

FOUNDATION INVESTIGATION AND DESIGN REPORT
SWAMP AND HIGH FILL CROSSINGS
for
HIGHWAY 69 FOUR-LANING
FROM 4 KM SOUTH OF ESTAIRE TO 1 KM NORTH OF HIGHWAY 537
G.W.P. 312-99-00
DISTRICT 54, TOWNSHIPS OF BURWASH, SECORD AND DILL
SUDBURY, ONTARIO

VOLUME 1

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Geocres No.: 41I-174
November 17, 2004

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VOLUME 2

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- Record of Borehole Sheets: Swamps 601 to 604
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VOLUME 3

Appendix C - Explanation of Terms Used in Report
- Record of Borehole Sheets: Swamps 605 to 608, High Fill 609,
Swamps 610 and 611
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Appendix C - Explanation of Terms Used in Report
- Record of Borehole Sheets: High Fill 613 (incl. Highway 537 High Fill) and Swamp 101
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Appendix D - Figures 612-1 to 612-3 - Plasticity Charts
- Figures 612-4 to 612-9 - Grain Size Distribution Curves
- Figures 612-10 to 612-13 - Consolidation Test Results
- Explanation of Terms Used in Report
- Record of Borehole Sheets: Swamp 612
- Record of Penetration Test Sheets: Swamp 612
- Drawings 612-1 to 612-5 - Borehole Locations and Soil Strata

FOUNDATION INVESTIGATION REPORT SWAMP AND HIGH FILL CROSSINGS

for

Highway 69 Four-Laning
From 4 km South Of Estaire To 1 km North of Highway 537
G.W.P. 312-99-00
District 54, Townships of Burwash, Secord and Dill
Sudbury, Ontario

1. INTRODUCTION

Realignment of the 12 km long section of Highway 69 that extends from 4 km south of Estaire to about 1 km north of Highway 537, some 15 km south of Sudbury, is planned. This report was prepared for Totten Sims Hubicki Associates (TSH) on behalf of the Ministry of Transportation of Ontario (MTO).

The study corridor extends from Station 11+286.5 (Burwash Township) to 11+308 (Dill Township), Highway 69 centreline. There are two chainage equations within the project limits:

- 20+066.514 Township of Burwash = 10+000.000 Township of Secord
- 10+760.775 Township of Secord = 10+000.000 Township of Dill

A total of 13 swamp and high fill crossings were identified along the study corridor in the RFP documents for this project. For ease of reference, the crossings were designated sequential numbers in the 600 series from 601 to 613. Crossing 612 was subsequently deleted from this study. Crossing 101 investigated during the study for GWP 5556-02-00, Geocres 41I-164 (PML ref. 01TF003 dated July 2003) is included in this study area. The identification number and location of each crossing are shown on the Key Map (Drawing A) and in Table A.

This report summarizes the results of the field investigation conducted at the swamp and high fill crossings identified in the RFP for this project. The subsurface conditions along the remaining portion of the realigned section are provided in the Draft Pavement Design Report (PML Ref.: 03TF014 dated June 14, 2004). The factual information obtained during the field investigation conducted for swamp 612 is provided in Appendix D.



2. SITE DESCRIPTION AND GEOLOGY

The 12 km long section of Highway 69 to be realigned is situated about 15 km south of Sudbury in a wooded region with open swampy areas.

The study area is located in the Precambrian Laurentian peneplane. The topography is irregular in detail and dotted with areas of wet ground separated by steep rock ridges. Pleistocene lacustrine/fluvial deposits and recent swamp sediments have been laid down in depressions and are probably associated with the Nipissing post-glacial stage of the Great Lakes. Gravel and sand deposits were also encountered. Soil cover over the rock outcrops is generally sparse.

Metasedimentary rocks of the Huronian Supergroup and gneisses of the Grenville Province underlay the alignment. The area has undergone considerable folding, intrusive activity, regional metamorphism and faulting. The bedrock outcrops at many locations throughout the project section.

3. INVESTIGATION PROCEDURES

The field work for the foundation investigation involved a total of 790 boreholes and 117 dynamic cone penetration tests carried out during the period of March 6, 2003 to February 20, 2004. The test locations and drawings for each crossing are identified by a prefix corresponding to the crossing number and numbered sequentially for each crossing. The test locations at each crossing are shown on corresponding Drawings (Appendix B). The records of the test holes are compiled in Appendix C.

The test holes were advanced to depths ranging from 0.0 to 34.0 m below existing grade, generally terminating on bedrock/probable bedrock. Some test holes, however, were terminated in competent materials (typically compact silt/sand).

The test hole locations were established in accordance with the MTO requirements indicated in the RFP document and in general accordance with the requirements of the MTO Northeastern Region Pavement Design Practices and Guidelines (May 20, 1997). TSH laid out



the reference lines of the new highway in the field and these lines were used to reference the test hole locations. Geodetic elevations were referred to field temporary benchmarks provided by TSH.

It is noteworthy, however, that the embankment grades provided with the RFP document were revised in January 2004 and again in October 2004. Hence, the actual locations of the test holes may not be at the toe of slope of the embankments at all locations.

The grade change between the RFP document and the October 2004 grade at each crossing is noted in the following table:

CROSSING	GRADE CHANGE (m)
601	-0.8 to 6.3
602	-6.3 to 0.2
603	0.5 to 6.5
604	-2.0 to -0.2
605	-2.5 to 2.6
606	-1.1 to 4.9
607	0.8 to 7.9
608 *	-2.8 to 0.8
609 *	-1.4 to 1.0
610*	-1.3 to -0.3
611	5.0 to 11.1
613	-8.2 to 0.5
101*	-1.7 to 0.0

* Relative to grades provided in January 2004

Based on a rockfill slope inclination of 1.25H:1V and the 2 m wide mid-height berm for embankments higher than 6 m, the actual test hole locations at some crossings are as much as 10 to 12 m from the design toe of slope.

The test holes were advanced using a combination of equipment including track-mounted drill rigs, excavators, manual hand sampling and mechanized hand sampling (portable rotary drilling). The equipment was supplied and operated by contractors working under the full-time supervision of members of our engineering staff.



Representative samples of the soils were recovered at frequent depth intervals using a conventional split spoon sampler during drilling. Thin wall (Shelby) tube samples were also recovered at selected locations. Standard penetration tests were conducted simultaneously with the sampling operation to assess the strength characteristics of the substrata. In situ vane shear and pocket penetrometer testing was also performed to further assess the shear strength of the cohesive soils encountered. The results of the field tests and observations are reported on the Record of Borehole sheets compiled in Appendix C.

The groundwater conditions at the borehole locations were assessed during drilling by visual examination of the soil, the sampler and drill rods as the samples were retrieved and, when appropriate, by measurement of the water level in the open boreholes. Upon completion of drilling, the boreholes were backfilled with a bentonite/cement mixture in accordance with the MTO guidelines for borehole abandonment procedures.

Soils were identified in the field in accordance with the MTO Soil Classification procedures. The soil samples were returned to our laboratory for detailed visual examination, classification and routine moisture content determination. Atterberg limits tests (43) and grain size distribution analyses (79) were performed on selected soil samples from crossings 601, 602, 605, 607, 610, 611 and 613 (refer to the appended corresponding figures) where a significant thickness of clayey soils was identified. Consolidation and unconfined compressive strength tests were conducted on a relatively undisturbed Shelby tube sample of silty clay from crossing 602 (Figure 602-C-1). The laboratory test results are presented in Appendix A.

Consolidation tests were also performed on samples retrieved during the field investigation conducted for swamp 612 and the embankment fill to be constructed at Highway 537. The test data is provided in Appendix A.

4. SUMMARIZED SUBSURFACE CONDITIONS

Reference is made to the appended Record of Borehole and Record of Penetration Test sheets presented in Appendix C for details of the subsurface conditions including soil classifications, inferred stratigraphy, standard and dynamic cone penetration test data, in situ vane and pocket



penetrometer undrained shear strength values as well as groundwater observations. The results of laboratory Atterberg limits, unconfined compressive strength testing, grain size distribution analyses and natural moisture content determination are also shown on the Record of Borehole sheets.

The stratigraphic profiles along the centreline of the new Highway 69 alignment and the toe of the embankment slopes (established from profile in RFP) as well as characteristic cross-sections at selected locations at each swamp and high fill crossing are presented on Drawings 601-1 to 613-7 and 101-1 to 101-5 (Appendix B). The boundaries between soil strata have been established at the borehole locations only. Between and beyond the boreholes, the boundaries are assumed and may vary.

A general description of the subsurface conditions encountered at the swamp and high fill crossings is provided in Table A. The shear strength/consistency of the cohesive soils noted on the Log of Borehole sheets and in the subsequent sections of the report are primarily based on in situ vane shear testing (using the MTO 'N' vane according to the procedure described in the Northern Region Pavement Design Practices and Guidelines dated May 1997), penetrometer tests on recovered samples and unconfined compression tests conducted in the laboratory. Less consideration was given to SPT-N values since the shear strength indicated by this technique is less reliable in very soft to soft clayey soils. A brief highlight of the findings is given below.

4.1 Swamp 601

A total of 82 test holes comprising 67 boreholes and 15 dynamic cone penetration tests were carried out in swamp 601. The alignment crosses a low-lying swamp section between Sta. 12+080 and 12+180 on the northbound lanes and between Sta. 11+910 and 12+020 on the southbound lanes of the highway.

The highway alignment is skewed in relation to the rock outcrop contour topography. The bedrock surface below grade is variable in elevation, with rock faces locally sloping at an angle of up to 30° to the horizontal.



The subsurface stratigraphy revealed in the low-lying swamp section generally comprised a surficial peat layer over cohesionless very loose to dense, typically loose, sandy and/or silty deposits extending to bedrock and containing discontinuous layers of cohesive soft to stiff silty clay and/or clayey silt.

4.1.1 Peat

A surficial deposit of peat was identified in 54 boreholes. The peat had a thickness of 0.1 to 3.2 m and a moisture content of 218 to 692%. This deposit was penetrated at elevation 219.4 to 226.2.

4.1.2 Silty Clay/Clayey Silt

Discontinuous layers of cohesive silty clay and/or clayey silt were encountered beneath the peat at elevation 219.6 to 222.4 in 5 boreholes and below sandy/silty soils at depths of 1.7 to 4.8 m (elevation 217.6 to 221.3) in 11 boreholes. These strata were 0.9 to at least 8.0 m thick and soft to stiff, typically firm. The results of in situ vane shear testing carried out in the silty clay indicate the undisturbed shear strength values in a range of 20 to 59 kPa (soil sensitivity is 2 to 3). The moisture content of the silty clay varied between 23 and 32%. The results of Atterberg limits testing and grain size distribution analyses performed on the clayey silt are presented in respective Figures 601-PC-1 and 601-1 (Appendix A). The liquid and plastic limits of the material ranged from 28 to 31 and from 19 to 21 respectively, thus giving the plasticity index of 7 to 12. The cohesive strata were penetrated at depths of 3.1 to 10.1 m (elevation 212.3 to 219.9), with the exception of borehole 601-14N terminated within the clayey silt at 12.8 m depth (elevation 209.6).

4.1.3 Sand/Silt

Present surficially in 4 boreholes or underlying the peat/topsoil at elevation 219.4 to 226.2 in 47 boreholes and silty clay/clayey silt at depths of 3.1 to 9.0 m (elevation 213.4 to 219.9) in 9 boreholes were cohesionless sandy/silty soils. This unit was 1.3 to over 15.1 m thick and very loose to very dense, typically loose (SPT-N values of 0 to 61). The moisture content of the sand/silt ranged from 8 to 38%, typically 19 to 27%. The results of Atterberg limits testing and grain size distribution analyses performed on the silt are presented in respective



Figures 601-PC-2 and 601-2 (Appendix A). The liquid and plastic limits of the material ranged from 17 to 21 and from 13 to 20 respectively, thus giving the plasticity index of 1 to 4. The results of grain size distribution analyses conducted on sandy samples are presented in Figures 601-3 and 601-4 (Appendix A). The unit was penetrated at confirmed depths of 1.6 to 14.5 m (elevation 208.5 to 224.4).

4.1.4 Bedrock

Bedrock was exposed at elevation 223.6 to 232.5 in 8 boreholes and inferred by refusal at depths of 0.6 to 22.4 m (elevation 200.0 to 224.4) in 41 test holes. No bedrock was contacted in the remaining test holes terminated at depths of 5.2 to 19.5 m (elevation 203.2 to 220.3).

4.1.5 Groundwater

Groundwater was observed in 48 boreholes in the course of the field work. In the process of augering, water was encountered at depths of 0.1 to 3.7 m (elevation 219.1 to 224.3). Upon completion of drilling, groundwater was measured to be at depths of 0.0 to 7.8 m (elevation 215.2 to 224.2).

4.2 Swamp 602

A total of 97 test holes comprising 69 boreholes and 28 dynamic cone penetration tests were carried out in swamp 602. The alignment crosses two low-lying swamp sections situated in the areas of shallow water courses flowing in the northerly direction and intersecting the new highway centreline median at approximate Sta. 12+680 and between Sta. 12+860 and 12+900.

The level of the bedrock surface below grade is variable, with the lowest elevation 206 in the low-lying swamp sections and about elevation 230 in the areas of shallow soil cover.

The subsurface stratigraphy revealed in the low-lying swamp sections generally comprised a surficial peat/topsoil layer overlying predominantly non-plastic loose to compact silt and/or cohesive firm to stiff clayey silt/silty clay/clay extending to bedrock.



4.2.1 Peat/Topsoil

A surficial deposit of peat was identified in 62 boreholes. The peat had a typical thickness of 100 to 300 mm (1.2 m in borehole 602-12N), a moisture content of about 100% and was penetrated at elevation 229.1 to 237.2.

Topsoil was present surficially in 5 boreholes (locally covered with 100 to 300 mm of snow/ice). This unit was 100 to 200 mm thick and penetrated at elevation 232.7 to 235.7.

Neither peat nor topsoil was encountered in boreholes 602-36N and 602-12S.

4.2.2 Clayey Silt/Silty Clay/Clay

Cohesive soils were encountered surficially in borehole 602-36N and below the peat or silt at depths of 0.1 to 6.5 m (elevation 226.4 to 234.9) in 39 boreholes. The cohesive soil comprised layered clayey silt, silty clay and/or clay and varied in thickness between 1.0 and 12.1 m, locally up to 16.1 m. The clayey silt/silty clay/clay layers were soft to hard in consistency, typically firm to stiff. Pocket penetrometer tests conducted on cohesive soil samples indicate a shear strength of 25 to 145 kPa with a typical range of 40 to 80 kPa. The results of in situ vane shear testing carried out in the silty clay/clayey silt at depths of 4.0 to 13.1 m yielded the undisturbed shear strength values in a range of 26 to 90 kPa, typically 35 to 50 kPa (soil sensitivity is 2 to 4). The moisture content was 20 to 48% in the clayey silt and 17 to 58%, typically 29 to 42%, in the silty clay units. The results of a consolidation test, Atterberg limits testing and grain size distribution analyses performed on the cohesive soil samples are presented in Figures 602-C-1, 602-PC-1 to 602-PC-3 and 602-1 to 602-3 respectively (Appendix A). The liquid and plastic limits of the clayey silt ranged from 28 to 30 and from 19 to 21 respectively, with the plasticity index of 9. The liquid and plastic limits of the silty clay were 36 to 46 and 21 to 23 respectively, thus giving the plasticity index of 13 to 25. The liquid and plastic limits of the clay were 56 and 23 respectively, with the plasticity index of 33. The cohesive soils were penetrated at depths of 1.2 to 16.3 m (elevation 217.0 to 233.5).



4.2.3 Silt/Sand

Overlain in 59 boreholes by the peat/topsoil at elevation 230.1 to 237.2 and/or by the cohesive soils at depths of 1.2 to 14.5 m (elevation 218.1 to 233.5) was silt and/or sandy silt. This stratum was 0.2 to 14.9 m thick and very loose to dense (SPT-N values of 0 to 36), typically loose to compact. The moisture content of the silt/sandy silt varied between 15 and 32%, locally decreasing to 9%. The results of grain size distribution analyses performed on silt and sandy silt samples are presented in Figures 602-4 and 602-5 respectively (Appendix A). The stratum was penetrated at depths of 0.4 to 26.5 m (elevation 206.4 to 236.4).

Present surficially in borehole 602-12S and underlying the peat or silt/sandy silt at depths of 0.2 to 14.4 m (elevation 218.9 to 233.9) in 6 boreholes was cohesionless sand or silty sand (sand and gravel in borehole 602-3N). This layer was 0.3 to 0.9 m thick, locally 2.0 m, and very loose to compact in relative density (SPT-N values of 1 to 27). The sand/silty sand was penetrated at depths of 0.5 to 16.4 m (elevation 216.9 to 233.3).

4.2.4 Bedrock

Bedrock was inferred by refusal at depths of 0.2 to 27.7 m (elevation 205.6 to 236.4) in 88 test holes. No bedrock was contacted in the remaining test holes terminated at depths of 3.7 to 17.7 m (elevation 215.7 to 233.4).

4.2.5 Groundwater

In the course of the field work, groundwater was observed in 28 boreholes. In the process of augering, water was encountered at depths of up to 6.1 m (elevation 225.1 to 233.1). Upon completion of drilling, groundwater was measured to be at depths of up to 14.6 m (elevation 218.7 and 233.2). The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.



4.3 Swamp 603

A total of 33 boreholes were advanced in swamp 603. Access to the four boreholes identified on Drawing 603-1 has been granted; they will be drilled at a later stage.

Bedrock is exposed in the southern half of the crossing. The subsurface stratigraphy revealed outside the exposed bedrock area generally comprised a surficial topsoil layer over cohesionless sand extending to shallow bedrock. No groundwater was encountered in any of the boreholes. However, the groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.3.1 Topsoil/Peat

Topsoil was present surficially in 14 boreholes. The thickness of this unit was 100 mm except in borehole 603-11N where it reached 200 mm.

A surficial deposit of peat identified in borehole 603-5S had a thickness of 100 mm.

4.3.2 Sand/Silt

Directly beneath the topsoil at elevation 220.4 to 232.7 in 10 boreholes was cohesionless sand (silty sand in borehole 603-1M). This stratum ranged in thickness from 0.1 to 0.8 m, locally 1.7 m, and was penetrated at depths of 0.2 to 1.8 m (elevation 219.7 to 231.9). It is noteworthy that boulders were encountered within the sand in 3 boreholes.

A 700 mm thick layer of silt was revealed below the peat at elevation 222.3 in borehole 603-5S.

4.3.3 Bedrock

Bedrock was exposed at elevation 220.4 to 233.7 in 18 boreholes and inferred at depths of 0.1 to 1.8 m (elevation 219.7 to 231.9) in the remaining boreholes.



4.4 Swamp 604

A total of 30 boreholes were advanced in swamp 604. Boreholes planned at seven locations for this crossing will be drilled in future when permission to enter is received.

Bedrock is exposed at both limits of the crossing. The subsurface stratigraphy revealed in the boreholes put down between the exposed bedrock locations generally comprised a surficial topsoil/peat layer over cohesionless loose sand, locally underlain by cohesive soft clayey silt, extending to shallow bedrock.

4.4.1 Topsoil/Peat

Topsoil was present surficially in 13 boreholes. The thickness of this unit was 100 mm except in boreholes 604-7N and 604-5S where it reached 200 mm.

A surficial deposit of peat was identified in boreholes 604-3M, 604-8N, 604-6S, 604-8S and had a thickness of 100 mm.

The topsoil/peat was penetrated at elevation 229.3 to 237.9.

4.4.2 Sand

Directly beneath the topsoil/peat at elevation 229.7 to 237.9 in 13 boreholes was cohesionless sand. This stratum was loose in relative density and varied in thickness between 100 and 800 mm. The sand was penetrated at depths of 0.2 to 0.9 m (elevation 229.5 to 237.8).

4.4.3 Clayey Silt

Underlying the sand at 0.6 m depth (elevation 230.2) in borehole 604-2M was a layer of cohesive clayey silt. This unit was 300 mm thick and soft in consistency.



4.4.4 Bedrock

Bedrock was exposed at elevation 228.8 to 240.0 in 13 boreholes and inferred at depths of 0.1 to 0.9 m (elevation 229.3 to 237.8) in the remaining boreholes.

4.4.5 Groundwater

In the process of augering, groundwater was encountered at a depth of 0.6 m (elevation 230.2) in borehole 604-2M. No water was observed in any of the other boreholes during or upon completion of drilling. The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.5 Swamp 605

A total of 101 test holes comprising 79 boreholes and 22 dynamic cone penetration tests were carried out in swamp 605. The alignment crosses a major low-lying swamp section extending from approximate Sta. 14+280 to Sta. 14+500 on the northbound lanes and between Sta. 14+245 and 14+410 on the southbound lanes of the highway.

Exposed bedrock was found at both limits of the crossing. The subsurface stratigraphy revealed in the low-lying swamp section generally comprised a surficial peat/topsoil layer overlying cohesionless very loose to compact silt/sand and/or cohesive soft to firm silty clay/clayey silt extending to bedrock.

4.5.1 Peat/Topsoil

A surficial deposit of peat was identified in 50 boreholes. The peat had a thickness of 0.1 to 3.0 m, moisture content of 310 to 918% and was penetrated at elevation 231.0 to 247.8.

Topsoil was present surficially in seven boreholes. This unit was 100 to 300 mm thick and penetrated at elevation 233.7 to 241.5.



4.5.2 Silty Clay/Clayey Silt

A deposit of cohesive soils was encountered at depths of 0.1 to 4.6 m (elevation 229.3 to 238.4) in 35 boreholes. Consisting of layered silty clay and clayey silt, this deposit varied in thickness between 0.3 and 12.1 m. The deposit was very soft to hard in consistency, typically soft to firm. The results of in situ vane shear testing carried out in the silty clay/clayey silt at depths of 2.5 to 11.5 m indicate the undisturbed shear strength values in a range of 10 to 52 kPa, typically 18 to 26 kPa (soil sensitivity is 2 to 4). The moisture content was 21 to 51%, typically 26 to 42%, in the clayey silt and 25 to 63%, typically 30 to 53%, in the silty clay units. The results of Atterberg limits testing and grain size distribution analyses performed on the cohesive soil samples are presented in Figures 605-PC-1, 605-PC-2 and 605-1, 605-2 respectively (Appendix A). The liquid and plastic limits of the clayey silt ranged from 24 to 32 and from 18 to 21 respectively, with the plasticity index of 4 to 13. The liquid and plastic limits of the silty clay were 37 to 49 and 20 to 21 respectively, thus giving the plasticity index of 17 to 29. The cohesive soils were penetrated at depths of 0.9 to 14.5 m (elevation 219.5 to 237.2).

4.5.3 Silt/Sand

Overlain in 29 boreholes by the peat/topsoil at elevation 231.2 to 237.2 and/or by the cohesive soils at depths of 3.0 to 14.5 m (elevation 219.5 to 230.9) was silt and/or sandy silt. This stratum was 0.1 to 9.4 m thick and very loose to compact (SPT-N values of 0 to 26). The moisture content of the silt/sandy silt was typically 20 to 28%, locally up to 48%. The results of grain size distribution analyses performed on the silt are presented in Figure 605-3 (Appendix A). The stratum was penetrated at depths of 0.2 to 22.0 m (elevation 212.0 to 236.7).

Cohesionless sand or silty sand underlay the peat/topsoil at elevation 234.4 to 247.8 in 12 boreholes or silt at depths of 16.7 and 20.1 m (elevation 217.2 and 213.9) in boreholes 605-26S and 605-8M respectively. The thickness of this unit was typically 0.1 to 1.0 m except in borehole 605-8M where it increased to 2.5 m. The sand/silty sand was loose to compact in relative density (SPT-N values of up to 21), its moisture content varying between 14 and 17%. The unit was penetrated at typical depths of 0.2 to 1.1 m (elevation 234.2 to 247.7), in boreholes 605-26S and 605-8M – at 17.7 and 22.6 m (elevation 216.2 and 211.4) respectively.



4.5.4 Bedrock

Bedrock was exposed at elevation 235.6 to 246.7 in 22 boreholes and inferred by refusal at depths of 0.1 to 27.1 m (elevation 206.8 to 247.7) in the remaining test holes, with the exception of boreholes 605-10N and 605-12N terminated at respective depths of 4.9 and 2.2 m (elevation 231.9 and 234.5).

4.5.5 Groundwater

In the course of the field work, groundwater was observed in 23 boreholes. In the process of augering, water was encountered at depths of 1.8 to 9.1 m (elevation 224.9 to 232.1). Upon completion of drilling, groundwater was measured to be at depths of 0.0 to 13.7 m (elevation 220.3 and 238.7). The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.6 Swamp 606

A total of 19 boreholes were advanced in swamp 606. The original northern limit of this crossing was extended to the southern limit of the adjacent swamp 607 in view of cohesive soil cover found along the southbound lanes. A soil cover along the crossing was encountered in 7 of the 16 boreholes. Bedrock was exposed at the other nine borehole locations.

Bedrock is exposed in six boreholes and overlain by shallow topsoil/peat in another five boreholes. The subsurface stratigraphy revealed in the boreholes put down outside the exposed bedrock locations generally comprised a surficial topsoil/peat layer overlying cohesionless loose to very loose sand/silt and/or cohesive soft to very stiff clayey silt extending to bedrock.

4.6.1 Topsoil/Peat

Topsoil was present surficially in 10 boreholes. This unit was 100 to 300 mm thick and penetrated at elevation 247.0 to 254.4.



A surficial deposit of peat was identified in boreholes 606-4S, 606-5S and 606-7S. The peat had a thickness of 100 to 300 mm and was penetrated at elevation 246.2 to 247.1.

4.6.2 Sand/Silt

Cohesionless sand or silt of various granulometric composition (successive layers of silt, sand and silty sand in borehole 606-9S) was revealed below the topsoil/peat at elevation 246.2 to 252.8 in 8 boreholes. The sand/silt unit ranged in thickness from 0.1 to 1.1 m and was loose to very loose in relative density. The moisture content determined on a sample of sandy silt was about 28%. These strata were penetrated at depths of 0.2 to 1.2 m (elevation 245.3 to 252.7).

4.6.3 Clayey Silt

Overlain by the sand/silt at 1.2 m depth (elevation 245.3 to 246.0) in boreholes 606-4S, 606-5S and 606-7S was cohesive clayey silt. Having a moisture content of about 20%, this unit was 2.1 to 2.9 m thick and soft to very stiff in consistency. The clayey silt was penetrated at depths of 3.3 to 4.1 m (elevation 242.4 to 243.9).

4.6.4 Bedrock

Bedrock was exposed at elevation 249.6 to 255.7 in 6 boreholes and inferred by refusal at depths of 0.1 to 4.1 m (elevation 242.4 to 254.4) in the remaining boreholes.

4.6.5 Groundwater

In the process of augering, groundwater was encountered at depths of 0.3 to 1.5 m (elevation 245.1 to 246.2) in boreholes 606-4S, 606-5S and 606-7S. No water was observed in any of the other boreholes during or upon completion of drilling. The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.7 Swamp 607

A total of 32 test holes comprising 28 boreholes and 4 dynamic cone penetration tests were carried out in swamp 607.



Bedrock is exposed at both limits of the crossing. The highway alignment is skewed in relation to the rock outcrop contour topography. The subsurface stratigraphy revealed in the swamp section generally comprised a surficial topsoil/peat layer overlying cohesionless very loose to compact silt/sand and/or cohesive firm to very stiff clayey silt extending to bedrock.

4.7.1 Topsoil/Peat

Topsoil was present surficially in 9 boreholes. This unit was 100 to 300 mm thick and penetrated at elevation 244.8 to 246.4 (252.7 in borehole 607-12S).

A surficial deposit of peat was identified in 7 boreholes. The peat had a thickness of 200 to 500 mm and a moisture content of about 45%. This deposit was penetrated at elevation 243.7 to 245.6.

4.7.2 Clayey Silt

Cohesive clayey silt was encountered beneath the topsoil/peat at elevation 245.2 to 246.4 in 7 boreholes and below silt at a depth of 0.9 m (elevation 244.6) in borehole 607-8N. This unit was 0.9 to 2.8 m in thickness and typically firm to stiff in consistency. The moisture content determined on one sample of the unit was about 19%. The results of Atterberg limits testing and grain size distribution analyses performed on the clayey silt are presented in respective Figures 607-PC-1 and 607-1 (Appendix A). The liquid and plastic limits of the material ranged from 28 to 35 and from 18 to 20 respectively, thus giving the plasticity index of 10 to 17. The clayey silt was penetrated at depths of 1.1 to 3.0 m (elevation 242.8 to 245.2).

4.7.3 Silt/Sand

Underlying the topsoil/peat at elevation 243.7 to 245.2 in 7 boreholes and clayey silt at 3.0 m depth (elevation 242.8) in borehole 607-2S was silt. This stratum was 0.4 to 2.2 m thick and very loose to dense (SPT-N values of 2 to 43). The moisture content of the silt varied between 15 and 21%. The results of Atterberg limits testing and grain size distribution analyses performed on the silt are presented in respective Figures 607-PC-2 and 607-2 (Appendix A). The liquid and plastic



limits of the material ranged from 18 to 21 and from 15 to 16 respectively, thus giving the plasticity index of 2 to 6. The silt was penetrated at depths of 0.7 to 5.2 m (elevation 240.6 to 244.6).

Overlain by the peat at elevation 245.2 in borehole 607-4S or silt at 1.2 m depth (elevation 243.8) in borehole 607-3M was a layer of cohesionless sand. Being compact in relative density, this unit had a moisture content of about 8% and thickness of 1.0 m in the former borehole and 0.6 m in the latter. The sand was penetrated at respective depths of 1.5 and 1.8 m (elevation 244.2 and 243.2).

4.7.4 Bedrock

Bedrock was exposed at elevation 246.8 to 254.5 in 12 boreholes and inferred by refusal at depths of 0.1 to 5.2 m (elevation 240.6 to 252.7) in the remaining test holes, with the exception of borehole 607-10N terminated at 1.2 m depth (elevation 243.5).

4.7.5 Groundwater

Groundwater was observed in 3 boreholes in the course of the field work. In borehole 607-11N, water was encountered at a depth of 1.5 m (elevation 242.4) both during and upon completion of drilling. Groundwater was measured in boreholes 607-5N and 607-2S to be at respective depths of 1.5 and 3.0 m (elevation 244.5 and 242.8) after augering was complete. The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.8 Swamp 608

A total of 79 boreholes were advanced in swamp 608. Bedrock is exposed at 11 borehole locations and overlain by shallow peat/topsoil in another 12 boreholes. The subsurface stratigraphy revealed in the boreholes put down outside the exposed bedrock locations generally comprised a surficial peat/topsoil layer overlying cohesionless sand extending to shallow bedrock. A layer of fill was encountered in boreholes 608-25S and 608-30S.



4.8.1 Peat/Topsoil

Topsoil was present surficially in 25 boreholes located north of the existing Highway 69. This unit had a thickness of 100 to 300 mm, except in borehole 608-31N where it reached 600 mm, and was penetrated at elevation 231.8 to 244.6.

A surficial deposit of peat was revealed in 30 boreholes mostly drilled to the south of the existing Highway 69. This deposit was 100 to 300 mm thick and had a moisture content of 200 to 265%. The peat was penetrated at elevation 230.5 to 249.8.

4.8.2 Sand/Silt

Cohesionless sand and/or silty sand was present surficially at elevation 233.1 to 245.0 in 9 boreholes or encountered below the peat/topsoil (and silt/sandy silt in boreholes 608-16N and 608-32N) at depths of 0.1 to 0.6 m (elevation 230.5 to 245.8) in 40 boreholes. The sandy soils ranged in thickness from 0.1 to over 2.2 m and had a moisture content of 14 to 24%. The sand/silty sand was penetrated at depths of 0.2 to 2.2 m (elevation 229.3 to 244.6).

A 0.2 to 1.7 m thick layer of silt or sandy silt was identified directly beneath the peat/topsoil at elevation 232.4 to 244.1 in boreholes 608-16N, 608-32N to 608-34N and penetrated at elevation 231.9 to 242.8.

4.8.3 Bedrock

Bedrock was exposed at elevation 237.5 to 246.9 in 11 boreholes and inferred at depths of 0.1 to 2.2 m (elevation 229.3 to 249.8) in 54 boreholes. No bedrock was contacted in 14 boreholes terminated at depths of 0.6 to 2.3 m (elevation 229.5 to 243.9).

4.8.4 Groundwater

Upon completion of drilling, groundwater was encountered at 0.5 m depth (elevation 232.0) in borehole 608-16N. No water was observed in any of the other boreholes during or upon



completion of drilling. The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.9 Swamp 609

A total of 49 boreholes were advanced in swamp 609. Bedrock is exposed at 15 borehole locations and overlain by shallow topsoil in another 12 boreholes. The subsurface stratigraphy revealed outside the exposed bedrock locations generally comprised a surficial topsoil layer over cohesionless silt extending to shallow bedrock. No groundwater was encountered in any of the boreholes. However, the groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.9.1 Topsoil

Topsoil was present surficially in 34 boreholes and had a thickness of 100 mm.

4.9.2 Silt

Directly beneath the topsoil at elevation 237.9 to 253.6 in 21 boreholes was cohesionless silt (sandy silt in borehole 609-1S). Identified as loose to compact in relative density, this stratum ranged in thickness from 0.1 to about 1.6 m, locally 3.0 m, and was penetrated at depths of 0.2 to 3.1 m (elevation 236.8 to 252.5). Boreholes 609-5M, 609-15N, 609-1S and 609-15S were terminated within the silt/sandy silt at depths of 0.2 to 1.7 m (elevation 243.1 to 248.8).

4.9.3 Bedrock

Bedrock was exposed at elevation 239.6 to 252.9 in 15 boreholes and inferred at depths of 0.1 to 3.1 m (elevation 236.8 to 252.5) in 30 boreholes. No bedrock was contacted in 4 boreholes.

4.10 Swamp 610

A total of 80 test holes comprising 60 boreholes and 20 dynamic cone penetration tests were carried out in swamp 610.



Bedrock is exposed in 4 boreholes and overlain by shallow peat in another 7 boreholes. The subsurface stratigraphy revealed in the boreholes advanced within the swamp limits generally comprised a surficial peat layer overlying cohesionless loose sandy/silty soils and/or a cohesive deposit of firm clayey silt/silty clay/clay extending to bedrock.

4.10.1 Peat

A surficial deposit of peat was present in 56 boreholes. The peat had a thickness of 0.1 to 0.5 m, increasing to 1.5 m in borehole 610-33S, and was penetrated at elevation 252.1 to 255.6.

4.10.2 Clayey Silt/Silty Clay/Clay

Overlain by the peat at elevation 252.1 to 255.3 in 22 boreholes or silty sand at depths of 0.5 to 1.5 m (elevation 252.3 to 253.7) in 20 boreholes was a cohesive deposit of clayey silt/silty clay/clay. Having a thickness of 0.3 to 7.4 m, this deposit was typically firm in consistency. Pocket penetrometer tests conducted on cohesive soil samples indicate a shear strength varying broadly from 25 to 225 kPa. The results of in situ vane shear testing mainly carried out in the silty clay yielded the undisturbed shear strength values in a range of 25 to 90 kPa, typically up to 50 kPa (soil sensitivity is 3 to 5). The moisture content of the clayey silt was 21 to 37%.

The results of Atterberg limits testing and grain size distribution analyses performed on the clay/silty clay/clayey silt are presented in Figures 610-PC-1 to 610-PC-3 and 610-1 to 610-3 respectively (Appendix A). The liquid and plastic limits of the clayey silt ranged from 23 to 33 and from 16 to 19 respectively, with the plasticity index of 7 to 13. The liquid and plastic limits of the silty clay were 37 to 45 and 21 to 22 respectively, thus giving the plasticity index of 16 to 23. The liquid and plastic limits of the clay were 57 and 24 respectively, with the plasticity index of 33. The deposit was penetrated at depths of 0.5 to 7.9 m (elevation 245.8 to 254.7).

4.10.3 Sand/Silt

Directly beneath the peat at elevation 253.4 to 255.3 and/or below the clayey deposit (silt in borehole 610-12S) at depths of 0.6 to 7.9 m (elevation 246.3 to 254.7) was cohesionless silty sand/sand. This unit ranged in thickness from 0.2 to 1.4 m and was very loose to compact



(SPT-N values of 2 to 23). The moisture content of the silty sand was 21 to 29%. These strata were penetrated at depths of 0.4 to 8.4 m (elevation 245.8 to 254.7).

Non-plastic silt or sandy silt was encountered at depths of 0.2 to 6.4 m (elevation 247.8 to 255.6) in 12 boreholes. The silt/sandy silt was 0.2 to 2.5 m thick and very loose to compact in relative density (SPT-N values of 0 to 20). This material had a moisture content of 18 to 27%. The silt/sandy silt was penetrated at depths of 0.6 to 7.9 m (elevation 246.3 to 254.7).

A layer of sand and gravel was identified at depths of 1.7 to 7.9 m (elevation 245.8 to 252.1) in 4 boreholes. This layer had a thickness of 0.3 to 2.3 m and extended to bedrock. The relative density of the sand and gravel was loose to dense (SPT-N values of 5 to 34).

4.10.4 Bedrock

Bedrock was exposed at elevation 254.7 to 255.7 in 4 boreholes and inferred by refusal at depths of 0.1 to 8.4 m (elevation 245.4 to 255.2) in the remaining test holes.

4.10.5 Groundwater

In the course of the field work, groundwater was observed in 22 boreholes. In the process of augering, water was encountered at depths of 4.5 to 7.3 m (elevation 246.4 to 249.7). Upon completion of drilling, groundwater was measured in 20 boreholes to be at depths of 0.6 to 6.7 m (elevation 247.6 to 254.8).

4.11 Swamp 611

A total of 62 test holes comprising 50 boreholes and 12 dynamic cone penetration tests were carried out in swamp 611.

Bedrock is exposed at the south limit of the crossing. The subsurface stratigraphy revealed outside the exposed bedrock area generally comprised a surficial peat/topsoil layer over cohesionless very loose to compact silt and/or very loose to very dense sand extending to bedrock. Cohesive clayey silt was encountered in four boreholes.



4.11.1 Peat/Topsoil

A surficial deposit of peat was identified in 26 boreholes. The peat had a thickness of 100 to 300 mm and was penetrated at elevation 226.3 to 236.8.

Topsoil was present surficially in 8 boreholes. This unit was 100 to 200 mm thick and penetrated at elevation 232.1 to 238.2.

Neither peat nor topsoil was encountered in borehole 611-18S.

4.11.2 Clayey Silt

Overlain by the peat at elevation 226.6 to 227.9 in boreholes 611-9N, 611-13S, 611-14S and by sand at 1.2 m depth (elevation 228.4) in borehole 611-15S was cohesive clayey silt. This unit was 0.9 to 1.2 m thick and soft to very soft in consistency. The results of an Atterberg limits test and grain size distribution analysis performed on the clayey silt are presented in respective Figures 611-PC-1 and 611-1 (Appendix A). The liquid and plastic limits of the material were 24 and 18 respectively, with the plasticity index of 6. The clayey silt was penetrated at depths of 1.1 to 2.4 m (elevation 225.7 to 227.2).

4.11.3 Silt/Sand

Directly beneath the peat at elevation 228.1 to 236.8 in 15 boreholes and below the clayey silt at a depth of 2.4 m (elevation 227.2) in borehole 611-15S was silt or sandy silt. This stratum was 0.6 to 2.0 m thick and very loose to compact (SPT-N values of 1 to 14). The moisture content of the sandy silt varied between 20 and 39%. The results of an Atterberg limits test and grain size distribution analysis performed on the silt are presented in respective Figures 611-PC-2 and 611-2 (Appendix A). The liquid and plastic limits of the material were 16 and 14 respectively, thus giving the plasticity index of 2. The silt/sandy silt was penetrated at depths of 0.9 to 2.1 m (elevation 227.1 to 235.8), in borehole 611-15S at 4.4 m (elevation 225.2).

Present surficially in borehole 611-18S and underlying the peat/topsoil or silt of various granulometric composition at depths of 0.1 to 2.1 m (elevation 225.7 to 238.2) in 33 boreholes



was cohesionless sand and/or silty sand. Having a moisture content of 19 to 24%, locally 4%, this unit was 0.1 to 8.3 m thick and very loose to very dense in relative density (SPT-N values of up to 73). The results of grain size distribution analyses conducted on the sand/silty sand are presented in Figure 611-3 (Appendix A). The unit was penetrated at depths of 0.3 to 10.4 m (elevation 219.6 to 237.4). It is noteworthy that cobbles and/or boulders were encountered within the sand/silty sand in 7 boreholes.

4.11.4 Bedrock

Bedrock was exposed at elevation 229.2 to 247.8 in 15 boreholes and inferred by refusal at depths of 0.2 to 12.6 m (elevation 219.4 to 237.5) in the remaining test holes.

4.11.5 Groundwater

In the course of the field work, groundwater was observed in 23 boreholes. In the process of augering, water was encountered at depths of 0.3 to 2.4 m (elevation 225.7 to 235.8). Upon completion of drilling, groundwater was measured to be at depths of 0.0 to 4.6 m (elevation 226.0 and 235.1). The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.12 High Fill 613

This crossing is naturally divided into two areas by the Wanapitei River. A total of 142 test holes comprising 131 boreholes and 11 dynamic cone penetration tests were carried out in this crossing. In the area situated south of the river, 33 boreholes were put down; a total of 109 test holes comprising 98 boreholes and 11 dynamic cone penetration tests were advanced to the north of the river.

