |    |     |     |  |   |    |                        |         |
| 347.7         |   |             |         |      |              |            |  |    |    |     |     |  |   |    |                        |         |
| 20.5          | End of borehole.  |             |         |      |              |            |  |    |    |     |     |  |   |    |                        |         |

GWL  
7.1'



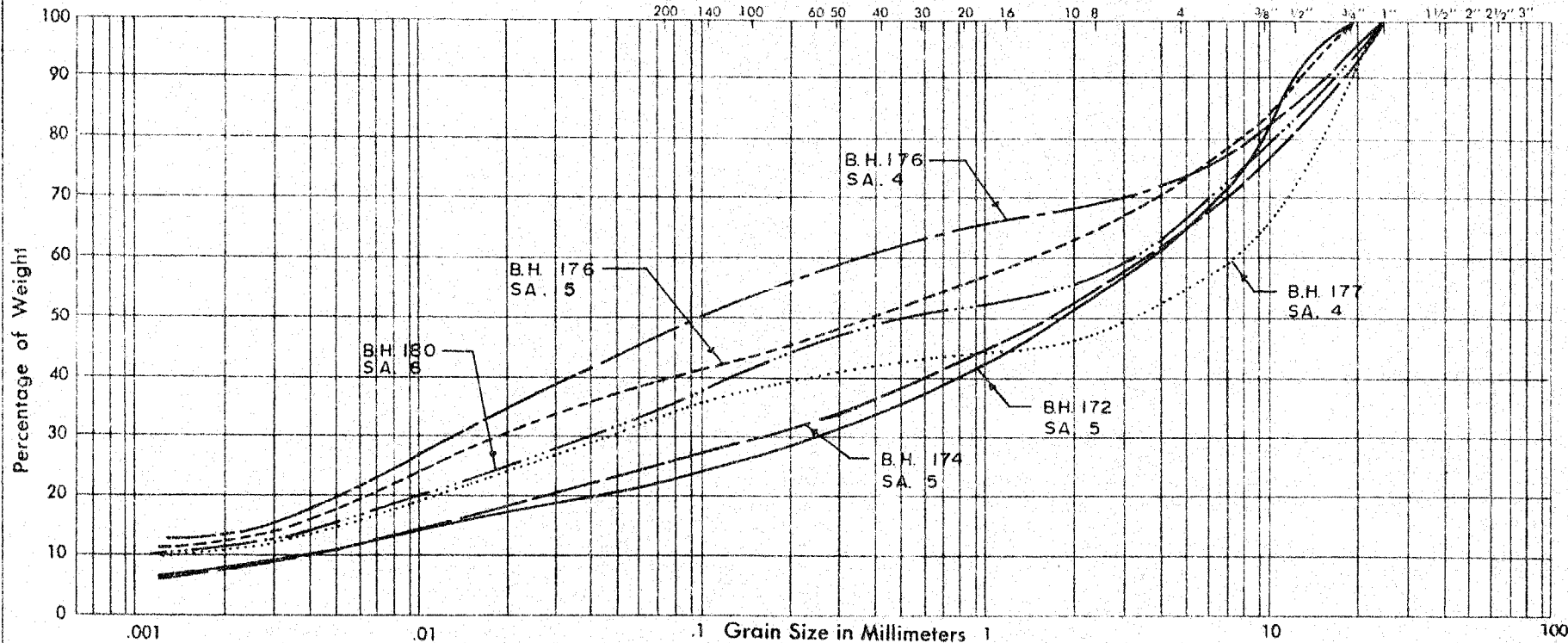
# DOMINION SOIL INVESTIGATION LIMITED

## GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO. 6-9-41  
Your Ref. No. W.P. 36-65-1

UNIFIED SOIL CLASSIFICATION  
SYSTEM

| SILT AND CLAY | SAND |        |        | GRAVEL |        |
|---------------|------|--------|--------|--------|--------|
|               | FINE | MEDIUM | COARSE | FINE   | COARSE |



PROJECT: Q.E.W. & HWY. No 27 INTERCHANGE  
LOCATION: BRIDGE No 17  
BOREHOLE NO.: 172, 174, 176, 176, 177, 180  
SAMPLE NO.: 5, 5, 4, 5, 4, 6  
DEPTH OF SAMPLE:  
ELEVATION OF SAMPLE:

COEFFICIENT OF UNIFORMITY  
COEFFICIENT OF CURVATURE

**Classification of Sample and Group Symbol:**  
SAND and SILT  
with some gravel and clay

PLASTIC PROPERTIES:

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

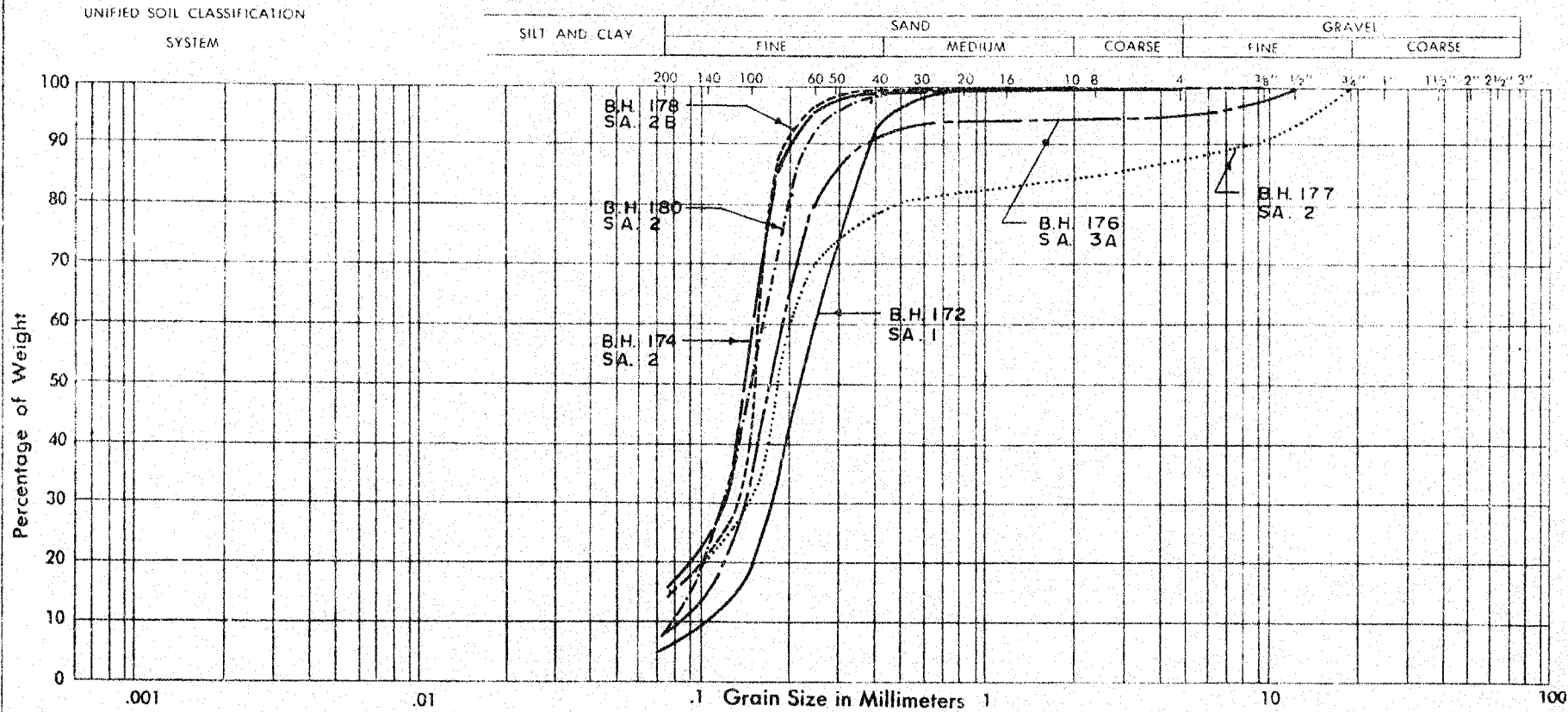
Enclosure No.



