Peto MacCallum Ltd.
CONSULTING ENGINEERS

FOUNDATION INVESTIGATION REPORT
FOR
SWAMP/HIGH FILL CROSSINGS
HIGHWAY 69 FOUR-LANING
FROM 2.6 KM NORTH OF HIGHWAY 124 NORTHERLY 4.8 KM
G.W.P. 293-97-00
DISTRICT 52, TOWNSHIP OF McDOUGALL
NOBEL, ONTARIO

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List of Abbreviations

OPSD 100.06

Record of Test Hole Sheets

High Fill 101:
- Borehole 101-1M
- Borehole 101-1N
- Borehole 101-1S
- Cone Penetration Test 101-1N
- Cone Penetration Test 101-1S
- Auger Probes 101-1 and 101-2

High Fill 102: (THIS SECTION DELETED)

High Fill 103:
- Boreholes 103-1M to 103-2M
- Boreholes 103-1N to 103-17N
- Boreholes 103-1S to 103-19S
- Cone Penetration Tests 103-1M to 103-3M
- Cone Penetration Tests 103-1N to 103-5N
- Cone Penetration Tests 103-1S to 103-7S

High Fill 104:
- Boreholes 104-1N to 104-11N
- Boreholes 104-1S to 104-13S
- Cone Penetration Tests 104-1N to 104-5N
- Cone Penetration Tests 104-1S to 104-3S
- Auger Probes 104-1 to 104-22

Swamp 105:
- Boreholes 105-1N to 105-14N
- Boreholes 105-1S to 105-14S
- Cone Penetration Tests 105-1N to 105-6N
- Cone Penetration Tests 105-1S to 105-6S
- Auger Probes 105-1 to 105-4

Swamp 106:
- Boreholes 106-1N to 106-6N
- Boreholes 106-1S to 106-5S
- Cone Penetration Tests 106-1N to 106-2N
- Cone Penetration Tests 106-1S to 106-3S
- Auger Probes 106-1 to 106-11

Swamp 107: (THIS SECTION DELETED)

Swamp 108: (THIS SECTION DELETED)

High Fill 109:
- Boreholes 109-1M to 109-3M
- Boreholes 109-1N to 109-11N
- Boreholes 109-1S to 109-19S
- Cone Penetration Tests 109-1M to 109-2M
- Cone Penetration Tests 109-1N to 109-2N
- Cone Penetration Tests 109-1S to 109-5S
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High Fill 102: THIS SECTION DELETED

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Swamp 105: Drawings S-105-1, S-105-2, S-105-3 and S-105-4

Swamp 106: Drawings S-106-1 and S-106-2

Swamp 107: THIS SECTION DELETED

Swamp 108: THIS SECTION DELETED

Swamp 109: Drawings S-109-1, S-109-2, S-109-3, S-109-4, S-109-5 and S-109-6

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FOUNDATION INVESTIGATION REPORT
For
SWAMP/HIGH FILL CROSSINGS
Highway 69 Four-Laning
From 2.6 Km North of Highway 124 Northerly 4.8 km
G.W.P. 293-97-00
District 52, Township of McDougall
Nobel, Ontario

1. INTRODUCTION

Construction of the realigned section of Highway 69 that extends from 2.6 km north of Highway 124 northerly 4.8 km in the Township of McDougall, District 52, Nobel, Ontario will involve the crossing of six swamp and high fill sections, as well as Portage Lake. This section of new Highway 69 alignment will be located to the east of the existing Highway 69 and will comprise all new alignment. The investigated swamp and high fill sections included only sections along the new main line alignment. This report was carried out for McCormick Rankin Corporation (MRC) on behalf of the Ministry of Transportation of Ontario (MTO).

The swamp and high fill sections have been identified by sequential numbers from 101 to 109 along the new Highway 69 centreline. Crossing 102 was deleted due to the lengthening of Portage Lake bridge and crossings 107 and 108 were deleted due to changes to the proposed highway alignment.

The identification number and location of each of the sections are provided on Table I, Appendix A and the Key Map, Drawing A, Appendix A.

2. PHYSIOGRAPHY AND GEOLOGY

The study section is located within the Georgian Bay Fringe physiographic region. The area is characterized by regionally uniform to sloping topography and good drainage interrupted by bare rock knobs and ridges. Overburden cover is generally shallow, but can vary substantially in thickness over short distances.

In general, the rock knobs are covered with a thin discontinuous veneer of till. Within the relatively flat, low lying depressions, lacustrine and glaciofluvial sand or sand and silt deposits have accumulated. Swamp environments including organic deposits have developed in areas of poor drainage.

The study section is located within the Central Gneiss Belt of the Grenville Province. The Grenville is a structural subdivision of the Canadian Precambrian Shield and forms the southern margin of the shield between Georgian Bay and Labrador.

The site lies within a litho tectonic subdivision of the Central Gneiss Belt known as the Algonquin Terrane and in particular, passes through two sub-units identified as the Britt Domain and the Bolger Pluton.

The Britt Domain occurs at the south end of the study area and comprises strongly deformed pink and grey gneisses and migmatites, intruded by younger plutons that are also further deformed and migmatized.

The Bolger Pluton is a large intrusive granitic pluton which extends from south of Nobel to north of the study limits.

3. INVESTIGATION PROCEDURES

The field work for this investigation was conducted in 2 stages. Stage 1 was carried out during July and August, 2001 and stage 2 in August 2002. It comprised 244 test holes (boreholes, dynamic cone penetration tests and auger probes in Swamp/High Fill sections 101, 103, 104, 105, 106 and 109) advanced to depths of 0.0 to 17.7 m below existing grade. The approximate locations of the test holes advanced in each crossing along with stratigraphic profiles in each swamp are shown on the 22 Borehole Locations & Soil Strata Drawings provided in Appendix D.

The test hole schedule was established in accordance with the requirements of MTO as outlined in the RFP document and in general accordance with Northern Region Pavement Design Practices and Guidelines (May 20, 1997). The control lines staked out along the centreline median in the field by MRC were used to reference the test holes.

Geodetic elevations were referred to field temporary benchmarks provided by MRC.

The boreholes and dynamic cone penetration tests were advanced using track-mounted CME-55 and D-50 drill rigs equipped with continuous flight solid and hollow stem augers supplied by a specialist drilling contractor. Representative samples of the overburden were recovered in each swamp or high fill area at frequent depth intervals using a conventional split spoon sampler in conjunction with Standard Penetration Tests. In addition, field vane tests, pocket penetrometer tests, dynamic cone tests and thin wall (Shelby) tube sampling were carried out at selected locations. The auger probes were advanced with hand augers.

The drilling and auger probes were carried out under the full-time supervision of members of our engineering staff.

Soils were identified visually in the field in accordance with the MTO Soil Classification procedures. Representative soil samples were returned to our laboratory for detailed visual examination, classification and laboratory testing.

Water level observations were made in the open test holes during and upon completion of augering.

The laboratory testing program consisted of:

- Moisture content determinations
- Grain size analyses
- Atterberg limits tests
- One consolidation test

The results of the laboratory moisture content determination, Atterberg limits tests and grain size analyses are shown on the Record of Borehole sheets. Detailed results are presented in Appendix B. The Atterberg test results are also plotted on the Plasticity Charts, Figures PC1 to PC3. Grain size distribution charts are presented on the attached Figures 1 to 7. The results of the consolidation test are presented on the attached Figure 8. Shear strength values determined by laboratory vane tests are also shown on the Record of Borehole sheets.

4. SUBSURFACE CONDITIONS

Reference is made to the Record of Borehole, Record of Dynamic Cone Penetration Test and Auger Probe sheets in Appendix C for soil classifications, inferred stratigraphy, standard penetration test "N" values, dynamic cone penetration test resistance, field and laboratory undrained shear strength values, together with groundwater observations in the open boreholes. The results of laboratory natural moisture content determinations, grain size analyses and Atterberg limits tests are also shown on the Record of Borehole sheets.

The standard penetration test "N" values recorded in some of the wet silt layers at depth are not considered to be representative of the relative density of these deposits due to the relatively large differential hydraulic gradients that develop at the bottom of the boreholes during drilling/sampling/testing, although the holes were filled with water. Some of the field vane test results are considered to be unrepresentative due to sand seams interbedded within the cohesive silty clay deposits.

Soil profiles at selected locations in each swamp are shown on Drawings S-101-1 to S-109-6, except S-109-1. The boundaries between soil strata have been established only at the borehole locations. Between boreholes, the boundaries are assumed and may vary.

The subsurface stratigraphy in the swamp and high fill crossings typically comprised localized fill, topsoil, peat, silt and/or sand with discontinuous clay layers mantling bedrock at a typically shallow depth.

A localized asphalt pavement exists in a section of High Fill 101 which is adjacent to an abandoned building near the south end of the new alignment.

A summary of the subsoil conditions in each swamp/high fill section is presented in Table III, Appendix C.

A brief summary of the geotechnical characteristics of the major soil types is presented below.

4.1 Peat

Surficial peat was typically encountered in all the swamp/high fill sections with the exception of High Fill 101 where peat was not contacted. The peat was dark brown to black and ranged from coarse fibrous to amorphous in texture. The thickness of the peat ranged from 100 to 900 mm with the greatest thickness of peat encountered in Swamp 105. The moisture contents of the peat ranged from 86 to 438%.

4.2 Topsoil

Surficial topsoil was encountered in all the swamp/high fill sections. The topsoil was generally dark brown silty sand to silt with rootlets and organic inclusions. The thickness of the topsoil ranged from 50 to 400 mm.

4.3 Pavement and Fill

A 50 mm thick asphaltic concrete pavement was encountered surficially in borehole 101-1M, High Fill 101. It is believed that the asphalt formed part of a paved pad associated with an adjacent abandoned building.

Fill was encountered in borehole 109-11S to 250 mm depth. The fill comprised mixed sand and organics and is associated with the earthwork of the existing quarry access road. The gravel and rock fill pavement of this road is within the new alignment of the proposed highway.

4.4 Glacial Till

Below 100 mm of topsoil, a localized 0.60 to 1.75 m thick cohesionless silty sand till deposit was contacted in boreholes 105-13N, 14N, and 13S located near the north end of Swamp 105. The results of a grain size analysis on a representative soil sample are presented in Appendix B, Figure 1. The glacial till was typically loose. Moisture content determinations of 10 and 11% were obtained in the material.

4.5 Sand/Silty Sand

Cohesionless sand and silty sand with variable amounts of silt and gravel and trace clay were typically encountered below the peat and topsoil in all swamp/high fill sections. These cohesionless units were also encountered below clay deposits and above the underlying probable bedrock in Swamp/High Fill crossings 103, 104, 105, 106 and 109. The sand/silty sand units ranged in thickness from 0.1 to 7.8 m. The grain size distribution chart of a silty sand sample from High Fill 109 is shown in Appendix B, Figure 1. The envelopes of grain size analyses of the sand units are presented on Figures 2 and 3.

Standard penetration test “N” values ranged from 1 to 45 blows per 300 mm penetration. Dynamic cone resistance values varied from 0 to 62 blows per 300 mm. The materials were generally loose. North of about Sta. 22+900 in High Fill 109, the cohesionless

sand/silty sand units were typically compact with dense zones below an upper loose zone up to 2 m thick. Moisture contents ranged from 2 to 35%.

4.6 Silt/Sandy Silt/ Sand and Silt

Localized deposits of cohesionless silt/sandy silt/sand and silt were encountered beneath the peat, topsoil and sand deposits in Swamp/High Fill sections 103, 104 and 109 and also below clay units in High Fill crossing 109, where it graded to sand some silt, trace clay. The silt/sandy silt/sand and silt unit ranged in thickness from 0.2 to 4.6 m. The silt contains varying amounts of sand and clay. The envelope of results of grain size analyses are presented in Appendix B, Figure 4.

Standard penetration test “N” values ranged from 0 to 15 blows per 300 mm penetration. Dynamic cone resistance values varied from 0 to 20 blows per 300 mm. The silt/sandy silt materials were typically loose in Swamp 103 and compact in Swamp 104. North of about Sta. 22+900 High Fill 109, the sand and silt unit was compact to dense. The moisture contents typically ranged from 15 to 25%, with local values of 10%.

4.7 Silty Clay/Clayey Silt

Deposits of cohesive silty clay and clayey silt trace sand were generally contacted in Swamp/High Fill sections 103, 104, 105 and 109 beneath and interbedded with sand and silt deposits. A localized 0.2 m thick deposit was also contacted in auger probe 101-2, within High Fill 101. The thickness of the cohesive deposits varied from 0.2 to 10.1 m with the maximum thickness encountered in Swamp 103 northbound lanes. In this area, the silty clay extended to 11.3 m depth.

Standard penetration test “N” values ranged from 0 to 28 blows per 300 mm penetration. Laboratory and field vane tests carried out in the clay layer measured undrained shear strength values of 10 to 92 kPa, with an average value of about 40 kPa. The higher field vane shear strength values are attributed to silt and sand layers within the clay. The sensitivity ranged between 1 and 5. Pocket penetrometer tests on a localized silty clay

layer between Sta. 23+000 and Sta. 23+050, High Fill 109 southbound lanes were 137 to 150 kPa. Dynamic cone resistance values varied from 0 to 18 blows per 300 mm penetration.

The consistency of the silty clay and clayey silt deposits ranged from very soft to locally very stiff, typically soft to firm.

Atterberg limits test results are plotted on the plasticity charts in Appendix B, Figures PC1, PC2 and PC3. The results of grain size analyses and one consolidation test are presented in Appendix B, Figures 5 to 8.

The moisture contents of the cohesive deposits varied between 25 and 86%. The liquid limits ranged from 23 to 63, plastic limit from 12 to 27, with computed plasticity indices of 10 to 36, indicating the cohesive materials are low to high plasticity. A summary of the Atterberg limits tests is enclosed in Appendix B, Table II. Based on the results of the laboratory tests, the silty clay samples from Swamp/High Fill sections 103, 104 and 109 are classed as CI and CH and clayey silt samples as CL in accordance with the MTC Soil Classification Manual. The clay sample from Swamp 105 is classed as CL-CI material.

A consolidation test conducted on sample 5A retrieved from borehole 103-10N, at a depth of 6.7 to 7.3 m measured an initial void ratio of 1.67, a recompression index of 0.11, and a compression index of 1.04. The results of the consolidation test are enclosed in Appendix B, Figure 8.

4.8 Bedrock

Bedrock was inferred by auger, split spoon sampler and/or dynamic cone refusal in the test holes at depths of 0.0 to 17.7 m except borehole 109-10S and cone test 109-2M in High Fill 109 that terminated in competent founding material at 12.65 and 8.20 m depths, respectively. Bedrock outcrop exposures were contacted in each swamp/high fill.

The bedrock comprises granitic gneisses and migmatites.

5. CLOSURE

The field investigation was carried out under the direction and supervision of Mr. D. Hanvey, P.Eng., Project Engineer. This report was prepared by Mr. D. Hanvey, P.Eng., and Mr. C.M.P. Nascimento, P.Eng., Senior Foundation Engineer, and was reviewed by Mr. D.W. Kerr, P.Eng., Chief Foundation Engineer. Mr. B.R. Gray, M. Eng., P. Eng., President of Peto MacCallum Ltd., conducted an independent review of the report.

Yours very truly

Peto MacCallum Ltd.

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APPENDIX A : SWAMP/HIGH FILL LOCATIONS

- **TABLE I – SWAMP/HIGH FILL NUMBER AND LOCATION**
- **DRAWING A – HIGH FILL AND SWAMP CROSSINGS KEY MAP**

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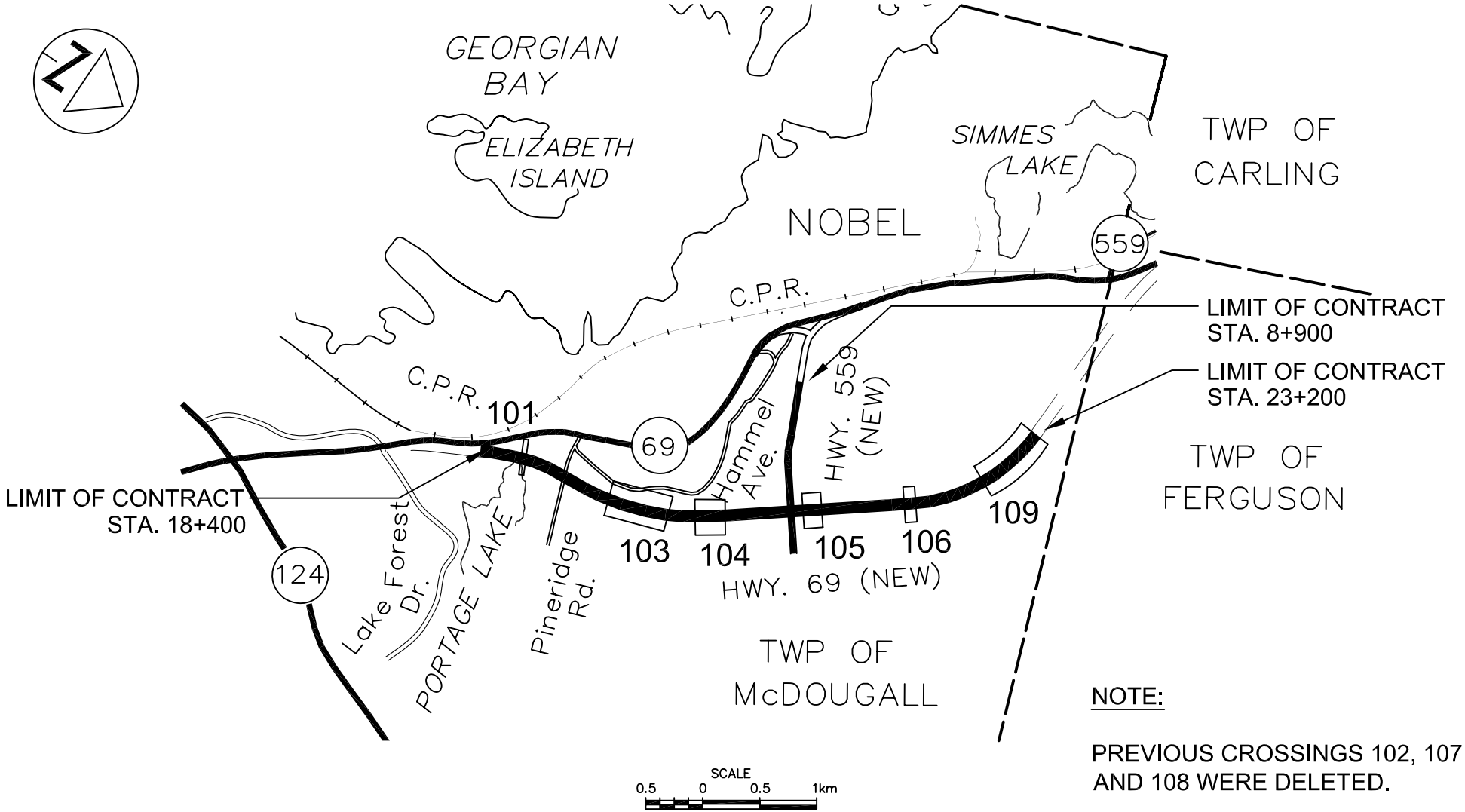
TABLE I

SWAMP/HIGH FILL NUMBER AND LOCATION
HIGHWAY 69 FOUR-LANING
FROM 2.6 KM NORTH OF HIGHWAY 124 NORTHERLY 4.8 KM
G.W.P. 293-97-00
DISTRICT 52, TOWNSHIP OF McDOUGALL
NOBEL, ONTARIO

ALIGNMENT	HIGH FILL / SWAMP CROSSING NO.	CROSSING LIMITS (1)
Hwy 69 Northbound Lane	101	Sta. 18+505 to 18+530
	102	(2)
	103	Sta. 19+465 to 19+865
	104	Sta. 20+165 to 20+365
	105	Sta. 21+065 to 21+235
	106	Sta. 21+965 to 22+065
	107	(3)
	108	(3)
	109	Sta. 22+590 to 22+950
Hwy 69 Southbound Lane	101	Sta. 18+505 to 18+535
	102	(2)
	103	Sta. 19+365 to 19+865
	104	Sta. 20+165 to 20+365
	105	Sta. 21+065 to 21+235
	106	Sta. 21+965 to 22+065
	107	(3)
	108	(3)
	109	Sta. 22+575 to 23+200

Notes: (1) Crossing limits specified by MTO.
(2) Crossing 102 was deleted due to lengthening of Portage Lake bridges.
(3) Crossings 107 and 108 were deleted due to realignment of highway.



NOTE:

PREVIOUS CROSSINGS 102, 107 AND 108 WERE DELETED.

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HIGH FILL AND SWAMP CROSSINGS KEY MAP

Highway 69 Four-Laning, Nobel

2.6km North of Highway 124 Northerly 4.8km

G.W.P. 293-97-00

LEGEND:

109 CROSSING LOCATION

DRAWING NO. A

REV.

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APPENDIX B : LABORATORY TEST RESULTS

- TABLE II: ATTERBERG LIMITS TEST RESULTS SUMMARY
- FIGURES PC1 TO PC3: PLASTICITY CHARTS
- FIGURES 1 TO 7: GRAIN SIZE DISTRIBUTION CHARTS
- FIGURE 8: CONSOLIDATION TEST RESULTS

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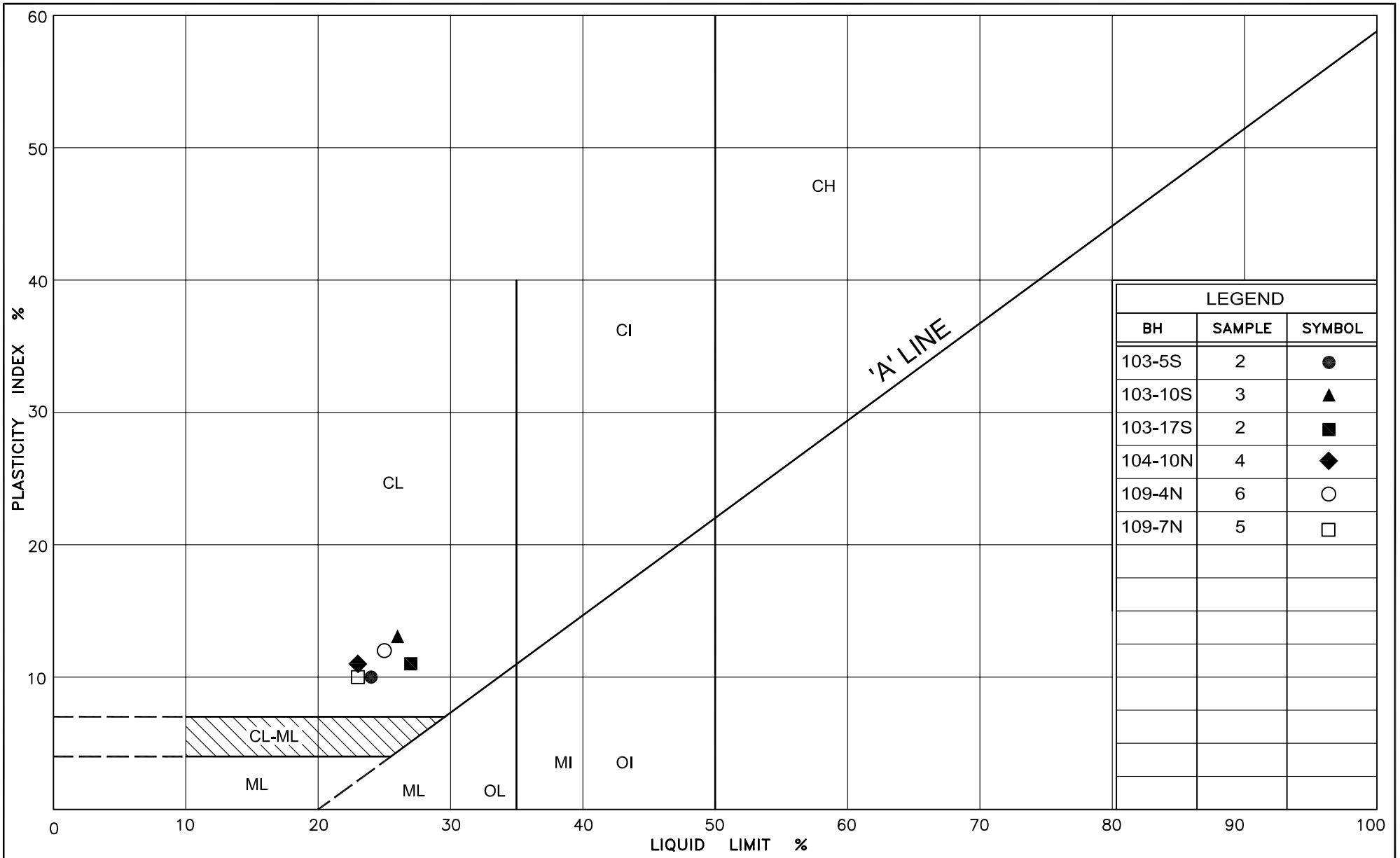
TABLE II

ATTERBERG LIMITS TEST RESULTS SUMMARY
HIGHWAY 69 FOUR-LANING
FROM 2.6 KM NORTH OF HIGHWAY 124 NORTHERLY 4.8 KM
G.W.P. 293-97-00
DISTRICT 52, TOWNSHIP OF McDOUGALL
NOBEL, ONTARIO

MAINLINE HIGHWAY 69							
SOIL TYPE	SWAMP / HIGH FILL NO.	TEST HOLE NO.	SAMPLE		ATTERBERG LIMITS		
			NO.	DEPTH (m)	LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX
CL	103	5S	2	1.5 - 2.1	24	14	10
	103	10S	3	3.1 - 3.7	26	13	13
	103	17S	2	1.5 - 2.1	27	16	11
	104	10N	4	4.6 - 5.2	23	12	11
	109	4N	6	3.7 - 4.5	25	13	12
	109	7N	5	3.0 - 3.5	23	13	10
CL - CI to CI	103	10N	4	4.6 - 5.2	37	16	21
	104	7S	2	1.5 - 2.1	37	15	22
	105	6S	3	3.1 - 3.7	35	16	19
	109	2S	5	3.0 - 3.5	47	19	28
	109	11S	4	2.2 - 2.7	47	21	26
CH	103	10N	5A	6.7 - 7.3	57	24	33
	104	3S	2	1.5 - 2.1	63	27	36
	109	7N	4	2.3 - 2.7	53	22	31



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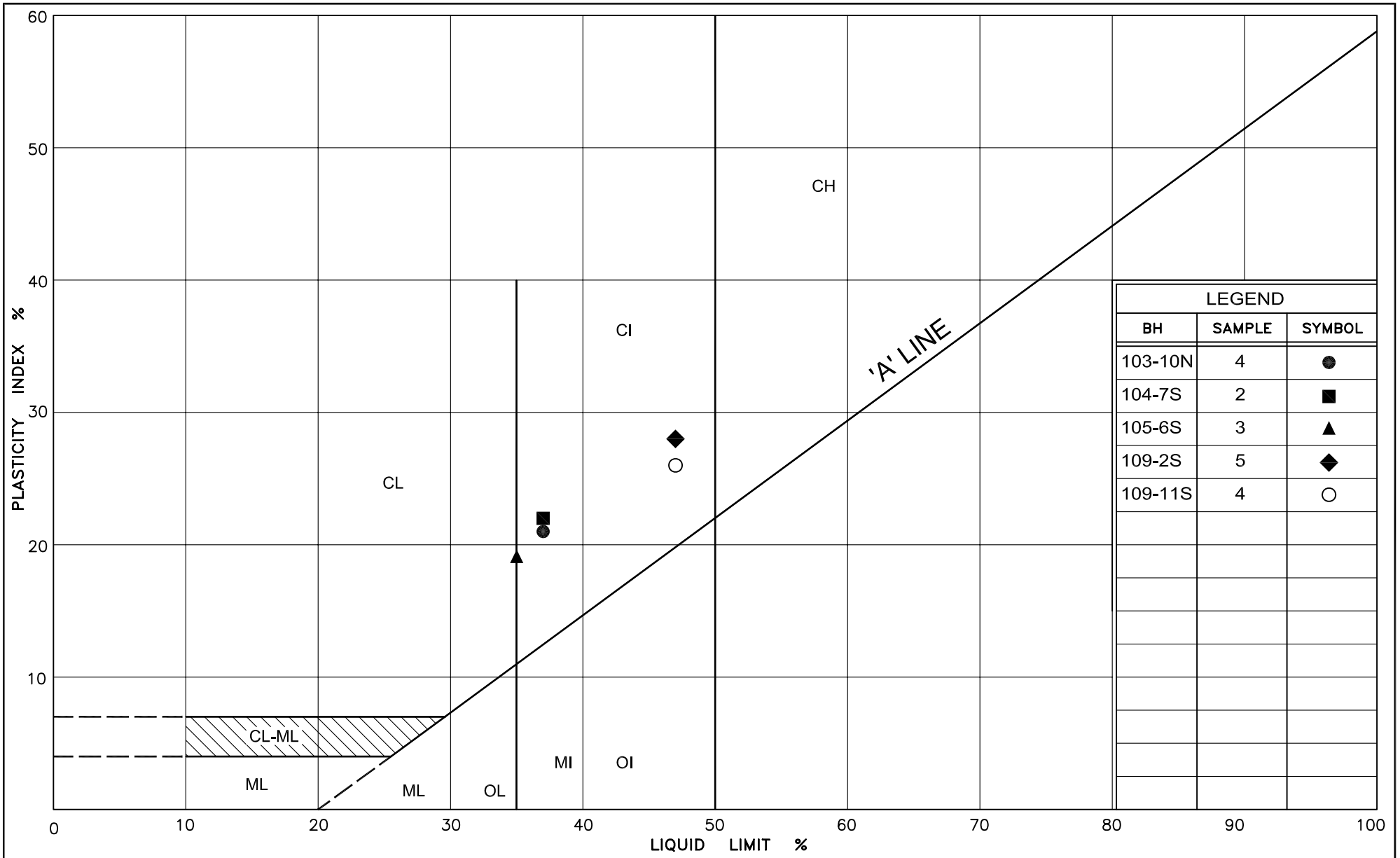
PLASTICITY CHART

CLAYEY SILT trace sand to with sand (CL)

FIG No PC 1

HIGHWAY 69

G.W.P No. 293-97-00



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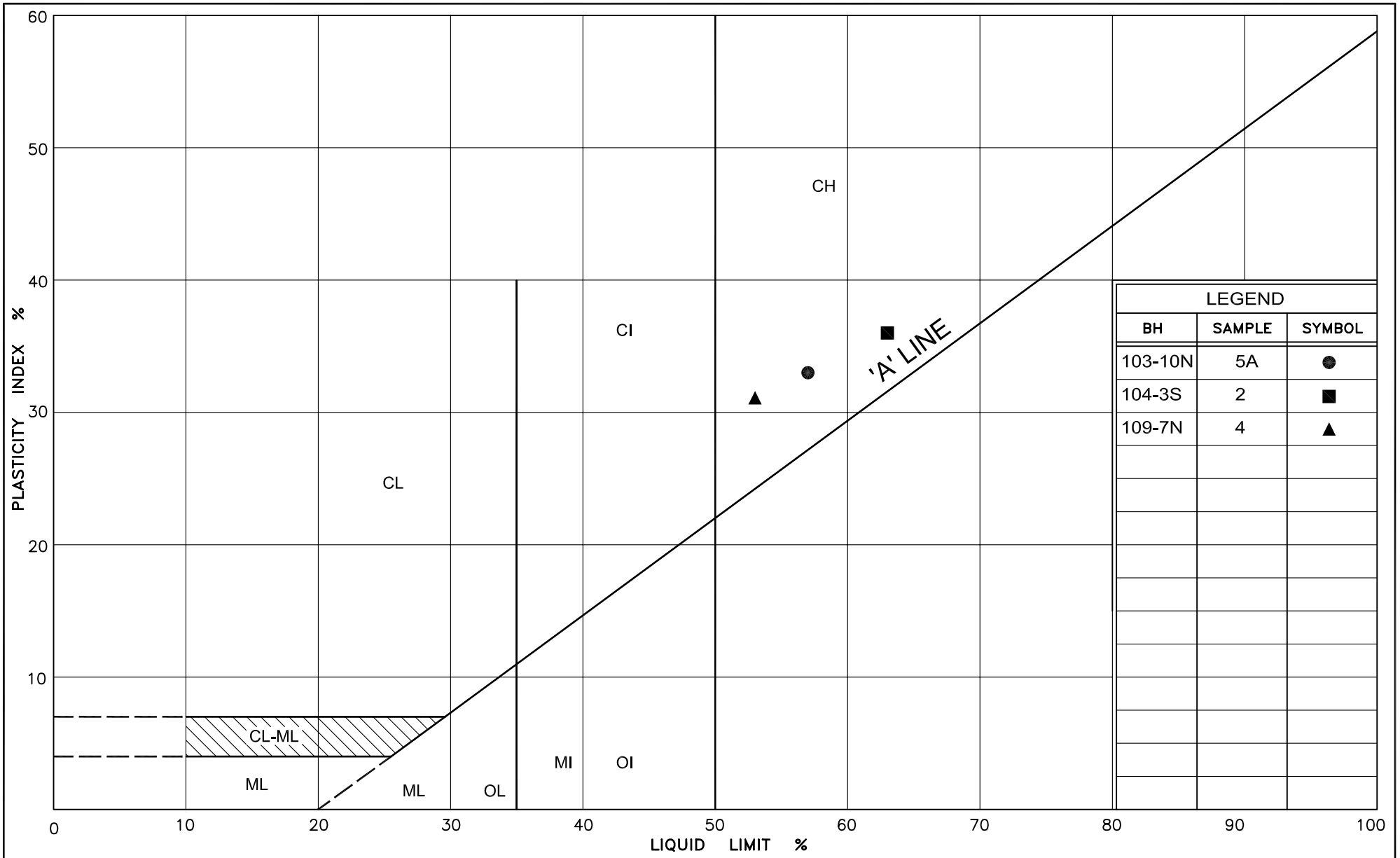
PLASTICITY CHART

SILTY CLAY trace sand (CL–CI to CI)

FIG No PC 2

HIGHWAY 69

G.W.P No. 293-97-00



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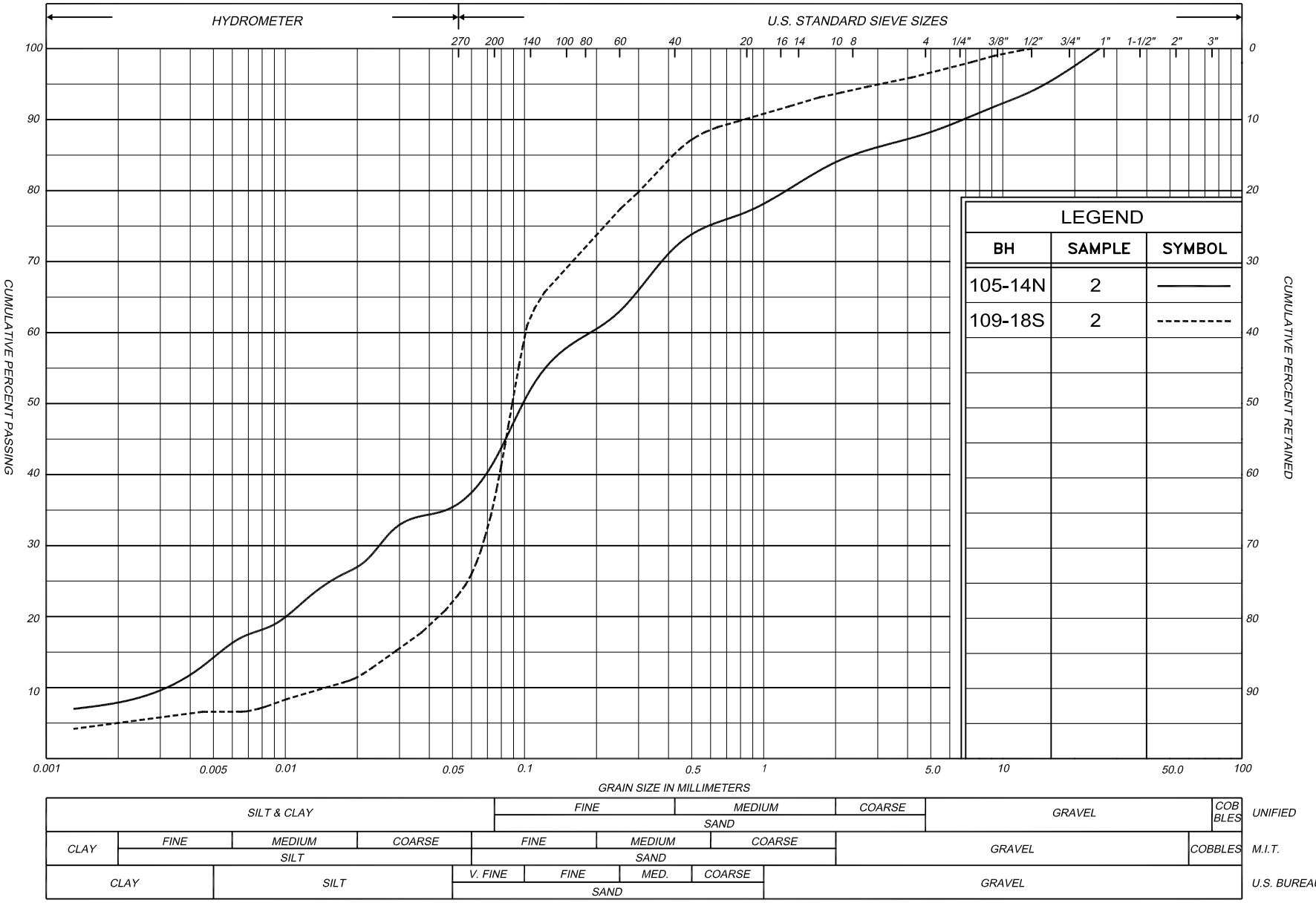
PLASTICITY CHART

CLAY with silt to SILTY CLAY trace sand (CH)

FIG No PC 3

HIGHWAY 69

G.W.P No. 293-97-00



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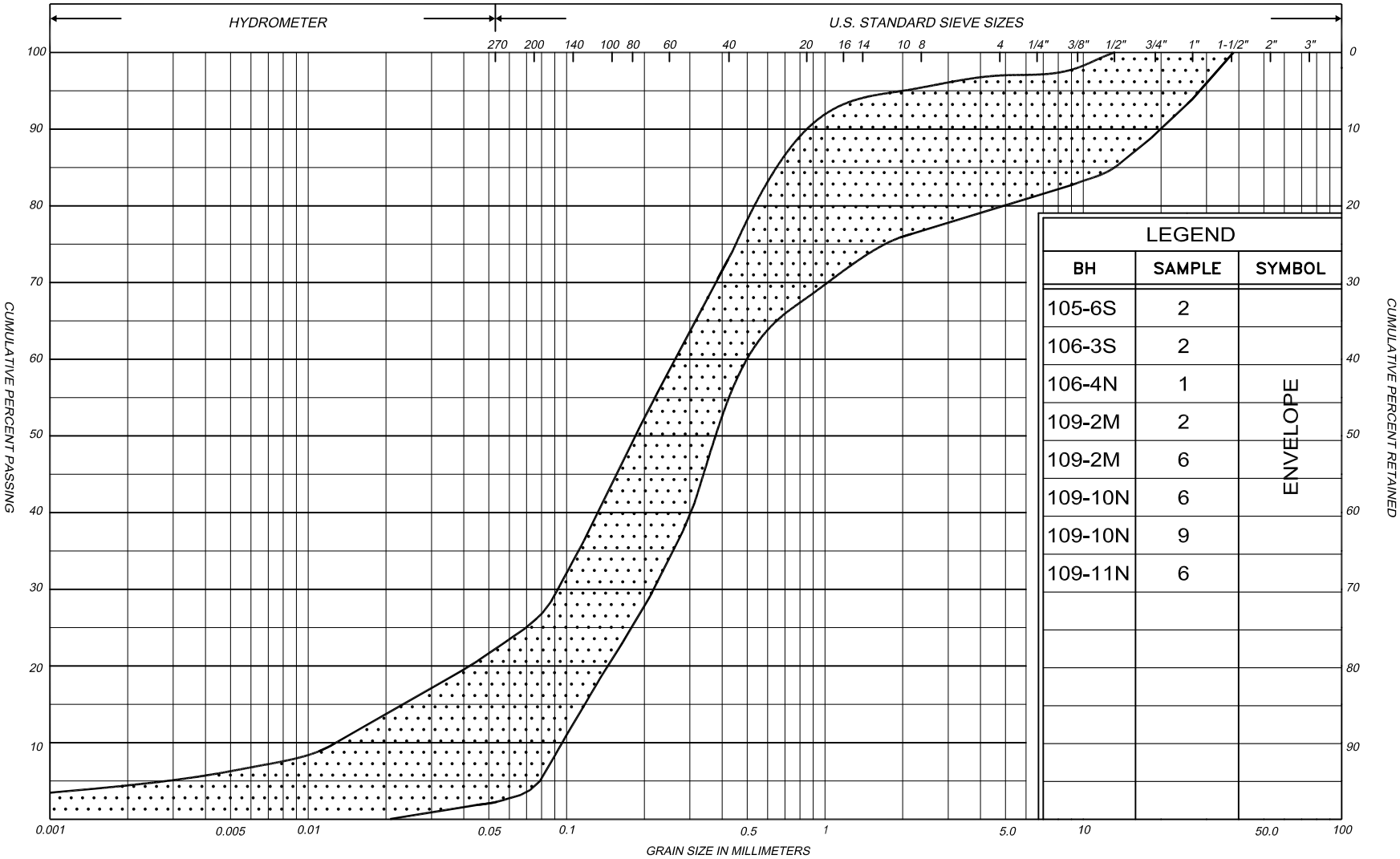
GRAIN SIZE DISTRIBUTION

SILTY SAND trace to some gravel trace clay

FIG No 1

HIGHWAY 69

G.W.P No. 293-97-00



LEGEND		
BH	SAMPLE	SYMBOL
105-6S	2	
106-3S	2	
106-4N	1	
109-2M	2	
109-2M	6	
109-10N	6	
109-10N	9	
109-11N	6	

SILT & CLAY				FINE	MEDIUM	COARSE	GRAVEL		COB BLES	UNIFIED
				SAND						
CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	GRAVEL		COBBLES	M.I.T.
	SILT			SAND						
CLAY	SILT			V. FINE	FINE	MED.	COARSE	GRAVEL		U.S. BUREAU
				SAND						

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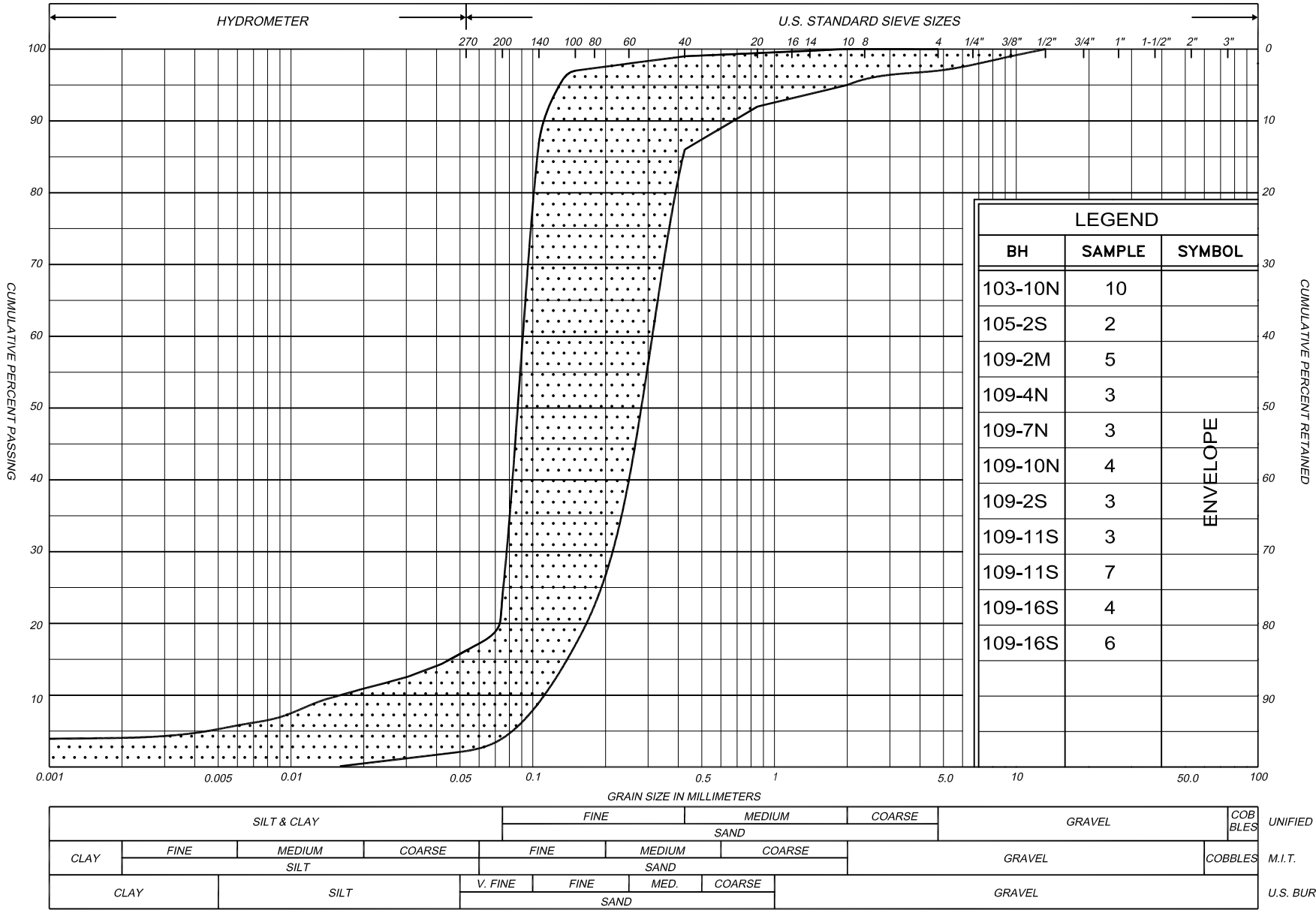
GRAIN SIZE DISTRIBUTION