On the south side of the Wanapitei River, bedrock was exposed in 8 boreholes and overlain by 100 to 300 mm of topsoil in another 14 boreholes. In the remaining 11 boreholes, the topsoil was underlain by 0.1 to 1.9 m of cohesive clayey silt and/or cohesionless sandy/silty soils extending to bedrock. Groundwater was measured in 7 boreholes to be at depths of 0.1 to 0.9 m



(elevation 218.3 to 225.9). The bedrock surface was contacted at depths of 0.0 to 2.0 m (elevation 217.0 to 232.7).

The subsurface stratigraphy revealed on the north side of the river generally comprised a surficial topsoil/peat layer overlying cohesionless very loose to loose silt/sand and/or cohesive firm clayey silt/silty clay/clay extending to bedrock. Bedrock was exposed at the north limit of the crossing.

4.12.1 Topsoil/Peat

Topsoil was present surficially in 73 boreholes. This unit was 100 to 500 mm thick and penetrated at elevation 217.9 to 226.8.

A surficial deposit of peat was identified in 12 boreholes. This deposit was 100 to 400 mm thick and penetrated at elevation 218.0 to 221.5. The moisture content of the peat was about 75%.

4.12.2 Clayey Silt/Silty Clay/Clay

Cohesive soils were encountered below the topsoil, peat or silty/sandy soils at depths of 0.1 to 9.4 m (elevation 212.5 to 225.3) in 83 boreholes. Consisting of layered clayey silt, silty clay and/or clay, these soils varied in thickness between 0.3 and 13.8 m. The clayey silt/silty clay/clay layers were soft to stiff in consistency, typically firm, and had a moisture content of 24 to 74%. Pocket penetrometer tests conducted on cohesive soil samples indicate a shear strength of 15 to 160 kPa with a typical range of 40 to 100 kPa. The results of in situ vane shear testing yielded the undisturbed shear strength values in a range of 14 to over 100 kPa, typically 30 to 50 kPa (soil sensitivity is 3 to 5). Three unconfined compression tests produced a shear strength of 28 to 34 kPa. The results of Atterberg limits testing and grain size distribution analyses performed on the clay/silty clay/clayey silt are presented in Figures 613-PC-1 to 613-PC-3 and 613-1 to 613-3 respectively (Appendix A). The liquid and plastic limits of the clayey silt ranged from 24 to 26 and from 18 to 21 respectively, with the plasticity index of 4 to 7. The liquid and plastic limits of the silty clay were 45 to 48 and 22 to 23 respectively, thus giving the plasticity index of 23 to 25. The liquid and plastic limits of the clay were 51 to 69 and 23 to 25 respectively, with the plasticity index of 28 to 44. The cohesive soils were penetrated at depths of 2.1 to 18.0 m (elevation 206.4 to 220.4).



4.12.3 Silt/Sand

Encountered below the topsoil at elevation 217.9 to 224.4 in 10 boreholes and/or below clayey/sandy soils at depths of 0.9 to 18.0 m (elevation 206.4 to 224.2) was silt and/or sandy silt. This stratum was typically 0.7 to 12.8 m thick and very loose to compact (SPT-N values of 0 to 31). The moisture content of the silt varied between 19 and 31%, locally increasing to 41%. The results of Atterberg limits testing and grain size distribution analysis conducted on the silt are presented in Figures 613-PC-4 and 613-4 respectively (Appendix A). The liquid and plastic limits of the material were 22 and 19 respectively, with the plasticity index of 3. The confirmed depth of penetration of the silt/sandy silt was in a range of 5.1 to 20.1 m (elevation 201.9 to 220.0), locally 28.5 and 29.0 m (elevation 193.2 and 195.7).

Cohesionless sand and/or silty sand underlay the topsoil/peat at elevation 218.8 to 226.8 in 38 boreholes and/or the silty/clayey soils at depths of 0.5 to 20.1 m (elevation 201.9 to 224.1), locally 28.5 m (elevation 193.2). This layer was 0.7 to 12.1 m thick, very loose to dense in relative density (SPT-N values of 0 to 61) and had a moisture content of 10 to 32%. The results of grain size distribution analyses performed on the silty sand and sand are presented in respective Figures 613-5 and 613-6 (Appendix A). The sand/silty sand was penetrated at confirmed depths of 0.8 to 20.7 m (elevation 198.5 to 225.3), locally 29.9 to 32.7 m (elevation 189.0 to 191.3).

A layer of gravelly sand with cobbles and boulders was encountered at 29.0 m depth (elevation 195.7) in borehole 537-7. This layer was 3.6 m in thickness and dense (SPT-N values of 38). It is worth noting that cobbles and boulders were also present in borehole 537-8.

4.12.4 Bedrock

Bedrock was exposed at elevation 228.6 to 230.7 in 6 boreholes and inferred by refusal at depths of 0.8 to 32.7 m (elevation 189.0 to 225.3) in 21 test holes. At the revised Highway 537 structure at approximate Sta. 10+700, Highway 69 chainage, bedrock was confirmed in three boreholes to be at depths of 29.9 to 32.6 m (elevation 190.6 to 192.1). No bedrock was contacted in the remaining test holes terminated at depths of 8.5 to 34.0 m (elevation 188.0 to 218.5).



4.12.5 Groundwater

In the course of the field work, groundwater was observed in 59 boreholes. In the process of augering, water was encountered at depths of 0.3 to 6.7 m (elevation 214.0 to 224.9), locally 10.4 to 15.2 m (elevation 204.6 to 210.4). Upon completion of drilling, groundwater was measured to be at depths of 0.1 to 13.7 m (elevation 207.7 to 226.0), locally up to 18.9 m (elevation 203.1). It is worth mentioning that the water level in the Wanapitei River was at elevation 216.1 in April 2004. The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.

4.13 Swamp 101

A total of 96 boreholes and 5 dynamic cone penetration tests were carried out in swamp 101. The swamp 101 crossing comprises a low-lying swamp section about 120 m long between Sta. 10+980 and Sta. 11+100 in the northbound lanes and between Sta. 11+000 and Sta. 11+120 in the southbound lanes bounded by typical rock outcrop environments with earth pockets to the north and south.

The stratigraphy south of the swamp section comprised rock outcrops and relatively shallow soil cover. The soil typically consisted of topsoil and silt extending to depths of up to 0.8 m. The bedrock surface ranged from elevation 221.7 to 233.1.

North of the swamp area, the depth of soil cover was variable, comprising up to 200 mm of peat or topsoil underlain by generally compact silts and sands with cobbles, overlying probable bedrock. The probable bedrock was encountered at depths of 0.0 to 11.3 m (elevation 223.9 to 246.8).

The soil stratigraphy in the 120 m long swamp section comprised deposits of peat and cohesive clays overlying cohesionless deposits, including a local veneer of till above bedrock. The strata encountered in this section are described below.



4.13.1 Peat

The peat encountered at the surface of the low-lying swamp section of the crossing increased in relative depth from 2.0 to 7.7 m in a westerly direction. Some 100 to 150 mm of peat or topsoil was encountered elsewhere in the swamp. The moisture content of peat samples varied from 259 to 713%.

4.13.2 Silt/Sand

Deposits of loose cohesionless sandy silt and medium to coarse sand were encountered below the peat at separate locations. The silt/sand deposits were 1.0 to 2.9 m thick and extended to depths ranging from 1.2 to 8.6 m.

4.13.3 Clay/Silty Clay/Clayey Silt

Cohesive silty clay, clay and clayey silt deposits were encountered below the peat and isolated sandy silt and sand layers in most boreholes drilled within the swamp section. The cohesive soil units extended to variable depths between 2.8 and 8.9 m (elevation 212.1 to 218.8) along the northbound lanes and from 0.8 to 10.4 m (elevation 210.4 to 220.4) in the southbound lanes. The materials were typically soft to firm, with stiff and very stiff zones. The moisture content of the cohesive soil samples varied widely from about 20 to 58%, locally 135% immediately below the peat.

4.13.4 Silt/Sand

Deposits of cohesionless silt, sandy silt, gravelly sand and sand were encountered below the cohesive deposits. The materials extended to depths ranging from 3.0 to 16.1 m (elevation 204.7 to 218.6) in the northbound lanes and 2.4 to 10.4 m (elevation 210.4 to 218.4) in the southbound lanes. The soil units were in loose to dense condition, with a moisture content of about 10 to 30%, typically 20 to 30%.



Localized glacial till deposits comprising cohesionless sandy silt and silty sand were encountered primarily in the southbound alignment below the cohesive and cohesionless soils. The till was very loose to very dense in relative density. The till extended to depths of 6.1 to 13.0 m and overlay probable bedrock encountered at depths ranging from about 6.4 to 13.1 m.

4.13.5 Bedrock

Probable bedrock was inferred below the cohesionless silt, sand and localized glacial till units at depths of 3.0 to 16.1 m (elevation 204.7 to 218.6) in the northbound boreholes and 2.4 to 12.7 m (elevation 208.1 to 218.4) in the southbound lanes. Probable bedrock was found as deep as 20.4 m (elevation 200.3) in dynamic cone penetration tests.

4.13.6 Groundwater

Groundwater was encountered in most of the boreholes drilled within the swamp section at about the level of the ground surface (elevation 220.7 to 221.2). North of the swamp section, perched water was revealed in several boreholes between elevation 229.0 and 232.5. The groundwater levels at the site are subject to seasonal fluctuations and rainfall patterns.



5. CLOSURE

Messrs. C. Bondar, R. Elliot, S. Heino, V. Khanamirian, F. Portela, and M. Rapsey carried out the field investigation for this study under the supervision of Mr. P. Cullen, P.Eng., Field Engineer, and direction of Mr. C.M.P. Nascimento, P.Eng., Senior Foundation Engineer.

This report was prepared by Mr. G.O. Degil, PhD, P.Eng., Senior Foundation Engineer, and was reviewed by Mr. D.W. Kerr, MEng, P.Eng., Chief Foundation Engineer. Mr. B.R. Gray, MEng, P.Eng., MTO Designated Contact, conducted an independent review of the report.

Yours very truly,

Peto MacCallum Ltd.

Grigory O. Degil, PhD, P.Eng.
Senior Foundation Engineer

Dennis W. Kerr, MEng, P.Eng.
Chief Foundation Engineer

Brian R. Gray, MEng, P. Eng.
MTO Designated Contact

DG/DWK:dg-lad-mi

TABLE A
SUMMARY OF SUBSOIL CONDITIONS

SWAMP NO.	ROAD COMPONENT	NO. OF TEST HOLES ⁽¹⁾	PEAT/TOPSOIL THICKNESS ⁽²⁾ (m)	DEPTH TO BOTTOM OF CLAY ⁽²⁾ (m)	DEPTH TO PROBABLE BEDROCK ⁽³⁾ (m)	NOTES AND/OR SOIL PROFILE
601 Twp of Burwash Sta. 11+786.5 to 12+236.5 Hwy 69 Mainline	Hwy 69 NBL Sta. 11+786.5 to 12+080	36	0.0 - 1.5, locally 2.7	0.0 - 5.5	0.0 - 17.7 (El. 207.3 - 225.5)	Exposed bedrock in 1 borehole. Peat present in all boreholes overlies cohesionless very loose to dense (typically loose) sandy and/or silty deposits extending to bedrock.
	Sta. 12+080 to 12+180	12	2.4 - 2.9, locally 0.3	3.7 - 9.0, locally 12.8	6.9 - 22.4 (El. 200.0 - 215.6)	Peat overlies cohesionless very loose to compact sand and/or silt extending to bedrock and containing layers of cohesive soft to stiff silty clay and/or clayey silt.
	Sta. 12+180 to 12+236.5	4	0.3	NE	1.6 - 6.6 (El. 217.2 - 224.4)	Peat underlain by cohesionless loose to compact sand overlying bedrock
	Hwy 69 SBL Sta. 11+786.5 to 11+910	8	0.0 - 1.0, locally 2.0	NE	0.0 - 11.7 (El. 212.8 - 224.5)	Exposed bedrock in 2 boreholes. Peat overlies bedrock in 2 boreholes or cohesionless very loose to compact sand and gravel, sand and silt, sand and/or silty sand extending to bedrock.
	Sta. 11+910 to 12+020	6	0.1 - 1.1	3.1 - 5.7	Over 8.1 - 19.9 (El. 203.1 - under 214.9)	Peat underlain by cohesive firm to stiff silty clay or clayey silt and cohesionless very loose to dense sandy and/or silty deposits. Probable bedrock reached in 1 dynamic cone penetration test.
	Sta. 12+020 to 12+236.5	16	0.0 - 3.2	NE	0.0 - over 19.5 (El. under 203.2 - 232.5)	Exposed bedrock in 5 boreholes put down near the north limit of the crossing. Peat overlies bedrock in 1 borehole or cohesionless very loose to compact sand and/or silt extending to bedrock.

NE - Not Encountered

TABLE A
SUMMARY OF SUBSOIL CONDITIONS

SWAMP NO.	ROAD COMPONENT	NO. OF TEST HOLES ⁽¹⁾	PEAT/TOPSOIL THICKNESS ⁽²⁾ (m)	DEPTH TO BOTTOM OF CLAY ⁽²⁾ (m)	DEPTH TO PROBABLE BEDROCK ⁽³⁾ (m)	NOTES AND/OR SOIL PROFILE
602 Twp of Burwash Sta. 12+586.5 to 12+966.5 Hwy 69 Mainline	<u>Hwy. 69 NBL</u> Sta. 12+586.5 to 12+655	10	0.1 - 0.3	NE	0.8 - 5.7 (El. 229.8 - 233.4)	Peat present in all boreholes overlies non-plastic very loose to compact silt, underlain by cohesionless compact sand in 2 boreholes, extending to bedrock.
	Sta. 12+655 to 12+720	8	0.1 - 0.3, locally 1.2	3.5 - 7.0, locally 1.2	4.1 - 11.4 (El. 221.7 - 228.7)	Peat present in all boreholes overlies cohesive firm to stiff silty clay/clayey silt and/or cohesionless very loose to compact silt extending to bedrock.
	Sta. 12+720 to 12+820	12	0.1 - 0.2	3.0 NE in 11 holes	0.2 - 4.5 (El. 230.6 - 235.1)	Peat overlies bedrock in 1 borehole or non-plastic very loose to compact silt, underlain by a 1.5 m thick layer of cohesive firm silty clay in 1 borehole, extending to bedrock.
	Sta. 12+820 to 12+966.5	22	0.0 - 0.3, locally 1.2	0.0 - 15.1	1.9 - 26.8 (El. 206.4 - 234.0)	Up to 900 mm of surface snow/ice at 9 borehole locations. Peat/topsoil identified in 11 boreholes overlies interlayered deposits of non-plastic very loose to dense (typically loose to compact) silt and cohesive firm to very stiff silty clay/clayey silt extending to bedrock.
	<u>Hwy 69 SBL</u> Sta. 12+586.5 to 12+620	4	0.1 - 0.2	NE	0.4 - over 3.8 (El. under 230.9 - 236.4)	Peat present in all boreholes overlies non-plastic very loose to compact silt extending to bedrock.
	Sta. 12+620 to 12+720	11	0.0 - 0.4	1.9 - 7.9	1.9 - 14.8 (El. 216.7 - 231.1)	Peat found in 8 boreholes overlies cohesionless very loose to compact silt/sandy silt and cohesive firm to very stiff silty clay and/or clayey silt extending to bedrock.
	Sta. 12+720 to 12+805	9	0.1 - 0.2	NE	0.2 - 4.9 (El. 230.2 - 235.5)	Peat present in all boreholes overlies bedrock in 1 borehole or cohesionless loose to compact silt/silty sand extending to bedrock.
	Sta. 12+805 to 12+966.5	21	0.1 - 0.3, locally 0.6	2.4 - 11.0, locally 16.0	3.7 - 27.7 (El. 205.6 - 231.5)	Peat overlies cohesive soft to hard (typically firm to stiff) clay/silty clay/clayey silt and/or cohesionless very loose to compact silt/sand extending to bedrock.

TABLE A
SUMMARY OF SUBSOIL CONDITIONS

SWAMP NO.	ROAD COMPONENT	NO. OF TEST HOLES ⁽¹⁾	PEAT/TOPSOIL THICKNESS ⁽²⁾ (m)	DEPTH TO BOTTOM OF CLAY ⁽²⁾ (m)	DEPTH TO PROBABLE BEDROCK ⁽³⁾ (m)	NOTES AND/OR SOIL PROFILE
603 Twp of Burwash Sta. 13+156.5 to 13+316.5 Hwy 69 Mainline	Hwy 69 NBL	18	0.0 - 0.2	NE	0.0 - 1.8 (El. 219.7 - 233.7)	Exposed bedrock in 10 boreholes located in the southern half of the crossing. Topsoil present in the remaining boreholes overlies bedrock in 1 borehole or cohesionless sand extending to shallow bedrock.
	Hwy 69 SBL	15	0.0 - 0.1	NE	0.0 - 0.9 (El. 219.8 - 231.9)	Exposed bedrock in 8 boreholes located in the southern half of the crossing. Topsoil, locally peat, present in the remaining boreholes overlies bedrock in 3 boreholes or cohesionless sand, locally silt, extending to shallow bedrock.
604 Twp of Burwash Sta. 13+526.5 to 13+686.5 Hwy 69 Mainline	Hwy 69 NBL	16	0.0 - 0.2	0.9 NE in 15 holes	0.0 - 0.9 (El. 228.8 - 238.6)	Exposed bedrock in 6 boreholes. Topsoil/peat present in the remaining boreholes overlies bedrock in 2 boreholes or cohesionless loose sand, underlain in 1 borehole by cohesive soft clayey silt, extending to shallow bedrock.
	Hwy 69 SBL	14	0.0 - 0.2	NE	0.0 - 0.9 (El. 229.9 - 240.0)	Exposed bedrock in 7 boreholes put down at both limits of the crossing. Topsoil/peat present in the remaining boreholes overlies bedrock in 2 boreholes or cohesionless loose sand extending to shallow bedrock.
605 Twp of Burwash Sta. 14+086.5 to 14+506.5 Hwy 69 Mainline	<u>Hwy 69 NBL</u> Sta. 14+086.5 to 14+240	21	0.0 - 0.6	0.9 - 4.9	0.0 - over 4.9 (El. under 231.9 - 242.2)	Exposed bedrock in 3 boreholes. Peat, locally topsoil, overlies bedrock in 2 boreholes or cohesionless sandy/silty deposits and/or cohesive soft silty clay extending to bedrock.
	Sta. 14+240 to 14+280	4	0.0 - 0.2	NE	0.0 - 3.8 (El. 230.2 - 236.8)	Exposed bedrock in 1 borehole. Topsoil present in the remaining 2 boreholes overlies non-plastic very loose to compact silt extending to bedrock.
	Sta. 14+280 to 14+506.5	36	0.0 - 3.0	Typically 4.1 - 14.5 1.1 - 3.0 at north end	0.0 - 27.1 (El. 206.8 - 241.7)	Exposed bedrock in 2 boreholes. Peat, locally topsoil, overlies bedrock in 2 boreholes or interlayered cohesive typically soft to firm silty clay/clayey silt and/or predominantly non-plastic very loose to compact silt extending to bedrock.

TABLE A
SUMMARY OF SUBSOIL CONDITIONS

SWAMP NO.	ROAD COMPONENT	NO. OF TEST HOLES ⁽¹⁾	PEAT/TOPSOIL THICKNESS ⁽²⁾ (m)	DEPTH TO BOTTOM OF CLAY ⁽²⁾ (m)	DEPTH TO PROBABLE BEDROCK ⁽³⁾ (m)	NOTES AND/OR SOIL PROFILE
605 Twp of Burwash Sta. 14+086.5 to 14+506.5 Hwy 69 Mainline	<u>Hwy 69 SBL</u> Sta. 14+086.5 to 14+235	15	0.0 - 0.1	0.9 NE in 14 holes	0.0 - 1.0 (El. 235.6 - 246.7)	Exposed bedrock in 11 boreholes. Topsoil in 3 boreholes overlies cohesionless sand extending to shallow bedrock. An 800 mm thick layer of cohesive silty clay encountered in 1 borehole underlies 100 mm of peat and extends to bedrock.
	Sta. 14+235 to 14+410	17	0.9 - 2.7	Typically 4.7 - 12.3	0.0 - 17.8 (El. 216.1 - 235.6)	Exposed bedrock in 1 borehole. Peat present in the remaining 16 boreholes overlies predominantly non-plastic very loose to compact silt and/or cohesive layers of typically soft to firm clayey silt/silty clay extending to bedrock.
	Sta. 14+410 to 14+506.5	8	0.0 - 0.1	NE	0.0 - 1.1 (El. 234.2 - 247.7)	Exposed bedrock in 4 boreholes. Peat in the remaining boreholes overlies bedrock in 1 borehole or cohesionless sand/silty sand extending to shallow bedrock.
606 Twp of Burwash Sta. 15+236.5 to 15+326.5 Hwy 69 Mainline	Hwy 69 NBL	10	0.0 - 0.2	NE	0.0 - 0.2 (El. 251.9 - 255.7)	Exposed bedrock in 4 boreholes. Topsoil in the remaining boreholes overlies bedrock in 4 boreholes or a 100 mm thick layer of cohesionless sand extending to shallow bedrock.
	Hwy 69 SBL	9	0.0 - 0.3	0.0 - 4.1	0.0 - 4.1 (El. 242.4 - 254.4)	Exposed bedrock in 2 boreholes. Topsoil/peat in the remaining boreholes overlies bedrock in 1 borehole or cohesionless very loose to loose sandy/silty deposits underlain in 3 boreholes by cohesive firm to very stiff clayey silt extending to bedrock.
607 Twp of Burwash Sta. 15+326.5 to 15+466.5 Hwy 69 Mainline	<u>Hwy 69 NBL</u>	18	0.0 - 0.5	0.0 - 2.7	0.0 - 2.7 (El. 241.0 - 253.0)	Exposed bedrock in 6 boreholes located at both limits of the crossing. Peat/topsoil present in the remaining 9 boreholes overlies cohesionless very loose to dense silt/sand and/or cohesive firm to very stiff clayey silt extending to bedrock
	<u>Hwy 69 SBL</u> Sta. 15+326.5 to 15+405	8	0.0 - 0.5	0.0 - 3.0	0.0 - 5.2 (El. 240.6 - 252.1)	Exposed bedrock in 1 borehole. Topsoil/peat overlies cohesive firm to very stiff clayey silt and/or cohesionless compact silt/sand extending to bedrock.
	Sta. 15+405 to 15+466.5	6	0.0 - 0.1	NE	0.0 - 0.1 (El. 247.0 - 254.5)	Exposed bedrock in 5 boreholes. In the remaining borehole, a 100 mm thick layer of topsoil covers bedrock.

TABLE A
SUMMARY OF SUBSOIL CONDITIONS

SWAMP NO.	ROAD COMPONENT	NO. OF TEST HOLES ⁽¹⁾	PEAT/TOPSOIL THICKNESS ⁽²⁾ (m)	DEPTH TO BOTTOM OF CLAY ⁽²⁾ (m)	DEPTH TO PROBABLE BEDROCK ⁽³⁾ (m)	NOTES AND/OR SOIL PROFILE
608 Burwash Township Sta. 16+406.5 to 16+906.5 Hwy 69 Mainline	Hwy 69 NBL	46	0.0 - 0.3, locally 0.6	NE	0.0 - 2.2 (El. 229.3 - 245.5)	Exposed bedrock in 4 boreholes. Peat/topsoil overlies bedrock in 6 boreholes or cohesionless sand extending to shallow bedrock.
	Hwy 69 SBL	33	0.0 - 0.2	NE	0.0 - over 2.3 (El. 231.9 - 249.8)	Exposed bedrock in 7 boreholes. Peat/topsoil overlies bedrock in 6 boreholes or cohesionless sand extending to shallow bedrock.
609 Burwash Township Sta. 17+646.5 to 17+966.5 Hwy 69 Mainline	Hwy 69 NBL	28	0.0 - 0.1	NE	0.0 - 3.1 (El. 236.8 - 252.9)	Exposed bedrock in 9 boreholes. Topsoil overlies bedrock in 6 boreholes or cohesionless silt extending to shallow bedrock.
	Hwy 69 SBL	21	0.0 - 0.1	NE	0.0 - 1.5 (El. 241.9 - 252.5)	Exposed bedrock in 6 boreholes. Topsoil overlies bedrock in 6 boreholes or cohesionless silt extending to shallow bedrock.
610 Burwash Township Sta. 18+986.5 to 19+166.5 Hwy 69 Mainline	Hwy 69 NBL	43	0.0 - 0.5	0.0 - 6.4	0.0 - 8.1 (El. 246.0 - 255.3)	Exposed bedrock in 2 boreholes. Peat overlies bedrock in 4 boreholes or cohesionless loose sandy/silty soils and/or a cohesive deposit of firm clayey silt/silty clay/clay extending to bedrock.
	Hwy 69 SBL	37	0.0 - 0.5, locally 1.5	0.0 - 7.9	0.0 - 8.4 (El. 245.4 - 255.7)	Exposed bedrock in 2 boreholes. Peat overlies bedrock in 3 boreholes or cohesionless loose sandy/silty soils and/or a cohesive deposit of firm clayey silt/silty clay/clay extending to bedrock.
611 Burwash Township Sta. 19+586.5 to 19+886.5 Hwy 69 Mainline (except Makynen Road Overpass, Sta. 19+750 to 19+810)	Hwy 69 NBL	37	0.1 - 0.3	1.1 NE in 36 holes	Typically 0.0 - 5.2, locally up to 12.6 (El. 219.4 - 247.8)	Exposed bedrock in 9 boreholes put down at the south limit of the crossing. Peat/topsoil present in the remaining boreholes overlies bedrock in 1 borehole or cohesionless very loose to very dense sandy/silty deposits extending to bedrock. A 900 mm thick layer of clayey silt found in 1 borehole.
	Hwy 69 SBL Sta. 19+586.5 to 19+720	12	0.0 - 0.3	NE	0.0 - 4.1 (El. 224.1 - 244.9)	Exposed bedrock in 6 boreholes. Peat, locally topsoil, overlies cohesionless loose to compact silt and/or sand/silty sand extending to bedrock.
	Sta. 19+720 to 19+750	3	0.2 - 0.3	1.1 - 2.4	4.4 - 5.2 (El. 223.0 - 225.2)	Peat overlies cohesive very soft to soft clayey silt and cohesionless very loose to very dense sand/silt extending to bedrock.
	Sta. 19+750 to 19+886.5	10	0.0 - 0.3	NE	0.3 - 8.2 (El. 223.6 - 236.0)	Peat/topsoil present in 8 of the 9 boreholes drilled overlies cohesionless very loose to dense silt and/or sand extending to bedrock.
612	Deleted from Investigation					

TABLE A
SUMMARY OF SUBSOIL CONDITIONS

SWAMP NO.	ROAD COMPONENT	NO. OF TEST HOLES ⁽¹⁾	PEAT/TOPSOIL THICKNESS ⁽²⁾ (m)	DEPTH TO BOTTOM OF CLAY ⁽²⁾ (m)	DEPTH TO PROBABLE BEDROCK ⁽³⁾ (m)	NOTES AND/OR SOIL PROFILE
613 ⁴ Twp of Dill Sta. 10+178.0 to 10+838.0 Hwy 69 Mainline	<u>Hwy 69 NBL</u> Sta. 10+178 to 10+250 (Wanapitei River)	18	0.0 - 0.3	0.0 - 2.0	0.0 - 2.0 (El. 217.0 - 232.6)	Exposed bedrock in 4 boreholes. Topsoil overlies bedrock in 8 boreholes or cohesive clayey silt extending to shallow bedrock.
	Sta. 10+350 to 10+475	11	0.1 - 0.4	0.0 - 5.8	12.1 - 21.1 (El. 197.3 - 206.9)	Peat/topsoil underlain by cohesive firm clayey silt/silty clay and/or cohesionless very loose to loose sandy/silty soils extending to bedrock.
	Sta. 10+475 to 10+838	37	0.0 - 0.5	0.0 - 14.0	0.0 - over 22.9 (El. under 198.9 - 228.8)	Exposed bedrock in 3 boreholes. Topsoil underlain by cohesive firm clayey silt/silty clay/clay and/or cohesionless very loose to loose silt/sand overlying bedrock.
	<u>Hwy 69, SBL</u> Sta. 10+178 to 10+250 (Wanapitei River)	15	0.0 - 0.2	0.0 - 1.0	0.0 - 1.0 (El. 222.5 - 232.7)	Exposed bedrock in 4 boreholes. Topsoil overlies bedrock in 6 boreholes or cohesionless sandy/silty soils or cohesive clayey silt extending to shallow bedrock.
	Sta. 10+350 to 10+475	8	0.1 - 0.3	0.0 - 10.3	Over 9.8 - 18.3 (El. 201.6 - under 208.5)	Topsoil/peat underlain by cohesive firm clayey silt/silty clay/clay and/or cohesionless very loose to loose sandy/silty soils extending to bedrock.
	Sta. 10+475 to 10+838	29	0.0 - 0.3	0.0 - 14.0	0.0 - over 34.0 (El. under 188.0 - 230.7)	Exposed bedrock in 3 boreholes. Topsoil/peat underlain by cohesive firm clayey silt/silty clay/clay and/or cohesionless very loose to loose silt/sand extending to bedrock.
	Sta. 10+700 <u>Hwy 537 High Fill</u> Sta. 9+900 to 10+200 Hwy 537 Centreline	24	0.0 - 0.5	0.0 - 18.0	1.2 - 32.6 (El. 190.6 - 221.7)	Topsoil/peat underlain by cohesive firm clayey silt/silty clay/clay and/or cohesionless very loose to loose silt/sand extending to bedrock.

TABLE A
SUMMARY OF SUBSOIL CONDITIONS

SWAMP NO.	ROAD COMPONENT	NO. OF TEST HOLES ⁽¹⁾	PEAT/TOPSOIL THICKNESS ⁽²⁾ (m)	DEPTH TO BOTTOM OF CLAY ⁽²⁾ (m)	DEPTH TO PROBABLE BEDROCK ⁽³⁾ (m)	NOTES AND/OR SOIL PROFILE
101 Twp of Dill Sta. 10+908.0 to 11+308.0 Hwy 69 Mainline	<u>Hwy 69 NBL</u>	63	0.0 - 4.2	0.0 - 8.9	0.0 - 20.4 (El. 200.3 - 245.7)	Exposed bedrock in 5 boreholes. Topsoil/peat overlies bedrock in 4 boreholes or cohesive clayey silt/silty clay/clay and/or cohesionless silt/sand extending to bedrock.
	<u>Hwy 69 SBL</u>	38	0.0 - 7.7	0.0 - 10.4	0.0 - 12.7 (El. 208.1 - 246.8)	Exposed bedrock in 9 boreholes. Topsoil/peat overlies bedrock in 4 boreholes or cohesive clayey silt/silty clay and/or cohesionless silt/sand extending to bedrock.

NOTES:

1. Soil stratigraphy in test holes drilled along centreline was included with NBL test holes for this table. Test holes include boreholes and dynamic cone penetration tests.
2. Thickness of topsoil/peat and cohesive deposits was based on borehole data only.
3. Depth to probable bedrock was based on both borehole and dynamic cone penetration test data.
4. Wanapetai River extends from Sta. 10+250 to 10+350.

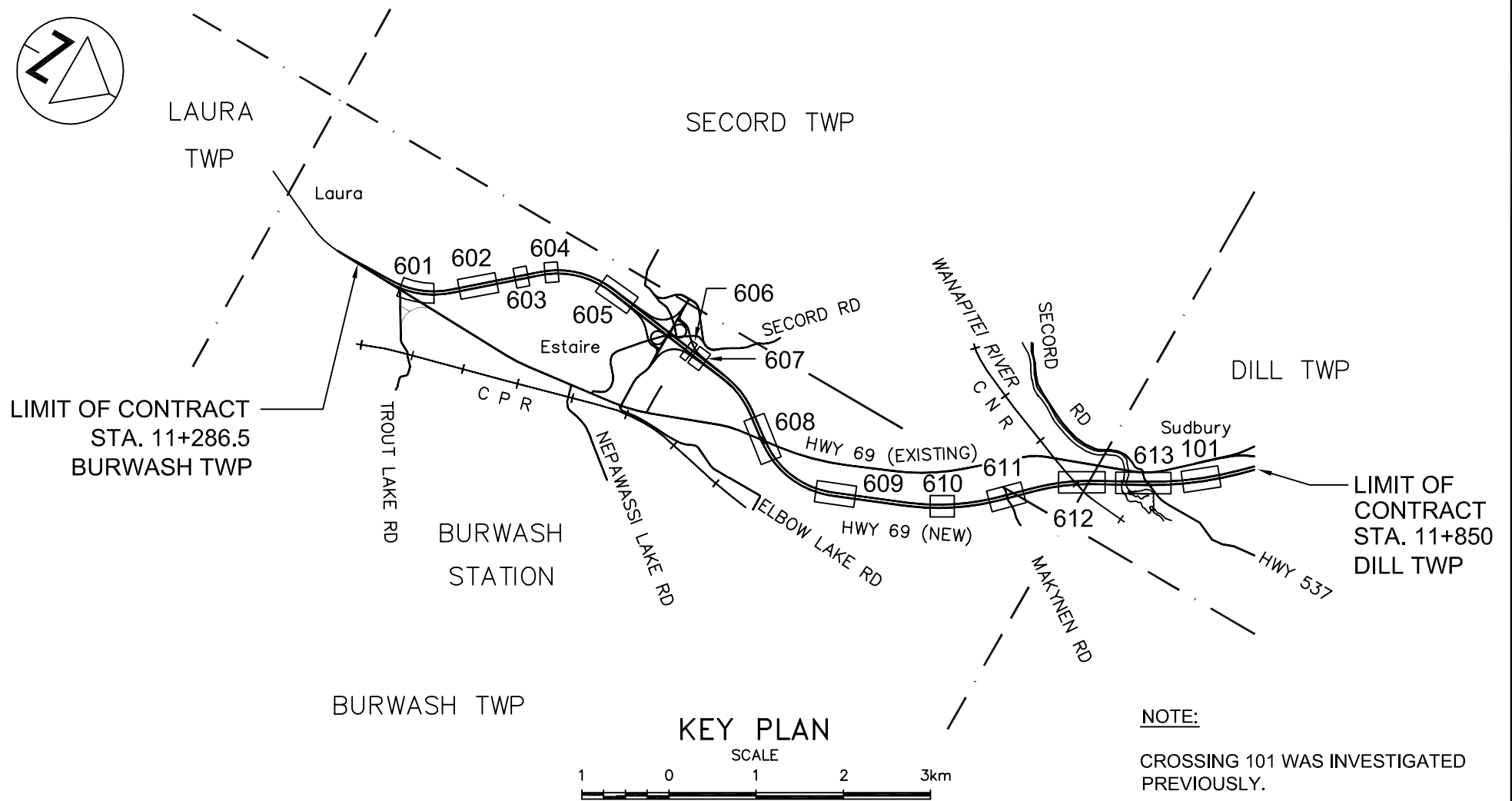


APPENDIX A

Figures 601-PC-1 to 613-PC-4, 612-1 to 612-3, (Highway 537) PC-1 to PC-3 -
Plasticity Charts

Figures 601-1 to 613-6, 612-4 to 612-9, (Highway 537) GS-1 to GS-5 -
Grain Size Distribution Curves

Figures 602-C-1, 612-10 to 612-13, (Highway 537) C-1 -
Consolidation Test Results



HIGH FILL AND SWAMP CROSSINGS KEY MAP


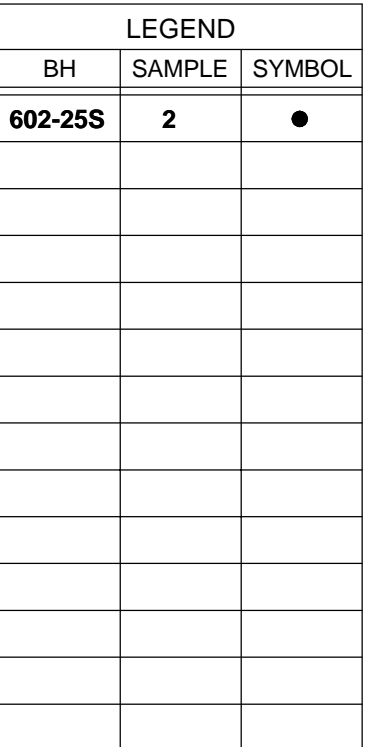
Highway 69 Four-Laning For 12km
From 4km South of Estaire to 1km North of Highway 537
G.W.P. 312-99-00

613 LEGEND:
 CROSSING LOCATION

DRAWING NO.

A

REV.