# DOMINION SOIL INVESTIGATION LIMITED

## GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO. 6-9-41  
Your Ref. No. W.P. 36-65-1



PROJECT: Q.E.W. & HWY. No 27 INTERCHANGE

LOCATION: BRIDGE No 17

BOREHOLE NO.: 172, 174, 176, 177, 178, 180

SAMPLE NO.: 1, 2, 3A, 2, 2B, 2

DEPTH OF SAMPLE:

ELEVATION OF SAMPLE:

COEFFICIENT OF UNIFORMITY

COEFFICIENT OF CURVATURE

**Classification of Sample and Group Symbol:**

FINE SAND

with some silt

PLASTIC PROPERTIES:

LIQUID LIMIT % =

PLASTIC LIMIT % =

PLASTICITY INDEX % =

MOISTURE CONTENT % =

ACTIVITY =

Enclosure No.

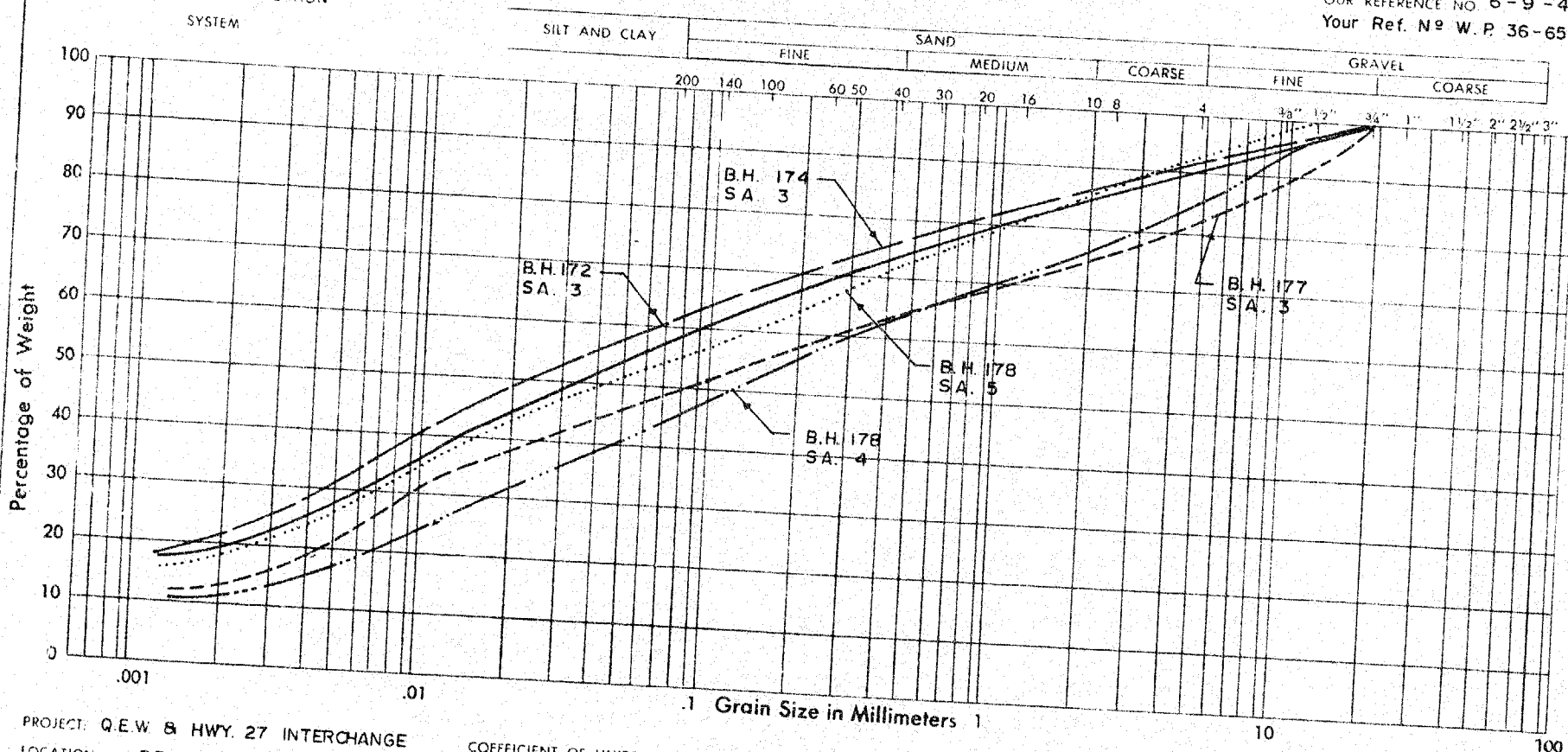


# DOMINION SOIL INVESTIGATION LIMITED

## GRAIN SIZE DISTRIBUTION

UNIFIED SOIL CLASSIFICATION  
SYSTEM

OUR REFERENCE NO 6-9-41  
Your Ref. No W.P. 36-65-1



PROJECT: Q.E.W. & HWY. 27 INTERCHANGE  
LOCATION: BRIDGE No 17  
BOREHOLE NO.: 172, 174, 177, 178, 178  
SAMPLE NO.: 3, 3, 3, 4, 5

COEFFICIENT OF UNIFORMITY  
COEFFICIENT OF CURVATURE

**Classification of Sample and Group Symbol:**  
CLAYEY SILT  
with some sand and gravel

PLASTIC PROPERTIES:

|                  |   |   |
|------------------|---|---|
| LIQUID LIMIT     | % | = |
| PLASTIC LIMIT    | % | = |
| PLASTICITY INDEX | % | = |
| MOISTURE CONTENT | % | = |
| ACTIVITY         | % | = |

Enclosure No.