FINE to MEDIUM SAND
trace to with silt trace clay trace to some gravel

FIG No 2

HIGHWAY 69

G.W.P No. 293-97-00



LEGEND		
BH	SAMPLE	SYMBOL
103-10N	10	
105-2S	2	
109-2M	5	
109-4N	3	
109-7N	3	
109-10N	4	
109-2S	3	
109-11S	3	
109-11S	7	
109-16S	4	
109-16S	6	

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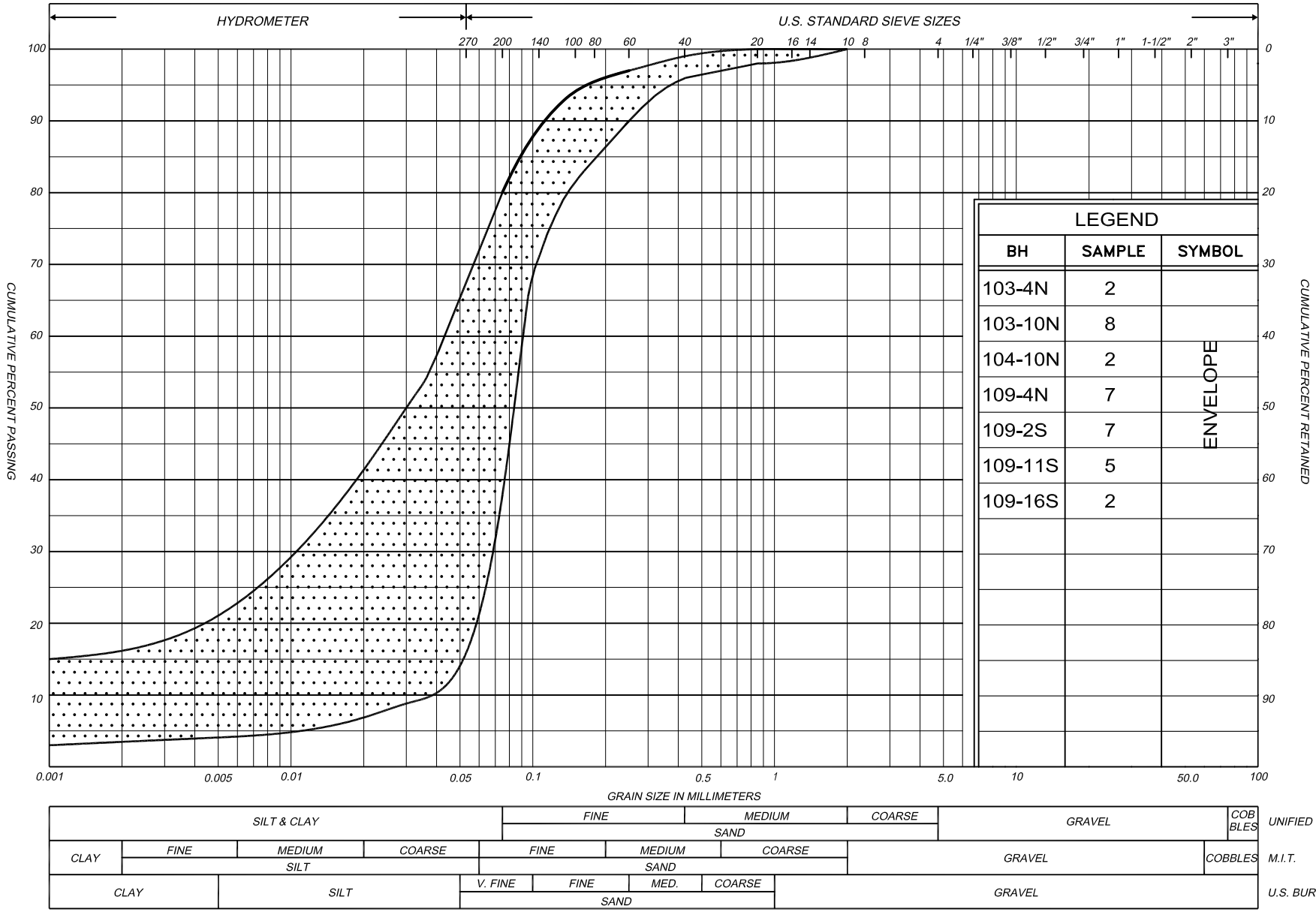
GRAIN SIZE DISTRIBUTION

FINE SAND trace to some silt trace clay trace gravel

FIG No 3

HIGHWAY 69

G.W.P No. 293-97-00



LEGEND		
BH	SAMPLE	SYMBOL
103-4N	2	
103-10N	8	
104-10N	2	ENVELOPE
109-4N	7	
109-2S	7	
109-11S	5	
109-16S	2	

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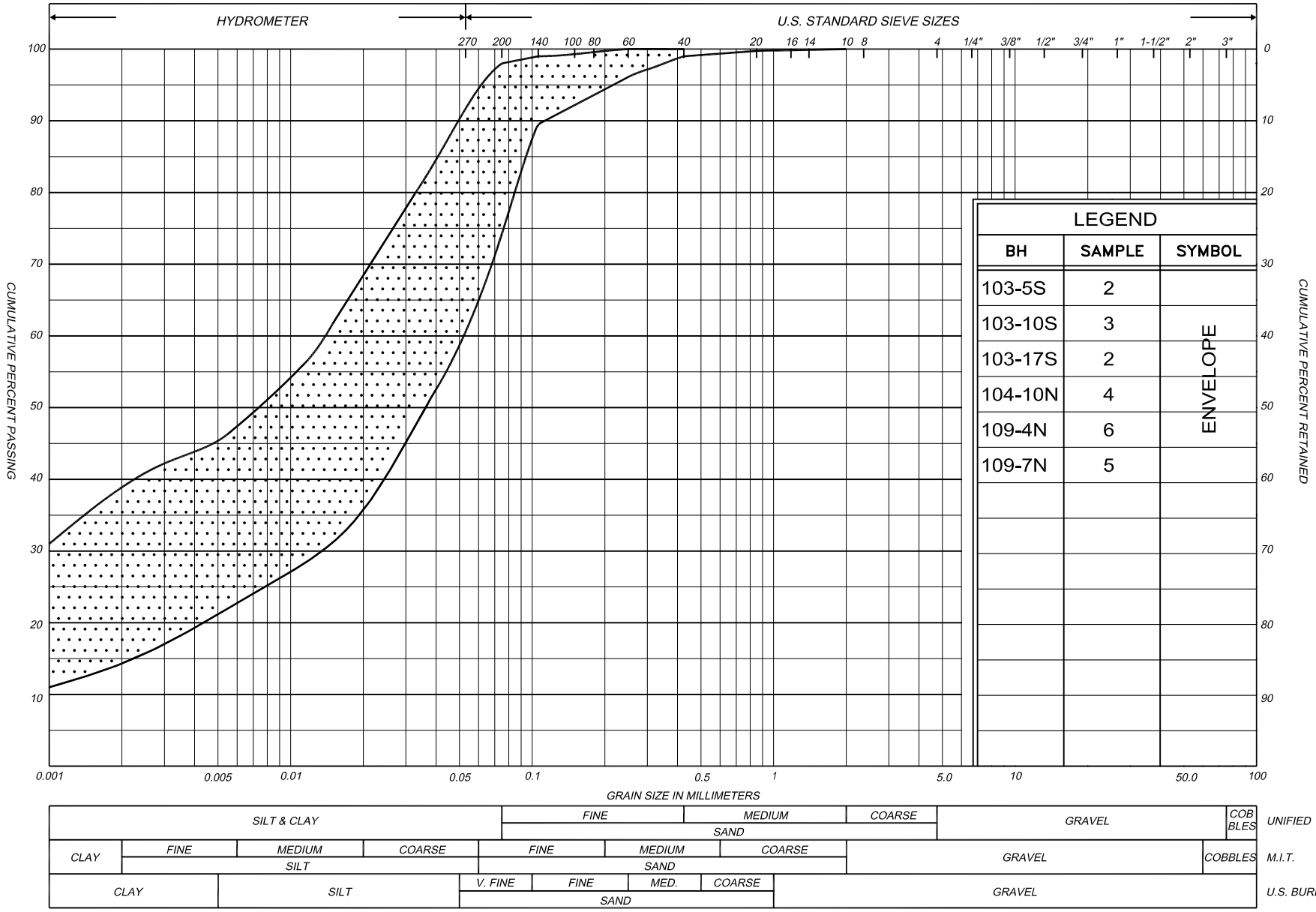
GRAIN SIZE DISTRIBUTION

SAND AND SILT trace to some clay to
SILT some sand some clay

FIG No 4

HIGHWAY 69

G.W.P No. 293-97-00



LEGEND		
BH	SAMPLE	SYMBOL
103-5S	2	
103-10S	3	ENVELOPE
103-17S	2	
104-10N	4	
109-4N	6	
109-7N	5	

Ministry of Transportation
Ontario

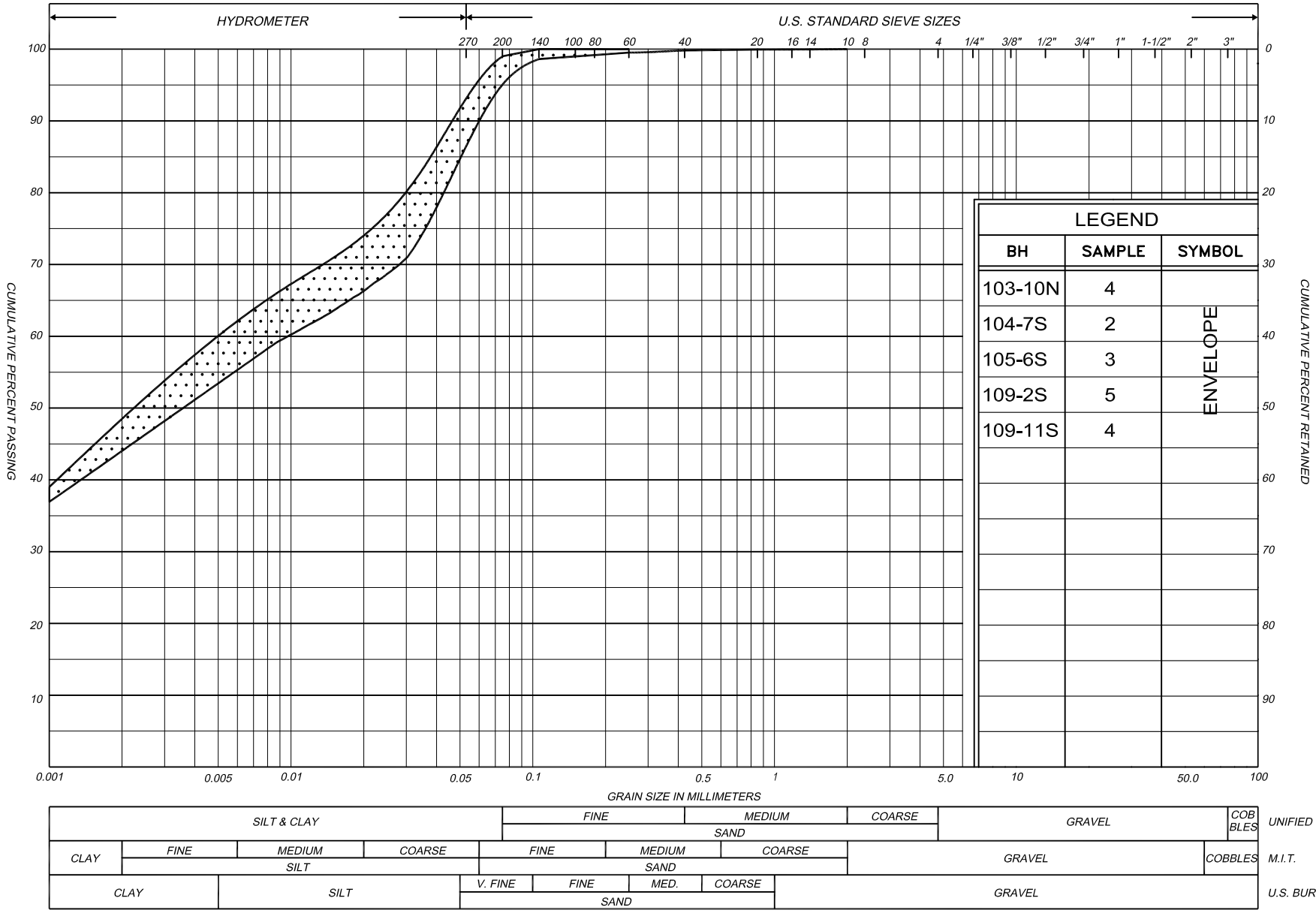
GRAIN SIZE DISTRIBUTION

CLAYEY SILT trace sand to with sand (CL)

FIG No 5

HIGHWAY 69

G.W.P No. 293-97-00



LEGEND		
BH	SAMPLE	SYMBOL
103-10N	4	
104-7S	2	ENVELOPE
105-6S	3	
109-2S	5	
109-11S	4	

Ministry of Transportation
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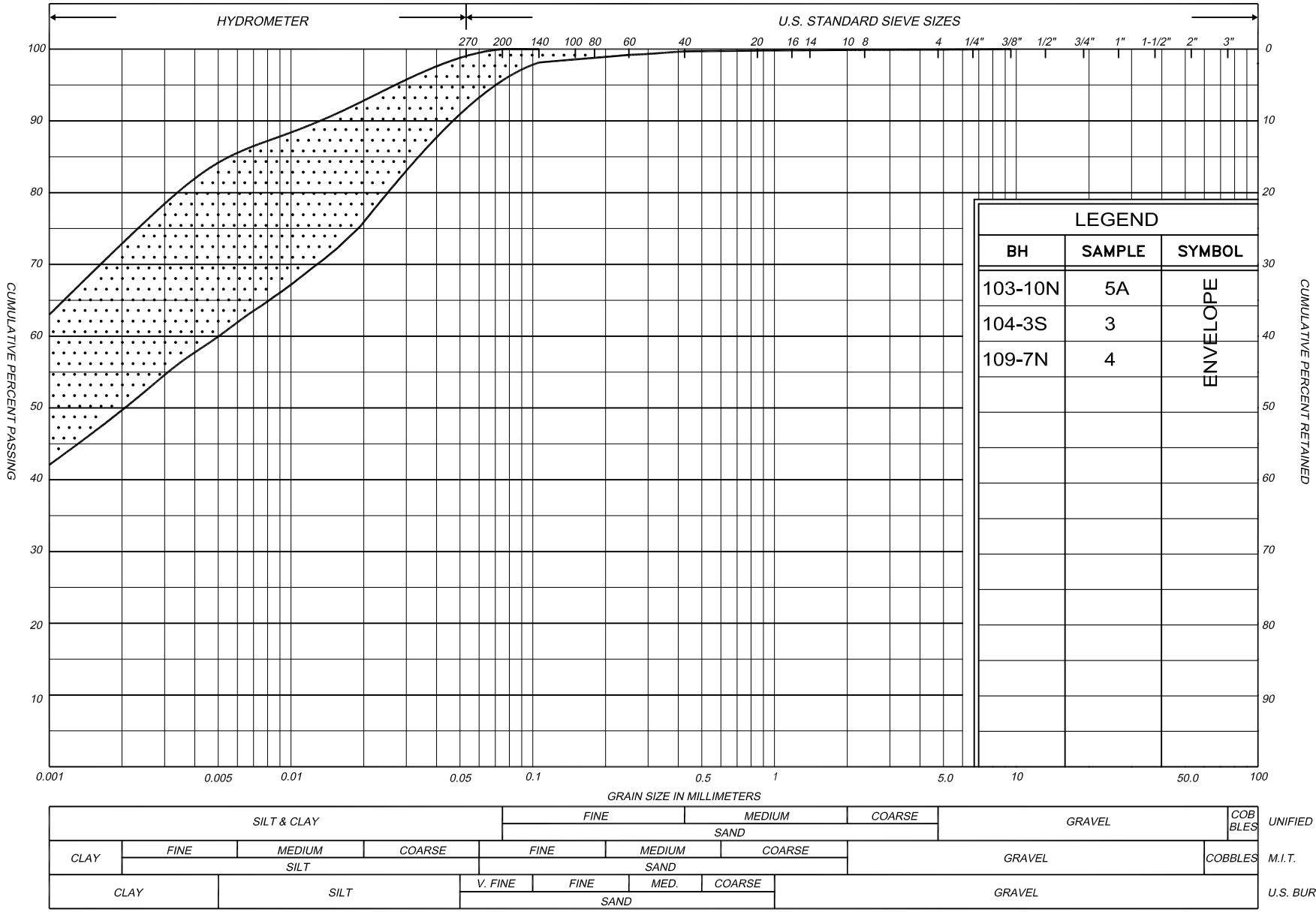
GRAIN SIZE DISTRIBUTION

SILTY CLAY trace sand (CL–CI to CI)

FIG No 6

HIGHWAY 69

G.W.P No. 293-97-00



LEGEND		
BH	SAMPLE	SYMBOL
103-10N	5A	ENVELOPE
104-3S	3	
109-7N	4	

Ministry of Transportation
Ontario

GRAIN SIZE DISTRIBUTION

CLAY with silt to SILTY CLAY trace sand (CH)

FIG No 7

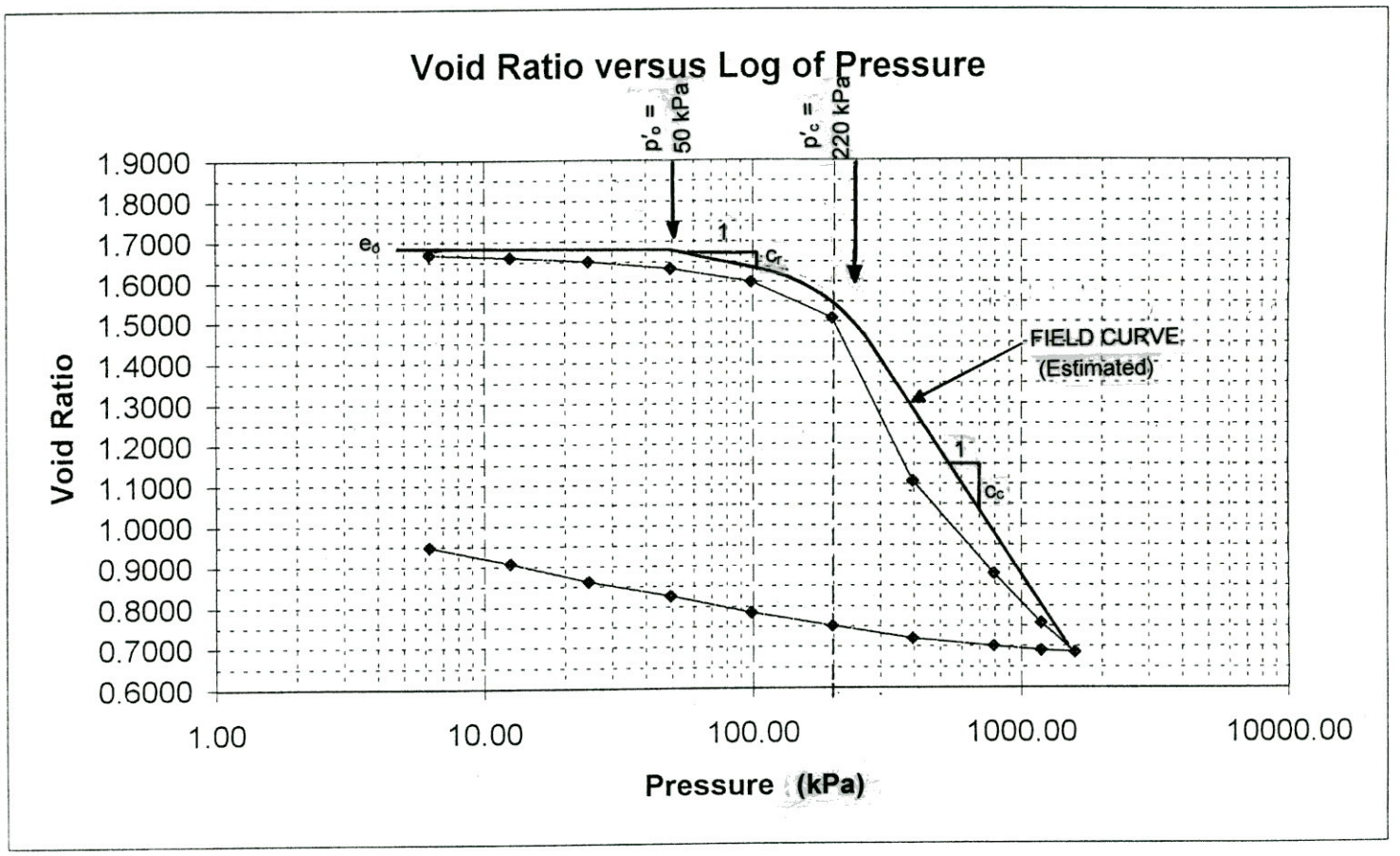
HIGHWAY 69

G.W.P No. 293-97-00

Laboratory Consolidation Test Results

Highway 69 Four-Laning
From 2.5 km North of Highway 124 Northerly 6.1 km
G.W.P. 293-97-00
District 52, Townships of McDougall and Ferguson
Nobel, Ontario

BOREHOLE 103-10N, SAMPLE 5A



SOIL TYPE: SILTY CLAY (CH)		DEPTH: 6.70 – 7.30 m
e_o = 1.67	p'_o = 50 kPa	FIGURE: 8
w_o = 64%	p'_c = 220 kPa	HIGHWAY 69
γ = 16.4 kN/m^3	C_c = 1.04	TWPS OF McDOUGALL AND FERGUSON
w_L = 57; w_p = 24; PI = 33	C_r = 0.11	G.W.P. 293-97-00

Peto MacCallum Ltd.
CONSULTING ENGINEERS

APPENDIX C : SOILS DATA

- **TABLE III – SUMMARY OF SUBSOIL CONDITIONS**
- **LIST OF ABBREVIATIONS**
- **OPSD 100.06**
- **RECORD OF TEST HOLE SHEETS**

High Fill 101:
- Borehole 101-1M
- Borehole 101-1N
- Borehole 101-1S
- Cone Penetration Test 101-1N
- Cone Penetration Test 101-1S
- Auger Probes 101-1 and 101-2

High Fill 102: (THIS SECTION DELETED)

High Fill 103:
- Boreholes 103-1M to 103-2M
- Boreholes 103-1N to 103-17N
- Boreholes 103-1S to 103-19S
- Cone Penetration Tests 103-1M to 103-3M
- Cone Penetration Tests 103-1N to 103-5N
- Cone Penetration Tests 103-1S to 103-7S

High Fill 104:
- Boreholes 104-1N to 104-11N
- Boreholes 104-1S to 104-13S
- Cone Penetration Tests 104-1N to 104-5N
- Cone Penetration Tests 104-1S to 104-3S
- Auger Probes 104-1 to 104-22

Swamp 105:
- Boreholes 105-1N to 105-14N
- Boreholes 105-1S to 105-14S
- Cone Penetration Tests 105-1N to 105-6N
- Cone Penetration Tests 105-1S to 105-6S
- Auger Probes 105-1 to 105-4

Swamp 106:
- Boreholes 106-1N to 106-6N
- Boreholes 106-1S to 106-5S
- Cone Penetration Tests 106-1N to 106-2N
- Cone Penetration Tests 106-1S to 106-3S
- Auger Probes 106-1 to 106-11

Swamp 107: (THIS SECTION DELETED)

Swamp 108: (THIS SECTION DELETED)

High Fill 109:
- Boreholes 109-1M to 109-3M
- Boreholes 109-1N to 109-11N
- Boreholes 109-1S to 109-19S
- Cone Penetration Tests 109-1M to 109-2M
- Cone Penetration Tests 109-1N to 109-2N
- Cone Penetration Tests 109-1S to 109-5S
- Auger Probes 109-1 to 109-17

TABLE III

SUMMARY OF SUBSOIL CONDITIONS
SWAMP/HIGH FILL CROSSINGS
HIGHWAY 69 FOUR-LANING
FROM 2.6 KM NORTH OF HIGHWAY 124 NORTHERLY 4.8 KM
G.W.P. 293-97-00
DISTRICT 52, TOWNSHIP OF McDOUGALL
NOBEL, ONTARIO

Swamp/ High Fill No. (1)	Road Component	No. of Test Holes (2)	Peat/Topsoil Thickness (m) (3)	Clay Thickness (m)(3)	Depth To Probable Bedrock (m) (4)	Notes and/or Underlying Materials
101	Highway 69, NBL Township of McDougall Sta. 18+505 to 18+530	4	0.0 – 0.2	0.0 – 0.2	0.0 – 1.2 (El. 200.85 – 205.65)	Topsoil over silty sand and/or probable bedrock. Isolated 200 mm thick clay layer in 1 auger probe. Bedrock exposure at 1 of 4 test holes. Asphalt layer at 1 test hole location.
	Highway 69, SBL Township of McDougall Sta. 18+505 to 18+535	3	0.0	0.0	0.0 – 2.6 (El. 203.20 – 206.50)	Silt and silty sand over probable bedrock. Bedrock exposure at 1 of 3 test holes.
103	Highway 69, NBL Township of McDougall Sta. 19+465 to 19+625	10	0.1 – 0.3	0.0 – 3.9	0.4 – 5.3 (El. 200.00 – 208.25)	Peat/clay identified (generally between 19+600 to 19+750) in 9 of 19 boreholes; underlying materials consisted of probable bedrock or, silt/sand over probable bedrock. Topsoil over sand/silt and/or probable bedrock identified in the remaining test holes.
	Sta. 19+625 to 19+700	7	0.2	7.4 –10.1	5.3 –17.7 (El. 187.75 – 200.05)	
	Sta. 19+700 to 19+865	10	0.1 – 0.2	0.0 – 7.2	1.1 – 9.6 (El. 196.25 – 210.35)	
	Highway 69, SBL Township of McDougall Sta. 19+365 to 19+865	26	0.0 – 0.3	0.0 – 5.9	0.0 – 10.5 (El. 195.40 – 211.85)	Peat/clay/clayey silt identified (generally between 19+550 and 19+800) in 12 of 19 boreholes; underlying materials consisted of probable bedrock or sand over probable bedrock. Topsoil over sand/silt and/or probable bedrock identified in the remaining test holes. Bedrock exposure identified at 2 of 26 test holes.
104	Highway 69, NBL Township of McDougall Sta. 20+165 to 20+365	27	0.0 – 0.6	0.0 – 3.5	0.0 – 9.2 (El. 205.35 – 218.30)	Peat/clay identified in 9 of 22 boreholes and auger probes; clay layer generally less than 1.5 m thick; underlying materials consisted of probable bedrock or sand/silt over probable bedrock. Topsoil over sand/silt and/or probable bedrock identified in the remaining test holes. Bedrock exposures identified at 7 of 27 test holes.
	Highway 69, SBL Township of McDougall Sta. 20+165 to 20+365	27	0.0 – 0.3	0.0 – 2.1	0.0 – 6.4 (El. 208.45 – 218.90)	Peat/clay identified in 11 of 24 boreholes and auger probes; clay layer generally less than 1.5 m thick; underlying materials consisted of probable bedrock or sand over probable bedrock. Topsoil over probable bedrock identified in the remaining test holes. Bedrock exposures identified at 12 of 27 test holes.

TABLE III

SUMMARY OF SUBSOIL CONDITIONS
SWAMP/HIGH FILL CROSSINGS
HIGHWAY 69 FOUR-LANING
FROM 2.6 KM NORTH OF HIGHWAY 124 NORTHERLY 4.8 KM
G.W.P. 293-97-00
DISTRICT 52, TOWNSHIP OF McDOUGALL
NOBEL, ONTARIO

Swamp/ High Fill No. (1)	Road Component	No. of Test Holes (2)	Peat/Topsoil Thickness (m) (3)	Clay Thickness (m)(3)	Depth To Probable Bedrock (m) (4)	Notes and/or Underlying Materials
105	Highway 69, NBL Township of McDougall Sta. 21+065 to 21+235	23	0.0 – 0.4	0.0 – 1.6	0.0 – 3.4 (El. 220.00 – 229.20)	Clay identified in 2 of 17 boreholes and auger probes; surficial peat identified in 6 of 17 boreholes and auger probes; underlying materials consisted of probable bedrock or sand over probable bedrock. Topsoil over sand/silt and/or probable bedrock identified in the remaining test holes. Bedrock exposure identified at 8 of 23 test holes.
	Highway 69, SBL Township of McDougall Sta. 21+065 to 21+235	21	0.1 – 0.9	0.0 – 1.3	0.2 – 6.0 (El. 217.40 – 225.20)	Clay identified in 7 of 15 boreholes and auger probes; peat identified in 11 of 15 boreholes and auger probes; underlying materials consisted of probable bedrock or sand/silt over probable bedrock. Topsoil over sand/silt and/or probable bedrock identified in the remaining test holes.
106	Highway 69, NBL Township of McDougall Sta. 21+965 to 22+065	13	0.0 – 0.3	0	0.0 – 1.7 (El. 217.75 – 223.90)	Peat identified in 1 of 11 boreholes and auger probes; underlying materials consisted of sand over probable bedrock. Topsoil over sand/silt and/or probable bedrock identified in the remaining test holes. Bedrock exposure identified at 2 of 13 test holes.
	Highway 69, SBL Township of McDougall Sta. 21+965 to 22+065	14	0.0 – 0.5	0	0.0 – 2.1 (El. 217.05 – 222.50)	Peat identified in 3 of 11 boreholes and auger probes; underlying materials consisted of sand over probable bedrock. Topsoil over sand/silt and/or probable bedrock identified in the remaining test holes. Bedrock exposure identified at 3 of 14 test holes.
109	Highway 69, NBL Township of McDougall Sta. 22+590 to 22+735	10	0.00 – 0.15	0.95 – 2.50	0.00 – 5.95 (El. 211.20 – 220.25)	Topsoil found in 6 of 7 boreholes. Underlying soils comprised sand some silt and sand and silt with interbedded silty clay deposits. Sands are typically loose and clays are very soft. Exposed bedrock noted at 1 borehole. Other boreholes encountered probable bedrock.
	Sta. 22+735 to 22+875	9	0.00 - 0.20	0	0.00 – 2.00 (El. 210.80 – 222.10)	Bedrock exposure in 6 of 9 test holes. Topsoil identified in 3 of 9 test holes. Underlying soils comprise sand over probable bedrock.
	Sta. 22+875 to 22+950	5	0.05 – 0.30	0	4.80 – 12.50 (El. 204.65 211.20)	Topsoil/peat identified in all 3 boreholes. Underlying materials comprised typically compact sand some silt over probable bedrock.

TABLE III

SUMMARY OF SUBSOIL CONDITIONS
SWAMP/HIGH FILL CROSSINGS
HIGHWAY 69 FOUR-LANING
FROM 2.6 KM NORTH OF HIGHWAY 124 NORTHERLY 4.8 KM
G.W.P. 293-97-00
DISTRICT 52, TOWNSHIP OF McDOUGALL
NOBEL, ONTARIO

Swamp/ High Fill No. (1)	Road Component	No. of Test Holes (2)	Peat/Topsoil Thickness (m) (3)	Clay Thickness (m)(3)	Depth To Probable Bedrock (m) (4)	Notes and/or Underlying Materials
109	Highway 69, SBL Township of McDougall Sta. 22+575 to 22+735	8	0.00 – 0.15	0.35 – 3.15	0.45 – 7.60 (El. 210.05 – 218.45)	Topsoil identified in 6 of 7 boreholes. Underlying soils comprised sand trace silt and sandy silt with interbedded very soft to stiff silty clay. Soils mantled probable bedrock.
	Sta. 22+735 to 22+875	9	0.00 – 0.05	0	0.00 – 0.30 (El. 217.00 – 221.95)	Exposed bedrock encountered in 9 of 10 test holes. Topsoil identified at 1 test hole location covering silt underlain by probable bedrock.
	Sta. 22+875 to 23+000	4	0.05 – 0.30	0	0.00 – 7.85 (El. 205.20 – 214.45)	Topsoil identified in all 3 boreholes. Underlying soils comprised sand some silt overlying probable bedrock. Bedrock exposure at 1 of 4 test holes.
	Sta. 23+000 to 23+050	5	0.20 – 0.35	0.60	1.60 – 12.65 * (El. 204.55 * – 215.85)	Peat identified in all 3 boreholes. Underlying soils comprised sand some silt overlying a layer of silty clay underlain by sand and silt. Probable bedrock was contacted at 3 of 5 test holes. Fill from existing Quarry Access Road found at 1 borehole.
	Sta. 23+050 to 23+200	9	0.15 – 0.30	0	1.35 – 7.45 (El. 209.25 – 216.70)	Peat identified in all 7 boreholes. Underlying soils comprised sand with variable amounts of silt trace clay and gravel mantling probable bedrock. Fill from existing Quarry Access Road is present within alignment of highway.

Notes: (1) Crossings 102, 107 and 108 deleted from original RFP scope of work.
(2) Test holes drilled on centreline median have been included in NBL; Test holes include boreholes, dynamic cone penetration tests and auger probes.
(3) Peat/topsoil and clay thickness based on borehole and auger probe data only.
(4) Depth to probable bedrock is based on borehole, dynamic cone penetration test and auger probe data.
* Borehole and DCPT did not reach probable bedrock.

EXPLANATION OF TERMS USED IN REPORT

N VALUE: THE STANDARD PENETRATION TEST (SPT) N VALUE IS THE NUMBER OF BLOWS REQUIRED TO CAUSE A STANDARD 51mm O.D. SPLIT BARREL SAMPLER TO PENETRATE 0.3m INTO UNDISTURBED GROUND IN A BOREHOLE WHEN DRIVEN BY A HAMMER WITH A MASS OF 63.5kg, FALLING FREELY A DISTANCE OF 0.76m. FOR PENETRATIONS OF LESS THAN 0.3m N VALUES ARE INDICATED AS THE NUMBER OF BLOWS FOR THE PENETRATION ACHIEVED. AVERAGE N VALUE IS DENOTED THUS $\bar{N}$.

DYNAMIC CONE PENETRATION TEST: CONTINUOUS PENETRATION OF A CONICAL STEEL POINT (51mm O.D. 60° CONE ANGLE) DRIVEN BY 475 J IMPACT ENERGY ON 'A' SIZE DRILL RODS. THE RESISTANCE TO CONE PENETRATION IS MEASURED AS THE NUMBER OF BLOWS FOR EACH 0.3m ADVANCE OF THE CONICAL POINT INTO THE UNDISTURBED GROUND.

SOILS ARE DESCRIBED BY THEIR COMPOSITION AND CONSISTENCY OR DENSENESS.

CONSISTENCY: COHESIVE SOILS ARE DESCRIBED ON THE BASIS OF THEIR UNDRAINED SHEAR STRENGTH (c_u) AS FOLLOWS:

c_u (kPa)	0 - 12	12 - 25	25 - 50	50 - 100	100 - 200	>200
	VERY SOFT	*SOFT*	*FIRM*	*STIFF*	*VERY STIFF*	*HARD*

DENSENESS: COHESIONLESS SOILS ARE DESCRIBED ON THE BASIS OF DENSENESS AS INDICATED BY SPT N VALUES AS FOLLOWS:

N (BLOWS/0.3m)	0 - 5	5 - 10	10 - 30	30 - 50	>50
	VERY LOOSE	*LOOSE*	*COMPACT*	*DENSE*	*VERY DENSE*

ROCKS ARE DESCRIBED BY THEIR COMPOSITION AND STRUCTURAL FEATURES AND / OR STRENGTH.

RECOVERY: SUM OF ALL RECOVERED ROCK CORE PIECES FROM A CORING RUN EXPRESSED AS A PERCENT OF THE TOTAL LENGTH OF THE CORING RUN.

MODIFIED RECOVERY: SUM OF THOSE INTACT CORE PIECES, 100mm+ IN LENGTH EXPRESSED AS A PERCENT OF THE LENGTH OF THE CORING RUN. THE ROCK QUALITY DESIGNATION (R Q D), FOR MODIFIED RECOVERY, IS:

RQD (%)	0 - 25	25 - 50	50 - 75	75 - 90	90 - 100
	VERY POOR	*POOR*	*FAIR*	*GOOD*	*EXCELLENT*

JOINTING AND BEDDING:

SPACING	50mm	50 - 300mm	0.3m - 1m	1m - 3m	>3m
JOINTING	*VERY CLOSE*	*CLOSE*	*MOD. CLOSE*	*WIDE*	*VERY WIDE*
BEDDING	*VERY THIN*	*THIN*	*MEDIUM*	*THICK*	*VERY THICK*

ABBREVIATIONS AND SYMBOLS

FIELD SAMPLING

S S	SPLIT SPOON	T P	THINWALL PISTON
W S	WASH SAMPLE	O S	OSTERBERG SAMPLE
S T	SLOTTED TUBE SAMPLE	R C	ROCK CORE
B S	BLOCK SAMPLE	P H	T W ADVANCED HYDRAULICALLY
C S	CHUNK SAMPLE	P M	T W ADVANCED MANUALLY
T W	THINWALL OPEN	F S	FOIL SAMPLE
F V	FIELD VANE		

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
r_u	1	PORE PRESSURE RATIO
σ	kPa	TOTAL NORMAL STRESS
σ'	kPa	EFFECTIVE NORMAL STRESS
τ	kPa	SHEAR STRESS
$\sigma_1, \sigma_2, \sigma_3$	kPa	PRINCIPAL STRESSES
ϵ	%	LINEAR STRAIN
$\epsilon_1, \epsilon_2, \epsilon_3$	%	PRINCIPAL STRAINS
E	kPa	MODULUS OF LINEAR DEFORMATION
G	kPa	MODULUS OF SHEAR DEFORMATION
μ	1	COEFFICIENT OF FRICTION

MECHANICAL PROPERTIES OF SOIL

m_v	kPa^{-1}	COEFFICIENT OF VOLUME CHANGE
C_c	1	COMPRESSION INDEX
C_s	1	SWELLING INDEX
C_α	1	RATE OF SECONDARY CONSOLIDATION
c_v	m^2/s	COEFFICIENT OF CONSOLIDATION
H	m	DRAINAGE PATH
T_v	1	TIME FACTOR
U	%	DEGREE OF CONSOLIDATION
σ'_{vo}	kPa	EFFECTIVE OVERBURDEN PRESSURE
σ'_p	kPa	PRECONSOLIDATION PRESSURE
τ_f	kPa	SHEAR STRENGTH
c'	kPa	EFFECTIVE COHESION INTERCEPT
ϕ'	-°	EFFECTIVE ANGLE OF INTERNAL FRICTION
c_u	kPa	APPARENT COHESION INTERCEPT
ϕ_u	-°	APPARENT ANGLE OF INTERNAL FRICTION
τ_R	kPa	RESIDUAL SHEAR STRENGTH
τ_r	kPa	REMOULDED SHEAR STRENGTH
S_t	1	SENSITIVITY = $\frac{c_u}{\tau_r}$

PHYSICAL PROPERTIES OF SOIL

ρ_s	kg/m^3	DENSITY OF SOLID PARTICLES
γ_s	kN/m^3	UNIT WEIGHT OF SOLID PARTICLES
ρ_w	kg/m^3	DENSITY OF WATER
γ_w	kN/m^3	UNIT WEIGHT OF WATER
ρ	kg/m^3	DENSITY OF SOIL
γ	kN/m^3	UNIT WEIGHT OF SOIL
ρ_d	kg/m^3	DENSITY OF DRY SOIL
γ_d	kN/m^3	UNIT WEIGHT OF DRY SOIL
ρ_{sat}	kg/m^3	DENSITY OF SATURATED SOIL
γ_{sat}	kN/m^3	UNIT WEIGHT OF SATURATED SOIL
ρ'	kg/m^3	DENSITY OF SUBMERGED SOIL
γ'	kN/m^3	UNIT WEIGHT OF SUBMERGED SOIL
e	1,%	VOID RATIO

n	1,%	POROSITY
w	1,%	WATER CONTENT
S_r	%	DEGREE OF SATURATION
w_L	%	LIQUID LIMIT
w_P	%	PLASTIC LIMIT
w_S	%	SHRINKAGE LIMIT
I_P	%	PLASTICITY INDEX = $w_L - w_P$
I_L	1	LIQUIDITY INDEX = $\frac{w - w_P}{I_P}$
I_C	1	CONSISTENCY NDEX = $\frac{w_L - w}{I_P}$
DTPL		DRIER THAN PLASTIC LIMIT
APL		ABOUT PLASTIC LIMIT
WTPL		WETTER THAN PLASTIC LIMIT

e_{max}	1,%	VOID RATIO IN LOOSEST STATE
e_{min}	1,%	VOID RATIO IN DENSEST STATE
I_D	1	DENSITY INDEX = $\frac{e_{max} - e}{e_{max} - e_{min}}$
D	mm	GRAIN DIAMETER
D_n	mm	n PERCENT - DIAMETER
C_U	1	UNIFORMITY COEFFICIENT
h	m	HYDRAULIC HEAD OR POTENTIAL
q	m^3/s	RATE OF DISCHARGE
v	m/s	DISCHARGE VELOCITY
i	1	HYDRAULIC GRADIENT
k	m/s	HYDRAULIC CONDUCTIVITY
j	kN/m^3	SEEPAGE FORCE

ABBREVIATIONS FOR BORING AND TEST DATA

Accep	Acceptable
Agg	Aggregate
Amor	Amorphous
Asph	Asphalt
BR	Bedrock
Blk	Black
Bl	Blue
BH	Borehole
Bld (y)	Boulder (y)
Blds	Boulders
BU	Break Up
Br	Brown
CF	Channel Face
Cl	Clay
Co	Coarse
Cob	Cobbles
Comp	Compact
Conc	Concrete
Contam	Contaminated
Cord	Corduroy
Cr	Crushed
Dk	Dark
Decomp	Decomposed
D	Dense
E	Earth
Fib	Fibrous
w	Field Moisture Content
F	Fine
Fr Wat	Free Water
FB	Frost Boil
FH	Frost Heave
Gran	Granular
Gr	Gravel (y)
Grn	Green
Gry	Grey
H	Heavy
Hi	Highly
HP	High Plasticity
HM	Hot Mix
Lt	Light
Liq	Liquid
W_L	Liquid Limit
Lo	Loam
L	Loose
Mrl	Marl
Matl	Material
Max	Maximum
MDD	Maximum Dry Density
MWD	Maximum Wet Density
Med	Medium
MP	Medium Plasticity
Mod	Moderate
Mott	Mottled
Mul	Mulch
NFP	No Further Progress
NFP (Blds)	No Further Progress (Boulders)
Num	Numerous
OCC	Occasional
Wopt	Optimum Moisture Content
Ora	Orange
Org	Organic
Org M	Organic Matter
Ob	Overburden
Pavt	Pavement
Pedo	Pedological
Pen Mac	Penetration Macadam
W_P	Plastic Limit
I_P	Plasticity Index
Psty	Polystyrene
Poss	Possible
PST	Prime & Surface Treatment
Quant	Quantity
Reinf	Reinforced
RSS	Remoulded Shear Strength
RF	Rock Fill
Sa	Sand
Sat	Saturated
Sh	Shale
St	Sensitivity
SSM	Select Subgrade Material
Sh Rk	Shot Rock
Si (y)	Silt (y)
Sl (y)	Slight (ly)
SP	Slight Plastic
Stn (y)	Stone (y)
D_R	Relative Density
Stks	Streaks
Surf	Surface
Temp	Temperature
TH	Test Hole
TP	Test Pit
Tps	Topsoil
Tr	Trace
USS	Undisturbed Shear Strength
Unreif	Unreinforced
Varv	Varved
VF	Very Fine
WT	Water Table
Weath	Weathered
W	With
Wd (y)	Wood (y)
Yel	Yellow