Ministry of
Transportation
Ontario

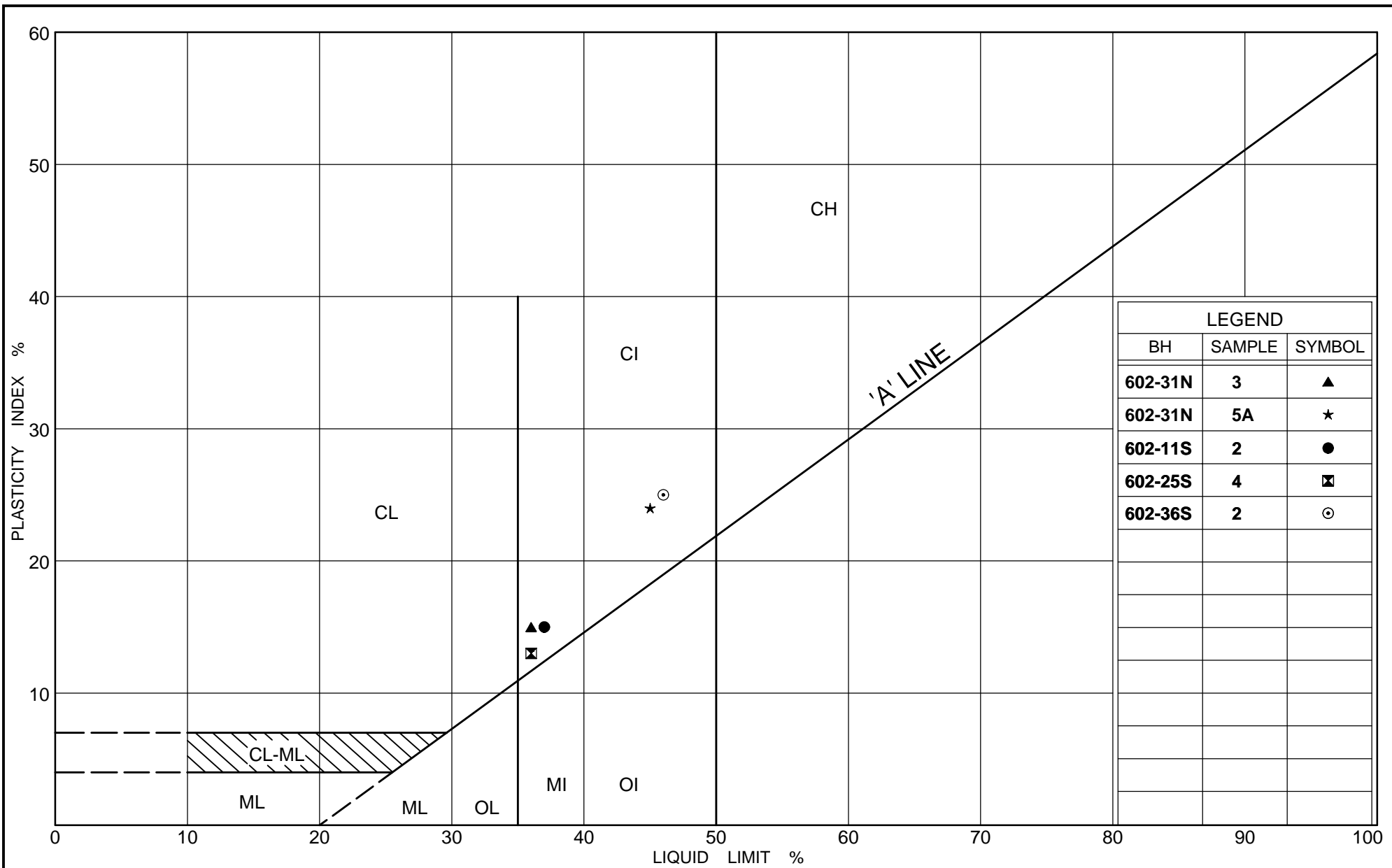
PLASTICITY CHART

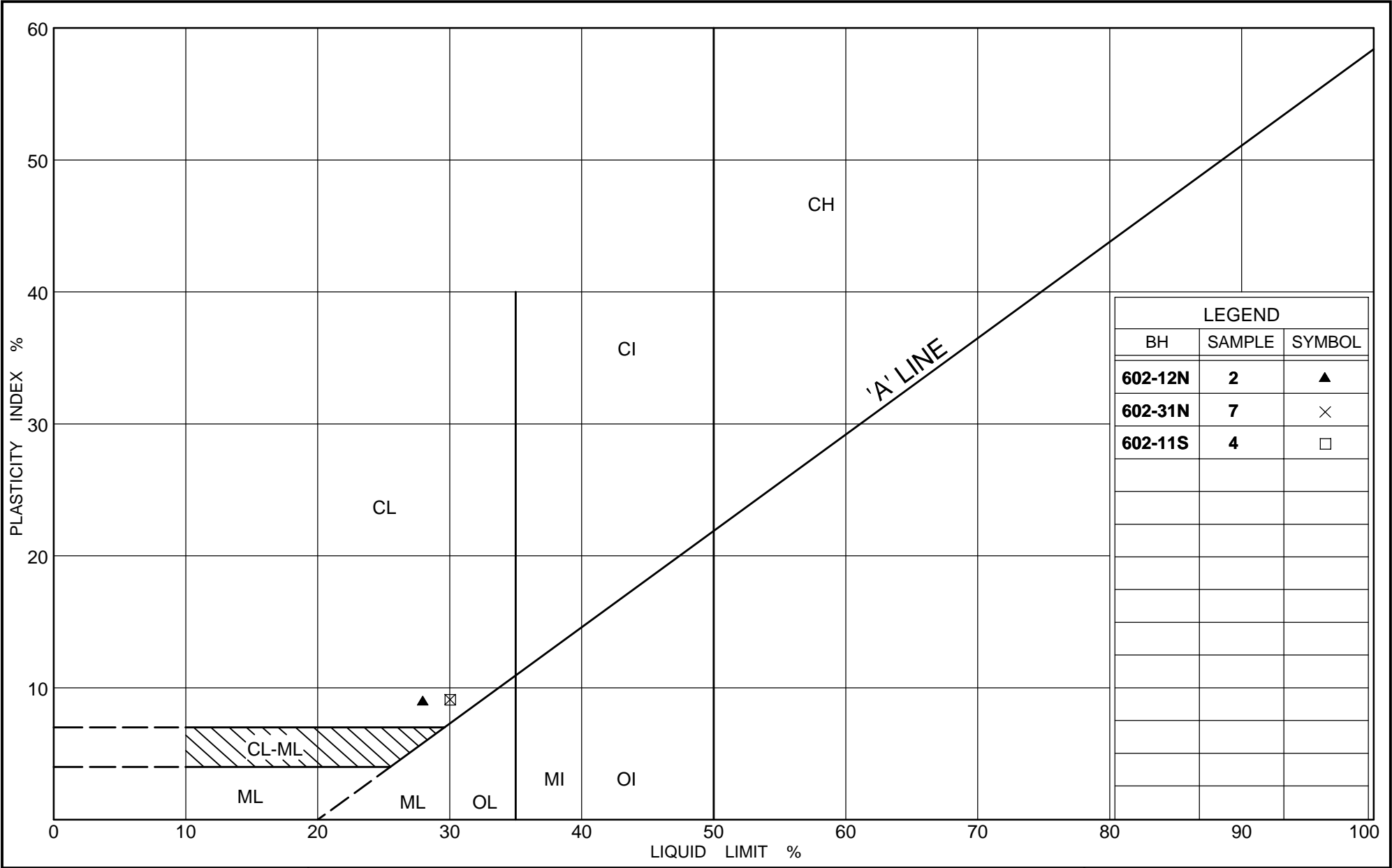
CLAY trace SAND (CH)

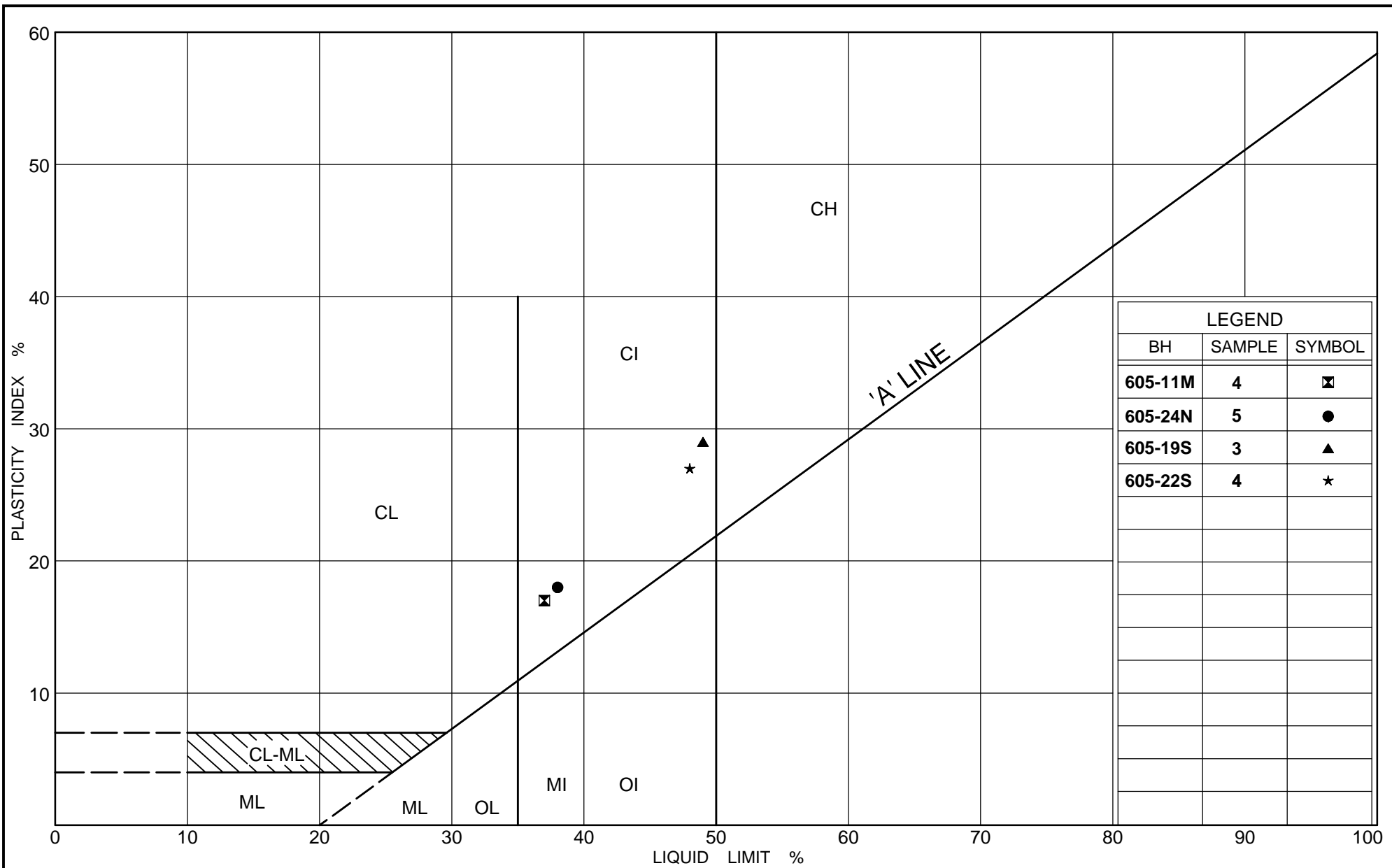
FIG No.	602-PC-1
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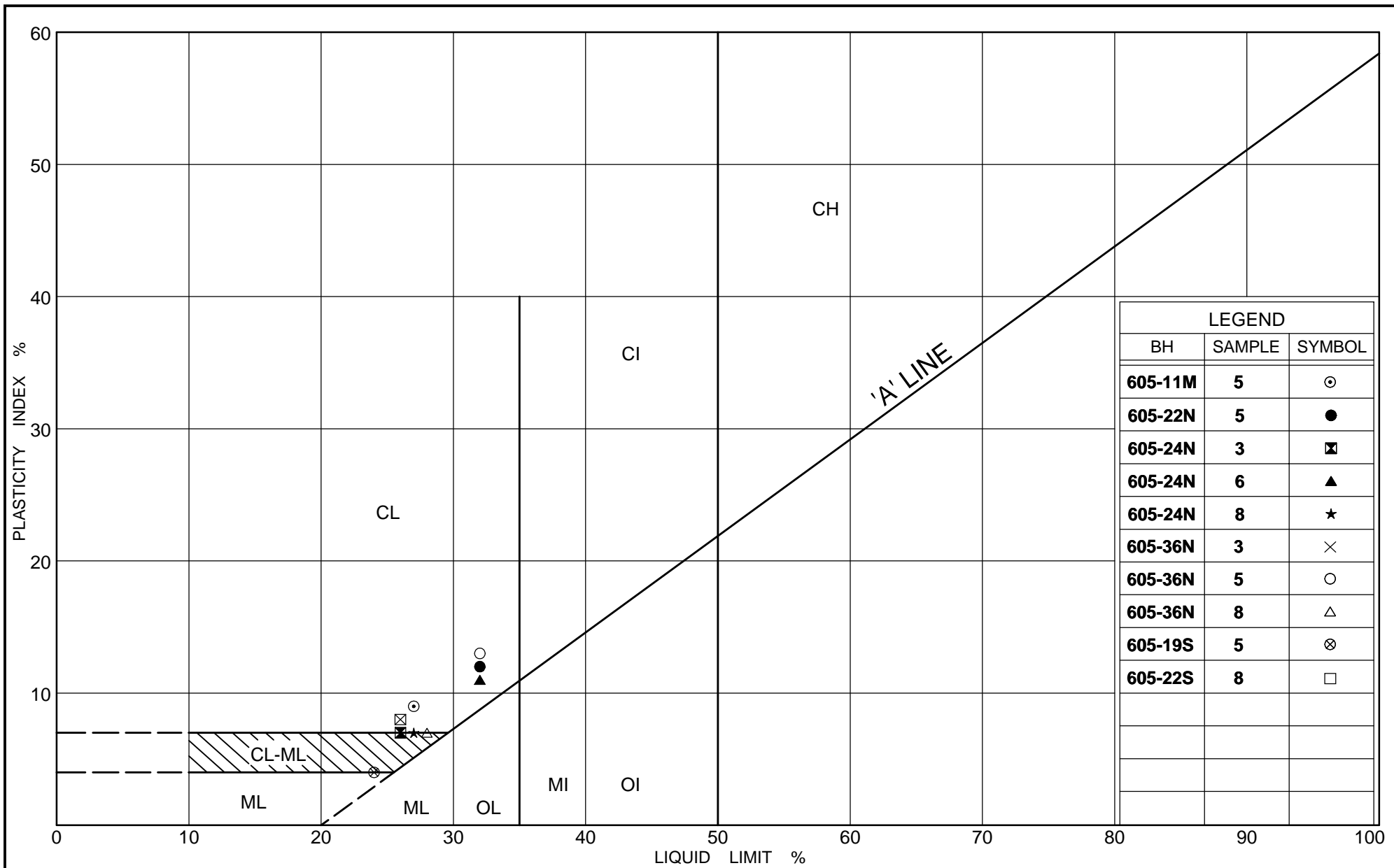
HWY 69

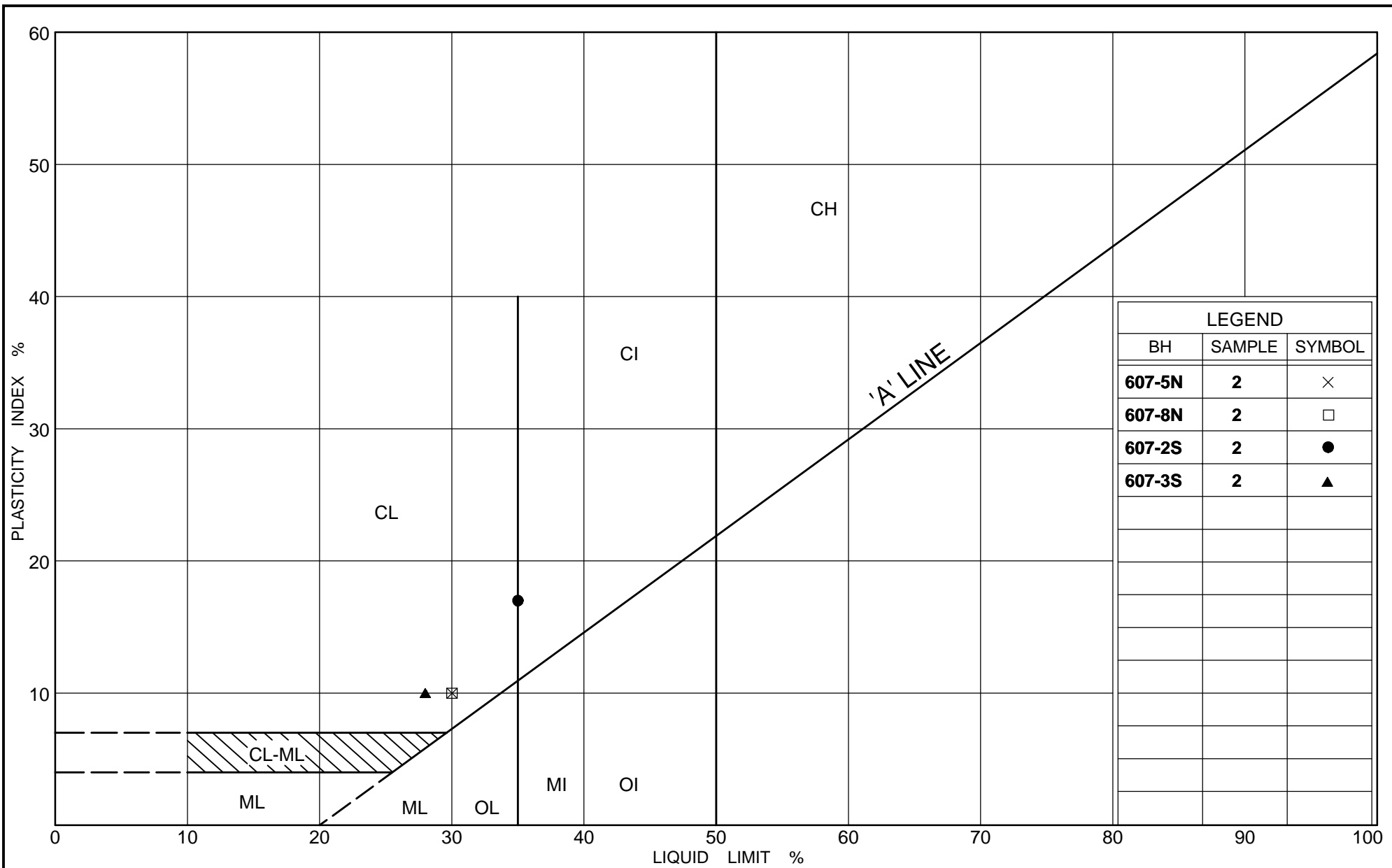
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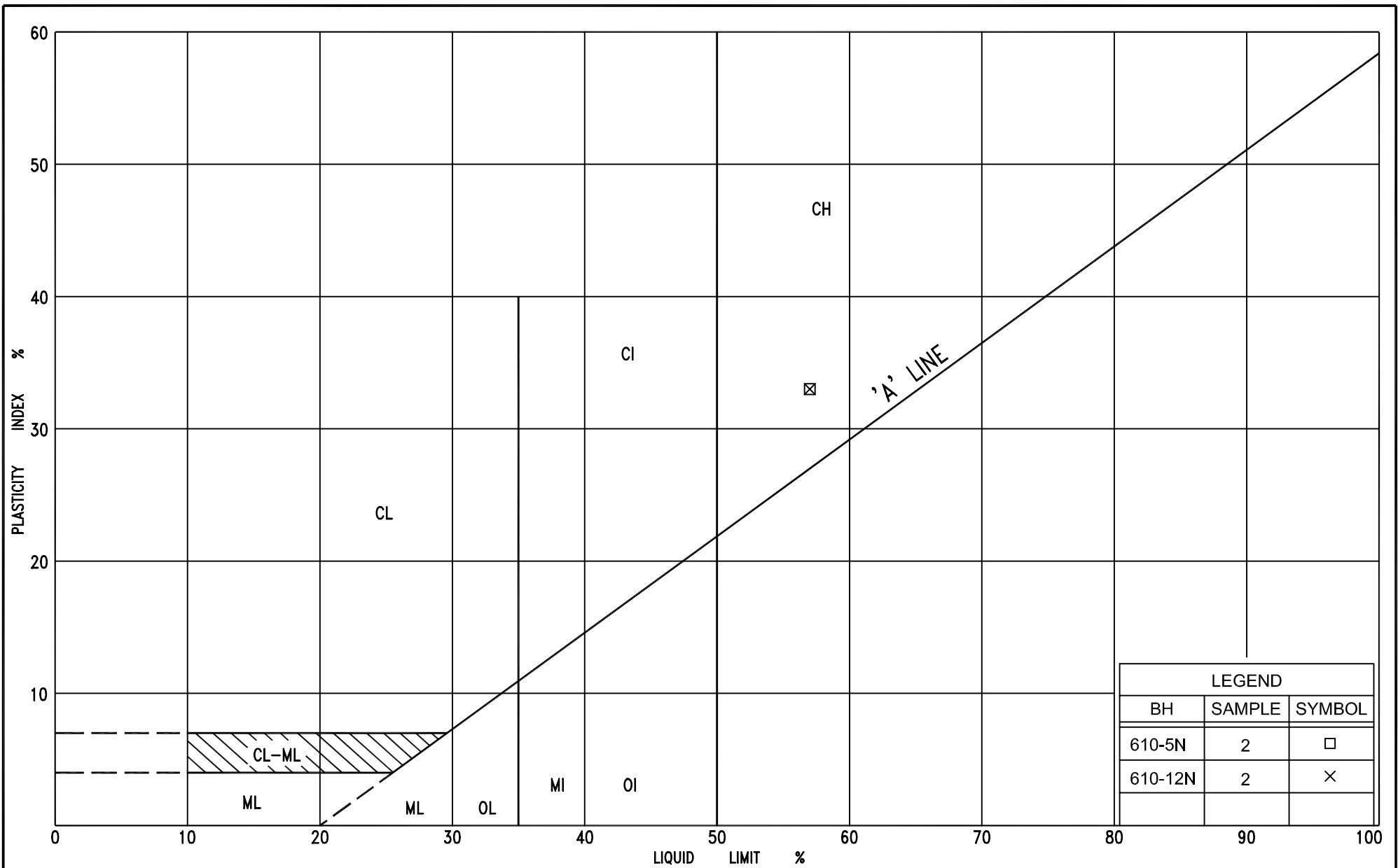






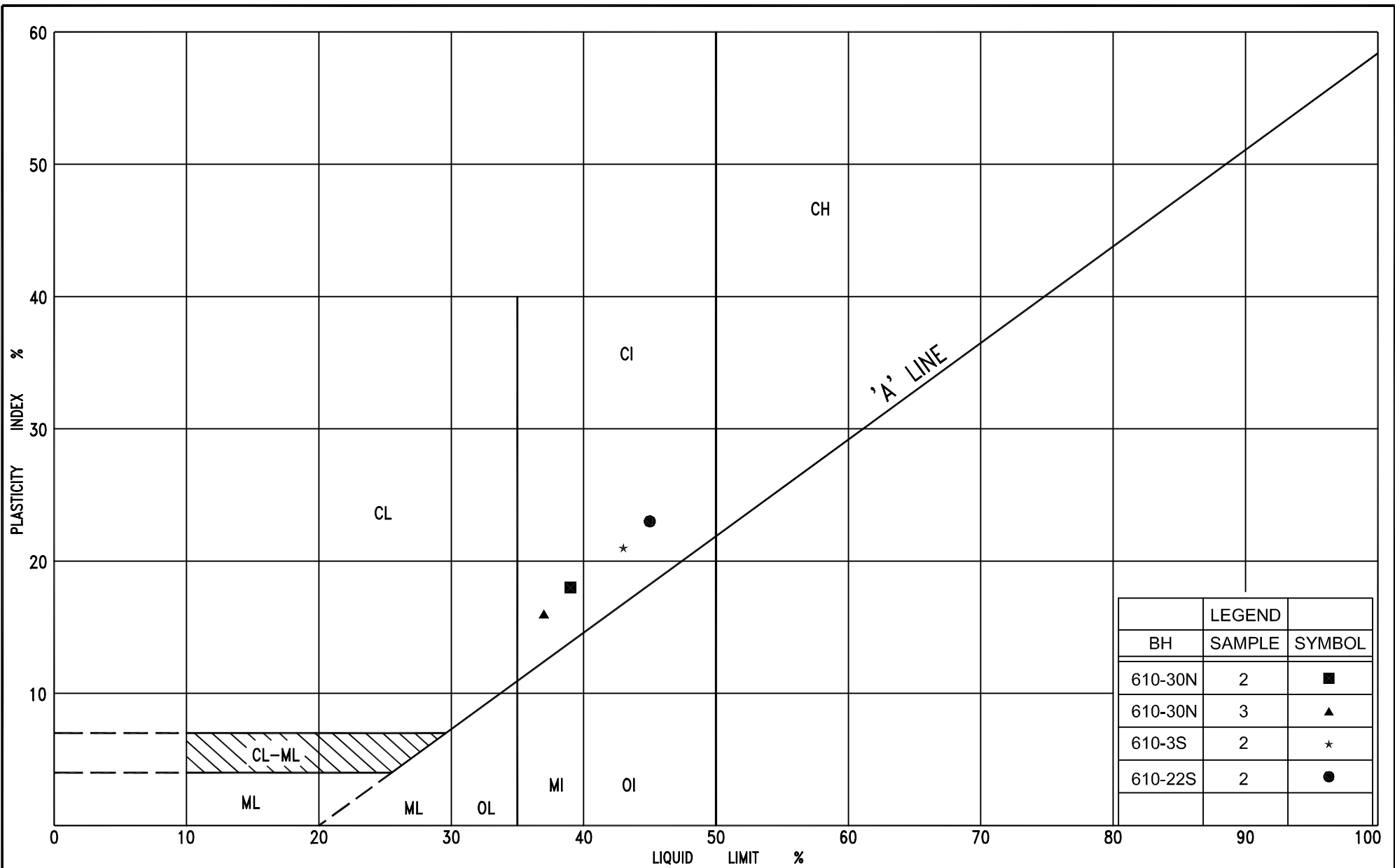


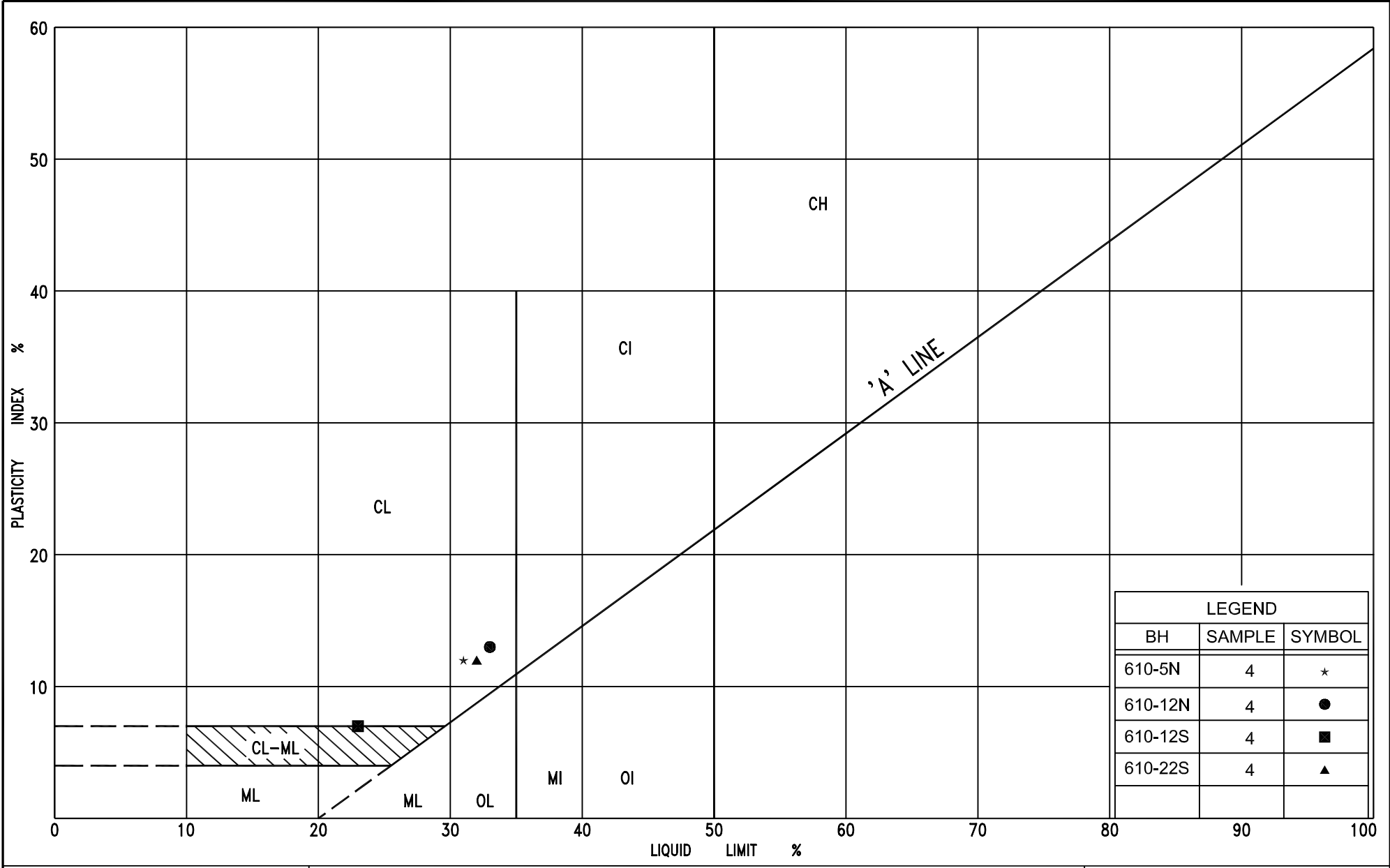




LEGEND		
BH	SAMPLE	SYMBOL
610-5N	2	□
610-12N	2	×

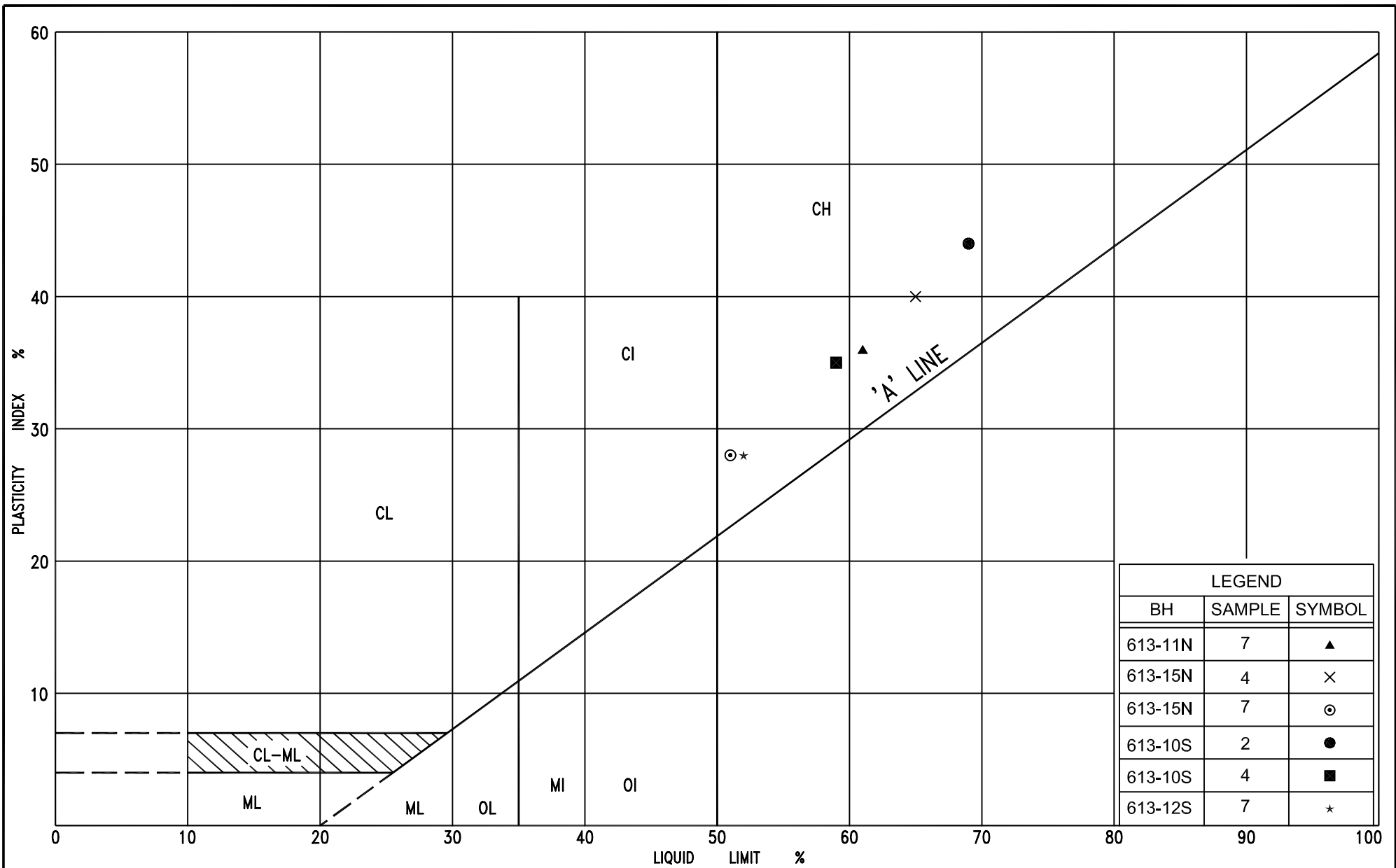
PLASTICITY CHART CLAY (CH)



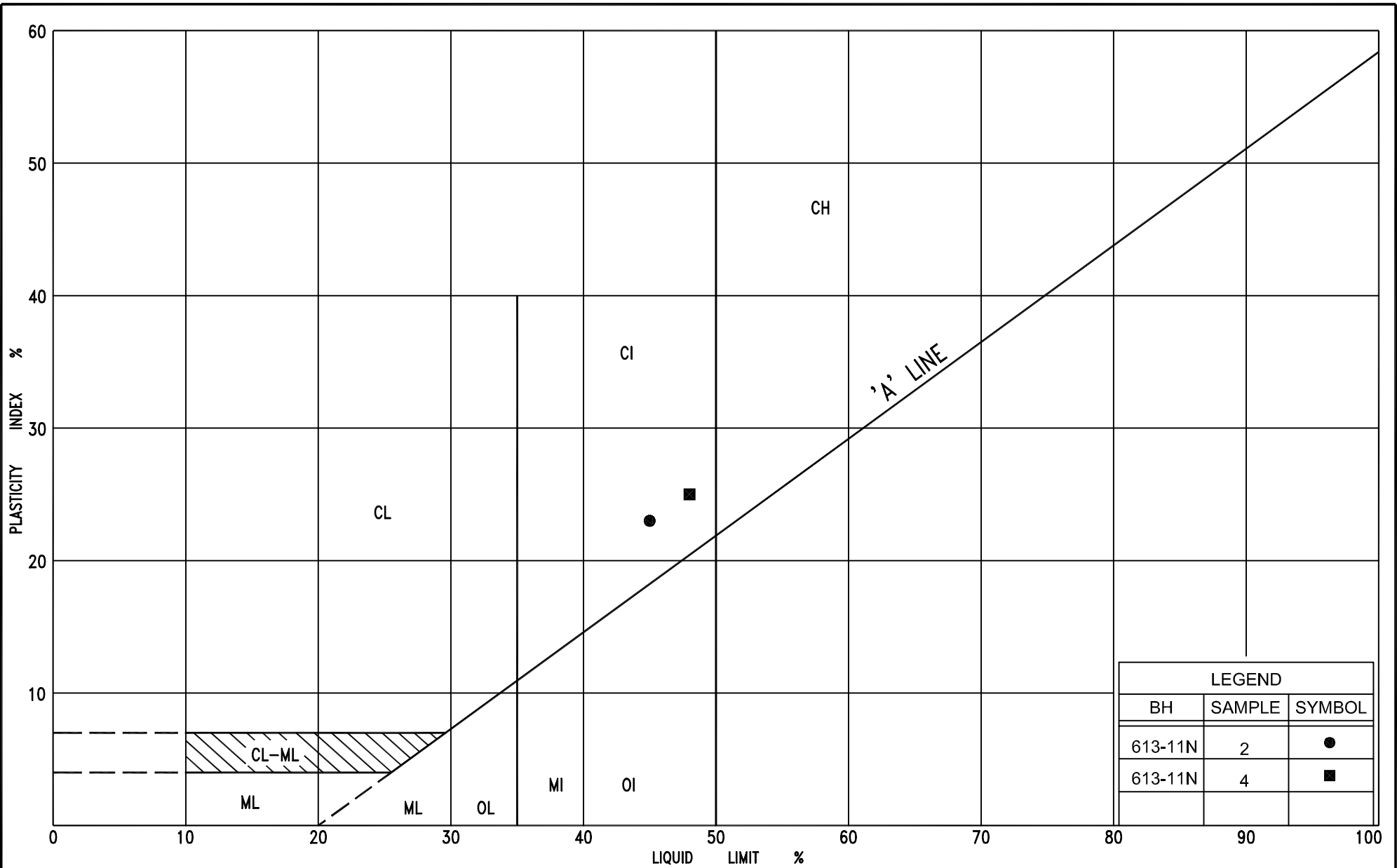


LEGEND		
BH	SAMPLE	SYMBOL
610-5N	4	*
610-12N	4	●
610-12S	4	■
610-22S	4	▲

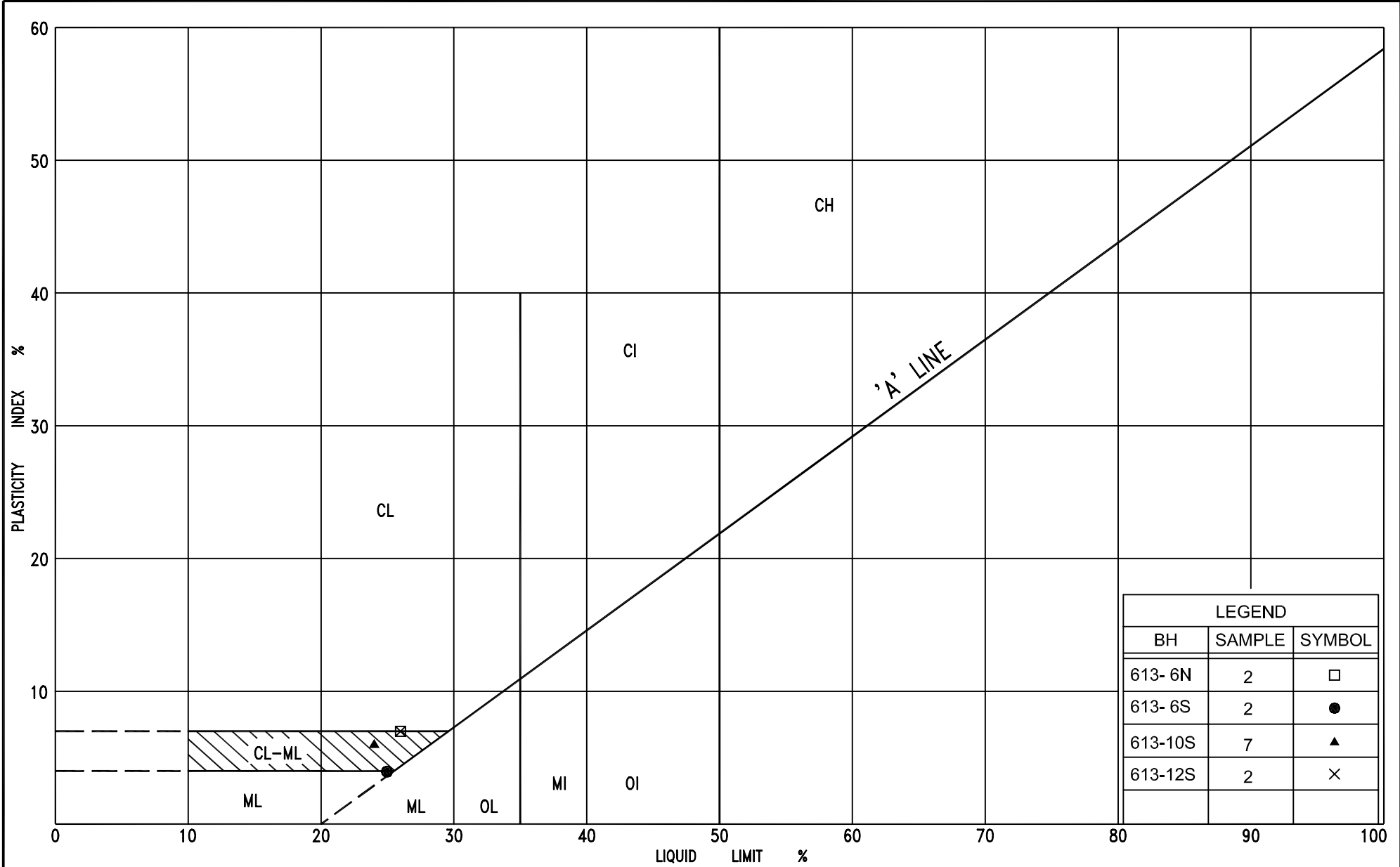
PLASTICITY CHART
CLAYEY SILT (CL)