# DOMINION SOIL INVESTIGATION LIMITED

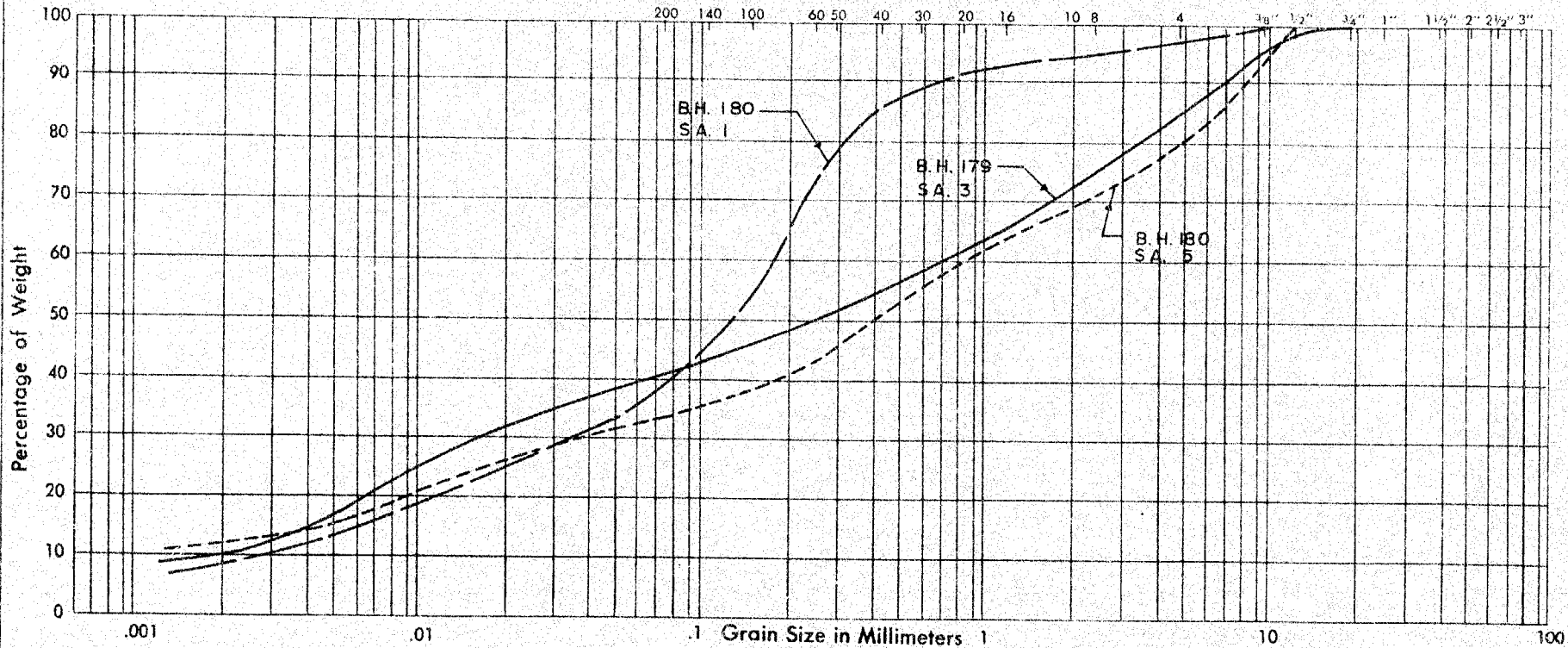
## GRAIN SIZE DISTRIBUTION

OUR REFERENCE NO. 6 - 9 - 41

Your Ref. No. W.P. 36-65-1

UNIFIED SOIL CLASSIFICATION  
SYSTEM

| SILT AND CLAY | SAND |        |        | GRAVEL |        |
|---------------|------|--------|--------|--------|--------|
|               | FINE | MEDIUM | COARSE | FINE   | COARSE |



PROJECT: Q.E.W. & HWY. 27 INTERCHANGE

LOCATION: BRIDGE No 17

BOREHOLE NO.: 179, 180, 190

SAMPLE NO.: 3, 1, 5

DEPTH OF SAMPLE:

ELEVATION OF SAMPLE:

COEFFICIENT OF UNIFORMITY

COEFFICIENT OF CURVATURE

PLASTIC PROPERTIES:

LIQUID LIMIT % =

PLASTIC LIMIT % =

PLASTICITY INDEX % =

MOISTURE CONTENT % =

ACTIVITY =

**Classification of Sample and Group Symbol:**

SAND and SILT  
with some gravel and clay

Enclosure No.



Mr. B. A. Davis,  
Bridge Engineer,  
Bridge Division.

Attention: Mr. A. McComb

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

January 24, 1967

A.E.C. & Exp. 227 Interchange  
Test Pits at Sites of Bridges #17 & 23  
S.J. 65-P-104 - S.R. 36-66-1, S.R. 32-66  
District No. 6 (Toronto)

Two test pits were recently dug at the locations of S.R. #17 and S.R. #23 of the above project. The purpose of the pits was to examine more closely than was possible during the foundation investigation, the nature of the glacial till overburden which immediately overlies the shale and limestone bedrock.

The pits were inspected on January 17 and 18, 1967, together with an open sewer trench on Contract No. 66-237, at which location weathered shale bedrock extended from the ground surface for some 6 to 8 feet down to the sound bedrock.

The two test pits confirmed the original findings of the foundation investigation.

A description of the weathered rock in the sewer trench and of the glacial till overburden in the test pits, has been made by Mr. A. Singh, Materials & Testing Geologist and, for your information, is attached to this memo.

*H. L. Sully*

ICM/ def  
attach.

cc: Messrs. B. A. Davis (2)  
E. A. Ferguson  
D. A. Warren  
C. A. Hunter (2)  
F. Allen  
A. B. Kellyshya  
T. J. Lovich  
K. A. Singh  
A. Dutka

Foundations Files -  
Gen. Files

A. G. Selby,  
SUPERVISING FOUNDATION ENGR.  
Per:  
A. G. Stenson,  
SENIOR FOUNDATION ENGR.



MINISTRY OF HIGHWAYS - ONTARIO

MATERIALS & TESTING DIVISION

# RECORD OF BOREHOLE NO. 16

FOUNDATION SECTION

JOB 65-F-104

LOCATION 478,674 N 210,466 E

ORIGINATED BY P.Me

W.P. 275-64-1

BORING DA Oct. 20, 1965.

COMPILED BY H.S.

DATUM G.S.C.

BOREHOLE TYPE Washboring - NX Casing.