SUSCEPTIBILITY TO FROST HEAVING

HSFH - High
MSFH - Medium
LSFH - Low

ONTARIO PROVINCIAL STANDARD DRAWING

Date	1996 07 18	Rev	
Date			

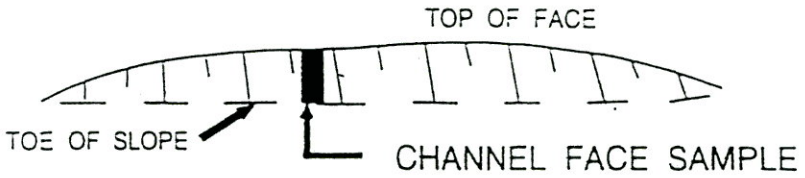
ABBREVIATIONS

GEOTECHNICAL

OPSD - 100.06

FIELD SKETCH LEGEND

PIT FACE, CUT OR FILL

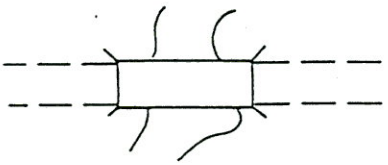


PROBABLE OUTLINE OF DEPOSIT

TEST HOLE: ■ BACKHOE, ● AUGER OR DIAMOND DRILL

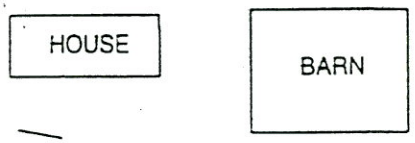
RIVER OR CREEK

STRUCTURE



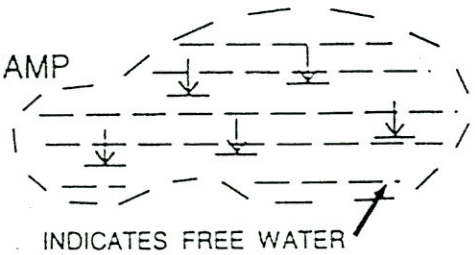
(DESIGNATE TYPE)

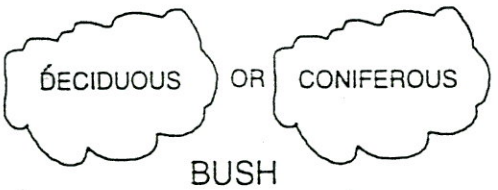
BUILDINGS



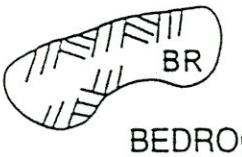
(DESIGNATE TYPE)

SWAMP

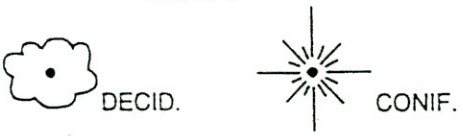




BUSH

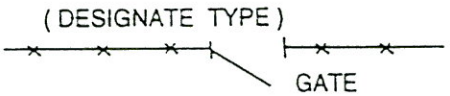


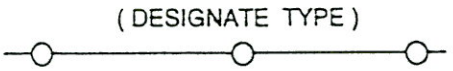
BEDROCK



TREES

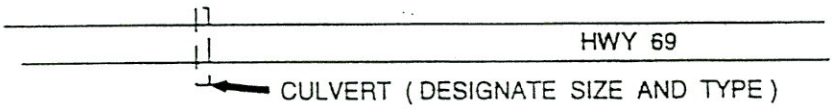
FENCE



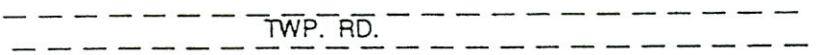


OVERHEAD UTILITY LINES

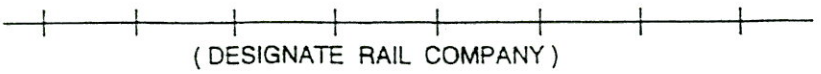
PAVED ROAD



GRAVEL ROAD



RAILWAY



UNDER GROUND UTILITY

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RECORD OF BOREHOLE No 101-1M 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 18+512.5, CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				
206.30 / 0.00	Ground Surface										
0.05	Asphalt (PAVEMENT)		1	SS	5		206		○		
0.25 / 205.65	Topsoil										
0.65	Silty sand Loose Brown Damp										
	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 101-1N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 18+525, o/s 13.5m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
204.00	Ground Surface										
0.00	End of borehole Refusal on bedrock * Groundwater level not established										

ON_MOT VER3 NB_101.GPJ ON_MOT.GDT 11/10/2002 3:22:17 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 101-1S

METRIC

G.W.P. 293-97-00	**LOCATION** HWY. 69 Sta. 18+525, o/s 13.5m Lt. CL Med.	**ORIGINATED BY** FP	
DIST 52 **HWY** 69	**BOREHOLE TYPE** Continuous Flight Hollow Stem Augers	**COMPILED BY** FP/DH	
DATUM Geodetic	**DATE** August 29, 2001	**CHECKED BY**	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); SHEAR STRENGTH kPa: O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					
206.50 / 0.00	Ground Surface										
	End of borehole Refusal on probable bedrock * Groundwater level not established										

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

20 / 15 –O– 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF PENETRATION TEST No 101-1N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 18+509, o/s 23m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES														
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
202.00	Ground Surface										
0.00											
							201	120/25cm			
200.85											
1.15	End of dynamic cone penetration test Refusal on probable bedrock										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF PENETRATION TEST No 101-1S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 18+512.5, o/s 25m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.80	Ground Surface										
0.00							205				
							204				
203.20								120/15cm			
2.60	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_101PT.GPJ ON_MOT.GDT 11/10/2002 3:19:27 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

AUGER PROBE LOGS

G.W.P. 293-97-00 Highway 69
Four-Laning from 2.6 km North of Highway 124 Northerly 4.8 km
District 52 Township of McDougall

DATUM: Proposed Centreline Median

101 - 1

18+505		18.8	Lt C/L	205.30
0	-	450	Lt Br Si Moist	
		450	NFP Poss BR	

101 - 2

18+505		18.8	Rt C/L	202.85
0	-	400	Lt Br Si Dry	
400	-	600	Br/Lt Br Cl Dry	
600	-	1.00	Lt Br Si Dry	
		1.00	NFP Poss BR	

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RECORD OF BOREHOLE No 103-1M

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+625, CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 12, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)	SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L (WATER CONTENT (%) 20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.60	Ground Surface										
0.00											
0.20	Topsoil	1	SS	7							
	Silty sand Loose Brown Damp				▽*	205					
203.80						204					
1.80	Trace clay Grey Wet	2	SS	2							
	Silty clay trace sand Firm Grey Wet					203	3				
		3	SS	1/60cm							
						202	3				
		4	SS	1/60cm		201					
						200	4				
		5	SS	1/60cm							
						199	3				
	Interbedded clayey silt trace sand seams	6	SS	1/60cm		198					
						197	2				
196.45											
9.15	Silt some sand some clay Loose Grey Wet	7	SS	1/60cm***		196					
194.90		8	SS	5/5cm**		195					
10.70	End of borehole										

Refusal on probable bedrock

* 2001 08 12

▽ Water level observed during drilling

** Refusal to spoon

*** Low 'N' values due to hydraulic disturbance.

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-2M

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+725, CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 11, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					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	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa: ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE (20 40 60 80 100)	WATER CONTENT (%) (20 40 60)			kN/m³	GR SA SI CL
206.10 / 0.00	Ground Surface						206						
0.10	Topsoil		1	SS	4								
	Silty sand Loose Brown Damp					▽*	205						
204.60 / 1.50	Silty clay trace sand Firm Reddish/ Grey Wet		2	SS	1/45cm	▼*	204	4					
			3	SS	1/45cm		203						
							202	3					
	Interbedded clayey silt some sand seams		4	SS	1/60cm		201						
200.00 / 6.10			5	SS	4/23cm**		200						
199.60 / 6.50	Fine to medium sand trace gravel Loose Grey Wet												
	End of Borehole Refusal on probable bedrock												

* 2001 08 11

▽ Water level observed during drilling

▼ Water level measured after drilling

** Refusal to spoon

Unable to advance field vane at 5.35m.

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-1N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+465, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
207.50	Ground Surface										
0.00											
0.20	Topsoil		1	SS	3						
206.90	Silty sand						207				
0.60	Loose Brown Damp										
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+475, o/s 7m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
206.65	Ground Surface					*					
0.00 / 0.20	Topsoil		1	SS	3						
	Silty sand Loose Brown Damp						206				
205.15 / 1.50	Silty clay trace sand		2	SS	7		205				
204.65 / 2.00	Firm Brown Moist										
	End of borehole Refusal on probable bedrock										
	* Borehole dry upon completion										

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:43:16 PM

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

20 / 15 —○— 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-3N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+475, o/s 33m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa: O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, X LAB VANE; 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
208.60	Ground Surface					*					
0.00											
208.25 / 0.25	Topsoil		1	SS	6/15cm**						
0.35	Silty sand Compact Grey Moist										
	End of borehole Refusal on probable bedrock										
	* Borehole dry upon completion ** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 –O– 5 / 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 103-4N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+500, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

ELEV / DEPTH	SOIL PROFILE – DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
206.45	Ground Surface											
0.00	Topsoil											
0.25	Silty sand Loose Brown Moist	1	SS	2	∇* (water level)	206	~19					
204.95 / 1.50	Sandy silt some clay Loose Brown Wet	2	SS	6		205	~21		0	38	51	11
204.15 / 2.30	End of borehole Refusal on probable bedrock											

* 2001 08 15

∇ Water level observed during drilling

Borehole dry upon completion

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

REMARKS & GRAIN SIZE DISTRIBUTION (%)

+7, ×5 : Numbers refer to Sensitivity   20 / 15 –○– 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-5N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+525, o/s 6m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
207.00	Ground Surface										
0.00											
0.15	Topsoil		1	SS	10						
206.55											
0.45	Silty sand Compact Brown Damp										
	End of borehole Refusal on probable bedrock										
	* Borehole dry upon completion										

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:44:21 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-6N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+525, o/s 34m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)				REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE					UNIT WEIGHT γ kN/m³	GR SA SI CL
206.80	Ground Surface												
0.00													
0.20	Topsoil		1	SS	8								
	Silty sand												
	Loose Brown Damp						206						
205.65													
1.15	End of borehole												
	Refusal on probable bedrock												
	* Borehole dry upon completion												

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:44:54 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-7N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+550, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)			
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.90	Ground Surface										
0.00 / 0.10	Topsoil		1	SS	15				○		
	Sandy silt trace clay										
204.95	Compact Brown Damp						205				
0.95	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-8N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+575, o/s 40m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	w_P	w	w_L	γ kN/m³	GR SA SI CL
205.35	Ground Surface												
0.00 / 0.10	Peat, fine fibrous		1	SS	5	∇*	205						
	Silty clay some sand Firm Mottled Grey/Brown Wet												
	Trace sand Grey		2	SS	1/60cm		204						
202.40							203	+ 2					
2.95	End of borehole Refusal on probable bedrock												

* 2001 08 15

∇ Water level observed during drilling

Borehole dry upon completion

WATER CONTENT (%) 20 40 60

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-9N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+600, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					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	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa (20 40 60 80 100) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	WATER CONTENT (%) (20 40 60)	kN/m³	GR SA SI CL
205.40	Ground Surface										
0.00											
0.20	Topsoil		1	SS	4		205				
	Silty sand Loose Brown Damp					∇*					
204.30											
1.10	Silty clay trace sand Firm Grey Wet		2	SS	2		204				
							203	2			
	Soft		3	SS	1/60cm		202				
201.30								3			
4.10	End of borehole Refusal on probable bedrock										

* 2001 08 15

∇ Water level observed during drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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Ontario

Peto MacCallum Ltd.
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RECORD OF BOREHOLE No 103-10N 1 of 2 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+650, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15 & 16, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.65	Ground Surface							
0.00 / 0.15	Topsoil	1	SS	3		205		
	Silty sand Loose Brown Damp							
204.15 / 1.50	Silty clay trace sand Firm Grey Wet	2	SS	1/60cm	▽*	204		
						203		
		3	SS	1/60cm	▼*	202		
		4	SS	1/60cm		201		0 4 51 45
						200		
		5	SS	1/60cm		199		
		5A	TW	-			16.4	0 0 38 62
		6	SS	1/60cm		198		
						197		
196.50 / 9.15	Silt with sand some clay Interbedded clayey silt seams Loose Grey Wet	7	SS	1***		196		
		8	SS	1/60cm***		195		0 30 54 16
						194		
		9	SS	1/60cm***		193		
191.95 / 13.70	Fine sand some silt trace clay Loose Grey Wet Cont'd	10	SS	1***		192		0 85 11 4
						191		

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

ON_MOT TWO DATES NB_103.GPJ ON_MOT.GDT 11/10/2002 3:34:00 PM

+7, ×5 : Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-10N 2 of 2 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+650, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15 & 16, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
205.65	Ground Surface										
			11	SS	5		190		○		
189.70 / 15.95	End of borehole Refusal on probable bedrock * 2001 08 15 Water level observed during drilling Water level measured after drilling *** Low 'N' values due to hyraulic disturbance.										

ON_MOT TWO DATES NB_103.GPJ ON_MOT.GDT 11/10/2002 3:34:02 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-11N 1 of 2 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+675, o/s 41m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
205.45	Ground Surface					
0.00						
0.20	Topsoil	1	SS	4		205
	Silty sand Loose Brown Moist					
204.25						
1.20	Silty clay trace sand Soft Grey Wet	2	SS	1		204
						203
	Firm	3	SS	1		202
		4	SS	1/60cm		201
						200
	Interbedded sandy silt seams	5	SS	1/60cm		199
						198
	Some sand	6	SS	1/60cm		197
						196
	Stiff	7	SS	1/60cm		195
	Interbedded silty sand seams	8	SS	4		
194.15						
11.30	Silty sand trace clay Loose Grey Wet					194
		9	SS	2***		193
						192
		10	SS	7		191
	Cont'd					

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:39:21 PM

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 103-11N 2 of 2 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+675, o/s 41m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 15, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
205.45	Ground Surface										
			11	SS	9		190				
							189				
188.70 / 16.75	End of borehole						188	120/0cm			
187.75 / 17.70	End of dynamic cone penetration test Refusal on probable bedrock At 15.25m, 2.15m sand heave. * 2001 08 15 Water level observed during drilling Water level measured after drilling *** Low 'N' value due to hydraulic disturbance.										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-12N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+700, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 16, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
205.50	Ground Surface										
0.00 / 0.15	Topsoil		1	SS	4		205				
	Silty sand Loose Brown Damp					▼* ▽*					
204.00 / 1.50	Silty clay trace sand Soft Grey Wet		2	SS	1		204				
							203	+3			
	Firm		3	SS	1/60cm		202				
								+4			
	Some sand		4	SS	1/60cm		201				
							200	+5			
			5	SS	1/60cm		199				
							198	+3			
			6	SS	1/60cm		197				
196.80 / 8.70	End of borehole Refusal on probable bedrock * 2001 08 16 ▽ Water level observed during drilling ▼ Water level measured after drilling										

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:39:52 PM

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-13N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+750, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 22, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
207.20	Ground Surface										
0.00 / 0.15	Topsoil		1	SS	6		207				
	Silty sand Loose Brown Damp					▽*	206				
205.70 / 1.50	Silty clay trace sand Firm Reddish/ Grey Wet		2	SS	2		205	3			
			3	SS	1		204				
202.95 / 4.25	Fine to medium sand Loose Grey Wet		4	SS	2***	▼*	203				
202.00 / 5.20	End of borehole Refusal on probable bedrock						202				

* 2001 08 22

▽ Water level observed during drilling

▼ Water level measured after drilling

*** Low 'N' value due to hydaulic disturbance.

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 103-14N   1 of 1   METRIC

G.W.P. 293-97-00   LOCATION HWY. 69 Sta. 19+775, o/s 40m Rt. CL Med.   ORIGINATED BY FP

DIST 52   HWY 69   BOREHOLE TYPE Continuous Flight Hollow Stem Augers   COMPILED BY DH/FP

DATUM Geodetic   DATE August 22, 2001   CHECKED BY

ELEV / DEPTH	SOIL PROFILE – DESCRIPTION	STRAT PLOT	SAMPLES – NUMBER	SAMPLES – TYPE	SAMPLES – "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L – WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
208.25	Ground Surface					*					
0.00	Topsoil										
0.20	Silty sand Loose Brown Damp Trace clay Interbedded clayey silt seams		1	SS	5		208				
							207				
			2	SS	13						
206.05 2.20	Compact Grey										
	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

$+^7$, $\times^5$: Numbers refer to Sensitivity   20 / 15 –O– 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-15N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+800, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 22, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
209.50	Ground Surface										
0.00											
0.20	Topsoil										
	Silty sand Loose Brown Damp		1	SS	5		209				
							208				
207.60			2	SS	27/25cm**	*					
1.90	End of borehole Refusal on probable bedrock * Borehole dry upon completion ** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-16N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+825, o/s 5m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 22, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
210.95	Ground Surface										
0.00											
0.20	Topsoil		1	SS	7						
	Silty sand Loose Brown Damp						210				
	Compact Grey Moist		2	SS	27		209				
208.70											
2.25	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:41:27 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-17N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+850, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 22, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
211.95	Ground Surface										
0.00											
0.15	Topsoil		1	SS	9						
	Silty sand Loose Brown Damp						211				
210.35			2	SS	5/0cm	**					
1.60	Compact Moist										
	End of borehole Refusal on probable bedrock * Borehole dry upon completion ** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-1S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+365, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)	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	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa: ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE (20 40 60 80 100)	WATER CONTENT (%) (20 40 60)			kN/m³	GR SA SI CL
206.60	Ground Surface												
0.00	Topsoil		1	SS	3								
0.25	Silty sand Loose Brown Damp						206						
205.10						∇*							
1.50	Silty clay trace sand Stiff Grey Wet		2	SS	5/10cm**		205						
204.80													
1.80	End of borehole Refusal on probable bedrock												

* 2001 08 14

∇ Water level observed during drilling

Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-2S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+375, o/s 31m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
206.65	Ground Surface										
0.00											
0.15	Topsoil		1	SS	4						
	Silty sand						206				
205.75	Loose Brown Damp										
0.90											
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:43:30 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-3S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+400, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
208.00	Ground Surface										
0.00											
0.15	Topsoil		1	SS	5						
	Silty sand										
207.10	Loose Brown Damp										
0.90											
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

+7 , ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-4S 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 19+425, o/s 9m Lt. CL Med. | ORIGINATED BY FP

DIST 52 | HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY DH/FP

DATUM Geodetic | DATE August 14, 2001 | CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60			
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
209.60	Ground Surface										
0.00											
	End of borehole										
	Refusal on bedrock										
	* Groundwater level not established										
	** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 ○ 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-5S

METRIC

G.W.P. 293-97-00	LOCATION HWY. 69 Sta. 19+450, o/s 19m Lt. CL Med.		ORIGINATED BY FP
DIST 52	HWY 69	BOREHOLE TYPE Continuous Flight Hollow Stem Augers	COMPILED BY DH/FP
DATUM Geodetic	DATE August 14, 2001		CHECKED BY

ELEV / DEPTH	DESCRIPTION (SOIL PROFILE)	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
207.35	Ground Surface										
0.00 / 0.20	Peat, fine fibrous										
	Silty sand Loose Grey/Brown Moist		1	SS	7		207				
205.85 / 1.50							206				
	Clayey silt some sand Firm Grey Wet		2	SS	5		205		⊢⊣		0 12 63 25
204.45 / 2.90	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:44:38 PM

$+^7$, $\times^5$: Numbers refer to Sensitivity

20 / 15 —○— 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 103-6S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+475, o/s 33m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
206.65	Ground Surface										
0.00	Topsoil		1	SS	2/15cm**	*					
0.30	End of borehole										

Refusal on probable bedrock

* Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-7S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+500, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
206.60	Ground Surface										
0.00	Peat, fine fibrous		1	SS	8						
0.15	Silty sand trace clay						206				
205.80	Loose Grey Moist										
0.80	End of borehole										

Refusal on probable bedrock

* Borehole dry upon completion

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-8S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+525, o/s 5m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
206.65	Ground Surface										
0.00			1	SS	2/3cm	**					
0.20	Topsoil										
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										
	** Refusal to spoon										

ON_MOT LINES OVER BDRY NB_103.GPJ ON_MOT.GDT 11/10/2002 3:30:50 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 103-9S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+550, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
205.45	Ground Surface										
0.00	Topsoil										
0.15	Silty sand Loose Mottled Damp Grey/Brown to Moist		1	SS	4	∇*	205				
203.95											
1.50	Silty clay trace sand Firm Grey Wet		2	SS	2		204				
							203	4 +			
			3	SS	1/60cm		202				
201.45											
4.00	End of borehole Refusal on probable bedrock * 2001 08 14 ∇ Water level observed during drilling Borehole dry upon completion Unable to advance field vane at 3.95m.										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-10S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+575, o/s 40m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L (WATER CONTENT (%))	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.40	Ground Surface									
0.00										
0.20	Topsoil	1	SS	5		205				
	Silty sand Loose Brown Damp				▽*					
203.90						204				
1.50	Clayey silt some sand Firm Grey Wet	2	SS	1/60cm						
						203	+ 2			
		3	SS	1/60cm		202				0 19 48 33
					▼*		+ 4			
200.80						201				
4.60	Silty sand trace clay	4	SS	2***						
200.20	Interbedded clayey silt seams									
5.20	Loose Grey Wet									
	End of borehole									
	Refusal on probable bedrock									

* 2001 08 14

▽ Water level observed during drilling

▼ Water level measured after drilling

*** Low 'N' value due to hydaulic disturbance.

+7, ×5 : Numbers refer to Sensitivity

15–20–10–5 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 103-11S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+600, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L (WATER CONTENT (%) 20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
205.75	Ground Surface										
0.00	Topsoil										
0.10	Silty sand Interbedded clayey silt seams Loose Mottled Grey/Brown Damp to Moist		1	SS	4	∇*	205				
204.25											
1.50	Silty clay trace sand Firm Grey Wet		2	SS	1/45cm		204				
							203	4			
			3	SS	1/60cm		202	3			
201.15											
4.60	End of borehole Refusal on probable bedrock * 2001 08 14 ∇ Water level observed during drilling Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-12S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+650, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 11, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.90 / 0.00	Ground Surface									
0.15	Topsoil	1	SS	4						
	Silty sand Loose Brown Damp				▽*	205				
204.40 / 1.50										
204.20 / 1.70	Sandy silt Loose Reddish/Grey Wet	2	SS	3		204				
	Silty clay trace sand Firm Reddish/Grey Wet					203	+ 3			
	Grey	3	SS	1/60cm						
						202	+ 3			
		4	SS	1/60cm		201				
							+ 3			
						200				
	Interbedded clayey silt seams	5	SS	1/60cm						
198.30 / 7.60						199				
							+ 3			
	Clayey silt some sand Interbedded silty clay seams Firm Grey Wet	6	SS	1/60cm		198				
							+ 3			
						197				
		7	SS	1/60cm						
						196				
195.40 / 10.50	End of borehole Refusal on probable bedrock * 2001 08 15 ▽ Water level observed during drilling									

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation Ontario

RECORD OF BOREHOLE No 103-13S

METRIC

G.W.P. 293-97-00		**LOCATION**	HWY. 69 Sta. 19+675, o/s 41m Lt. CL Med.	**ORIGINATED BY**	FP
DIST 52	**HWY** 69	**BOREHOLE TYPE**	Continuous Flight Hollow Stem Augers	**COMPILED BY**	DH/FP
DATUM Geodetic		**DATE**	August 12, 2001	**CHECKED BY**	

ELEV / DEPTH	SOIL PROFILE: DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
206.10	Ground Surface										
0.00	Topsoil						206				
0.20	Silty sand Loose Brown Damp		1	SS	5	∇*	205				
204.60 / 1.50	Silty clay trace sand Firm Reddish/Grey Wet		2	SS	2		204	+3			
203.05 / 3.05	Clayey silt some sand		3	SS	1/45cm		203				
202.60 / 3.50	Interbedded sandy silt some clay seams Firm Grey Wet										

End of borehole

Refusal on probable bedrock

* 2001 08 12

∇ Water level observed during drilling

+7, ×5: Numbers refer to Sensitivity

20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-14S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+700, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 11, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L (WATER CONTENT (%) 20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
205.70	Ground Surface										
0.00	Topsoil										
0.20	Silty sand Loose Brown Damp		1	SS	4	▽*	205				
204.20											
1.50	Silty clay trace sand Firm Reddish/ Grey Wet		2	SS	1/45cm		204				
							203	+ 3			
	Soft		3	SS	1/60cm	▼*	202	+ 2			
201.30											
4.40	End of borehole Refusal on probable bedrock * 2001 08 14 ▽ Water level observed during drilling ▼ Water level measured after drilling										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-15S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+750, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 11, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					
207.05	Ground Surface										
0.00	Topsoil						207				
0.15	Silty sand Loose Brown Damp		1	SS	5						
205.85							206				
1.20	Clayey silt Interbedded sandy silt seams		2	SS	3						
204.90							205				
2.15	Firm Brown Wet End of borehole Refusal on probable bedrock * Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-16S 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 19+775, o/s 41m Lt. CL Med. | ORIGINATED BY FP

DIST 52 | HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY DH/FP

DATUM Geodetic | DATE August 11, 2001 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
208.35	Ground Surface										
0.00	Topsoil										
0.15	Silty sand Compact Brown Damp		1	SS	10		208		○		
206.85							207				
1.50	Silty clay Interbedded sandy silt seams		2	SS	3				○		
205.80	Firm Reddish/ Brown Wet						206				
2.55	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation Ontario

Foundation Design

RECORD OF BOREHOLE No 103-17S

METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 19+800, o/s 19m Lt. CL Med. | ORIGINATED BY FP

DIST 52 HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY DH/FP

DATUM Geodetic | DATE August 11, 2001 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	WATER CONTENT (%) (Wp, w, WL)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
209.35	Ground Surface					*					
0.00	Topsoil										
0.20	Silty sand Loose Brown Damp		1	SS	7		209				
207.85 1.50	Clayey silt trace sand Stiff Reddish/Grey Moist		2	SS	10		208		Wp–WL range plotted		0 2 61 37
206.75 2.60	End of borehole Refusal on probable bedrock * Borehole dry upon completion						207				

Legend: SHEAR STRENGTH kPa — O UNCONFINED; + FIELD VANE; ● QUICK TRIAXIAL; × LAB VANE. Scales: 20 40 60 80 100 (DCPT / shear strength); 20 40 60 (water content).

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:42:00 PM

$+^7, \times^5$: Numbers refer to Sensitivity

20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 103-18S 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 19+825, o/s 4m Lt. CL Med. | ORIGINATED BY FP

DIST 52 | HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY DH/FP

DATUM Geodetic | DATE August 11, 2001 | CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
210.70	Ground Surface										
0.00	Topsoil										
0.10	Silty sand Very Loose Brown Damp		1	SS	1		210				
	Interbedded sandy silt some clay seams		2	SS	10		209				
208.15	Compact Grey Moist										
2.55	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

ON_MOT VER3 NB_103.GPJ ON_MOT.GDT 11/10/2002 3:42:10 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

RECORD OF BOREHOLE No 103-19S

METRIC

G.W.P.	293-97-00	**LOCATION**	HWY. 69 Sta. 19+850, o/s 19m Lt. CL Med.	**ORIGINATED BY**	FP
DIST	52 **HWY** 69	**BOREHOLE TYPE**	Continuous Flight Hollow Stem Augers	**COMPILED BY**	DH/FP
DATUM	Geodetic	**DATE**	August 11, 2001	**CHECKED BY**	

SOIL PROFILE			SAMPLES						DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L / WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE					
211.85 / 0.00	Ground Surface											
	End of borehole Refusal on bedrock * Groundwater level not established ** Refusal to spoon				5/0cm**							

ON_MOT LINES OVER BDRY NB_103.GPJ ON_MOT.GDT 11/10/2002 3:30:10 PM

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

20 / 15 —○— 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-1M

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+575, CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** DH/FP

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE			kN/m³	GR SA SI CL
205.30 / 0.00	Ground Surface						205				
							204				
							203				
							202				
							201				
200.00 / 5.30							200	120/10cm			
	End of dynamic cone penetration test Refusal on probable bedrock										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-2M

METRIC

G.W.P.	293-97-00	**LOCATION**	HWY. 69 Sta. 19+675, CL Med.	**ORIGINATED BY**	FP
DIST 52 **HWY**	69	**BOREHOLE TYPE**	Dynamic Cone Penetration Test	**COMPILED BY**	FP/DH
DATUM	Geodetic	**DATE**	August 12, 2001	**CHECKED BY**	

SOIL PROFILE: ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.80 / 0.00	Ground Surface										
							205				
							204				
							203				
							202				
							201				
							200				
							199				
							198				
196.80 / 9.00							197	120/15cm			
	End of dynamic cone penetration test Refusal on probable bedrock										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-3M

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+775, CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 11, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
208.20	Ground Surface										
0.00							208				
207.10								120/20cm			
1.10	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:04:48 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

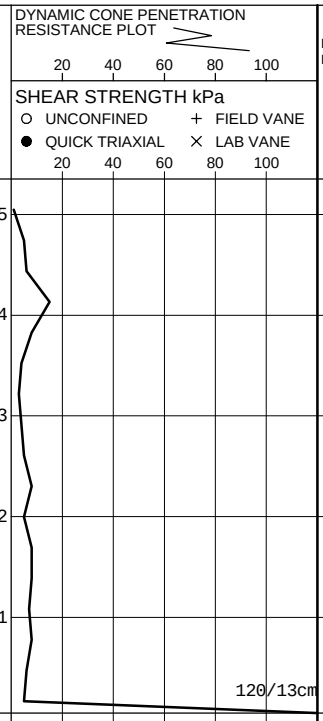
Foundation Design

RECORD OF PENETRATION TEST No 103-1N

METRIC

G.W.P. 293-97-00	**LOCATION** HWY. 69 Sta. 19+625, o/s 40m Rt. CL Med.	**ORIGINATED BY** FP	
DIST 52 **HWY** 69	**BOREHOLE TYPE** Dynamic Cone Penetration Test	**COMPILED BY** FP/DH	
DATUM Geodetic	**DATE** August 15, 2001	**CHECKED BY**	

SOIL PROFILE: ELEV / DEPTH	SOIL PROFILE: DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.35 / 0.00	Ground Surface										
200.05 / 5.30	End of dynamic cone penetration test Refusal on probable bedrock										



+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+637.5, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 16, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	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	WATER CONTENT (%) 20 40 60	kN/m³	GR SA SI CL
205.55 / 0.00	Ground Surface										
190.80 / 14.75	Cont'd										

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:04:28 PM

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+637.5, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 16, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
205.55	Ground Surface										
	End of dynamic cone penetration test Refusal on probable bedrock										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 10 — 5 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-3N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+662.5, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 16, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
205.70 / 0.00	Ground Surface										
							205				
							204				
							203				
							202				
							201				
							200				
							199				
							198				
							197				
							196				
							195				
							194				
							193				
							192				
							191				
	Cont'd										

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:04:57 PM

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-3N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+662.5, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 16, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
205.70	Ground Surface										
190.35								120/13cm			
15.35	End of dynamic cone penetration test Refusal on probable bedrock										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-4N

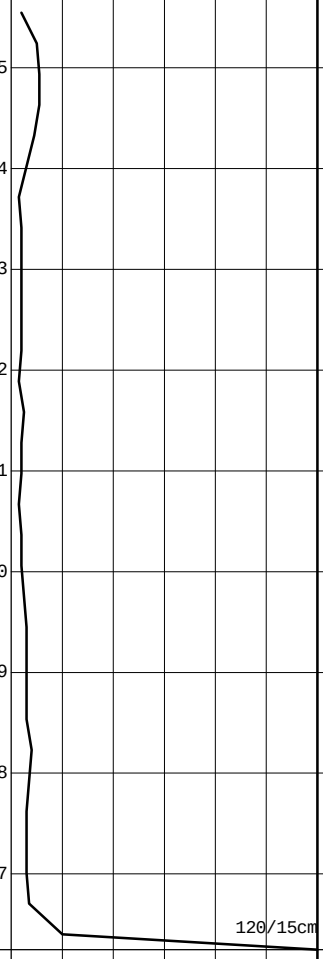
METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+725, o/s 42m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 16, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES										
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.85 / 0.00	Ground Surface										
							205				
							204				
							203				
							202				
							201				
							200				
							199				
							198				
							197	120/15cm			
196.25 / 9.60	End of dynamic cone penetration test Refusal on probable bedrock										



+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-5N

METRIC

G.W.P. 293-97-00	**LOCATION** HWY. 69 Sta. 19+825, o/s 35m Rt. CL Med.	**ORIGINATED BY** FP	
DIST 52 **HWY** 69	**BOREHOLE TYPE** Dynamic Cone Penetration Test	**COMPILED BY** FP/DH	
DATUM Geodetic	**DATE** August 22, 2001	**CHECKED BY**	

SOIL PROFILE: ELEV / DEPTH	SOIL PROFILE: DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
210.95	Ground Surface										
0.00							210				
208.80							209	120/3cm			
2.15	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:05:35 PM

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-1S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+375, o/s 9m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
206.75	Ground Surface										
0.00							206				
204.80							205	120/13cm			
1.95	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:04:09 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-2S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+425, o/s 31m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa (20 40 60 80 100) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	w_P	w	w_L	γ kN/m³	GR SA SI CL
209.05	Ground Surface												
0.00							209	120/13cm					
208.60 / 0.45	End of dynamic cone penetration test Refusal on probable bedrock												

WATER CONTENT (%) 20 40 60

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:04:39 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-3S

 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+475, o/s 7m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
206.70	Ground Surface										
0.00							206				
								120/20cm			
204.95							205				
1.75	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:05:08 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-4S

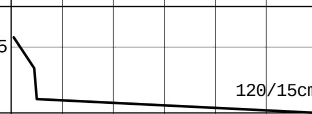
 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+525, o/s 35m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 14, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.40	Ground Surface										
0.00							205	120/15cm			
204.35 1.05	End of dynamic cone penetration test Refusal on probable bedrock										



+7, ×5 : Numbers refer to Sensitivity   20 / 15 –○– 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-5S

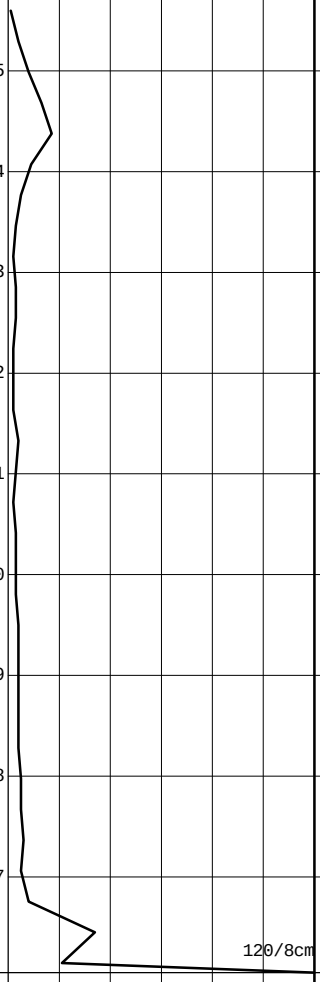
METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+625, o/s 40m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 12, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES										
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
205.90 / 0.00	Ground Surface										
196.05 / 9.85	End of dynamic cone penetration test Refusal on probable bedrock										



MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:05:44 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-6S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+725, o/s 42m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 11, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
206.35 / 0.00	Ground Surface						206 / 205 / 204	120/5cm			
203.25 / 3.10	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:05:53 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 103-7S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 19+825, o/s 36m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 11, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES															
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
211.65	Ground Surface										
0.00											
							211	120/8cm			
210.95											
0.70	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_103PT.GPJ ON_MOT.GDT 11/10/2002 4:06:02 PM

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-1N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+187.5, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)	SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
216.05	Ground Surface									
0.00	Peat, coarse fibrous	1	SS	5	216					
0.25	Silty sand Loose Brown Damp				215					
	Wet	2	SS	5	214					
	Grey									
213.00					213					
3.05	Silty clay trace sand Firm Reddish/ Grey Wet	3	SS	1						
212.10										
3.95	End of borehole Refusal on probable bedrock									

* 2001 08 02

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-2N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+200, o/s 35m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
215.75	Ground Surface							
0.00								
0.25	Peat, coarse fibrous	1	SS	7				
	Silty sand Loose Brown Damp				▽*	215		
214.15								
1.60	Grey Wet	2	SS	1		214		
	Silty clay trace sand Firm Grey Wet				▼*			
						213		
		3	SS	1/60cm				
						212		
210.85		4	SS	6		211		
4.90	End of borehole Refusal on probable bedrock							

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

* 2001 08 02

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-3N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+212.5, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60			REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE			UNIT WEIGHT γ kN/m³	GR SA SI CL
216.25	Ground Surface										
0.00	Peat, coarse fibrous		1	SS	6		216				
0.30	Silty sand Loose Brown Damp										
215.10											
1.15	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-4N 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 20+237.5, o/s 19m Rt. CL Med. | ORIGINATED BY FP

DIST 52 HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY FP/DH

DATUM Geodetic | DATE August 01, 2001 | CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa (20 40 60 80 100)	WATER CONTENT (%) (20 40 60)	γ kN/m³	GR SA SI CL
216.65	Ground Surface					*					
0.00	End of borehole Refusal on bedrock										

* Groundwater level not established

ON_MOT LINES OVER BDRY NB_104.GPJ ON_MOT.GDT 11/10/2002 4:12:41 PM

+7, ×5 : Numbers refer to Sensitivity

15 20 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-5N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+250, o/s 33m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 01, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
216.20	Ground Surface										
0.00	Peat, coarse fibrous		1	SS	7		216				
215.65											
0.55	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

ON_MOT VER3 NB_104.GPJ ON_MOT.GDT 11/10/2002 4:16:57 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-6N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+262.5, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 01, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
216.00	Ground Surface					*					
0.00 / 215.60	Topsoil		1	SS	0/40cm**						
0.40	End of borehole Refusal on probable bedrock * Borehole dry upon completion ** Refusal to spoon										

ON_MOT VER3 NB_104.GPJ ON_MOT.GDT 11/10/2002 4:17:07 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 104-7N

METRIC

G.W.P. 293-97-00	LOCATION HWY. 69 Sta. 20+287.5, o/s 19m Rt. CL Med.		ORIGINATED BY FP
DIST 52 HWY 69	BOREHOLE TYPE Continuous Flight Hollow Stem Augers		COMPILED BY FP/DH
DATUM Geodetic	DATE August 01, 2001		CHECKED BY

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	STRAT PLOT	SAMPLES NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.50	Ground Surface					*					
0.00 / 0.20	Peat, coarse fibrous		1	SS	5						
	Sandy silt						214				
213.55 / 0.95	Loose Brown Damp										
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

20 / 15—○—5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-8N

METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 20+300, o/s 34m Rt. CL Med. | ORIGINATED BY FP

DIST 52 HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY FP/DH

DATUM Geodetic | DATE August 01, 2001 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.85	Ground Surface										
0.00											
0.20	Peat, coarse fibrous										
	Silty sand Loose Brown Damp		1	SS	6	▼* ▽*	214				
213.35 1.50	Silty clay trace sand Stiff Reddish/Grey Wet		2	SS	1		213	+4			
212.25 2.60	End of borehole Refusal on probable bedrock										

* 2001 08 01

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 —O— 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-9N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+312.5, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 01, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE
214.00	Ground Surface				
0.00	Peat, coarse fibrous	1	SS	6	
0.30	Silty sand Loose Brown Damp				213
212.50					
1.50	Sandy silt trace clay Loose Grey Wet	2	SS	8	212
210.95					211
3.05	Silty clay trace sand Soft Grey Wet	3	SS	2	
210.45					
3.55					
210.20					
3.80	Silty sand trace clay Loose Grey Wet				

End of borehole

Refusal on probable bedrock

* 2001 08 01

▽ Water level observed during drilling

▼ Water level measured after drilling

GROUND WATER CONDITIONS: ▼* ▽*

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE (20 40 60 80 100)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) 20 40 60

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 104-10N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+325, o/s 6m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 01, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.10	Ground Surface						
0.00 / 0.20	Peat, coarse fibrous	1	SS	12		214	
	Silty sand Compact Brown Damp				▽*	213	
212.60 / 1.50	Sandy silt trace clay Interbedded sand seams Compact Grey Wet	2	SS	11		212	0 38 58 4
					▼*		
	Loose	3	SS	9		211	
210.15 / 3.95	Clayey silt trace sand Interbedded silty sand seams Firm Grey Wet	4	SS	1		210	0 9 61 30
						209	
		5	SS	1/45cm		208	
						207	
206.65 / 7.45	Silty sand	6	SS	2/30cm**			
206.20 / 7.90	Very Loose Grey Wet						
	End of borehole Refusal on probable bedrock						

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) 20 40 60

UNIT WEIGHT γ kN/m³

* 2001 08 01

▽ Water level observed during drilling

▼ Water level measured after drilling

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 104-11N

METRIC

G.W.P. 293-97-00	**LOCATION** HWY. 69 Sta. 20+337.5, o/s 19m Rt. CL Med.		**ORIGINATED BY** FP
DIST 52	**HWY** 69	**BOREHOLE TYPE** Continuous Flight Hollow Stem Augers	**COMPILED BY** FP/DH
DATUM Geodetic	**DATE** August 01, 2001		**CHECKED BY**

ELEV / DEPTH	DESCRIPTION (SOIL PROFILE)	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
214.70	Ground Surface					
0.00 / 0.20	Peat, coarse fibrous					
	Silty sand Loose Brown Damp	1	SS	9	∇*	214
213.20 / 1.50	Sandy silt trace clay Interbedded sand seams Compact Grey Wet	2	SS	11	▼*	213 / 212
211.95 / 2.75	Silty clay trace sand Very Soft Grey Wet	3	SS	0/45cm		
211.10 / 3.60	Silty sand trace clay Loose Grey Wet					211
210.30 / 4.40	End of borehole Refusal on probable bedrock					

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE (20 40 60 80 100)

PLASTIC LIMIT w_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT w_L; WATER CONTENT (%): 20 40 60

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%): GR SA SI CL

* 2001 08 01

∇ Water level observed during drilling

▼ Water level measured after drilling

$+^{7}$, $\times^{5}$: Numbers refer to Sensitivity

20 / 15 –○– 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-1S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+165, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
215.25	Ground Surface										
0.00											
0.20	Peat, coarse fibrous		1	SS	7		215				
	Silty sand Loose Brown Damp					▽*					
213.75							214				
1.50	Silty clay Stiff Reddish/ Grey Wet		2	SS	8						
212.80	Interbedded coarse sand seams					▼*	213				
2.45	End of borehole Refusal on probable bedrock										

* 2001 08 02

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

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Ontario

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RECORD OF BOREHOLE No 104-2S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+175, o/s 5m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
215.20	Ground Surface										
0.00	Peat, coarse fibrous		1	SS	11		215				
0.30	Silty sand Compact Brown Damp					▽*	214				
213.70						▼*					
1.50	Silty clay trace sand Stiff Reddish/ Grey Wet		2	SS	4		213	+ 5			
212.45											
2.75	End of borehole Refusal on probable bedrock										

* 2001 08 02

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

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Ontario

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RECORD OF BOREHOLE No 104-3S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+187.5, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L (WATER CONTENT (%))	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.60	Ground Surface										
0.00	Peat		1	SS	9						
0.30	Silty sand Loose Brown Damp					▽*	214				
213.10											
1.50	Clay with silt Firm Reddish/ Grey Wet		2	SS	6		213				0 0 27 73
						▼*	212	4			
211.55											
3.05	Fine to medium sand Loose Grey Wet		3	SS	6		211				
210.55											
4.05	End of borehole Refusal on probable bedrock										