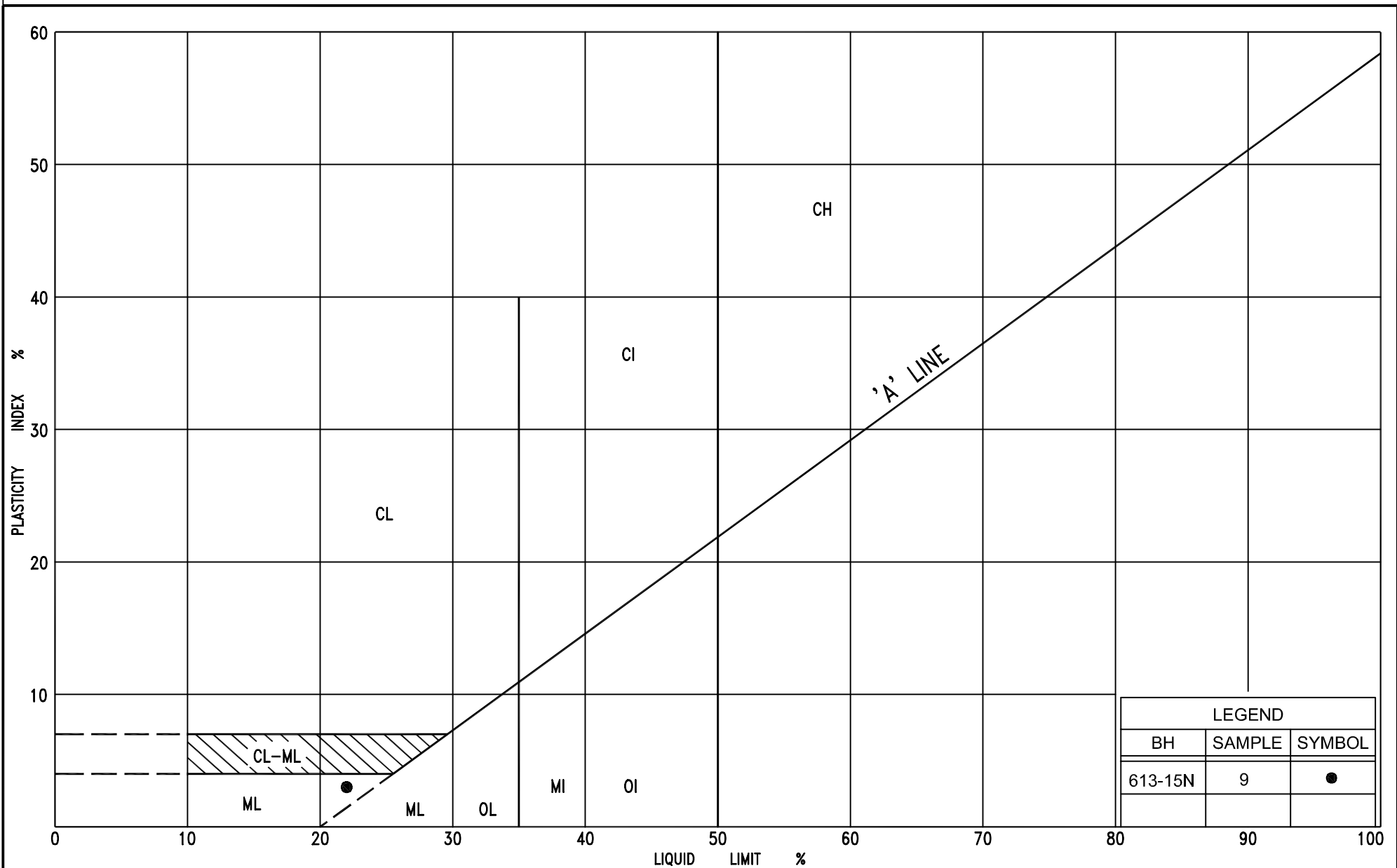


PLASTICITY CHART CLAY

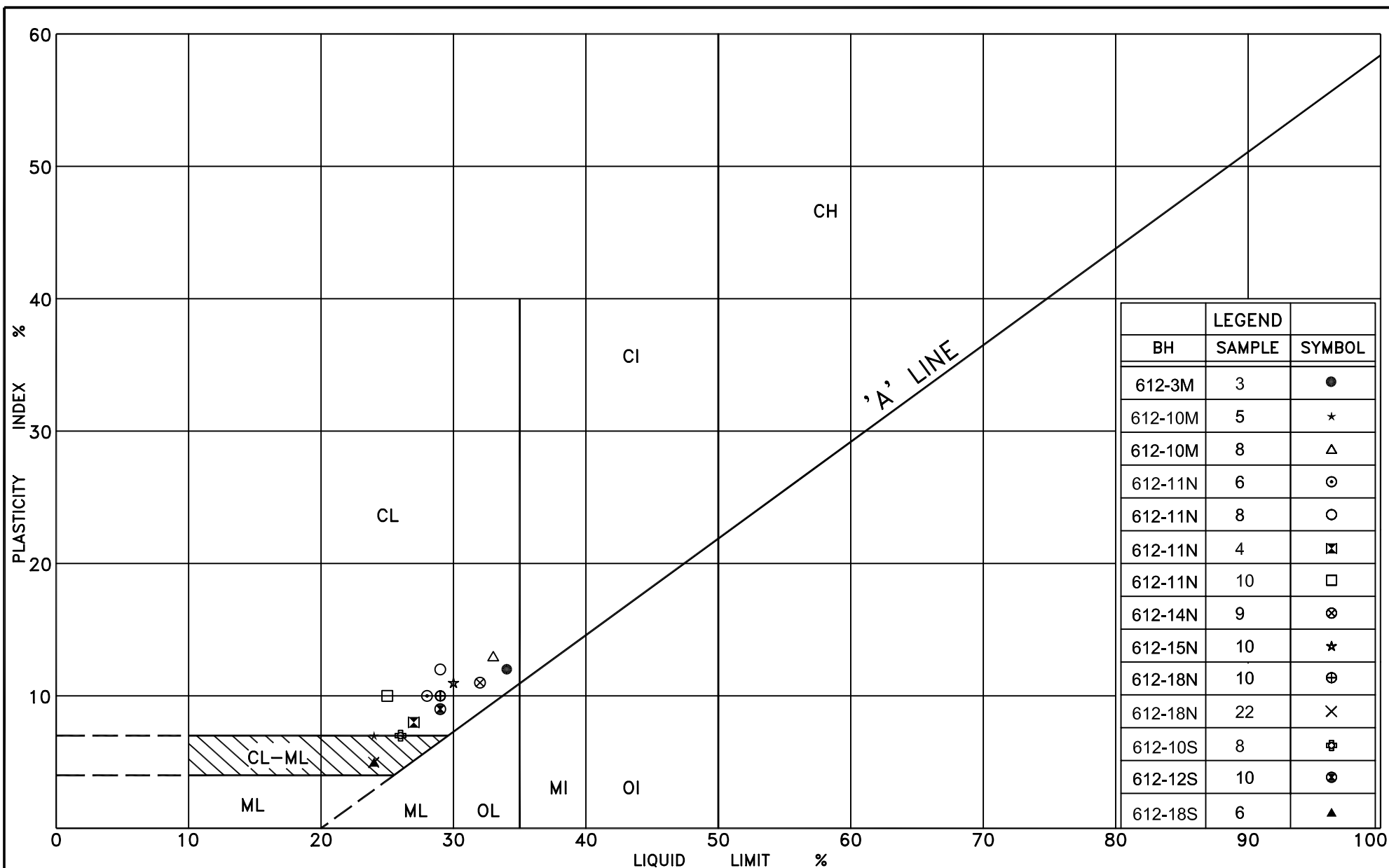


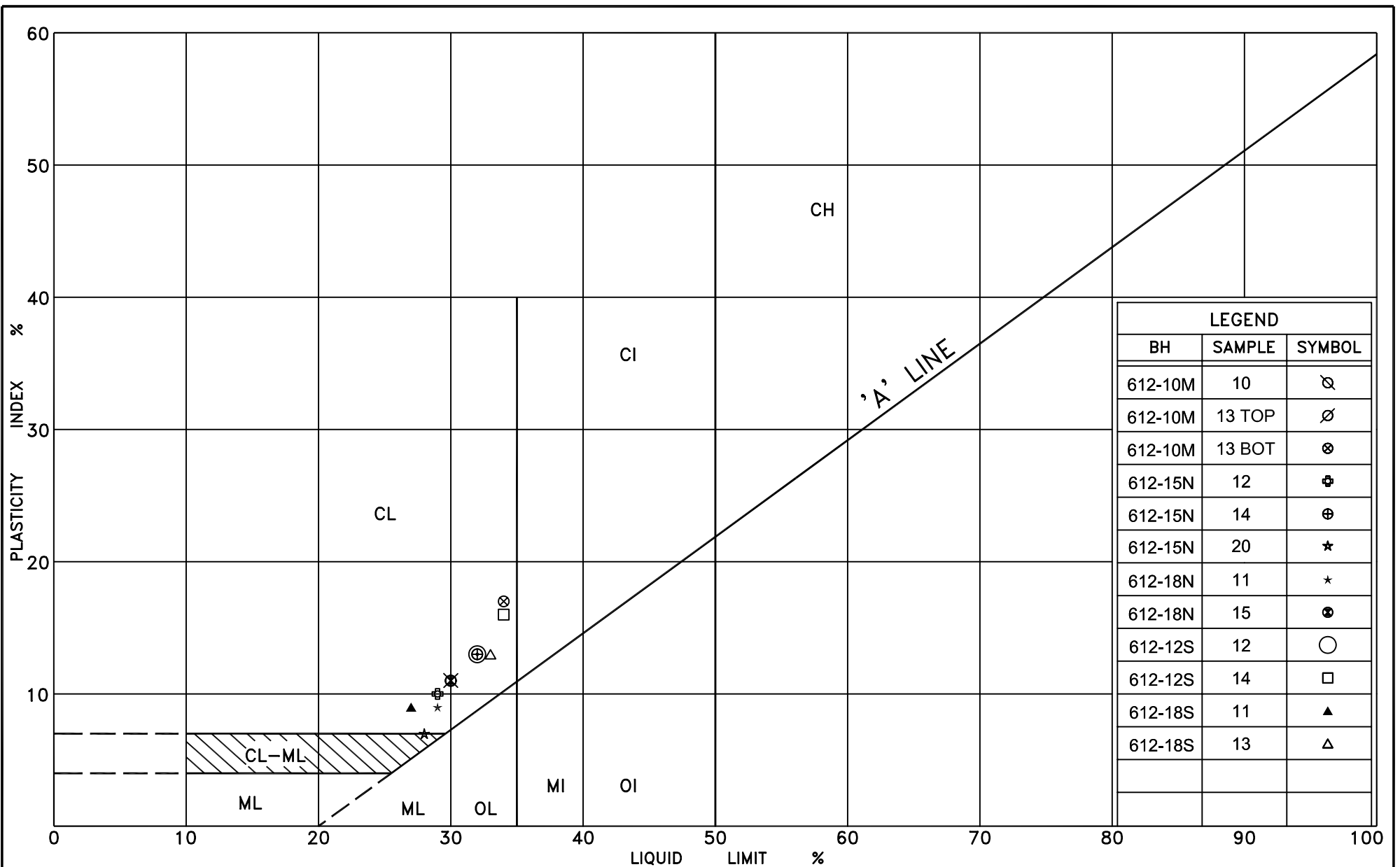
LEGEND		
BH	SAMPLE	SYMBOL
613-11N	2	●
613-11N	4	■

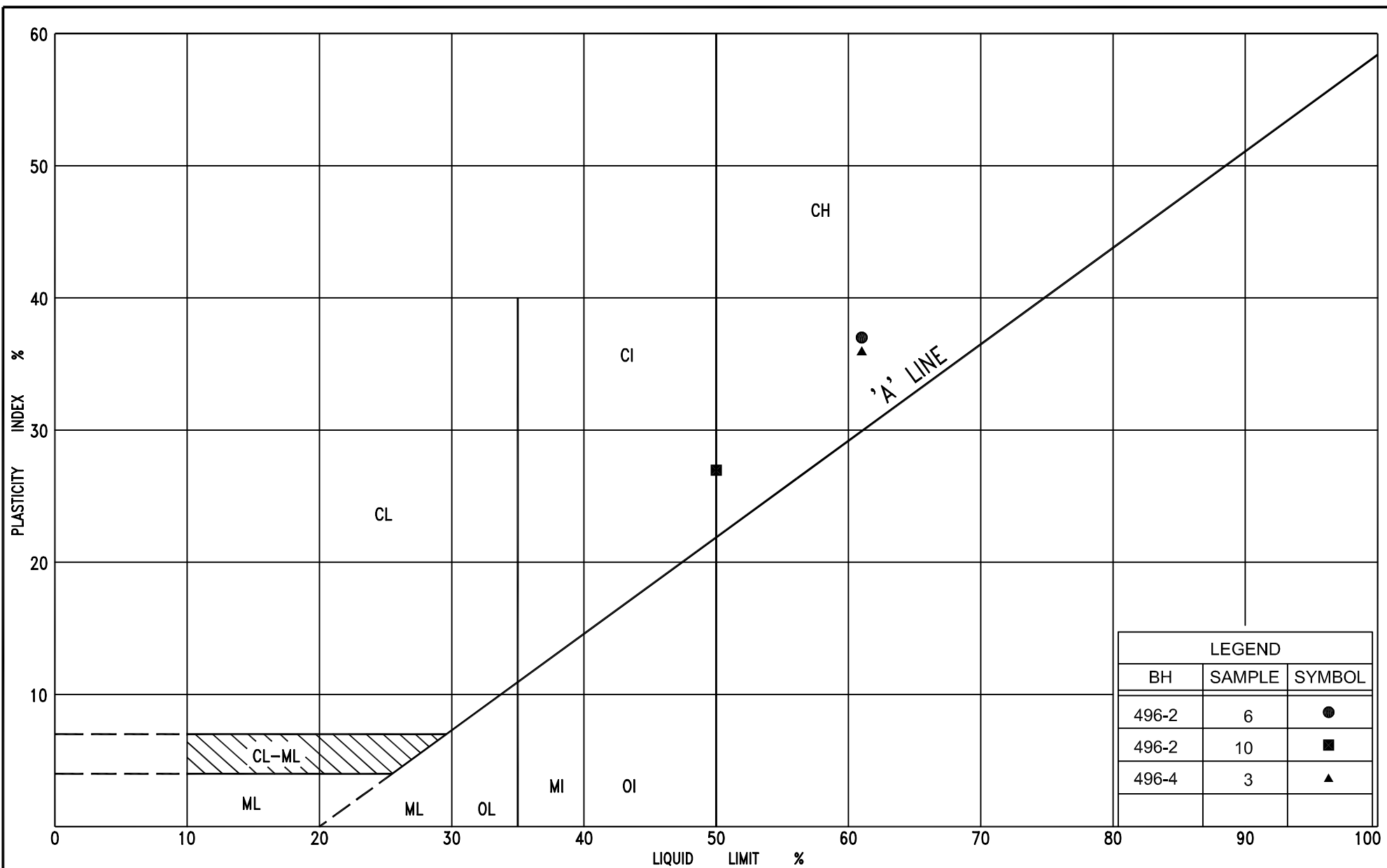




PLASTICITY CHART SILT

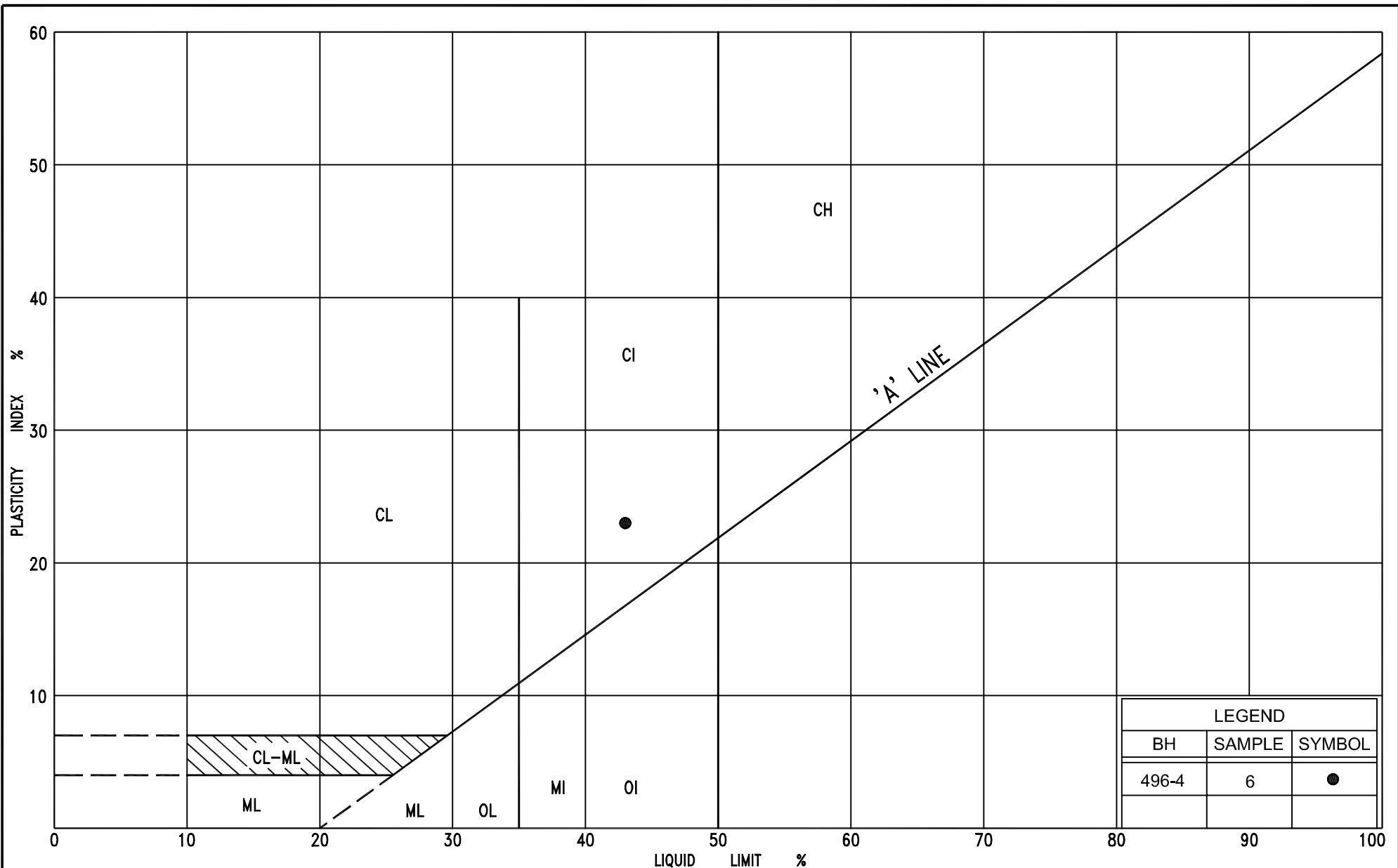




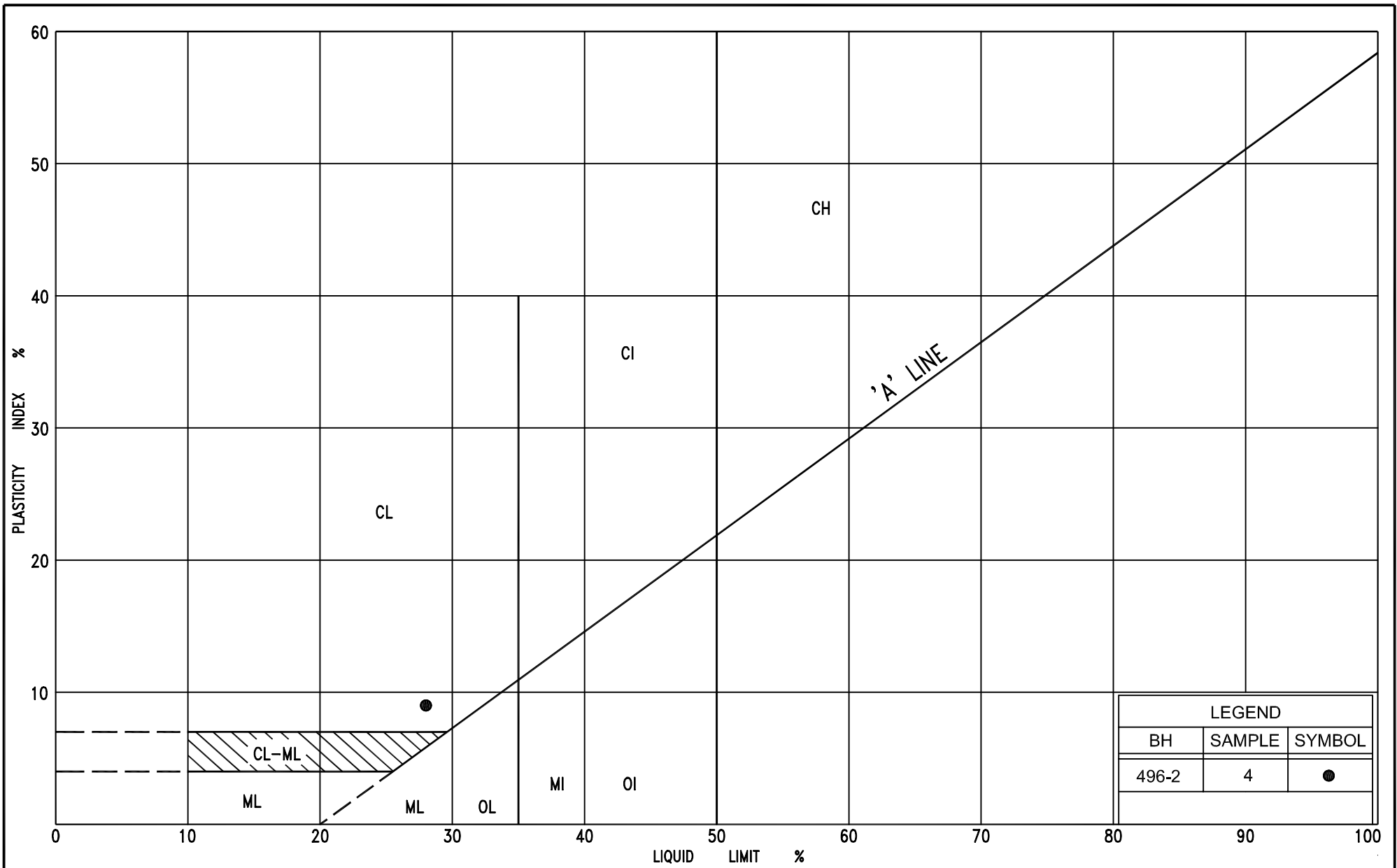


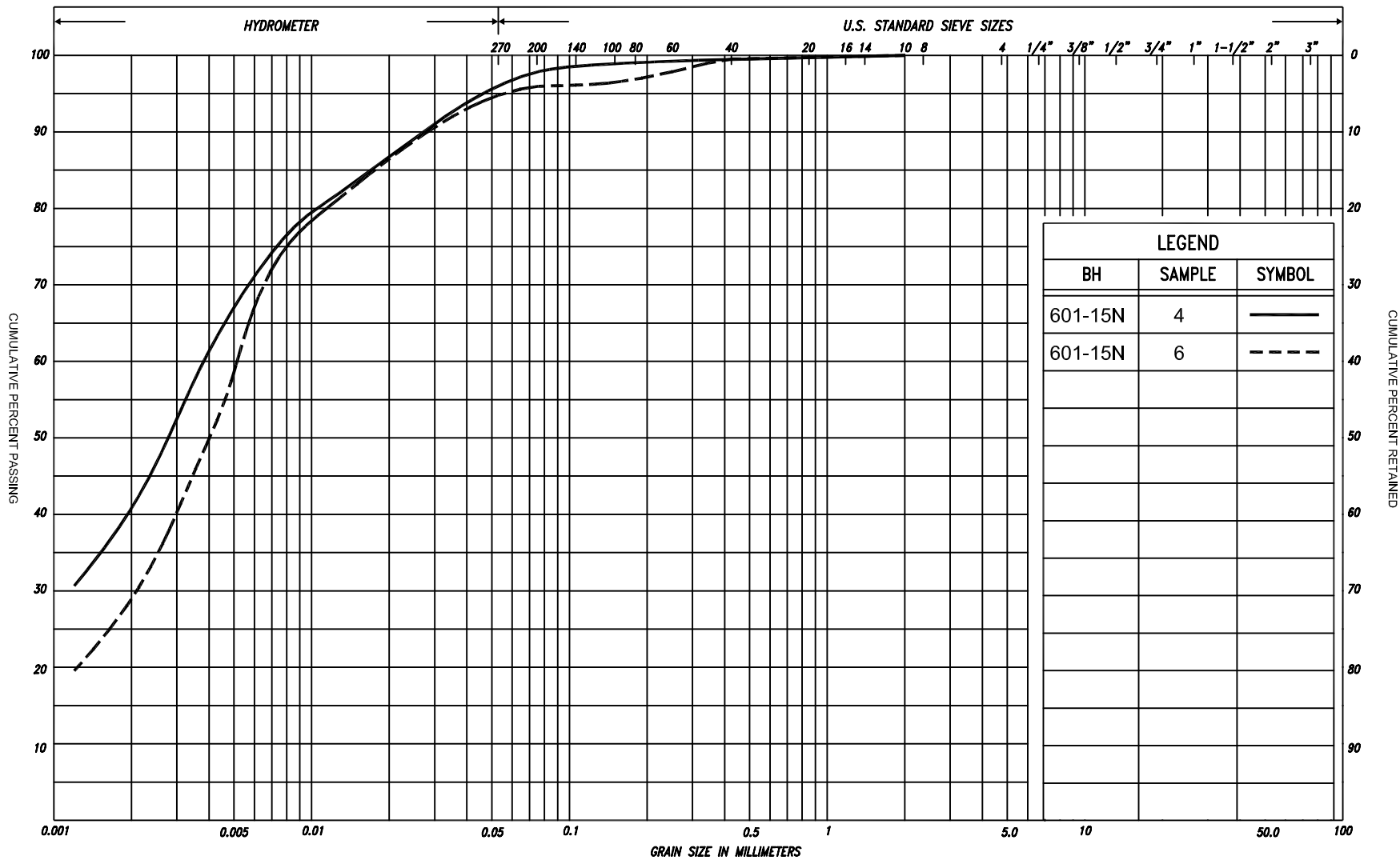
PLASTICITY CHART
CLAY (CH)

FIG No. PC 1
HWY 69
G.W.P. No. 312-99-00

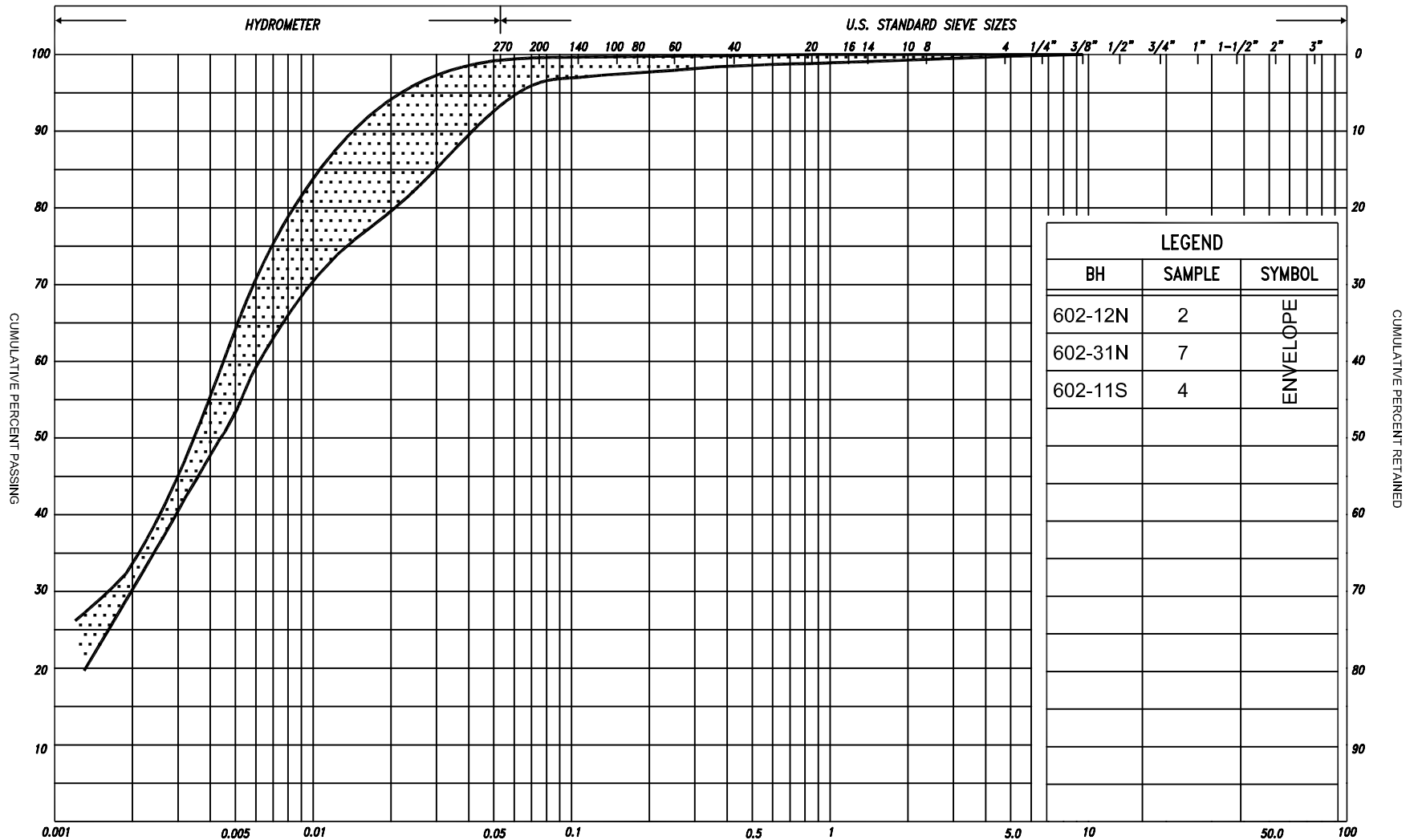


PLASTICITY CHART
SILTY CLAY (CI)

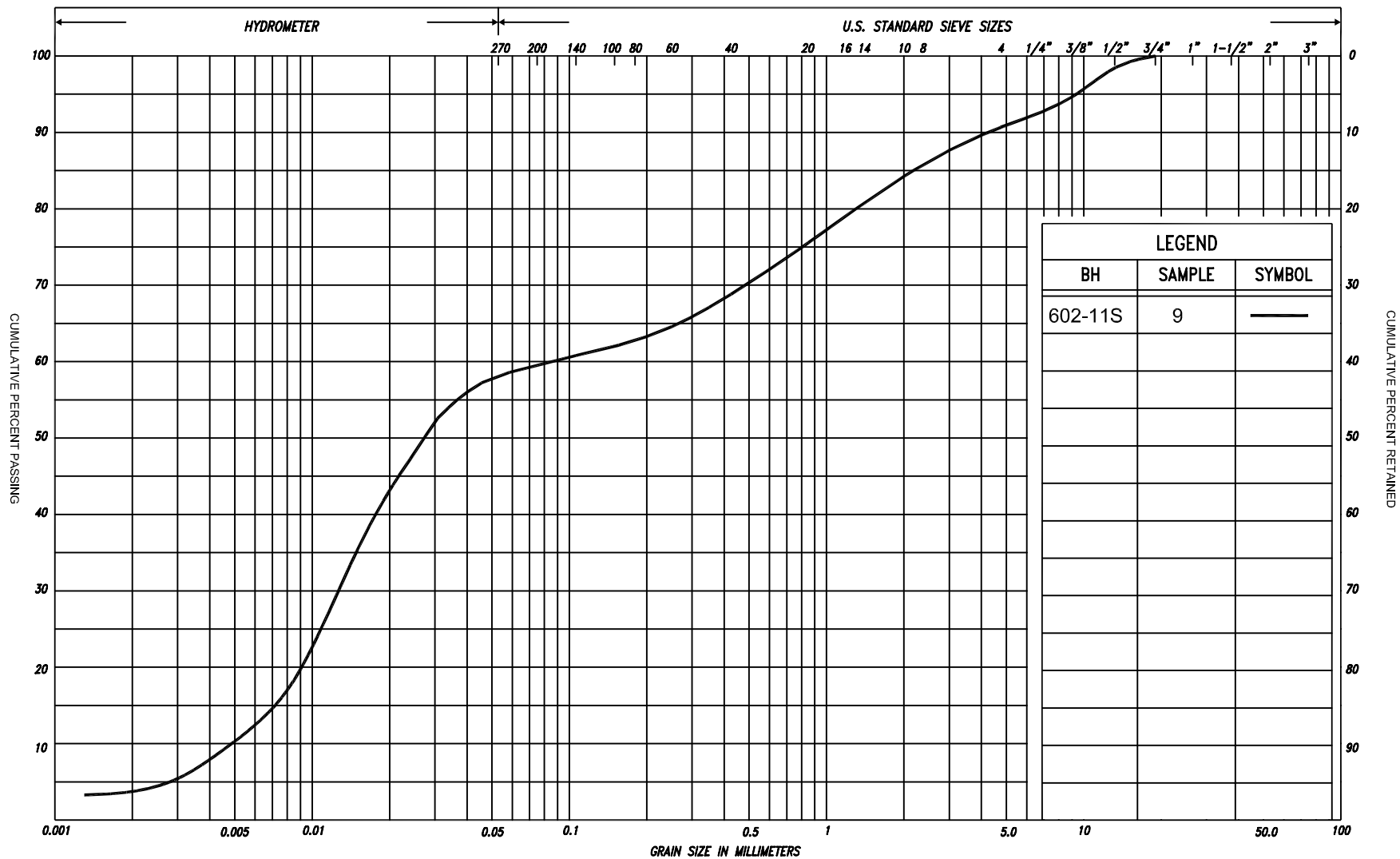




SILT & CLAY				FINE		MEDIUM		COARSE		GRAVEL			COBBLES	UNIFIED		
				SAND												
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE		GRAVEL	COBBLES	M.I.T.	
	SILT															
CLAY			SILT			V. FINE		FINE		MED.		COARSE		GRAVEL		U.S. BUREAU
						SAND										



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



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



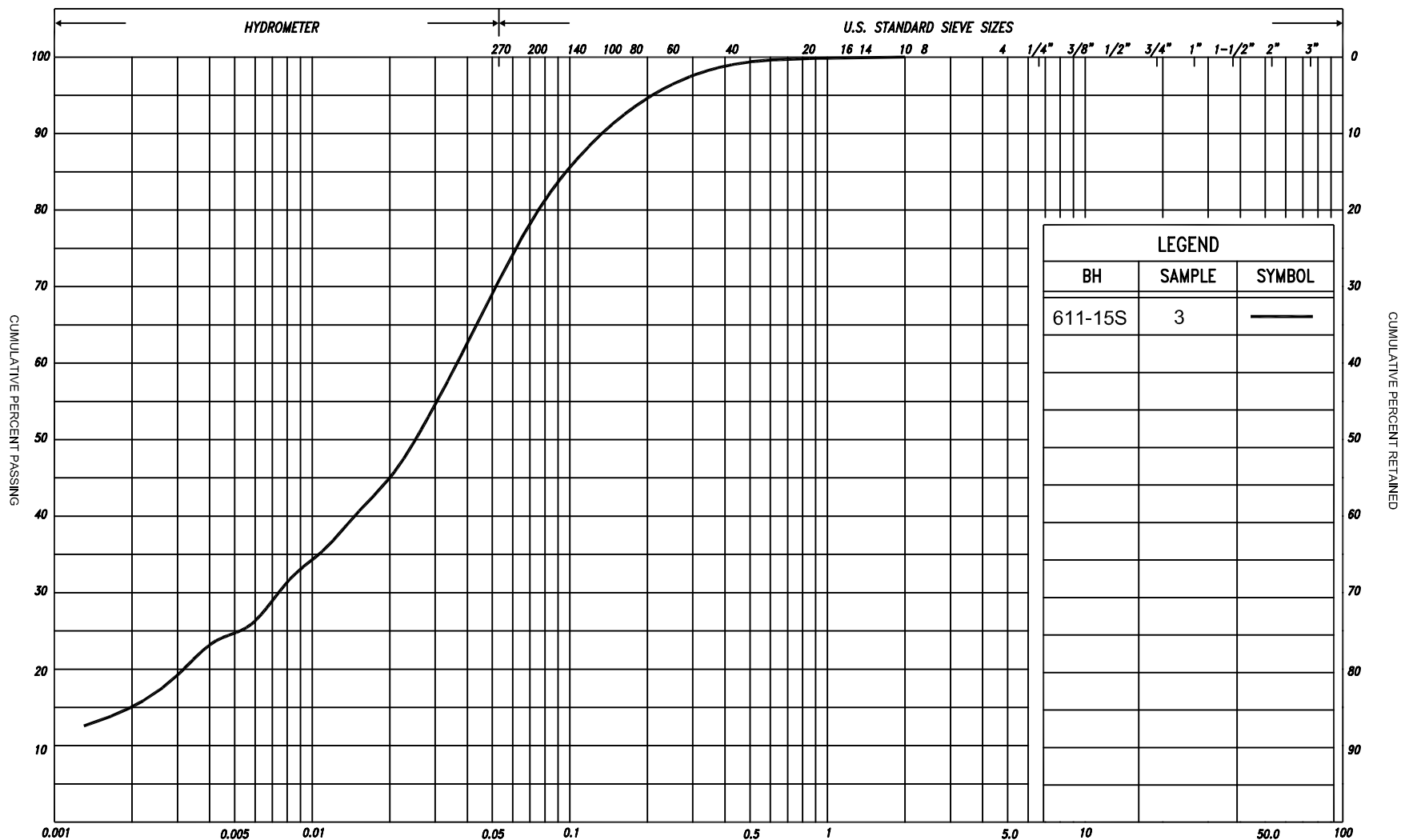
Ministry of
Transportation
Ontario

GRAIN SIZE DISTRIBUTION

FIG No. 602 - 5

HWY 69

G.W.P. No. 312-99-00



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

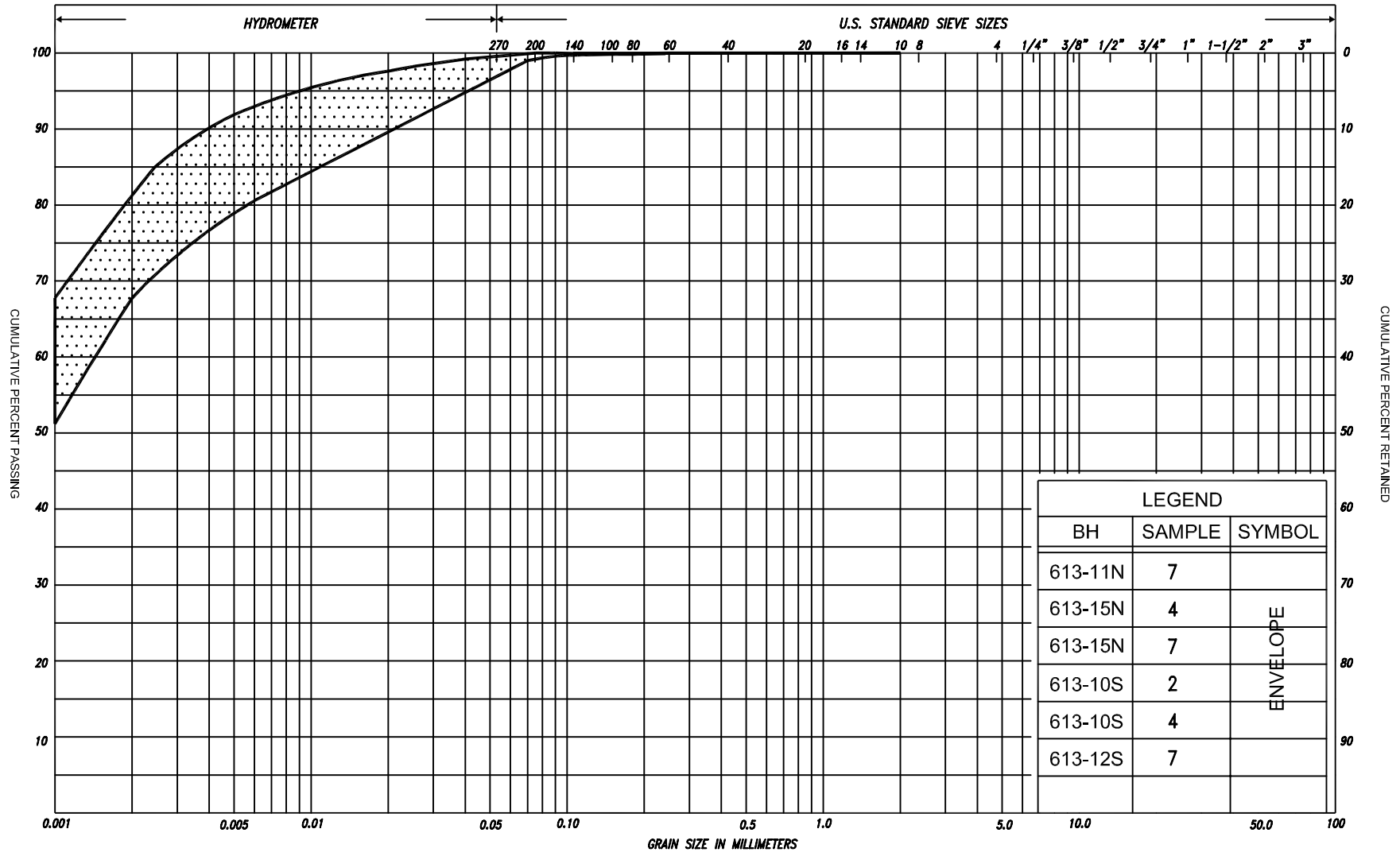


GRAIN SIZE DISTRIBUTION
SILT some SAND some CLAY (ML)

