

ENGINEERING MATERIALS OFFICE
FOUNDATION DESIGN SECTION

WP 421-92-00

DIST 2

HWY 126

STR SITE

Settlement of Sanitary Sewer
Bradley Ave./Highbury Ave. Interchange

DISTRIBUTION

T. Irving (3)
E.J. Zavitski (2)
M. Bond
F. Bacchus (Cover Only)
File

GEOCRES 40114-119

DATE

SEP 01 1992

memorandum



To: T. Irving
Head, Planning and Design Section
Southwestern Region

Date: 1992 08 27

Attn: Fred Lukianow, Sr. Project Manager

From: Foundation Design Section
Room 315, Central Building
Downsview

Re: Settlement of Sanitary Sewer
Bradley Avenue/Highbury Avenue Interchange
W.P. 421-92-00
District 2, London

INTRODUCTION

Further to your memo of June 16, 1992 and the subsequent meeting on June 22, 1992 at your office concerning the settlement of the sanitary sewer in the vicinity of Bradley Avenue/Highbury Avenue Interchange, the site investigation for the above noted project has been completed by the Foundation Design Section. Due to the urgency of this project, as per your request, we are herewith submitting our recommendations. This memo provides a summary of existing subsurface conditions and recommendations which will permit your office to proceed with remedial work for the sanitary sewer.

BACKGROUND

During the construction of the N-E/W ramp at Bradley Avenue/Highway Avenue (formerly Hwy. 126) interchange (refer to Contract 90-13), a large settlement of the sanitary sewer near manhole No. 33 and the failure of ramp fills occurred. Site investigations by the Foundation Design Section revealed insufficient removal of swamp material (Refer to our memos of September 18, 1991 and October 22, 1990). Twenty six boreholes (BH# 401 to BH# 424) were put down at locations shown on Figure 1 and 1A. Remedial work recommended by this section was carried out at that time.

Upon completion of the Bradley Avenue/Highway Avenue interchange construction, the area was transferred to the City of London.

MTO Construction Office has been monitoring the settlement in this area over the past 1½ years. The monitoring results indicate some 216 mm of settlement of manhole No. 33.

The City of London has conducted a video examination of the sanitary sewer between Manhole # 32 and Manhole # 38. The video shows some high water level in 750 mm sanitary sewer between MH# 32 and MH# 34, and between MH# 36 and MH# 37 as indicated in Figure 1 as a red marker. Based on the above examination, the City of London expressed their concern regarding the on-going settlement of the ramp and potential failure of the sanitary sewer.

SITE INVESTIGATION

The fieldwork was carried out between 92 07 09 and 92 07 16. Seven boreholes (BH# 92-01 to BH# 92-8) were advanced and sampled as part of this investigation by means of hollow stem augers at locations shown on Figure 1 (refer to borehole logs). These boreholes extended to depths of 11.1 m at BH#'s 92-4, #92-6 and #92-7, and 15.7 m at BH# 92-2 below the existing ground surface (refer to cross-sections, Figures 2 to 4). BH# 92-5 was not driven during the site investigation due to the existence of previous BH# 419. BH# 92-8 was drilled from the top of the existing ramp embankment, whereas the rest of boreholes were put down in the vicinity of sanitary sewer in order to verify the existence of any peat or organic silt layers underneath the sewer and embankment fill.

SURFACE CONDITIONS

Based on the site investigation, it was found that some compressible peat and organic silt layers were still left in place underneath the sanitary sewer and embankment fill in the vicinity of Bradley Avenue/Highbury Avenue interchange areas. As much as 1.8 m of these materials were encountered at BH# 92-3 as shown on Section DD-DD (Figure 3) and summarized as follows.

A) Between Section D-D and F-F:

| | | |
|----------|---|--------------------------------|
| BH# 92-1 | - | 1.1 m |
| BH# 92-2 | - | 1.5 m |
| BH# 92-3 | - | 1.8 m |
| BH# 92-4 | - | 0 m |
| BH# 92-8 | - | 0.6 |
| BH# 404 | - | 2.1 m (previous investigation) |
| BH# 420 | - | 1.2 m (" ") |

B) Between Section H-H and MH# 37:

| | | |
|----------|---|--------------------------------|
| BH# 92-6 | - | 1.5 m |
| BH# 92-7 | - | 1.5 m |
| BH# 419 | - | 1.2 m (previous investigation) |
| BH# 417 | - | 1.5 m (" ") |

It should be noted that the bedding sand for the sanitary sewer was not properly compacted during the construction. In this stratum, the "N" value ranges from 0 to generally less than 10 blows/0.3 m, indicating a state of compaction described as very loose to loose.

DISCUSSION AND RECOMMENDATIONS

It is believed that the existence of some compressible organic layers and very loose and loose bedding sand might cause about 216 mm settlement of the Manhole No. 33 for the sanitary sewer system and jeopardize the slope stability.

A) Between MH# 32 and MH# 34, and between MH# 36 AND MH# 37

In view of this information, it is our opinion that these compressible peat and organic silt layers underneath the sanitary sewer and embankment fill should be completely removed from the area of question as indicated on figure 1. To do this, the following procedures are recommended:

- 1) The sanitary sewer should be relocated to the temporary location or be maintained by using the by-pass system with pump during the remedial work.
- 2) Ramp embankment fill should be removed above the original ground surface between the following locations (figure 1);
 - a) Between MH# 32 and MH# 34 - From 30 m north of MH# 33 to 20 m south of MH# 33.
 - b) Between MH# 36 and MH# 37 - From 25 m east of MH# 37 to 5 m south of MH# 37.
- 3) Loose backfill sand (SSM) and compressible peat and organic silt layers should be removed down to the top of grey fine sand and of grey silty sand or interlayered sandy silt to clayey silt layers.
- 4) As shown on Figure 5, sub-excavation of peat should follow the sketch provided in order to ensure the integrity of the ramp embankment.
- 5) The excavated area should be backfilled with well compacted sand (SSM) to the level of foundation of manhole for the sanitary sewer.
- 6) The sanitary sewer system should be reconstructed on properly prepared bedding (B-1).
- 7) Complete backfill operation to the original ground surface.
- 8) The ramp embankment should be built with 2:1 side slope to the required level.
- 9) Some survey points should be set up to monitor any movement of manholes and side slope after completion of the remedial work.

It should be noted that even though the groundwater level was measured to approximately 14 m below the existing ground surface, actual groundwater levels were not stabilized during the site investigation. However, based on the report

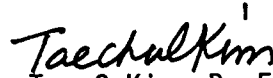
of our geotechnical consultant (Golder Associates Report 881-3237, September, 1988), it was predicted that extensive excavation and filling would be required under poor soil and high groundwater conditions. The backfill operation should be carried out in dry conditions.

The following recommendations should be made for the other area in question.

B) Between Sections CC-CC and H-H (to Bradley Avenue):

- 1) Excavate peat and organic material from the toe of the embankment with 1 to 1 slope, then backfilled with compacted sand fill and flatten the embankment slope to 2.5H to 1V slope as shown on Figure 6.
- 2) Some survey sections should be set up to monitor any settlement of embankment between Sections CC-CC and H-H.

We believe that this memorandum meets with your present requirements, if you have any further questions, please contact this office.


Tae C Kim, P. Eng.
Sr. Foundation Engineer

for

M. Devata, P. Eng.
Chief Foundation Engineer

APPENDIX

RECORD OF BOREHOLE No 92-1 1 OF 1 METRIC

W.P. 421-92-00 LOCATION Sta. 10+309.5; o/s 18.4m Rt. E of N-E/W Ramp ORIGINATED BY MI
DIST 2 HWY 126 BOREHOLE TYPE HS Augers, Vane Tests COMPILED BY MI
DATUM Geodectic DATE July 10, 1992 CHECKED BY TCK

| 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 | WATER CONTENT (%) W | UNIT WEIGHT γ kN/m ³ | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---------------|--|------------|---------|------|------------|----------------------------|--------------------|---|----|----|----|-----|------------------------------------|-------------------------------------|-----------------------------------|------------------------|--|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | 'N' VALUES | | | 20 | 40 | 60 | 80 | 100 | | | | | | |
| 270.0 | Ground Surface | | | | | | | | | | | | | | | | | |
| 269.7 | Cobbles (Rip Rap) | | | | | | | | | | | | | | | | | |
| 0.3 | | | | | | | | | | | | | | | | | | |
| | | | 1 | SS | 4 | | 269 | | | | | | | | | | | |
| | | | | | | | 268 | | | | | | | | | | | |
| | Sand (SSM) | | | | | | 267 | | | | | | | | | | | |
| | (Fill) | | 2 | SS | 4 | | 266 | | | | | | | | | | | |
| | Loose | | | | | | 265 | | | | | | | | | | | |
| | | | 3 | SS | 4 | | 264 | | | | | | | | | | | |
| | | | | | | | 263 | | | | | | | | | | | |
| 262.1 | Brown | | 4 | SS | 6 | | 262 | | | | | | | | | | | |
| 7.9 | Dark Grey | | | | | | 261 | | | | | | | | | | | |
| | Organic Silt | | 5 | SS | 4 | | 260 | | | | | | | | | | | |
| 261.0 | Dark Grey | | 6 | SS | 4 | | 259 | | | | | | | | | | | |
| 9.0 | Grey | | | | | | 258 | | | | | | | | | | | |
| | Clayey Silt | | 7 | SS | 4 | | 257 | | | | | | | | | | | |
| | Firm to Stiff | | 8 | SS | 10 | | 256 | | | | | | | | | | | |
| 258.7 | | | | | | | 255 | | | | | | | | | | | |
| 11.3 | Clayey Silt, with some Sand and Gravel | | 9 | SS | 18 | | 254 | | | | | | | | | | | |
| | (Glacial Till) | | | | | | 253 | | | | | | | | | | | |
| | Very Stiff | | | | | | 252 | | | | | | | | | | | |
| 256.8 | | | | | | | 251 | | | | | | | | | | | |
| 13.2 | Silt, with some Sand and Gravel | | 10 | SS | 24 | | 250 | | | | | | | | | | | |
| | (Glacial Till) | | | | | | 249 | | | | | | | | | | | |
| 255.8 | Compact | | | | | | 248 | | | | | | | | | | | |
| 14.2 | End of Borehole | | | | | | 247 | | | | | | | | | | | |
| | * Water Level measured 2 hours after completion | | | | | | 246 | | | | | | | | | | | |

RECORD OF BOREHOLE No 92-2 2 OF 2 METRIC

W.P. 421-92-00 LOCATION Sta. 10+321.3; o/s 19.2m Rt. C of N-E/W Ramp ORIGINATED BY MI
DIST 2 HWY 126 BOREHOLE TYPE HS Augers, Cone Test COMPILED BY MI
DATUM Geodetic DATE July 9, 1992 CHECKED BY TCK

| 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 kN/m ³ | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---------------|--|------------|--------|------|----------------------------|-----------------|---|----|----|----|----|------------------------------------|-------------------------------------|-----------------------------------|--|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | | | 'N' VALUES | 20 | 40 | 60 | 80 | | | | | |
| 254.8 | Continued | | 16 | SS | 4 | | | | | | | | | | | |
| 15.2 | | | | | | | | | | | | | | | | |
| 254.3 | | | | | | | | | | | | | | | | |
| 15.7 | End of Borehole | | | | | | | | | | | | | | | |
| | * Water level measured after completion | | | | | | | | | | | | | | | |

RECORD OF BOREHOLE No 92-3

1 OF 1

METRIC

W.P. 421-92-00 LOCATION Sta. 10+329.0; o/s 19.4m Rt. C of N-E/W Ramp ORIGINATED BY MI
DIST 2 HWY 126 BOREHOLE TYPE HS Augers, Vane Tests COMPILED BY MI
DATUM Geodectic DATE July 13, 1992 CHECKED BY TCK

| 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 (%) |
|---------------|--|------------|---------|------|------------|----------------------------|-----------------|---|-----------------|------------------------------------|-------------------------------------|-----------------------------------|---------------------|---|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | 'N' VALUES | | | 20 40 60 80 100 | 20 40 60 80 100 | | | | | |
| 270.3 | Ground Surface | | | | | | | | | | | | | |
| 0.0 | | | | | | DRY * | 270 | | | | | | | |
| | | | | | | | 269 | | | | | | | |
| | | | | | | | 268 | | | | | | | |
| | Sand (SSM) (Fill) Loose to Compact | | | | | | 267 | | | | | | | |
| | | | | | | | 266 | | | | | | | |
| | | | 1 | SS | 15 | | 265 | | | | | | | |
| | | | 2 | SS | 6 | | 264 | | | | | | | |
| 263.9 | Brown | | 3 | SS | 4 | | 263 | | | | | | | |
| 6.4 | Dark Brown | | | | | | 262 | | | | | | | |
| | Peat | | 4 | SS | 5 | | 261 | | | | | | | |
| 262.8 | Dark Brown | | | | | | 260 | | | | | | | |
| 7.5 | Dark Grey | | | | | | 259 | | | | | | | |
| | Organic Silt | | | | | | 258 | | | | | | | |
| 262.1 | Dark Grey | | | | | | 257 | | | | | | | |
| 8.2 | Grey | | 5 | SS | 2 | | 256 | | | | | | | |
| | Clayey Silt to Silt Very Soft | | | | | | 255 | | | | | | | |
| 261.3 | | | 6 | SS | 5 | | 254 | | | | | | | |
| 9.0 | | | | | | | 253 | | | | | | | |
| | Silty Sand Loose to Compact | | | | | | 252 | | | | | | | |
| 259.2 | | | 7 | SS | 13 | | 251 | | | | | | | |
| 11.1 | | | | | | | 250 | | | | | | | |
| | Clayey Silt occasional Sand layers (Glacial Till) Stiff to Very Stiff | | | | | | 249 | | | | | | | |
| | | | 8 | SS | 10 | | 248 | | | | | | | |
| | | | | | | | 247 | | | | | | | |
| 256.1 | | | 9 | SS | 28 | | 246 | | | | | | | |
| 14.2 | End of Borehole | | | | | | 245 | | | | | | | |
| | * Water Level measured after completion. | | | | | | 244 | | | | | | | |