CHECKED BY *LL*

| SOIL PROFILE |  | SAMPLES    |        |      | ELEV. SCALE | DYNAMIC PENETRATION RESISTANCE |    |    |    |     | LIQUID LIMIT — W <sub>L</sub> |                                |                                 | BULK DENSITY | REMARKS |
|--------------|--|------------|--------|------|-------------|--------------------------------|----|----|----|-----|-------------------------------|--------------------------------|---------------------------------|--------------|---------|
| ELEV. DEPTH  | DESCRIPTION  | STRAT. PLT | NUMBER | TYPE |             | BLOWS / FOOT                   | 25 | 50 | 75 | 100 | 125                           | WATER CONTENT — W <sub>p</sub> | W <sub>p</sub> — W <sub>L</sub> |              |         |
| 57.5         | Ground level                                       |            |        |      |             |                                |    |    |    |     |                               |                                |                                 |              |         |
| 0.6          |  |            |        |      |             |                                |    |    |    |     |                               |                                |                                 |              |         |
| 62.5         | Silty Sand   |            | 1      | SS   | 6           |                                |    |    |    |     |                               |                                |                                 |              |         |
| 8.0          | Loose to v. dense.                                 |            | 2      | SS   | 57          | 360                            |    |    |    |     |                               |                                |                                 |              |         |
| 98.0         |  |            | 3A     |      |             |                                |    |    |    |     |                               |                                |                                 |              |         |
| 9.5          | Clayey silt with some sand & gravel (Glacial Till) |            | 3B     | SS   | 139         |                                |    |    |    |     |                               |                                |                                 |              |         |
|              | Very dense   |            | 4      | SS   | 93          |                                |    |    |    |     |                               |                                |                                 |              |         |
|              |  |            | 5      | RC   | 586         |                                |    |    |    |     |                               |                                |                                 |              |         |
|              |  |            | 6      | ES   | 892         |                                |    |    |    |     |                               |                                |                                 |              |         |
| 128.0        |  |            |        |      |             | 350                            |    |    |    |     |                               |                                |                                 |              |         |
| 17.5         | Shaly limestone.                                   |            | 7      | RC   | 642         |                                |    |    |    |     |                               |                                |                                 |              |         |
|              |  |            | 8      | RC   | 512         |                                |    |    |    |     |                               |                                |                                 |              |         |
| 23.0         |  |            |        |      |             |                                |    |    |    |     |                               |                                |                                 |              |         |
| 24.5         | End of borehole.                                   |            |        |      |             | 340                            |    |    |    |     |                               |                                |                                 |              |         |

CWL  
4.4'  
1-46Sa79%  
3411301 3%



MEMORANDUM

To: Mr. B. B. Davis,  
Bridge Engineer,  
Bridge Division.

Attention: Mr. S. McCombie

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

DATE: November 29, 1966

OUR FILE REF.

IN REPLY TO:

SUBJECT:

FOUNDATION INVESTIGATION REPORT  
For

Q.E.W. and Hwy. #27 Interchange,  
Twp. of Etobicoke, County of York,  
District #6 (Toronto)  
W.J. 65-F-104 -- W.P. 275-64-1

Enclosed please find the results of our final  
foundation investigation for Structure No. 17.

Please attach these to your copy(s) of Foundation  
Report #65-F-104.

AGS/MdeF  
Attach.

cc: Messrs. B. R. Davis (2)  
H. A. Tregaskes  
D. W. Farren  
C. K. Hunter (2)  
F. Allen  
T. J. Kovich  
W. S. Melinyshyn  
A. Watt

*A. G. Stermac*  
A. G. Stermac,  
PRINCIPAL FOUNDATION ENGINEER

Foundations Office  
Gen. Files



DOMINION SOIL INVESTIGATION LIMITED  
77 CROCKFORD BOULEVARD - SCARBOROUGH ONTARIO CANADA - TELEPHONE 751-6565

BRANCH  
69 QUEENS AVENUE  
LONDON, ONTARIO  
TELEPHONE GE. 3-3851



FOUNDATION ENGINEERS

ASSOCIATED COMPANY  
SOIL TESTING AND ENGINEERING LTD.  
34 BRIGHTFORD ROAD,  
KINGSTON 5, JAMAICA, WEST INDIES  
TELEPHONE: 68866

Our Ref. No: 6-9-41  
Your Ref: W.P. 36-65-1

Mr. A.G. Stermac,  
Principal Foundation Engineer,  
Materials and Testing Division,  
Department of Highways,  
Downsview Avenue,  
Downsview, Ontario.

Attention: Mr. K. Selby, P.Eng.

Re: Soil Investigation for Proposed Q.E.W. and  
Hwy. # 27 Interchange. Bridge No. 17

Dear Sirs,

We have pleasure in enclosing eleven (11) copies of the records of boreholes No. 172 to 180 inclusive, together with the laboratory test results performed in connection with the subject project.

We believe that the factual information contained on the borehole logs is sufficient for your requirements. Should you have any queries, however, please contact the undersigned.

Yours very truly,

DOMINION SOIL INVESTIGATION LIMITED

I.P. Lieszkowszky, P.Eng.,  
Chief Engineer.

IPL/me  
Enclosures.



## MEMORANDUM

To: Mr. M. DeVata,  
Sr. Foundation Engineer,  
Room 107, Lab. Building.

FROM: Bridge Division,  
Downsview, Ontario

DATE: September 26, 1966

OUR FILE REF.

IN REPLY TO

SUBJECT: W.P. 36-65-1, Site No. 37-723,  
Bridge No. 17, East Mall Overpass,  
Q.E.W. District 6

This is to confirm our telephone conversation of this date. We would suggest the boring of 10 test holes, starting on the north side of the structure, 5 equally spaced holes at the east abutment and 5 equally spaced holes at the west abutment, the last holes to be at the south-end of the structure.



W. S. Melinyshyn,  
Regional Bridge Location Engineer

RNC/pr

Ken,

Dominion Soil will be doing this. Howe Reed has the preliminary  
Draw for Bridge #17. you have to organize some one to write the  
report. This is for your information.

Murty  
27th Sept/66.



OUR REFERENCE NO. 6-9-41

METHOD OF BORING      WASH BORING

ENCLOSURE NO

DATE: OCT 18, 1966

W.P. 36-65-1

| ELEVATION<br>ft. | DEPTH<br>ft. | STRATIFICATION<br>DESCRIPTION | STRATIFICATION<br>SYMBOL | SAMPLES |      | PENETRATION RESISTANCE<br>blows per foot |    |    |    |     | CONSISTENCY<br>water content % |   | REMARKS |
|------------------|--------------|-------------------------------|--------------------------|---------|------|--|----|----|----|-----|--------------------------------|---|---------|
|                  |              |                               |                          | NUMBER  | TYPE | 20                                       | 40 | 60 | 80 | 100 | PL                             | W |         |
|                  |              |                               |                          |         |      | SHEAR STRENGTH<br>lbs/sq ft              |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
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|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
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|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
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|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
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|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
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|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
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|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  |    |    |    |     |                                |   |         |
|                  |              |                               |                          |         |      |  | </ |    |    |     |                                |   |         |



OUR REFERENCE NO. 6 - 9 - 41

## GEOTECHNICAL DATA SHEET FOR BOREHOLE . 173 .

CLIENT: D. H. O.

