

DOCUMENT MICROFILMING IDENTIFICATION

G.I.-30 SEPT. 1976

GEOCRES No. 30M12-177

DIST. 4 REGION

W.P. No. 173-80-00

CONT. No.

W. O. No.

STR. SITE No. 10

HWY. No. 407

LOCATION HWY 407 & C.P.R.

=====

OVERSIZE DRAWINGS TO BE INCLUDED WITH THIS REPORT.

REMARKS:



GEORGES # 30 H 12-177

FILE No. _____

DATE _____

REMARKS



METRIC

W P 173-80-00 LOCATION N 4826 440 E 280 490 ORIGINATED BY BY
DIST 4 HWY 407 BOREHOLE TYPE HOLLOW-STEM AUGER COMPILED BY DD
DATUM GEODETIC DATE 82 08 11 CHECKED BY DD

| SOIL PROFILE | | | SAMPLES | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | PLASTIC LIMIT W _p | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W _L | UNIT WEIGHT γ | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|----------------|---|------------|---------|------|-------------------------|-----------------|--|----|---------------------------------|-------------------------------|--------------------------------|------------------|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | | | 'N' VALUES | 20 | | | | | |
| GROUND SURFACE | | | | | | | | | | | | | |
| 205.5 204.0 | ① Silty Clay some sand and gravel | 1 | SS | 40 | | | | | | | | | |
| 204.0 201.0 | ② Silty Sand trace clay and gravel dense to very dense | 2 | SS | 100 | 25cm | | | | | | | | 23 37 35 5 |
| 201.0 201.7 | ③ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 3 | SS | 100 | 20cm | | | | | | | | 1 26 69 4 |
| 201.7 198.5 | ④ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 4 | SS | 100 | 15cm | | | | | | | | 10 36 48 6 |
| 198.5 197.0 | ⑤ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 5 | SS | 100 | 20cm | | | | | | | | 4 33 56 7 |
| 197.0 193.9 | ⑥ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 6 | SS | 100 | 15cm | | | | | | | | |
| 193.9 190.6 | ⑦ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 7 | SS | 100 | 20cm | | | | | | | | |
| 190.6 186.9 | ⑧ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 8 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ⑨ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 9 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ⑩ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 10 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ⑪ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 11 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ⑫ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 12 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ⑬ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 13 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ⑭ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 14 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ⑮ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 15 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ⑯ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 16 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ⑰ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 17 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ⑱ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 18 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ⑲ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 19 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ⑳ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 20 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㉑ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 21 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㉒ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 22 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㉓ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 23 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㉔ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 24 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㉕ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 25 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㉖ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 26 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㉗ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 27 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㉘ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 28 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㉙ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 29 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㉚ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 30 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㉛ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 31 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㉜ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 32 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㉝ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 33 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㉞ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 34 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㉟ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 35 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㊱ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 36 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㊲ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 37 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㊳ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 38 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㊴ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 39 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㊵ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 40 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㊶ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 41 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㊷ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 42 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㊸ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 43 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㊹ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 44 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㊺ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 45 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㊻ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 46 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㊼ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 47 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㊽ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 48 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | ㊾ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 49 | SS | 100 | 20cm | | | | | | | | |
| 186.9 186.9 | ㊿ Silty Clay (CL) to Silt some/trace sand hard (slight plasticity) ML-CL | 50 | SS | 100 | 15cm | | | | | | | | |
| 186.9 186.9 | END OF BOREHOLE | | | | | | | | | | | | |

+3, x5: Numbers refer to Sensitivity

20
15 
10

memorandum



To: G.C.E. Burkhardt
Head, Structural Section
Central (5000 Yonge St.) Reg.
Attn: R.A. Jeffries

Date: 82 09 08

From: Pavement & Foundation Design Section
Room 315, Central Bldg.
Downsview

Re: Preliminary Foundation Investigation
Hwy. 407 - C.P.R. Crossing
W.P. 173-80-00, Site 10
District 4, Hamilton

Fieldwork for the above-noted preliminary recommendations has been completed. This memo will summarize the subsurface conditions encountered at this site and indicate possible problems associated with an underpass. It is intended that this information will be sufficient foundation input for the decision of whether the proposed Hwy. 407/C.P.R. crossing should be an underpass or an overpass.

The ground surface elevation at the borehole location at this site is approximately 205.5 m, some 1.5 m below the top of the C.P.R. embankment. The subsoil consists of alternating strata (1.5 to 5.5 m in thickness) of cohesive and non-cohesive material. The groundwater elevation was approximately 204.5 m (1.0 m below ground surface) at the time of the field investigation.

It has been assumed that the footing elevation for an underpass would be approximately 197.0 m. This would result in a hydrostatic head of approximately 7.5 m at the footing level. Note that non-cohesive soil is highly susceptible to problems associated with conditions of unbalanced hydrostatic head.

Because of the high water level, there will be problems involved with the construction of an underpass. However, an underpass is feasible and these problems can be overcome by a proper design.

.../2

- 2 -

Permanent drainage may present a more serious problem. There will probably be a permanent seepage problem requiring that water at the underpass invert be drained (to a sewer below the foundation elevation) or pumped.

If there are any questions, please contact this office.

D. H. Dundas

D.H. Dundas, P. Eng.
Project Foundations Engineer

DHD:syc