+3, x5 Numbers refer to
Sensitivity

20
15-5 (%) STRAIN AT FAILURE
10

1 OF 1

METRIC

DATUM Geodetic DATE July 13, 1992 CHECKED BY TCK

+3, x5: Numbers refer to Sensitivity

RECORD OF BOREHOLE No 92-6

1 OF 1

METRIC

W.P. 421-92-00 LOCATION Sta. 10+483.3; e/s 17.9m Rt. C of N-E/W Ramp ORIGINATED BY MI
DIST 2 HWY 126 BOREHOLE TYPE HS Augers COMPILED BY MI
DATUM Geodetic DATE July 15, 1992 CHECKED BY TCK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | | | | PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT | | | UNIT WEIGHT 7 kN/m ³ | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---------------|---|------------|---------|------|------------|----------------------------|--------------------|---|----|----|----|-----|--|---|----------------|--|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | 'N' VALUES | | | 20 | 40 | 60 | 80 | 100 | W _p | W | W _L | | |
| 269.6 | Ground Surface | | | | | | | | | | | | | | | | |
| 0.0 | | | | | | | | | | | | | | | | | |
| | Sand (SSM) (Fill) Very Loose | | | | | | | | | | | | | | | | |
| | | | 1 | SS | 3 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| 263.2 | Brown | | 2 | SS | 3 | | | | | | | | | | | | |
| 6.4 | Dark Brown | | | | | | | | | | | | | | | | |
| | Peat | | | | | | | | | | | | | | | | |
| 262.3 | Dark Brown | | 3 | SS | 3 | | | | | | | | | | | | |
| 7.3 | Dark Grey | | | | | | | | | | | | | | | | |
| 261.7 | Organic Silt | | 4 | SS | 7 | | | | | | | | | | | | |
| 7.9 | Dark Grey | | | | | | | | | | | | | | | | |
| | Grey | | | | | | | | | | | | | | | | |
| | Clayey Silt with some Sand and Gravel (Glacial Till) Stiff to Very Stiff | | 5 | SS | 11 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| 258.5 | | | 6 | SS | 22 | | | | | | | | | | | | |
| 11.1 | End of Borehole | | | | | | | | | | | | | | | | |
| | * Water Level measured after completion | | | | | | | | | | | | | | | | |

1 OF 1

METRIC

+3, x5: Numbers refer to Sensitivity

1 OF 1

W.P. 421-92-00 LOCATION Sta. 10+321.2; o/s 1.3m Rt. C of N-E/W Ramp ORIGINATED BY MI
DIST 2 HWY 126 BOREHOLE TYPE HS Augers COMPILED BY MI
DATUM Geodectic DATE July 16, 1992 CHECKED BY TCK

[illegible]

+³, x⁵: Numbers refer to Sensitivity

RECORD OF BOREHOLE No 401

METRIC

W P CONT 90-13 LOCATION 14.4 m LT. FROM M.H. #33 ORIGINATED BY TCK
 DIST 2 HWY 126 BOREHOLE TYPE H.S. DUGED COMPILED BY JP
 DATUM GEODETIC DATE 1990 09 13 CHECKED BY TCK

| SOIL PROFILE | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT γ | | | | | 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 | 40 | 60 | 80 | 100 | | | | | |
| 275.8 | Ground Surface | | | | | | | | | | | | | | | |
| 0.0 | | | | | | | | | | | | | | | | |
| 275.0 | SAND & GRAVEL (FILL) | | | | | | | | | | | | | | | |
| 0.8 | | | | | | | | | | | | | | | | |
| | CLAYEY SILT, SOME SAND & GRAVEL (FILL) Stiff to Very Stiff | | 1 | SS | 9 | * | | | | | | | | | | |
| | | | 2 | SS | 19 | | | | | | | | | | | |
| | | | 3 | SS | 14 | | | | | | | | | | | |
| 269.5 | | | 4 | SS | 13 | | | | | | | | | | | |
| 6.3 | SAND, SOME GRAVEL (SSM, FILL) | | 5 | SS | 18 | | | | | | | | | | | |
| | | | 6 | SS | 7 | | | | | | | | | | | |
| 266.6 | | | 7 | SS | 11 | | | | | | | | | | | |
| 9.2 | PEAT & ORGANIC SILT | | 8 | SS | 7 | | | | | | | | | | | |
| 265.6 | | | 9 | SS | 7 | | | | | | | | | | | |
| 10.2 | FINE TO MEDIUM SAND Loose to Compact | | 10 | SS | 20 | | | | | | | | | | | |
| 263.2 | | | | | | | | | | | | | | | | |
| 12.6 | END OF BOREHOLE * BOREHOLE DRY DURING SITE INVESTIGATION | | | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

+3, x⁵: Numbers refer to
Sensitivity

20
15 \div 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 402

METRIC

W P CONT 90-13 LOCATION 1.7 m RT. FROM M.H. # 33 ORIGINATED BY TCK
 DIST 2 HWY 126 BOREHOLE TYPE H. S. AUGER COMPILED BY JP
 DATUM GEODETIC DATE 1990 09 14 CHECKED BY Tck

| 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 | 40 | 60 | 80 | 100 | | | | | |
| 269.7 0.0 | Ground Surface | | | | | | | | | | | | | | | | |
| 268.7 1.0 | CLAYEY SILT (Fill) | | 1 | SS | 14 | | 268 | | | | | | | | | | |
| | | | 2 | SS | 6 | | | | | | | | | | | | |
| | | | 3 | SS | 7 | | | | | | | | | | | | |
| | SAND, some GRAVEL (SSM, FILL) | | 4 | SS | 9 | | 266 | | | | | | | | | | |
| | | | 5 | SS | 12 | | | | | | | | | | | | |
| | | | 6 | SS | 7 | | | | | | | | | | | | |
| 263.8 5.9 | PEAT | Brown Black | 7 | SS | 1 | | 264 | | | | | | | | | | |
| 262.5 7.2 | ORGANIC SILT | | 8 | SS | 2 | | | | | | | | | | | | |
| 261.5 8.2 | ORGANIC CLAYEY SILT | Black Dark Gray | 9 | SS | | | 262 | | | | | | | | | | |
| 260.7 9.0 | SILTY SAND | Grey | 10 | SS | 2 | | | | | | | | | | | | |
| 259.4 10.3 | SAIDY SILT, WITH CLAY SEAMS (Till) | | 11 | SS | 1 | | 260 | | | | | | | | | | |
| 258.6 11.1 | END OF BOREHOLE | | 12 | SS | 3 | | | | | | | | | | | | |
| | | | 13 | SS | 3 | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 403

METRIC

W P Cout 90-13 LOCATION 5.7 m RT From M.H. #33 ORIGINATED BY TCK
 DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER COMPILED BY JP
 DATUM GEODETIC DATE 1990 09 14 CHECKED BY TCK

| 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 | | | SHEAR STRENGTH kPa | | | | | | | | | | WATER CONTENT (%) |
| | | | | | | | | 20 40 60 80 100 | | | | | | | | | | |
| 269.7 0.0 | Ground Surface | | | | | | | | | | | | | | | | | |
| 268.9 0.8 | CLAYEY SILT (FILL) | | | | | | | | | | | | | | | | | |
| 266.3 3.4 | SAND, SOME GRAVEL (SSM, FILL) Very Loose | Brown Black | 1 | SS | 2 | | 268 | | | | | | | | | | | |
| | PEAT | | 2 | SS | 2 | | 266 | | | | | | | | | | | |
| 264.1 5.6 | ORGANIC SILT | | | | | | 264 | | | | | | | | | | | |
| 261.1 8.6 | INTERLAYERED SANDY SILT TO CLAYEY SILT | Black Gray | 3 | SS | 1 | | 262 | | | | | | | | | | | |
| 259.5 10.2 | SANDY SILT, WITH CLAY SEAMS (Till) | | 4 | SS | 2 | | 260 | | | | | | | | | | | |
| 258.6 11.1 | END OF BOREHOLE | | 5 | SS | 9 | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 404

METRIC

W P 90-13 LOCATION STA. 10+298; 0/5.26.0m RT FR. & OF N-E/W RAMP ORIGINATED BY V.H.
 DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER COMPILED BY V.H.
 DATUM GEODETIC DATE 20 09 28 CHECKED BY JCK

| SOIL PROFILE | | | SAMPLES | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT <u>2</u> | | PLASTIC LIMIT W _p | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W _L | UNIT WEIGHT γ | REMARKS & GRAIN SIZE DISTRIBUTION (%) |
|---------------|----------------------|------------|---------|------|----------------------------|--------------------|--|----|------------------------------------|-------------------------------------|-----------------------------------|---------------------|---|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | | | VALUES | 20 | | | | | |
| 26.0 | GROUND SURFACE | | | | | | | | | | | | |
| 0.0 | CLAYEY SILT (FILL) | | | | | | | | | | | | |
| 26.2 | | | | | | | | | | | | | |
| 0.0 | | | | | | | | | | | | | |
| 5 | SAND (FILL) | | 1 | SS | 6 | | | | | | | | |
| | Thin SILT | | | | | | | | | | | | |
| 10 | (SSM) | | 2 | SS | 1 | | | | | | | | |
| | | | | | | | | | | | | | |
| 15 | BROWN | | | | | | | | | | | | |
| 26.5 | D. BROWN TO BLACK | | 3 | SS | 1 | | | | | | | | |
| 4.6 | ORGANIC SILT | | | | | | | | | | | | |
| 20 | occ. PEAT LANCES | | | | | | | | | | | | |
| | WOOD FRAGMENTS BROWN | | | | | | | | | | | | |
| 24.3 | D. BROWN TO BLACK | | 4 | SS | 2 | | | | | | | | |
| 4.7 | SILTY SAND GRAY | | | | | | | | | | | | |
| 26.8 | CLAYEY SILT (thin) | | 5 | SS | 14 | | | | | | | | |
| 7.3 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 30 | CAVE @ 2.1m | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 405

METRIC

W P CONT. 90.13 LOCATION STA. 10+298; 0/S 6.0m AT FR. E OF N-E/W RAMP ORIGINATED BY WM
 DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER COMPILED BY WM
 DATUM GEODETIC DATE 20 10 03 CHECKED BY TCK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT <u>2</u> 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE | 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 | | | | | | | | |
| 273.9 | GROUND SURFACE | | | | | | | | | | | | |
| 273.5 | SAND (GRAVEL FILL) | | | | | | | | | | | | |
| 273.0 | CLAYEY SILT (FILL) | | 1 | CS | | | 272 | | | | | | |
| 270.5 | GRAVELEY | | 2 | CS | | | 270 | | | | | | |
| 268.5 | FINE SAND (FILL) (45M) TRACE WOOD DEBRIS | | 3 | CS | | | | | | | | | |
| 268.4 | BROWN | | | | | | 268 | | | | | | |
| 267.5 | FINE SAND SOME SILT | | 4-5-6 | | | | 268 | | | | | | |
| 267.4 | CLAYEY SILT (TILL) | | | | | | | | | | | | |
| 265.0 | TL SAND & GRAVEL | | 5-5-12 | | | | 266 | | | | | | |
| 261.1 | E.D. H. | | | | | | | | | | | | |
| 250.0 | * DRY CAVE @ 1.5m W.L. ESTIMATED FROM SOIL SAMPLES | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION



Ministry
of
Transportation
Ontario

RECORD OF BOREHOLE No 406

METRIC

W P 20-13 LOCATION STR. 10+310 ; 0.5 27.4 m RT FR. 40FN-BW RAMP ORIGINATED BY LSH
DIST 2 HWY 126 BOREHOLE TYPE H.S AUGER COMPILED BY LSH
DATUM GEODATIC DATE 20-07-28 CHECKED BY JCK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 | PLASTIC LIMIT W _p | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W _L | UNIT WEIGHT Y | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---------------|---|------------|---------|------|------------|----------------------------|-----------------|--|------------------------------------|-------------------------------------|-----------------------------------|---------------------|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | 'N' VALUES | | | | | | | | |
| 260.0 | GROUND SURFACE | | | | | | | | | | | | |
| 0.0 | CLAYEY SILT (TILL) | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | |
| 267.1 | BROWN D. BROWN TO BLACK PEAT | | 1 | SS | 2 | | 268 | | | | | | |
| 10 | | | 2 | SS | 1 | | 266 | | | | | | |
| 15 | | | 3 | CS | | | | | | | | | |
| 268.0 | | | 4 | SS | 0 | | | | | | | | |
| 4.5 | ORGANIC SILT | | 5 | SS | 0 | | 264 | | | | | | |
| 20 | DEC. WOOD FRAGMENTS & PEAT LAYERS | | 6 | SS | 0 | | 262 | | | | | | |
| 25 | | | 7 | SS | 1 | | 260 | | | | | | |
| 268.1 | D. BROWN TO BLACK | | | | | | | | | | | | |
| 27.4 | INTERLAYERED GREY SANDY SILT TO CLAYEY SILT | | | | | | | | | | | | |
| 28.1 | | | | | | | | | | | | | |
| 10.2 | CLAYEY SILT (TILL) | | 8 | SS | 0 | | | | | | | | |
| 28.4 | | | | | | | | | | | | | |
| 11.1 | | | | | | | | | | | | | |
| 40 | * GROUNDWATER LEVEL MEASURED 2 HRS AFTER COMPLETION | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | | |

* 3, x 5 : Numbers refer to
Sensitivity

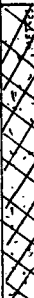
20
15 5 (%) STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 406B

METRIC

W P 90-13 LOCATION STA. 10+305 ; 0/5 26.0m RT FR. OF N-B/W Ramp ORIGINATED BY W.H.
 DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER COMPILED BY W.H.
 DATUM GEODETIC DATE 90.09.28 CHECKED BY TCK

| SOIL PROFILE | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT | | | UNIT WEIGHT Y | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL | |
|--------------|----------------------|---|--------|------|-------------------------|-----------------|--|-----------------|---|---|----------------|------------------|--|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | | | N' VALUES | 20 40 60 80 100 | Wp | W | W _L | | | |
| 219.5 0.0 | GROUND SURFACE | | | | | | | | | | | | | |
| 5 | SAND (FILL) (SSM) |  | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | |
| 219.4 0.1 | ORGANIC SILT | | | | | | | | | | | | | |
| 218.9 0.6 | | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

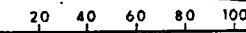
+3, x5: Numbers refer to Sensitivity

20
15
10
5 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 407

METRIC

W P 90-13 LOCATION STA. 10+333 ; O/S 22.7m RT FA. & OF N-E/W Ramp ORIGINATED BY WH
 DIST 2 HWY 126 BOREHOLE TYPE 14.5 AUGER COMPILED BY WH
 DATUM Geodetic DATE 90-02-28 CHECKED BY TCK

| 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 (%) |
|--------------|------------------------------------|------------|---------|------|-----------|-------------------------|-----------------|---|---------------------------------|-------------------------------|--------------------------------|------------------|---------------------------------------|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | N' VALUES | | | | | | | | |
| 2632 0.0 | GROUND SURFACE | | | | | | | | | | | | |
| 2631 1.0 | CLAYEY SILT (Fill) | | | | | | | | | | | | |
| 2630 1.8 | BROWN D. BROWN TO BLACK PEAT | | 1 | SS | 5 | | 268 | | | | | | |
| 2629 2.5 | | | 2 | SS | 1 | | 266 | | | | | | |
| 2628 4.0 | ORGANIC SILT D. BROWN TO BLACK | | 3 | SS | 1 | | ESTIMATED | | | | | | |
| 2627 5.5 | SILTY SAND GREY | | 4 | SS | 11 | | 264 | | | | | | |
| 2626 8.1 | | | 5 | SS | 10 | | 262 | | | | | | |
| 2625 8.1 | CLAYEY SILT | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

METRIC

W P 90-13 LOCATION STA. 10+333 ; O/S 21.7m RT. FR. & OF N-E/W RAMP ORIGINATED BY W.H.
DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER COMPILED BY W.H.
DATUM GEODETTIC DATE 90.09.28 CHECKED BY TCK

[illegible]

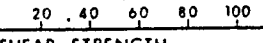
OFFICE REPORT ON SOIL EXPLORATION

+3, x5: Numbers refer to Sensitivity

RECORD OF BOREHOLE No 408

METRIC

W P CONT. 90.13 LOCATION STA. 10+385; O/S 26.4m RT FR E OF N-E/W Ramp ORIGINATED BY W.H.
 DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER COMPILED BY W.H.
 DATUM Geodetic DATE 901003 CHECKED BY TCK

| 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 (%) |
|--------------|--------------------------------|-------------|---------|------|-------------------------|-----------------|---|---------------------------------|-------------------------------|--------------------------------|------------------|---------------------------------------|
| ELEV. DEPTH | DESCRIPTION | STRAT. PLOT | NUMBER | TYPE | | | | | | | | |
| 269.8 | GROUND SURFACE | | | | | | | | | | | |
| 0.0 | CLAYEY SILT (FILL) | | | | | | | | | | | |
| 268.6 | BROWN | | | | | | | | | | | |
| 1.2 | PEAT D. BROWN TO BLACK | | 1 | SS | 4 | 268 | | | | | | |
| 267.2 | | | | | | | | | | | | |
| 2.0 | ORGANIC SILT | | 2 | SS | 2 | | | | | | | |
| 265.8 | small shells D. BROWN TO BLACK | | | | | 266 | | | | | | |
| 4.0 | SILTY SAND grey | | | | | ESTIMATED | | | | | | |
| 264.8 | | | 3 | SS | 7 | | | | | | | |
| 5.0 | CLAYEY SILT (MCL) | | | | | 264 | | | | | | |
| 20 | | | | | | | | | | | | |
| 25 | DRY CAVE @ 1.2m | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 409

METRIC

W P 20-13 LOCATION STA. 10+385; O/S 3.5m RT FR. E OF N-E/W RAMP ORIGINATED BY W.H.
 DIST 2 HWY 126 BOREHOLE TYPE H.S. Aug 58 COMPILED BY W.H.
 DATUM GEODETIC DATE 90-10-05 CHECKED BY TCK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT <u>2</u> | | 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 40 60 80 100 | | | | | | |
| 2727 0.0 | GROUND SURFACE | | | | | | | | | | | | | |
| 2757 1.8 | SAND & GRAVEL (FILL) | | | | | | | | | | | | | |
| 2757 1.8 | | | 1 | CS | | | 276 | | | | | | | |
| | CLAYEY SILT. (FILL) | | | | | | 274 | | | | | | | |
| | | | | | | | 272 | | | | | | | |
| | | | 2 | SS | 16 | | 270 | | | | | | | |
| | | | 3 | SS | 23 | | | | | | | | | |
| 2652 6.5 | SAND (FILL) Some SILT (SSM) | | 4 | SS | 26 | | 268 | | | | | | | |
| 2652 6.5 | | | 5 | SS | 6 | | | | | | | | | |
| 2652 6.5 | ORGANIC SILT BROWN 10mm TEST SEAM | | 6 | SS | 13 | | 266 | | | | | | | |
| 2652 6.5 | SILTY SAND (GRAVEL 4%) | | 7 | SS | 8 | | | | | | | | | |
| 2652 6.5 | CLAYEY SILT (FILL) | | | | | | | | | | | | | |
| | CLAY @ 3.7m | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

+3, x5: Numbers refer to
Sensitivity

20
15 \div 5 (%) STRAIN AT FAILURE
10

METRIC

WP CONT 90-13

LOCATION STA. 10+422 ; 0/5 26.0m RT FR. ϕ OF N-E/W Ramp

ORIGINATED BY WH

DIST 2 HWY 126

BOREHOLE TYPE U.S. AUGER

COMPILED BY W/H

DATUM GEODETIC

DATE 20 10 03

CHECKED BY TCR

[illegible]

OFFICE REPORT ON SOIL EXPLORATION

⁺³, ^{x5} : Numbers refer to Sensitivity

20
15 ϕ 5 (%) STRAIN AT FAILURE
10



METRIC

W P 20-13 LOCATION STA. 9+700; 0/5 21.4 m LT FR. E OF BRADLEY AVE. ORIGINATED BY W.H.
DIST 2 HWY 126 BOREHOLE TYPE U.S. AUGER COMPILED BY W.H.
DATUM GEODETIC DATE 20-10-09 CHECKED BY TCK

| 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 (%) |
|---------------|-----------------------|------------|---------|------|------------|----------------------------|-----------------|---|----|------------------------------------|-------------------------------------|-----------------------------------|---------------------|---|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | 'N' VALUES | | | 20 | 40 | | | | | |
| | | | | | | | | | | | | | | |
| 270.1 | GROUND SURFACE | | | | | | | | | | | | | |
| 269.2 | CLAYEY SILT (FILL) | | | | | | | | | | | | | |
| 268.3 | SAND (FILL) | | | | | | | | | | | | | |
| 267.4 | ORGANIC SILT D. BROWN | | | | | | | | | | | | | |
| 266.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 265.6 | SILT (FILL) | | | | | | | | | | | | | |
| 264.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 263.8 | SAND (FILL) | | | | | | | | | | | | | |
| 262.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 262.0 | SAND (FILL) | | | | | | | | | | | | | |
| 261.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 260.2 | SAND (FILL) | | | | | | | | | | | | | |
| 259.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 258.4 | SAND (FILL) | | | | | | | | | | | | | |
| 257.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 256.6 | SAND (FILL) | | | | | | | | | | | | | |
| 255.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 254.8 | SAND (FILL) | | | | | | | | | | | | | |
| 253.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 253.0 | SAND (FILL) | | | | | | | | | | | | | |
| 252.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 251.2 | SAND (FILL) | | | | | | | | | | | | | |
| 250.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 249.4 | SAND (FILL) | | | | | | | | | | | | | |
| 248.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 247.6 | SAND (FILL) | | | | | | | | | | | | | |
| 246.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 245.8 | SAND (FILL) | | | | | | | | | | | | | |
| 244.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 244.0 | SAND (FILL) | | | | | | | | | | | | | |
| 243.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 242.2 | SAND (FILL) | | | | | | | | | | | | | |
| 241.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 240.4 | SAND (FILL) | | | | | | | | | | | | | |
| 239.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 238.6 | SAND (FILL) | | | | | | | | | | | | | |
| 237.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 236.8 | SAND (FILL) | | | | | | | | | | | | | |
| 235.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 235.0 | SAND (FILL) | | | | | | | | | | | | | |
| 234.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 233.2 | SAND (FILL) | | | | | | | | | | | | | |
| 232.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 231.4 | SAND (FILL) | | | | | | | | | | | | | |
| 230.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 229.6 | SAND (FILL) | | | | | | | | | | | | | |
| 228.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 227.8 | SAND (FILL) | | | | | | | | | | | | | |
| 226.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 226.0 | SAND (FILL) | | | | | | | | | | | | | |
| 225.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 224.2 | SAND (FILL) | | | | | | | | | | | | | |
| 223.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 222.4 | SAND (FILL) | | | | | | | | | | | | | |
| 221.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 220.6 | SAND (FILL) | | | | | | | | | | | | | |
| 219.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 218.8 | SAND (FILL) | | | | | | | | | | | | | |
| 217.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 217.0 | SAND (FILL) | | | | | | | | | | | | | |
| 216.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 215.2 | SAND (FILL) | | | | | | | | | | | | | |
| 214.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 213.4 | SAND (FILL) | | | | | | | | | | | | | |
| 212.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 211.6 | SAND (FILL) | | | | | | | | | | | | | |
| 210.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 209.8 | SAND (FILL) | | | | | | | | | | | | | |
| 208.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 208.0 | SAND (FILL) | | | | | | | | | | | | | |
| 207.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 206.2 | SAND (FILL) | | | | | | | | | | | | | |
| 205.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 204.4 | SAND (FILL) | | | | | | | | | | | | | |
| 203.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 202.6 | SAND (FILL) | | | | | | | | | | | | | |
| 201.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 200.8 | SAND (FILL) | | | | | | | | | | | | | |
| 199.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 199.0 | SAND (FILL) | | | | | | | | | | | | | |
| 198.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 197.2 | SAND (FILL) | | | | | | | | | | | | | |
| 196.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 195.4 | SAND (FILL) | | | | | | | | | | | | | |
| 194.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 193.6 | SAND (FILL) | | | | | | | | | | | | | |
| 192.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 191.8 | SAND (FILL) | | | | | | | | | | | | | |
| 190.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 190.0 | SAND (FILL) | | | | | | | | | | | | | |
| 189.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 188.2 | SAND (FILL) | | | | | | | | | | | | | |
| 187.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 186.4 | SAND (FILL) | | | | | | | | | | | | | |
| 185.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 184.6 | SAND (FILL) | | | | | | | | | | | | | |
| 183.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 182.8 | SAND (FILL) | | | | | | | | | | | | | |
| 181.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 181.0 | SAND (FILL) | | | | | | | | | | | | | |
| 180.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 179.2 | SAND (FILL) | | | | | | | | | | | | | |
| 178.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 177.4 | SAND (FILL) | | | | | | | | | | | | | |
| 176.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 175.6 | SAND (FILL) | | | | | | | | | | | | | |
| 174.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 173.8 | SAND (FILL) | | | | | | | | | | | | | |
| 172.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 172.0 | SAND (FILL) | | | | | | | | | | | | | |
| 171.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 170.2 | SAND (FILL) | | | | | | | | | | | | | |
| 169.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 168.4 | SAND (FILL) | | | | | | | | | | | | | |
| 167.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 166.6 | SAND (FILL) | | | | | | | | | | | | | |
| 165.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 164.8 | SAND (FILL) | | | | | | | | | | | | | |
| 163.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 163.0 | SAND (FILL) | | | | | | | | | | | | | |
| 162.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 161.2 | SAND (FILL) | | | | | | | | | | | | | |
| 160.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 159.4 | SAND (FILL) | | | | | | | | | | | | | |
| 158.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 157.6 | SAND (FILL) | | | | | | | | | | | | | |
| 156.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 155.8 | SAND (FILL) | | | | | | | | | | | | | |
| 154.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 154.0 | SAND (FILL) | | | | | | | | | | | | | |
| 153.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 152.2 | SAND (FILL) | | | | | | | | | | | | | |
| 151.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 150.4 | SAND (FILL) | | | | | | | | | | | | | |
| 149.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 148.6 | SAND (FILL) | | | | | | | | | | | | | |
| 147.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 146.8 | SAND (FILL) | | | | | | | | | | | | | |
| 145.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 145.0 | SAND (FILL) | | | | | | | | | | | | | |
| 144.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 143.2 | SAND (FILL) | | | | | | | | | | | | | |
| 142.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 141.4 | SAND (FILL) | | | | | | | | | | | | | |
| 140.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 139.6 | SAND (FILL) | | | | | | | | | | | | | |
| 138.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 137.8 | SAND (FILL) | | | | | | | | | | | | | |
| 136.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 136.0 | SAND (FILL) | | | | | | | | | | | | | |
| 135.1 | PEAT (FILL) | | | | | | | | | | | | | |
| 134.2 | SAND (FILL) | | | | | | | | | | | | | |
| 133.3 | PEAT (FILL) | | | | | | | | | | | | | |
| 132.4 | SAND (FILL) | | | | | | | | | | | | | |
| 131.5 | PEAT (FILL) | | | | | | | | | | | | | |
| 130.6 | SAND (FILL) | | | | | | | | | | | | | |
| 129.7 | PEAT (FILL) | | | | | | | | | | | | | |
| 128.8 | SAND (FILL) | | | | | | | | | | | | | |
| 127.9 | PEAT (FILL) | | | | | | | | | | | | | |
| 127.0 | SAND (FILL) | | | | | | | | | | | | | |
| 126.1 | PEAT (F | | | | | | | | | | | | | |