PROJECT: Q.E.W. &amp; HWY. No 27 INTERCHANGE - BRIDGE 17

METHOD OF BORING: WASHBORING

ENCLOSURE NO

LOCATION: 178, 828 N., 210, 445 E.

DIAMETER OF BOREHOLE: 2 3/8 "

DATE: OCT. 17, 1966

DATUM ELEVATION: G.S.C.

W.P. 36 - 65 - 1

| ELEVATION<br>ft. | DEPTH<br>ft. | STRATIFICATION<br>DESCRIPTION   | STRATIFICATION<br>SYMBOL | SAMPLES |      |                                      | PENETRATION RESISTANCE<br>blows per foot |     |     |     |      | CONSISTENCY<br>water content % |    | REMARKS |
|------------------|--------------|---|--------------------------|---------|------|--------------------------------------|--|-----|-----|-----|------|--------------------------------|----|---------|
|                  |              |   |                          | NUMBER  | TYPE | N<br>or<br>Advancement<br>of Sampler | 2.0                                      | 4.0 | 6.0 | 8.0 | 10.0 | PL                             | LI |         |
| 366.9            | 0            | GROUND SURFACE  |                          |         |      |                                      |  |     |     |     |      |                                |    |         |
| 365.0            |              | 4" TOPSOIL<br>Compact<br>FINE SAND<br>with some silt  |                          | 1       | S.S. | 15                                   |  |     |     |     |      |                                |    |         |
| 360.6            | 6.3          | Brown<br>Grey (wet)   |                          | 2       | S.S. | 27                                   |  |     |     |     |      |                                |    |         |
| 360.0            |              | Very Hard<br>Grey<br>CLAYEY SILT<br>with a trace of<br>gravel and some<br>random oriented<br>shale fragments. |                          | 3       | S.S. | 78                                   |  |     |     |     |      |                                |    |         |
| 355.0            | 10           |   |                          | 4       | S.S. | 81                                   |  |     |     |     |      |                                |    |         |
| 353.5            | 13.4         |   |                          | 5       | S.S. | 92                                   |  |     |     |     |      |                                |    |         |
| 350.0            | 15           | Grey<br>SHALE<br>BED ROCK   |                          | 6       | S.S. | 100/4"                               |  |     |     |     |      |                                |    |         |
|                  |              |   |                          | 7       | S.S. | 100/2"                               |  |     |     |     |      |                                |    |         |
|                  |              |   |                          | 8       | S.S. | 100/2"                               |  |     |     |     |      |                                |    |         |
| 347.0            | 20           | weathered<br>sound  |                          | 9       | S.S. | 100/4"                               |  |     |     |     |      |                                |    |         |
| 345.0            |              |   |                          | 10      | R.C. | 73.5%                                |  |     |     |     |      |                                |    |         |
| 342.0            | 25           |   |                          |         |      |                                      |  |     |     |     |      |                                |    |         |
| 340.0            |              | END OF BOREHOLE   |                          |         |      |                                      |  |     |     |     |      |                                |    |         |

W.L. El. 361.4'  
Oct. 19, 1966



OUR REFERENCE NO. 6 - 9 - 41

PROJECT: Q.E.W. & HWY. NO 27 INTERCHANGE - BRIDGE NO 17

LOCATION. 178,754 N., 210,495 E.

DATUM ELEVATION: G. S. C.

METHOD OF BORING      WASH BORING

DIAMETER OF BOREHOLE: 2  $\frac{3}{8}$  "

DATE: OCT. 14, 1966

W P 36-65-1

ENCLOSURE NO

| ELEVATION<br>ft. | DEPTH<br>ft. | STRATIFICATION<br>DESCRIPTION                                | STRATIFICATION<br>SYMBOL | SAMPLES |      |  | PENETRATION RESISTANCE<br>blows per foot |                           | CONSISTENCY<br>water content % |             | REMARKS   |
|------------------|--------------|--|--------------------------|---------|------|--|--|---------------------------|--------------------------------|-------------|---|
|                  |              |  |                          | NUMBER  | TYPE | N or<br>Advance-<br>ment of<br>Sampler | 2.0 4.0 6.0 8.0 10.0                     | SHEAR STRENGTH lbs./sq ft | PL W LI                        | 10 20 30 40 |   |
| 367.5            | 0            | GROUND SURFACE   |                          |         |      |  |  |                           |                                |             |   |
| 365.0            |              | Compact, Brown SAND<br>with some gravel<br>(FILL)            |                          | 1       | C.S. |  |  |                           |                                |             |   |
| 362.7            | 4.8          | Dense, Brown FINE SAND<br>with some silt                     |                          | 2       | S.S. | 54                                     |  |                           |                                |             | Sa. 84% ; Si.-Cl. 16%<br>C.I. El. 362.0'<br>Oct. 19, 1966 |
| 360.4            | 7.1          | Very Hard Grey CLAYEY SILT<br>with some sand and gravel.     |                          | 3       | S.S. | 72                                     |  |                           |                                |             | Gr. 8% ; Sa. 31%<br>Si. 40% ; Cl. 21%                     |
| 360.0            | 10           | numerous random oriented shale fragments below elev. 356 ft. |                          | 4A      | S.S. | 95                                     |  |                           |                                |             |   |
| 355.0            |              |  |                          | B       |      |  |  |                           |                                |             |   |
| 353.5            | 14.0         | Grey SHALE BEDROCK<br>(weathered)                            |                          | 5       | S.S. | 106                                    |  |                           |                                |             | Gr. 36% ; Sa. 38%<br>Si. 18% ; Cl. 8%                     |
| 350.0            | 15           |  |                          | 6       | S.S. | 125/6                                  |  |                           |                                |             |   |
|                  |              |  |                          | 7       | R.C. | 55%                                    |  |                           |                                |             |   |
| 347.0            | 20           |  |                          |         |      |  |  |                           |                                |             |   |
| 345.0            | 20.5         | END OF BOREHOLE  |                          | 8       | R.C. |  |  |                           |                                |             |   |



# GEOTECHNICAL DATA SHEET FOR BOREHOLE . 175 .

OUR REFERENCE NO. 6-9-41

CLIENT: D.H.O.

PROJECT: Q.E.W. & HWY. No 27 INTERCHANGE - BRIDGE No 17

LOCATION: 178,690 N., 210,538 E.

DATUM ELEVATION: G. S. C.

METHOD OF BORING: WASH BORING

DIAMETER OF BOREHOLE: 2 3/8"

DATE: OCT. 7, 1966

ENCLOSURE NO.