* 2001 08 02

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 104-4S 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 20+212.5, o/s 19m Lt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE August 02, 2001 CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
218.40	Ground Surface										
0.00	End of borehole Refusal on bedrock * Groundwater level not established										

ON_MOT LINES OVER BDRY NB_104.GPJ ON_MOT.GDT 11/10/2002 4:12:51 PM

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 104-5S 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 20+237.5, o/s 19m Lt. CL Med. | ORIGINATED BY FP

DIST 52 HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY FP/DH

DATUM Geodetic | DATE August 02, 2001 | CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	WATER CONTENT (%)	γ kN/m^3	GR SA SI CL
217.90	Ground Surface					*					
0.00	End of borehole Refusal on bedrock * Groundwater level not established										

ON_MOT LINES OVER BDRY NB_104.GPJ ON_MOT.GDT 11/10/2002 4:13:00 PM

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

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Ontario

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RECORD OF BOREHOLE No 104-6S 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 20+262.5, o/s 19m Lt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE August 02, 2001 CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
215.85	Ground Surface										
0.00	Peat, coarse fibrous		1	SS	9						
0.25	Silty sand										
215.20	Loose Brown Damp										
0.65	End of borehole										
	Refusal on probable bedrock										

* Borehole dry upon completion

ON_MOT LINES OVER BDRY NB_104.GPJ ON_MOT.GDT 11/10/2002 4:13:10 PM

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-7S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+287.5, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR	SA	SI	CL
213.85	Ground Surface									
0.00										
0.25	Peat, coarse fibrous	1	SS	4						
	Silty sand Loose Grey Damp				▽*	213				
212.35					▼*					
1.50	Silty clay trace sand Firm Grey Wet	2	SS	1/60cm		212	0	2	54	44
						211				
210.80										
3.05	Fine to medium sand trace silt	3	SS	8						
210.25										
3.60	Loose Grey Wet									

End of borehole

Refusal on probable bedrock

* 2001 08 02

▽ Water level observed during drilling

▼ Water level measured after drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE (20 40 60 80 100)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) 20 40 60

UNIT WEIGHT γ kN/m³

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 104-8S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+300, o/s 40m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
213.75	Ground Surface										
0.00	Peat, coarse fibrous		1	SS	10						
0.25	Silty sand Compact Brown Damp					▽*	213				
	Loose Grey Wet		2	SS	5		212				
							211				
210.70 3.05	Silty clay trace sand Firm Grey Wet		3	SS	1/60cm	▼*	210	+ 4			
209.35 4.40	End of borehole Refusal on probable bedrock										

* 2001 08 02

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

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Ontario

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RECORD OF BOREHOLE No 104-9S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+300, o/s 4m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 08, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
214.10	Ground Surface										
0.00	Peat, coarse fibrous		1	SS	6		214				
0.25	Silty sand Loose Brown Damp					▽*	213				
212.60						▼*					
1.50	Silty clay trace sand Very Soft Reddish/Grey Wet		2	SS	1		212				
211.40											
2.70	End of borehole Refusal on probable bedrock										

* 2001 08 08

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 104-10S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+312.5, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 02, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
213.90	Ground Surface							
0.00	Peat, coarse fibrous	1	SS	9				
0.30	Fine to medium sand trace silt Loose Brown Damp				▽*	213		
212.40								
1.50	Silty sand Compact Grey Wet	2	SS	11	▼*	212		
210.65	Loose					211		
3.25	Silty clay trace sand Firm Grey Wet	3	SS	2		210		
208.95	Interbedded silty sand seams	4	SS	1		209		
4.95								
208.60	Silty sand Loose Grey Wet							
5.30	End of borehole Refusal on probable bedrock							

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE (20 40 60 80 100)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60

* 2001 08 02

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 104-11S 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 20+325, o/s 5m Lt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE August 01, 2001 CHECKED BY

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.00	Ground Surface							
0.00	Peat, coarse fibrous							
0.25	Silty sand Loose Brown Damp	1	SS	7	▽*	213		
212.50								
1.50	Sandy silt trace clay Compact Grey Wet	2	SS	11		212		
210.95						211		
3.05	Silty clay trace sand Stiff Grey Wet	3	SS	1/60cm	▼*	210		
		4	SS	1/45cm		209		
208.85								
5.15	End of borehole Refusal on probable bedrock							

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P NATURAL MOISTURE CONTENT w LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

* 2001 08 01

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

Ministry of Transportation Ontario

Foundation Design

RECORD OF BOREHOLE No 104-12S

METRIC

G.W.P.	293-97-00	**LOCATION**	HWY. 69 Sta. 20+337.5, o/s 19m Lt. CL Med.	**ORIGINATED BY**	FP
DIST	52 **HWY** 69	**BOREHOLE TYPE**	Continuous Flight Hollow Stem Augers	**COMPILED BY**	FP/DH
DATUM	Geodetic	**DATE**	August 01, 2001	**CHECKED BY**	

ELEV / DEPTH	SOIL PROFILE – DESCRIPTION	STRAT PLOT	SAMPLES – NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
214.10	Ground Surface						
0.00							214
0.20	Peat, coarse fibrous		1	SS	7		
	Silty sand						
213.05 / 1.05	Loose Brown Damp					▽*	213
	Silty clay trace sand						
211.95 / 2.15	Very Soft Reddish/Brown Wet		2	SS	0/45cm	▼*	212
	End of borehole						
	Refusal on probable bedrock						

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L; WATER CONTENT (%): 20 40 60

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%): GR SA SI CL

* 2001 08 01

▽ Water level observed during drilling

▼ Water level measured after drilling

ON_MOT VER3 NB_104.GPJ ON_MOT.GDT 11/10/2002 4:15:26 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — ○ — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

RECORD OF BOREHOLE No 104-13S   1 of 1   METRIC

G.W.P. 293-97-00   **LOCATION** HWY. 69 Sta. 20+350, o/s 34m Lt. CL Med.   **ORIGINATED BY** FP

DIST 52   **HWY** 69   **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers   **COMPILED BY** FP/DH

DATUM Geodetic   **DATE** August 01, 2001   **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); SHEAR STRENGTH kPa: O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L; WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					
216.05	Ground Surface										
0.00							216				
0.20	Peat, coarse fibrous										
	Silty sand Loose Brown Damp		1	SS	8						
214.80 / 1.25							215				
	End of borehole Refusal on probable bedrock										
	* Borehole dry on completion										

$+^7$, $\times^5$: Numbers refer to Sensitivity

20 / 15—O—5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 104-1N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+200, o/s 5m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 08, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES														
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
215.35	Ground Surface										
0.00							215				
213.95							214	120/18cm			
1.40	End of dynamic cone penetration test Refusal on probable bedrock										

MTO_DCPT NB_104PT.GPJ ON_MOT.GDT 11/10/2002 4:24:30 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 104-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+225, o/s 33m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 08, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
216.00	Ground Surface										
0.00							215				
213.95							214	120/20cm			
2.05	End of dynamic cone penetration test Refusal on probable bedrock										

MTO_DCPT NB_104PT.GPJ ON_MOT.GDT 11/10/2002 4:24:44 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 104-3N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+275, o/s 33m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 08, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
215.65	Ground Surface										
0.00								120/25cm			
0.25	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT LINE OVER BDRY NB_104PT.GPJ ON_MOT.GDT 11/10/2002 4:23:32 PM

+7, ×5 : Numbers refer to Sensitivity

15 20 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 104-4N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+300, o/s 6m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 08, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES														
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.15	Ground Surface										
0.00							214				
							213				
212.20								120/13cm			
1.95	End of dynamic cone penetration test Refusal on probable bedrock										

MTO_DCPT NB_104PT.GPJ ON_MOT.GDT 11/10/2002 4:25:13 PM

+7, ×5: Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 104-5N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+325, o/s 34m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 01, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES														
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.50 / 0.00	Ground Surface										
							214				
							213				
							212				
							211				
							210				
							209				
							208				
							207				
							206	120/0cm			
205.35 / 9.15	End of dynamic cone penetration test Refusal on probable bedrock										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 104-1S

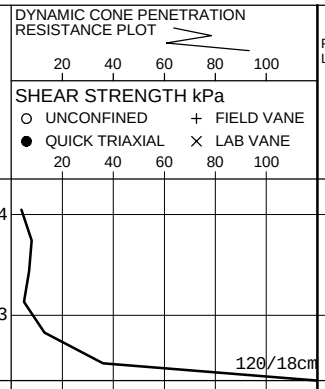
METRIC

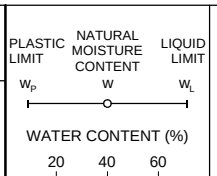
G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+175, o/s 39m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 08, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
214.35	Ground Surface										
0.00							214				
							213				
212.35								120/18cm			
2.00	End of dynamic cone penetration test Refusal on probable bedrock										





UNIT WEIGHT γ kN/m^3

GR SA SI CL

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 104-2S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+275, o/s 38m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 08, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
213.95	Ground Surface										
0.00							213				
							212				
211.30								120/20cm			
2.65	End of dynamic cone penetration test Refusal on probable bedrock										

MTO_DCPT NB_104PT.GPJ ON_MOT.GDT 11/10/2002 4:24:56 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 104-3S

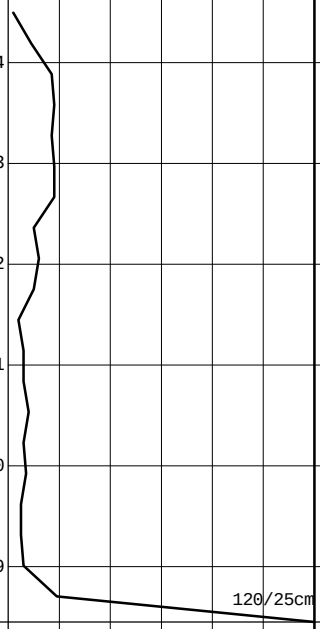
METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 20+325, o/s 39m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 08, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES												
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.80 / 0.00	Ground Surface										
208.45 / 6.35	End of dynamic cone penetration test Refusal on probable bedrock										



+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

AUGER PROBE LOGS

G.W.P. 293-97-00 Highway 69
Four-Laning from 2.6 km North of Highway 124 Northerly 4.8 km
District 52 Township of McDougall

DATUM: Proposed Centreline Median

104 - 1
20+165 18.8 Rt C/L 218.30
0 NFP BR

104 - 2
20+175 7.0 Rt C/L 215.85
0 - 180 Dk Br Si Tps Moist
180 - 650 Br Si Tr Gr Moist
650 NFP Poss BR

104 - 3
20+175 33.0 Rt C/L 217.05
0 - 130 Dk Br Si Tps Moist
130 - 500 Br Si Tr Gr Moist
500 NFP Poss BR

104 - 4
20+200 38.0 Lt C/L 218.85
0 NFP BR

104 - 5
20+200 6.0 Lt C/L 217.35
0 NFP BR

104 - 6
20+225 34.0 Lt C/L 217.85
0 NFP BR

104 - 7
20+225 9.0 Lt C/L 218.90
0 NFP BR

104 - 8
20+225 7.0 Rt C/L 218.20
0 NFP BR

104 - 9
20+250 34.0 Lt C/L 215.60
0 NFP BR

104 - 10
20+250 9.0 Lt C/L 217.10
0 NFP BR

104 - 11
20+250 6.0 Rt C/L 216.30
0 - 150 Dk Br Si Tps Moist
150 NFP Poss BR

104 - 12
20+250 34.0 Rt C/L 216.80
0 NFP BR

104 - 13
20+275 6.0 Lt C/L 215.15
0 NFP BR

104 - 14
20+275 6.0 Rt C/L 215.20
0 NFP BR

AUGER PROBE LOGS

G.W.P. 293-97-00 Highway 69
Four-Laning from 2.6 km North of Highway 124 Northerly 4.8 km
District 52 Township of McDougall

DATUM: Proposed Centreline Median

104 - 15

20+275	38.0	Rt C/L	215.75

0 -	100	Dk Br Si Tps Moist
	100	NFP Poss BR

104 - 16

20+350	32.0	Lt C/L	217.25

0 -	100	Dk Br Si Tps Moist
	100	NFP Poss BR

104 - 17

20+350	18.8	Lt C/L	217.15

	0	NFP BR

104 - 18

20+350	9.0	Lt C/L	215.90

	0	NFP BR

104 - 19

20+350	6.0	Rt C/L	215.60

	0	NFP BR

104 - 20

20+350	38.0	Rt C/L	216.00

0 -	100	Dk Br Si Tps Moist
100 -	500	Br Si(y) Sa Some Gr Moist
	500	NFP Poss BR/Blds

104 - 21

20+363	18.8	Lt C/L	217.15

	0	NFP BR

104 - 22

20+363	18.8	Rt C/L	217.45

	0	NFP BR

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-1N 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 21+075, o/s 19m Rt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE July 29, 2001 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					
224.45	Ground Surface										
0.00	End of borehole Refusal on bedrock										
	* Groundwater level not established										

ON_MOT LINES OVER BDRY NB_105.GPJ ON_MOT.GDT 11/10/2002 4:33:50 PM

+7, ×5: Numbers refer to Sensitivity

15 20 5 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 105-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+087.5, o/s 30m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
223.80	Ground Surface										
0.00	Peat, fine fibrous		1	SS	6						
0.25	Silty sand										
	Interbedded clayey silt seams						223				
222.50	Loose Mottled Grey/Brown Moist										
1.30	End of borehole										
	Refusal on probable bedrock										

* Borehole dry upon completion

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-3N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+100, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				
223.75	Ground Surface										
0.00 / 223.40	Peat, fine fibrous		1	SS	6						
0.35	Silty sand						223				
222.65	Interbedded clayey silt seams										
1.10	Loose Brown to Grey Moist										
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-4N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+112.5, o/s 9m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
223.20	Ground Surface										
0.00	Peat, fine fibrous		1	SS	1/45cm		223				
0.30	Silty clay Firm Grey Wet										
221.80							222				
1.40	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

ON_MOT VER3 NB_105.GPJ ON_MOT.GDT 11/10/2002 4:38:41 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-5N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+125, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES															
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
223.40	Ground Surface										
0.00											
0.20	Peat, fine fibrous		1	SS	1		223				
	Silty sand Very Loose Grey Moist										
221.90							222				
1.50	Silty clay trace sand Very Soft Brown Wet		2	SS	1/60cm						
						∇*	221				
220.35						▼*					
3.05			3	SS	7/15cm**						
220.00	Silty sand trace gravel						220				
3.40	Loose Grey Wet										
	End of borehole Refusal on probable bedrock										

* 2001 07 30

∇ Water level observed during drilling

▼ Water level measured after drilling

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

RECORD OF BOREHOLE No 105-6N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+137.5, o/s 31m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); SHEAR STRENGTH kPa: O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
224.45	Ground Surface					*					
0.00 / 0.15	Peat, fine fibrous										
	Silty sand Loose Brown Damp		1	SS	4		224				
							223				
222.75 / 1.70			2	SS	6/15cm						
	End of borehole Refusal on probable bedrock										
	* Borehole dry upon completion										

ON_MOT VER3 NB_105.GPJ ON_MOT.GDT 11/10/2002 4:39:25 PM

+7, ×5: Numbers refer to Sensitivity

15 —O— 5 (20 above, 10 below) (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-7N 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 21+150, o/s 19m Rt. CL Med. | ORIGINATED BY FP

DIST 52 | HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY FP/DH

DATUM Geodetic | DATE July 30, 2001 | CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
224.85	Ground Surface										
0.00											
0.15	Peat, fine fibrous		1	SS	9/25**	*					
224.45											
0.40	Silty sand Loose Grey Damp										
	End of borehole Refusal on probable bedrock										

* Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 105-8N 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 21+162.5, o/s 10m Rt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE July 29, 2001 CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60		REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE			UNIT WEIGHT γ kN/m³	GR SA SI CL
226.15	Ground Surface										
0.00	End of borehole Refusal on bedrock										
	* Groundwater level not established										

ON_MOT LINES OVER BDRY NB_105.GPJ ON_MOT.GDT 11/10/2002 4:34:09 PM

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 105-9N 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 21+175, o/s 19m Rt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE July 29, 2001 CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
226.95	Ground Surface										
0.00	End of borehole										
	Refusal on bedrock										
	* 2001 07 29										
	Groundwater level not established										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 105-10N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+187.5, o/s 31m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
227.95	Ground Surface										
0.00	End of borehole Refusal on bedrock										
	* Groundwater level not established										

ON_MOT LINES OVER BDRY NB_105.GPJ ON_MOT.GDT 11/10/2002 4:32:51 PM

+7, ×5: Numbers refer to Sensitivity

15 20 5 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 105-11N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+200, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
226.55	Ground Surface										
0.00	End of borehole										
	Refusal on bedrock										
	* 2001 07 29										
	Groundwater level not established										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 105-12N 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 21+212.5, o/s 9m Rt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE July 29, 2001 CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60				
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
225.95	Ground Surface					*					
0.00	End of borehole Refusal on bedrock										
	* Groundwater level not established										

ON_MOT LINES OVER BDRY NB_105.GPJ ON_MOT.GDT 11/10/2002 4:33:21 PM

+7, ×5: Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 105-13N 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 21+225, o/s 19m Rt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE July 29, 2001 CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100	WATER CONTENT (%) 20 40 60			γ kN/m³	GR SA SI CL
226.70	Ground Surface												
0.00													
0.10	Topsoil		1	SS	7								
226.00	Silty sand some gravel trace clay												
0.70	Loose Brown Damp (TILL)												
	End of borehole												
	Refusal on probable bedrock												
	* Borehole dry upon completion												

ON_MOT LINES OVER BDRY NB_105.GPJ ON_MOT.GDT 11/10/2002 4:33:31 PM

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 105-14N

METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 21+235, o/s 19m Rt. CL Med. | ORIGINATED BY FP

DIST 52 HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY FP/DH

DATUM Geodetic | DATE July 29, 2001 | CHECKED BY

ELEV DEPTH	SOIL PROFILE DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
226.30	Ground Surface											
0.00 / 0.10	Topsoil											
	Silty sand some gravel trace clay Interbedded cobbles and boulders Loose Brown Damp Compact (TILL) Grey	1	SS	2		226	o					
						225						
224.45 / 1.85		2	SS	20/15cm**			o		12	49	32	7
	End of borehole Refusal on probable bedrock											

* Borehole dry upon completion

** Refusal to spoon

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa: O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE; 20 40 60 80 100
PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L; WATER CONTENT (%) 20 40 60
REMARKS & GRAIN SIZE DISTRIBUTION (%)

$+^7$, $\times^5$: Numbers refer to Sensitivity

20 / 15—O—5 / 10 (%) STRAIN AT FAILURE

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RECORD OF BOREHOLE No 105-1S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+075, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				
223.50	Ground Surface										
0.00	Topsoil		1	SS	1		223				
0.25	Silty sand Loose Mottled Grey/Brown Moist										
222.45											
1.05	End of borehole Refusal on probable bedrock										

* Borehole dry upon completion

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 105-2S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+087.5, o/s 31m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
223.25	Ground Surface										
0.00 / 222.85	Peat, fine fibrous		1	SS	1		223				
0.40	Fine to medium sand trace silt trace clay Compact Grey Wet					▼* ∇*	222				
			2	SS	11						0 95 4 1
							221				
220.20 / 3.05	Silty clay Very Soft Grey Wet		3	SS	1		220				
219.15 / 4.10	Interbedded sand seams										
	End of borehole Refusal on probable bedrock										

* 2001 07 31

∇ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 105-3S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+100, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
224.40	Ground Surface										
0.00	Peat, amorphous		1	SS	1	▼* ▽*	224		438		
223.50											
0.90	Medium to coarse sand trace gravel Compact Grey Wet		2	SS	11		223				
							222				
221.35											
3.05	Silty sand Loose Grey Wet		3	SS	8		221				
							220				
219.50	Trace clay		4	SS	14						
4.90	Compact End of borehole Refusal on probable bedrock										

* 2001 07 30

▽ Water level observed during drilling

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 105-4S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+112.5, o/s 9m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	ELEVATION SCALE	WATER CONTENT (%) w	UNIT WEIGHT γ kN/m³
223.40	Ground Surface						
0.00	Peat, amorphous	1	SS	1	223	86	
222.50							
0.90	Fine to medium sand trace silt Loose Grey Wet	2	SS	9	222		
		3	SS	7	220		
218.80					219		
4.60							
218.50	Silty clay Soft Grey Wet	4	SS	1***			
4.90	Silty sand Interbedded clayey silt seams				218		
217.40							
6.00	Loose Grey Wet End of borehole Refusal on probable bedrock						

* 2001 07 31

▽ Water level observed during drilling

▼ Water level measured after drilling

*** Low 'N' value due to hydraulic disturbance.

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) 20 40 60

REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 105-5S

METRIC

G.W.P. 293-97-00	**LOCATION** HWY. 69 Sta. 21+125, o/s 19m Lt. CL Med.		**ORIGINATED BY** FP
DIST 52 **HWY** 69	**BOREHOLE TYPE** Continuous Flight Hollow Stem Augers		**COMPILED BY** FP/DH
DATUM Geodetic	**DATE** July 30, 2001		**CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
223.20	Ground Surface						
0.00	Peat, amorphous		1	SS	1/45cm		223
0.30	Medium to coarse sand trace gravel Loose Grey Wet					∇* (observed during drilling)	222
	Compact		2	SS	13	▼* (measured after drilling)	221
			3	SS	20		220
							219
218.60 / 4.60	Silty clay Very Soft Brown Wet		4	SS	1		218
217.55 / 5.65	End of borehole Refusal on probable bedrock						

Other column headings (no data recorded): DYNAMIC CONE PENETRATION RESISTANCE PLOT (20, 40, 60, 80, 100); SHEAR STRENGTH kPa — ○ UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE (20, 40, 60, 80, 100); PLASTIC LIMIT w_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT w_L, WATER CONTENT (%) (20, 40, 60); UNIT WEIGHT γ kN/m³; REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL.

* 2001 07 30

∇ Water level observed during drilling

▼ Water level measured after drilling

ON_MOT VER3 NB_105.GPJ ON_MOT.GDT 11/10/2002 4:39:14 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 105-6S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+137.5, o/s 31m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES																
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
223.50	Ground Surface										
0.00	Peat, amorphous		1	SS	1/60cm		223				
222.60											
0.90	Fine to medium sand trace gravel trace silt trace clay Compact Grey Wet		2	SS	19		222				9 85 5 1
							221				
220.45											
3.05	Silty clay trace sand Very Soft Grey Wet		3	SS	1		220				0 3 51 46
219.40											
4.10	End of borehole Refusal on probable bedrock										

* 2001 07 31

▽ Water level observed during drilling

▼ Water level measured after drilling

Unable to advance field vane at 3.80m

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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Ontario

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RECORD OF BOREHOLE No 105-7S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+150, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
223.40	Ground Surface										
0.00 / 0.15	Peat, fine fibrous		1	SS	1		223				
	Silty sand Loose Mottled Grey/Brown Moist										
221.90							222				
1.50 / 221.50	Silty clay trace sand		2	SS	4/15cm**						
1.90	Firm Grey Wet										
	End of borehole Refusal on probable bedrock										

* Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-8S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+162.5, o/s 6m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
224.15	Ground Surface					*					
0.00	Peat, fine fibrous		1	SS	13/25cm**		224				
223.55											
0.60	End of borehole Refusal on probable bedrock										

* 2001 07 31
Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 105-9S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+175, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES																										
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	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 γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
								SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100						WATER CONTENT (%) 20 40 60				kN/m³	GR	SA	SI	CL
224.55	Ground Surface					*																							
0.00																													
0.10	Peat, fine fibrous																												
0.30	Silty sand Loose Brown Damp																												
	End of borehole Refusal on probable bedrock																												
	* Borehole dry upon completion																												

ON_MOT LINES OVER BDRY NB_105.GPJ ON_MOT.GDT 11/10/2002 4:34:28 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

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Ontario

Foundation Design

RECORD OF BOREHOLE No 105-10S 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 21+187.5, o/s 33m Lt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE July 31, 2001 CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
223.95	Ground Surface										
0.00	Peat, fine fibrous		1	SS	3/13cm**						
0.30	End of borehole Refusal on probable bedrock										

* 2001 07 31
Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 105-11S

 METRIC

G.W.P. 293-97-00	LOCATION HWY. 69 Sta. 21+200, o/s 19m Lt. CL Med.	ORIGINATED BY FP
DIST 52 HWY 69	BOREHOLE TYPE Continuous Flight Hollow Stem Augers	COMPILED BY FP/DH
DATUM Geodetic	DATE July 29, 2001	CHECKED BY

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	NATURAL MOISTURE CONTENT w (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
224.40	Ground Surface								
0.00 0.25	Peat, amorphous								
	Silty clay Interbedded silty sand pockets Soft Mottled Moist Grey/Brown	1	SS	1		224	~45		
222.90 222.75 1.50 1.65	Silty sand trace gravel trace clay Loose Brown Wet	2	SS	5/0cm**	∇*	223	~15		
	End of borehole Refusal on probable bedrock								

* 2001 07 29

∇ Water level observed during drilling

Borehole dry upon completion

** Refusal to spoon

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100
SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE
PLASTIC LIMIT W_P, LIQUID LIMIT W_L, WATER CONTENT (%) 20 40 60

+7, ×5: Numbers refer to Sensitivity; 20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-12S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+212.5, o/s 9m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					
224.55	Ground Surface										
0.00 / 223.95	Peat, fine fibrous		1	SS	7		224				
0.60 / 223.40	Sandy silt trace clay		2	AS	-						
1.15	Mottled Grey/Brown Moist										
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

ON_MOT VER3 NB_105.GPJ ON_MOT.GDT 11/10/2002 4:37:16 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-13S 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 21+225, o/s 19m Lt. CL Med. | ORIGINATED BY FP

DIST 52 | HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY FP/DH

DATUM Geodetic | DATE July 29, 2001 | CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	SHEAR STRENGTH kPa (20 40 60 80 100) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE	w_P	w	w_L	γ kN/m³	GR SA SI CL
224.95	Ground Surface												
0.00													
0.10	Topsoil		1	SS	6								
	Silty sand trace gravel trace clay												
224.05													
0.90	Loose Mottled Grey/brown Damp (TILL)												
	End of borehole												
	Refusal on probable bedrock												
	* Borehole dry upon completion												

WATER CONTENT (%) 20 40 60

ON_MOT LINES OVER BDRY NB_105.GPJ ON_MOT.GDT 11/10/2002 4:33:40 PM

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 105-14S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+235, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L (WATER CONTENT (%) 20 40 60)	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) 20 40 60 80 100		kN/m³	GR SA SI CL
224.65	Ground Surface										
0.00											
0.10	Topsoil										
0.20	Silty sand Loose Brown Moist		1	SS	3		224				
	Silty clay trace sand										
223.15	Firm Mottled Grey/Brown Moist					▼* ∇*					
223.00			2	SS	0/5cm**		223				
1.50											
1.70	Fine to medium sand Interbedded silty sand and clayey silt seams Loose Brown Wet										
	End of borehole Refusal on probable bedrock										

* 2001 07 29

∇ Water level observed during drilling

▼ Water level measured after drilling

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

15 20 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-1N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+087.5, o/s 10m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES														
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
223.40	Ground Surface										
0.00							223				
221.90							222	120/0cm			
1.50	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:46:33 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+112.5, o/s 31m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
224.25	Ground Surface										
0.00							224	120/13cm			
223.20											
1.05	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:46:50 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-3N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+137.5, o/s 9m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
223.65	Ground Surface										
0.00							223	120/18cm			
222.55											
1.10	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:47:07 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-4N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+162.5, o/s 30m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 29, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						
226.05	Ground Surface										
0.00	End of dynamic cone penetration test Refusal on bedrock										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-5N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+187.5, o/s 9m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
226.50 / 0.00	Ground Surface										
	End of dynamic cone penetration test										
	Refusal on bedrock										

MOT DCPT LINE OVER BDRY NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:44:49 PM

+7 , ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-6N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+212.5, o/s 31m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
229.20 / 0.00	Ground Surface										
	End of dynamic cone penetration test										
	Refusal on bedrock										

MOT DCPT LINE OVER BDRY NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:45:08 PM

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-1S

METRIC

G.W.P. 293-97-00	**LOCATION** HWY. 69 Sta. 21+087.5, o/s 9m Lt. CL Med.	**ORIGINATED BY** FP	
DIST 52 **HWY** 69	**BOREHOLE TYPE** Dynamic Cone Penetration Test	**COMPILED BY** FP/DH	
DATUM Geodetic	**DATE** July 31, 2001	**CHECKED BY**	

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa	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				WATER CONTENT (%)	kN/m³	GR SA SI CL
223.35 / 0.00							223				
							222				
							221				
219.85 / 3.50							220	120/15cm			
	End of dynamic cone penetration test Refusal on probable bedrock										

SHEAR STRENGTH kPa: ○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

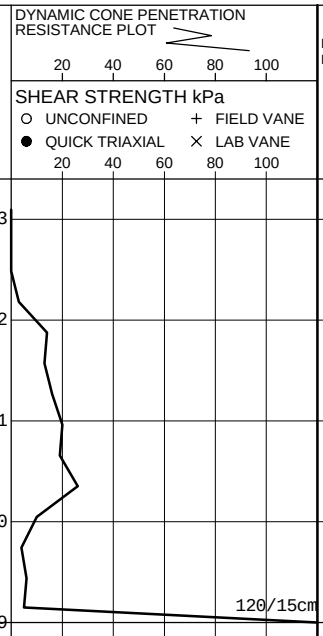
Foundation Design

RECORD OF PENETRATION TEST No 105-2S

METRIC

G.W.P. 293-97-00	**LOCATION** HWY. 69 Sta. 21+112.5, o/s 31m Lt. CL Med.	**ORIGINATED BY** FP	
DIST 52 **HWY** 69	**BOREHOLE TYPE** Dynamic Cone Penetration Test	**COMPILED BY** FP/DH	
DATUM Geodetic	**DATE** July 31, 2001	**CHECKED BY**	

SOIL PROFILE: ELEV / DEPTH	SOIL PROFILE: DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
223.40 / 0.00	Ground Surface										
219.00 / 4.40	End of dynamic cone penetration test Refusal on probable bedrock										



+7, ×5: Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-3S

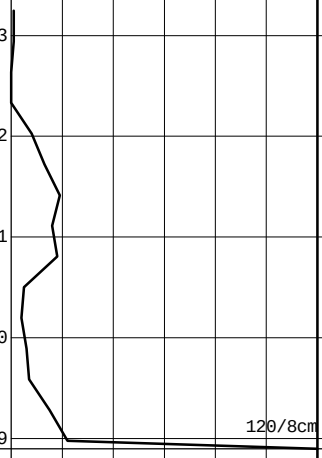
 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+137.5, o/s 9m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
223.55 / 0.00	Ground Surface										
							223				
							222				
							221				
							220				
218.90 / 4.65							219	120/8cm			
	End of dynamic cone penetration test Refusal on probable bedrock										



MOT DCPT NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:47:16 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-4S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+162.5, o/s 34m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES															
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)	SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
224.65	Ground Surface														
0.00							224	120/10cm							
223.65															
1.00	End of dynamic cone penetration test Refusal on probable bedrock														

MOT DCPT NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:47:24 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-5S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+187.5, o/s 7m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
225.40	Ground Surface										
0.00								120/20cm			
0.20	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT LINE OVER BDRY NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:44:58 PM

+ 7 , × 5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 105-6S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+212.5, o/s 31m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** July 31, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
224.80	Ground Surface										
0.00								120/0cm			
0.30	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT LINE OVER BDRY NB_105PT.GPJ ON_MOT.GDT 11/10/2002 4:45:17 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

AUGER PROBE LOGS

G.W.P. 293-97-00 Highway 69
Four-Laning from 2.6 km North of Highway 124 Northerly 4.8 km
District 52 Township of McDougall

DATUM: Proposed Centreline Median

105 - 1

21+065 18.8 Lt C/L 223.95

0	-	200	Dk Br Si Tr Sa Tps Moist
		200	NFP Poss BR

105 - 2

21+065 9.0 Rt C/L 226.30

0	-	90	Dk Br Si Tps Moist
90	-	350	Br Si Tr Sa Moist
		350	NFP Poss BR

105 - 3

21+065 18.8 Rt C/L 225.40

0	-	100	Dk Br Si Tps Moist
100	-	500	Br Si Tr Sa Moist
		500	NFP Poss BR

105 - 4

21+065 30.5 Rt C/L 227.15

0	-	50	Dk Br Si Tr Sa Tps Moist
		50	NFP Poss BR

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-1N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+965, o/s 5m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
220.00	Ground Surface					*					
0.00	Topsoil		1	SS	5/0cm	**					
0.25	End of borehole Refusal on probable bedrock * Borehole dry upon completion ** Refusal to spoon										

ON_MOT LINES OVER BDRY NB_106.GPJ ON_MOT.GDT 11/10/2002 4:56:27 PM

+7, ×5 : Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+975, o/s 19m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
219.75	Ground Surface					*					
0.00	Topsoil		1	SS	1/23cm**						
0.25	End of borehole Refusal on probable bedrock * Borehole dry upon completion ** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-3N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+987.5, o/s 34m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
221.35	Ground Surface					*					
0.00	Topsoil		1	SS	5/0cm	**					
0.25	End of borehole Refusal on probable bedrock * Borehole dry upon completion ** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-4N

METRIC

G.W.P. 293-97-00		**LOCATION**	HWY. 69 Sta. 22+000, o/s 19m Rt. CL Med.	**ORIGINATED BY**	FP
DIST 52	**HWY** 69	**BOREHOLE TYPE**	Continuous Flight Hollow Stem Augers	**COMPILED BY**	FP/DH
DATUM Geodetic		**DATE**	August 30, 2001	**CHECKED BY**	

ELEV / DEPTH	SOIL PROFILE: DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
220.20	Ground Surface					*					
0.00 0.15	Peat, fine fibrous										
219.55 0.65	Fine to medium sand with silt trace gravel trace clay Compact Brown Damp		1	SS	11						7 65 25 3
	End of borehole Refusal on probable bedrock										
	* Borehole dry upon completion										

ON_MOT LINES OVER BDRY NB_106.GPJ ON_MOT.GDT 11/10/2002 4:57:15 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

RECORD OF BOREHOLE No 106-5N

METRIC

G.W.P.	293-97-00	**LOCATION**	HWY. 69 Sta. 22+012.5, o/s 7m Rt. CL Med.	**ORIGINATED BY**	FP
DIST 52	**HWY** 69	**BOREHOLE TYPE**	Continuous Flight Hollow Stem Augers	**COMPILED BY**	FP/DH
DATUM	Geodetic	**DATE**	August 30, 2001	**CHECKED BY**	

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE) 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
221.60	Ground Surface					*					
0.00 0.10	Topsoil										
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

+7, ×5: Numbers refer to Sensitivity

20 / 15 —○— 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-6N 1 of 1 METRIC

G.W.P. 293-97-00 LOCATION HWY. 69 Sta. 22+012.5, o/s 33m Rt. CL Med. ORIGINATED BY FP

DIST 52 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH

DATUM Geodetic DATE August 30, 2001 CHECKED BY

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
221.65	Ground Surface										
0.00	Topsoil		-	-	-						
0.30	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

ON_MOT LINES OVER BDRY NB_106.GPJ ON_MOT.GDT 11/10/2002 4:57:34 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-1S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+965, o/s 35m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	*					GR SA SI CL
221.65	Ground Surface										
0.00	End of borehole Refusal on probable bedrock * Groundwater level not established										

ON_MOT LINES OVER BDRY NB_106.GPJ ON_MOT.GDT 11/10/2002 4:56:34 PM

+7, ×5: Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-2S

METRIC

G.W.P.	293-97-00	**LOCATION**	HWY. 69 Sta. 21+975, o/s 19m Lt. CL Med.	**ORIGINATED BY**	FP
DIST 52	**HWY** 69	**BOREHOLE TYPE**	Continuous Flight Hollow Stem Augers	**COMPILED BY**	FP/DH
DATUM	Geodetic	**DATE**	August 30, 2001	**CHECKED BY**	

SOIL PROFILE			SAMPLES						DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa: O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE; 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L; WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE					
221.30 / 0.00	Ground Surface											
	End of borehole Refusal on probable bedrock * Groundwater level not established											

ON_MOT LINES OVER BDRY NB_106.GPJ ON_MOT.GDT 11/10/2002 4:56:55 PM

$+^7$, $\times^5$: Numbers refer to Sensitivity

20 / 15 —○— 5 / 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 106-3S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+987.5, o/s 5m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE: ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
219.15	Ground Surface										
0.00 / 218.75	Peat, fine fibrous		1	SS	1		219		○		
0.40	Fine to medium sand with silt trace gravel trace clay Loose Grey Wet						218				
217.05			2	SS	9				○		7 66 23 4
2.10	End of borehole Refusal on probable bedrock * Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

15 20 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-4S 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 22+000, o/s 19m Lt. CL Med. | ORIGINATED BY FP

DIST 52 | HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY FP/DH

DATUM Geodetic | DATE August 30, 2001 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
219.50	Ground Surface										
0.00	Peat, fine fibrous		1	SS	3						
219.00							219				
0.50	Fine to medium sand with silt trace gravel trace clay organic inclusions Loose Grey Wet										
217.90			2	SS	570cm	** ∇*	218				
1.60	End of borehole Refusal on probable bedrock										

* 2001 08 30

∇ Water level observed during drilling

Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 106-5S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+012.5, o/s 34m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (20 40 60 80 100)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT W_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
219.50	Ground Surface					*					
0.00 / 0.15	Peat, fine fibrous										
	Fine to medium sand with silt trace gravel trace clay organic inclusions Loose Grey Wet		1	SS	1		219		o		
218.00 / 1.50							218				
217.80 / 1.70	Sand and gravel Compact Grey Moist		2	SS	5/0cm	**			o		
	End of borehole Refusal on probable bedrock										

* Borehole dry upon completion

** Refusal to spoon

SHEAR STRENGTH kPa: O UNCONFINED; + FIELD VANE; ● QUICK TRIAXIAL; × LAB VANE

+7, ×5: Numbers refer to Sensitivity

20 / 15 —o— 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 106-1N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+965, o/s 35m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
221.00 / 0.00	Ground Surface										
	End of dynamic cone penetration test										
	Refusal on bedrock										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 106-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+987.5, o/s 6m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
219.45 0.00	Ground Surface										
							219				
							218	120/15cm			
217.75 1.70	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_106PT.GPJ ON_MOT.GDT 11/10/2002 5:03:03 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 106-1S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 21+965, o/s 5m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
219.90	Ground Surface										
0.00							219	120/0cm			
218.70											
1.20	End of dynamic cone penetration test Refusal on probable bedrock										

MOT DCPT NB_106PT.GPJ ON_MOT.GDT 11/10/2002 5:02:55 PM

+7, ×5: Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 106-2S

METRIC

G.W.P. 293-97-00	**LOCATION** HWY. 69 Sta. 21+992.5, o/s 35m Lt. CL Med.	**ORIGINATED BY** FP	
DIST 52 **HWY** 69	**BOREHOLE TYPE** Dynamic Cone Penetration Test	**COMPILED BY** FP/DH	
DATUM Geodetic	**DATE** August 30, 2001	**CHECKED BY**	

SOIL PROFILE: ELEV / DEPTH	SOIL PROFILE: DESCRIPTION	STRAT PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: "N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
219.40 / 0.00	Ground Surface						219				
							218	120/0cm			
217.55 / 1.85	End of dynamic cone penetration test Refusal on probable bedrock										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 106-3S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+012.5, o/s 6m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** FP/DH

DATUM Geodetic **DATE** August 30, 2001 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
221.40 / 0.00	Ground Surface										
	End of dynamic cone penetration test										
	Refusal on bedrock										

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

AUGER PROBE LOGS

G.W.P. 293-97-00 Highway 69
Four-Laning from 2.6 km North of Highway 124 Northerly 4.8 km
District 52 Township of McDougall

DATUM: Proposed Centreline Median

106 - 1

22+025	33.0	Lt C/L	220.55

0	-	90	Dk Br Si Tps Moist
90	-	600	Br Si Tr Sa Moist
		600	NFP Poss BR

106 - 2

22+025	7.0	Lt C/L	221.95

0	-	100	Dk Br Si Tps Moist
100	-	550	Br Si Tr Sa Moist
		550	NFP Poss BR

106 - 3

22+025	18.8	Rt C/L	222.10

0	-	100	Dk Br Si Tps Moist
		100	NFP Poss BR

106 - 4

22+038	18.8	Lt C/L	222.90

0	-	100	Dk Br Si Tps Moist
100	-	400	Br Si(y) Sa Moist
		400	NFP Poss BR

106 - 5

22+038	7.0	Rt C/L	222.85

0	-	150	Dk Br Si Tps Moist
		150	NFP Poss BR

106 - 6

22+038	33.0	Rt C/L	223.00

0	-	120	Dk Br Si Tr Sa Tps Moist
120	-	480	Br Sa(y) Si Moist
		480	NFP Poss BR

106 - 7

22+050	33.0	Lt C/L	222.10

0	-	50	Dk Br Si Tps Moist
		50	NFP Poss BR

106 - 8

22+050	7.0	Lt C/L	222.60

0	-	100	Dk Br Si Tps Moist
100	-	300	Br Si Tr Sa Moist
		300	NFP Poss BR

106 - 9

22+050	18.8	Rt C/L	222.80

0	-	50	Dk Br Si Tps Moist
		50	NFP Poss BR

106 - 10

22+065	18.8	Lt C/L	223.15

0	-	200	Dk Br Si Tps Moist
200	-	700	Br Si Some Gr Tr Sa Moist
		700	NFP Poss BR

106 - 11

22+065	18.8	Rt C/L	223.90

	0	NFP BR

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 109-1M

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+700, CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 20, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
216.80	Ground Surface					*					
0.00	Topsoil										
0.15	Sand some silt Very Brown Moist Loose to Wet		1	SS	2		216				
215.75			2	SS	2						
1.05	Silty clay trace sand Very Brown Moist Stiff										
215.05			3	SS	50/5cm**				150 ■		
1.75	End of borehole Refusal on probable bedrock * Borehole dry upon completion ■ Penetrometer Test ** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-2M 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 22+900, CL Med. | ORIGINATED BY AJS

DIST 52 HWY 69 | BOREHOLE TYPE Continuous Flight Solid Stem Augers | COMPILED BY CN

DATUM Geodetic | DATE August 20, 2002 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
212.25 / 0.00	Ground Surface										
0.05	Topsoil										
	Sand some silt, trace gravel		1	SS	1		212				
	Very Loose — Dark Brown — Moist		2	SS	3						9 81 10 0
	Brown						211				
	Loose — Wet		3	SS	6						
	Grey		4	SS	5		210				
	Compact		5	SS	10		209				0 78 22 0
							208				
			6	SS	19						3 87 10 0
							207				
206.30 / 5.95	End of borehole										
	Refusal on probable bedrock										
	* Groundwater level not established										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

RECORD OF BOREHOLE No 109-3M   1 of 1   METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+925, 19m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 20, 2002 **CHECKED BY**

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
212.70	Ground Surface					
0.00	Topsoil	1	SS	4		
0.30	Sand some silt Loose Brown Moist					212
		2	SS	8		
	Compact	3	SS	13		211
	Trace gravel Wet	4	SS	24		210
					∇*	
		5	SS	19		209
	Grey	6	SS	15		208
206.90 5.80	End of borehole Refusal on probable bedrock * 2002 08 20 ∇ Water level observed during drilling					207

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L

WATER CONTENT (%): 20 40 60

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%): GR SA SI CL

+7, ×5: Numbers refer to Sensitivity

20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 109-1N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+590, o/s 19m Rt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Manual Drilling **COMPILED BY** CN

DATUM Geodetic **DATE** July 30, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
220.25	Ground Surface					*					
0.00	End of borehole										
	Refusal on bedrock										
	* Borehole dry upon completion										

+ 7, × 5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-2N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+600, o/s 5m Rt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.80 / 0.00	Ground Surface										
0.05	Topsoil										
	Sand some silt trace clay Compact Brown to Grey Moist		1	SS	4				○		
			2	SS	18		217		○		
			3	SS	11	∇*	216		○		
215.70 / 2.10	Silty clay some sand Very Soft to Stiff Grey Wet		4	SS	1/45cm		215		○		
214.45 / 3.35			5	SS	58/15cm**				○		
	End of borehole Refusal on probable bedrock * 2002 08 21 Water level observed during drilling ** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-3N

METRIC

G.W.P.	293-97-00	**LOCATION**	HWY. 69 Sta. 22+601.5, o/s 35m Rt. CL Med.	**ORIGINATED BY**	AJS
DIST 52 **HWY**	69	**BOREHOLE TYPE**	C.F.S.S.A. and Dynamic Cone Penetration Test	**COMPILED BY**	CN
DATUM	Geodetic	**DATE**	August 21, 2002	**CHECKED BY**	

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
218.20 / 0.00	Ground Surface							
0.05	Topsoil							
	Sand some silt Compact Grey Moist	1	SS	2				
		2	SS	10				
		3	SS	9				
	Wet	4	SS	10	▼*			
215.30 / 2.90	Silty clay trace sand Very Soft Grey Wet	5	SS	2				
213.90 / 4.30	Sand trace gravel Compact Grey Wet	6	SS	21				
212.95 / 5.25	End of borehole Refusal on probable bedrock							

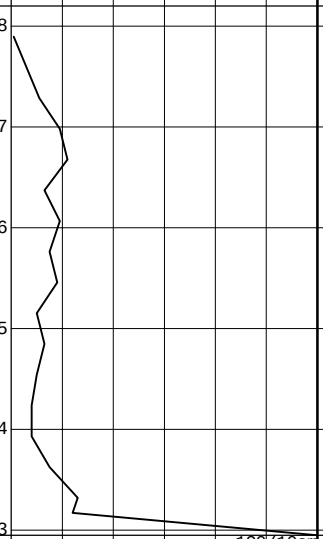
* 2002 08 21

▼ Water level measured after drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20, 40, 60, 80, 100)

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
(20, 40, 60, 80, 100)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L
WATER CONTENT (%) (20, 40, 60)



+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 109-4N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+625, o/s 19m Rt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
217.25 / 0.00	Ground Surface													
0.05	Topsoil													
	Sand trace silt Loose Brown Damp	1	SS	12		217								
		2	SS	1	▼*	216								
	Compact Wet	3	SS	13							0	97	3	0
215.25 / 2.00	Clayey silt trace sand Very Soft Grey Wet	4	SS	1/45cm		215								
		5	SS	1/45cm		214								
	With sand	6	GS								0	26	52	22
212.75 / 4.50	Sand and silt trace clay Very Loose Grey Wet	7	SS	1		213		N.P.			0	43	48	9
211.30 / 5.95	End of borehole					212								

Refusal on probable bedrock

* 2002 08 21

▼ Water level measured after drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

WATER CONTENT (%) 20 40 60

REMARKS & GRAIN SIZE DISTRIBUTION (%)

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 109-5N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+650, o/s 40m Rt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES																
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.80	Ground Surface										
0.00	Topsoil										
0.15	Silt and sand Compact Brown Damp		1	SS	2						
			2	SS	14		217				
						▼*					
			3	SS	15		216				
215.40											
2.40	Silty clay trace sand Very Soft Brown Wet		4	SS	2		215				
			5	SS	1						
214.30											
3.50	Sand trace silt Very Loose Grey Wet						214				
213.85											
3.95	End of borehole Refusal on probable bedrock										

* 2002 08 21

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

RECORD OF BOREHOLE No 109-6N

METRIC

G.W.P.	293-97-00	**LOCATION**	HWY. 69 Sta. 22+675, o/s 19m Rt. CL Med.	**ORIGINATED BY**	AJS
DIST 52	**HWY** 69	**BOREHOLE TYPE**	Continuous Flight Solid Stem Augers	**COMPILED BY**	CN
DATUM	Geodetic	**DATE**	August 21, 2002	**CHECKED BY**	

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.65 / 0.00	Ground Surface				*				
0.05	Topsoil								
	Sand some silt Loose Brown Moist	1	SS	2		217	○		
216.60 / 1.05		2	SS	9			○		
	Silty clay trace sand Soft Brown Wet	3	SS	2		216	○		
215.65 / 2.00									
215.50 / 2.15	Sand trace silt Loose Grey Wet								
	End of borehole Refusal on probable bedrock * Groundwater level not established								

Chart headings: DYNAMIC CONE PENETRATION RESISTANCE PLOT (20, 40, 60, 80, 100); SHEAR STRENGTH kPa (○ UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE; 20, 40, 60, 80, 100); PLASTIC LIMIT w_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT w_L; WATER CONTENT (%) 20, 40, 60.