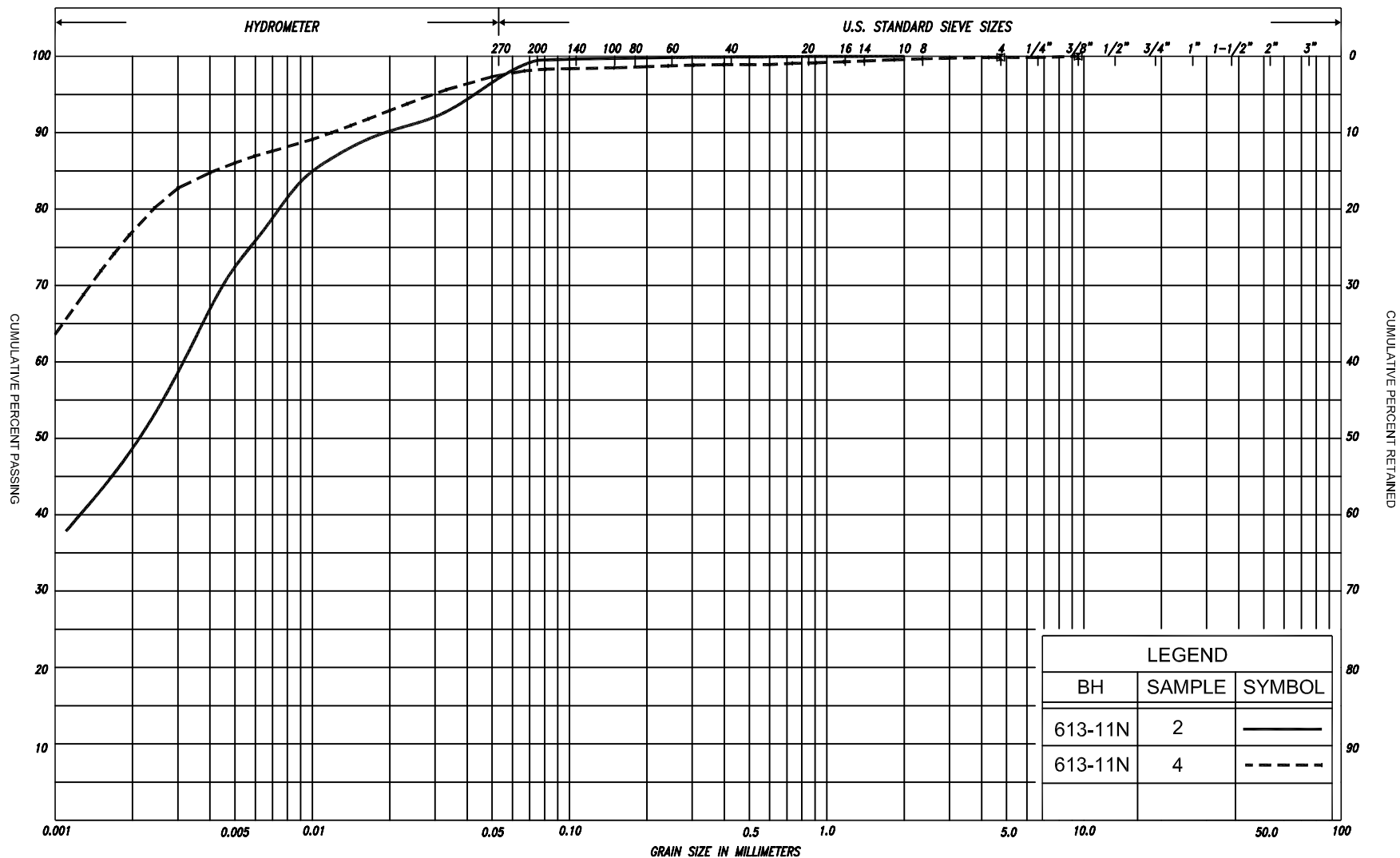
FIG No. 611-2

HWY 69

G.W.P. No. 312-99-00



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



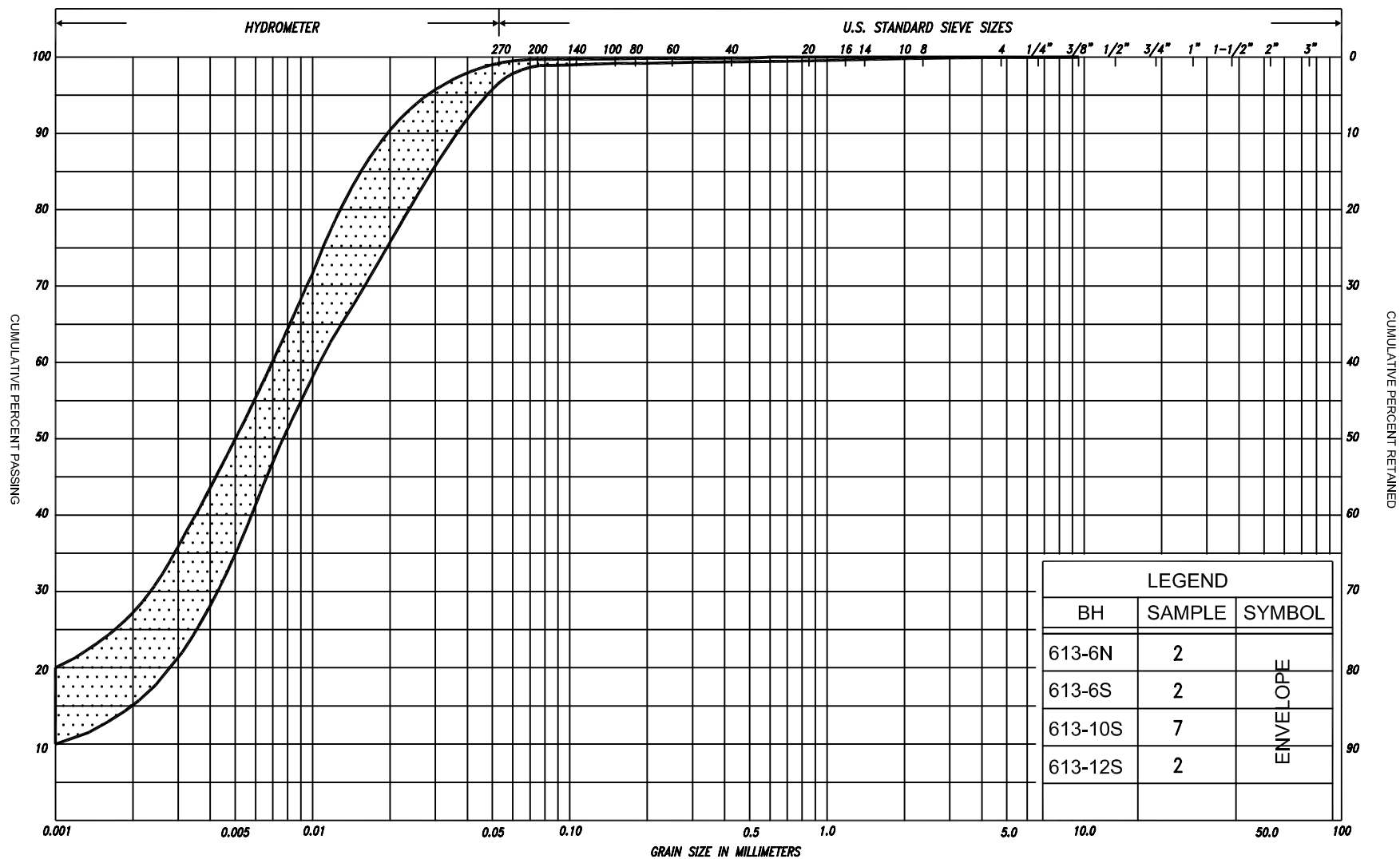
SILT & CLAY					FINE		MEDIUM		COARSE		GRAVEL			COBBLES	UNIFIED		
					SAND												
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE		GRAVEL			COBBLES	M.I.T.
	SILT							SAND									
CLAY		SILT			V. FINE	FINE	MED.	COARSE	GRAVEL							U.S. BUREAU	
					SAND												

GRAIN SIZE DISTRIBUTION SILTY CLAY

FIG No. 613-2

HWY 69

G.W.P. No. 312-99-00



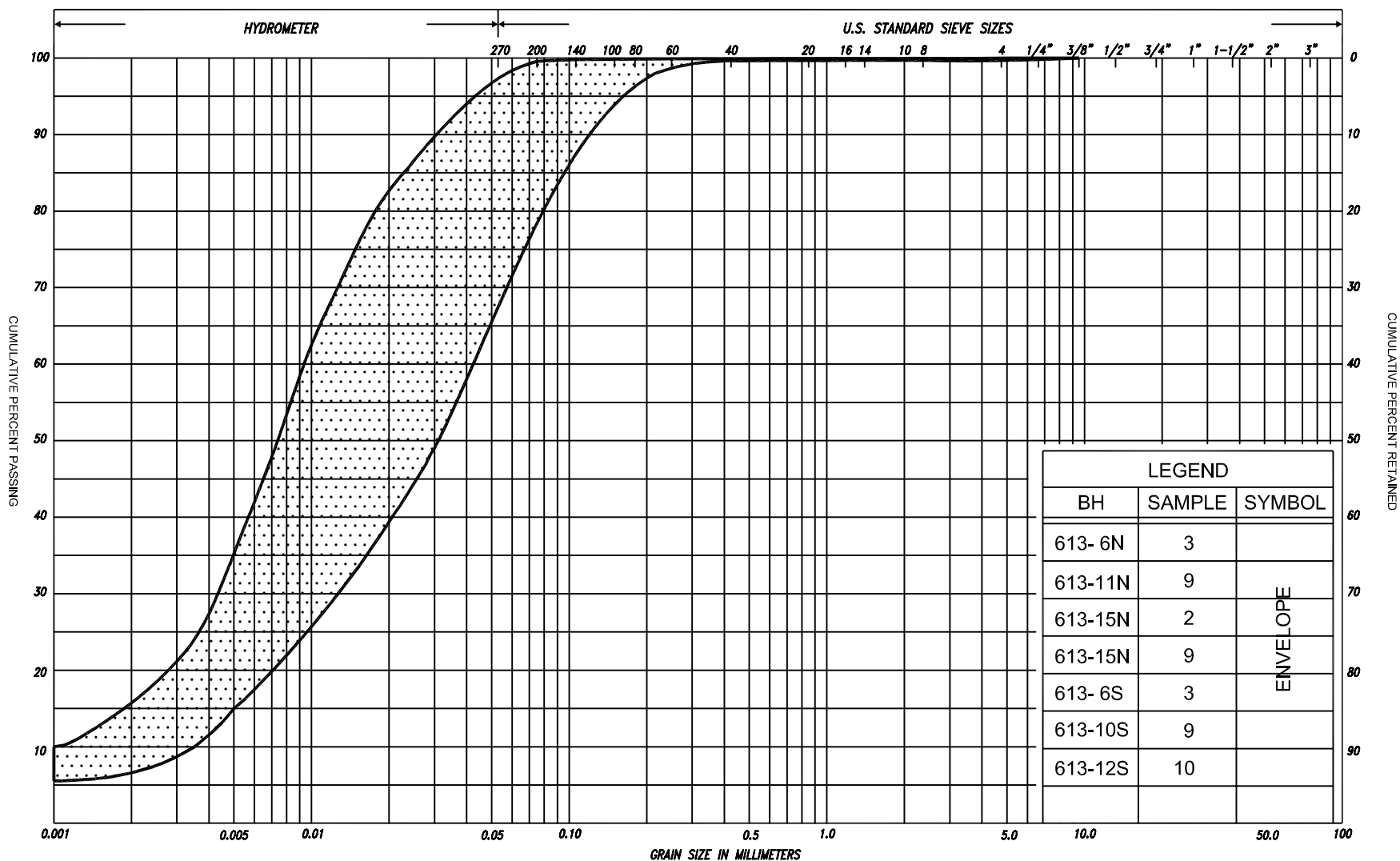
SILT & CLAY					FINE		MEDIUM		COARSE		GRAVEL			COBBLES	UNIFIED		
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE		GRAVEL			COBBLES	M.I.T.
	SILT				V. FINE	FINE	MED.	COARSE	GRAVEL							U.S. BUREAU	
						SAND											

GRAIN SIZE DISTRIBUTION CLAYEY SILT

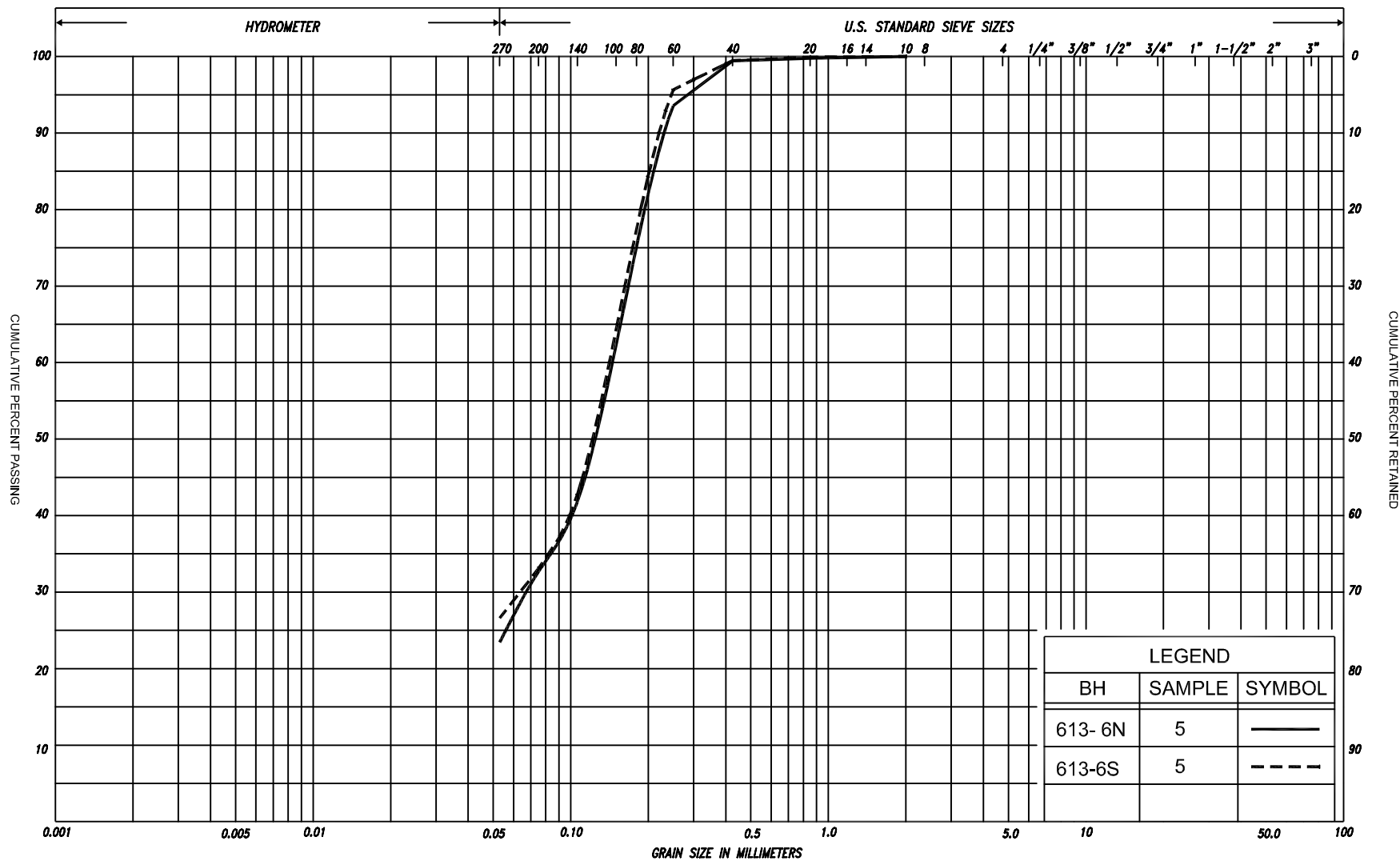
FIG No. 613-3

HWY 69

G.W.P. No. 312-99-00



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



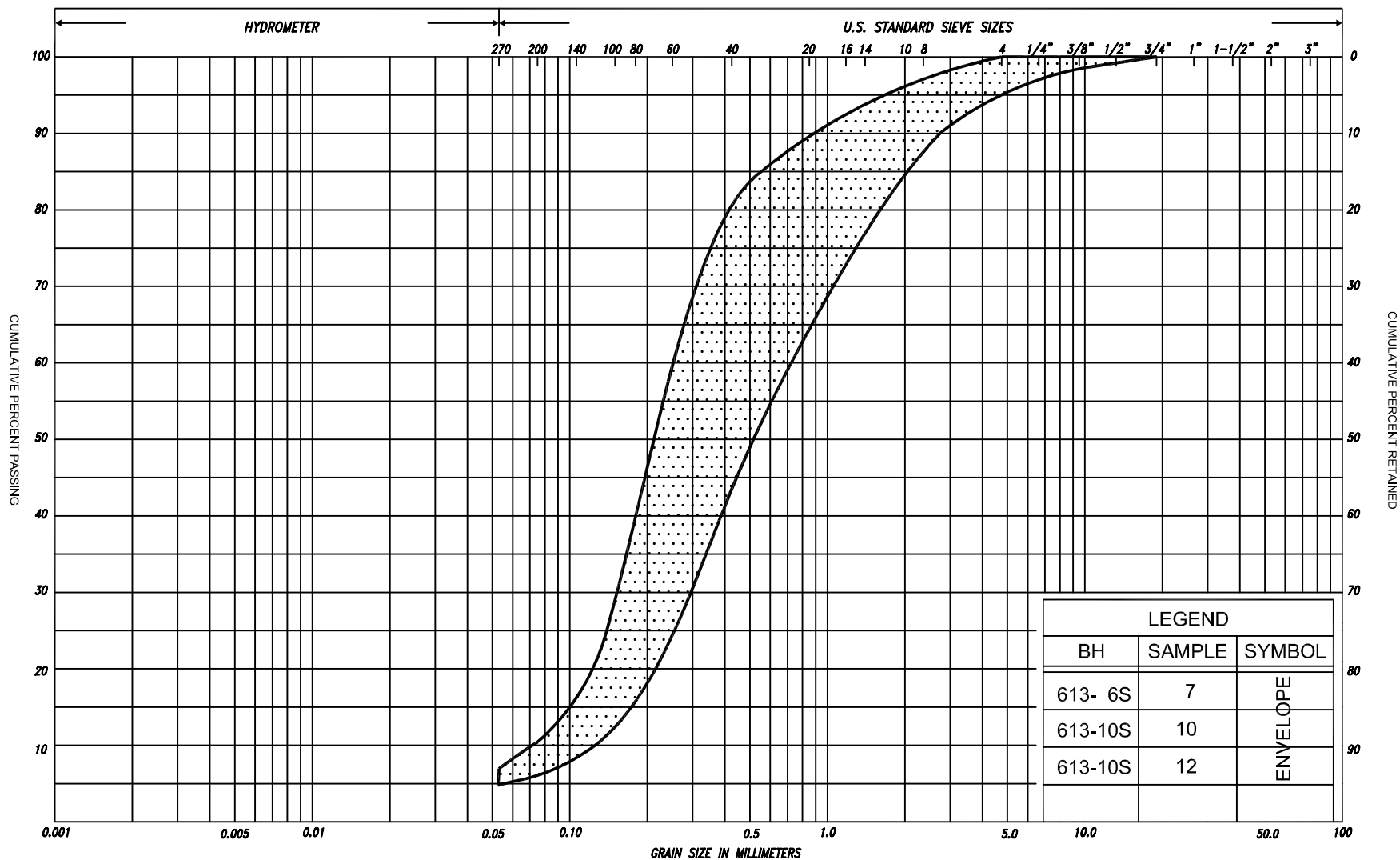
SILT & CLAY				FINE SAND			MEDIUM SAND		COARSE SAND		GRAVEL		COBBLES	UNIFIED
CLAY	FINE SILT			MEDIUM SILT			COARSE SILT			GRAVEL		COBBLES		M.I.T.
	CLAY			SILT			SAND			GRAVEL		COBBLES		U.S. BUREAU

GRAIN SIZE DISTRIBUTION SILTY SAND

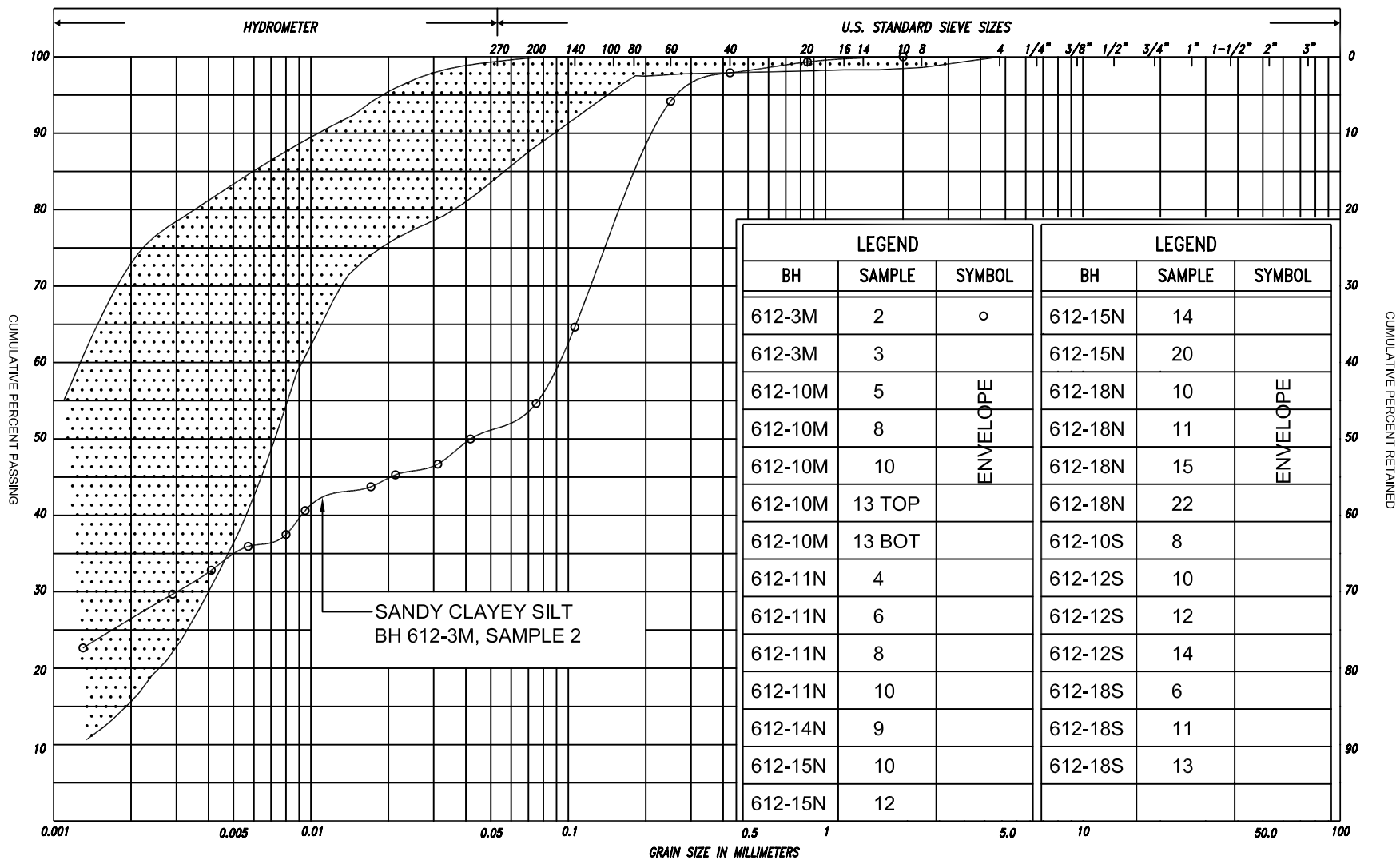
FIG No. 613-5

HWY 69

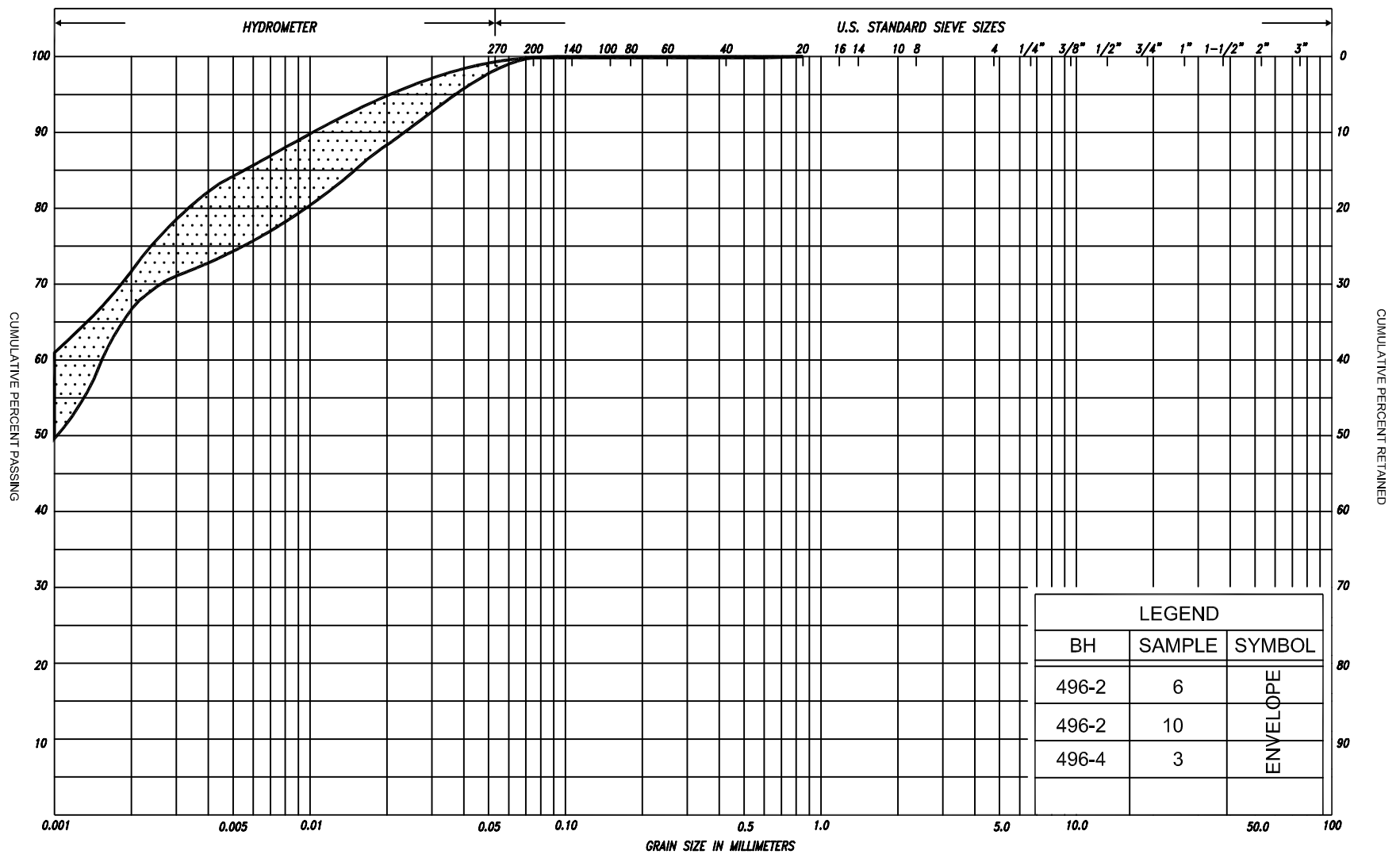
G.W.P. No. 312-99-00



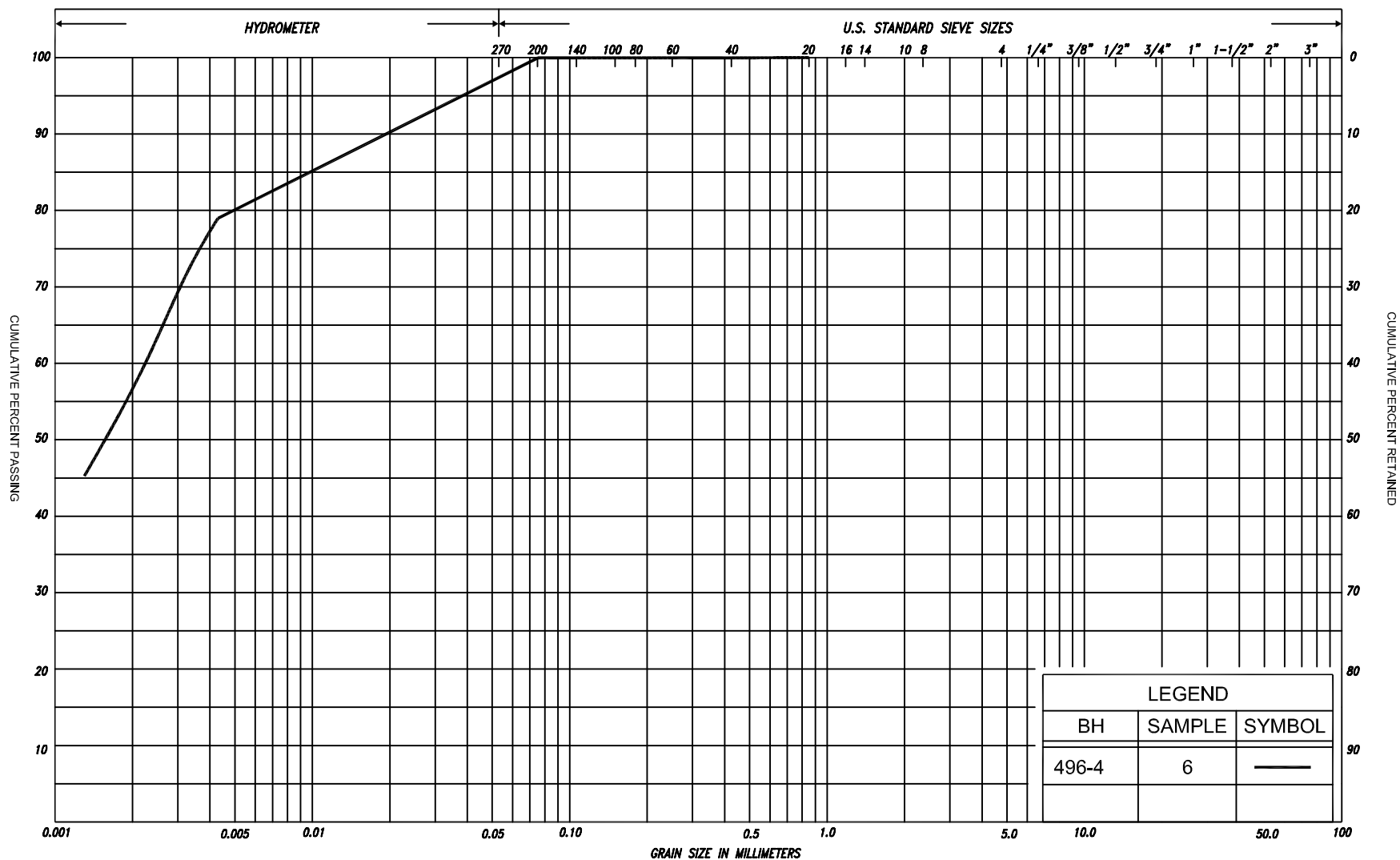
SILT & CLAY				FINE SAND			MEDIUM SAND		COARSE SAND	GRAVEL		COBBLES	UNIFIED
CLAY	FINE SILT			MEDIUM SILT			COARSE SILT			GRAVEL		COBBLES	M.I.T.
	CLAY			SILT			SAND			GRAVEL			U.S. BUREAU



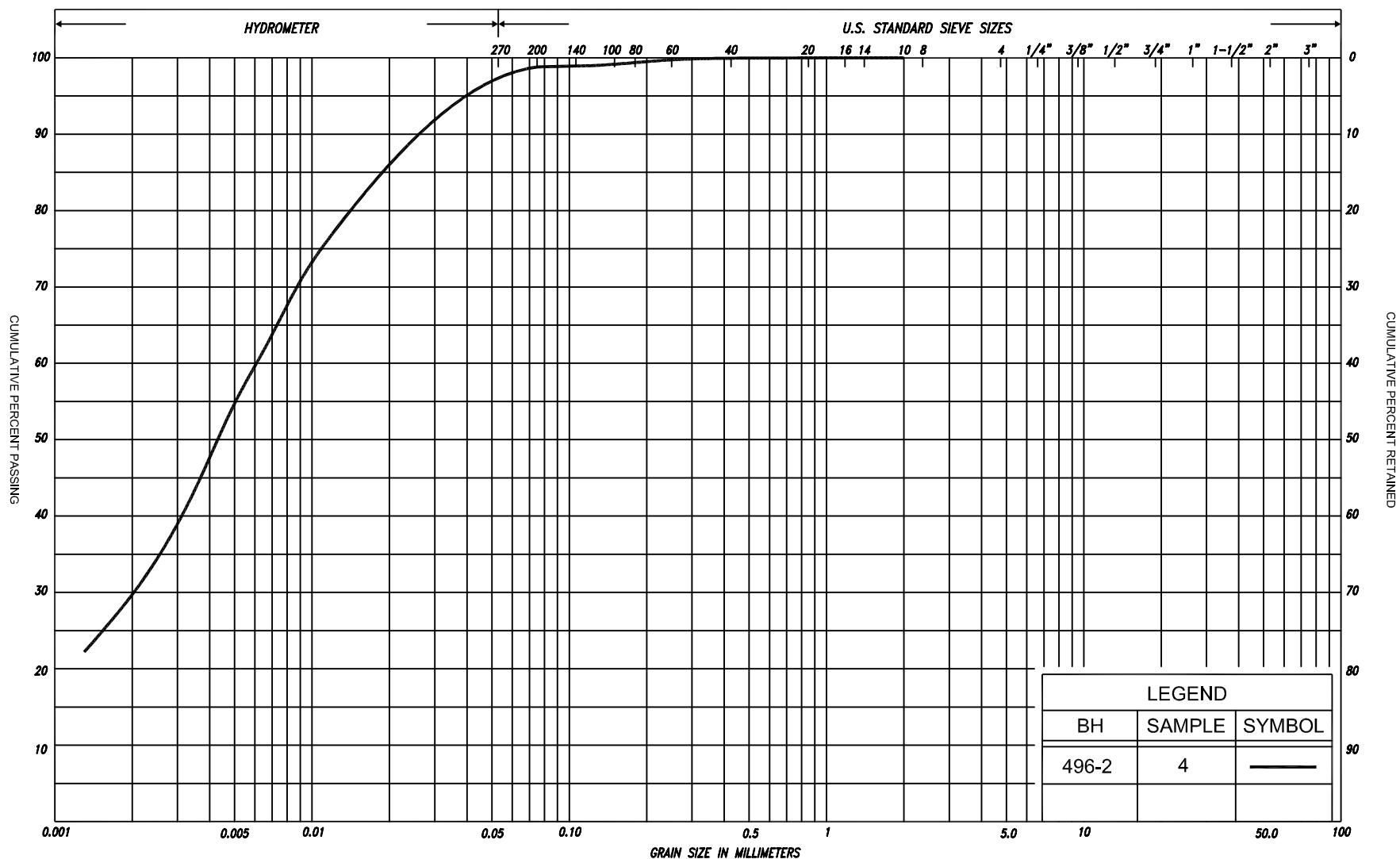
SILT & CLAY					FINE		MEDIUM		COARSE		GRAVEL			COBBLES	UNIFIED		
					SAND												
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE		GRAVEL			COBBLES	M.I.T.
	SILT																
CLAY		SILT			V. FINE	FINE	MED.	COARSE		GRAVEL							U.S. BUREAU
					SAND												



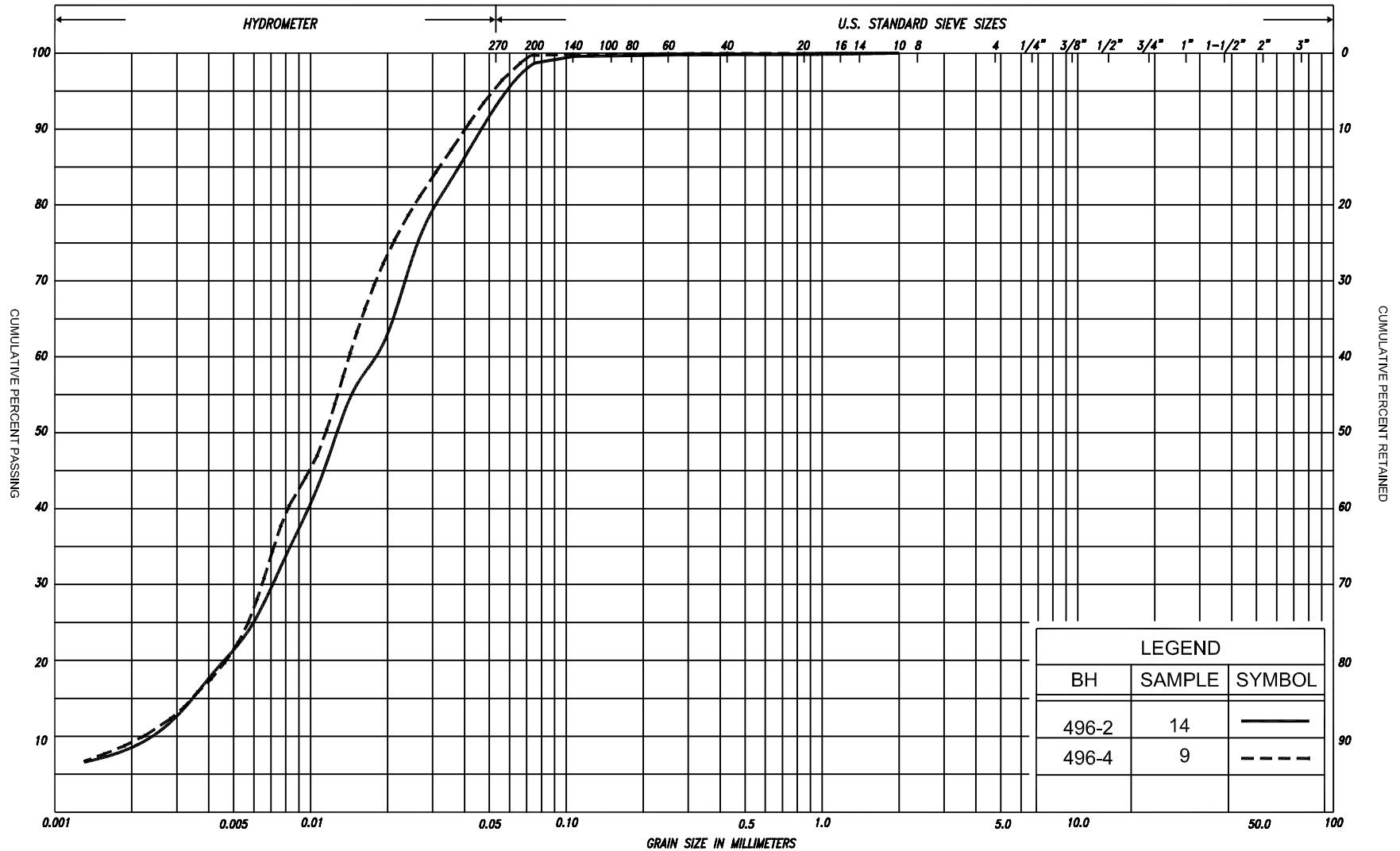
SILT & CLAY					FINE		MEDIUM		COARSE	GRAVEL			COBBLES	UNIFIED		
					SAND											
CLAY	FINE		MEDIUM		COARSE	FINE		MEDIUM		COARSE		GRAVEL			COBBLES	M.I.T.
	SILT															
CLAY		SILT			V. FINE	FINE	MED.	COARSE		GRAVEL						U.S. BUREAU
					SAND											



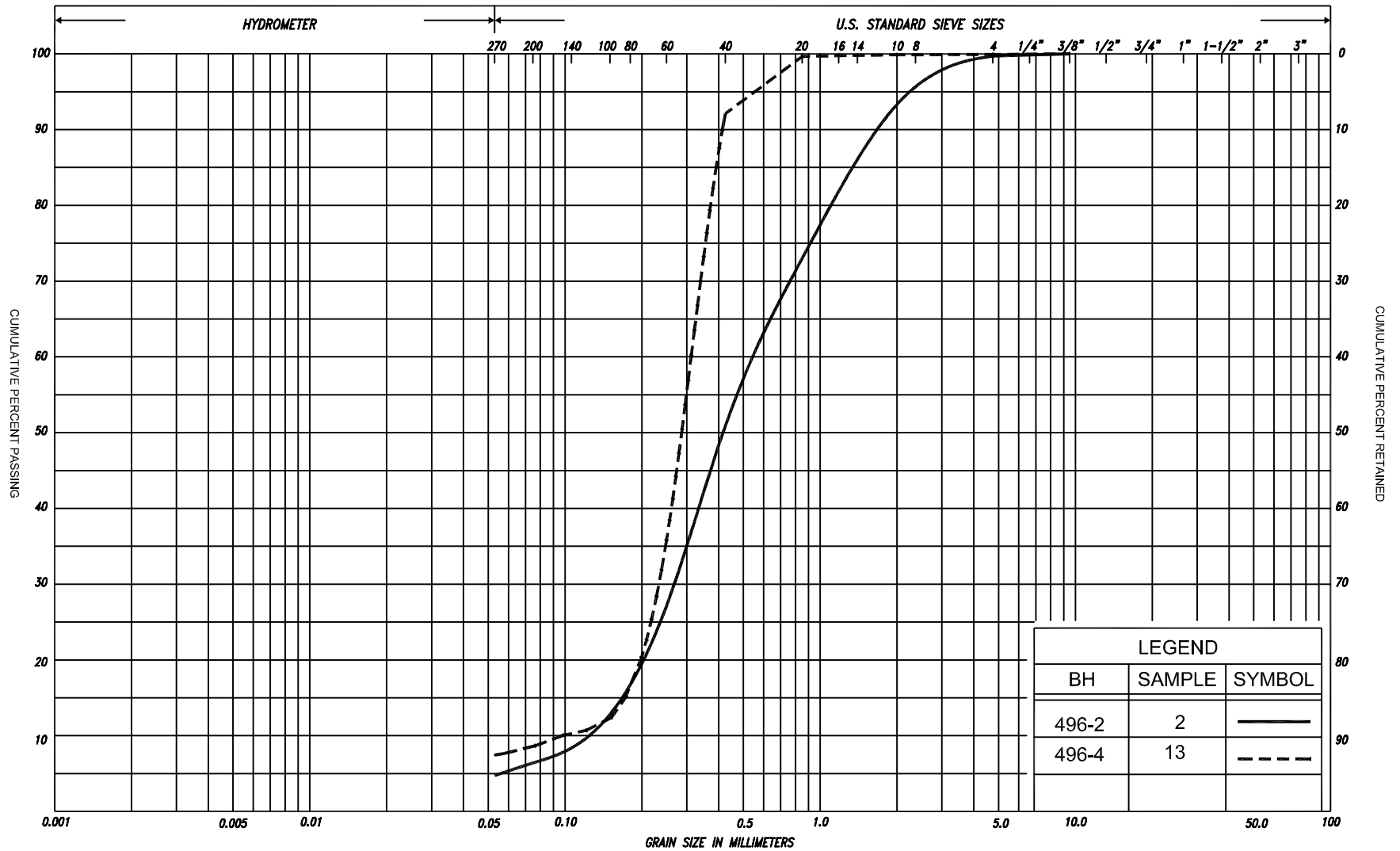
SILT & CLAY					FINE		MEDIUM		COARSE		GRAVEL			COB BLES	UNIFIED		
					SAND												
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE		GRAVEL			COBBLES	M.I.T.
	SILT							SAND									
CLAY		SILT			V. FINE	FINE	MED.	COARSE	GRAVEL							U.S. BUREAU	
					SAND												