W.P. 36-65-1

| ELEVATION<br>ft. | DEPTH<br>ft. | STRATIFICATION<br>DESCRIPTION                     | STRATIFICATION<br>SYMBOL | SAMPLES |      |                                       | PENETRATION RESISTANCE |     |           |     | CONSISTENCY     |         | REMARKS |
|------------------|--------------|---|--------------------------|---------|------|---------------------------------------|------------------------|-----|-----------|-----|-----------------|---------|---------|
|                  |              |   |                          | NUMBER  | TYPE | N-<br>or<br>Advancement<br>of Sampler | blows per foot         |     |           |     | water content % |         |         |
|                  |              |   |                          |         |      |                                       | 2.0                    | 4.0 | 6.0       | 8.0 | 100             | PL W LI |         |
|                  |              |   |                          |         |      |                                       | SHEAR STRENGTH         |     | lbs/sq ft |     |                 |         |         |
| 367.1            | 0            | GROUND SURFACE                                    |                          |         |      |                                       |                        |     |           |     |                 |         |         |
| 365.0            | 2.0          | SANDY TOPSOIL                                     |                          |         |      |                                       |                        |     |           |     |                 |         |         |
|                  |              | Compact, Brown SAND and SILT (FILL)               |                          | 1       | C.S. |                                       |                        |     |           |     |                 |         |         |
| 361.6            | 5.5          | BLACK TOPSOIL                                     |                          | 2       | S.S. | 11                                    |                        |     |           |     |                 |         |         |
| 361.1            | 6.0          | FINE SAND, some silt                              |                          |         |      |                                       |                        |     |           |     |                 |         |         |
| 360.0            | 7.1          | Dense, Grey SANDY SILT with some clay and gravel. |                          | 3       | S.S. | 56                                    |                        |     |           |     |                 |         |         |
|                  |              | boulder   |                          | 4       | S.S. | 200/2"                                |                        |     |           |     |                 |         |         |
| 358.6            | 11.5         |   |                          | 5       | R.C. |                                       |                        |     |           |     |                 |         |         |
| 355.0            |              |   |                          | 6       | S.S. | 85/6"                                 |                        |     |           |     |                 |         |         |
|                  |              | Grey SHALE  |                          | 7       | S.S. | 65/6"                                 |                        |     |           |     |                 |         |         |
|                  | 15           | weathered sand                                    |                          | 8       | S.S. | 116/7"                                |                        |     |           |     |                 |         |         |
| 350.0            |              |   |                          | 9       | R.C. | 100 %                                 |                        |     |           |     |                 |         |         |
|                  | 20           | BEDROCK   |                          | 10      | R.C. | 87%                                   |                        |     |           |     |                 |         |         |
| 345.0            |              |   |                          |         |      |                                       |                        |     |           |     |                 |         |         |
| 344.1            | 23.0         | END OF BOREHOLE                                   |                          |         |      |                                       |                        |     |           |     |                 |         |         |

W.L. El. 362.8'  
Oct. 12, 1966



# GEOTECHNICAL DATA SHEET FOR BOREHOLE 17.6.

OUR REFERENCE NO. 6 - 9 - 41

CLIENT: D.H.O.

PROJECT: Q.E.W. & HWY. No 27 INTERCHANGE - BRIDGE No 17

LOCATION: 178, 621 N., 210, 575 E.

DATUM ELEVATION: G.S.C.

METHOD OF BORING: WASH BORING

DIAMETER OF BOREHOLE 2 3/8"

DATE: OCT. 5, 1966

W.P. 36 - 65 - 1

ENCLOSURE NO.

| ELEVATION<br>ft. | DEPTH<br>ft. | STRATIFICATION<br>DESCRIPTION   | STRATIFICATION<br>SYMBOL | SAMPLES |      |                                  | PENETRATION RESISTANCE   |     |     |     |      | CONSISTENCY     |  |  |  | REMARKS |
|------------------|--------------|---|--------------------------|---------|------|----------------------------------|--------------------------|-----|-----|-----|------|-----------------|--|--|--|---------|
|                  |              |   |                          | NUMBER  | TYPE | N or<br>Advancement<br>of Sample | blows per foot           |     |     |     |      | water content % |  |  |  |         |
|                  |              |   |                          |         |      |                                  | 2.0                      | 4.0 | 6.0 | 8.0 | 10.0 | PL W LI         |  |  |  |         |
|                  |              |   |                          |         |      |                                  | SHEAR STRENGTH lbs/sq ft |     |     |     |      | 1.0 2.0 3.0 4.0 |  |  |  |         |
| 368.3            | 0            | GROUND SURFACE  |                          |         |      |                                  |                          |     |     |     |      |                 |  |  |  |         |
|                  |              | Brown GRAVELLY SAND FILL  |                          |         |      |                                  |                          |     |     |     |      |                 |  |  |  |         |
| 365.8            | 2.5          | Dark Brown CLAYEY SILT with some sand   |                          | 1       | C.S. |                                  |                          |     |     |     |      |                 |  |  |  |         |
| 363.5            | 5            | Black ORGANIC SILT  |                          | 2       | S.S. | 3 4                              |                          |     |     |     |      |                 |  |  |  |         |
| 362.3            | 6.0          | Dense, Brown FINE SAND with some silt   |                          | 3 A     | S.S. | 5 1                              |                          |     |     |     |      |                 |  |  |  |         |
| 360.0            | 8.5          | Very Dense Grey SILTY SAND with some clay, gravel and random shale fragments. |                          | 4       | S.S. | 8 3                              |                          |     |     |     |      |                 |  |  |  |         |
| 359.8            | 10           |   |                          | 5       | S.S. | 9 2                              |                          |     |     |     |      |                 |  |  |  |         |
| 355.0            | 14.5         |   |                          | 6       | S.S. | 24/10"                           |                          |     |     |     |      |                 |  |  |  |         |
| 353.8            | 15           | Grey SHALE BED ROCK with hard bands of limestone.                             |                          | 7       | R.C. | 88 %                             |                          |     |     |     |      |                 |  |  |  |         |
| 350.0            | 20           |   |                          | 8       | R.C. | 80 %                             |                          |     |     |     |      |                 |  |  |  |         |
| 345.0            | 25           |   |                          | 9       | R.C. | 97 %                             |                          |     |     |     |      |                 |  |  |  |         |
| 343.5            |              | END OF BOREHOLE   |                          |         |      |                                  |                          |     |     |     |      |                 |  |  |  |         |

W.L. El. 363.0'  
Oct. 7, 1966

Gr. 4% ; Sa. 88 %  
Si. 8 %

Gr. 26% ; Sa. 27 %  
Si. 34% ; Cl. 13 %

Gr. 26 % ; Sa. 34 %  
Si. 28 % ; Cl. 12 %



OUR REFERENCE NO. 6 - 9 - 41

## GEOTECHNICAL DATA SHEET FOR BOREHOLE . . 17.7.

CLIENT: D. H. O.