+7, ×5 : Numbers refer to Sensitivity   20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

RECORD OF BOREHOLE No 109-7N

METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 22+725, o/s 19m Rt. CL Med. | ORIGINATED BY AJS

DIST 52 HWY 69 | BOREHOLE TYPE Continuous Flight Solid Stem Augers | COMPILED BY CN

DATUM Geodetic | DATE August 21, 2002 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	GR	SA	SI	CL
216.40	Ground Surface				*							
0.00	Topsoil											
0.15	Sand some silt, Loose, Brown, Moist	1	SS	3		216						
		2	SS	5								
	Compact	3	SS	10		215			0	90	10	0
214.10 / 2.30	Silty clay trace sand, Soft, Brown, Wet	4	SS	2		214			0	4	46	50
213.35 / 3.05	Sandy clayey silt, Very Soft, Brown, Wet	5	SS	1/45cm		213			0	25	57	18
211.90 / 4.50	Sand trace silt, Compact, Grey, Wet	6	SS	16		212						
211.20 / 5.20	End of borehole											

Refusal on probable bedrock

■ Penetrometer Test

* Groundwater level not established

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE; 20 40 60 80 100

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L; WATER CONTENT (%) 20 40 60

REMARKS & GRAIN SIZE DISTRIBUTION (%)

+7, ×5 : Numbers refer to Sensitivity

20 / 15—○—5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation Ontario

RECORD OF BOREHOLE No 109-8N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+750, o/s 40m Rt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 20, 2002 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100); SHEAR STRENGTH kPa: O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P, NATURAL MOISTURE CONTENT w, LIQUID LIMIT w_L; WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
213.00 / 0.00	Ground Surface										
0.20	Topsoil										
	Sand some silt, Loose, Brown, Moist		1	SS	1	▼*					
			2	SS	8		212				
211.35 / 1.65	Wet		3	SS	50/0cm**						
	End of borehole. Refusal on probable bedrock										

* 2002 08 20

▼ Water level measured after drilling

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 109-9N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+850, o/s 36m Rt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 20, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
212.80	Ground Surface										
0.00	Topsoil										
0.20	Sand some silt Loose Brown Wet		1	SS	1						
			2	SS	4		212				
	Compact Grey		3	SS	25		211				
210.80											
2.00	End of borehole Refusal on probable bedrock * Groundwater level not established										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 109-10N 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 22+925, o/s 19m Rt. CL Med. | ORIGINATED BY FP

DIST 52 HWY 69 | BOREHOLE TYPE Continuous Flight Hollow Stem Augers | COMPILED BY CN

DATUM Geodetic | DATE August 16, 2002 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L (WATER CONTENT (%))	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.15	Ground Surface								
0.00	Peat, coarse Dark Brown	1	SS	2		217			
0.30	Sand trace to some silt Loose Brown Damp	2	SS	5		216			
		3	SS	9					
	Compact Moist	4	SS	18		215			0 97 3 0
		5	SS	21		214			
						213			
	Some gravel trace clay	6	SS	27					13 64 18 5
						212			
	Wet				▽*				
		7	SS	16		211			
						210			
		8	SS	9					
						209			
	With gravel trace silt Compact to Dense	9	SS	33		208			21 77 2 0
						207			
		10	SS	10					
						206			
						205			
204.65		11	SS	100/15cm**					
12.50	End of borehole								

Refusal on probable bedrock

* 2002 08 16 ▽ Water level observed during drilling

** Refusal to spoon

DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100

SHEAR STRENGTH kPa
○ UNCONFINED + FIELD VANE
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

WATER CONTENT (%) 20 40 60

+7, ×5 : Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 109-11N 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+950, o/s 36m Rt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 16, 2002 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
215.50	Ground Surface										
0.00	Peat, coarse Dark Brown		1	SS	5		215				
0.23	Sand some silt trace clay Loose Brown Damp		2	SS	5						
	Trace to some gravel Compact		3	SS	28		214				
			4	SS	19		213				
	Dense		5	SS	30		212				
						∇*	211				
	Some gravel trace silt Wet		6	SS	82/15cm**						14 79 7 0
210.50											
5.00	End of borehole										

Refusal on probable bedrock

* 2002 08 16 Water level observed during drilling ∇

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 109-1S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+575, o/s 19m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
218.90	Ground Surface										
0.00	Silty sand roots										
218.45	Loose Dark Brown Damp										
0.45	End of borehole										

Refusal on probable bedrock

* Borehole dry upon completion

+ 7, × 5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 109-2S

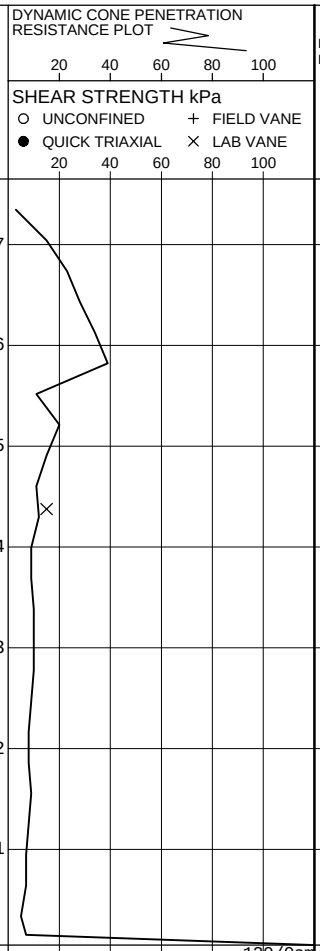
METRIC

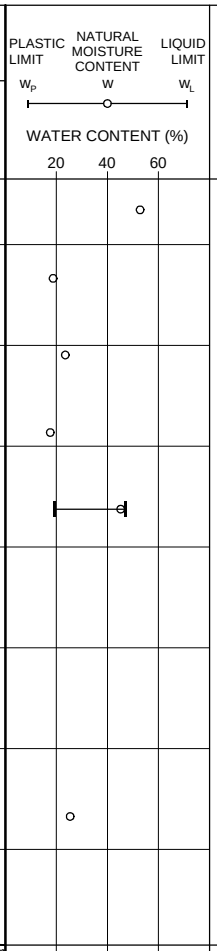
G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+600, o/s 40m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** C.F.S.S.A. and Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.65 / 0.00	Ground Surface							
0.05	Topsoil							
	Sand some silt Very Loose Brown Moist	1	SS	8		217		
		2	SS	2				
	Compact Grey	3	SS	18		216		0 86 14 0
215.10 / 2.55		4	SS	5	▼*	215		
	Silty clay trace sand Very Soft Grey Wet	5	SS	1/45cm		214		0 5 50 45
		6	SS	1/45cm		213		
211.95 / 5.70	Sand and silt trace clay Very Loose Grey Wet	7	SS	2		212		0 46 46 8
210.05 / 7.60	End of borehole Refusal on probable bedrock * 2002 08 21 ▼ Water level measured after drilling					211		





+7, ×5 : Numbers refer to Sensitivity

20 / 15 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-3S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+600, o/s 5m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES																
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.70 / 0.00	Ground Surface														
0.05	Topsoil														
	Sand some silt Compact Brown Moist		1	SS	2										
			2	SS	22		217								
			3	SS	13		216								
215.30						▼*									
2.40	Silty clay trace sand Soft Grey Wet		4	SS	2		215								
			5	SS	2			×							
213.80							214								
3.90	Sand trace silt Dense Grey Wet														
213.00			6	SS	46/15cm**		213								
4.70	End of borehole														

Refusal on probable bedrock

* 2002 08 21 Water level measured after drilling

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

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RECORD OF BOREHOLE No 109-4S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+625, o/s 19m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES																
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.20 / 0.00	Ground Surface										
0.05	Topsoil										
	Sand some silt		1	SS	10		217				
	Compact Brown Moist					▼*					
	Wet		2	SS	10						
215.70							216				
1.50	Silty clay trace sand		3	SS	1/45cm						
215.10	Very Brown Wet										
2.10	Soft										
214.80	Sand trace silt		4	SS	50/3cm**		215				
2.40	Compact Grey Wet										
	End of borehole										
	Refusal on probable bedrock										
	* 2002 08 21 Water level measured after drilling										
	** Refusal to spoon										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-5S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+650, o/s 40m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	REMARKS
216.35 / 0.00	Ground Surface						
0.05	Topsoil						
	Silt and sand, Very Loose, Brown, Wet	1	SS	3	▼*	216	
215.60 / 0.75	Silty clay trace sand, Firm, Brown, Wet						
215.25 / 1.10	End of borehole						

Refusal on probable bedrock

* 2002 08 21

▼ Water level measured after drilling

Chart headings: DYNAMIC CONE PENETRATION RESISTANCE PLOT (20, 40, 60, 80, 100); SHEAR STRENGTH kPa (○ UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE; 20, 40, 60, 80, 100); PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L; WATER CONTENT (%) 20, 40, 60; UNIT WEIGHT γ kN/m³; REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

+7, ×5: Numbers refer to Sensitivity

20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-6S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+675, o/s 19m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES																		
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
216.50	Ground Surface										
0.00	Topsoil										
0.15	Sand some silt Loose Brown Moist Wet		1	SS	2	▼*	216				
			2	SS	6						
215.30											
1.20	Silty clay trace sand Stiff Brown Wet						215				
214.85											
1.65	Sand trace silt Compact Grey Wet		3	SS	16			■			
214.05											
2.45	End of borehole										

End of borehole

Refusal on probable bedrock

* 2002 08 21 Water level measured after drilling

■ Penetrometer Test

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-7S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+725, o/s 19m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 20, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
216.55 / 0.00	Ground Surface										
0.05	Topsoil		1	SS	1						
	Sandy silt						216				
215.50	Very loose Red Brown Wet										
1.05	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-8S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+950, o/s 42m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES																
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100	SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
211.90 / 0.00	Ground Surface														
0.05	Topsoil		1	SS	2	▼*									
	Sand some silt														
	Very Loose Brown Moist		2	SS	4		211								
	Trace gravel														
	Wet		3	SS	20										
	Compact						210								
			4	SS	24										
							209								
			5	SS	17										
	Grey						208								
			6	SS	20		207								
							206								
			7	SS	23										
205.20 / 6.70	End of borehole														

Refusal on probable bedrock

* 2002 08 21 Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-9S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+975, o/s 19m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 20, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES										
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
213.95 / 0.00	Ground Surface										
0.05	Topsoil										
	Sand some silt		1	SS	2						
	Loose Brown Moist		2	SS	8		213				
						▼*					
	Compact Wet		3	SS	14		212				
			4	SS	7						
							211				
			5	SS	13						
	Trace gravel						210				
	Grey		6	SS	18		209				
							208				
	Dense		7	SS	32						
							207				
206.10 / 7.85			8	SS	50/8cm**						
	End of borehole										

Refusal on probable bedrock

* 2002 08 20

▼ Water level measured after drilling

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-10S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+000, o/s 5m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 16, 2002 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L / WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.20	Ground Surface									
0.00	Peat, coarse Dark Brown	1	SS	3		217				
0.23	Sand some silt trace clay Compact Brown Moist to Dense	2	SS	9						
		3	SS	31		216				
215.10										
2.10	Silty clay trace sand Very Stiff Brown Moist	4	SS	14		215		137.5		
214.50										
2.70	Sand and silt to sand some silt, trace clay Compact Grey Moist	5	SS	21		214				
						213				
		6	SS	23						
						212				
	Wet	7	SS	11		211				
						210				
		8	SS	11	▽*					
						209				
		9	SS	11		208				
						207				
	Some gravel	10	SS	22						
						206				
						205				
204.55		11	SS	19						
12.65	End of borehole									

* 2002 08 16

▽ Water level observed during drilling

■ Penetrometer Test

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-11S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+025, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 16, 2002 **CHECKED BY**

ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" VALUES	GR	SA	SI	CL
216.95	Ground Surface							
0.00	Mixed sand, organics	1	SS	2				
0.25 / 216.35	Loose Brown Damp (FILL)							
0.60	Peat, coarse Dark Brown	2	SS	18				
	Sand some silt trace clay	3	SS	46	0	82	14	4
214.85	Compact Brown Moist to Dense to Damp							
2.10	Silty clay trace sand	4	SS	12	0	5	47	48
214.25	Very Stiff Brown Moist							
2.70	Sand and silt to sand some silt, trace clay							
	Compact Brown Moist to Grey	5	SS	19	0	43	49	8
	Dense Grey Wet	6	SS	31				
	Trace gravel Compact	7	SS	22	3	77	18	2
		8	SS	10				
207.80								
9.15	End of borehole							

Refusal on probable bedrock

* 2002 08 16 Water level observed during drilling

■ Penetrometer Test

SOIL PROFILE — STRAT PLOT — SAMPLES — GROUND WATER CONDITIONS — ELEVATION SCALE

DYNAMIC CONE PENETRATION RESISTANCE PLOT: 20 40 60 80 100

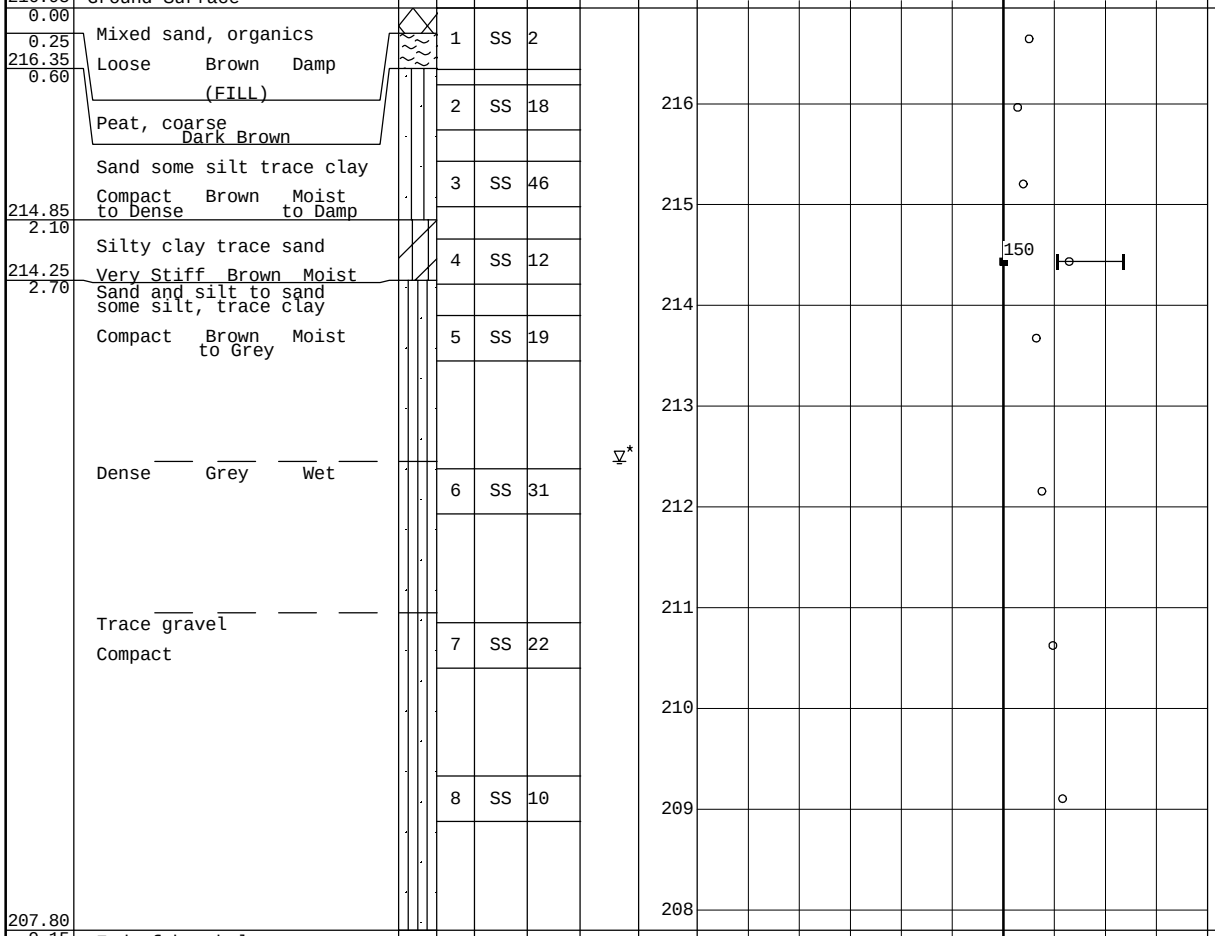
SHEAR STRENGTH kPa: ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE (20 40 60 80 100)

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) 20 40 60

UNIT WEIGHT γ kN/m³

REMARKS & GRAIN SIZE DISTRIBUTION (%)



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+7, ×5 : Numbers refer to Sensitivity

15 20 10 5 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-12S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+050, o/s 34m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

ELEV / DEPTH	SOIL PROFILE DESCRIPTION	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE
216.50	Ground Surface				*	
0.00						
0.20	Peat, coarse	1	SS	3		216
	Dark Brown Sand some silt trace clay Compact Brown Moist	2	SS	11		
214.80 / 1.70	Silty clay trace sand Very Stiff Brown Moist	3	SS	28		215
214.20 / 2.30	Sand and silt to sand some silt, trace clay Dense Grey Moist	4	SS	33		214
		5	SS	39		
212.85 / 3.65	cobbles					213
212.45 / 4.05	compact	6	SS	21		212
	Wet					211
		7	SS	21		210
209.00 / 7.50	End of borehole Refusal on probable bedrock * Groundwater level not established					209

Chart column headings (no data plotted): DYNAMIC CONE PENETRATION RESISTANCE PLOT (20, 40, 60, 80, 100); SHEAR STRENGTH kPa — O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE (20, 40, 60, 80, 100); PLASTIC LIMIT W_P, NATURAL MOISTURE CONTENT W, LIQUID LIMIT W_L; WATER CONTENT (%) (20, 40, 60); UNIT WEIGHT γ kN/m³; REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL

+7, ×5 : Numbers refer to Sensitivity — 20 / 15–○–5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-13S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+075, o/s 19m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Solid Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH kPa ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE 20 40 60 80 100	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE				GR SA SI CL
217.45	Ground Surface										
0.00											
0.18	Peat, coarse Dark Brown		1	SS	2		217				
	Sand some silt trace clay, trace gravel										
	Loose Brown Moist to Dense		2	SS	45						
215.80			3	SS	50/5cm**		216				
1.65	End of borehole										

Refusal on probable bedrock

* Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 5 — 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-14S 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 23+100, o/s 10m Lt. CL Med. | ORIGINATED BY FP

DIST 52 | HWY 69 | BOREHOLE TYPE Continuous Flight Solid Stem Augers | COMPILED BY CN

DATUM Geodetic | DATE August 15, 2002 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
218.05	Ground Surface					*					
0.00							218				
0.18	Peat, coarse Dark Brown		1	SS	2				○		
	Sand some silt trace clay Loose Brown Moist		2	SS	9		217		○		
216.70											
1.35	End of borehole										

Refusal on probable bedrock

* Borehole dry upon completion

Borehole moved 4m left after refusal to auger through existing access road rock fill

+7, ×5 : Numbers refer to Sensitivity

20 15 5 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

RECORD OF BOREHOLE No 109-15S

METRIC

G.W.P.	293-97-00	**LOCATION**	HWY. 69 Sta. 23+125, o/s 19m Lt. CL Med.	**ORIGINATED BY**	FP
DIST	52 **HWY** 69	**BOREHOLE TYPE**	Continuous Flight Hollow Stem Augers	**COMPILED BY**	CN
DATUM	Geodetic	**DATE**	August 15, 2002	**CHECKED BY**	

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (O UNCONFINED, + FIELD VANE, ● QUICK TRIAXIAL, × LAB VANE)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.20	Ground Surface					*					
0.00	Peat, coarse										
0.25	Dark Brown Sand some silt trace clay		1	SS	2		214				
	Loose Brown Moist to Damp		2	SS	7		213				
	Compact		3	SS	25		212				
	Very dense Grey		4	SS	52						
211.00 / 3.20			5	SS	50/3cm**		211				
	End of borehole										
	Refusal on probable bedrock										
	* Borehole dry upon completion										
	** Refusal to spoon										

$+^7$, $\times^5$: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-16S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+150, o/s 34m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES															
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
216.70	Ground Surface										
0.00											
0.23	Peat, coarse Dark Brown		1	SS	3						
	Sand and silt trace clay Loose Brown Moist						216				
			2	SS	9						0 56 40 4
215.09			3	SS	50/8cm		215				
1.61	Cobbles										
214.60											
2.10	Sand some silt trace clay trace gravel Compact Grey Moist		4	SS	23		214				1 82 15 2
			5	SS	20						
							213				
212.20											
4.50	Sand trace silt Compact Grey Wet		6	SS	21	▼*	212				0 93 7 0
							211				
			7	SS	20						
							210				
209.25											
7.45	End of borehole										

Refusal on probable bedrock

* 2002 08 15

▼ Water level measured after drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-17S 1 of 1 METRIC

G.W.P. 293-97-00 | LOCATION HWY. 69 Sta. 23+175, o/s 19m Lt. CL Med. | ORIGINATED BY FP

DIST 52 | HWY 69 | BOREHOLE TYPE Continuous Flight Solid Stem Augers | COMPILED BY CN

DATUM Geodetic | DATE August 15, 2002 | CHECKED BY

ELEV / DEPTH	DESCRIPTION	STRAT PLOT	SAMPLE NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.00	Ground Surface										
0.00	Peat, coarse Dark Brown		1	SS	2						
0.30	Sand some silt trace clay Very loose Brown Moist		2	SS	3		216				
215.65											
1.35	End of borehole										

Refusal on probable bedrock

* Borehole dry upon completion

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-18S 1 of 1 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+200, o/s 35m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES																
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
216.15	Ground Surface					*					
0.00	Peat, coarse Dark Brown		1	SS	4		216		○		
0.30	Silty sand trace clay trace gravel, rootlets										
	Compact Brown Moist to Damp		2	SS	13		215		○		4 60 31 5
	Dense		3	SS	43				○		
214.35 1.80	Cobbles										
214.05 2.10	Grey Moist						214				
			4	SS	29				○		
212.80			5	SS	50/5cm**		213		○		
3.35	End of borehole										

Refusal on probable bedrock

* Borehole dry upon completion

** Refusal to spoon

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF BOREHOLE No 109-19S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+200, o/s 5m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Continuous Flight Hollow Stem Augers **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				
216.40	Ground Surface										
0.00											
0.15	Peat, coarse Dark Brown		1	SS	2		216				
	Sand some silt trace clay										
	Compact Brown Moist to Damp		2	SS	30						
							215				
			3	SS	28						
			4	SS	17		214				
			5	SS	21						
	Wet						213				
							212				
			6	SS	13	▼*					
							211				
210.45											
5.95	End of borehole										

Refusal on probable bedrock

* 2002 08 15 Water level observed after drilling

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-1M

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+650, CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES														
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.15	Ground Surface										
0.00							217				
							216				
							215				
							214				
213.35											
3.80	End of dynamic cone penetration test Refusal on probable bedrock							120/15cm			

MTO_DCPT NB_109PT.GPJ ON_MOT.GDT 11/10/2002 5:26:36 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-2M

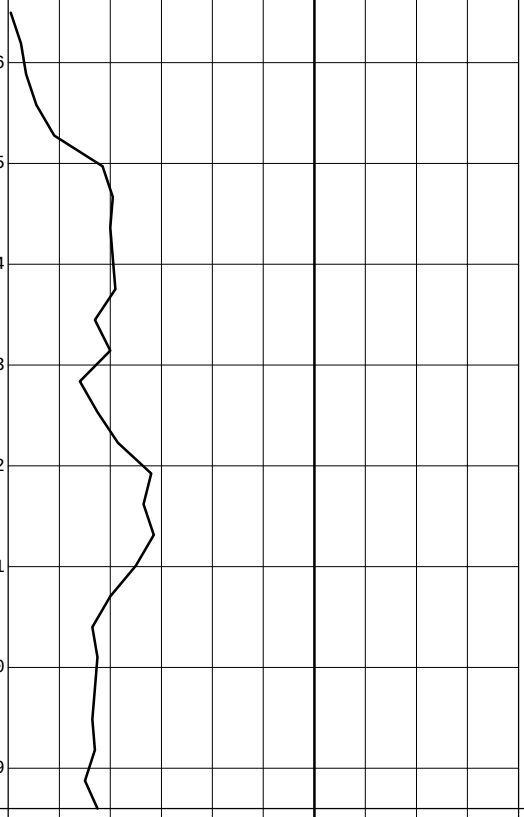
 METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+950, CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES										
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
216.80 / 0.00	Ground Surface										
							216				
							215				
							214				
							213				
							212				
							211				
							210				
							209				
208.60 / 8.20	End of dynamic cone penetration test										



MTO_DCPT NB_109PT.GPJ ON_MOT.GDT 11/10/2002 5:27:02 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-1N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+700, o/s 40m Rt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES												
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.60	Ground Surface										
0.00							217				
							216				
							215				
214.65											
2.95	End of dynamic cone penetration test Refusal on probable bedrock							120/23cm			

MTO_DCPT NB_109PT.GPJ ON_MOT.GDT 11/10/2002 5:26:43 PM

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-2N

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+900, o/s 45m Rt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 20, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES										
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
216.00	Ground Surface										
0.00							215				
							214				
							213				
							212				
211.20											
4.80	End of dynamic cone penetration test Refusal on probable bedrock							120/23cm			

MTO_DCPT NB_109PT.GPJ ON_MOT.GDT 11/10/2002 5:27:10 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-1S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+700, o/s 40m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 21, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES					DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE				GR SA SI CL
216.30	Ground Surface										
0.00							216				
							215				
214.70											
1.60	End of dynamic cone penetration test Refusal on probable bedrock							120/8cm			

+7, ×5 : Numbers refer to Sensitivity

15 — 20 — 10 — 5 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-2S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 22+998, o/s 35m Lt. CL Med. **ORIGINATED BY** AJS

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 20, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES														
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
214.35	Ground Surface										
0.00							214				
							213				
							212				
							211				
209.75							210				
4.60	End of dynamic cone penetration test Refusal on probable bedrock							120			

MTO_DCPT NB_109PT.GPJ ON_MOT.GDT 11/10/2002 5:27:18 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-3S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+050, o/s 6m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES						GR SA SI CL
217.45	Ground Surface										
0.00							217				
215.85							216				
1.60	End of dynamic cone penetration test Refusal on probable bedrock							120/8cm			

+7, ×5 : Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-4S

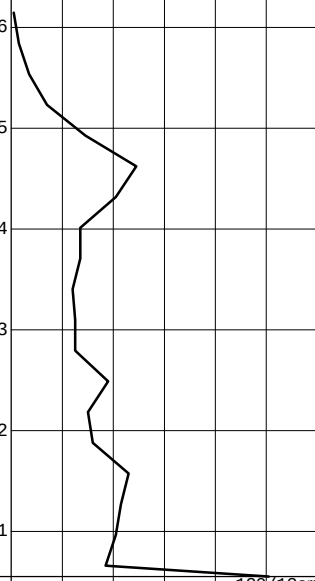
METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+100, o/s 34m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES												
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
216.45 / 0.00	Ground Surface										
							216				
							215				
							214				
							213				
							212				
							211				
210.55 / 5.90	End of dynamic cone penetration test Refusal on probable bedrock							120/13cm			



MTO_DCPT NB_109PT.GPJ ON_MOT.GDT 11/10/2002 5:27:34 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

Ministry of Transportation
Ontario

Foundation Design

RECORD OF PENETRATION TEST No 109-5S

METRIC

G.W.P. 293-97-00 **LOCATION** HWY. 69 Sta. 23+150, o/s 6m Lt. CL Med. **ORIGINATED BY** FP

DIST 52 **HWY** 69 **BOREHOLE TYPE** Dynamic Cone Penetration Test **COMPILED BY** CN

DATUM Geodetic **DATE** August 15, 2002 **CHECKED BY**

SOIL PROFILE			SAMPLES													
ELEV / DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH kPa (○ UNCONFINED, ● QUICK TRIAXIAL, + FIELD VANE, × LAB VANE) (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (20 40 60)	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
217.35	Ground Surface										
0.00							217				
							216				
							215				
							214				
							213				
							212				
211.50											
5.85	End of dynamic cone penetration test Refusal on probable bedrock							120/8cm			

MTO_DCPT NB_109PT.GPJ ON_MOT.GDT 11/10/2002 5:27:42 PM

+7, ×5: Numbers refer to Sensitivity

20 / 15 — 5 / 10 (%) STRAIN AT FAILURE

AUGER PROBE LOGS

G.W.P. 293-97-00 Highway 69
Four-Laning from 2.6 km North of Highway 124 Northerly 4.8 km
District 52 Township of McDougall

DATUM: Proposed Centreline Median

109 - 1
22+750 33.0 Lt C/L 220.85
0 NFP BR

109 - 2
22+750 7.0 Lt C/L 219.50
0 NFP BR

109 - 3
22+750 C/L 217.65
0 NFP BR

109 - 4
22+775 18.8 Lt C/L 219.95
0 - 050 Dk Br Si Tps Roots Dry
050 - 300 Br Si Tr Sa Dry
300 NFP Poss BR

109 - 5
22+775 18.8 Rt C/L 220.30
0 NFP BR

109 - 6
22+800 31.0 Lt C/L 220.90
0 NFP BR

109 - 7
22+800 7.0 Lt C/L 221.95
0 NFP BR

109 - 8
22+800 8.0 Rt C/L 222.10
0 NFP BR

109 - 9
22+800 32.0 Rt C/L 219.80
0 NFP BR

109 - 10
22+825 18.8 Lt C/L 221.60
0 NFP BR

109 - 11
22+825 18.8 Rt C/L 219.35
0 - 100 Dk Br Si Tps Roots Dry
100 NFP Poss BR

109 - 12
22+850 34.0 Lt C/L 218.60
0 NFP BR

109 - 13
22+850 6.0 Lt C/L 219.60
0 NFP BR

109 - 14
22+850 5.0 Rt C/L 219.20
0 NFP BR

109 - 15
22+875 18.8 Lt C/L 217.00
0 NFP BR

AUGER PROBE LOGS

G.W.P. 293-97-00 Highway 69
Four-Laning from 2.6 km North of Highway 124 Northerly 4.8 km
District 52 Township of McDougall

DATUM: Proposed Centreline Median

109 - 16
22+875 18.8 Rt C/L 214.70

0 NFP BR

109 - 17
22+900 43.0 Lt C/L 214.45

0 NFP BR

Peto MacCallum Ltd.
CONSULTING ENGINEERS

APPENDIX D : BOREHOLE LOCATION AND SOIL STRATA DRAWINGS

HIGH FILL 101: DRAWING S-101-1

HIGH FILL 102: THIS SECTION DELETED

HIGH FILL 103: DRAWINGS S-103-1, S-103-2, S-103-3, S-103-4, S-103-5 AND S-103-6

HIGH FILL 104: DRAWINGS S-104-1, S-104-2 AND S-104-3

SWAMP 105: DRAWINGS S-105-1, S-105-2, S-105-3 AND S-105-4

SWAMP 106: DRAWINGS S-106-1 AND S-106-2

SWAMP 107: THIS SECTION DELETED

SWAMP 108: THIS SECTION DELETED

HIGH FILL 109: DRAWINGS S-109-1, S-109-2, S-109-3, S-109-4, S-109-5, and S-109-6

METRIC

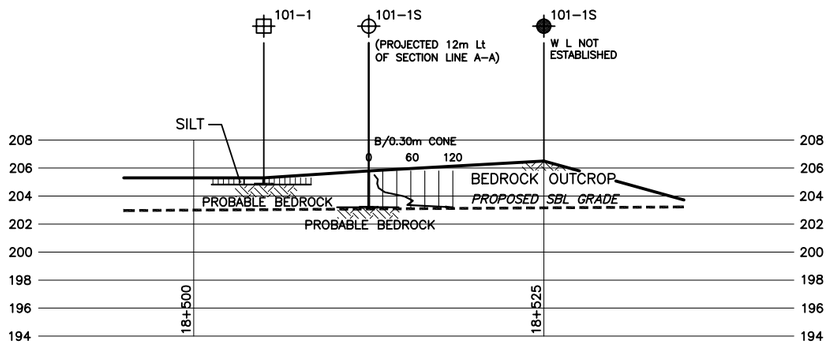
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

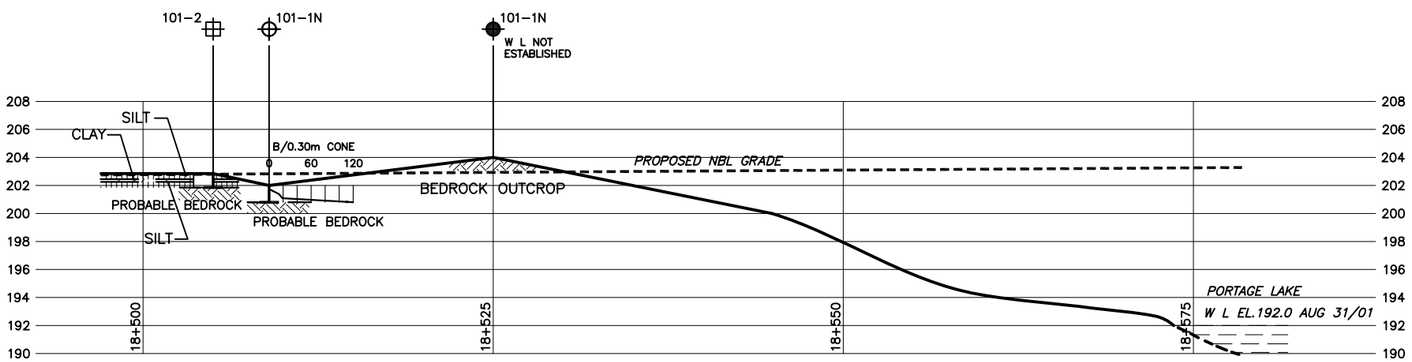
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
HIGH FILL 101, STA 18+505 TO 18+535)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

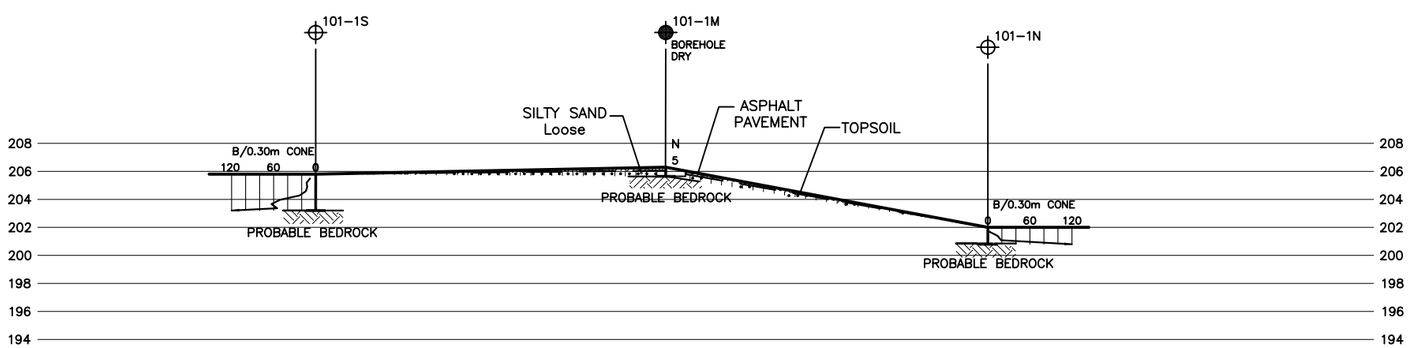
Poto MacCallum Ltd.
CONSULTING ENGINEERS



A–A

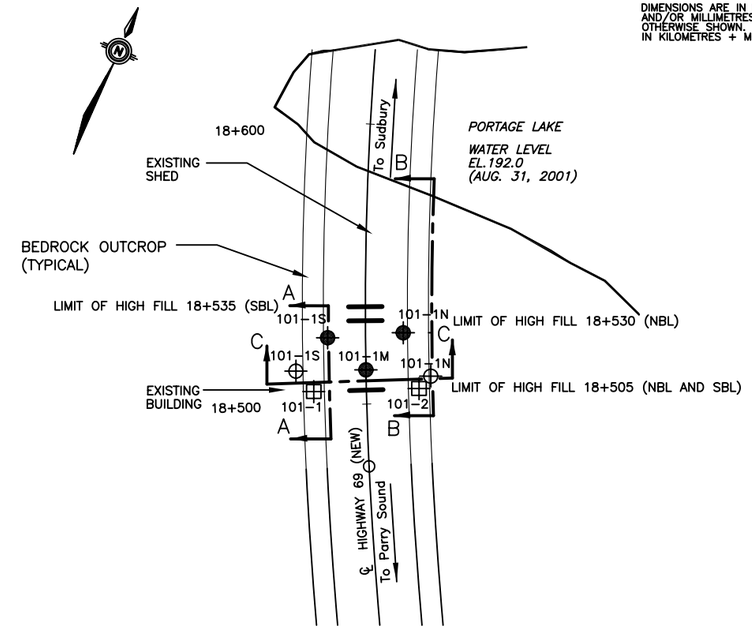


B–B



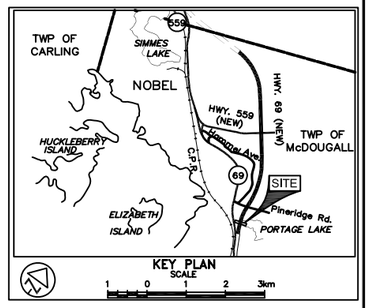
C–C

SECTIONS
SCALE
4 2 0 4 8m



HIGH FILL 101

PLAN
SCALE
20 10 0 20 40m



KEY PLAN
SCALE
1 0 1 2 3km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med
101-1M	206.30	18+512.5	CL
101-1N	204.00	18+525	13.5m Rt
101-1S	206.50	18+525	13.5m Lt
PT No	**ELEVATION**	**STA**	**o/s CL Med**
101-1N	202.00	18+509	23m Rt
101-1S	205.80	18+512.5	25m Lt
AP No	**ELEVATION**	**STA**	**o/s CL Med**
101-1	205.30	18+505	18.8m Lt
101-2	202.85	18+505	18.8m Rt

NOTE:

SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV 11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C. M. P. Nascimento Nov. 11/2002 PROVINCE OF ONTARIO

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No 69				DIST	52
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN NA/TK	CHECKED CN	APPROVED DWK		DWG	S-101-1