+3, x5 : Numbers refer to Sensitivity

20
15 ϕ S (%) STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 414

METRIC

W P 20-13 LOCATION STA. 9+72.8; P/S 26.0 m RT FR. C. F. BRADLEY AVE. ORIGINATED BY WCH
 DIST 2 HWY 126 BOREHOLE TYPE 1.5 Auger COMPILED BY W-14
 DATUM Geodetic DATE 20-10-05 CHECKED BY TCK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT <u>2</u> 20 40 60 80 100 SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE | 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 | | | | | | | | |
| 26.25 | GROUND SURFACE | | | | | | | | | | | | |
| 26.00 | CLAYEY SILT (TTL) | | | | | | | | | | | | |
| 25.75 | SAND (FILL) | | | | | | | | | | | | |
| 25.50 | Tr. Silt (SSM) BROWN | | 1 | CS | | | | | | | | | |
| 25.25 | PEAT BLACK | | 2 | SS | 3 | | | | | | | | |
| 25.00 | SILTY SAND GREY | | | | | | | | | | | | |
| 24.75 | CLAYEY SILT (TTL) | | 3 | CS | | | | | | | | | |
| 24.50 | | | | | | | | | | | | | |
| 24.25 | | | | | | | | | | | | | |
| 24.00 | | | | | | | | | | | | | |
| 23.75 | | | | | | | | | | | | | |
| 23.50 | | | | | | | | | | | | | |
| 23.25 | | | | | | | | | | | | | |
| 23.00 | | | | | | | | | | | | | |
| 22.75 | | | | | | | | | | | | | |
| 22.50 | | | | | | | | | | | | | |
| 22.25 | | | | | | | | | | | | | |
| 22.00 | | | | | | | | | | | | | |
| 21.75 | | | | | | | | | | | | | |
| 21.50 | | | | | | | | | | | | | |
| 21.25 | | | | | | | | | | | | | |
| 21.00 | | | | | | | | | | | | | |
| 20.75 | | | | | | | | | | | | | |
| 20.50 | | | | | | | | | | | | | |
| 20.25 | | | | | | | | | | | | | |
| 20.00 | | | | | | | | | | | | | |
| 19.75 | | | | | | | | | | | | | |
| 19.50 | | | | | | | | | | | | | |
| 19.25 | | | | | | | | | | | | | |
| 19.00 | | | | | | | | | | | | | |
| 18.75 | | | | | | | | | | | | | |
| 18.50 | | | | | | | | | | | | | |
| 18.25 | | | | | | | | | | | | | |
| 18.00 | | | | | | | | | | | | | |
| 17.75 | | | | | | | | | | | | | |
| 17.50 | | | | | | | | | | | | | |
| 17.25 | | | | | | | | | | | | | |
| 17.00 | | | | | | | | | | | | | |
| 16.75 | | | | | | | | | | | | | |
| 16.50 | | | | | | | | | | | | | |
| 16.25 | | | | | | | | | | | | | |
| 16.00 | | | | | | | | | | | | | |
| 15.75 | | | | | | | | | | | | | |
| 15.50 | | | | | | | | | | | | | |
| 15.25 | | | | | | | | | | | | | |
| 15.00 | | | | | | | | | | | | | |
| 14.75 | | | | | | | | | | | | | |
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| 14.00 | | | | | | | | | | | | | |
| 13.75 | | | | | | | | | | | | | |
| 13.50 | | | | | | | | | | | | | |
| 13.25 | | | | | | | | | | | | | |
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| 12.75 | | | | | | | | | | | | | |
| 12.50 | | | | | | | | | | | | | |
| 12.25 | | | | | | | | | | | | | |
| 12.00 | | | | | | | | | | | | | |
| 11.75 | | | | | | | | | | | | | |
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| 10.75 | | | | | | | | | | | | | |
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| 9.75 | | | | | | | | | | | | | |
| 9.50 | | | | | | | | | | | | | |
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| 9.00 | | | | | | | | | | | | | |
| 8.75 | | | | | | | | | | | | | |
| 8.50 | | | | | | | | | | | | | |
| 8.25 | | | | | | | | | | | | | |
| 8.00 | | | | | | | | | | | | | |
| 7.75 | | | | | | | | | | | | | |
| 7.50 | | | | | | | | | | | | | |
| 7.25 | | | | | | | | | | | | | |
| 7.00 | | | | | | | | | | | | | |
| 6.75 | | | | | | | | | | | | | |
| 6.50 | | | | | | | | | | | | | |
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| 5.00 | | | | | | | | | | | | | |
| 4.75 | | | | | | | | | | | | | |
| 4.50 | | | | | | | | | | | | | |
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| 4.00 | | | | | | | | | | | | | |
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| 2.00 | | | | | | | | | | | | | |
| 1.75 | | | | | | | | | | | | | |
| 1.50 | | | | | | | | | | | | | |
| 1.25 | | | | | | | | | | | | | |
| 1.00 | | | | | | | | | | | | | |
| 0.75 | | | | | | | | | | | | | |
| 0.50 | | | | | | | | | | | | | |
| 0.25 | | | | | | | | | | | | | |
| 0.00 | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 415

METRIC

W P 20-13 LOCATION STA. 9+72.8 ; 0.5 m LT FR. E OF BRADLEY AVE. ORIGINATED BY W.H.
 DIST 2 HWY 126 BOREHOLE TYPE 11 S. AUGER COMPILED BY W.H.
 DATUM GRADE DATE 20-10-09 CHECKED BY TOK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT <u>2</u> | 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 | | | | | | | | |
| 270.5 0.0 | GROUND SURFACE | | | | | | | | | | | | |
| 269.3 1.2 | SAND (FILL) CLAYEY SILT (SSM) | | | | | | | | | | | | |
| 268.4 2.1 | CLAYEY SILT (FILL) BROWN | | | | | | | | | | | | |
| 267.5 3.0 | SILTY SAND, GREY | | 1 | CS | | | | | | | | | |
| 266.5 4.0 | | | | | | | | | | | | | |
| 265.5 5.0 | | | | | | | | | | | | | |
| 264.5 6.0 | | | | | | | | | | | | | |
| 263.5 7.0 | | | | | | | | | | | | | |
| 262.5 8.0 | | | | | | | | | | | | | |
| 261.5 9.0 | | | | | | | | | | | | | |
| 260.5 10.0 | | | | | | | | | | | | | |
| 259.5 11.0 | | | | | | | | | | | | | |
| 258.5 12.0 | | | | | | | | | | | | | |
| 257.5 13.0 | | | | | | | | | | | | | |
| 256.5 14.0 | | | | | | | | | | | | | |
| 255.5 15.0 | | | | | | | | | | | | | |
| 254.5 16.0 | | | | | | | | | | | | | |
| 253.5 17.0 | | | | | | | | | | | | | |
| 252.5 18.0 | | | | | | | | | | | | | |
| 251.5 19.0 | | | | | | | | | | | | | |
| 250.5 20.0 | | | | | | | | | | | | | |
| 249.5 21.0 | | | | | | | | | | | | | |
| 248.5 22.0 | | | | | | | | | | | | | |
| 247.5 23.0 | | | | | | | | | | | | | |
| 246.5 24.0 | | | | | | | | | | | | | |
| 245.5 25.0 | | | | | | | | | | | | | |
| 244.5 26.0 | | | | | | | | | | | | | |
| 243.5 27.0 | | | | | | | | | | | | | |
| 242.5 28.0 | | | | | | | | | | | | | |
| 241.5 29.0 | | | | | | | | | | | | | |
| 240.5 30.0 | | | | | | | | | | | | | |
| 239.5 31.0 | | | | | | | | | | | | | |
| 238.5 32.0 | | | | | | | | | | | | | |
| 237.5 33.0 | | | | | | | | | | | | | |
| 236.5 34.0 | | | | | | | | | | | | | |
| 235.5 35.0 | | | | | | | | | | | | | |
| 234.5 36.0 | | | | | | | | | | | | | |
| 233.5 37.0 | | | | | | | | | | | | | |
| 232.5 38.0 | | | | | | | | | | | | | |
| 231.5 39.0 | | | | | | | | | | | | | |
| 230.5 40.0 | | | | | | | | | | | | | |
| 229.5 41.0 | | | | | | | | | | | | | |
| 228.5 42.0 | | | | | | | | | | | | | |
| 227.5 43.0 | | | | | | | | | | | | | |
| 226.5 44.0 | | | | | | | | | | | | | |
| 225.5 45.0 | | | | | | | | | | | | | |
| 224.5 46.0 | | | | | | | | | | | | | |
| 223.5 47.0 | | | | | | | | | | | | | |
| 222.5 48.0 | | | | | | | | | | | | | |
| 221.5 49.0 | | | | | | | | | | | | | |
| 220.5 50.0 | | | | | | | | | | | | | |
| 219.5 51.0 | | | | | | | | | | | | | |
| 218.5 52.0 | | | | | | | | | | | | | |
| 217.5 53.0 | | | | | | | | | | | | | |
| 216.5 54.0 | | | | | | | | | | | | | |
| 215.5 55.0 | | | | | | | | | | | | | |
| 214.5 56.0 | | | | | | | | | | | | | |
| 213.5 57.0 | | | | | | | | | | | | | |
| 212.5 58.0 | | | | | | | | | | | | | |
| 211.5 59.0 | | | | | | | | | | | | | |
| 210.5 60.0 | | | | | | | | | | | | | |
| 209.5 61.0 | | | | | | | | | | | | | |
| 208.5 62.0 | | | | | | | | | | | | | |
| 207.5 63.0 | | | | | | | | | | | | | |
| 206.5 64.0 | | | | | | | | | | | | | |
| 205.5 65.0 | | | | | | | | | | | | | |
| 204.5 66.0 | | | | | | | | | | | | | |
| 203.5 67.0 | | | | | | | | | | | | | |
| 202.5 68.0 | | | | | | | | | | | | | |
| 201.5 69.0 | | | | | | | | | | | | | |
| 200.5 70.0 | | | | | | | | | | | | | |
| 199.5 71.0 | | | | | | | | | | | | | |
| 198.5 72.0 | | | | | | | | | | | | | |
| 197.5 73.0 | | | | | | | | | | | | | |
| 196.5 74.0 | | | | | | | | | | | | | |
| 195.5 75.0 | | | | | | | | | | | | | |
| 194.5 76.0 | | | | | | | | | | | | | |
| 193.5 77.0 | | | | | | | | | | | | | |
| 192.5 78.0 | | | | | | | | | | | | | |
| 191.5 79.0 | | | | | | | | | | | | | |
| 190.5 80.0 | | | | | | | | | | | | | |
| 189.5 81.0 | | | | | | | | | | | | | |
| 188.5 82.0 | | | | | | | | | | | | | |
| 187.5 83.0 | | | | | | | | | | | | | |
| 186.5 84.0 | | | | | | | | | | | | | |
| 185.5 85.0 | | | | | | | | | | | | | |
| 184.5 86.0 | | | | | | | | | | | | | |
| 183.5 87.0 | | | | | | | | | | | | | |
| 182.5 88.0 | | | | | | | | | | | | | |
| 181.5 89.0 | | | | | | | | | | | | | |
| 180.5 90.0 | | | | | | | | | | | | | |
| 179.5 91.0 | | | | | | | | | | | | | |
| 178.5 92.0 | | | | | | | | | | | | | |
| 177.5 93.0 | | | | | | | | | | | | | |
| 176.5 94.0 | | | | | | | | | | | | | |
| 175.5 95.0 | | | | | | | | | | | | | |
| 174.5 96.0 | | | | | | | | | | | | | |
| 173.5 97.0 | | | | | | | | | | | | | |
| 172.5 98.0 | | | | | | | | | | | | | |
| 171.5 99.0 | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 416