PROJECT: Q.E.W. &amp; HWY. No 27 INTERCHANGE — BRIDGE No 17

METHOD OF BORING: WASHBORING

ENCLOSURE NO.

LOCATION: 178, 590 N., 210, 523 E.

DATE: OCT. 4, 1966

DATUM ELEVATION: G. S. C.

W. P. 36 - 65 - 1

| ELEVATION<br>ft | DEPTH<br>ft | STRATIFICATION<br>DESCRIPTION                                       | STRATIFICATION<br>SYMBOL | SAMPLES |       |                                   | PENETRATION RESISTANCE<br>blows per foot |     |     |     | CONSISTENCY<br>water content % |    |   |    | REMARKS |
|-----------------|-------------|---|--------------------------|---------|-------|-----------------------------------|--|-----|-----|-----|--------------------------------|----|---|----|---------|
|                 |             |   |                          | NUMBER  | TYPE  | Z or<br>Advancement<br>of Sampler | 2.0                                      | 4.0 | 6.0 | 8.0 | 10.0                           | Pl | W | LI |         |
| 365.4           | 0           | GROUND SURFACE  |                          |         |       |                                   |  |     |     |     |                                |    |   |    |         |
|                 |             | 6" TOPSOIL  |                          |         |       |                                   |  |     |     |     |                                |    |   |    |         |
|                 |             | Loose to Dense<br>FINE SAND<br>with some silt<br>and gravel.        |                          | 1       | C. S. |                                   |  |     |     |     |                                |    |   |    |         |
| 360.0           | 5           | brown<br>grey (wet)   |                          | 2       | S.S.  | 100/6"                            |  |     |     |     |                                |    |   |    |         |
| 358.6           | 6.8         | Very Dense<br>Grey<br>SAND and SILT<br>with some gravel<br>and clay |                          | 3       | S.S.  | 99                                |  |     |     |     |                                |    |   |    |         |
| 355.0           | 10          |   |                          | 4       | S.S.  | 91                                |  |     |     |     |                                |    |   |    |         |
| 354.4           | 11.0        | Grey  |                          | 5       | S.S.  | 100/3"                            |  |     |     |     |                                |    |   |    |         |
| 352.8           |             | weathered<br>sound SHALE  |                          | 6       | S.S.  | 200/3"                            |  |     |     |     |                                |    |   |    |         |
| 350.0           | 15          | BEDROCK   |                          | 7       | R.C.  | 53%                               |  |     |     |     |                                |    |   |    |         |
| 345.0           | 20          |   |                          | 8       | R.C.  | 94%                               |  |     |     |     |                                |    |   |    |         |
| 343.9           | 21.5        | END OF BOREHOLE   |                          |         |       |                                   |  |     |     |     |                                |    |   |    |         |

W.L. El. 360.9'  
Oct. 6, 1966  
Gr. 12% ; Sg. 72%  
Si. - Cl. 16%

Gr. 18% ; Sg. 33%  
Si. 37% ; Cl. 12%

Gr. 44% ; Sg. 22%  
Si. 23% ; Cl. 11%



# GEOTECHNICAL DATA SHEET FOR BOREHOLE 178..

OUR REFERENCE NO. 6 - 9 - 41

CLIENT: D. H. O.

PROJECT: Q.E.W. & HWY. N<sup>o</sup> 27 INTERCHANGE - BRIDGE N<sup>o</sup> 17

LOCATION: 178, 672 N., 210, 468 E.

DATUM ELEVATION: G. S. C.

METHOD OF BORING: WASH BORING

DIAMETER OF BOREHOLE: 2 3/8"

DATE: OCT. 6, 1966

W.P. 36 - 65 - 1

ENCLOSURE NO.

| ELEVATION<br>ft | DEPTH<br>ft | STRATIFICATION<br>DESCRIPTION                                       | STRATIFICATION<br>SYMBOL | SAMPLES  |      |  | PENETRATION RESISTANCE<br>blows per foot |     |     |     | CONSISTENCY<br>water content % |    |   |    | REMARKS |
|-----------------|-------------|---|--------------------------|----------|------|--|--|-----|-----|-----|--------------------------------|----|---|----|---------|
|                 |             |   |                          | NUMBER   | TYPE | N <sup>o</sup> or<br>Advancement<br>of Sampler | 2.0                                      | 4.0 | 6.0 | 8.0 | 10.0                           | PL | W | LI |         |
| 367.0           | 0           | GROUND SURFACE  |                          |          |      |  |  |     |     |     |                                |    |   |    |         |
| 365.0           |             | Loose<br>Brown, Grey, Black<br>SAND and SILT<br>(Probably Fill)     |                          | 1        | C.S. |  |  |     |     |     |                                |    |   |    |         |
| 361.2           | 5.8         | Dense<br>SILTY FINE SAND<br>Brown, Wet                              |                          | 2 A<br>B | S.S. | 43   |  |     |     |     |                                |    |   |    |         |
| 360.0           |             |   |                          |          |      |  |  |     |     |     |                                |    |   |    |         |
| 359.2           | 7.8         | Very Dense<br>Grey<br>SAND and SILT<br>with some clay<br>and gravel |                          | 3        | S.S. | 41   |  |     |     |     |                                |    |   |    |         |
| 355.0           | 10          |   |                          | 4        | S.S. | 83   |  |     |     |     |                                |    |   |    |         |
| 352.7           | 14.3        |   |                          | 5        | S.S. | 66   |  |     |     |     |                                |    |   |    |         |
| 350.0           | 15          | Grey<br>SHALE<br>BEDROCK<br>with layers of<br>limestone.            |                          | 6        | S.S. | 100/11"  |  |     |     |     |                                |    |   |    |         |
|                 |             |   |                          | 7        | R.C. | 88%  |  |     |     |     |                                |    |   |    |         |
| 345.0           | 23          |   |                          | 8        | R.C. | 67%  |  |     |     |     |                                |    |   |    |         |

W.L. El. 362.7'  
Oct. 12, 1966

Gr. 1% ; Sa. 84%  
Si. - Cl. 15%

Gr. 14% ; Sa. 42%  
Si. 32% ; Cl. 12%

Gr. 6% ; Sa. 39%  
Si. 37% ; Cl. 18%

100/11"

END OF BOREHOLE



OUR REFERENCE NO. 6 - 9 - 41

DATUM ELEVATION. G. S. C.

W.P. 36-65-1

ENCLOSURE NO

[illegible]



OUR REFERENCE NO. 6 - 9 - 41

PROJECT: Q. E. W. & HWY. NO 27 INTERCHANGE, BRIDGE NO 17

### METHOD OF BORING WASH BORING

DIAMETER OF BOREHOLE 2 3/8"

DATE: OCT. 14, 1966

DATUM ELEVATION: G. S. C.