METRIC

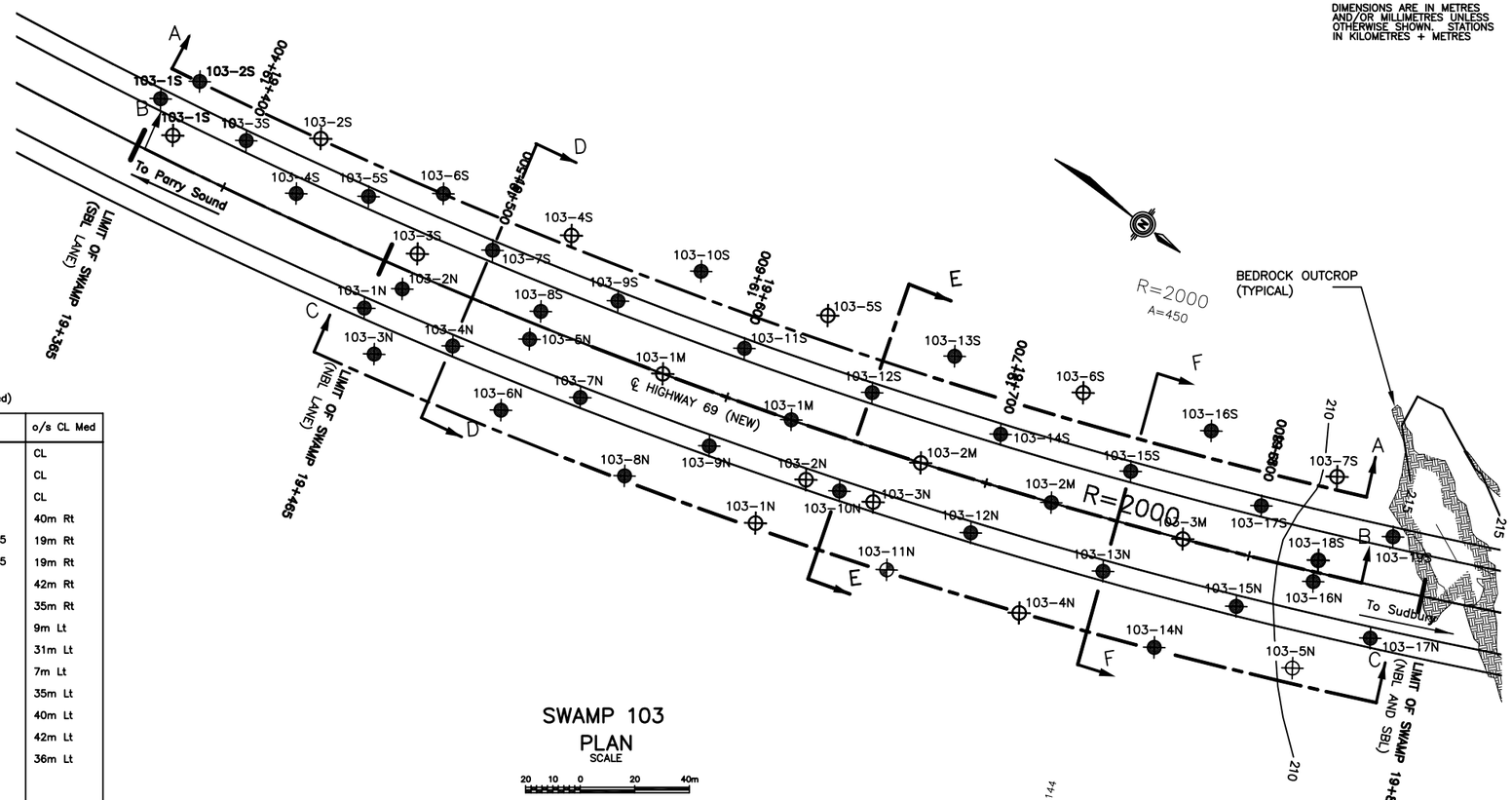
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

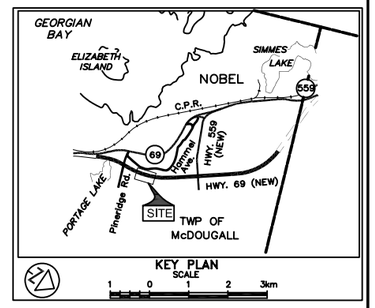
SHEET

HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
SWAMP 103, STA 19+365 TO 19+865)
BOREHOLE LOCATIONS & SOIL STRATA

Peto MacCallum Ltd.
CONSULTING ENGINEERS



SWAMP 103
PLAN
SCALE
20 10 0 20 40m



KEY PLAN
SCALE
1 0 1 2 3km

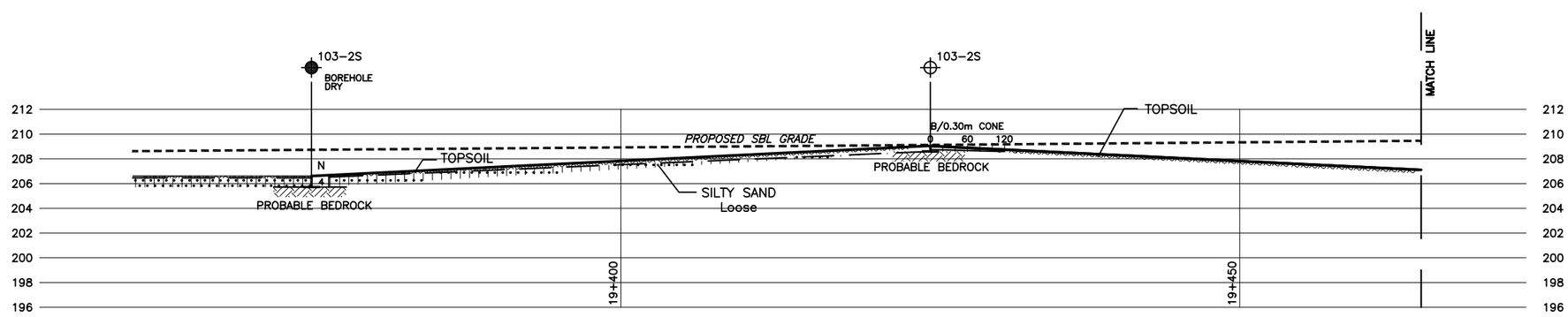
(Legend Continued)

BH No	ELEVATION	STA	o/s CL Med
103-1S	206.60	19+365	19m Lt
103-2S	206.65	19+375	31m Lt
103-3S	208.00	19+400	19m Lt
103-4S	209.60	19+425	9m Lt
103-5S	207.35	19+450	19m Lt
103-6S	206.65	19+475	33m Lt
103-7S	206.60	19+500	19m Lt
103-8S	206.65	19+525	5m Lt
103-9S	205.45	19+550	19m Lt
103-10S	205.40	19+575	40m Lt
103-11S	205.75	19+600	19m Lt
103-12S	205.90	19+650	19m Lt
103-13S	206.10	19+675	41m Lt
103-14S	205.70	19+700	19m Lt
103-15S	207.05	19+750	19m Lt
103-16S	208.35	19+775	41m Lt
103-17S	209.35	19+800	19m Lt
103-18S	210.70	19+825	4m Lt
103-19S	211.85	19+850	19m Lt

(Legend Continues)

(Legend Continued)

PT No	ELEVATION	STA	o/s CL Med
103-1M	205.30	19+575	CL
103-2M	205.80	19+675	CL
103-3M	208.20	19+775	CL
103-1N	205.35	19+625	40m Rt
103-2N	205.55	19+637.5	19m Rt
103-3N	205.70	19+662.5	19m Rt
103-4N	205.85	19+725	42m Rt
103-5N	210.95	19+825	35m Rt
103-1S	206.75	19+375	9m Lt
103-2S	209.05	19+425	31m Lt
103-3S	206.70	19+475	7m Lt
103-4S	205.40	19+525	35m Lt
103-5S	205.90	19+625	40m Lt
103-6S	206.35	19+725	42m Lt
103-7S	211.65	19+825	36m Lt



A-A

SECTION
SCALE
4 2 0 4 8m

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med
103-1M	205.60	19+625	CL
103-2M	206.10	19+725	CL
103-1N	207.50	19+465	19m Rt
103-2N	206.65	19+475	7m Rt
103-3N	208.60	19+475	33m Rt
103-4N	206.45	19+500	19m Rt
103-5N	207.00	19+525	6m Rt
103-6N	206.80	19+525	34m Rt
103-7N	205.90	19+550	19m Rt
103-8N	205.35	19+575	40m Rt
103-9N	205.40	19+600	19m Rt
103-10N	205.65	19+650	19m Rt
103-11N	205.45	19+675	41m Rt
103-12N	205.50	19+700	19m Rt
103-13N	207.20	19+750	19m Rt
103-14N	208.25	19+775	40m Rt
103-15N	209.50	19+800	19m Rt
103-16N	210.95	19+825	5m Rt
103-17N	211.95	19+850	19m Rt

(Legend Continues)

— NOTE —
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTE:

1. REFER TO DRAWING S-103-2 FOR SECTION A-A CONTINUED; DRAWING S-103-3 FOR SECTION B-B; DRAWING S-103-4 FOR SECTION B-B CONTINUED AND SECTION C-C; DRAWING S-103-5 FOR SECTIONS C-C CONTINUED AND D-D; DRAWING S-103-6 FOR SECTIONS E-E AND F-F.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY Nov. 11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C. M. P. Nowinski Nov. 11/2002 PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69					DIST	52
SUBM'D	DH	CHECKED	CN	DATE NOV 11, 2002		SITE	
DRAWN	TK	CHECKED	CN	APPROVED	DWK	DWG	S-103-1

METRIC

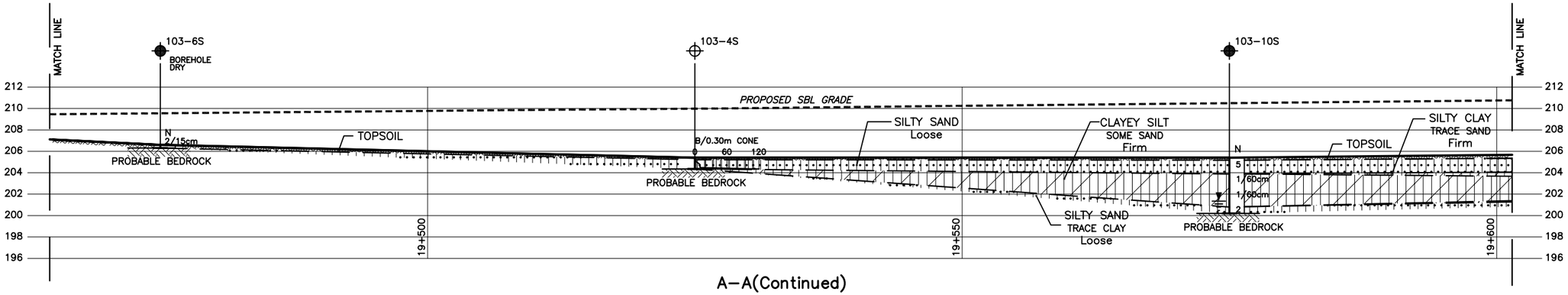
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

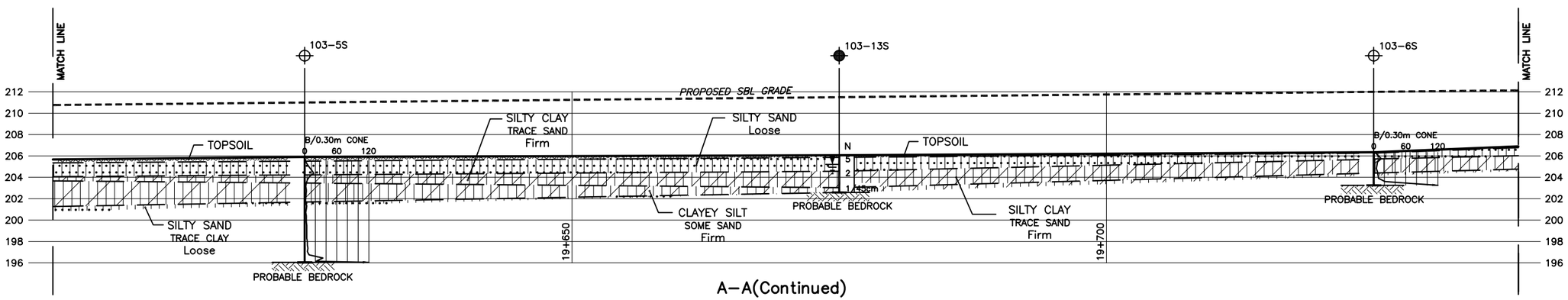
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km SWAMP 103, STA 19+365 TO 19+865)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

Pob MacCallum Ltd.
CONSULTING ENGINEERS



A-A(Continued)



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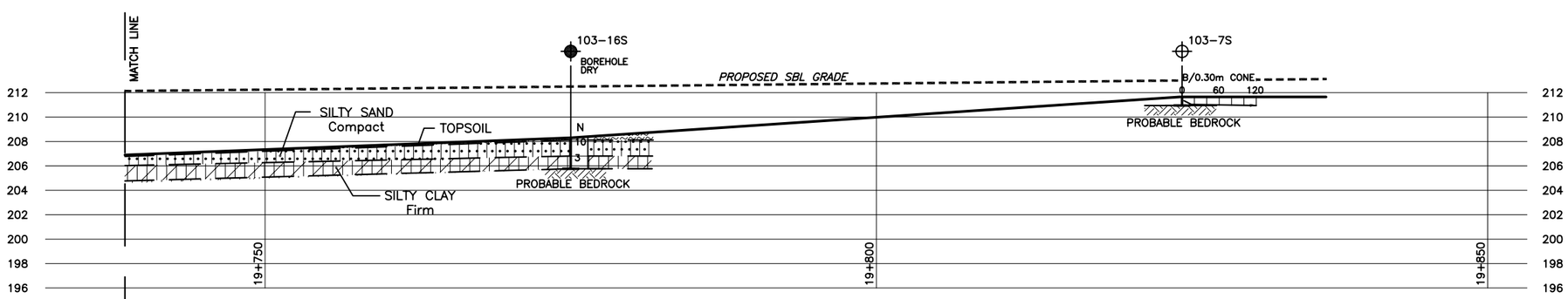

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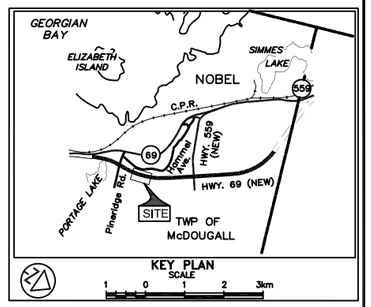


LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med

(Refer to drawing S-103-1 for co-ordinates)

(Legend Continues)

NOTES:

1. REFER TO DRAWING S-103-1 FOR PLAN AND PART OF SECTION A-A; DRAWING S-103-3 FOR PART OF SECTION B-B; DRAWING S-103-4 FOR SECTION B-B CONTINUED AND SECTION C-C; DRAWING S-103-5 FOR SECTION C-C CONTINUED AND SECTION D-D AND DRAWING S-103-6 FOR SECTIONS E-E AND F-F.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTION
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV 11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C. M. P. Nascimento Nov 11/02 PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

- NOTE -
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69					DIST	52
SUBM'D	DH	CHECKED	CN	DATE NOV 11, 2002		SITE	
DRAWN	TK	CHECKED	CN	APPROVED	DWK	DWG	S-103-2

METRIC

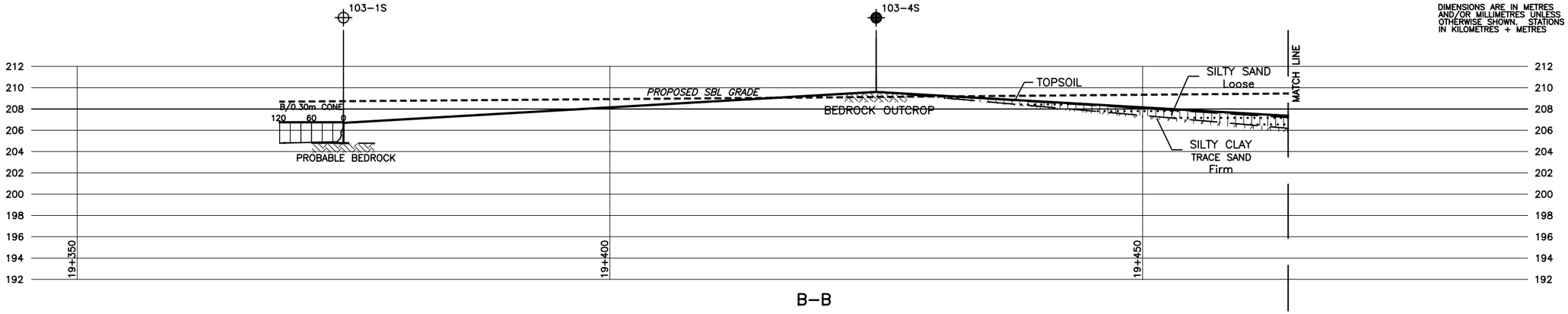
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

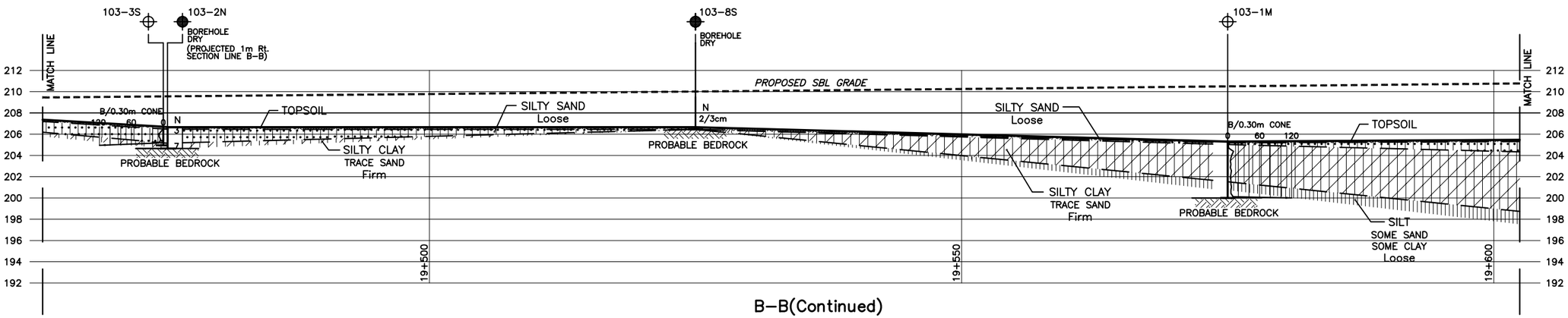
SHEET

HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km SWAMP 103, STA 19+365 TO 19+865)
BOREHOLE LOCATIONS & SOIL STRATA

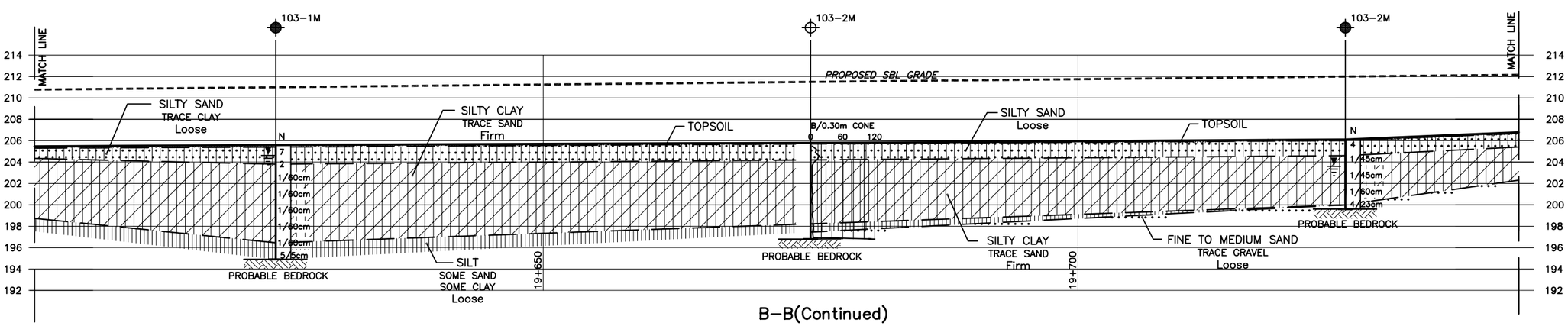
Poto MacCallum Ltd.
CONSULTING ENGINEERS



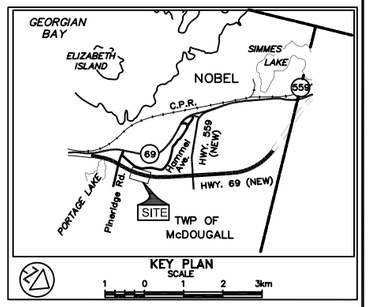
B–B



B–B(Continued)



B–B(Continued)



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med

(Refer to drawing S–103–1 for co–ordinates)

(Legend Continues)

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

1. REFER TO DRAWING S–103–1 FOR PLAN AND PART OF SECTION A–A; DRAWING S–103–2 FOR SECTION A–A CONTINUED; DRAWING S–103–4 FOR SECTION B–B CONTINUED AND PART OF SECTION C–C; DRAWING S–103–5 FOR PART OF SECTION C–C AND SECTION D–D AND DRAWING S–103–6 FOR SECTIONS E–E AND F–F.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN–SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTION
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV 11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C. M. P. Nascimento Nov 11/2002 PROVINCE OF ONTARIO

REF No E–01–020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1–02–07–15.dwg; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H–42

HWY No	69					DIST	52
SUBM'D	DH	CHECKED	CN	DATE NOV 11, 2002		SITE	
DRAWN	TK	CHECKED	CN	APPROVED	DWK	DWG	S–103–3

METRIC

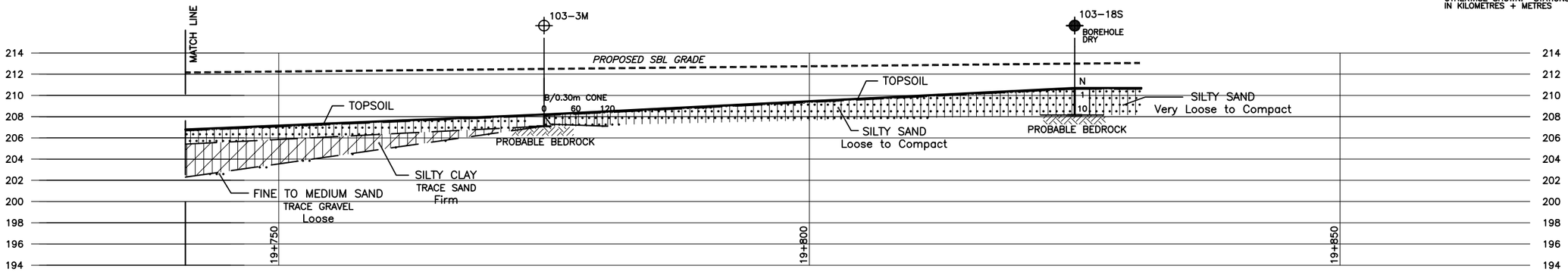
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

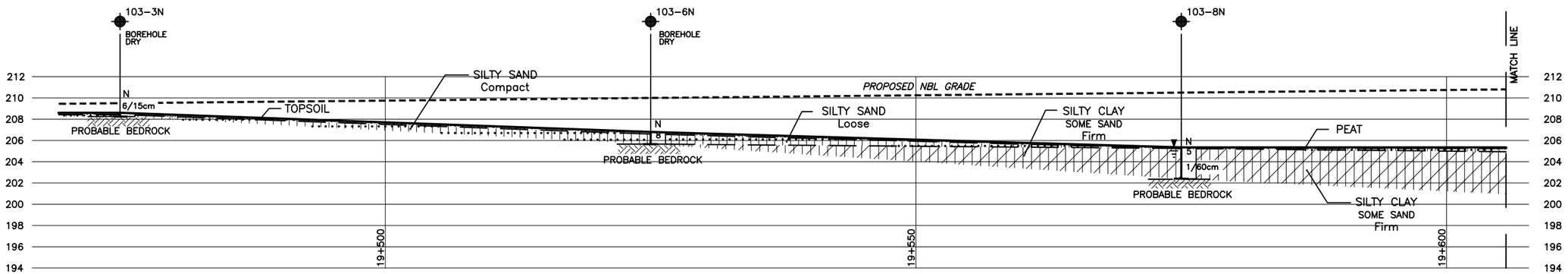
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km SWAMP 103, STA 19+365 TO 19+865)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

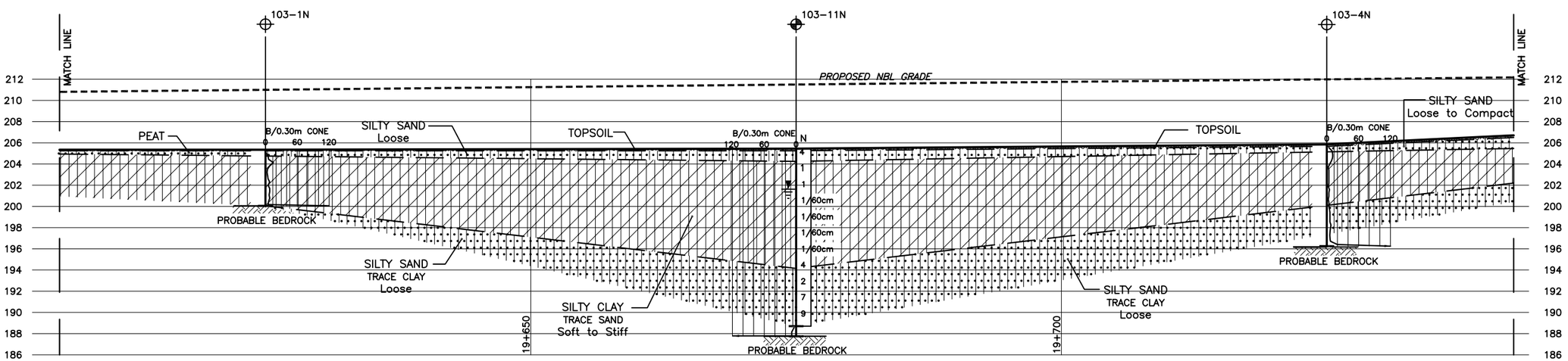
Poto MacCallum Ltd.
CONSULTING ENGINEERS



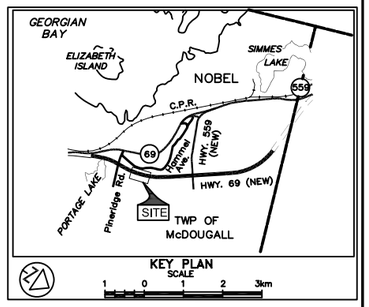
B–B(Continued)



C–C



C–C(Continued)



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER
- Encountered

BH No	ELEVATION	STA	o/s CL Med
(Refer to drawing S-103-1 for co-ordinates)			

(Legend Continues)

NOTES:

1. REFER TO DRAWING S-103-1 FOR PLAN AND PART OF SECTION A-A; DRAWING S-103-2 FOR SECTION A-A CONTINUED; DRAWING S-103-3 FOR PART OF SECTION B-B; DRAWING S-103-5 FOR SECTION C-C CONTINUED AND SECTION D-D AND DRAWING S-103-6 FOR SECTIONS E-E AND F-F.
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SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV 11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C. M. P. Nascimento Nov. 11/2002 PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69					DIST	52
SUBM'D	DH	CHECKED	CN	DATE NOV 11, 2002		SITE	
DRAWN	TK	CHECKED	CN	APPROVED	DWK	DWG	S-103-4

METRIC

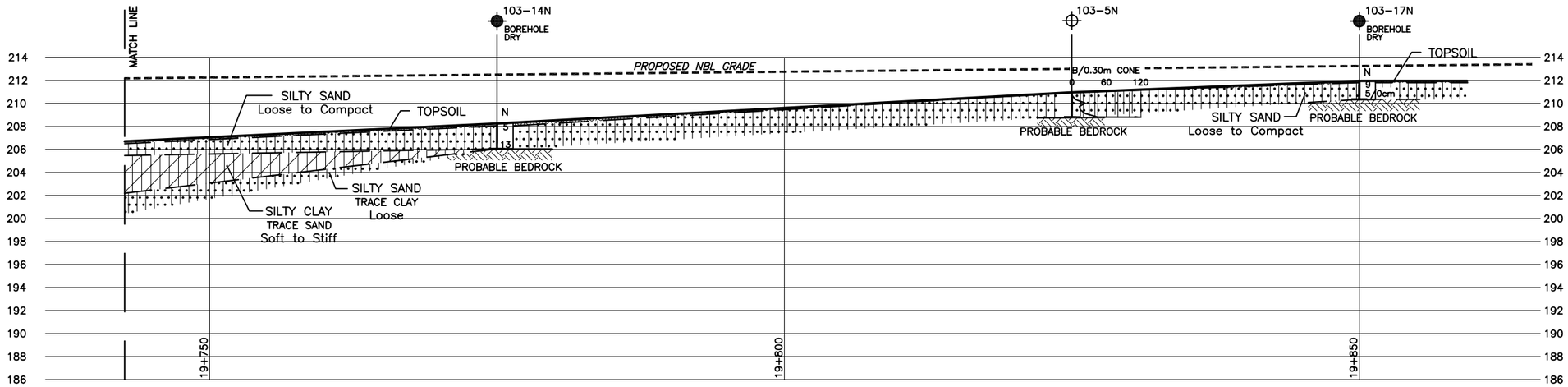
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

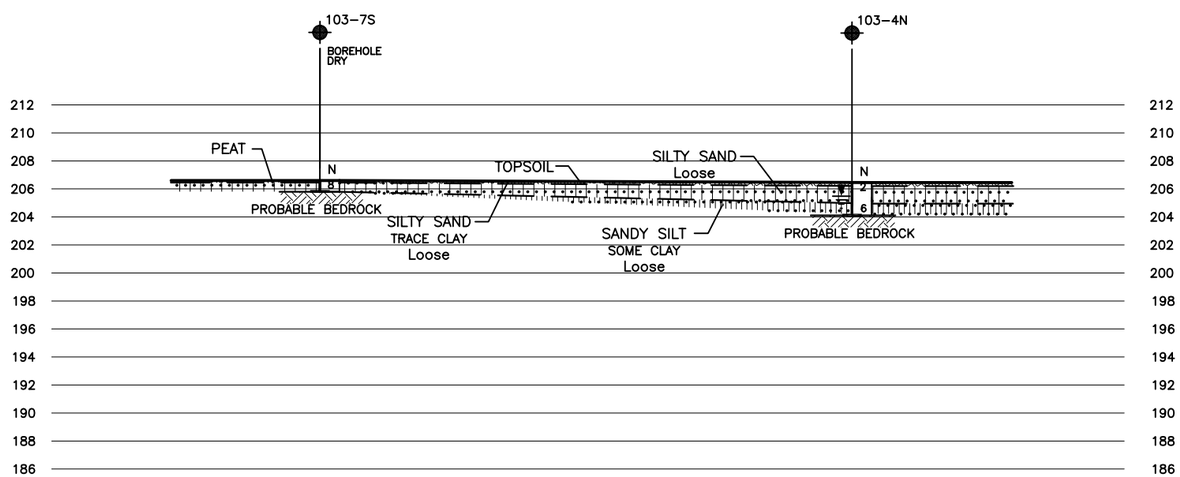
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
SWAMP 103, STA 19+365 TO 19+865)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

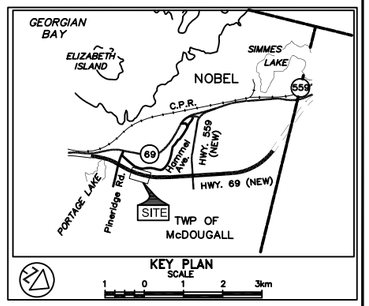
Poto MacCallum Ltd.
CONSULTING ENGINEERS



C–C(Continued)



D–D



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- N — Blows/0.3m (Std. Pen Test, 475 J / blow)
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- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med
(Refer to drawing S-103-1 for co-ordinates)			

(Legend Continues)

NOTES:

1. REFER TO DRAWING S-103-1 FOR PLAN AND PART OF SECTION A-A; DRAWING S-103-2 FOR SECTION A-A CONTINUED; DRAWING S-103-3 FOR PART OF SECTION B-B; DRAWING S-103-4 FOR SECTION B-B CONTINUED AND PART OF SECTION C-C AND DRAWING S-103-6 FOR SECTIONS E-E AND F-F.
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SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY PROVINCE OF ONTARIO Nov.11/02

REGISTERED PROFESSIONAL ENGINEER C. M. P. Nowinowski Nov.11/02 PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

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REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69					DIST	52
SUBM'D	DH	CHECKED	CN	DATE NOV 11, 2002		SITE	
DRAWN	TK	CHECKED	CN	APPROVED	DWK	DWG	S-103-5

METRIC

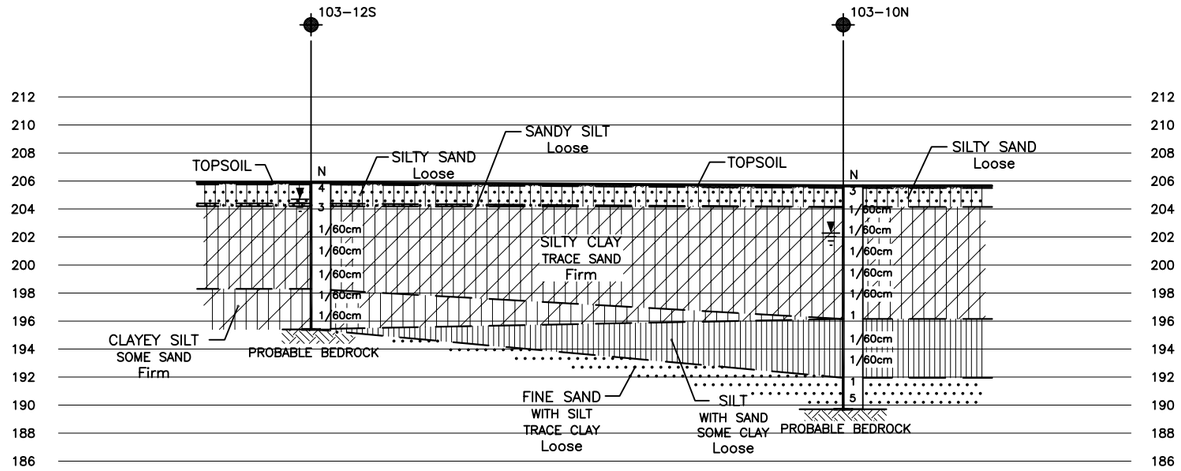
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

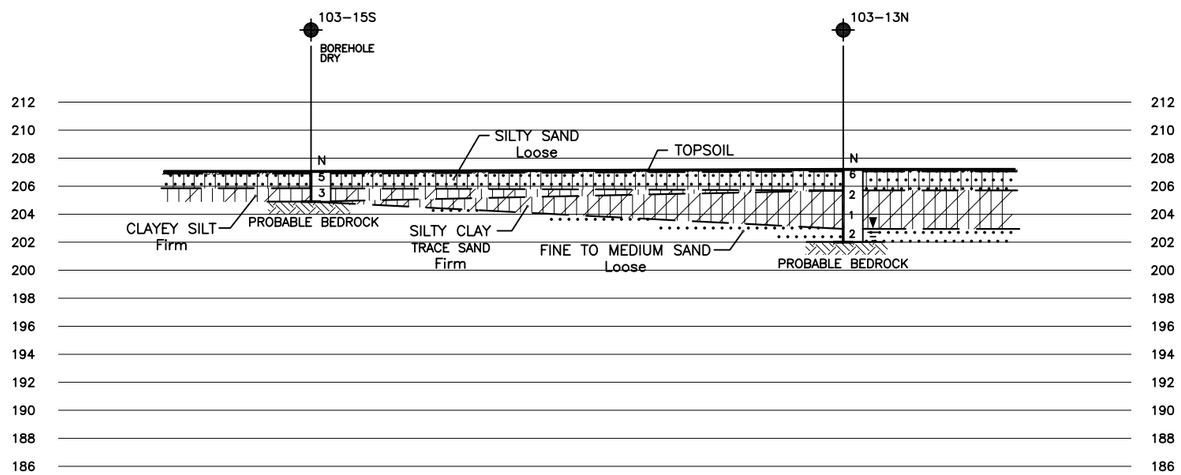
SHEET

HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
SWAMP 103, STA 19+365 TO 19+865)
BOREHOLE LOCATIONS & SOIL STRATA

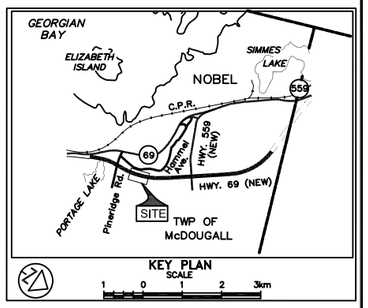
Peto MacCallum Ltd.
CONSULTING ENGINEERS



E-E



F-F



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- N — Blows/0.3m (Std. Pen Test, 475 J / blow)
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- W L at time of investigation Aug 2001
- Head
- ARTESIAN WATER
- Encountered

BH No	ELEVATION	STA	o/s CL Med
(Refer to drawing S-103-1 for co-ordinates)			

(Legend Continues)

NOTES:

1. REFER TO DRAWING S-103-1 FOR PLAN AND PART OF SECTION A-A; DRAWING S-103-2 FOR SECTION A-A CONTINUED; DRAWING S-103-3 FOR PART OF SECTION B-B; DRAWING S-103-4 FOR SECTION B-B CONTINUED AND PART OF SECTION C-C; DRAWING S-103-5 FOR SECTION C-C CONTINUED AND SECTION D-D.
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SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER
B. R. GRAY
NOV 11/02
PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER
C. M. P. Nascimento
NOV 11/2002
PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

– NOTE –
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REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69					DIST	52
SUBM'D	DH	CHECKED	CN	DATE NOV 11, 2002		SITE	
DRAWN	TK	CHECKED	CN	APPROVED	DWK	DWG	S-103-6

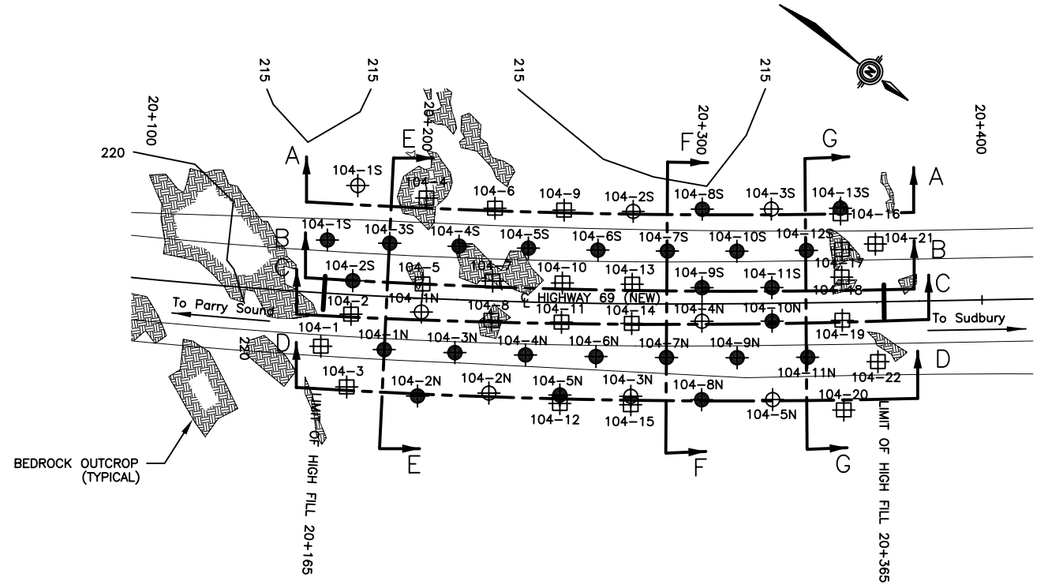
(Legend Continued)

BH No	ELEVATION	STA	o/s CL Med
104–10S	213.90	20+312.5	19m Lt
104–11S	214.00	20+325	5m Lt
104–12S	214.10	20+337.5	19m Lt
104–13S	216.05	20+350	34m Lt
PT No	**ELEVATION**	**STA**	**o/s CL Med**
104–1N	215.35	20+200	5m Rt
104–2N	216.00	20+225	33m Rt
104–3N	215.65	20+275	33m Rt
104–4N	214.15	20+300	6m Rt
104–5N	214.50	20+325	34m Rt
104–1S	214.35	20+175	39m Lt
104–2S	213.95	20+275	38m Lt
104–3S	214.80	20+325	39m Lt
AP No	**ELEVATION**	**STA**	**o/s CL Med**
104–1	218.30	20+165	18.8m Rt
104–2	215.85	20+175	7m Rt
104–3	217.05	20+175	33m Rt
104–4	218.85	20+200	38m Lt
104–5	217.35	20+200	6m Lt

(Legend Continues)

(Legend Continued)

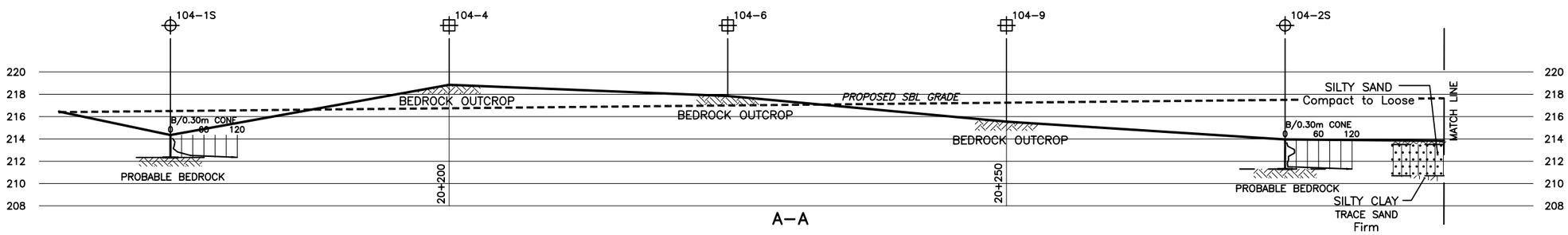
AP No	ELEVATION	STA	o/s CL Med
104–6	217.85	20+225	34m Lt
104–7	218.90	20+225	9m Lt
104–8	218.20	20+225	7m Rt
104–9	215.60	20+250	34m Lt
104–10	217.10	20+250	9m Lt
104–11	216.30	20+250	6m Rt
104–12	216.80	20+250	34m Rt
104–13	215.15	20+275	6m Lt
104–14	215.20	20+275	6m Rt
104–15	215.75	20+275	38m Rt
104–16	217.25	20+350	32m Lt
104–17	217.15	20+350	18.8m Lt
104–18	215.90	20+350	9m Lt
104–19	215.60	20+350	6m Rt
104–20	216.00	20+350	38m Rt
104–21	217.15	20+363	18.8m Lt
104–22	217.45	20+363	18.8m Rt



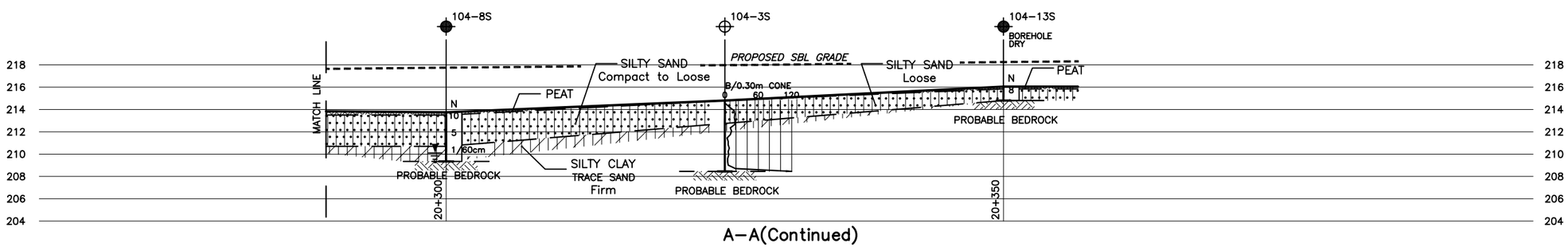
HIGH FILL 104

PLAN

SCALE 20 10 0 20 40m



A–A



A–A(Continued)

NOTES:

1. REFER TO DRAWING S–104–2 FOR SECTIONS B–B AND C–C AND DRAWING S–104–3 FOR SECTIONS D–D, E–E, F–F AND G–G.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN–SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTION
SCALE 4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY Nov.11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Nov.11/02 PROVINCE OF ONTARIO

REF No E–01–020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001

B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1–02–07–15.dwg; H4545xb2.dwg; July, 2002

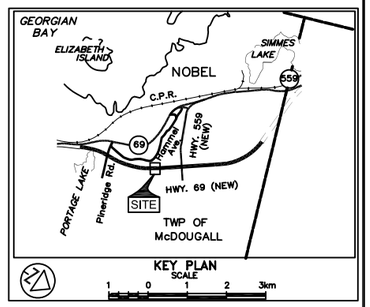
METRIC
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293–97–00

SHEET

HIGHWAY 69 FOUR–LANING
(2.5 km North of Hwy 124, Northerly 4.8 km
HIGH FILL 104, STA 20+165 TO 20+365)
BOREHOLE LOCATIONS & SOIL STRATA

Pato MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER
- Encountered

BH No	ELEVATION	STA	o/s CL Med
104–1N	216.05	20+187.5	19m Rt
104–2N	215.75	20+200	35m Rt
104–3N	216.25	20+212.5	19m Rt
104–4N	216.65	20+237.5	19m Rt
104–5N	216.20	20+250	33m Rt
104–6N	216.00	20+262.5	19m Rt
104–7N	214.50	20+287.5	19m Rt
104–8N	214.85	20+300	34m Rt
104–9N	214.00	20+312.5	19m Rt
104–10N	214.10	20+325	6m Rt
104–11N	214.70	20+337.5	19m Rt
104–1S	215.25	20+165	19m Lt
104–2S	215.20	20+175	5m Lt
104–3S	214.60	20+187.5	19m Lt
104–4S	218.40	20+212.5	19m Lt
104–5S	217.90	20+237.5	19m Lt
104–6S	215.85	20+262.5	19m Lt
104–7S	213.85	20+287.5	19m Lt
104–8S	213.75	20+300	40m Lt
104–9S	214.10	20+300	4m Lt