METRIC

W P 90-13 LOCATION STA. 9+774; O/S 29.4m RT. FR. C.O.F. BRADLEY AVE. ORIGINATED BY VIA
 DIST 2 HWY 126 BOREHOLE TYPE U.S. AUGER COMPILED BY VIA
 DATUM Geodetic DATE 20 10 05 CHECKED BY TCK

| SOIL PROFILE | | SAMPLES | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT <u>2</u> | | NATURAL MOISTURE CONTENT | | | UNIT WEIGHT Y | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---------------|-------------------------------------|------------|--------|----------------------------|-----------------|--|------------|--------------------------------|------------------------------------|---|---------------------|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | | | TYPE | 'N' VALUES | 20 40 60 80 100 | PLASTIC LIMIT W _p | W | | |
| 260.5 0.0 | GROUND SURFACE | | | | | | | | | | | |
| 5 | SAND (FILL) TRACE SILT (SSM) | | 1 | SS | | | | | | | | |
| 10 | | | | | | | | | | | | |
| 15 | | | | | | | | | | | | |
| 263.9 5.0 | BROWN GRAY CLAYEY SILT (TILL) | | 2 | SS | 3 | | | | | | | |
| 262.7 6.6 | | | 3 | SS | 10 | | | | | | | |
| 25 | CAVE @ 1.8m | | | | | | | | | | | |
| 30 | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION



Ministry
of
Transportation
Ontario

RECORD OF BOREHOLE No 417B

METRIC

W P CONT. 20-13 LOCATION STA. 9+778.8; O/S 28.3m LT FR. E OF BRADLEY AVE ORIGINATED BY LWH
DIST 2 HWY 126 BOREHOLE TYPE H.S. Auger Pease House COMPILED BY LWH
DATUM Geodetic DATE 20 10 03 CHECKED BY TCK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 | SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE | PLASTIC LIMIT W _p NATURAL MOISTURE CONTENT W LIQUID LIMIT W _L WATER CONTENT (%) | UNIT WEIGHT γ | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|--------------|---------------------------------|-------------|---------|------|------------|-------------------------|-----------------|---|--|---|------------------|--|
| ELEV DEPTH | DESCRIPTION | STRAT. PLOT | NUMBER | TYPE | 'N' VALUES | | | | | | | |
| 269.7 8.0 | GROUND SURFACE | | | | | | | | | | | |
| 5 | SAND (FILL) (SSM) | | | | | | 268 | | | | | |
| 10 | | | | | | | 266 | | | | | |
| 15 | BROWN PEAT D. BROWN TO BLACK | | | | | | | | | | | |
| 264.8 4.5 | PEAT | | | | | | | | | | | |
| 264.2 5.5 | ORGANIC SILT | | | | | | 264 | | | | | |
| 263.8 6.1 | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | |
| 30 | DRY CAVE @ 1.2m | | | | | | | | | | | |
| 35 | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | |

+³, x⁵: Numbers refer to
Sensitivity

20
15 - 5 (%) STRAIN AT FAILURE
10

OFFICE REPORT ON SOIL EXPLORATION

RECORD OF BOREHOLE No 412

METRIC

W P 90-13 LOCATION STA. 9+824 ; O/S 27.6m RT FR. 40 F BRADLEY AVE. ORIGINATED BY V.H.
 DIST 2 HWY 126 BOREHOLE TYPE U.S. AUGER COMPILED BY V.H.
 DATUM GEODETIC DATE 20.10.05 CHECKED BY TCK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT <u>2</u> | | 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 | 40 | | | | | |
| 260.4 | GROUND SURFACE | | | | | | | | | | | | | |
| 5 | SAND (FILL) TR. SILT (SSM) BROWN | | 1 | SS | 6 | | | | | | | | | |
| 10 | BROWN | | | | | | | | | | | | | |
| 10.4 | ORGANIC CLAYEY SILT BLACK | | 2 | ES | | | | | | | | | | |
| 10.8 | CLAYEY SILT (TILL) GREY | | 3 | ES | | | | | | | | | | |
| 15 | | | | | | | | | | | | | | |
| 15.6 | | | | | | | | | | | | | | |
| 20 | BH. DRY & OPEN UPON COMPLETION | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

+³, x⁵: Numbers refer to Sensitivity

20
15 ± 5 (%) STRAIN AT FAILURE
10

METRIC

W P 90-13 LOCATION STA. 9+809; 0/S 37.6 MLT FR. G. OF BRADLEY MS. ORIGINATED BY W.H.
DIST 2 HWY 126 BOREHOLE TYPE 11.5 AUGER COMPILED BY W.H.
DATUM GEODETIC DATE 90 10 05 CHECKED BY TCK

[illegible]

OFFICE REPORT ON SOIL EXPLORATION

+3, x5 : Numbers refer to Sensitivity

20
15 ϕ 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 420

METRIC

W.P. CONT. 90-13 LOCATION STA 10+349; 0/S 25.1m RT FR. Q DEN-EN Ramp
 DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER
 DATUM GEODETIC DATE 90-10-03
 ORIGINATED BY W.J. COMPILED BY W.M. CHECKED BY T.C.K.

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 | SHEAR STRENGTH O UNCONFINED + FIELD VANE X QUICK TRIAXIAL X LAB VANE | PLASTIC LIMIT W _p NATURAL MOISTURE CONTENT W LIQUID LIMIT W _L | WATER CONTENT (%) | UNIT WEIGHT γ | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|--------------|-------------------|------------|---------|------|------------|-------------------------|-----------------|---|--|--|-------------------|------------------|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | 'N' VALUES | | | | | | | | |
| 26.25 | GROUND SURFACE | | | | | | | | | | | | |
| 0.0 | CLAYEY SILT (FIL) | | | | | | | | | | | | |
| 26.20 | BROWN | | | | | | | | | | | | |
| 0.2 | PEAT | | | | | | | | | | | | |
| 26.70 | BLACK | | | | | | | | | | | | |
| 2.1 | SANDY SILT | | | | | | | | | | | | |
| 26.70 | GRAY | | | | | | | | | | | | |
| 2.7 | FINE SAND | | | | | | | | | | | | |
| 26.70 | BROWN | | | | | | | | | | | | |
| 2.7 | TOILET - 20% SILT | | | | | | | | | | | | |
| 26.42 | | | | | | | | | | | | | |
| 5.0 | | | | | | | | | | | | | |
| 20 | | | | | | | | | | | | | |
| 25 | | | | | | | | | | | | | |
| 30 | | | | | | | | | | | | | |
| 35 | | | | | | | | | | | | | |
| 40 | | | | | | | | | | | | | |
| 45 | | | | | | | | | | | | | |
| 50 | | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

+3, x5: Numbers refer to Sensitivity

20
15
10
5 (%) STRAIN AT FAILURE

METRIC

WP CONT. 20-13

LOCATION STA. 10+349; 0/S 3.7m RT FR. ϕ OF N-E/W RAMP

ORIGINATED BY WU

DIST 2 HWY 126

BOREHOLE TYPE W.S. Auger

COMPILED BY W4

DATUM GEODETIC

DATE 20.10.03

CHECKED BY TCK

| 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 40 60 80 100 | | | | | | | | | |
| | | | | | | | | SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE | | | | | | | | | |
| | | | | | | | WATER CONTENT (%) | | | | | | | | | | |
| 2766 | GROUND SURFACE | | | | | | 276 | | | | | | | | | | |
| 2757 | SAND & GRAVEL (FILL) | | | | | | | | | | | | | | | | |
| 2750 | CLAYEY SILT (FILL) | | | | | | | | | | | | | | | | |
| 2700 | | | | | | | | | | | | | | | | | |
| 2690 | SAND (FILL). TR. SILT (SSM) BROWN | | 1 | SS | 19 | | 270 | | | | | | | | | | |
| 2678 | | | 2 | SS | 23 | | | | | | | | | | | | |
| 2670 | SILTY SAND - GRAY | | 3 | SS | 14 | ESTIMATED | 268 | | | | | | | | | | |
| 2660 | CLAYEY SILT (FILL) | | | | | | | | | | | | | | | | |
| BH. DRY & OPEN @ COMPLETION | | | | | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

+3, x5: Numbers refer to Sensitivity

20
15 ϕ 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 422

METRIC

W.P. 20-13 LOCATION STA. 10+330; O/S 12.5m RT FR. Q OF N-EW Ramp ORIGINATED BY W.H.
DIST 2 HWY 126 BOREHOLE TYPE 1.5 Auger COMPILED BY W.H.
DATUM Geodetic DATE 20-10-01 CHECKED BY TCK

| SOIL PROFILE | | | SAMPLES | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT | | | | | PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT | | | UNIT WEIGHT γ | REMARKS & GRAIN SIZE DISTRIBUTION (%) |
|----------------|---|-------------|---------|------|----------------------------|-----------------|---|----|----|----|----|---|----------------|---|------------------|---|
| ELEV. DEPTH | DESCRIPTION | STRAT. PLOT | NUMBER | TYPE | | | VALUES | 20 | 40 | 60 | 80 | 100 | W _p | W | | |
| 271.2 0.0 | GROUND SURFACE | | | | | | | | | | | | | | | |
| 265.0 6.0 | CLAYEY SILT (FILL) TR. SAND & GRAVEL | | | | | | | | | | | | | | | |
| 265.0 9.0 | SAND FILL (SSM) | | 1 | SS | 7 | | | | | | | | | | | |
| 264.2 7.0 | | | 2 | SS | 7 | | | | | | | | | | | |
| 264.2 7.0 | | | 3 | SS | 29 | | | | | | | | | | | |
| 264.2 7.0 | | | 4 | SS | 15 | | | | | | | | | | | |
| 264.2 7.0 | SILTY SAND TO BROWN GRBY SAND | | 6 | SS | 12 | | | | | | | | | | | |
| 264.2 7.0 | | | 7 | SS | 6 | | | | | | | | | | | |
| 251.4 19.8 | | | | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

+3, x5: Numbers refer to
Sensitivity

20
15
10
5 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 423

METRIC

W P 90-13 LOCATION STA. 10+322; O/S 12.4m RT FR. C OF N-E/W RAMP ORIGINATED BY WH
 DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER COMPILED BY WH
 DATUM GEODETIC DATE 90.10.02 CHECKED BY TCK

| SOIL PROFILE | | | SAMPLES | | | GROUND WATER CONDITIONS | ELEVATION SCALE | DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 | SHEAR STRENGTH ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE | PLASTIC LIMIT W _p NATURAL MOISTURE CONTENT W LIQUID LIMIT W _L | UNIT WEIGHT Y | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---------------|---|------------|---------|------|------------|----------------------------|-----------------|--|--|--|------------------|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE | 'N' VALUES | | | | | | | |
| 27.3 0.0 | GROUND SURFACE | | | | | | | | | | | |
| 5 | CLAYEY SILT (Fill) Trace Sand & Gravel | | 1 | CS | | | 270 | | | | | |
| 10 | | | | | | | | | | | | |
| 15 | SAND (Fill) (SSM) | | 2 | CS | | | 268 | | | | | |
| 20 | | | | | | | 266 | | | | | |
| 25 | BROWN D. BROWN TO BLACK | | 3 | SS | 5 | | 264 | | | | | |
| 30 | ORGANIC SILT OC. TEXT LAMINAR & WOOD FRAGMENTS | | 4 | SS | 2 | | 262 | | | | | |
| 35 | | | | | | | | | | | | |
| 40 | INCL. CLAY CONTENT D. BROWN | | 5 | SS | 4 | | | | | | | |
| 45 | CLAYEY SILT (TILL) | | 6 | SS | 8 | | 260 | | | | | |
| 50 | | | | | | | | | | | | |
| 55 | | | | | | | | | | | | |
| 60 | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION

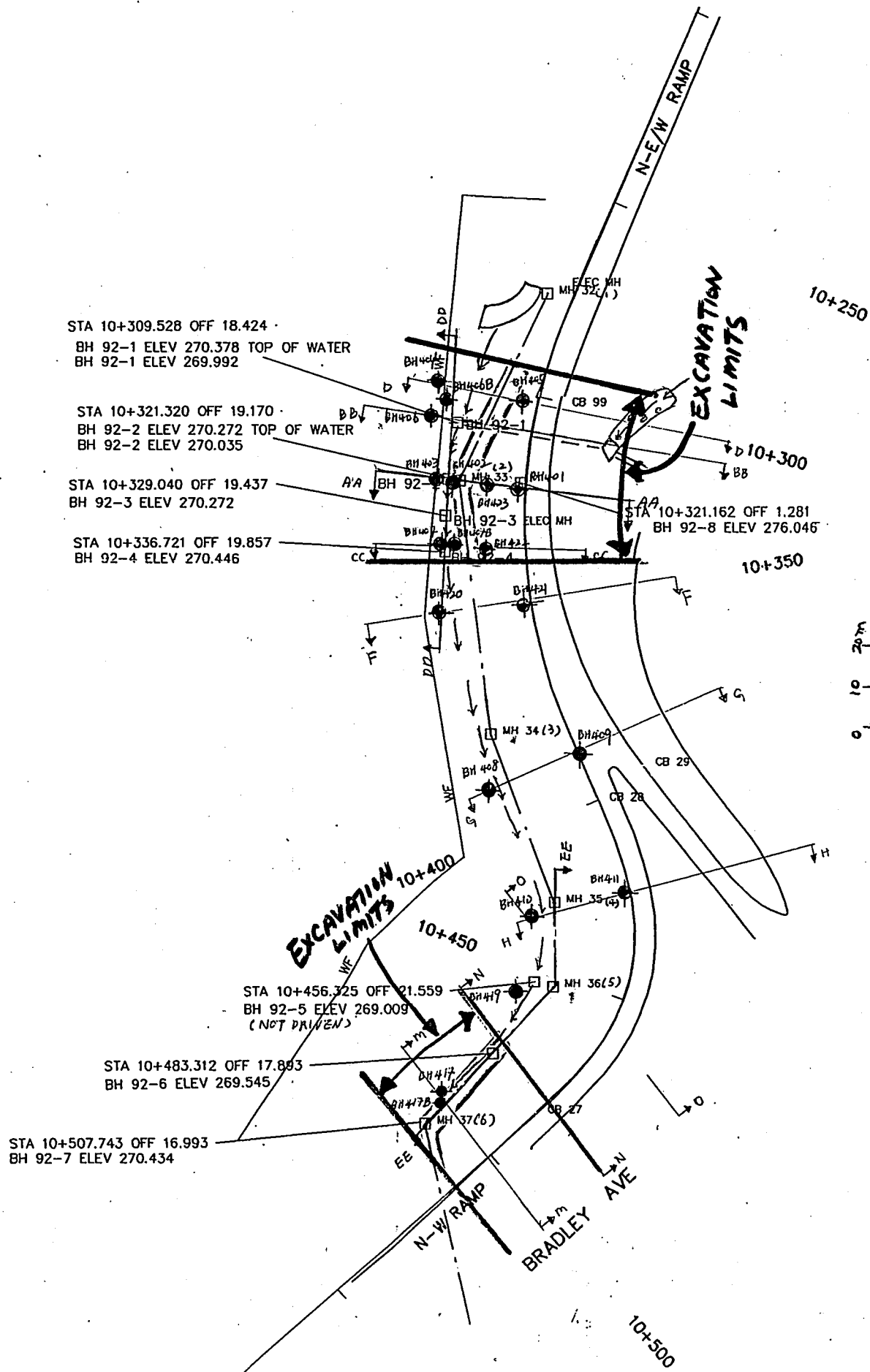
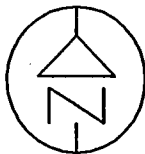
RECORD OF BOREHOLE No 424

METRIC

W P 90-13 LOCATION STA. 10+310; O/S 142M RT FR. 1/2 OF N-1/4 RAMP ORIGINATED BY W.H.
 DIST 2 HWY 126 BOREHOLE TYPE H.S. AUGER COMPILED BY W.H.
 DATUM GEODETIC DATE 90-10-01 CHECKED BY TCK

| 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 Y | REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL |
|---------------|--|------------|---------|----------------|----------------------------|-----------------|--|----------------|------------------------------------|-------------------------------------|-----------------------------------|---------------------|--|
| ELEV DEPTH | DESCRIPTION | STRAT PLOT | NUMBER | TYPE VALUES | | | 20 40 60 80 100 | SHEAR STRENGTH | | | | | |
| FEET | | | | | | | ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE | | | | | | |
| 272.1 | GROUND SURFACE | | | | | 272 | | | | | | | |
| 0.0 | CLAYEY SILT (FILL) | | | | | | | | | | | | |
| 5 | TR. SAND & GRAVEL | | 1 | SS 8 | | 270 | | | | | | | |
| 10 | | | 2 | SS 12 | | | | | | | | | |
| 268.1 | | | | | | 268 | | | | | | | |
| 15 | SAND (FILL) | | 3 | SS 7 | | | | | | | | | |
| 20 | (SSM) | | 4 | SS 2 | | 266 | | | | | | | |
| 25 | | | 5 | SS 3 | | | | | | | | | |
| 264.7 | BROWN | | 6 | SS 1 | | 264 | | | | | | | |
| 7.9 | D. BROWN TO BLACK | | 7 | SS 2 | | | | | | | | | |
| 30 | ORGANIC SILT | | 8 | SS 2 | | 262 | | | | | | | |
| 35 | LAMINATED PEAT SEAMS | | 9 | SS 1 | | | | | | | | | |
| 40 | DECOMPOSED WOOD | | 10 | SS 2 | | 260 | | | | | | | |
| 45 | | | 11 | SS 2 | | | | | | | | | |
| 259.5 | D. BROWN TO BLACK | | 12 | SS 2 | | 258 | | | | | | | |
| 14.6 | INTERLAYERED CLAYEY SILT TO SILTY SAND | | 13 | SS 2 | | | | | | | | | |
| 50 | SILTY SAND | | 14 | SS 2 | | | | | | | | | |
| 55 | | | 15 | SS 2 | | | | | | | | | |
| 60 | CAVE @ 4.6m | | | | | | | | | | | | |
| 65 | | | | | | | | | | | | | |
| 70 | | | | | | | | | | | | | |
| 75 | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | |
| 85 | | | | | | | | | | | | | |
| 90 | | | | | | | | | | | | | |
| 95 | | | | | | | | | | | | | |
| 99 | | | | | | | | | | | | | |

OFFICE REPORT ON SOIL EXPLORATION



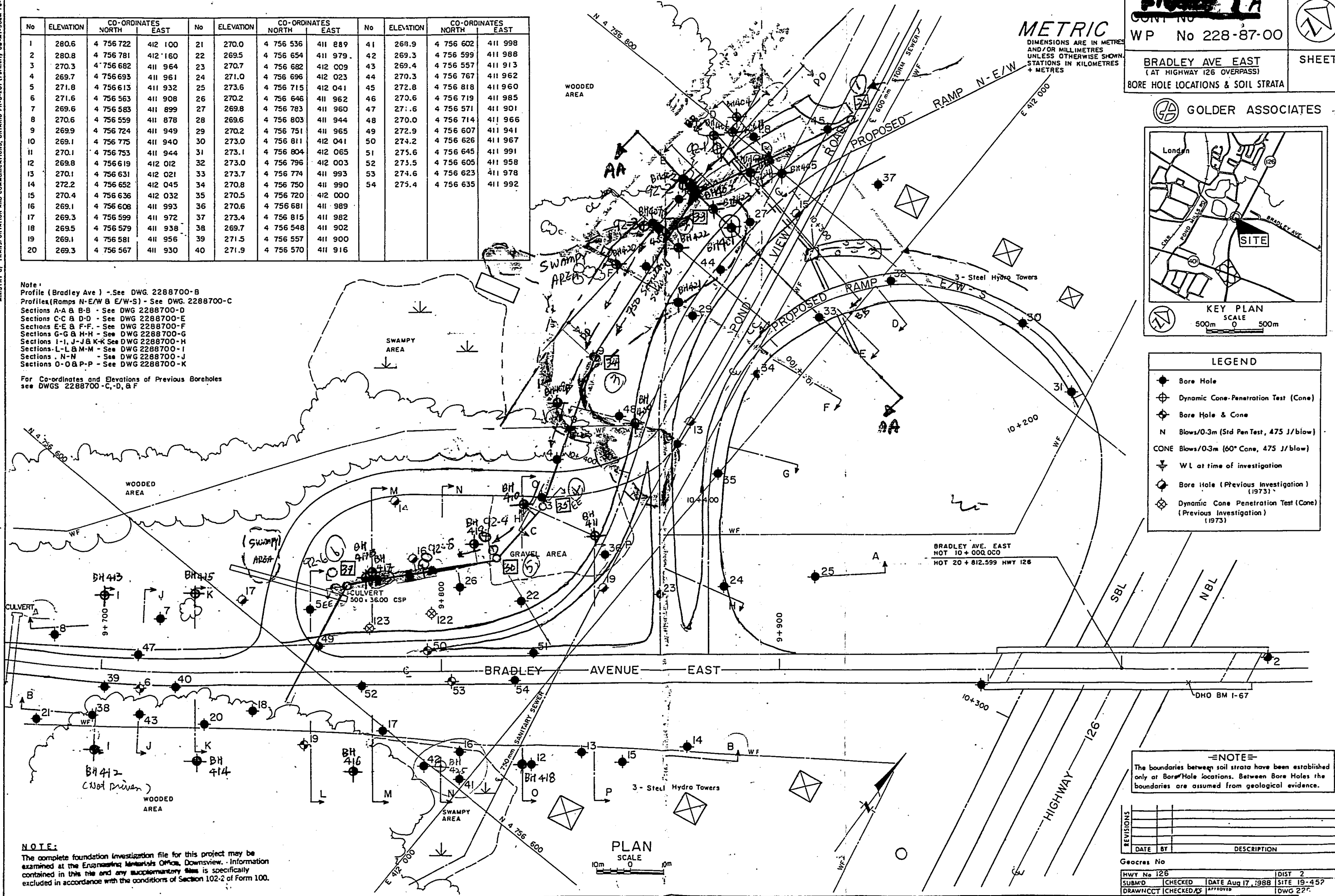
0 10 20 M
SCALE

FIGURE 1.

| No | ELEVATION | CO-ORDINATES NORTH | CO-ORDINATES EAST | No | ELEVATION | CO-ORDINATES NORTH | CO-ORDINATES EAST | No | ELEVATION | CO-ORDINATES NORTH | CO-ORDINATES EAST |
|----|-----------|--------------------|-------------------|----|-----------|--------------------|-------------------|----|-----------|--------------------|-------------------|
| 1 | 280.6 | 4 756 722 | 412 100 | 21 | 270.0 | 4 756 536 | 411 889 | 41 | 268.9 | 4 756 602 | 411 998 |
| 2 | 280.8 | 4 756 781 | 412 160 | 22 | 269.5 | 4 756 654 | 411 979 | 42 | 269.3 | 4 756 599 | 411 988 |
| 3 | 270.3 | 4 756 682 | 411 964 | 23 | 270.7 | 4 756 682 | 412 009 | 43 | 269.4 | 4 756 557 | 411 913 |
| 4 | 269.7 | 4 756 693 | 411 961 | 24 | 271.0 | 4 756 696 | 412 023 | 44 | 270.3 | 4 756 767 | 411 962 |
| 5 | 271.8 | 4 756 613 | 411 932 | 25 | 273.6 | 4 756 715 | 412 041 | 45 | 272.8 | 4 756 818 | 411 960 |
| 6 | 271.6 | 4 756 563 | 411 908 | 26 | 270.2 | 4 756 646 | 411 962 | 46 | 270.6 | 4 756 719 | 411 985 |
| 7 | 269.6 | 4 756 583 | 411 899 | 27 | 269.8 | 4 756 783 | 411 960 | 47 | 271.6 | 4 756 571 | 411 901 |
| 8 | 270.6 | 4 756 559 | 411 878 | 28 | 269.6 | 4 756 803 | 411 944 | 48 | 270.0 | 4 756 714 | 411 966 |
| 9 | 269.9 | 4 756 724 | 411 949 | 29 | 270.2 | 4 756 751 | 411 965 | 49 | 272.9 | 4 756 607 | 411 941 |
| 10 | 269.1 | 4 756 775 | 411 940 | 30 | 273.0 | 4 756 811 | 412 041 | 50 | 274.2 | 4 756 626 | 411 967 |
| 11 | 270.1 | 4 756 753 | 411 944 | 31 | 273.1 | 4 756 804 | 412 065 | 51 | 275.6 | 4 756 645 | 411 991 |
| 12 | 269.8 | 4 756 619 | 412 012 | 32 | 273.0 | 4 756 796 | 412 003 | 52 | 273.5 | 4 756 605 | 411 958 |
| 13 | 270.1 | 4 756 631 | 412 021 | 33 | 273.7 | 4 756 774 | 411 993 | 53 | 274.6 | 4 756 623 | 411 978 |
| 14 | 272.2 | 4 756 652 | 412 045 | 34 | 270.8 | 4 756 750 | 411 990 | 54 | 275.4 | 4 756 635 | 411 992 |
| 15 | 270.4 | 4 756 636 | 412 032 | 35 | 270.5 | 4 756 720 | 412 000 | | | | |
| 16 | 269.1 | 4 756 608 | 411 993 | 36 | 270.6 | 4 756 681 | 411 989 | | | | |
| 17 | 269.3 | 4 756 599 | 411 972 | 37 | 273.4 | 4 756 815 | 411 982 | | | | |
| 18 | 269.5 | 4 756 579 | 411 938 | 38 | 269.7 | 4 756 548 | 411 902 | | | | |
| 19 | 269.1 | 4 756 581 | 411 956 | 39 | 271.5 | 4 756 557 | 411 900 | | | | |
| 20 | 269.3 | 4 756 567 | 411 930 | 40 | 271.9 | 4 756 570 | 411 916 | | | | |