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



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

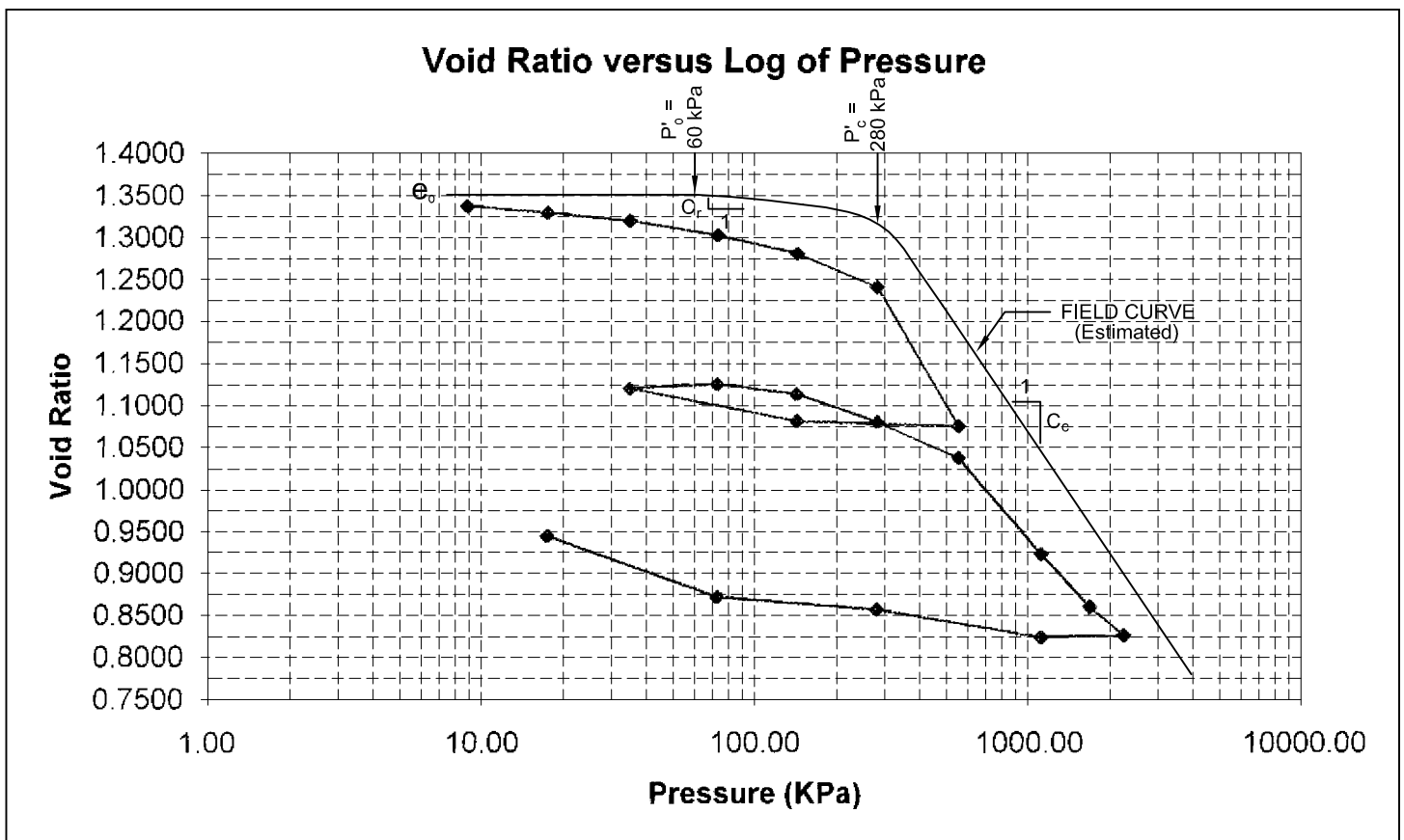


SILT & CLAY					FINE		MEDIUM		COARSE		GRAVEL			COBBLES	UNIFIED		
					SAND											M.I.T.	
CLAY	FINE		MEDIUM		COARSE		FINE		MEDIUM		COARSE		GRAVEL			COBBLES	U.S. BUREAU
	SILT							SAND									
CLAY		SILT			V. FINE	FINE	MED.	COARSE		GRAVEL							
					SAND												

Laboratory Consolidation Test Results

Highway 69 Four-Laning for 12 km
From 4 km South of Estaire to 1 km North of Highway 537
G.W.P. 312-99-00
Etaire, Ontario

BOREHOLE 602-31N, SAMPLE 5A



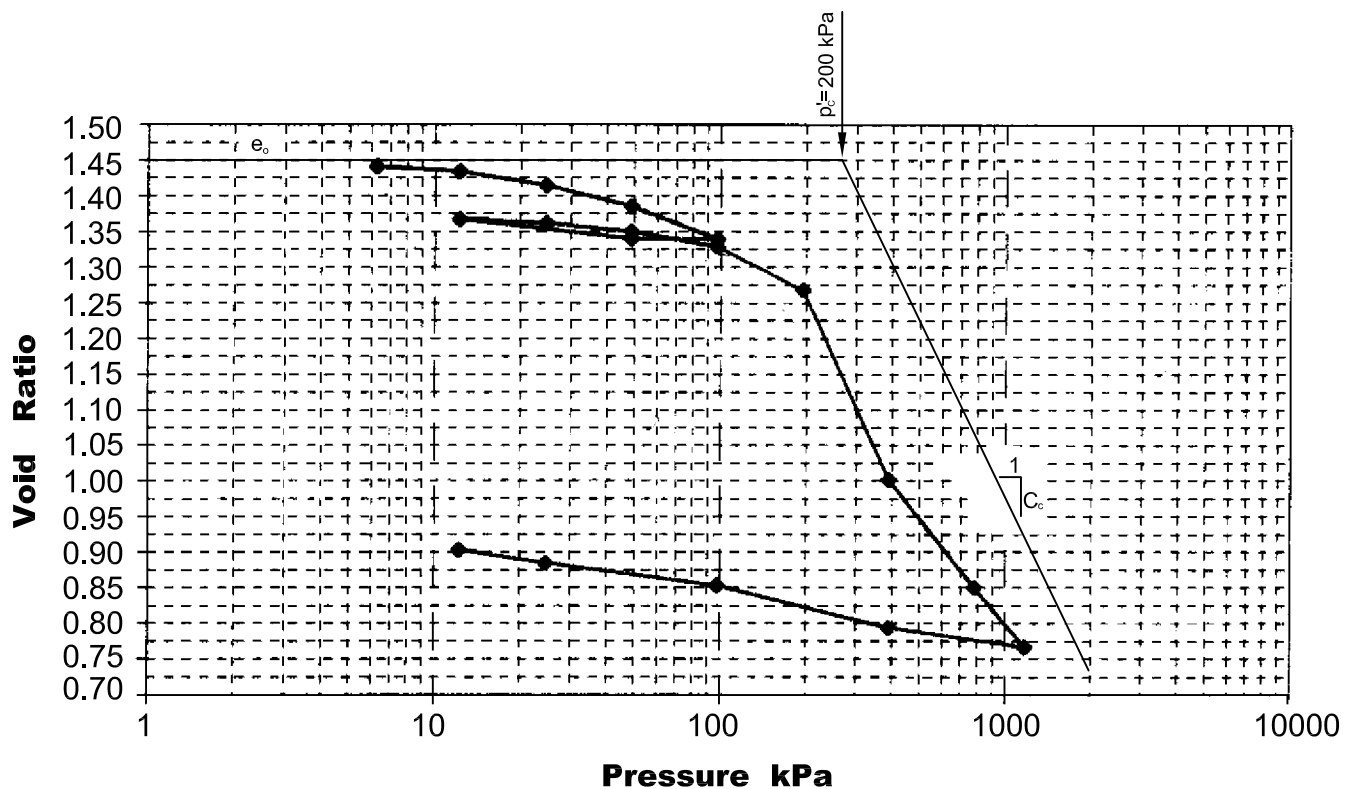
SOIL TYPE: SILTY CLAY		DEPTH: 7.5 - 8.1m
$e_0 = 1.35$	$P'_0 = 60$ kPa	FIGURE: 602-C-1
$W_0 = 50\%$	$P'_c = 280$ kPa	HIGHWAY 69
$\gamma = 17.5$ kN/m ³	$C_c = 0.46$	TWP OF BURWASH
$W_L = 45$; $W_P = 21$; $PI = 24$	$C_r = 0.05$	G.W.P. 312-99-00

Laboratory Consolidation Test Result

Highway 69
 G.W.P. 312-99-00
 District 54, Townships of Secord and Dill
 Sudbury, Ontario

BOREHOLE 612-12S, SAMPLE 16

Void Ratio versus Log of Pressure



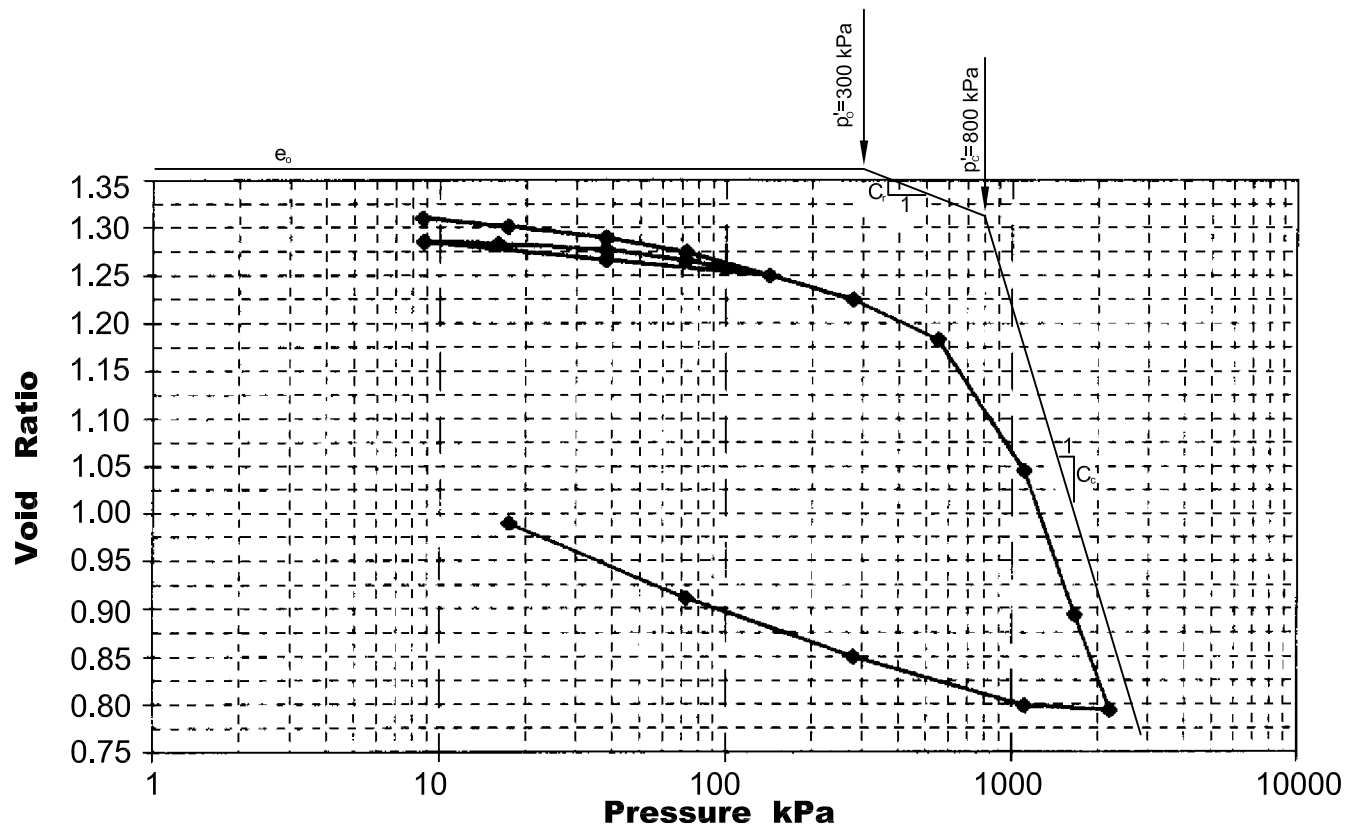
SOIL TYPE: CLAY		DEPTH: 27.4 - 27.9 m
$e_o = 1.45$	$p'_o = 250$ kPa	FIGURE 612-10
$w_o = 53\%$	$p'_c = 250$ kPa	HIGHWAY 69 (New)
$\gamma = 17.3$ kN/m ³	$C_c = 0.83$	TOWNSHIPS OF SECORD and DILL
$W_L = 56$ $W_P = 23$ $PI = 33$	$C_r = 0.07$	G.W.P. 312 - 99 - 00

Laboratory Consolidation Test Result

Highway 69
G.W.P. 312-99-00
District 54, Townships of Secord and Dill
Sudbury, Ontario

BOREHOLE 612-18N, SAMPLE 18

Void Ratio versus Log of Pressure



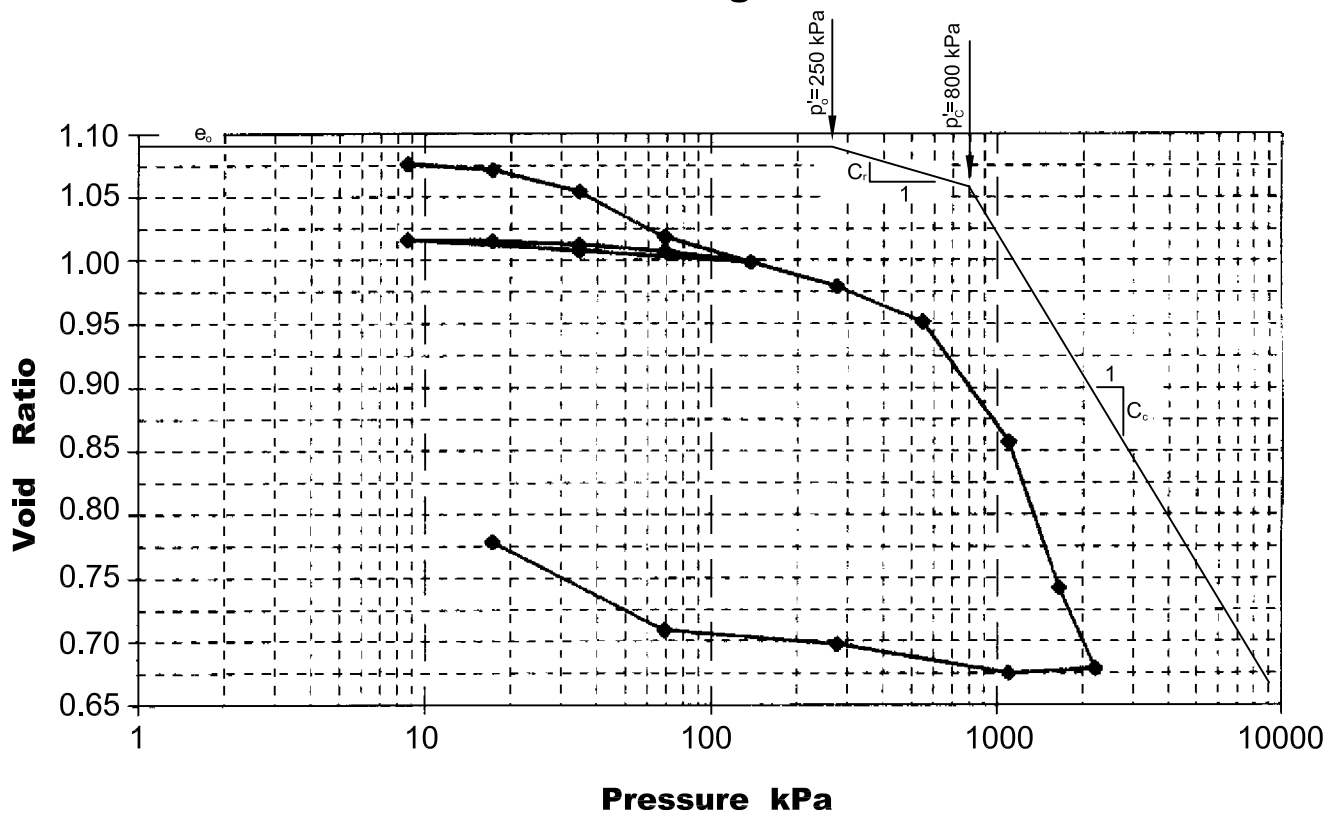
SOIL TYPE: CLAY		DEPTH: 33.5 m
$e_o = 1.36$	$p'_o = 300$ kPa	FIGURE 612-11
$w_o = 50\%$	$p'_c = 800$ kPa	HIGHWAY 69 (New)
$\gamma = 17.5$ kN/m ³	$C_c = 1.00$	TOWNSHIPS OF SECORD and DILL
$W_L = 58$ $W_P = 24$ $PI = 34$	$C_r = 0.12$	G.W.P. 312 - 99 - 00

Laboratory Consolidation Test Result

Highway 69
G.W.P. 312-99-00
District 54, Townships of Secord and Dill
Sudbury, Ontario

BOREHOLE 612-18S, SAMPLE 15

Void Ratio versus Log of Pressure



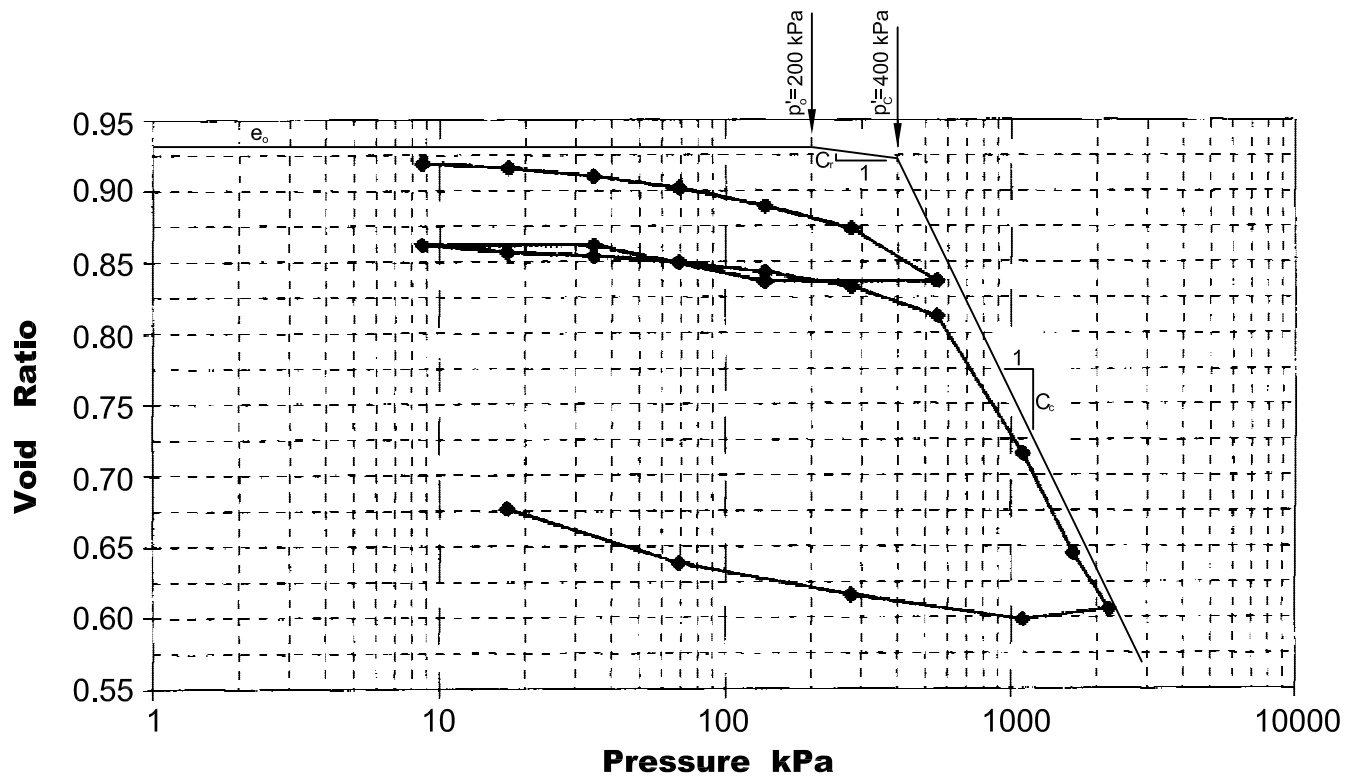
SOIL TYPE: SILTY CLAY		DEPTH: 24.4 - 24.9 m
$e_o = 1.09$	$p'_o = 250 \text{ kPa}$	FIGURE 612-12
$w_o = 38\%$	$p'_c = 800 \text{ kPa}$	HIGHWAY 69 (New)
$\gamma = 18.5 \text{ kN/m}^3$	$C_c = 0.75$	TOWNSHIPS OF SECORD and DILL
$W_L = 39 \quad W_P = 19 \quad PI = 20$	$C_r = 0.06$	G.W.P. 312 - 99 - 00

Laboratory Consolidation Test Result

Highway 69
 G.W.P. 312-99-00
 District 54, Townships of Secord and Dill
 Sudbury, Ontario

BOREHOLE 612-10M, SAMPLE 13

Void Ratio versus Log of Pressure

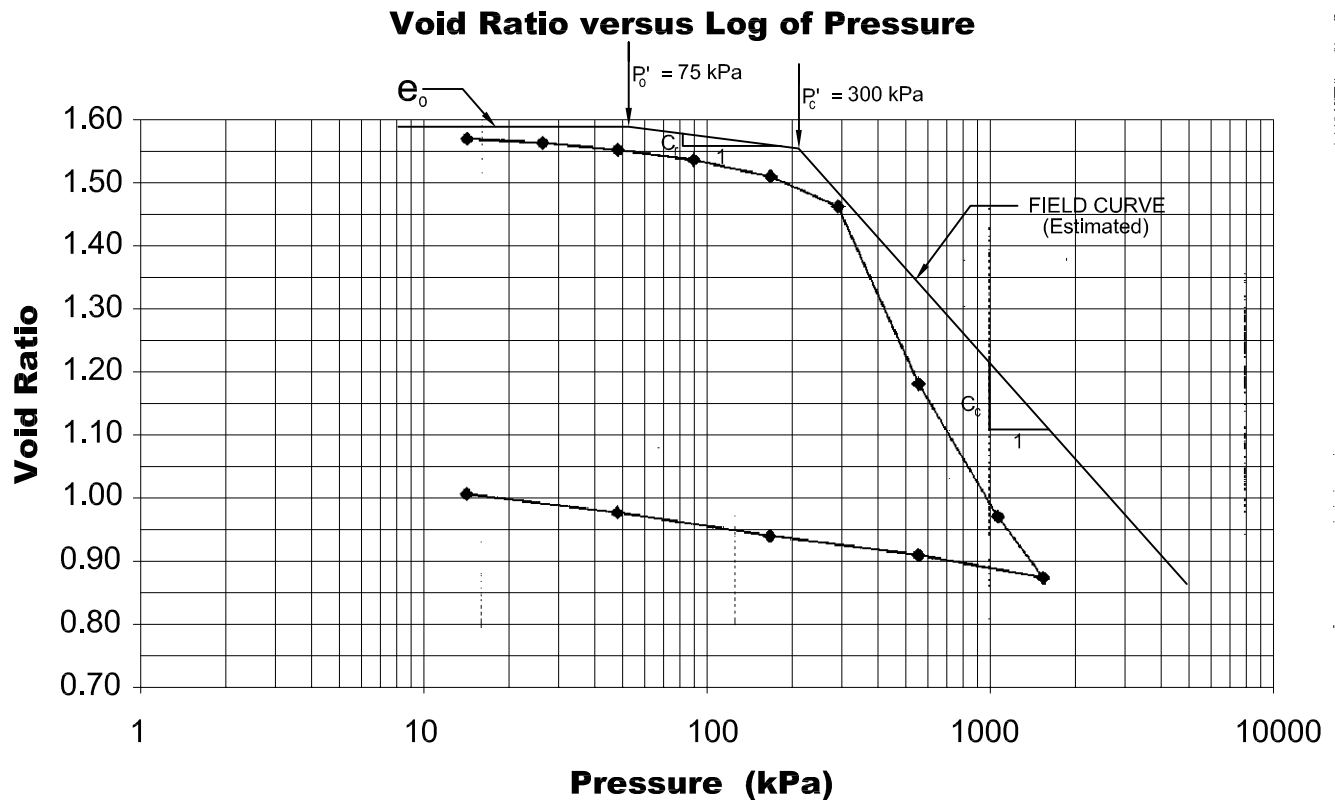


SOIL TYPE: CLAYEY SILT		DEPTH: 18.3 - 18.9 m
$e_o = 0.93$	$p'_0 = 200$ kPa	FIGURE 612-13
$w_o = 35\%$	$p'_c = 400$ kPa	HIGHWAY 69 (New)
$\gamma = 19.1$ kN/m ³	$C_c = 0.42$	TOWNSHIPS OF SECORD and DILL
$W_L = 34$ $W_P = 17$ $PI = 17$	$C_r = 0.03$	G.W.P. 312 - 99 - 00

Laboratory Consolidation Test Results

Highway 537 Underpass
W.P. 5051-00-01
Site 46-496, District 54
Township of Dill, Sudbury, Ontario

BOREHOLE 496-2, SAMPLE 6,
STATION 9 + 961, CL Highway 537



SOIL TYPE: CLAY, with silt			DEPTH: 7.6 - 8.2 m
$e_0 = 1.59$	$P'_0 = 75 \text{ kPa}$	$W_L = 61$	FIGURE: C-1
$W_0 = 62\%$	$C_c = 0.50$	$W_p = 24$	HIGHWAY 537
$\gamma = 16.8 \text{ kN/m}^3$	$C_r = 0.06$	$PI = 37$	TWP OF DILL, SUDBURY
			W.P. 5051-00-01



APPENDIX B

Drawings 601-1 to 613-7 and 101-1 to 101-5
Borehole Locations and Soils Strata

(Legend Continued)

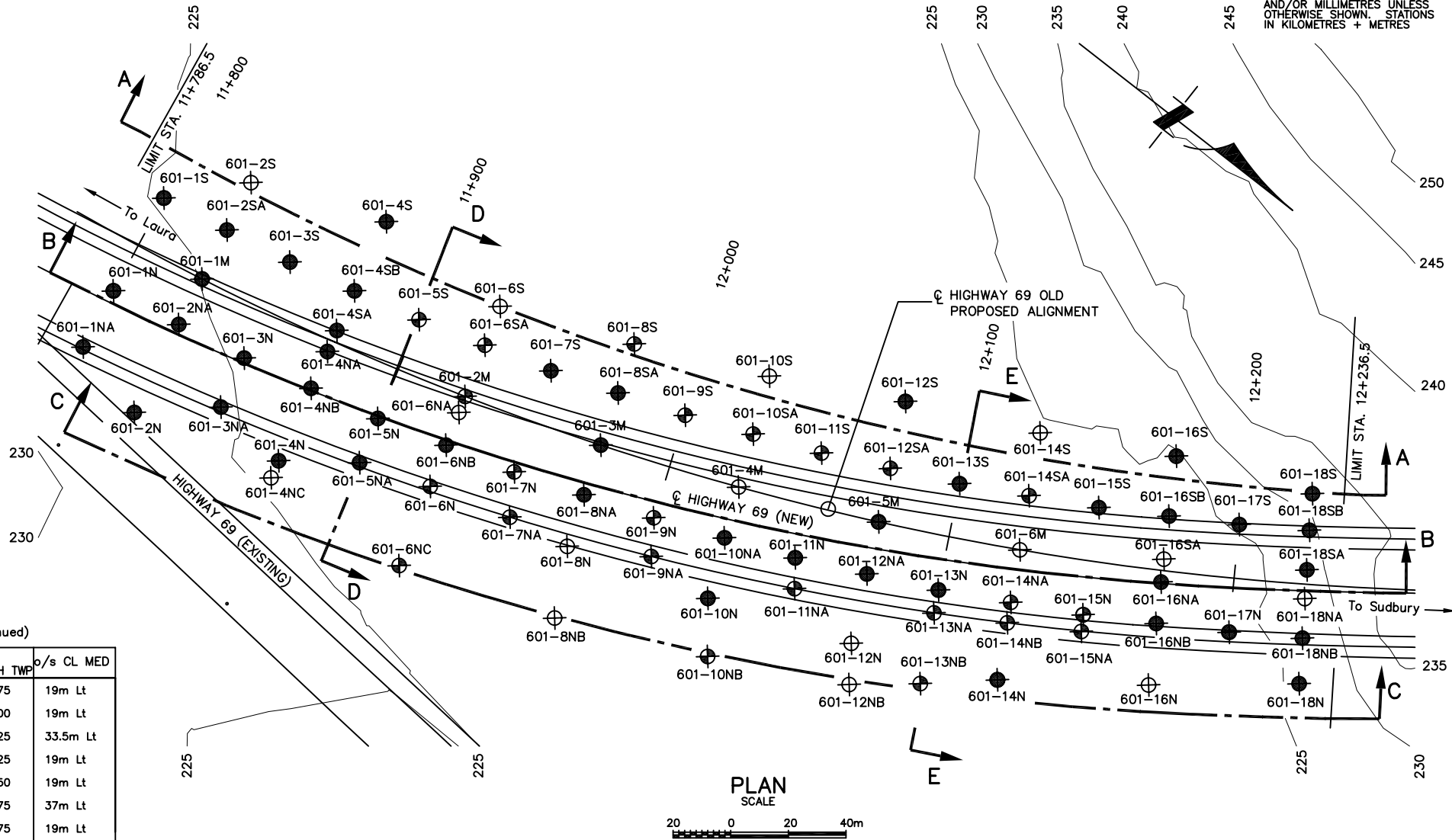
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
601-1N	226.3	11+800	19m Rt
601-1NA	225.5	11+800	40m Rt
601-2N	225.5	11+825	52m Rt
601-2NA	225.5	11+825	19m Rt
601-3N	223.7	11+850	19m Rt
601-3NA	225.5	11+850	37m Rt
601-4N	223.6	11+875	45.5m Rt
601-4NA	223.6	11+875	4m Rt
601-4NB	223.7	11+875	19m Rt
601-4NC	223.7	11+875	52m Rt
601-5N	224.8	11+900	19m Rt
601-5NA	223.7	11+900	35m Rt
601-6N	225.0	11+925	33.5m Rt
601-6NA	224.4	11+925	6m Rt
601-6NB	224.1	11+925	19m Rt
601-6NC	225.0	11+925	63m Rt
601-7N	223.7	11+950	19m Rt
601-7NA	224.8	11+950	32m Rt
601-8N	224.8	11+975	37m Rt
601-8NA	223.7	11+975	19m Rt
601-8NB	224.8	11+975	62m Rt
601-9N	223.8	12+000	19m Rt
601-9NA	223.8	12+000	31m Rt
601-10N	223.0	12+025	40m Rt
601-10NA	223.0	12+025	19m Rt
601-10NB	223.3	12+025	60m Rt
601-11N	222.7	12+050	19m Rt
601-11NA	222.7	12+050	29m Rt
601-12N	222.6	12+075	43m Rt
601-12NA	222.6	12+075	19m Rt
601-12NB	222.6	12+075	57m Rt
601-13N	222.4	12+100	19m Rt
601-13NA	222.4	12+100	26m Rt
601-13NB	222.4	12+100	52m Rt
601-14N	222.4	12+125	45.5m Rt
601-14NA	222.4	12+125	19m Rt
601-14NB	222.4	12+125	24m Rt
601-15N	222.4	12+150	19m Rt
601-15NA	222.4	12+150	24m Rt
601-16N	222.5	12+175	40m Rt
601-16NA	222.5	12+175	4m Rt
601-16NB	222.5	12+175	19m Rt
601-17N	223.8	12+200	19m Rt
601-18N	225.1	12+225	34m Rt
601-18NA	226.5	12+225	5m Rt
601-18NB	226.0	12+225	19m Rt
601-1S	224.4	11+800	19m Lt
601-2S	223.4	11+825	37.5m Lt
601-2SA	224.5	11+825	19m Lt
601-3S	223.6	11+850	19m Lt
601-4S	223.6	11+875	45.5m Lt
601-4SA	223.6	11+875	4m Lt

(Legend Continued)

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
601-4SB	223.6	11+875	19m Lt
601-5S	224.5	11+900	19m Lt
601-6S	223.0	11+925	33.5m Lt
601-6SA	223.0	11+925	19m Lt
601-7S	223.0	11+950	19m Lt
601-8S	222.9	11+975	37m Lt
601-8SA	223.0	11+975	19m Lt
601-9S	223.0	12+000	19m Lt
601-10S	222.6	12+025	40m Lt
601-10SA	222.8	12+025	19m Lt
601-11S	222.7	12+050	19m Lt
601-12S	222.6	12+075	43m Lt
601-12SA	222.6	12+075	19m Lt
601-13S	222.5	12+100	19m Lt
601-14S	223.0	12+125	41.5m Lt
601-14SA	222.5	12+125	19m Lt
601-15S	222.7	12+150	19m Lt
601-16S	224.9	12+175	40m Lt
601-16SA	222.7	12+175	4m Lt
601-16SB	224.5	12+175	19m Lt
601-17S	225.1	12+200	19m Lt
601-18S	232.5	12+225	31.5m Lt
601-18SA	226.5	12+225	5m Lt
601-18SB	226.7	12+225	19m Lt

NOTE:

REFER TO DRAWINGS 601-2 TO 601-5 FOR SECTIONS A-A, B-B, C-C, D-D AND E-E.



METRIC

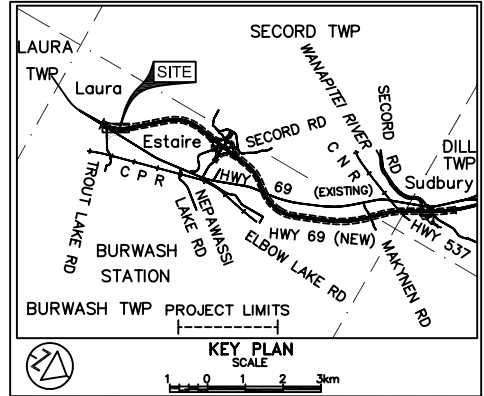
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 601, STA. 11+786.5 TO 12+236.5 BURWASH TWP
BOREHOLE LOCATIONS



PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W.L. at time of investigation Mar-Jun 2003 Apr 2004
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
601-1M	225.1	11+825	CL
601-2M	223.7	11+925	CL
601-3M	222.8	11+975	CL
601-4M	223.0	12+025	CL
601-5M	222.5	12+075	CL
601-6M	222.5	12+125	CL

(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.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	601-1



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

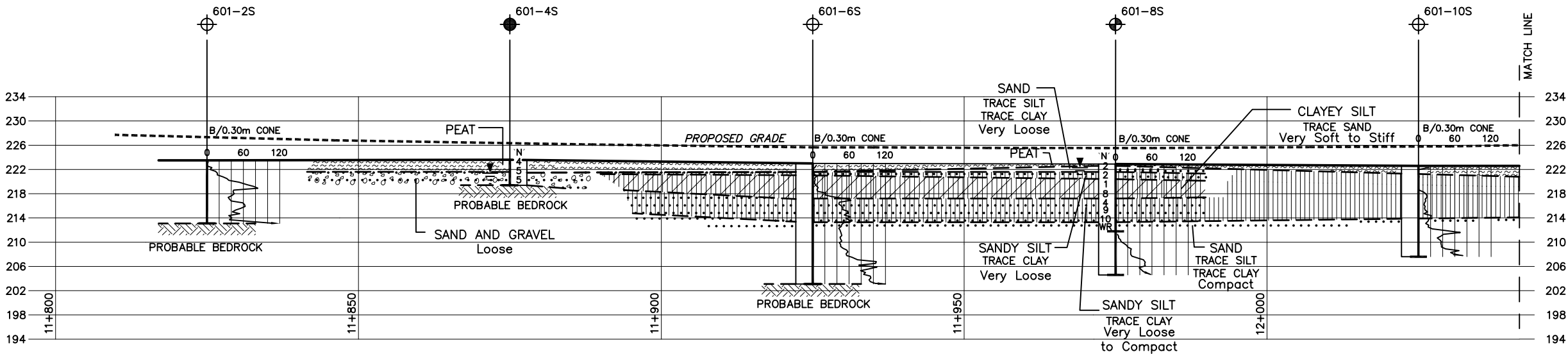
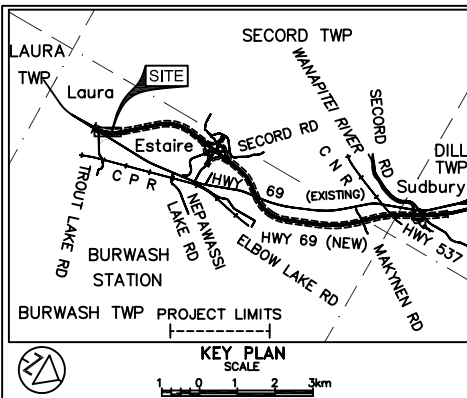
METRIC

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

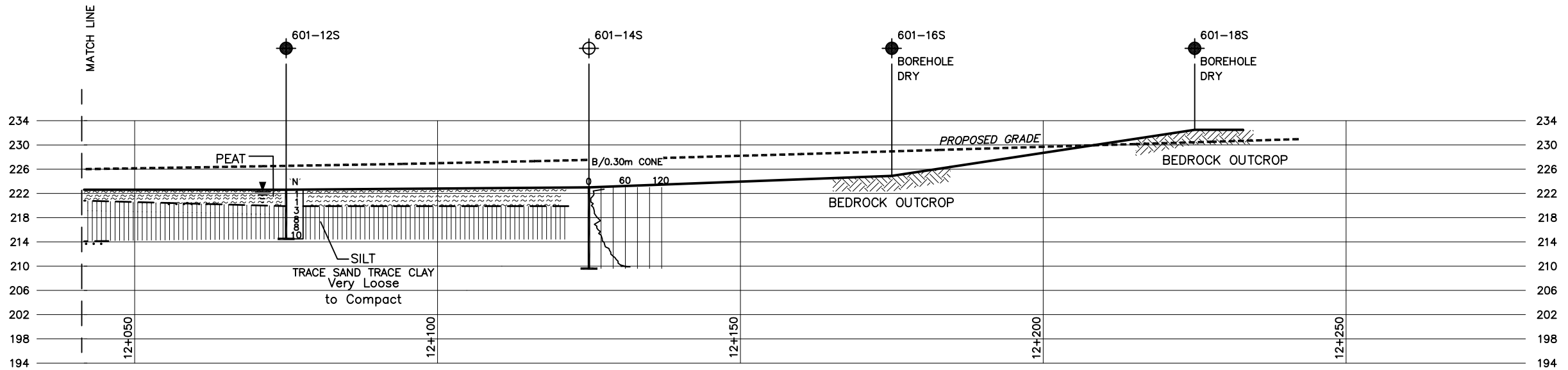
CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 601, STA. 11+786.5 TO 12+236.5 BURWASH TWP
SOIL STRATA

SHEET



A-A



A-A (Continued)

SECTION
SCALE

8 4 0 8 16m

NOTE:

REFER TO DRAWING 601-1 FOR PLAN; DRAWINGS 601-3 TO 601-5 FOR SECTIONS B-B, C-C, D-D AND E-E.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002

LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Mar-Jun 2003		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA	p/s	CL	MED
		BURWASH TWP			
Refer to drawing 601-1 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.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

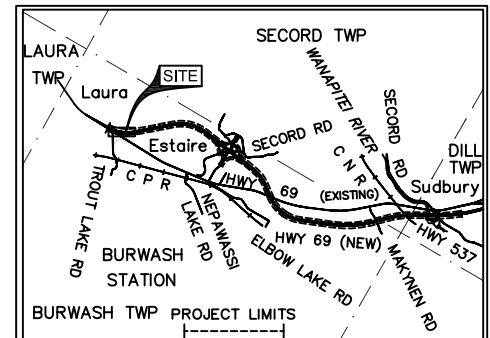
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
SITE		DWG	601-2

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

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 601, STA. 11+786.5 TO 12+236.5 BURWASH TWP
SOIL STRATA




Peto MacCallum Ltd.
CONSULTING ENGINEERS



Geological cross-section diagram showing soil profiles and borehole data. The diagram includes a vertical axis on the left with elevations from 194 to 230. A horizontal axis at the bottom shows stationing from 12+050 to 12+250. Four boreholes are shown: 601-5M, 601-6M, 601-16NA, and 601-18SA. Soil layers are labeled with terms like 'SAND', 'TRACE SILT', 'TRACE CLAY', 'PEAT', 'SILT', 'SANDY SILT', 'PROBABLE BEDROCK', and 'BEDROCK OUTCROP'. A 'PROPOSED GRADE' line is indicated by a dashed line. A 'MATCH LINE' is shown on the far left. A 'B/O.30m CONE' is noted near borehole 601-6M.








SECTION
SCALE



8 4 0 8 16m

REFER TO DRAWINGS 601-1 AND 601-2 FOR PLAN AND SECTION A-A; DRAWINGS 601-4 AND 601-5 FOR SECTIONS C-C, D-D AND E-E.