(Legend Continues)

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H–42

HWY No 69				DIST 52	
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN MM/NA	CHECKED CN	APPROVED DWK		DWG S–104–1	

METRIC

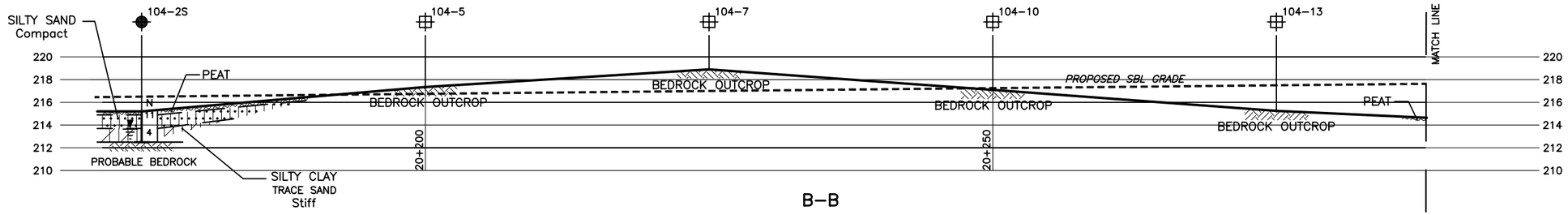
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

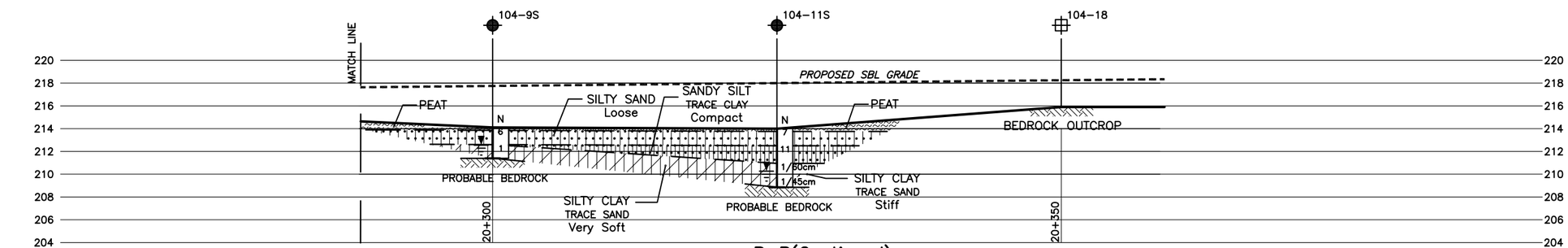
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km HIGH FILL 104, STA 20+165 TO 20+365)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

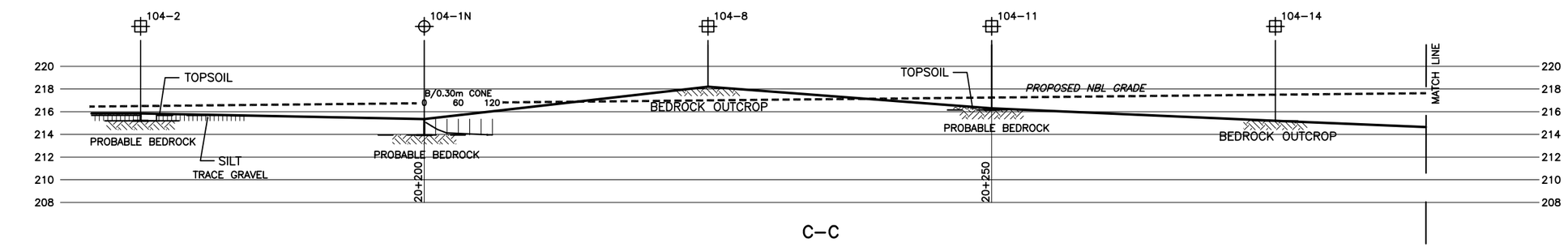
Peto MacCallum Ltd.
CONSULTING ENGINEERS



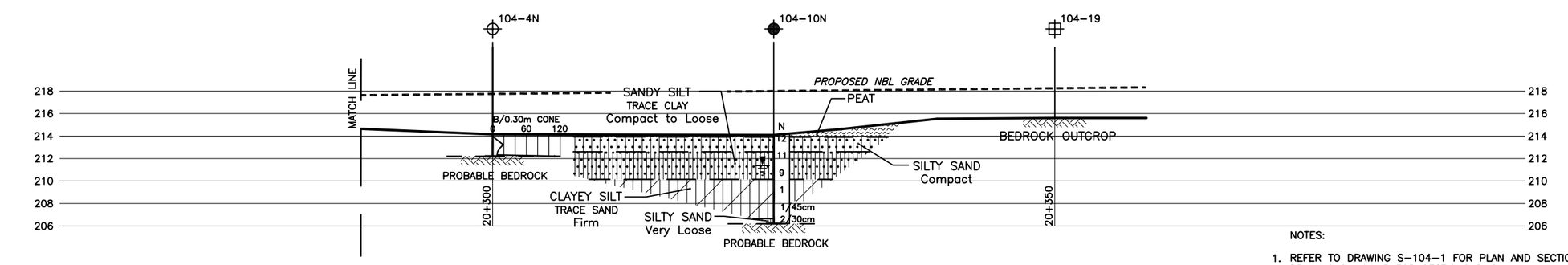
B–B



B–B(Continued)

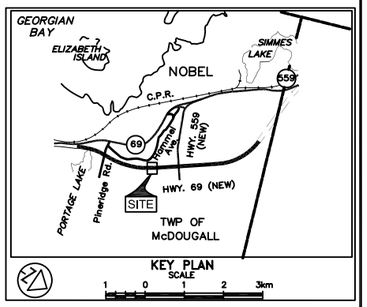


C–C



C–C(Continued)

SECTIONS
SCALE
4 2 0 4 8m



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER
- Encountered

BH No	ELEVATION	STA	o/s CL Med
(Refer to drawing S-104-1 for co-ordinates)			

NOTES:

1. REFER TO DRAWING S-104-1 FOR PLAN AND SECTION A-A; DRAWING S-104-3 FOR SECTIONS D-D, E-E, F-F AND G-G.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV.11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C. M. P. Nascimento NOV.11/02 PROVINCE OF ONTARIO

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No 69				DIST 52	
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN MM/NA	CHECKED CN	APPROVED DWK		DWG S-104-2	

METRIC

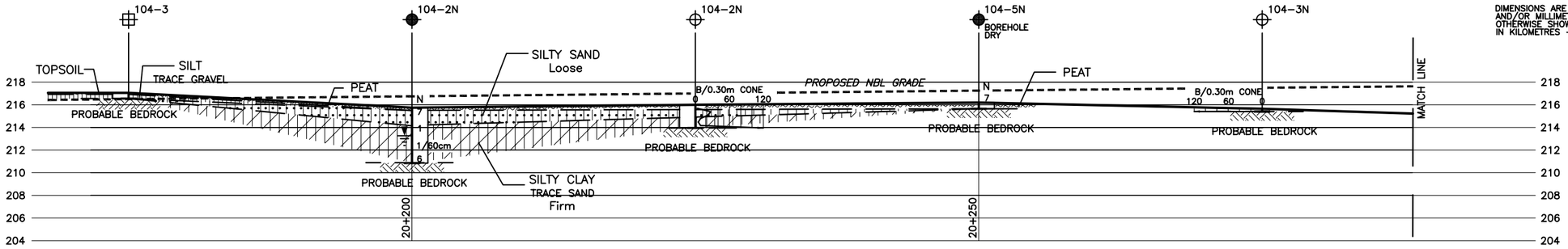
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

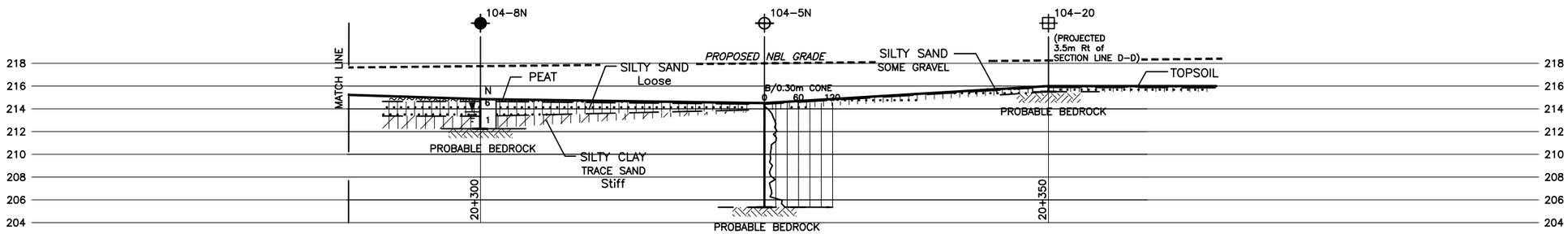
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km HIGH FILL 104, STA 20+165 TO 20+365)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

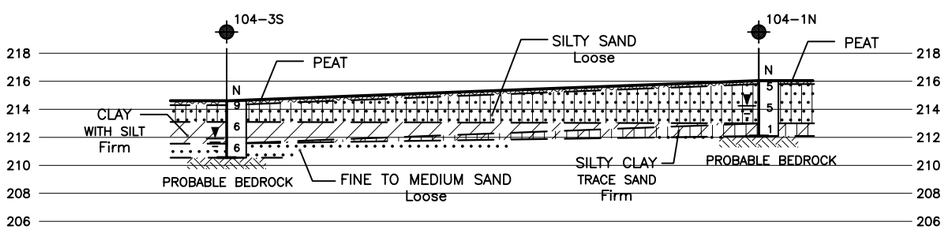
Poto MacCallum Ltd.
CONSULTING ENGINEERS



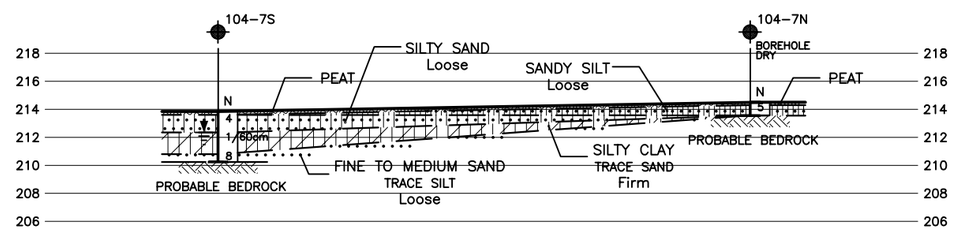
D–D



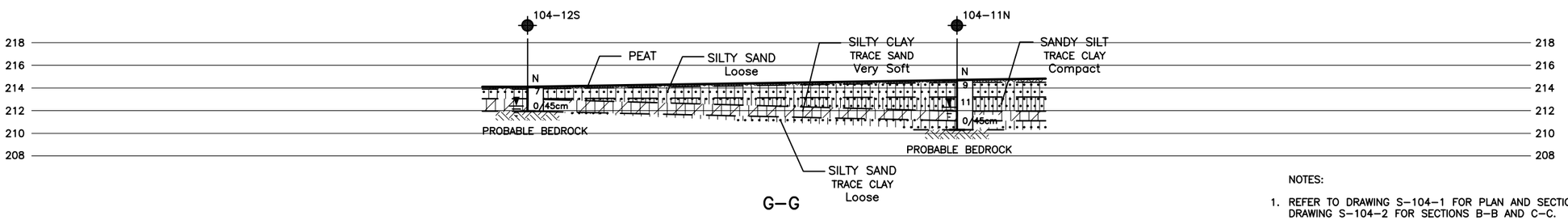
D–D(Continued)



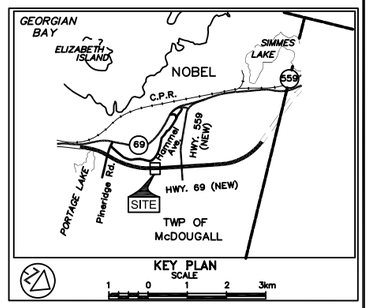
E–E



F–F



G–G



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med
(Refer to drawing S–104–1 for co–ordinates)			

SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV.11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Nov.11/2002 PROVINCE OF ONTARIO

NOTES:

1. REFER TO DRAWING S–104–1 FOR PLAN AND SECTION A–A; DRAWING S–104–2 FOR SECTIONS B–B AND C–C.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN–SITU TEST DATA AND LABORATORY TEST RESULTS.

REF No E–01–020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001

B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1–02–07–15.dwg; H4545xb2.dwg; July, 2002

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H–42

HWY No 69				DIST 52	
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN MM/NA	CHECKED CN	APPROVED DWK		DWG S–104–3	

METRIC

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

CONT No
GWP No 293-97-00

HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
SWAMP 105, STA 21+065 TO 21+235)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

Poto MacCallum Ltd.
CONSULTING ENGINEERS

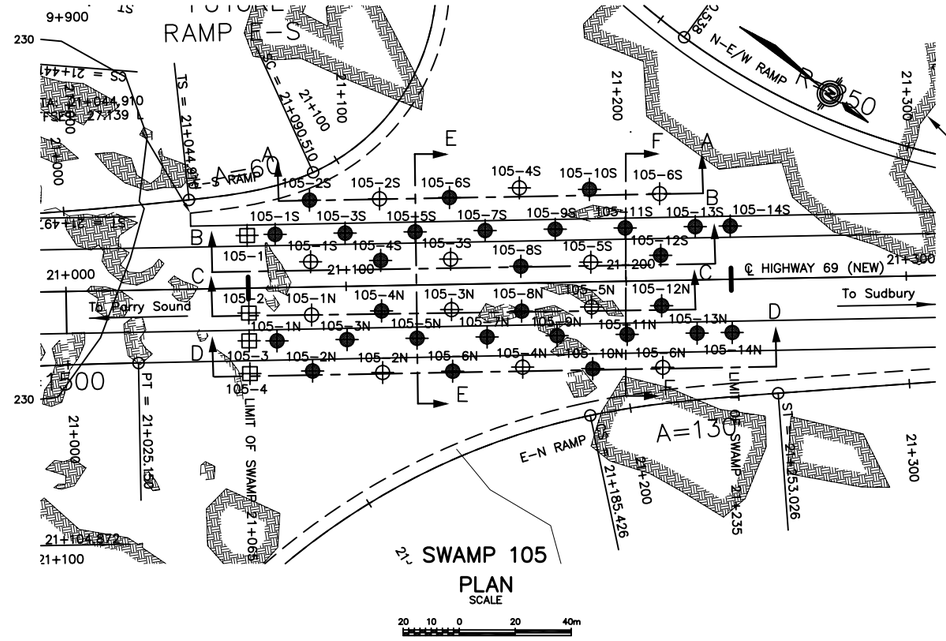
(Legend Continued)

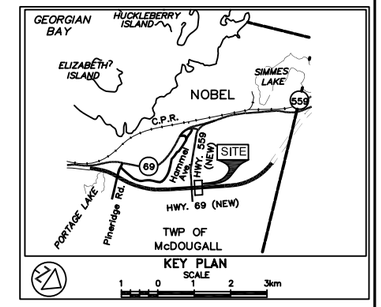
BH No	ELEVATION	STA	o/s CL Med
105-7S	223.40	21+150	19m Lt
105-8S	224.15	21+162.5	6m Lt
105-9S	224.55	21+175	19m Lt
105-10S	223.95	21+187.5	33m Lt
105-11S	224.40	21+200	19m Lt
105-12S	224.55	21+212.5	9m Lt
105-13S	224.95	21+225	19m Lt
105-14S	224.65	21+235	19m Lt
PT No	**ELEVATION**	**STA**	**o/s CL Med**
105-1N	223.40	21+087.5	10m Rt
105-2N	224.25	21+112.5	31m Rt
105-3N	223.65	21+137.5	9m Rt
105-4N	226.05	21+162.5	30m Rt
105-5N	226.50	21+187.5	9m Rt
105-6N	229.20	21+212.5	31m Rt
105-1S	223.35	21+087.5	9m Lt
105-2S	223.40	21+112.5	31m Lt
105-3S	223.55	21+137.5	9m Lt
105-4S	224.65	21+162.5	34m Lt
105-5S	225.40	21+187.5	7m Lt
105-6S	224.80	21+212.5	31m Lt

(Legend Continues)

(Legend Continued)

AP No	ELEVATION	STA	o/s CL Med
105-1	223.95	21+065	18.8m Lt
105-2	226.30	21+065	9m Rt
105-3	225.40	21+065	18.8m Rt
105-4	227.15	21+065	30.5m Rt



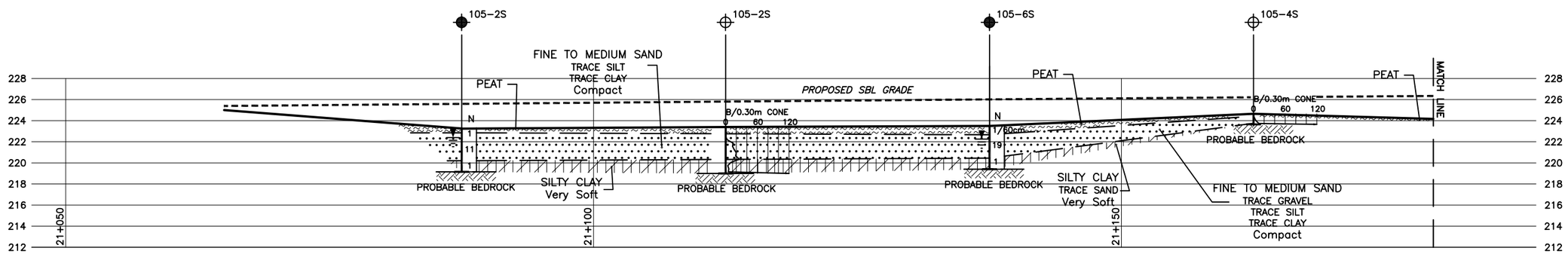


LEGEND

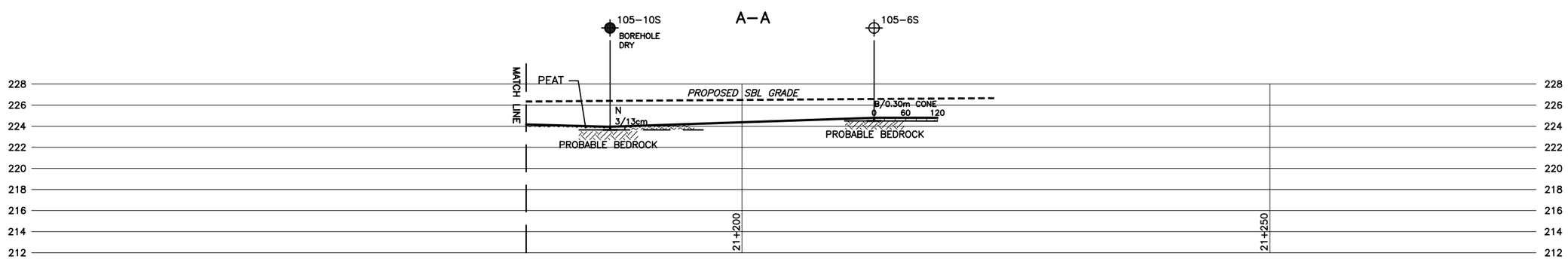
- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- N — Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE — Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation July 2001
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med
105-1N	224.45	21+075	19m Rt
105-2N	223.80	21+087.5	30m Rt
105-3N	223.75	21+100	19m Rt
105-4N	223.20	21+112.5	9m Rt
105-5N	223.40	21+125	19m Rt
105-6N	224.45	21+137.5	31m Rt
105-7N	224.85	21+150	19m Rt
105-8N	226.15	21+162.5	10m Rt
105-9N	226.95	21+175	19m Rt
105-10N	227.95	21+187.5	31m Rt
105-11N	226.55	21+200	19m Rt
105-12N	225.95	21+212.5	9m Rt
105-13N	226.70	21+225	19m Rt
105-14N	226.30	21+235	19m Rt
105-1S	223.50	21+075	19m Lt
105-2S	223.25	21+087.5	31m Lt
105-3S	224.40	21+100	19m Lt
105-4S	223.40	21+112.5	9m Lt
105-5S	223.20	21+125	19m Lt
105-6S	223.50	21+137.5	31m Lt

(Legend Continues)



A–A



A–A(Continued)

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

1. REFER TO DRAWING S-105-2 FOR SECTION B-B AND SECTION C-C; DRAWING S-105-3 FOR SECTION D-D AND DRAWING S-105-4 FOR SECTIONS E-E AND F-F.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTION
SCALE

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV.11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Nov.11/2002 PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No 69				DIST	52
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN NA/TK	CHECKED CN	APPROVED	DWK	DWG	S-105-1

METRIC

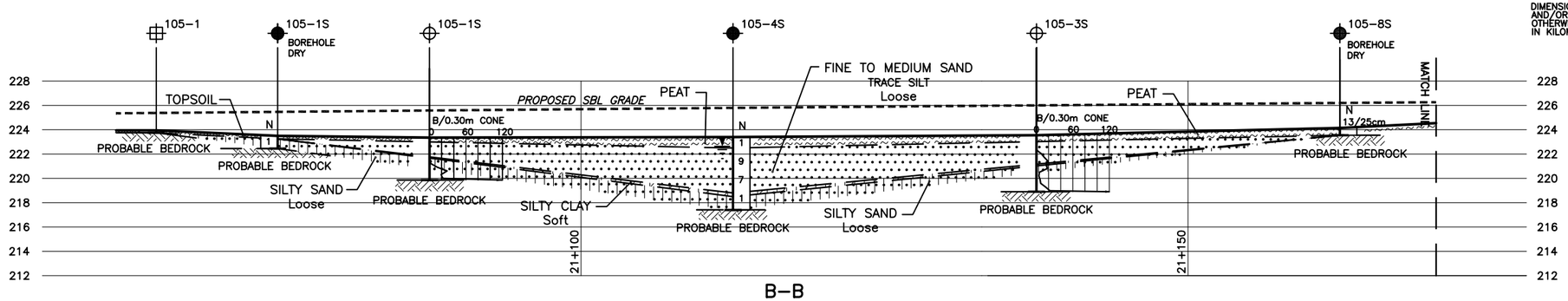
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

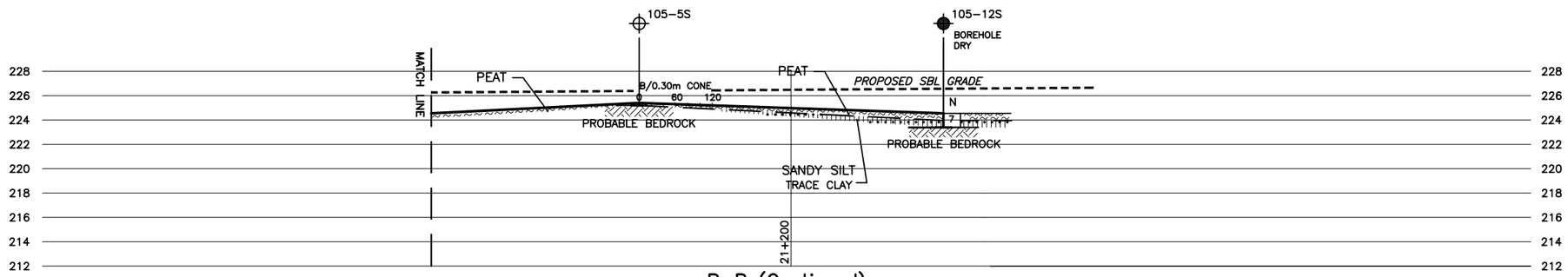
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km SWAMP 105, STA 21+065 TO 21+235)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

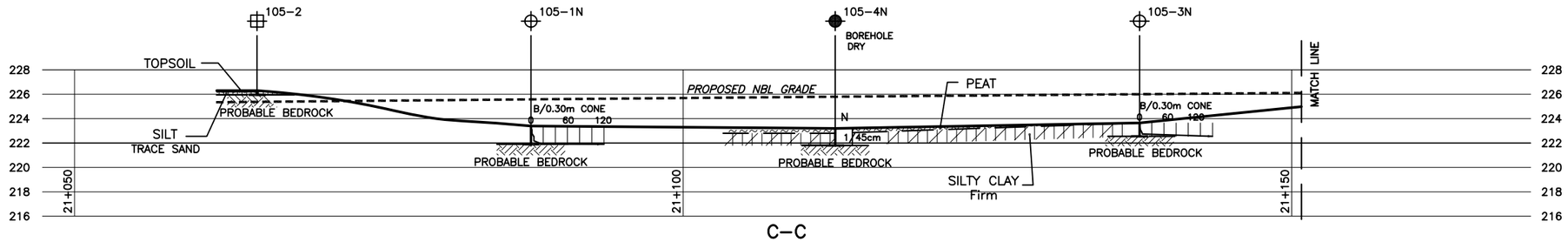
Peto MacCallum Ltd.
CONSULTING ENGINEERS



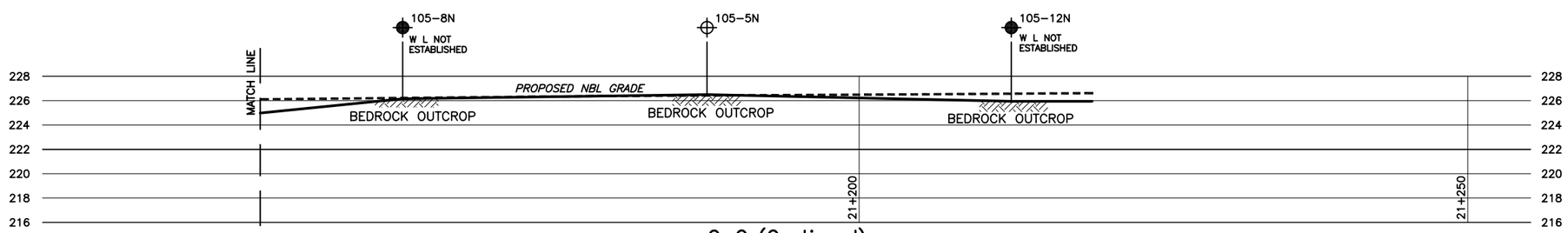
B–B



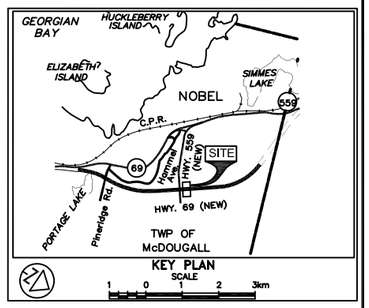
B–B (Continued)



C–C



C–C (Continued)



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 July 2001
- Head ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med

(Refer to Drawing S-105-1 for co-ordinates)

(Legend Continues)

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

1. REFER TO DRAWING S-105-1 FOR PLAN AND SECTION A-A; DRAWING S-105-3 FOR SECTION D-D; DRAWING S-105-4 FOR SECTIONS E-E AND F-F.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV. 11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Nov. 11/02 PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15; H4545xb2.dwg; July, 2002

REVISIONS

DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No 69				DIST	52
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN TK	CHECKED CN	APPROVED DWK		DWG	S-105-2

METRIC

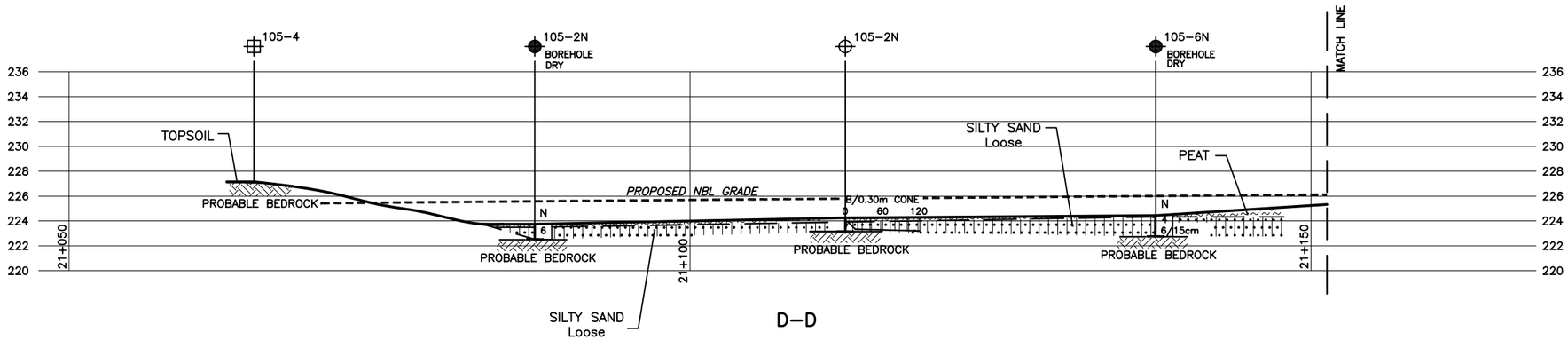
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

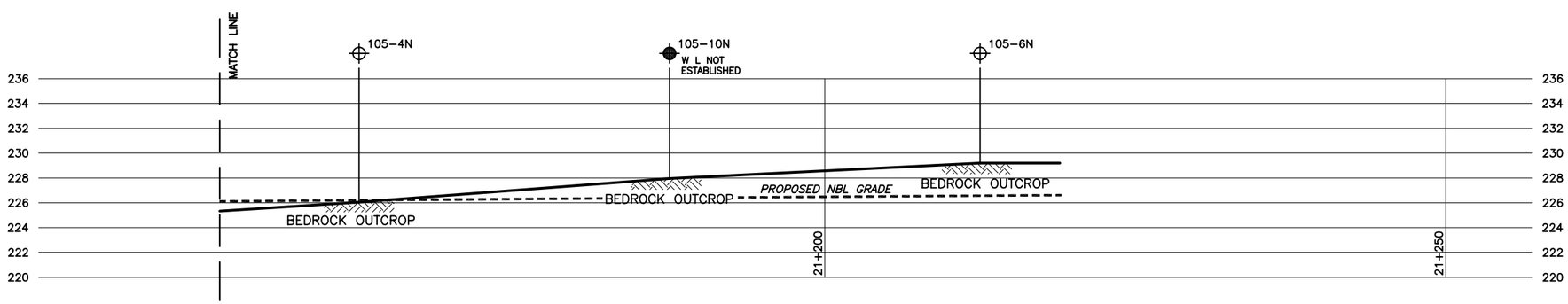
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
SWAMP 105, STA 21+065 TO 21+235)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

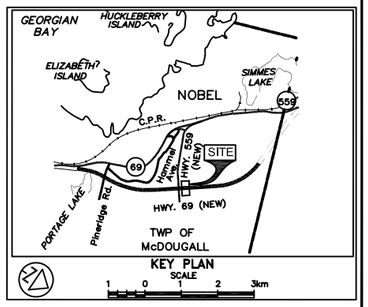
Peto MacCallum Ltd.
CONSULTING ENGINEERS



D-D



D-D (Continued)



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 July 2001
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med

(Refer to Drawing S-105-1 for co-ordinates)

(Legend Continues)

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

1. REFER TO DRAWING S-105-1 FOR PLAN AND SECTION A-A; DRAWING S-105-2 FOR SECTIONS B-B AND C-C; DRAWING S-105-4 FOR SECTIONS E-E AND F-F.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTION
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV.11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Nov.11/2002 PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No 69				DIST 52	
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN TK	CHECKED CN	APPROVED DWK		DWG S-105-3	

METRIC

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

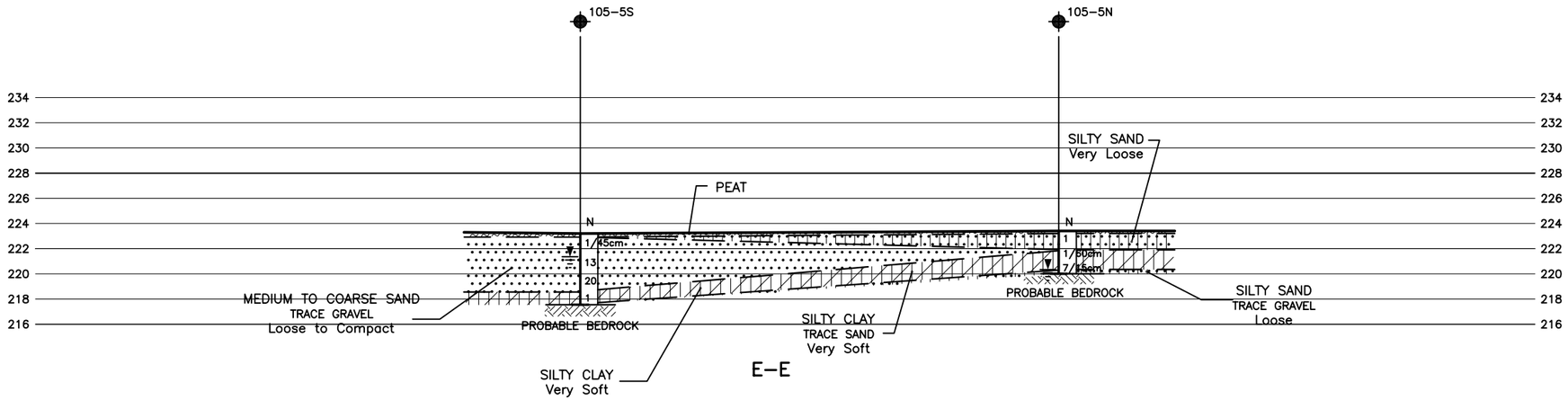
CONT No

GWP No 293-97-00

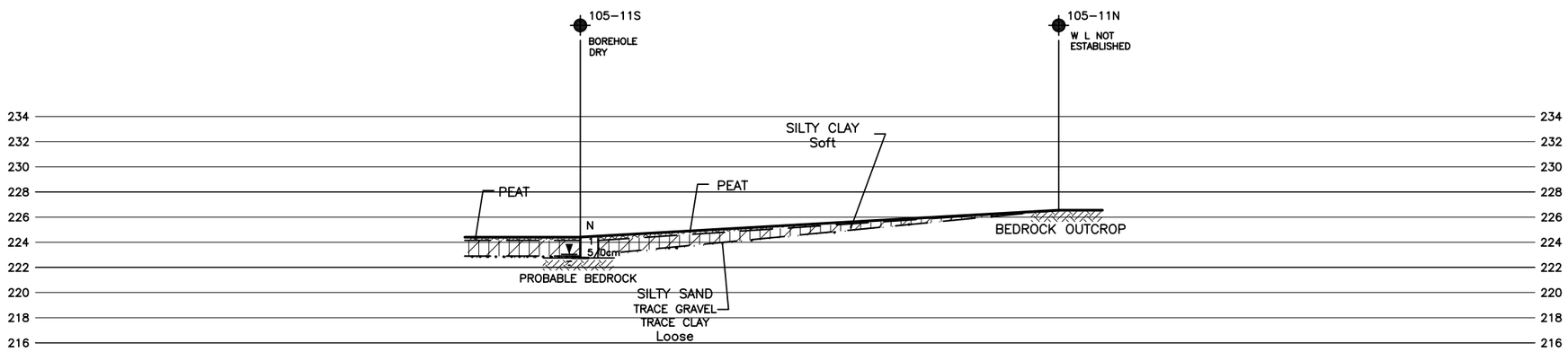
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
SWAMP 105, STA 21+065 TO 21+235)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

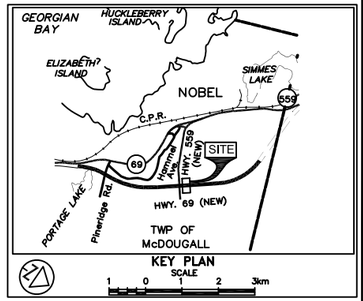
Peto MacCallum Ltd.
CONSULTING ENGINEERS



E-E



F-F



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 July 2001
- Head ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med

(Refer to Drawing S-105-1 for co-ordinates)

(Legend Continues)

– NOTE –

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

1. REFER TO DRAWING S-105-1 FOR PLAN AND SECTION A-A; DRAWING S-105-2 FOR SECTIONS B-B AND C-C; DRAWING S-105-3 FOR SECTION D-D.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No 69				DIST	52
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN TK	CHECKED CN	APPROVED DWK		DWG	S-105-4

(Legend Continued)

AP No	ELEVATION	STA	o/s CL Med
106–1	220.55	22+025	33m Lt
106–2	221.95	22+025	7m Lt
106–3	222.10	22+025	18.8m Rt
106–4	222.90	22+038	18.8m Lt
106–5	222.85	22+038	7m Rt
106–6	223.00	22+038	33m Rt
106–7	222.10	22+050	33m Lt
106–8	222.60	22+050	7m Lt
106–9	222.80	22+050	18.8m Rt
106–10	223.15	22+065	18.8m Lt
106–11	223.90	22+065	18.8m Rt

METRIC

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

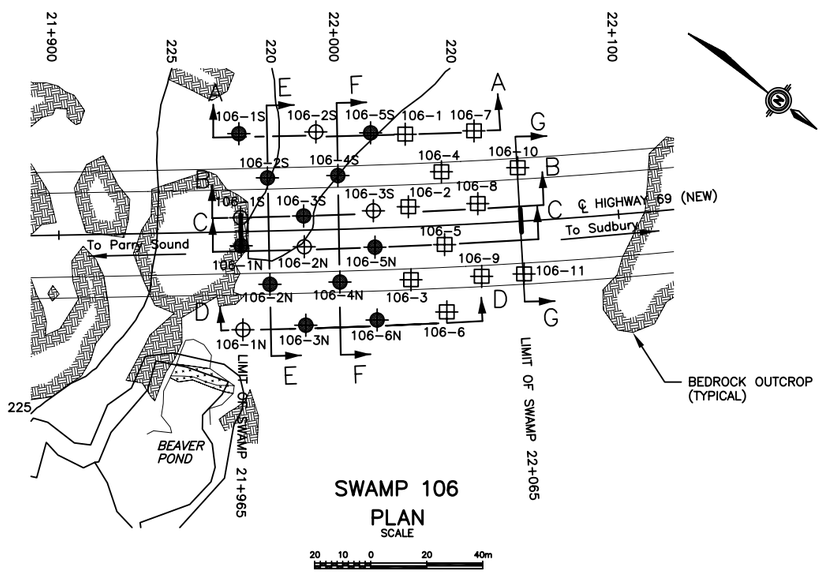
CONT No

GWP No 293–97–00

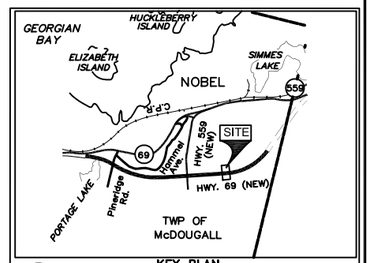
SHEET

HIGHWAY 69 FOUR–LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
SWAMP 106, STA 21+965 TO 22+065)
BOREHOLE LOCATIONS & SOIL STRATA

Poto MacCallum Ltd.
CONSULTING ENGINEERS



SWAMP 106
PLAN
SCALE
20 10 0 20 40m



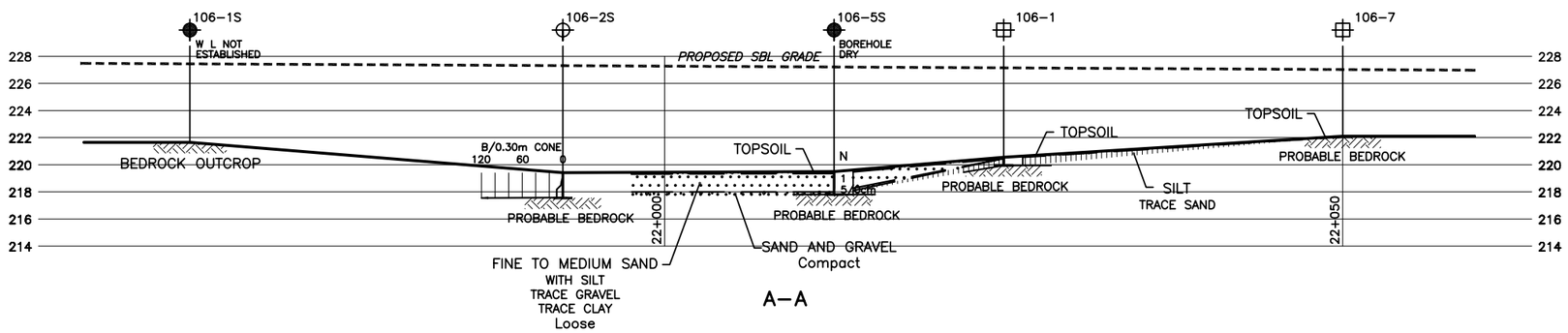
KEY PLAN
SCALE
1 0 1 2 3km

LEGEND

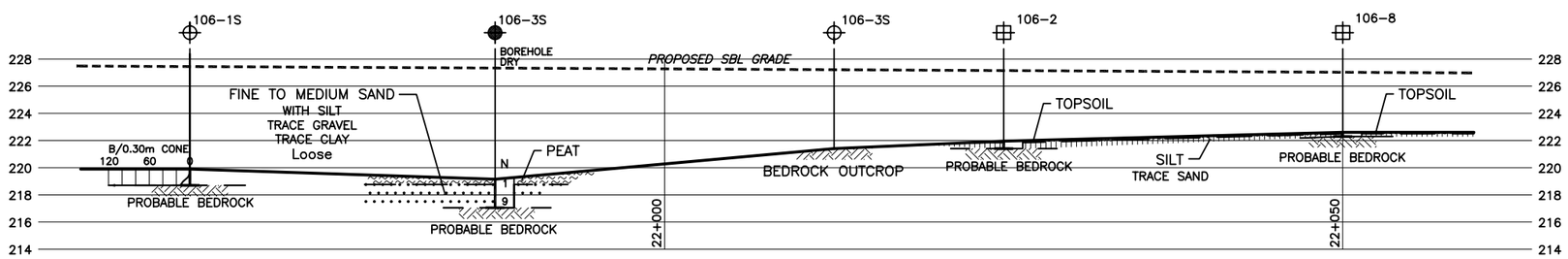
- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- N — Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE — Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Aug 2001
- Head ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med
106–1N	220.00	21+965	5m Rt
106–2N	219.75	21+975	19m Rt
106–3N	221.35	21+987.5	34m Rt
106–4N	220.20	22+000	19m Rt
106–5N	221.60	22+012.5	7m Rt
106–6N	221.65	22+012.5	33m Rt
106–1S	221.65	21+965	35m Lt
106–2S	221.30	21+975	19m Lt
106–3S	219.15	21+987.5	5m Lt
106–4S	219.50	22+000	19m Lt
106–5S	219.50	22+012.5	34m Lt

PT No	ELEVATION	STA	o/s CL Med
106–1N	221.00	21+965	35m Rt
106–2N	219.45	21+987.5	6m Rt
106–1S	219.90	21+965	5m Lt
106–2S	219.40	21+992.5	35m Lt
106–3S	221.40	22+012.5	6m Lt



A–A



B–B

(Legend Continues)

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

1. REFER TO DRAWING S–106–2 FOR SECTIONS C–C, D–D, E–E F–F AND G–G.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN–SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV.11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Nov.11/02 PROVINCE OF ONTARIO

REF No E–01–020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1–02–07–15.dwg; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H–42

HWY No 69				DIST 52	
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN MM/NA	CHECKED CN	APPROVED DWK		DWG S–106–1	

METRIC

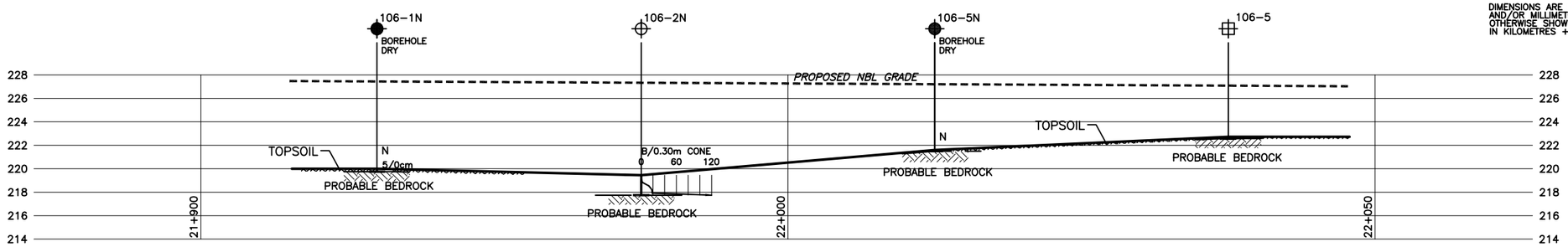
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

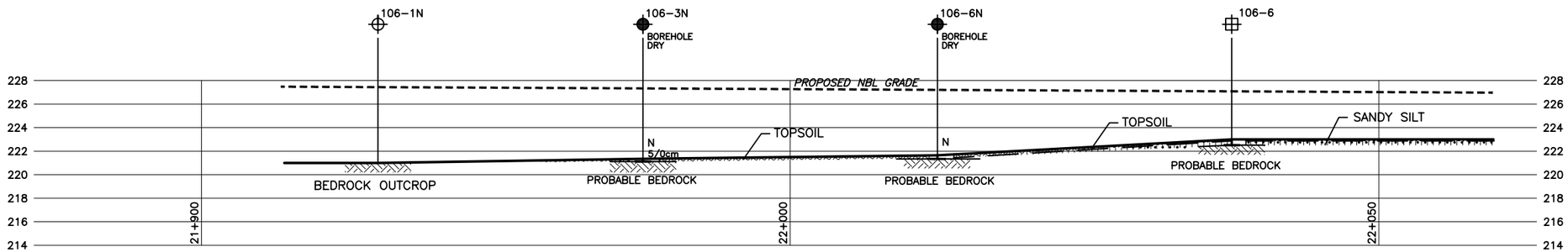
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km SWAMP 106, STA 21+965 TO 22+065)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

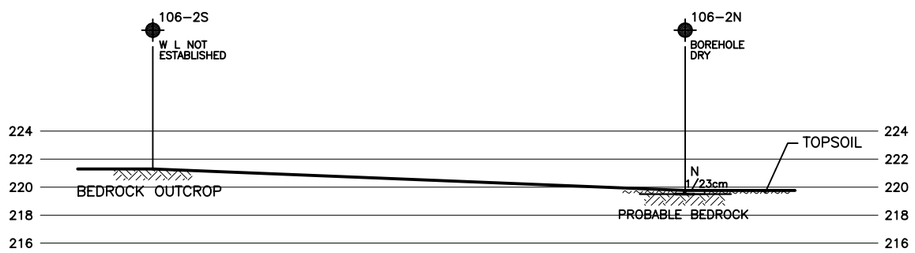
Peto MacCallum Ltd.
CONSULTING ENGINEERS



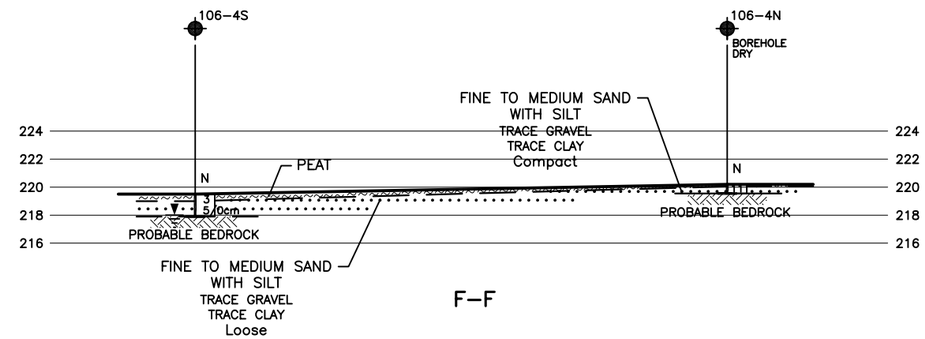
C–C



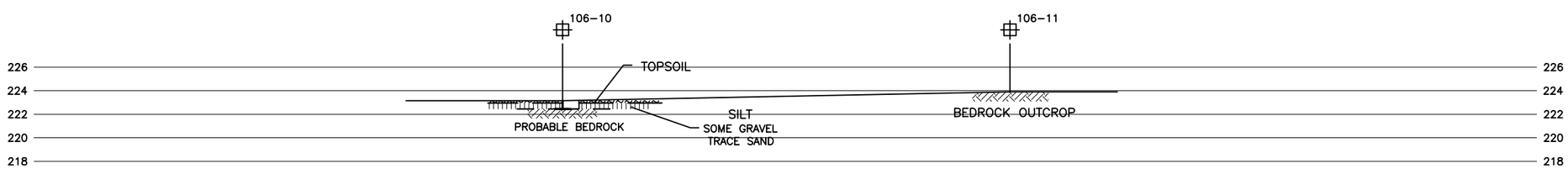
D–D



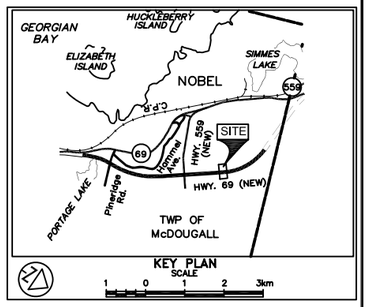
E–E



F–F



G–G



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2001
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med
(Refer to drawing S-106-1 for co-ordinates)			

(Legend Continues)

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

1. REFER TO DRAWING S-106-1 FOR PLAN AND SECTIONS A–A AND B–B.
2. SECTIONS ARE PROVIDED SOLELY FOR ILLUSTRATIVE PURPOSES. REFER TO RECORD OF BOREHOLE, RECORD OF PENETRATION TEST AND AUGER PROBE LOGS FOR DETAILED DESCRIPTION OF SUBSURFACE CONDITIONS, IN-SITU TEST DATA AND LABORATORY TEST RESULTS.

SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY Nov. 11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Nov. 11/2002 PROVINCE OF ONTARIO

REF No E-01-020 Base; H4545c03.dwg; H4545xB1.dwg; H4545xB2.dwg; March, 2001
B04520069001.dwg; B04520069002.dwg; E04520069001.dwg; E04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No 69				DIST 52	
SUBM'D DH	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN MM/NA	CHECKED CN	APPROVED DWK		DWG S-106-2	

METRIC

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

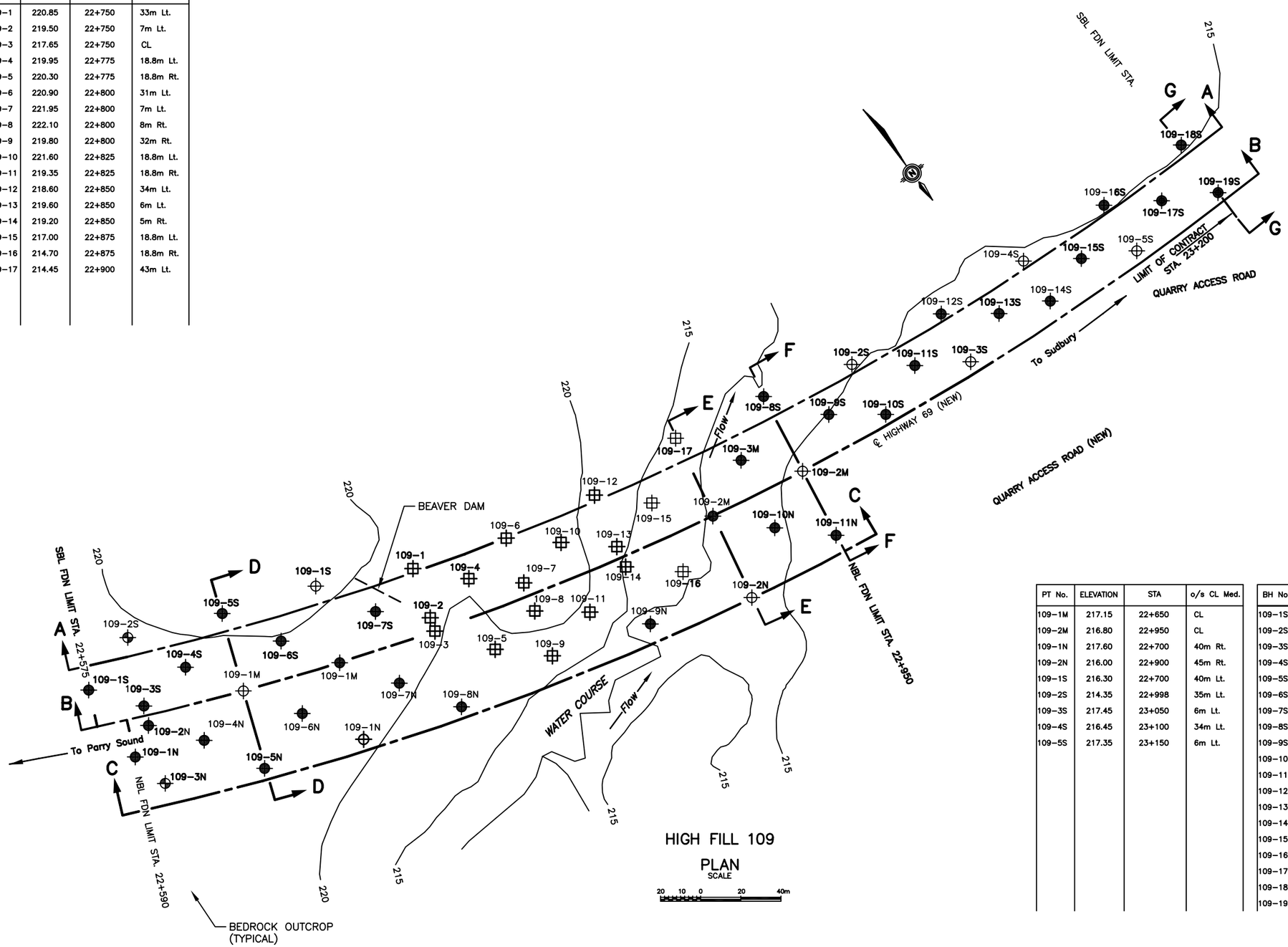
CONT No
GWP No 293-97-00

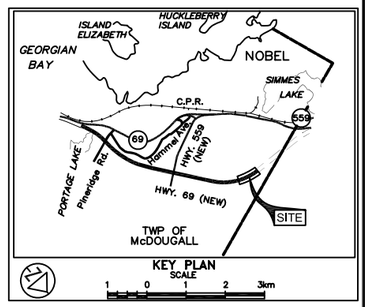
SHEET

HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
HIGH FILL 109, STA. 22+575 TO 23+200)
BOREHOLE LOCATIONS & SOIL STRATA

Poto MacCallum Ltd.
CONSULTING ENGINEERS

AP No	ELEVATION	STA	o/s CL Med.
109-1	220.85	22+750	33m Lt.
109-2	219.50	22+750	7m Lt.
109-3	217.65	22+750	CL
109-4	219.95	22+775	18.8m Lt.
109-5	220.30	22+775	18.8m Rt.
109-6	220.90	22+800	31m Lt.
109-7	221.95	22+800	7m Lt.
109-8	222.10	22+800	8m Rt.
109-9	219.80	22+800	32m Rt.
109-10	221.60	22+825	18.8m Lt.
109-11	219.35	22+825	18.8m Rt.
109-12	218.60	22+850	34m Lt.
109-13	219.60	22+850	6m Lt.
109-14	219.20	22+850	5m Rt.
109-15	217.00	22+875	18.8m Lt.
109-16	214.70	22+875	18.8m Rt.
109-17	214.45	22+900	43m Lt.





LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2002
- Head
- ARTESIAN WATER Encountered

PT No.	ELEVATION	STA	o/s CL Med.
109-1M	217.15	22+650	CL
109-2M	216.80	22+950	CL
109-1N	217.60	22+700	40m Rt.
109-2N	216.00	22+900	45m Rt.
109-1S	216.30	22+700	40m Lt.
109-2S	214.35	22+998	35m Lt.
109-3S	217.45	23+050	6m Lt.
109-4S	216.45	23+100	34m Lt.
109-5S	217.35	23+150	6m Lt.

BH No	ELEVATION	STA	o/s CL Med.
109-1S	218.90	22+575	19m Lt.
109-2S	217.65	22+600	40m Lt.
109-3S	217.70	22+600	5m Lt.
109-4S	217.20	22+625	19m Lt.
109-5S	216.35	22+650	40m Lt.
109-6S	216.50	22+675	19m Lt.
109-7S	216.55	22+725	19m Lt.
109-8S	211.90	22+950	42m Lt.
109-9S	213.95	22+975	19m Lt.
109-10S	217.20	23+000	5m Lt.
109-11S	216.95	23+025	19m Lt.
109-12S	216.50	23+050	34m Lt.
109-13S	217.45	23+075	19m Lt.
109-14S	218.05	23+100	10m Lt.
109-15S	214.20	23+125	19m Lt.
109-16S	216.70	23+150	34m Lt.
109-17S	217.00	23+175	19m Lt.
109-18S	216.15	23+200	35m Lt.
109-19S	216.40	23+200	5m Lt.

BH No	ELEVATION	STA	o/s CL Med.
109-1M	216.80	22+700	CL
109-2M	212.25	22+900	CL
109-3M	212.70	22+925	19m Lt.
109-1N	220.25	22+590	19m Rt.
109-2N	217.80	22+600	5m Rt.
109-3N	218.20	22+601.5	35m Rt.
109-4N	217.25	22+625	19m Rt.
109-5N	217.80	22+650	40m Rt.
109-6N	217.65	22+675	19m Rt.
109-7N	216.40	22+725	19m Rt.
109-8N	213.00	22+750	40m Rt.
109-9N	212.80	22+850	36m Rt.
109-10N	217.15	22+925	19m Rt.
109-11N	215.50	22+950	36m Rt.

– NOTE –
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTES:

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2. REFER TO DRAWING S-109-2 FOR PART OF SECTION A-A; DRAWING S-109-3 FOR SECTION A-A CONTINUED AND PART OF SECTION B-B; DRAWING S-109-4 FOR SECTION B-B CONTINUED AND PART OF SECTION C-C; DRAWING S-109-5 FOR SECTION C-C CONTINUED AND SECTION D-D AND SECTION E-E; DRAWING S-109-6 FOR SECTIONS F-F AND G-G.

REGISTERED PROFESSIONAL ENGINEER — B. R. GRAY — NOV 11/02 — PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER — C. M. P. Nascimento — Nov. 11/02 — PROVINCE OF ONTARIO

REF No E-01-020 Base.dwg; March 2001
B04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69			DIST	52
SUBM'D	CN	CHECKED	CN	DATE NOV 11, 2002	SITE
DRAWN	MM	CHECKED	CN	APPROVED DWK	DWG S-109-1

METRIC

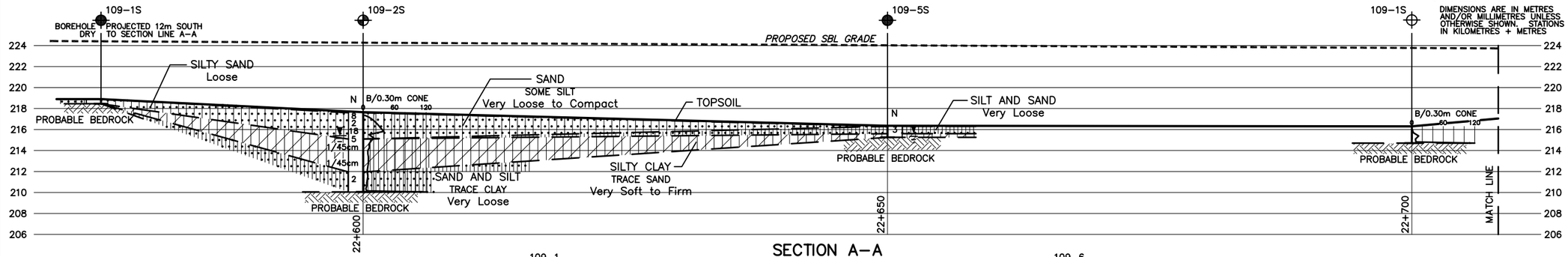
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

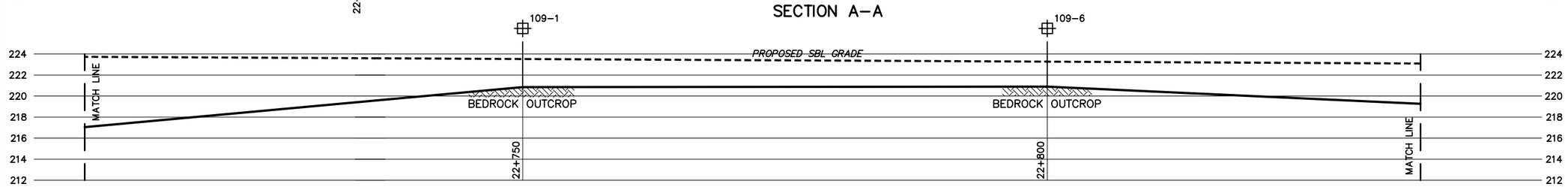
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
HIGH FILL 109, STA. 22+575 TO 23+200)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

Peto MacCallum Ltd.
CONSULTING ENGINEERS



SECTION A-A



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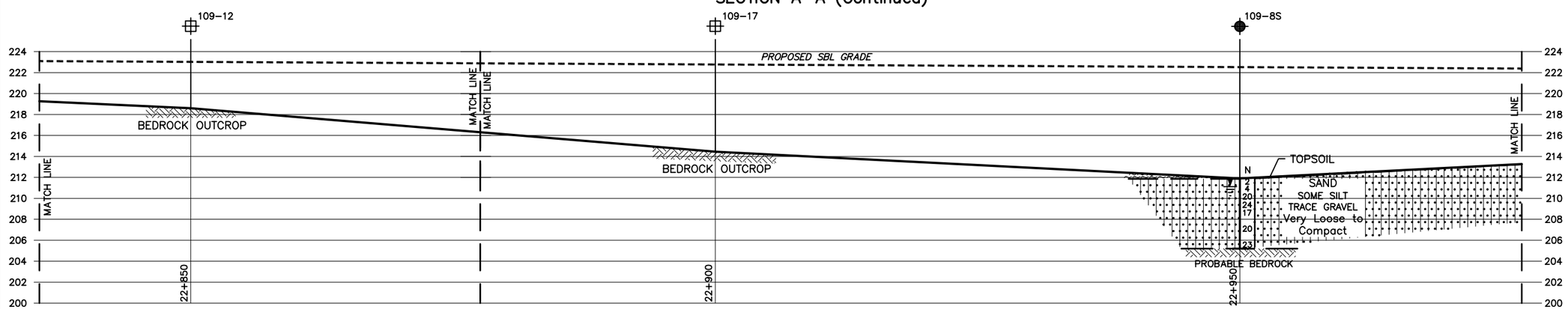
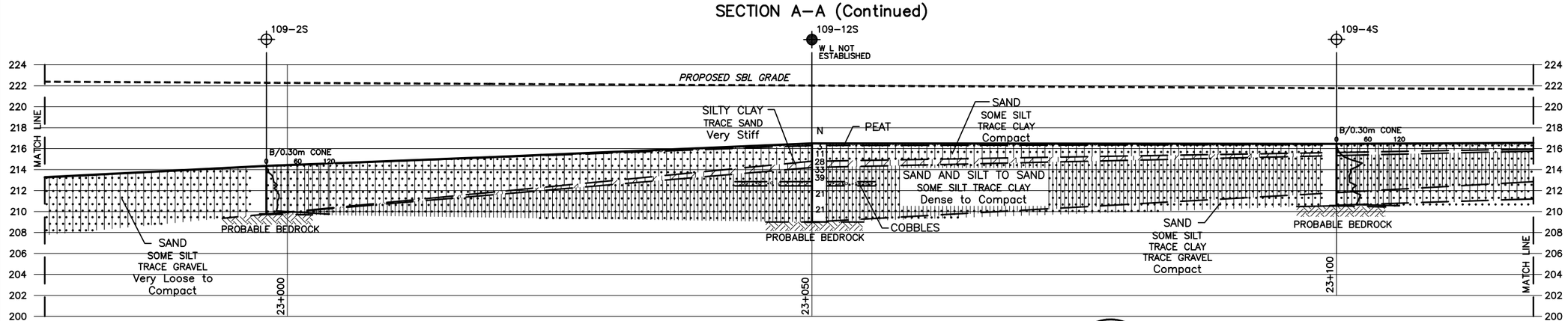
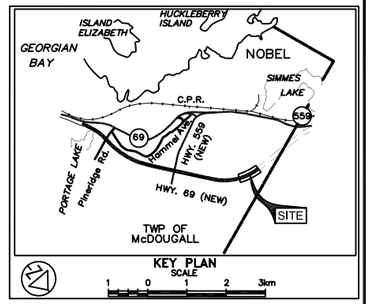


SECTION A-A (Continued)



SECTION A-A (Continued)



KEY PLAN

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2002
- Head
- ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med.

(Refer to drawing S-109-1 for co-ordinates)

– NOTE –
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SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER B. R. GRAY Nov/11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C. M. P. Nascimento Nov. 11/02 PROVINCE OF ONTARIO

REF No E-01-020 Base.dwg; March 2001
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H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No 69				DIST 52	
SUBM'D CN	CHECKED CN	DATE NOV 11, 2002		SITE	
DRAWN MM	CHECKED CN	APPROVED DWK		DWG S-109-2	

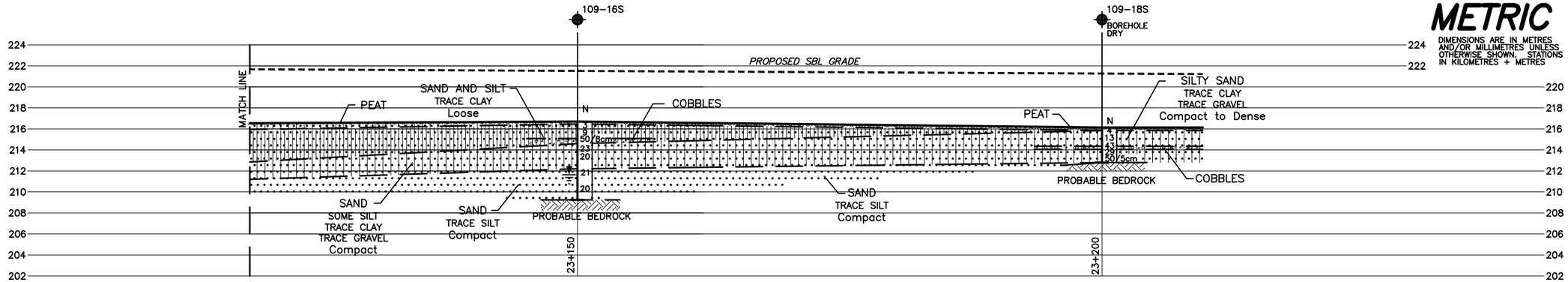
METRIC

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

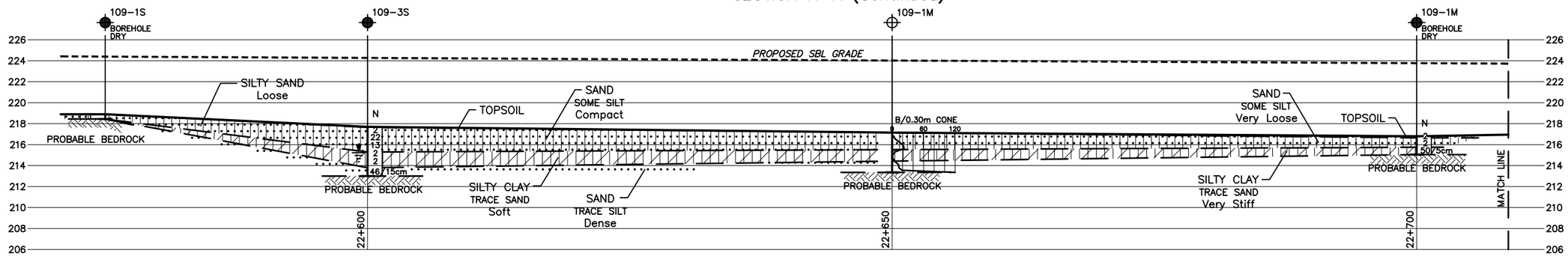
CONT No	
GWP No 293-97-00	SHEET

HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km HIGH FILL 109, STA. 22+575 TO 23+200)
BOREHOLE LOCATIONS & SOIL STRATA

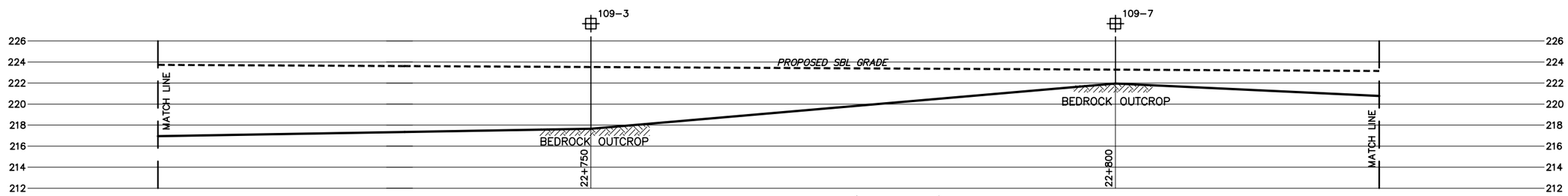
Pob MacCallum Ltd.
CONSULTING ENGINEERS



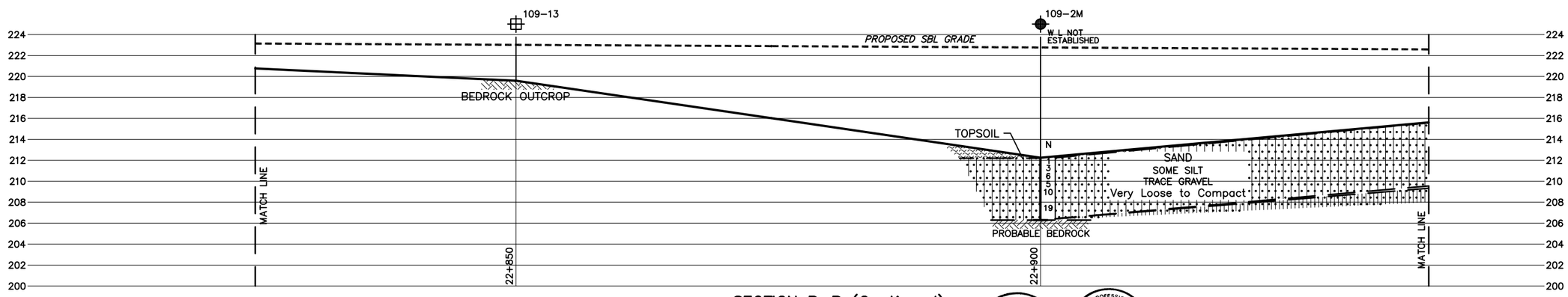
SECTION A–A (Continued)



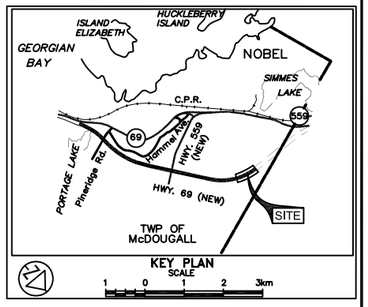
SECTION B–B



SECTION B–B (Continued)



SECTION B–B (Continued)



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- Auger Probe
- 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 Aug 2002
- Head ARTESIAN WATER Encountered

BH No	ELEVATION	STA	o/s CL Med.

(Refer to drawing S-109-1 for co-ordinates)

– NOTE –
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SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER — B. R. GRAY — Nov. 11/02 — PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER — C M P Nascimento — Nov. 11/02 — PROVINCE OF ONTARIO

REF No E-01-020 Base.dwg; March 2001
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H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69			DIST	52
SUBM'D	CN	CHECKED CN	DATE NOV 11, 2002	SITE	
DRAWN	MM	CHECKED CN	APPROVED DWK	DWG	S-109-3

METRIC

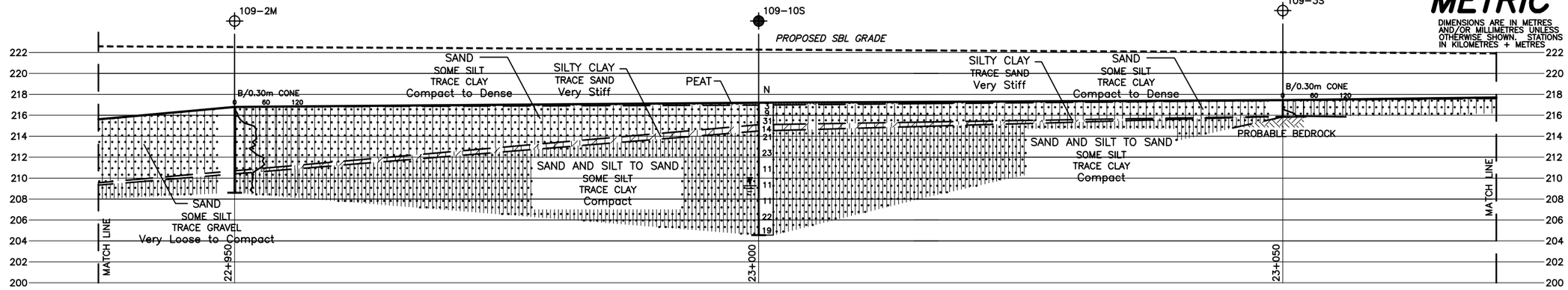
DIMENSIONS ARE IN METRES AND/OR MILLIMETRES UNLESS OTHERWISE SHOWN. STATIONS IN KILOMETRES + METRES

CONT No
GWP No 293-97-00

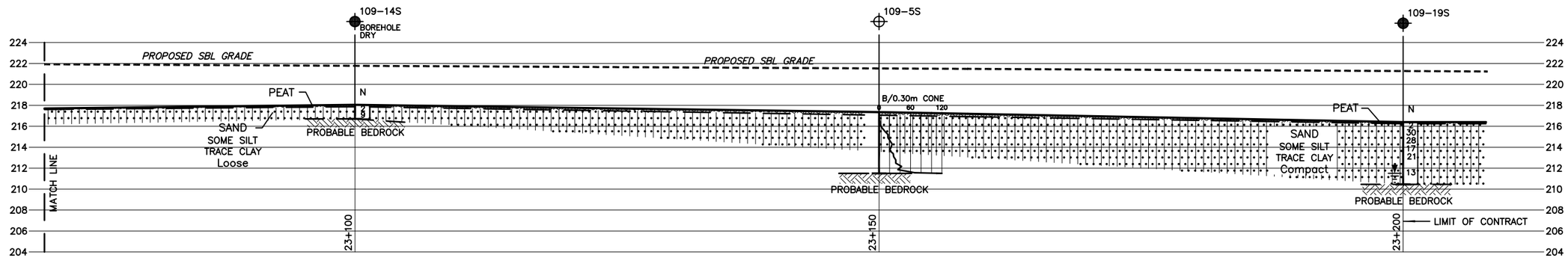
SHEET

HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km HIGH FILL 109, STA. 22+575 TO 23+200)
BOREHOLE LOCATIONS & SOIL STRATA

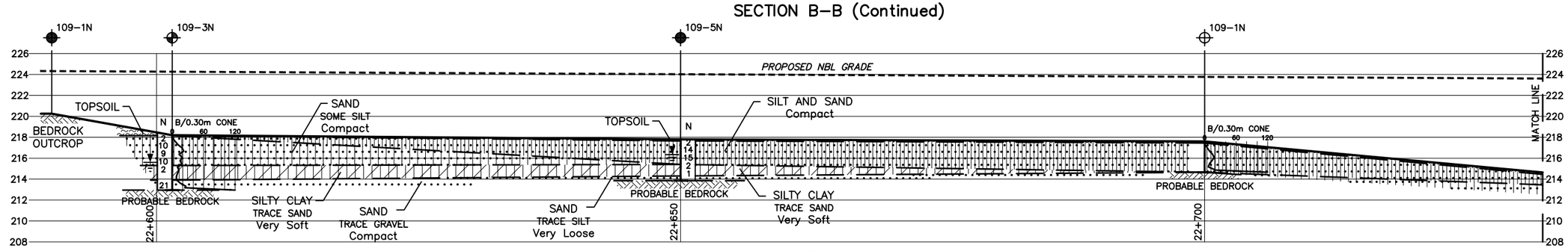
Poto MacCallum Ltd.
CONSULTING ENGINEERS



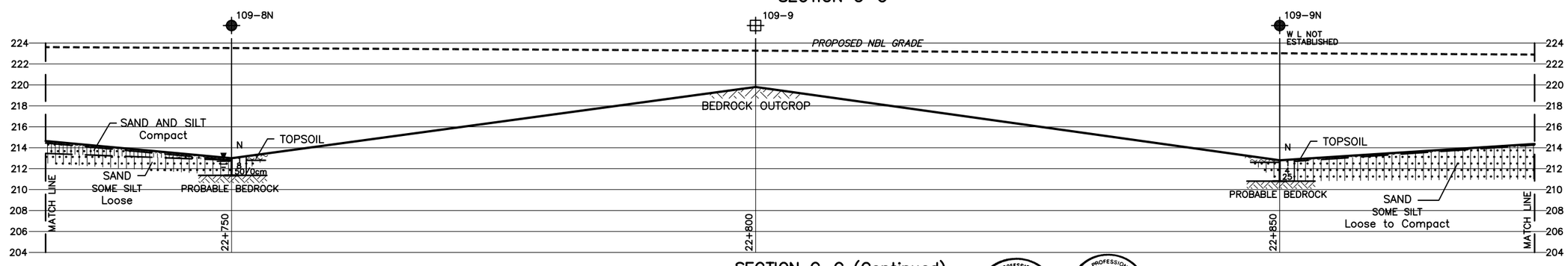
SECTION B-B (Continued)



SECTION B-B (Continued)

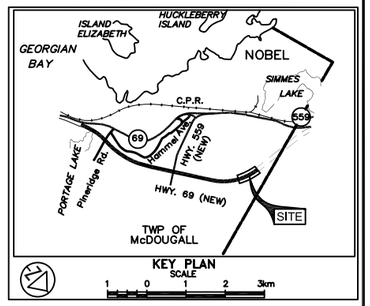


SECTION C-C



SECTION C-C (Continued)

SECTIONS
SCALE
4 2 0 4 8m



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
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BH No	ELEVATION	STA	o/s CL Med.
(Refer to drawing S-109-1 for co-ordinates)			

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REGISTERED PROFESSIONAL ENGINEER B. R. GRAY NOV.11/02 PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER C M P Nascimento Nov.11/02 PROVINCE OF ONTARIO

REF No E-01-020 Base.dwg; March 2001
B04520069002.dwg; September, 2001
H4545xa1-02-07-15.dwg; H4545xb2.dwg; July, 2002

REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69			DIST	52
SUBM'D	CN	CHECKED	CN	DATE NOV 11, 2002	SITE
DRAWN	MM	CHECKED	CN	APPROVED DWK	DWG S-109-4

METRIC

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

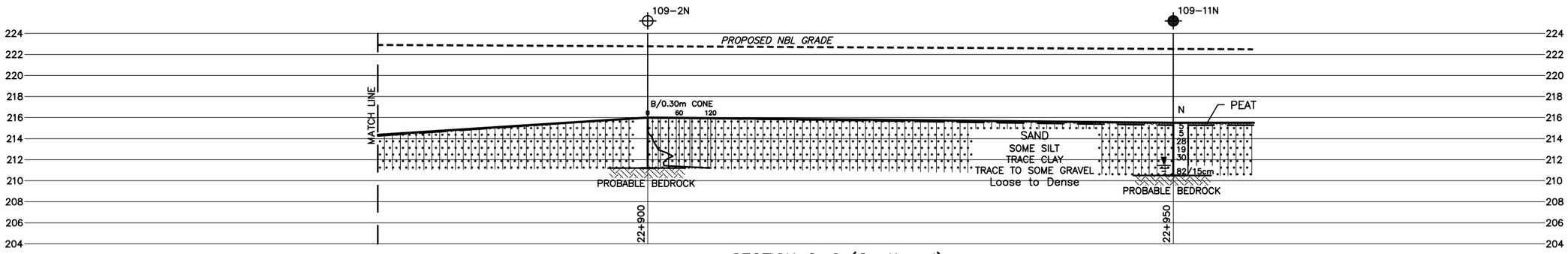
CONT No

GWP No 293-97-00

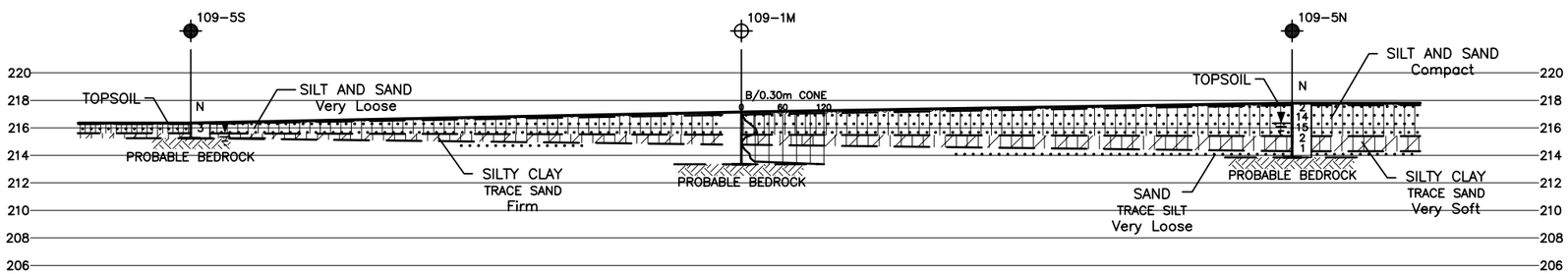
HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
HIGH FILL 109, STA. 22+575 TO 23+200)
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

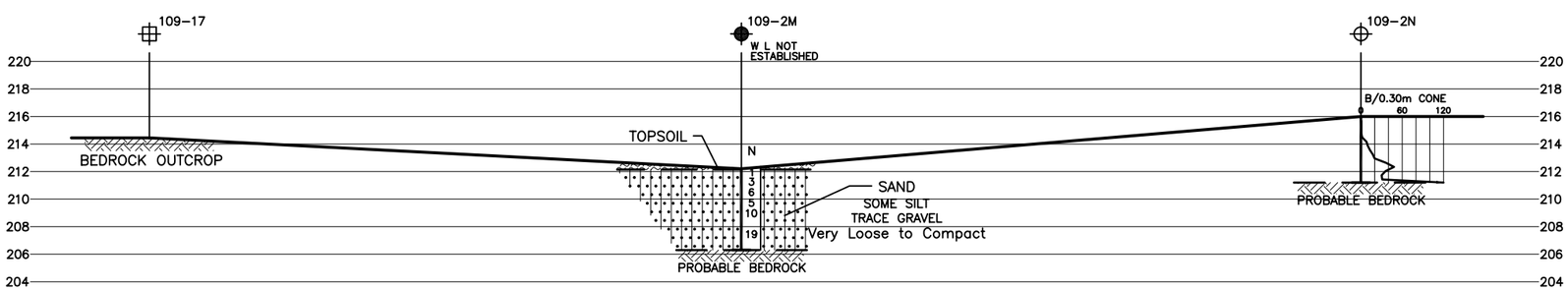
Poto MacCallum Ltd.
CONSULTING ENGINEERS



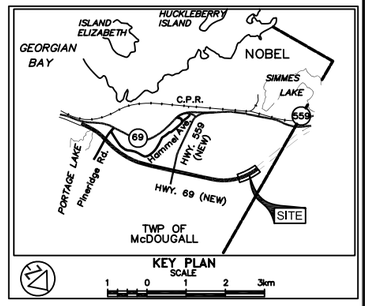
SECTION C-C (Continued)



SECTION D-D



SECTION E-E



LEGEND

- Borehole
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SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER — B. R. GRAY — NOV. 11/02 — PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER — C. M. P. Nascimento — Nov. 11/02 — PROVINCE OF ONTARIO

REF No E-01-020 Base.dwg; March 2001
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REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69			DIST	52
SUBM'D	CN	CHECKED	CN	DATE NOV 11, 2002	SITE
DRAWN	MM	CHECKED	CN	APPROVED DWK	DWG S-109-5

METRIC

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CONT No

GWP No 293-97-00

HIGHWAY 69 FOUR-LANING
(2.6 km North of Hwy 124, Northerly 4.8 km
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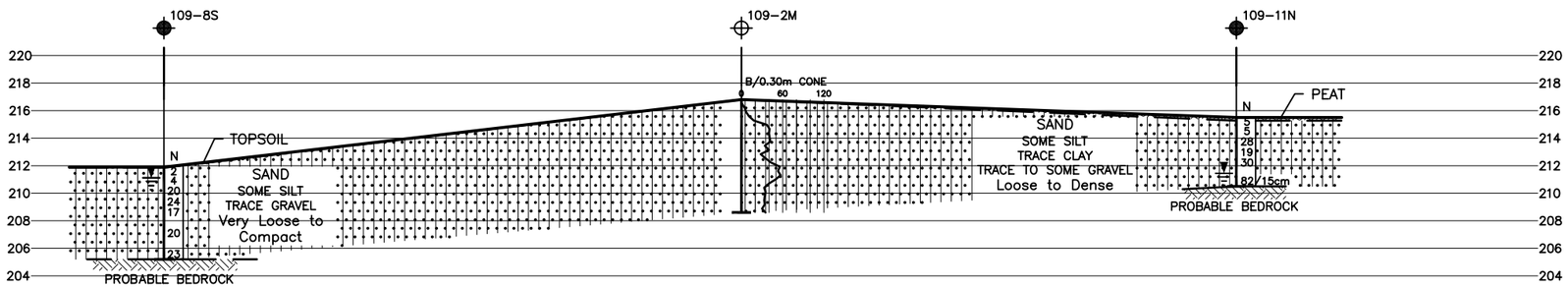
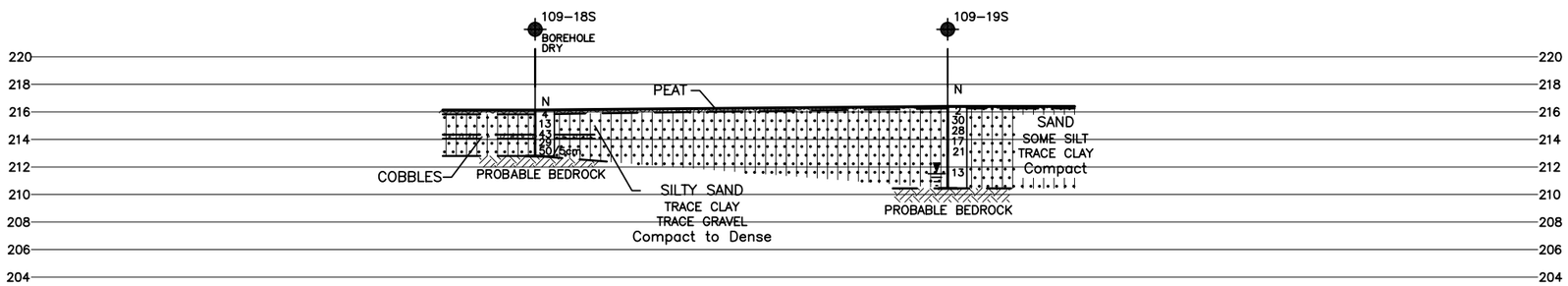
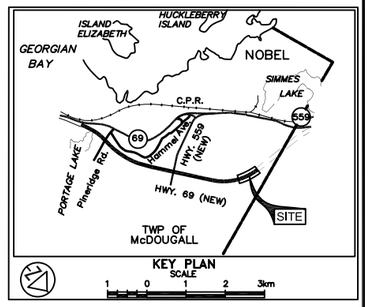


SECTION F-F



SECTION G-G



LEGEND	
●	Borehole
⊕	Dynamic Cone Penetration Test (Cone)
⊕	Borehole & Cone
⊞	Auger Probe
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 Aug 2002
▽	Head
▽	ARTESIAN WATER
▽	Encountered

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SECTIONS
SCALE
4 2 0 4 8m

REGISTERED PROFESSIONAL ENGINEER
B. R. GRAY
Nov. 11/02
PROVINCE OF ONTARIO

REGISTERED PROFESSIONAL ENGINEER
C M P Nascimento
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REF No E-01-020 Base.dwg; March 2001
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REVISIONS		
DATE	BY	DESCRIPTION

Geocres No. 41H-42

HWY No	69			DIST	52
SUBM'D	CN	CHECKED	CN	DATE NOV 11, 2002	SITE
DRAWN	MM	CHECKED	CN	APPROVED DWK	DWG S-109-6