Note:
 Profile (Bradley Ave) - See DWG. 2288700-B
 Profile (Ramps N-E/W & E-W-S) - See DWG. 2288700-C
 Sections A-A & B-B - See DWG. 2288700-D
 Sections C-C & D-D - See DWG. 2288700-E
 Sections E-E & F-F - See DWG. 2288700-F
 Sections G-G & H-H - See DWG. 2288700-G
 Sections I-I, J-J & K-K - See DWG. 2288700-H
 Sections L-L & M-M - See DWG. 2288700-I
 Sections N-N - See DWG. 2288700-J
 Sections O-O & P-P - See DWG. 2288700-K

For Co-ordinates and Elevations of Previous Boreholes
 see DWGS 2288700-C, -D, & F



NOTE:
 The complete foundation investigation file for this project may be examined at the Engineering Materials Office, Downsview. Information contained in this file and any supplementary files is specifically excluded in accordance with the conditions of Section 102-2 of Form 100.

FIGURE 1A
 CONT. NO. 3
 WP No 228-87-00
BRADLEY AVE EAST
 (AT HIGHWAY 126 OVERPASS)
 BORE HOLE LOCATIONS & SOIL STRATA

GOLDER ASSOCIATES

KEY PLAN
 SCALE 0 500m 500m

LEGEND

- Bore Hole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ⊗ Bore Hole & Cone
- N Blows/0.3m (Std Pen Test, 475 J/blow)
- CONE Blows/0.3m (60° Cone, 475 J/blow)
- W.L. at time of investigation
- ⊙ Bore Hole (Previous Investigation) (1973)
- ⊗ Dynamic Cone Penetration Test (Cone) (Previous Investigation) (1973)

NOTE
 The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

REVISIONS

| DATE | BY | DESCRIPTION |
|------|----|-------------|
| | | |
| | | |
| | | |
| | | |


Geocres No
 HWY No 126
 SUBNO 126
 DATE Aug 17, 1988
 SITE 19-452
 DWG 228

METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES.

CONT No
WP No 228-87-00

BRADLEY AVE EAST
(AT HIGHWAY 126 OVERPASS)
BORE HOLE LOCATIONS & SOIL STRATA

SHEET 1





 **GOLDER ASSOCIATES**

NOTES

See DWG 2288700-A for
location of sections

Boreholes offset from section
line as shown on plan

LEGEND

- | | |
|---|---------------------------------------|
|  | Bore Hole |
|  | Dynamic Cone Penetration Test (Cone) |
|  | Bore Hole & Cone |
| N | Blows/0.3m (Std Pen Test, 475 J/blow) |
| CONE | Blows/0.3m (60° Cone, 475 J/blow) |
|  | WL at time of investigation |

[illegible]

NOTE

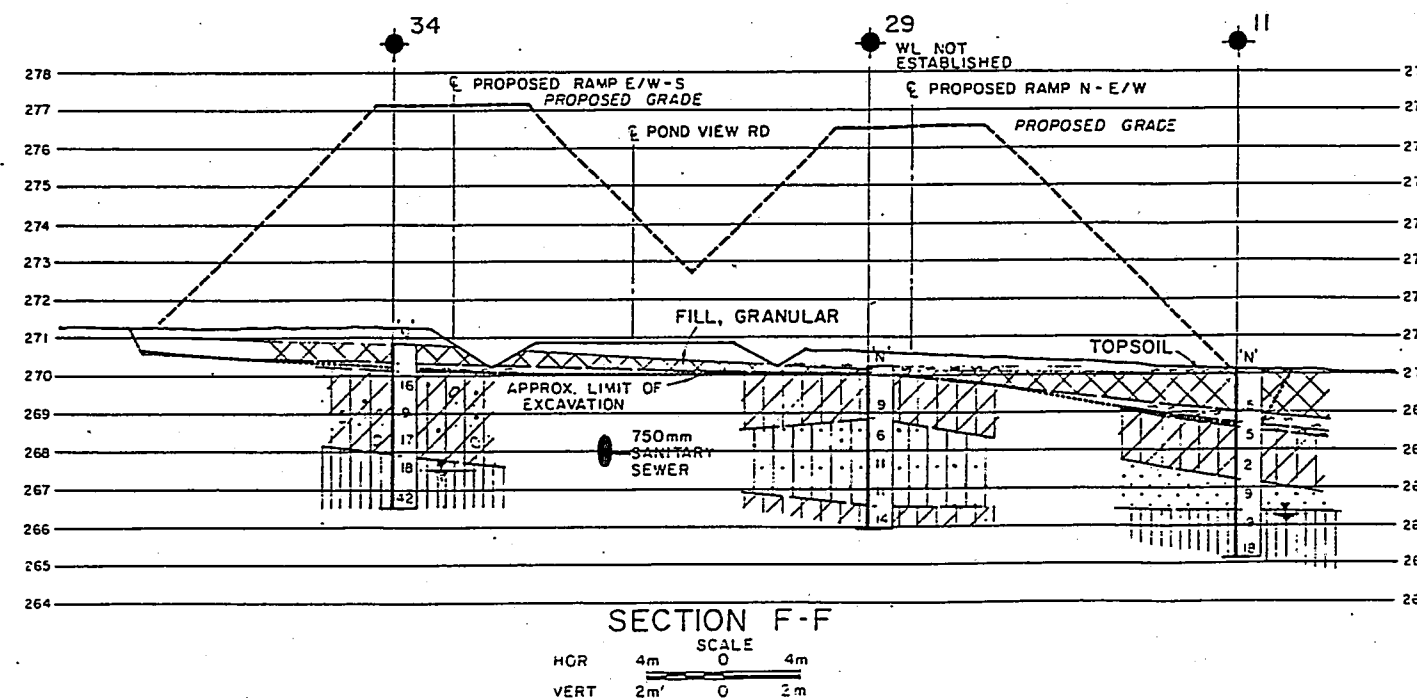
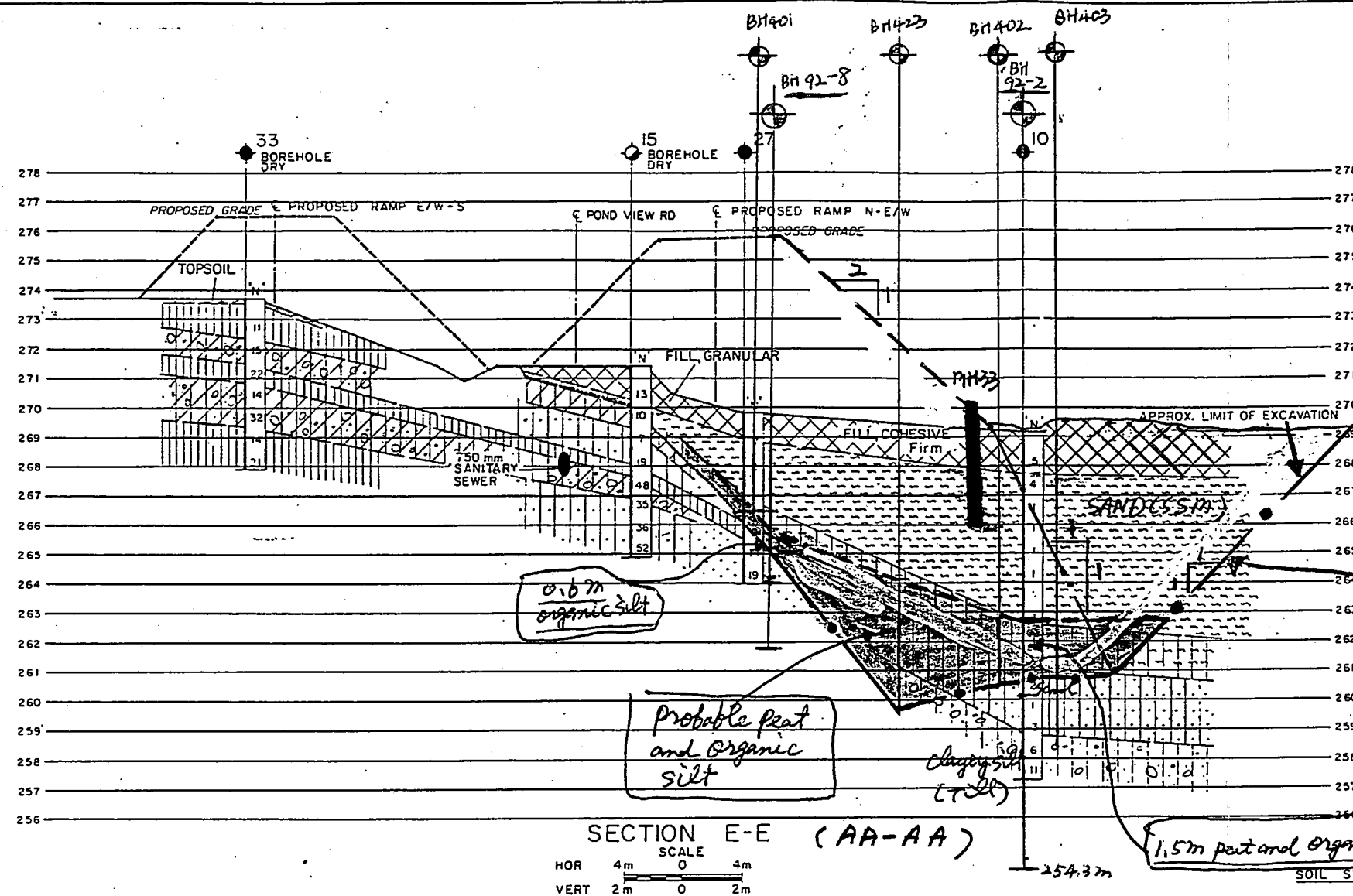
NOTE
The boundaries between soil strata have been established only at Bore Hole locations. Between Bore Holes the boundaries are assumed from geological evidence.