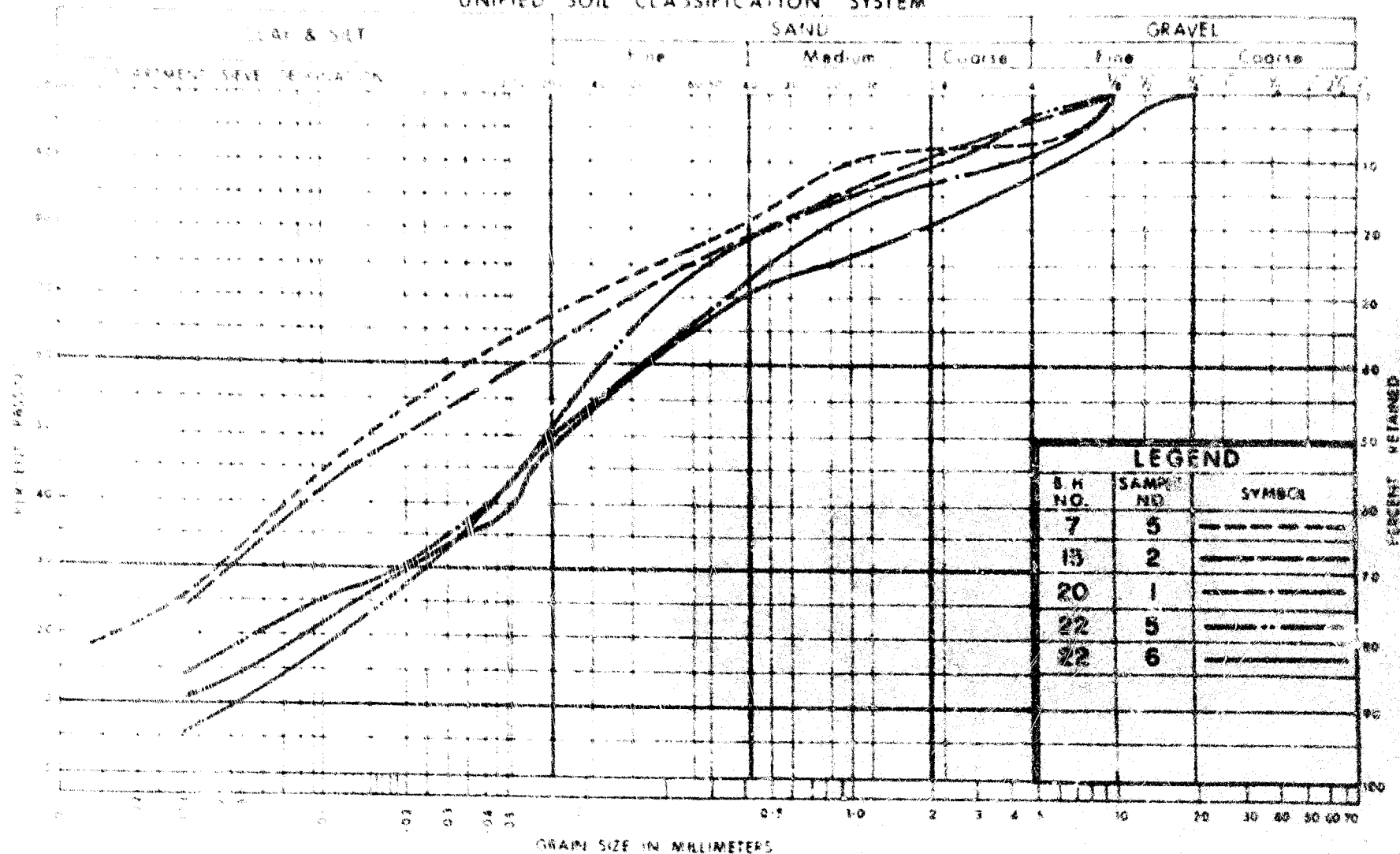
W.P. 36 - 65 - 1

ENCLOSURE NO

| ELEVATION<br>ft | DEPTH<br>ft | STRATIFICATION<br>DESCRIPTION   | STRATIFICATION<br>SYMBOL | SAMPLES |      |                                     | PENETRATION RESISTANCE                             | CONSISTENCY<br>water content %<br><br>PL      W      LI | REMARKS                                |
|-----------------|-------------|---|--------------------------|---------|------|-------------------------------------|--|---|--|
|                 |             |   |                          | NUMBER  | TYPE | N- or<br>Advance ment<br>of Sampler | blows per foot<br>2,0    4,0    6,0    8,0    10,0 |   |  |
|                 |             |   |                          |         |      |                                     | SHEAR STRENGTH                  lbs./sq ft.        | 10     20     30     40                                 |  |
| 367.5           | 0           | GROUND SURFACE  |                          |         |      |                                     |  |   |  |
| 365.0           |             | Compact, Brown SILT, FINE SAND, CLAY, ORGANIC MATTER (FILL)                     | [Symbol]                 | 1       | C.S. |                                     |  |   | Gr. 4% ; Sa. 58%<br>Si. 30% ; Cl. 8%   |
| 363.5           | 4.0         | Compact, Brown FINE SAND with some silt   | [Symbol]                 | 2       | S.S. | 27                                  |  |   | Sa. 92%, Si. 18%                       |
| 360.0           | 7.3         | Very Hard Grey boulder CLAYEY SILT with some sand and gravel or shale fragments | [Symbol]                 | 3       | S.S. | 100/1"                              | 100/5'   | O  —  | W.L. El. 361.0'<br>Oct. 19, 1966       |
| 357.5           | 10          |   | [Symbol]                 | 4       | R.C. |                                     |  |   |  |
| 355.0           |             |   | [Symbol]                 | 5       | S.S. | 68                                  |  | O  —  | Gr. 20% ; Sa. 46%<br>Si. 22% ; Cl. 12% |
| 354.0           | 13.5        | Grey weathered SHALE BEDROCK with bands of limestone                            | [Symbol]                 | 6       | S.S. | 80                                  |  | O  —  | Gr. 34% ; Sa. 30%<br>Si. 25% ; Cl. 11% |
| 351.5           |             |   | [Symbol]                 | 7       | S.S. | 110/1"                              |  |   |  |
| 350.0           |             |   | [Symbol]                 | 8       | R.C. | 71%                                 |  |   |  |
|                 |             |   | [Symbol]                 | 9       | R.C. | 92%                                 |  |   |  |
| 346.5           | 21.0        | END OF BOREHOLE   |                          |         |      |                                     |  |   |  |



## UNIFIED SOIL CLASSIFICATION SYSTEM



ONTARIO

DEPARTMENT OF HIGHWAYS  
MATERIALS and  
TESTING  
DIVISION

GRAIN SIZE DISTRIBUTION  
CLAYEY SILT, SAND & GRAVEL  
(GLACIAL TILL)

W.P. No.

JOB No. 65-F-104