REGISTERED PROFESSIONAL ENGINEER
D. W. KERR
PROVINCE OF ONTARIO

	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation Mar–Jun 2003
	Head ARTESIAN WATER
	Encountered
	PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
Refer to drawing 601-1 for co-ordinates			

- 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	

HWY No	69					DIST	54
SUBM'D	PC	CHECKED	CN	DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG	APPROVED	DWK	DWG	601-3

METRIC

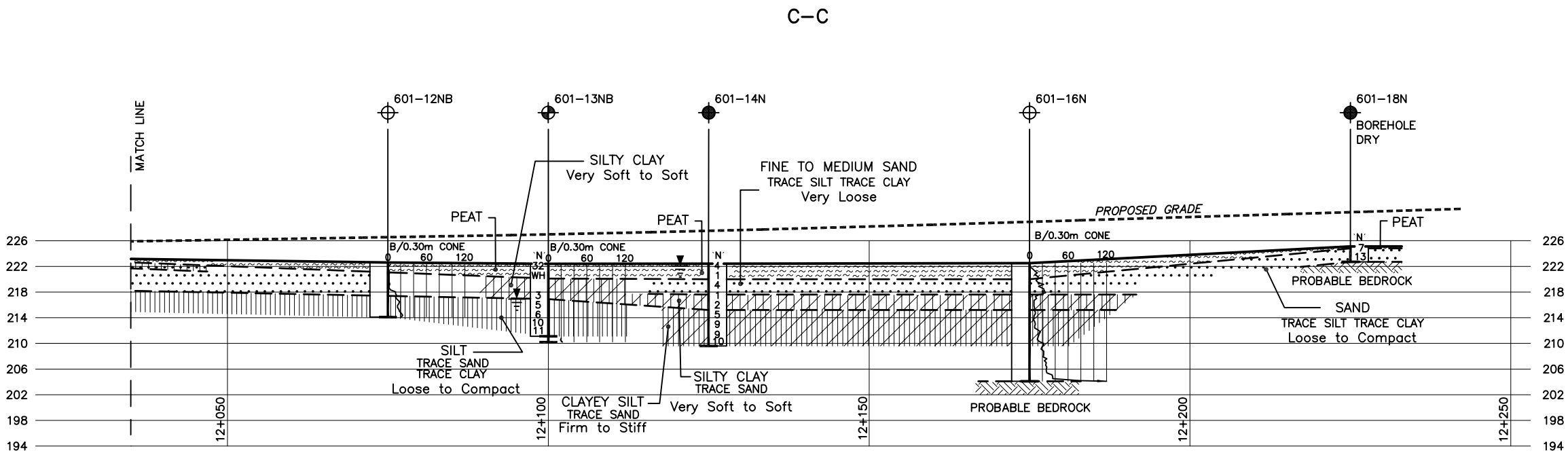
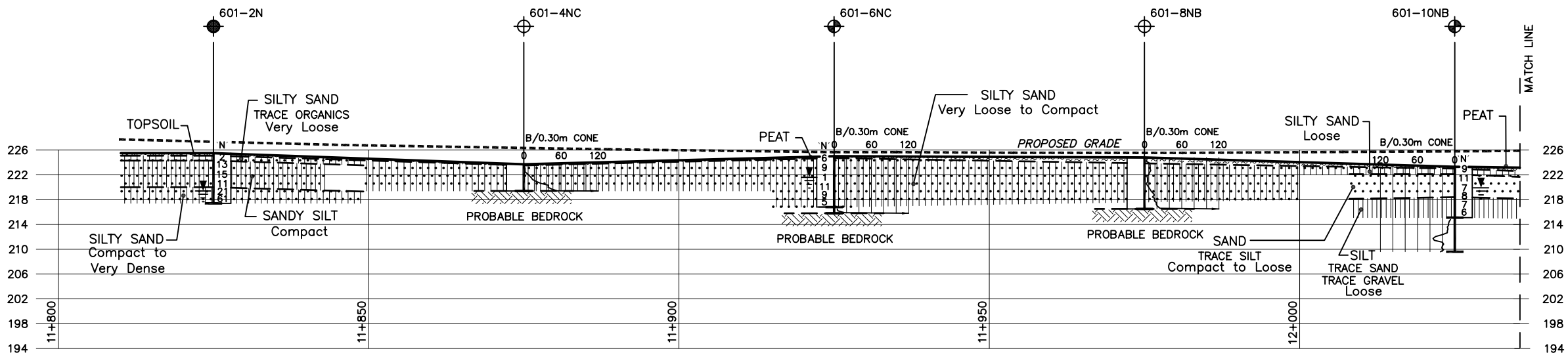
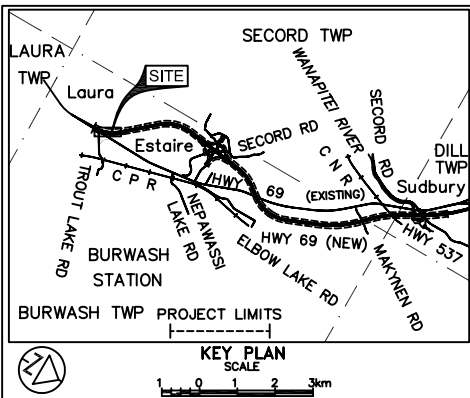
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

HIGHWAY 69
FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 601, STA. 11+786.5 TO 12+236.5 BURWASH TWP
SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-Jun 2003
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No ELEVATION STA BURWASH TWP P/s CL MED

Refer to drawing 601-1 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.

REVISIONS	DATE	BY	DESCRIPTION

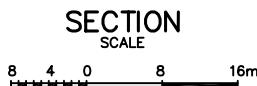
Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
SITE		DWG	601-4

NOTE:

REFER TO DRAWINGS 601-1 TO 601-3 FOR PLAN AND SECTIONS A-A, B-B; DRAWING 601-5 FOR SECTIONS D-D AND E-E.

C-C (Continued)



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002

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

SHEET



Peto MacCallum Ltd.
CONSULTING ENGINEERS



REFER TO DRAWINGS 601-1 TO 601-4 FOR PLAN AND SECTIONS A-A, B-B AND C-C.

The diagram shows a vertical borehole with several instruments and water levels indicated by symbols on the left side:

- Borehole**: Indicated by a solid black circle at the top.
- Dynamic Cone Penetration Test (Cone)**: Indicated by a circle with a crosshair.
- Borehole & Cone**: Indicated by a circle with a crosshair and a solid black circle inside.
- N Blows/0.3m (Std. Pen Test, 475 J / blow)**: Indicated by a solid black circle.
- CONE Blows/0.3m (60° Cone, 475 J / blow)**: Indicated by a circle with a crosshair.
- W L at time of investigation Mar–Jun 2003**: Indicated by a downward-pointing triangle above three horizontal lines.
- Head**: Indicated by an upward-pointing triangle.
- ARTESIAN WATER**: Indicated by a downward-pointing triangle.
- Encountered**: Indicated by a downward-pointing triangle above three horizontal lines.
- PIEZOMETER**: Indicated by a vertical line with a small circle at the bottom.

(Legend Continues)

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

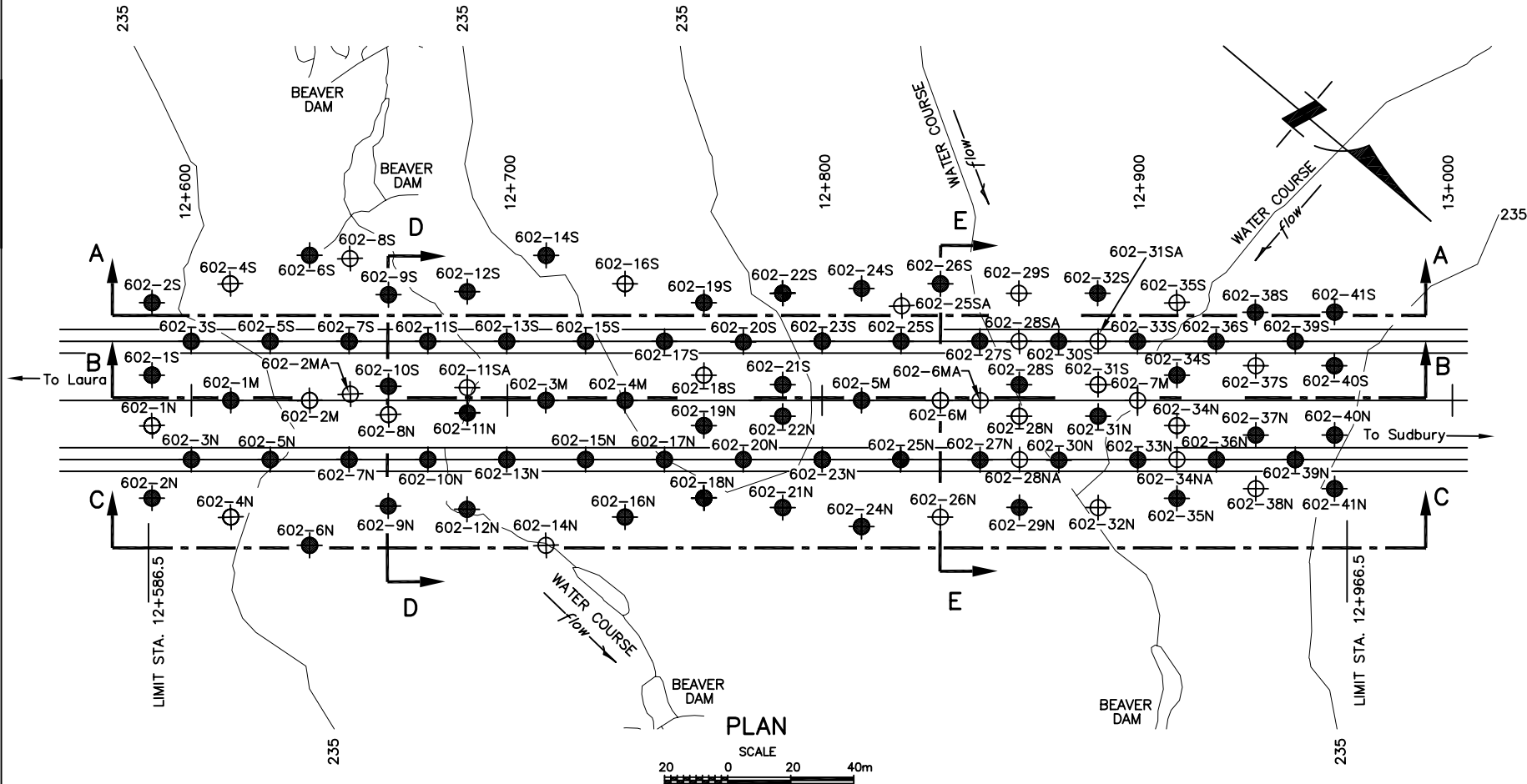
Geocres No.					
HWY No 69					DIST 54
SUBM'D	PC	CHECKED	CN	DATE OCT 29, 2004	SITE
DRAWN	MM	CHECKED	BRG	APPROVED DWK	DWG 601-5



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

(Legend Continued)			
BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
602-6MA	233.4	12+850	CL
602-7M	233.3	12+900	CL
602-1N	237.3	12+587.5	8m Rt
602-2N	237.1	12+587.5	31m Rt
602-3N	236.1	12+600	19m Rt
602-4N	235.5	12+612.5	37m Rt
602-5N	234.5	12+625	19m Rt
602-6N	233.5	12+637.5	46m Rt
602-7N	234.2	12+650	19m Rt
602-8N	233.1	12+662.5	4.5m Rt
602-9N	230.8	12+662.5	33.5m Rt
602-10N	230.3	12+675	19m Rt
602-11N	230.4	12+687.5	4m Rt
602-12N	230.3	12+687.5	34.5m Rt
602-13N	230.7	12+700	19m Rt
602-14N	230.0	12+712.5	46m Rt
602-15N	234.0	12+725	19m Rt
602-16N	233.4	12+737.5	37m Rt
602-17N	235.9	12+750	19m Rt
602-18N	234.9	12+762.5	31m Rt
602-19N	236.2	12+762.5	8m Rt
602-20N	235.8	12+775	19m Rt
602-21N	235.4	12+787.5	34m Rt
602-22N	235.8	12+787.5	5m Rt
602-23N	234.8	12+800	19m Rt
602-24N	233.8	12+812.5	40m Rt
602-25N	234.0	12+825	19m Rt
602-26N	233.6	12+837.5	37m Rt
602-27N	233.4	12+850	19m Rt
602-28N	233.3	12+862.5	5m Rt
602-28NA	233.3	12+862.5	19m Rt
602-29N	233.3	12+862.5	34m Rt
602-30N	233.2	12+875	19m Rt
602-31N	233.2	12+887.5	5m Rt
602-32N	233.2	12+887.5	34m Rt
602-33N	233.2	12+900	19m Rt
602-34N	233.4	12+912.5	8m Rt
602-34NA	233.2	12+912.5	19m Rt
602-35N	233.2	12+912.5	31m Rt
602-36N	233.3	12+925	19m Rt
602-37N	233.8	12+937.5	11m Rt
602-38N	233.8	12+937.5	28m Rt
602-39N	235.1	12+950	19m Rt
602-40N	235.9	12+962.5	11m Rt
602-41N	235.5	12+962.5	28m Rt

(Legend Continued)			
BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
602-1S	237.3	12+587.5	8m Lt
602-2S	236.8	12+587.5	31m Lt
602-3S	236.2	12+600	19m Lt
602-4S	234.7	12+612.5	37m Lt
602-5S	234.0	12+625	19m Lt
602-6S	231.7	12+637.5	46m Lt
602-7S	232.9	12+650	19m Lt
602-8S	231.5	12+650	45m Lt
602-9S	231.1	12+662.5	34m Lt
602-10S	233.1	12+662.5	4.5m Lt
602-11S	231.1	12+675	19m Lt
602-12S	230.5	12+687.5	34.5m Lt
602-13S	230.8	12+700	19m Lt
602-14S	235.0	12+712.5	46m Lt
602-15S	235.1	12+725	19m Lt
602-16S	235.3	12+737.5	37m Lt
602-17S	235.4	12+750	19 Lt
602-18S	236.2	12+762.5	8m Lt
602-19S	235.2	12+762.5	31m Lt
602-20S	235.5	12+775	19m Lt
602-21S	235.6	12+787.5	5m Lt
602-22S	233.6	12+787.5	34m Lt
602-23S	233.7	12+800	19m Lt
602-24S	233.5	12+812.5	40m Lt
602-25S	233.5	12+825	19m Lt
602-25SA	233.4	12+825	30m Lt
602-26S	233.3	12+837.5	37m Lt
602-27S	233.4	12+850	19m Lt
602-28S	233.3	12+862.5	5m Lt
602-28SA	233.3	12+862.5	19m Lt
602-29S	233.4	12+862.5	34m Lt
602-30S	233.3	12+875	19m Lt
602-31S	233.3	12+887.5	5m Lt
602-31SA	233.3	12+887.5	19m Lt
602-32S	233.4	12+887.5	34m Lt
602-33S	233.4	12+900	19m Lt
602-34S	233.4	12+912.5	8m Lt
602-35S	233.5	12+912.5	31m Lt
602-36S	233.7	12+925	19m Lt
602-37S	233.6	12+937.5	11m Lt
602-38S	233.8	12+937.5	28m Lt
602-39S	234.7	12+950	19m Lt
602-40S	235.2	12+962.5	11m Lt
602-41S	234.7	12+962.5	28m Lt

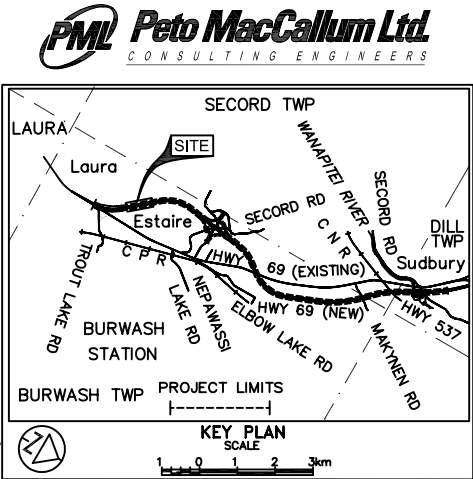


METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 602, STA. 12+586.5 TO 12+966.5 BURWASH TWP
BOREHOLE LOCATIONS

SHEET



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-Jun 2003
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
602-1M	235.7	12+612.5	CL
602-2M	233.9	12+637.5	CL
602-2MA	233.7	12+650	2m Lt
602-3M	232.8	12+712.5	CL
602-4M	235.3	12+737.5	CL
602-5M	234.3	12+812.5	CL
602-6M	233.4	12+837.5	CL

(Legend Continues)

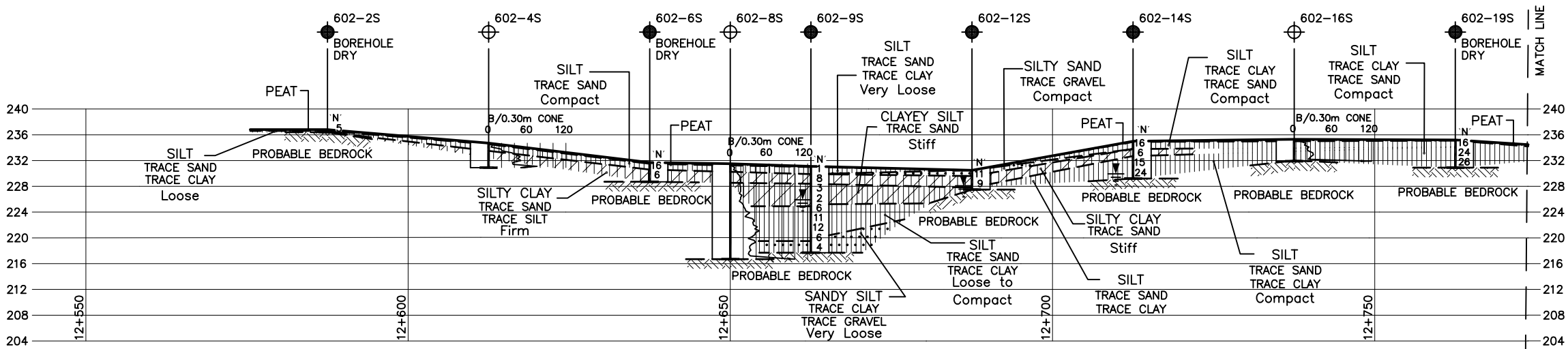
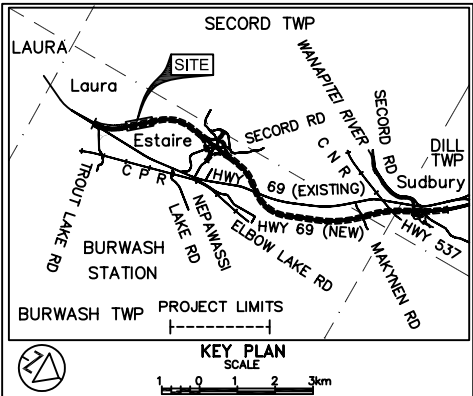
NOTE -
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

NOTE:
REFER TO DRAWING 602-2 TO 606-5 FOR SECTIONS A-A, B-B
C-C, D-D AND E-E.

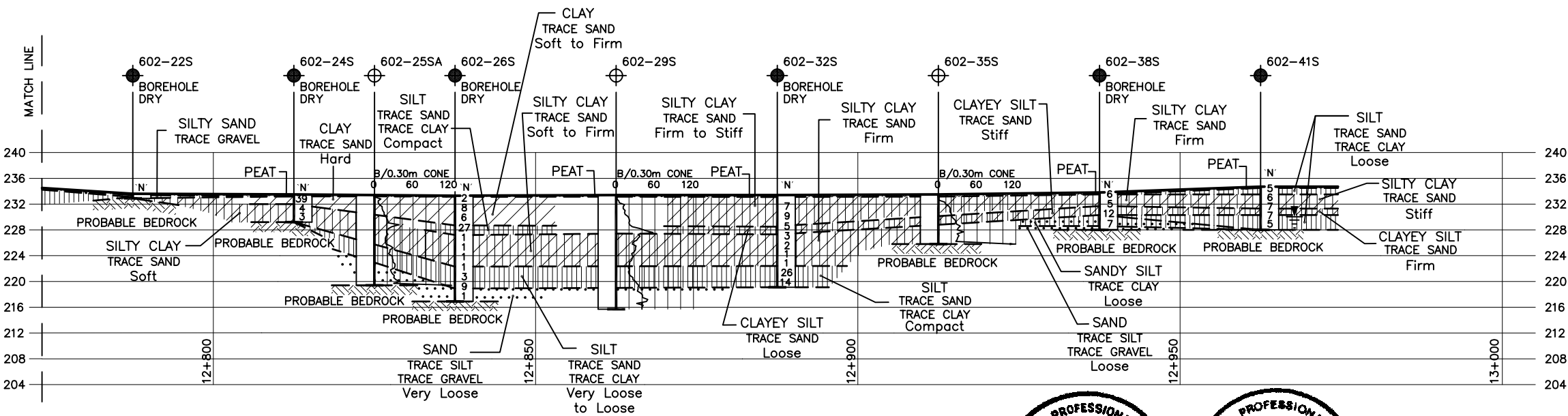
REF No E-Main69-5.dwg; 5Propty.dwg;1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002



REVISIONS			
DATE	BY	DESCRIPTION	
Geocres No.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED CN	DATE OCT 29, 2004
DRAWN	MM	CHECKED BRG	APPROVED DWK
DWG	602-1		



A-A



A-A (Continued)

SECTION
SCALE



NOTE:

REFER TO DRAWING 602-1 FOR PLAN; 602-3 TO 606-5 FOR
SECTIONS B-B, C-C, D-D AND E-E.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-Jun 2003
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
Refer to drawing 602-1 for co-ordinates			

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.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
SITE	DWG	602-2	

METRIC

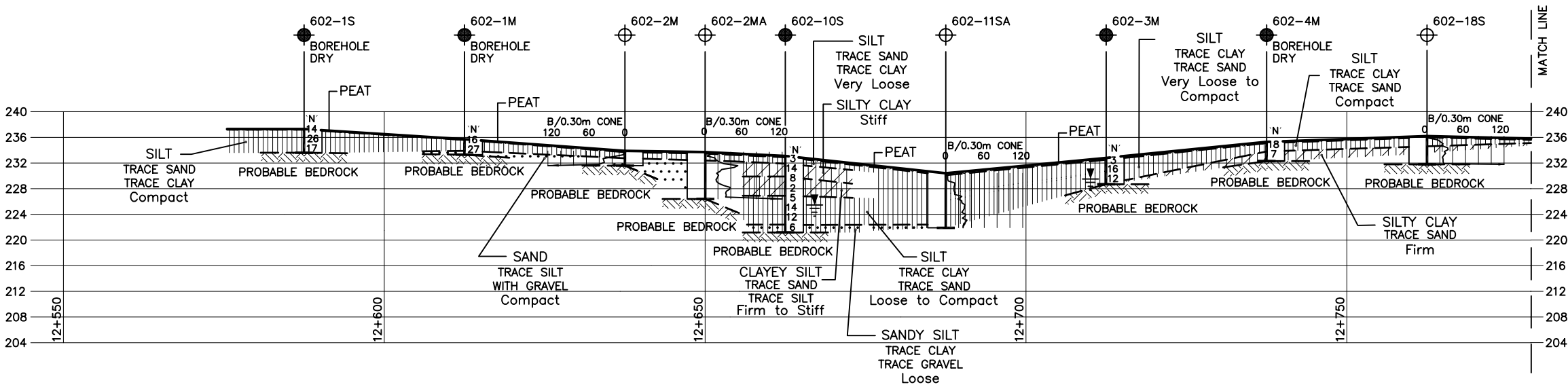
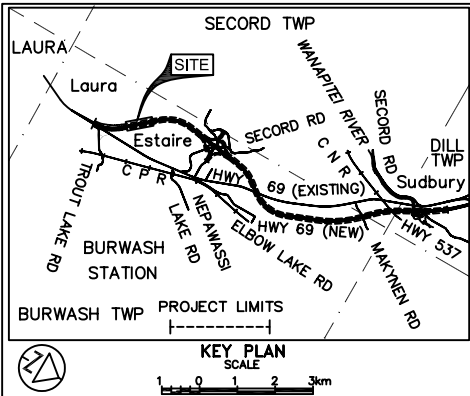
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

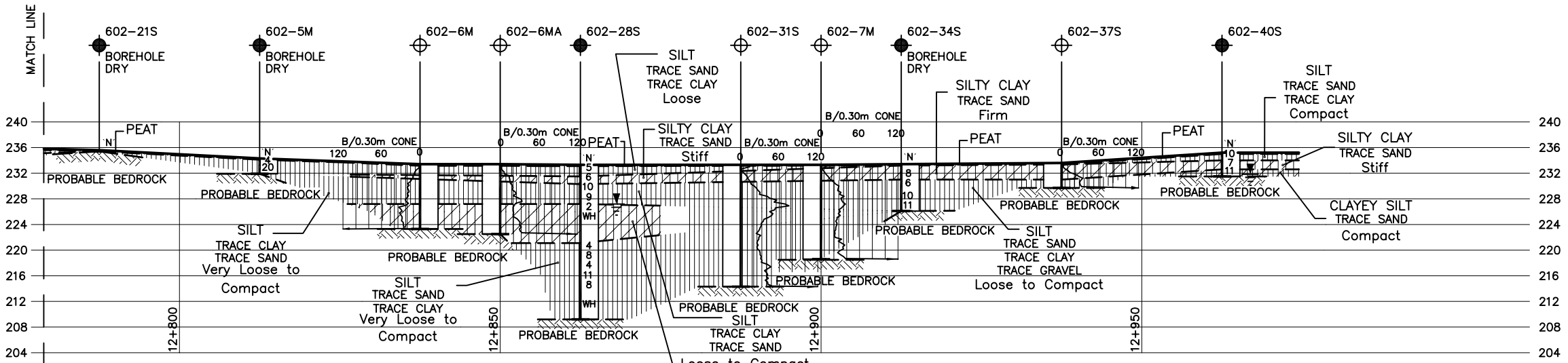
HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 602, STA. 12+586.5 TO 12+966.5 BURWASH TWP
SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



B-B



B-B (Continued)

SECTION
SCALE



NOTE:

REFER TO DRAWING 602-1 FOR PLAN; 602-2 FOR SECTION A-A
AND 602-4 TO 602-5 FOR SECTIONS C-C, D-D AND E-E.

LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Mar-Jun 2003		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		
BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
Refer to drawing 602-1 for co-ordinates			

NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

REVISIONS			
DATE	BY	DESCRIPTION	
Geocres No.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED CN	DATE OCT 29, 2004 SITE
DRAWN	MM	CHECKED BRG	APPROVED DWK DWG 602-3

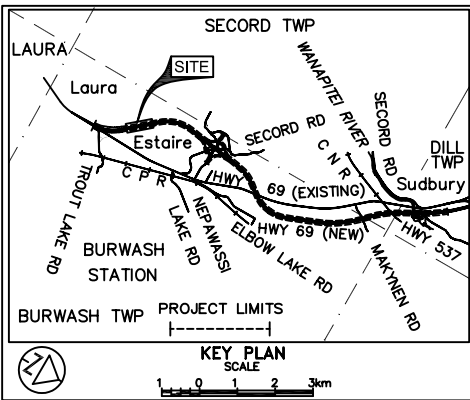
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 602, STA. 12+586.5 TO 12+966.5 BURWASH TWP
SOIL STRATA

SHEET



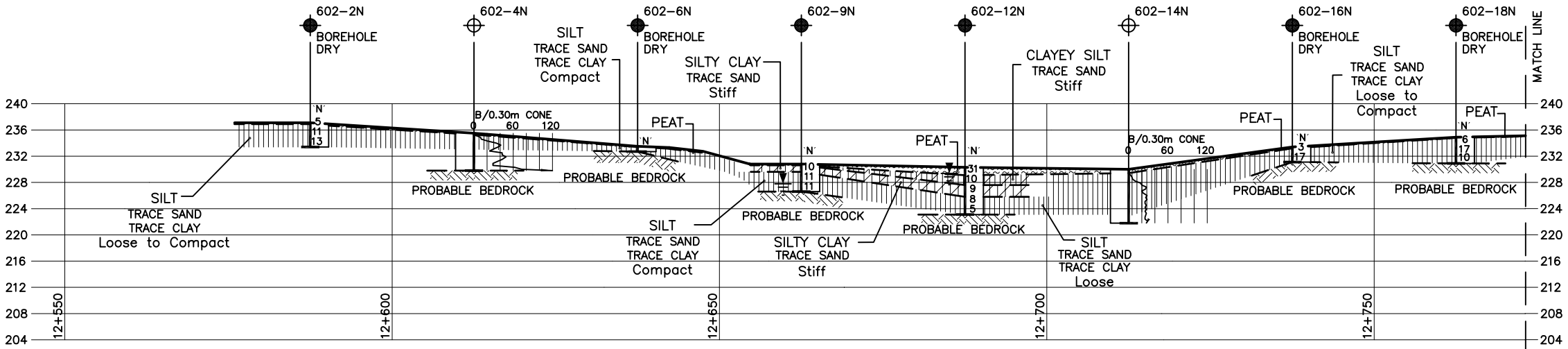
LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation Mar-Jun 2003
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
Refer to drawing 602-1 for co-ordinates			

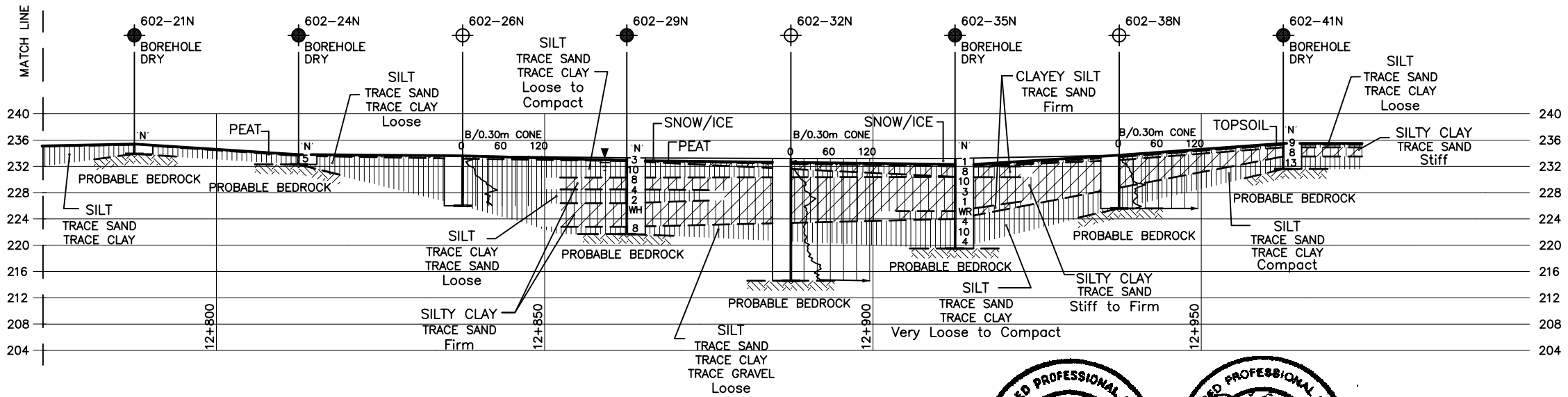
NOTE
The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
SITE		DWG	602-4



C-C



C-C (Continued)

SECTION
SCALE



NOTE:

REFER TO DRAWING 602-1 FOR PLAN; DRAWINGS 602-2 TO
602-3 FOR SECTIONS A-A AND B-B; DRAWING 602-5 FOR
SECTIONS D-D AND E-E.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002









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

SHEET

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 602, STA. 12+586.5 TO 12+966.5 BURWASH TWP
SOIL STRATA

Key plan map showing the project limits for the Second Twp. The map includes Laura, Estaire, and Sudbury. Key roads shown are Laura Rd, Trout Lake Rd, Burwash Station, Burwash Twp, Second Rd, C.N.R., Hwy 69 (Existing), Hwy 69 (New), Hwy 537, and Maktien Rd. The project limits are indicated by a dashed line between Laura and Estaire. A north arrow is present in the bottom left corner.

LEGEND

- | | |
|---|---|
|  | Borehole |
|  | Dynamic Cone Penetration Test (Cone) |
|  | Borehole & Cone |
| N | Blows/0.3m (Std. Pen Test, 475 J / blow) |
| CONE | Blows/0.3m (60° Cone, 475 J / blow) |
|  | W L at time of investigation Mar–Jun 2003 |
|  | Head |
|  | ARTESIAN WATER |
|  | Encountered |
|  | PIEZOMETER |

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED

Refer to drawing 602-1 for co-ordinates

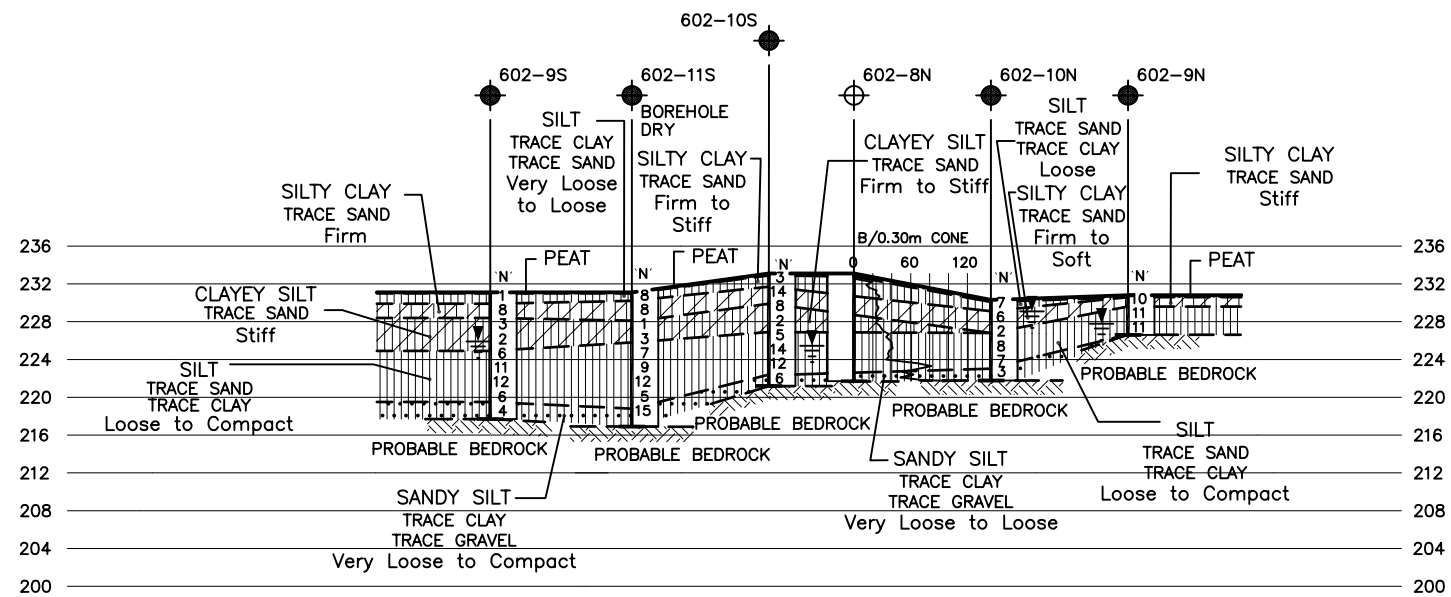
- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

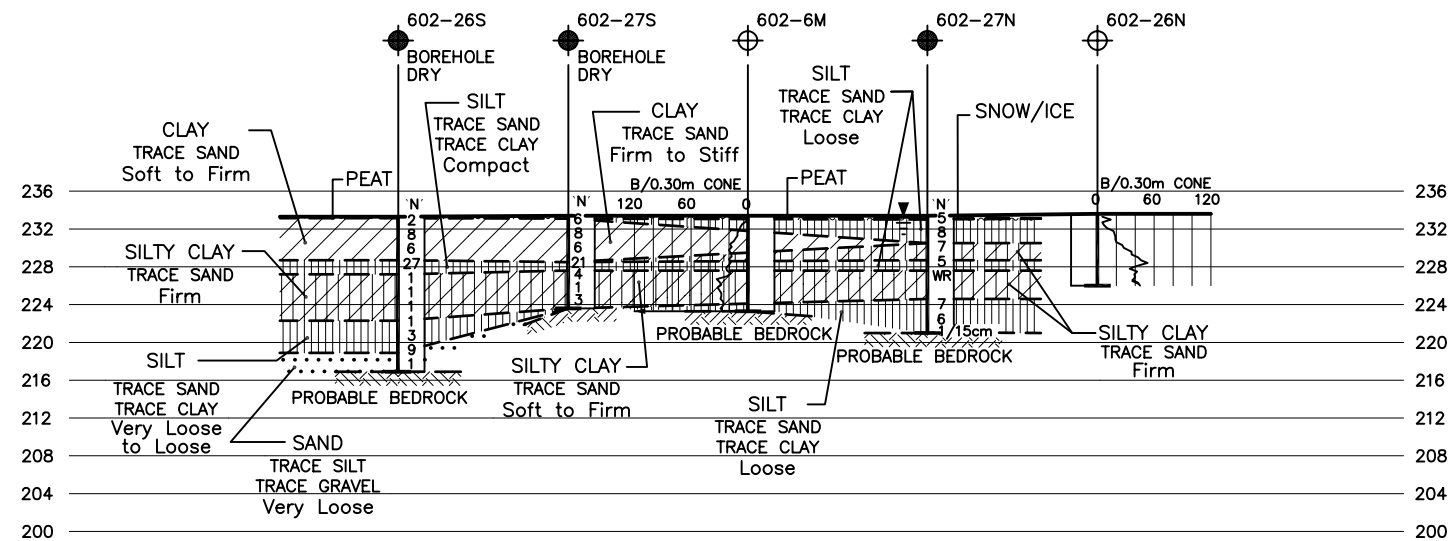
REVISIONS			
	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69				DIST	54
SUBM'D	PC	CHECKED	CN	DATE OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG	APPROVED DWK	DWG	602-5



D-D



E-E
SECTIONS
SCALE



NOTE:

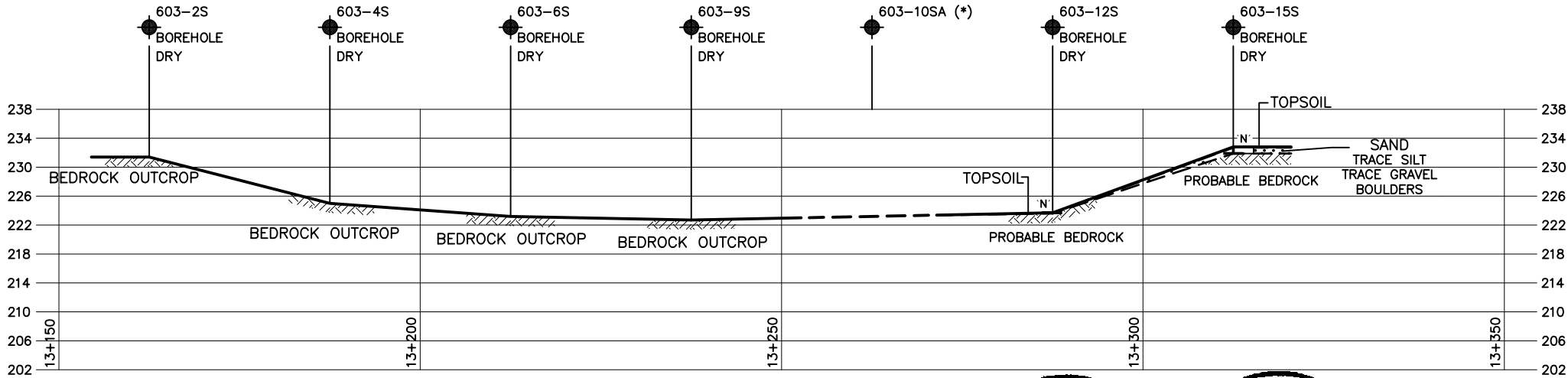
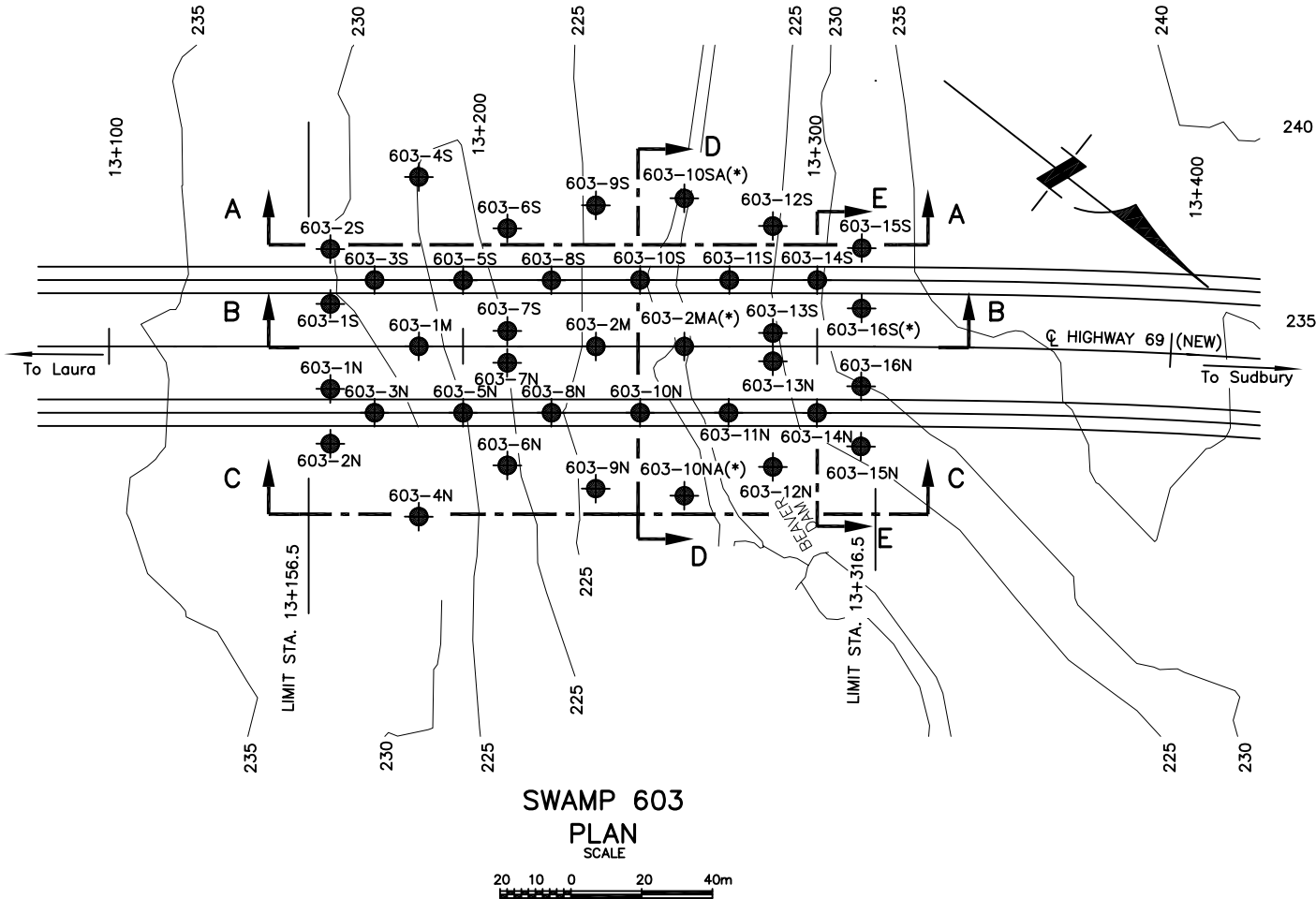
REFER TO DRAWING 602-1 FOR PLAN; 602-2 TO 602-4 FOR SECTIONS A-A, B-B AND C-C.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

(Legend Continued)

BH No	ELEVATION	STA	o/s CL MED
BURWASH TWP			
603-6N	223.9	13+212.5	33.5m Rt.
603-7N	225.0	13+212.5	4.5m Rt.
603-8N	227.0	13+225	19m Rt.
603-9N	223.8	13+237.5	40m Rt.
603-10N	220.4	13+250	19m Rt.
603-10NA	(*)	13+262.5	42m Rt.
603-11N	220.6	13+275	19m Rt.
603-12N	222.6	13+287.5	34m Rt.
603-13N	223.6	13+287.5	4m Rt.
603-14N	226.0	13+300	19m Rt.
603-15N	227.4	13+312.5	28m Rt.
603-16N	229.7	13+312.5	11m Rt.
603-1S	231.4	13+162.5	11m Lt.
603-2S	231.4	13+162.5	28m Lt.
603-3S	227.6	13+175	19m Lt.
603-4S	225.0	13+187.5	48m Lt.
603-5S	222.4	13+200	19m Lt.
603-6S	223.2	13+212.5	33.5m Lt.
603-7S	225.0	13+212.5	4.5m Lt.
603-8S	228.5	13+225	19m Lt.
603-9S	222.7	13+237.5	40m Lt.
603-10S	221.5	13+250	19m Lt.
603-10SA	(*)	13+262.5	42m Lt.
603-11S	220.7	13+275	19m Lt.
603-12S	223.7	13+287.5	34m Lt.
603-13S	224.4	13+287.5	4m Lt.
603-14S	227.5	13+300	19m Lt.
603-15S	232.8	13+312.5	28m Lt.
603-16S	(*)	13+312.5	11m Lt.