NOTE: The complete foundation investigation and design report for this project and other related documents may be examined at the Engineering Materials Office, Downsview, information contained in this report and related documents is specifically excluded in accordance with the conditions of Section 102-2 of Form 100.

| | | | | |
|------|----|-------------|--|--|
| REV. | | | | |
| DATE | BY | DESCRIPTION | | |

Geocres No

| | | | |
|-----------|-------------------------------------|------------|---------------|
| HWY No | 126 | DIST | 2 |
| SUBA'D | <input checked="" type="checkbox"/> | DATE SEPT. | 7, 1988 |
| | | SITE | 19-452 |
| DRAWN/CCT | <input checked="" type="checkbox"/> | APPROVED | DWG 228B700-F |



SOIL STRATIGRAPHY LEGEND










- | | |
|---|--|
|  | FILL |
|  | PEAT, Soft to Stiff |
|  | SOFT SILT, Soft to Stiff |
|  | SAND, FINE, SOME SILT Loose to Compact |
|  | SILTY SAND TO SANDY SILT, TRACE SILT AND GRAVEL Loose to Compact |
|  | SILT, CLAYEY SILT AND SANDY SILT LAYERS Compact to Dense |
|  | SILTY CLAY TO CLAYEY SILT, TRACE ORGANICS, SAND & GRAVEL Soft to Stiff |
|  | SILTY CLAY TO CLAYEY SILT (TILL), TRACE ORGANICS Stiff to Hard |
|  | SANDY SILT (TILL), WITH CLAY SEAMS Loose to Compact |

FIGURE 2

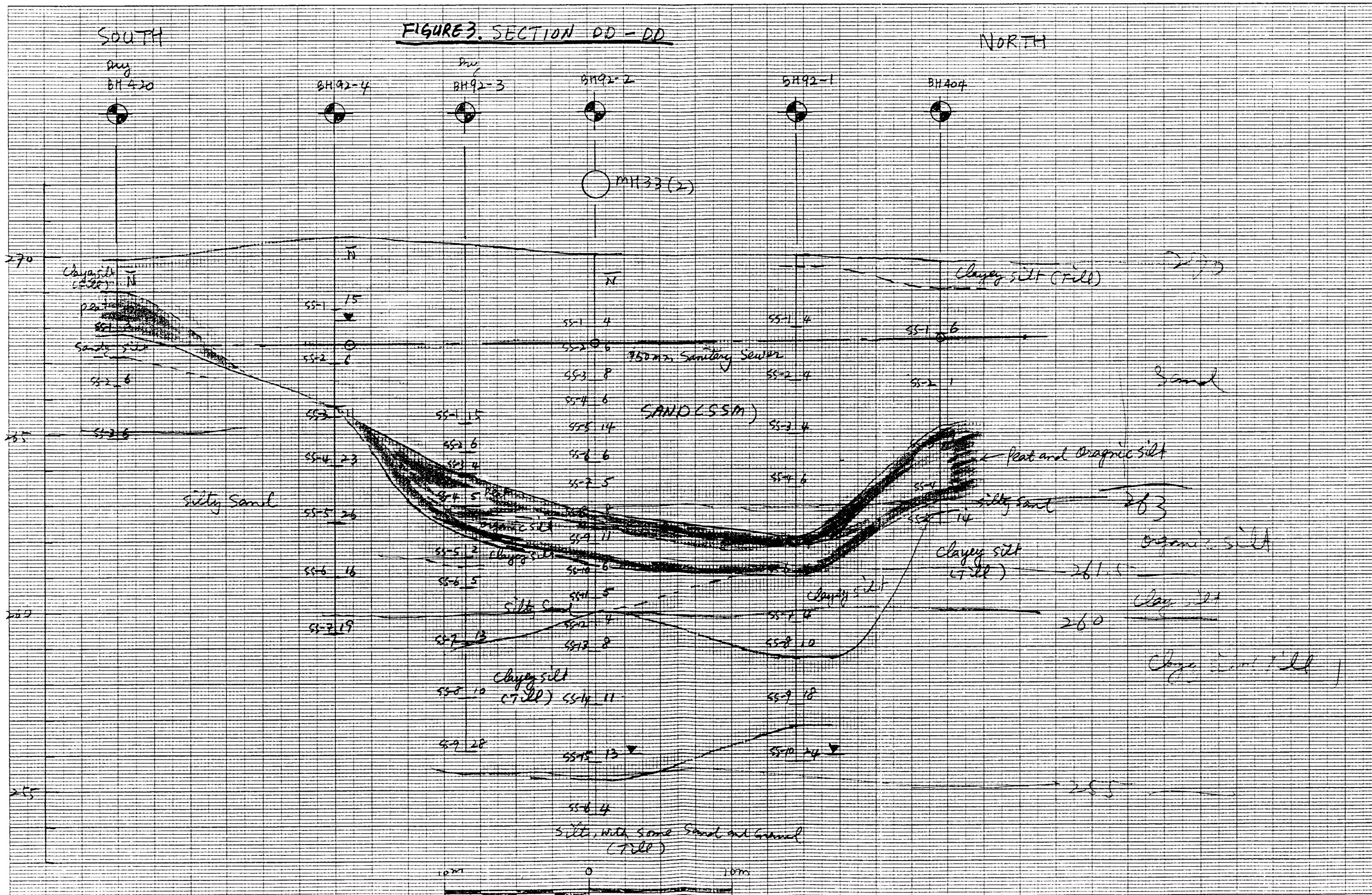


FIG. 3

47 1510

10 X 10 TO THE CENTIMETER 25 X 38 CM.
KEUFFEL & ESSER CO. MADE IN U.S.A.

FIGURE 4. SECTION EE-EE

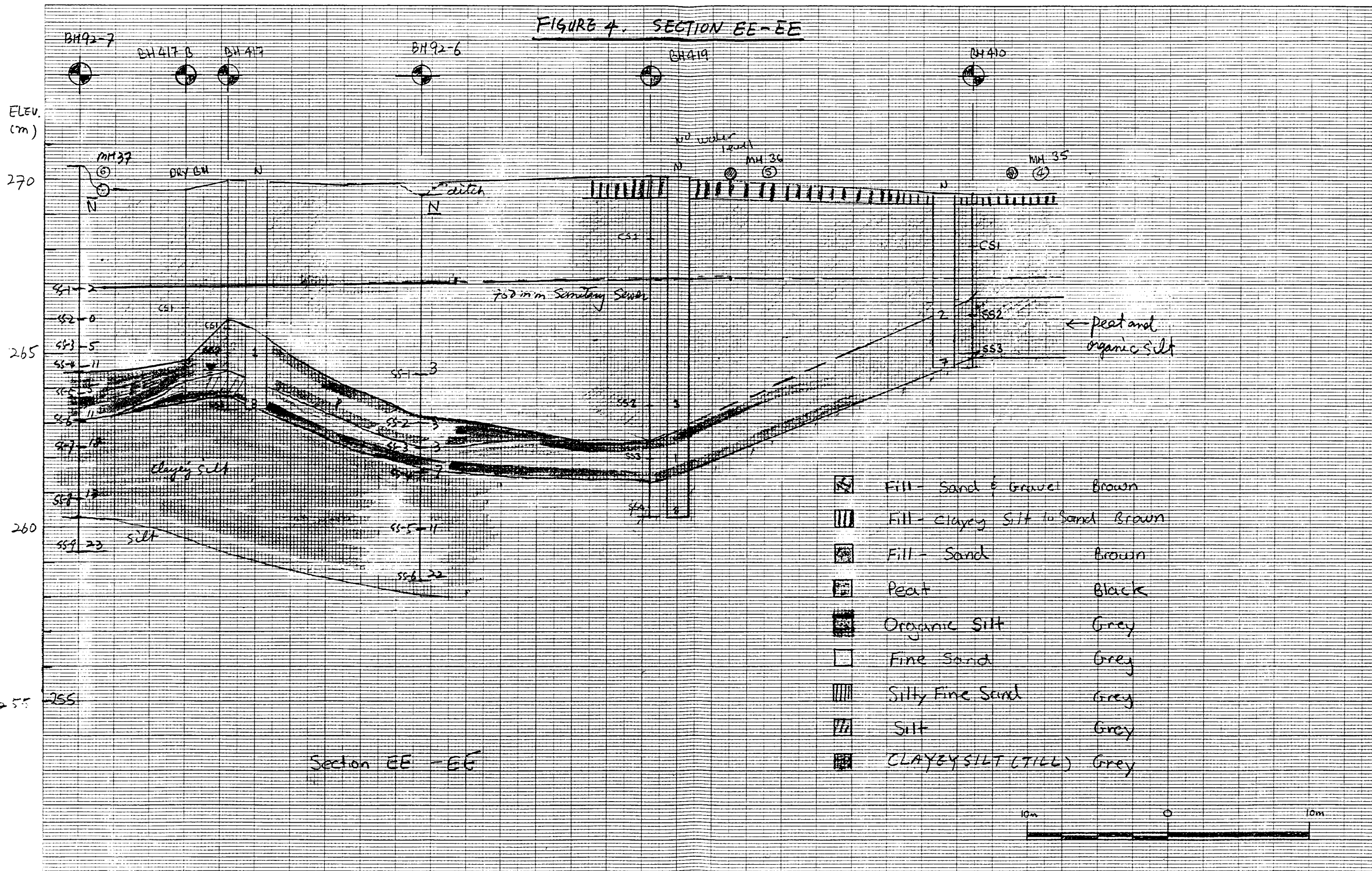
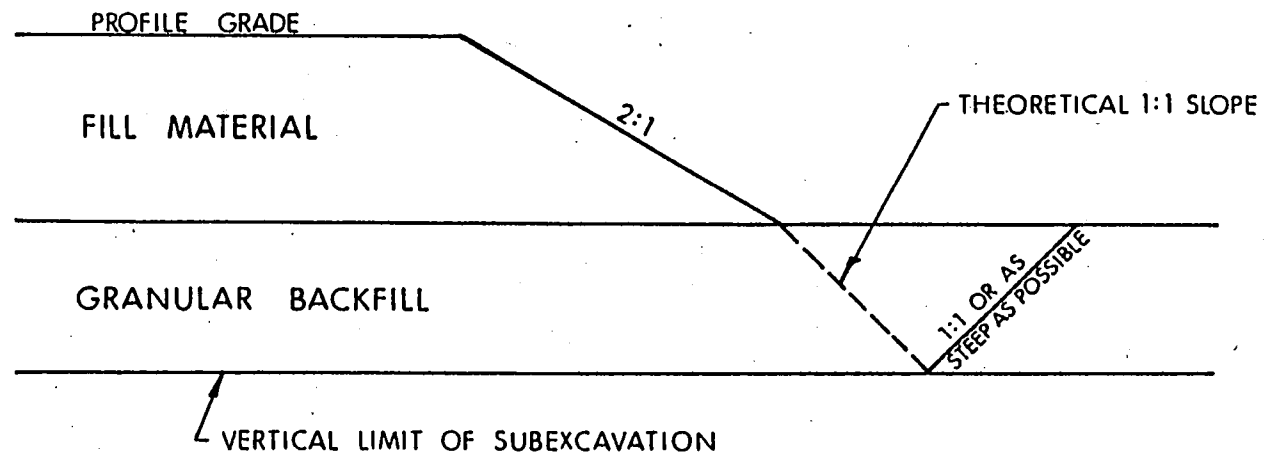


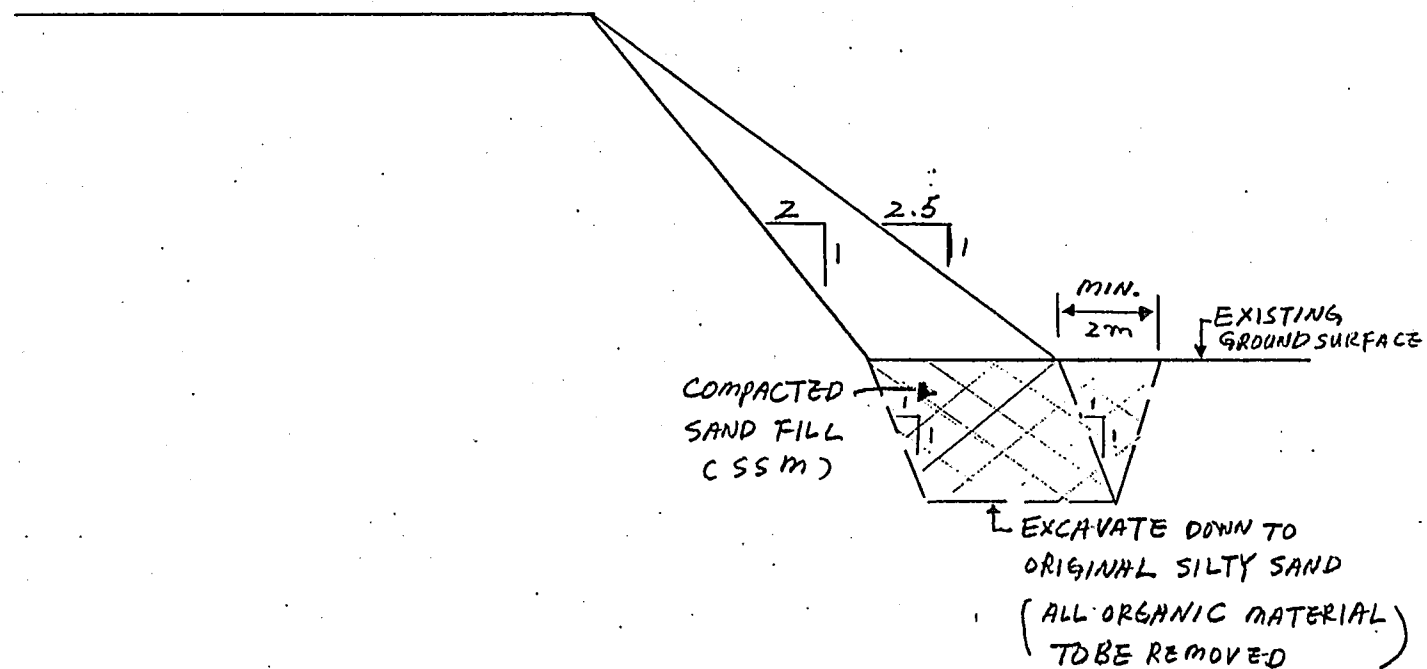
FIG. 4



(N.T.S.)

Fig. 5 SKETCH FOR SUB-EXCAVATION AND EMBANKMENT CONSTRUCTION

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SKETCH FOR THE SUB-EXCAVATION OF TOE AND
FLATTENING OF SLOPE BETWEEN SECTION F-F AND H-H

FIG No 6

W.P. 421-92-00