DRAFT NOTE:
(*) BOREHOLE TO BE DRILLED IN FUTURE, PENDING ACCESS.

NOTE:

REFER TO DRAWINGS 603-2 AND 603-3 FOR SECTIONS B-B,
C-C, D-D AND E-E.

A-A
SECTION
SCALE

8 4 0 8 16m



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

METRIC

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

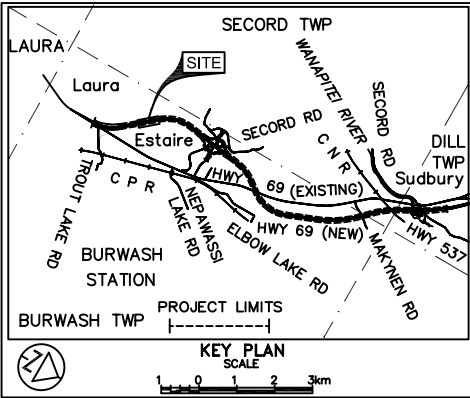
CONT No
GWP No 312-99-00

HIGHWAY 69

HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 603, STA. 13+156.5 TO 13+316.5 BURWASH TWP
BOREHOLE LOCATIONS & SOIL STRATA



SHEET



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-Jun 2003
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No	ELEVATION	STA	o/s CL MED
BURWASH TWP			
603-1M	228.9	13+187.5	CL
603-2M	225.4	13+237.5	CL
603-2MA	(*)	13+262.5	CL
603-1N	233.2	13+162.5	11m Rt.
603-2N	233.7	13+162.5	28m Rt.
603-3N	231.9	13+175	19m Rt.
603-4N	228.2	13+187.5	48m Rt.
603-5N	225.0	13+200	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.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	603-1

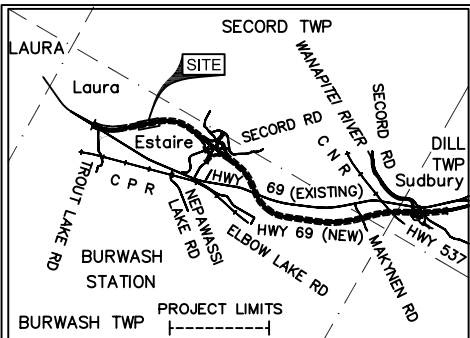
METRIC

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

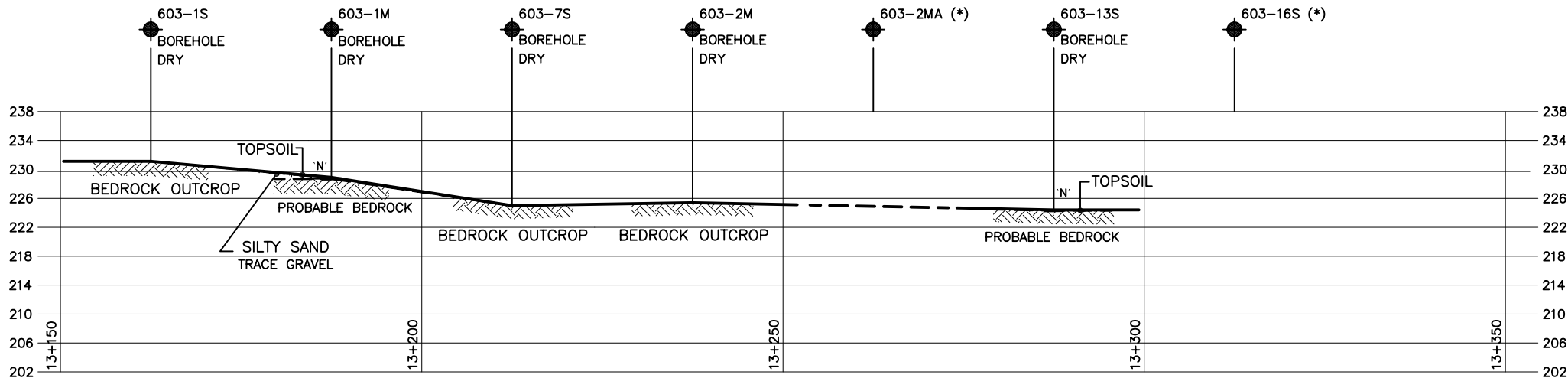
CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 603, STA. 13+156.5 TO 13+316.5 BURWASH TWP
SOIL STRATA

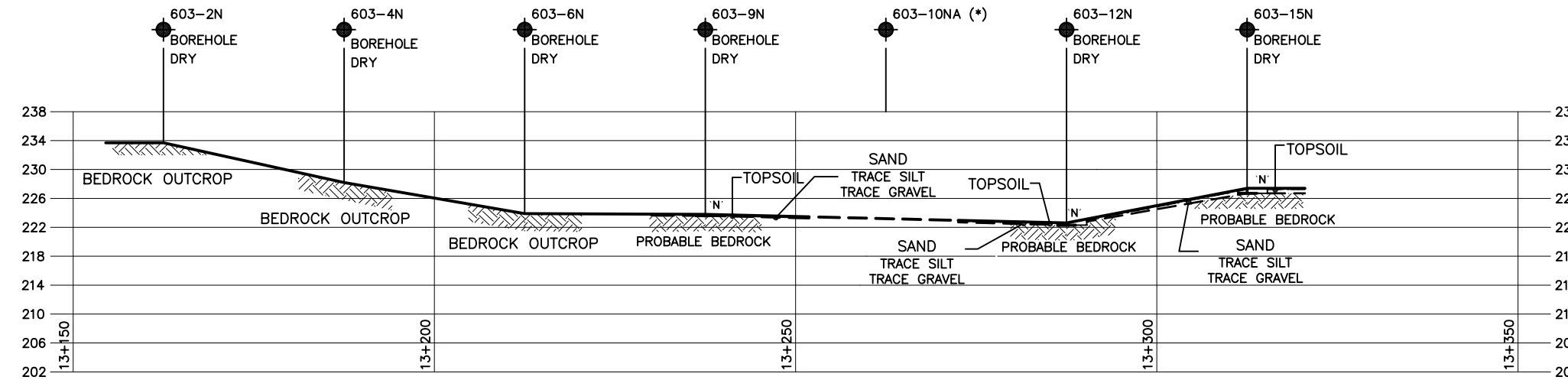
SHEET



KEY PLAN
SCALE
1:0 1 2 3km



B-B



C-C

LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Mar-Jun 2003		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
Refer to drawing 603-1 for co-ordinates			

- 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.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	603-2

DRAFT NOTE:
(*) BOREHOLE TO BE DRILLED IN FUTURE, PENDING ACCESS.

NOTE:

REFER TO DRAWING 603-1 FOR PLAN AND SECTION A-A;
DRAWING 603-3 FOR SECTIONS D-D AND E-E.

SECTIONS
SCALE



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

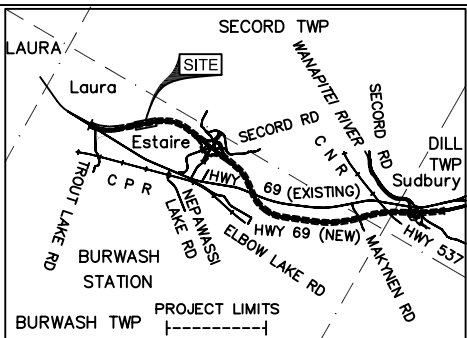
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 603, STA. 13+156.5 TO 13+316.5 BURWASH TWP
SOIL STRATA

SHEET



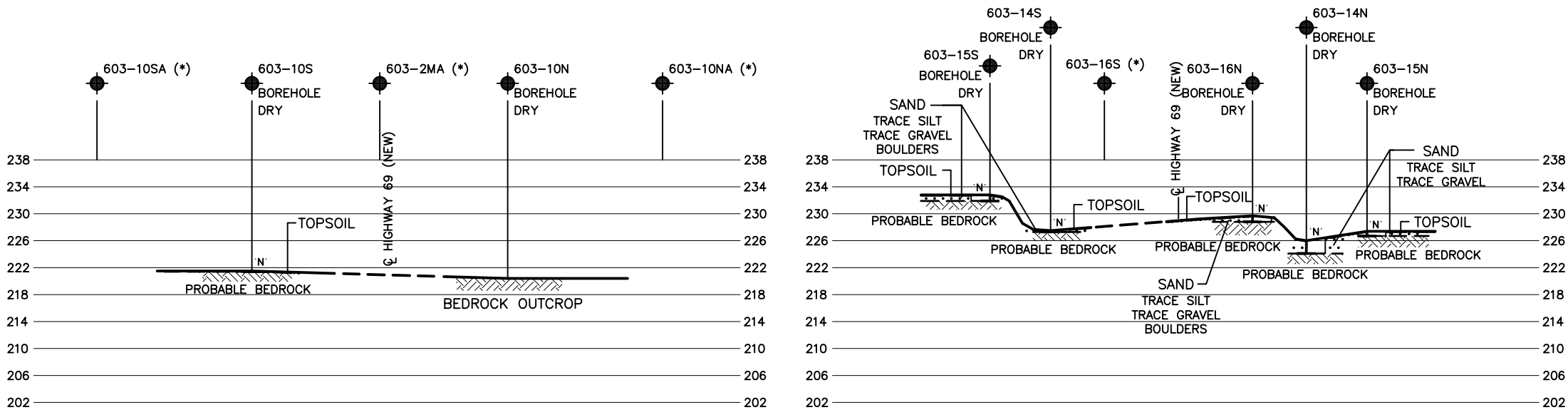
LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation Mar-Jun 2003
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	b/s CL MED
Refer to drawing 603-1 for co-ordinates			

— 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.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED CN	DATE OCT 29, 2004 SITE
DRAWN	MM	CHECKED BRG	APPROVED DWK DWG 603-3



D-D

E-E

SECTIONS

SCALE



DRAFT NOTE:
(*) BOREHOLE TO BE DRILLED IN FUTURE, PENDING ACCESS.

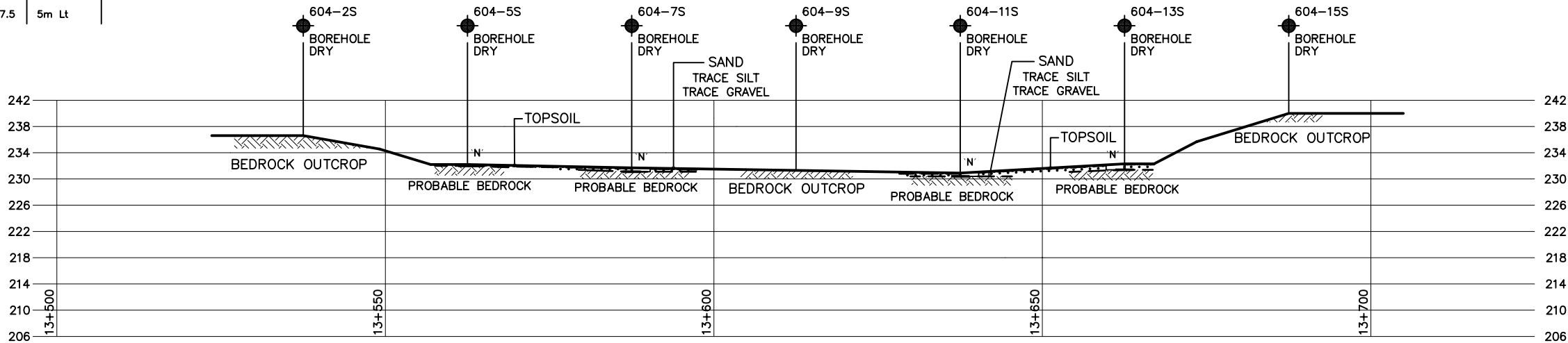
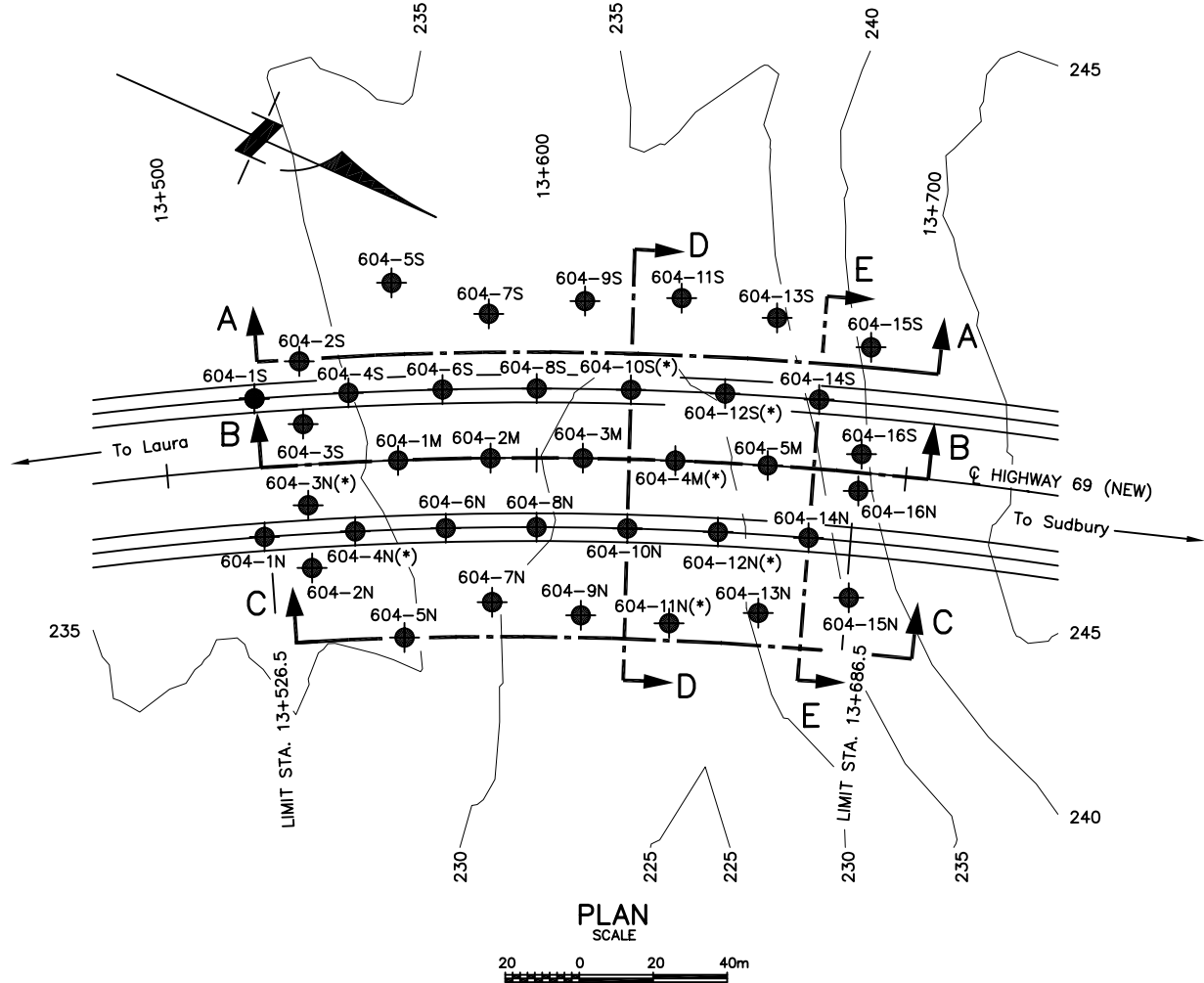
NOTE:

REFER TO DRAWINGS 603-1 AND 603-2 FOR PLAN AND
SECTIONS A-A, B-B AND C-C.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

(Legend Continued)			
BH No	ELEVATION	STA	o/s CL MED
604-1N	237.4	13+525	19m Rt
604-2N	236.7	13+537.5	28m Rt
604-3N	(*)	13+537.5	11m Rt
604-4N	(*)	13+550	19m Rt
604-5N	235.9	13+562.5	48m Rt
604-6N	232.2	13+575	19m Rt
604-7N	229.5	13+587.5	39m Rt
604-8N	229.8	13+600	19m Rt
604-9N	230.0	13+612.5	42.5m Rt
604-10N	228.8	13+625	19m Rt
604-11N	(*)	13+637.5	44m Rt
604-12N	(*)	13+650	19m Rt
604-13N	231.7	13+662.5	40m Rt
604-14N	232.5	13+675	19m Rt
604-15N	238.0	13+687.5	34m Rt
604-16N	238.6	13+687.5	5m Rt
604-1S	235.9	13+525	19m Lt
604-2S	236.6	13+537.5	28m Lt
604-3S	236.4	13+537.5	11m Lt
604-4S	235.7	13+550	19m Lt
604-5S	232.2	13+562.5	48m Lt
604-6S	230.8	13+575	19m Lt
604-7S	231.7	13+587.5	39m Lt
604-8S	231.5	13+600	19m Lt
604-9S	231.3	13+612.5	42.5m Lt
604-10S	(*)	13+625	19m Lt
604-11S	230.9	13+637.5	44m Lt
604-12S	(*)	13+650	19m Lt
604-13S	232.3	13+662.5	40m Lt
604-14S	235.9	13+675	19m Lt
604-15S	240.0	13+687.5	34m Lt
604-16S	239.2	13+687.5	5m Lt



DRAFT NOTE:
(*) BOREHOLE TO BE DRILLED IN FUTURE, PENDING ACCESS.

NOTE:

REFER TO DRAWING 604-2 FOR SECTIONS B-B AND C-C;
DRAWING 604-3 FOR SECTIONS D-D AND E-E.

A-A
SECTION
SCALE
8 4 0 8 16m



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

METRIC

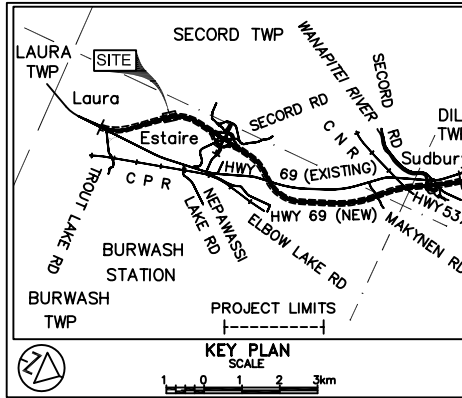
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 604, STA. 13+526.5 TO 13+686.5 BURWASH TWP
BOREHOLE LOCATIONS & SOIL STRATA



SHEET



LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation April 2003
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA	o/s CL MED
604-1M	233.2	13+562.5	CL
604-2M	230.8	13+587.5	CL
604-3M	230.9	13+612.5	CL
604-4M	(*)	13+637.5	CL
604-5M	231.2	13+662.5	CL

(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.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
SITE		DWG	604-1

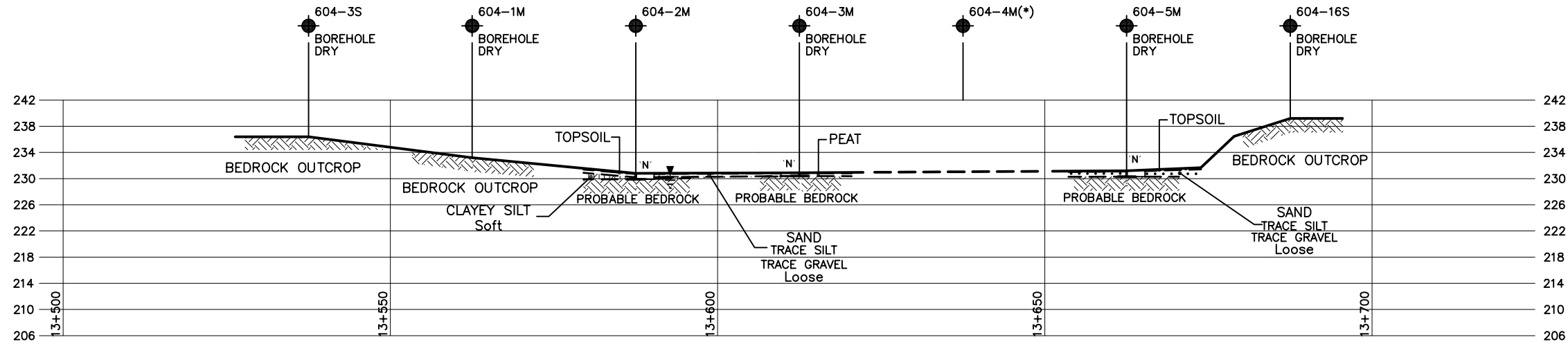
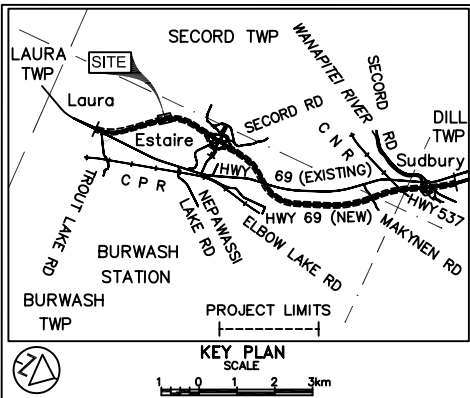
METRIC

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

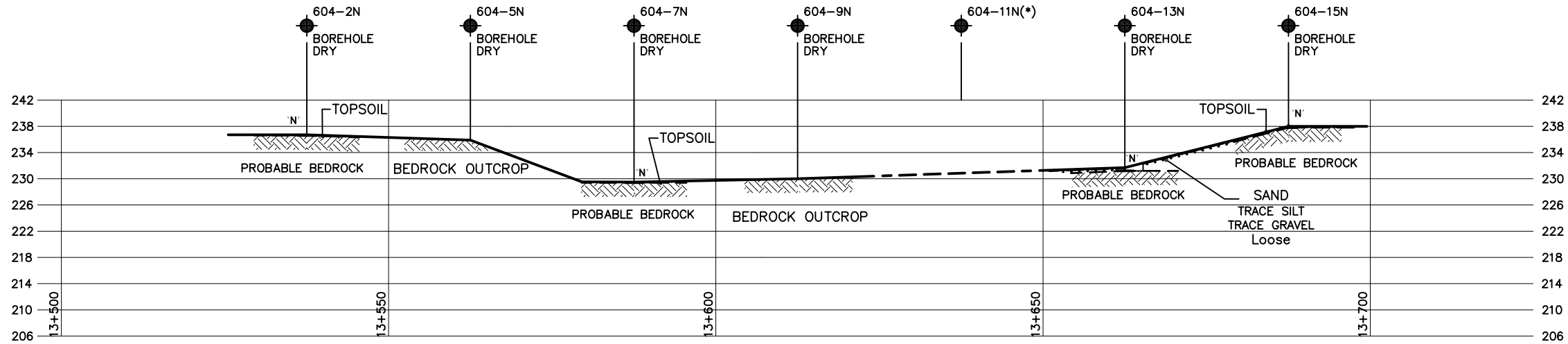
CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 604, STA. 13+526.5 TO 13+686.5 BURWASH TWP
SOIL STRATA

SHEET



B-B



C-C
SECTIONS
SCALE



DRAFT NOTE:
(*) BOREHOLE TO BE DRILLED IN FUTURE, PENDING ACCESS.

NOTE:

REFER TO DRAWING 604-1 FOR PLAN AND SECTION A-A;
DRAWING 604-3 FOR SECTIONS D-D AND E-E.

LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Apr 2003		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
Refer to drawing 604-1 for co-ordinates			

— NOTE —

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

REVISIONS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															</
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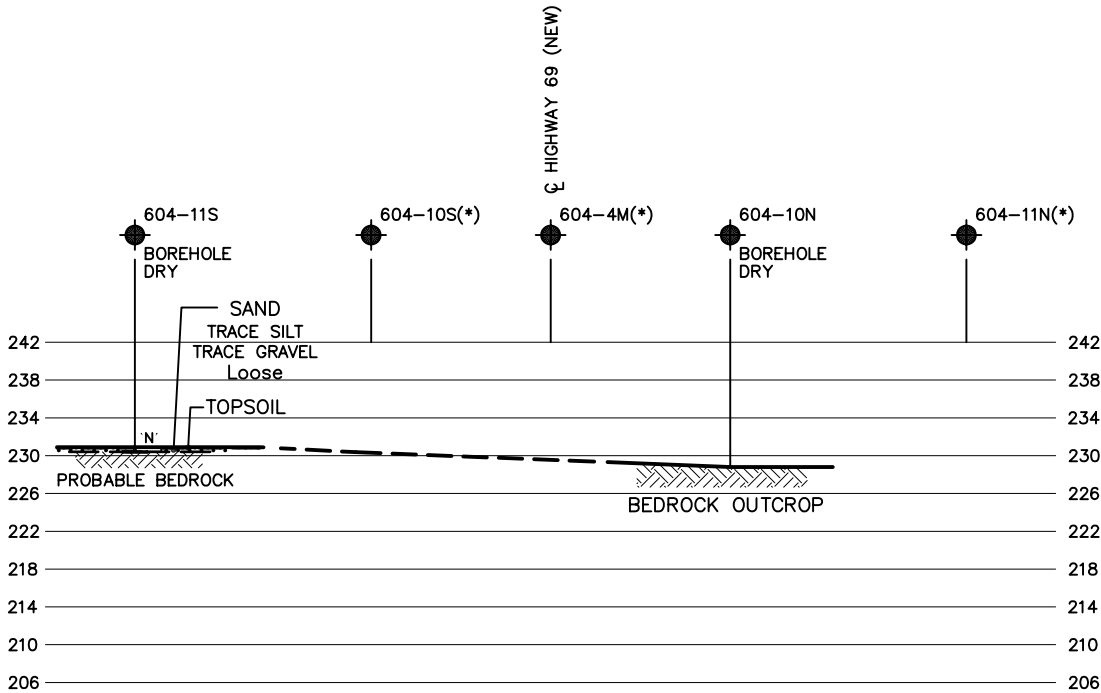
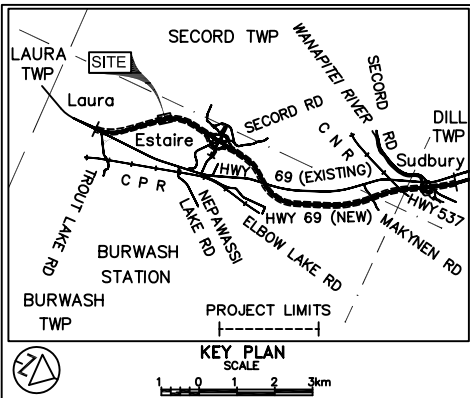
METRIC

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

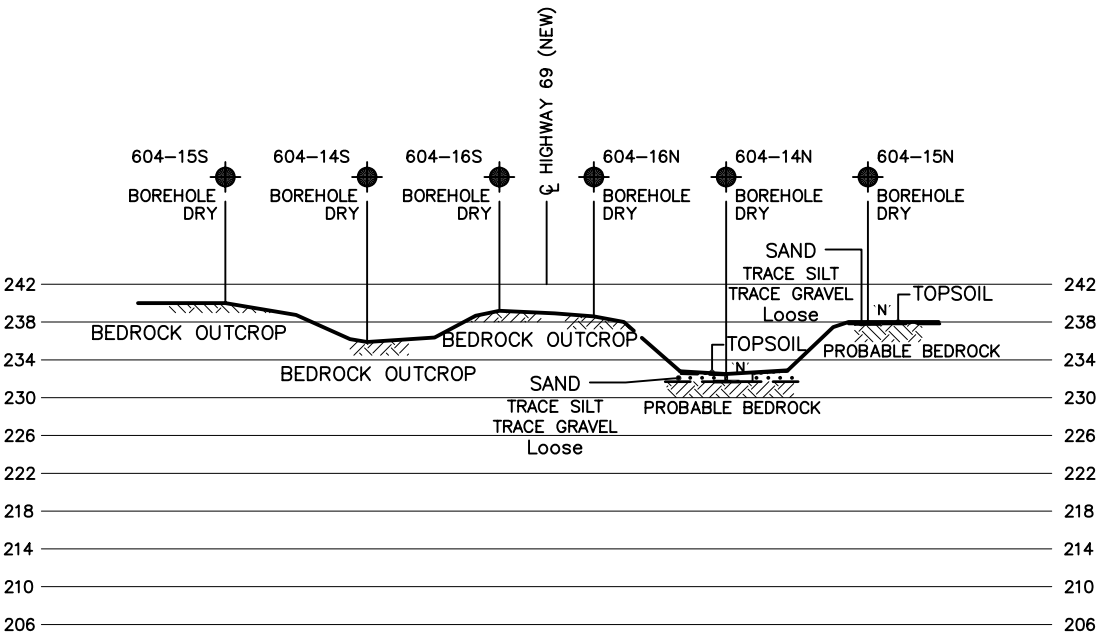
CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 604, STA. 13+526.5 TO 13+686.5 BURWASH TWP
SOIL STRATA

SHEET



D-D



E-E

SECTIONS
SCALE



DRAFT NOTE:
(*) BOREHOLE TO BE DRILLED IN FUTURE, PENDING ACCESS.

NOTE:

REFER TO DRAWINGS 604-1 AND 604-2 FOR PLAN AND
SECTIONS A-A, B-B AND C-C.

LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Apr 2003		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
Refer to drawing 604-1 for co-ordinates			

— NOTE —

The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.



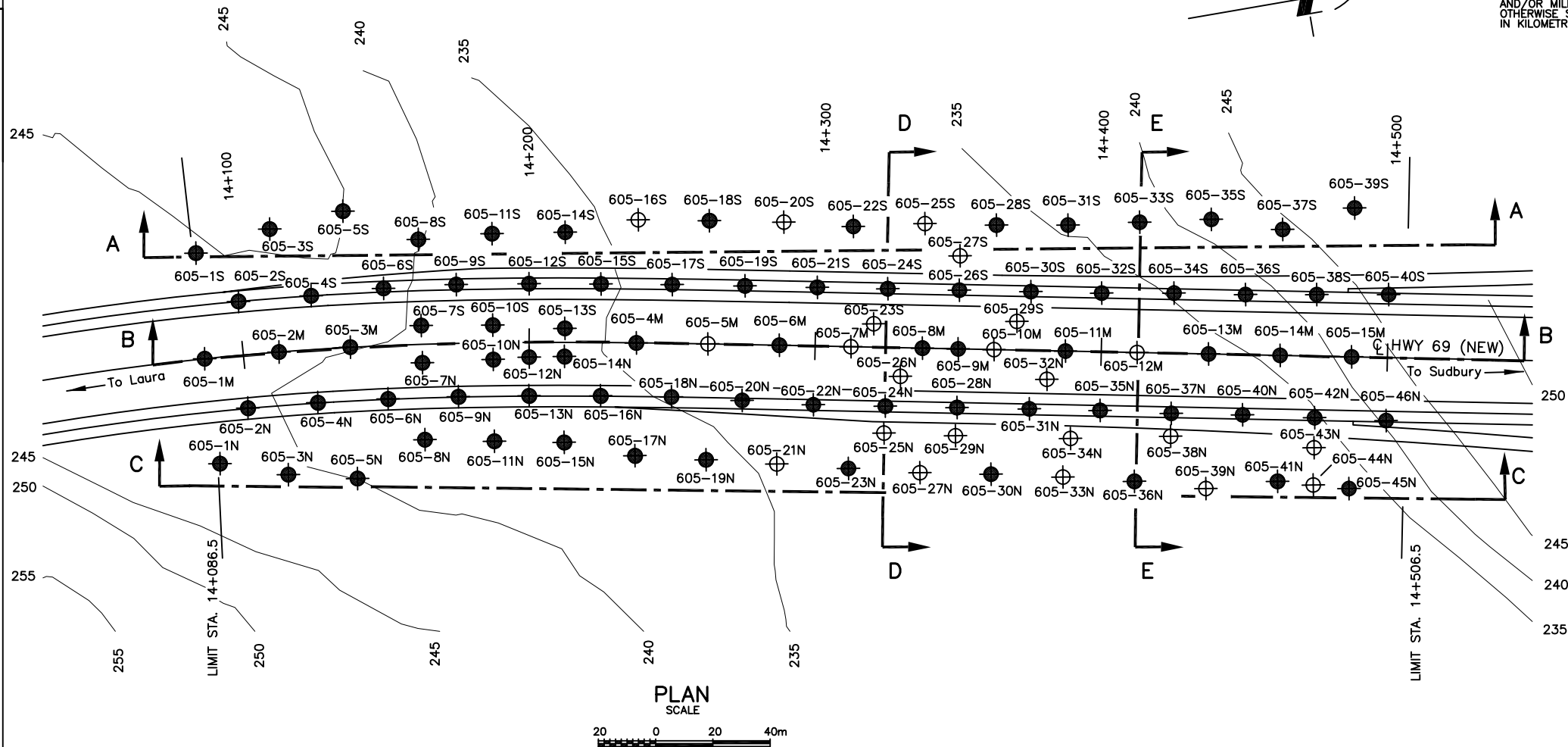
REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

REVISIONS									
	DATE	BY	DESCRIPTION						
Geocres No.									
HWY No	69							DIST	54
SUBM'D	PC	CHECKED	CN	DATE	OCT 29, 2004	SITE			
DRAWN	MM	CHECKED	BRG	APPROVED	DWK	DWG		604-3	

(Legend Continued)			
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
605-8M	234.0	14+337.5	CL
605-9M	234.0	14+350	CL
605-10M	233.9	14+362.5	CL
605-11M	234.1	14+387.5	CL
605-12M	233.9	14+412.5	CL
605-13M	234.0	14+437.5	CL
605-14M	237.1	14+462.5	CL
605-15M	240.7	14+487.5	CL
605-1N	239.0	14+087.5	37m Rt
605-2N	238.7	14+100	19m Rt
605-3N	239.8	14+112.5	43m Rt
605-4N	237.9	14+125	19m Rt
605-5N	239.6	14+137.5	46m Rt
605-6N	237.6	14+150	19m Rt
605-7N	239.3	14+162.5	6.5m Rt
605-8N	237.9	14+162.5	34m Rt
605-9N	237.1	14+175	19m Rt
605-10N	236.8	14+187.5	6m Rt
605-11N	237.6	14+187.5	35m Rt
605-12N	236.7	14+200	5m Rt
605-13N	236.4	14+200	19m Rt
605-14N	237.3	14+212.5	5m Rt
605-15N	236.9	14+212.5	35m Rt
605-16N	237.3	14+225	19m Rt
605-17N	237.1	14+237.5	40m Rt
605-18N	234.0	14+250	20m Rt
605-19N	236.8	14+262.5	41m Rt
605-20N	234.2	14+275	20m Rt
605-21N	233.9	14+287.5	41m Rt
605-22N	233.9	14+300	20.5m Rt
605-23N	234.0	14+312.5	42m Rt
605-24N	233.9	14+325	20.5m Rt
605-25N	234.0	14+325	30m Rt
605-26N	234.0	14+330	10m Rt
605-27N	234.0	14+337.5	43m Rt
605-28N	234.0	14+350	20.5m Rt
605-29N	234.0	14+350	30m Rt
605-30N	234.0	14+362.5	43m Rt
608-31N	234.0	14+375	20.5m Rt
605-32N	233.8	14+380	10m Rt
605-33N	233.9	14+387.5	44m Rt
605-34N	233.9	14+390	30m Rt
605-35N	234.0	14+400	20.5m Rt
605-36N	234.0	14+412.5	45m Rt
605-37N	233.9	14+425	21m Rt
605-38N	233.9	14+425	28m Rt
605-39N	234.0	14+437.5	47m Rt
605-40N	233.9	14+450	21m Rt
605-41N	234.0	14+462.5	44m Rt
605-42N	234.5	14+475	21.5m Rt
605-43N	234.5	14+475	32m Rt
605-44N	234.4	14+475	45m Rt

NOTE:

REFER TO DRAWINGS 605-2 TO 605-5 FOR SECTIONS A-A,
B-B, C-C, D-D AND E-E.



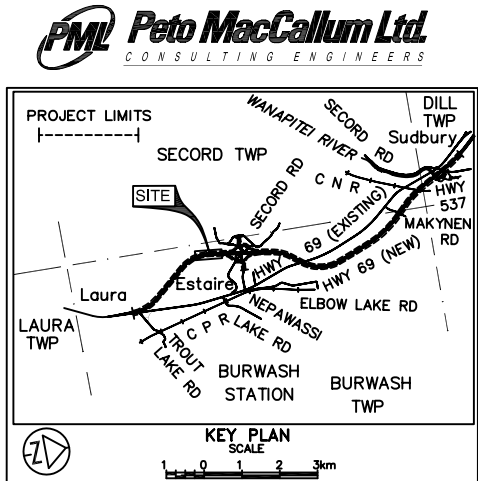
(Legend Continued)			
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
605-45N	236.1	14+487.5	46m Rt
605-46N	241.7	14+500	22m Rt
605-1S	242.2	14+087.5	37m Lt
605-2S	241.5	14+100	19m Lt
605-3S	244.5	14+112.5	43m Lt
605-4S	242.7	14+125.5	19m Lt
605-5S	246.7	14+137.5	47.5m Lt
605-6S	241.5	14+150	20m Lt
605-7S	239.4	14+162.5	6.5m Lt
605-8S	241.6	14+162.5	37m Lt
605-9S	238.1	14+175	21m Lt
605-10S	236.5	14+187.5	6m Lt
605-11S	241.4	14+187.5	38m Lt
605-12S	238.7	14+200	21m Lt
605-13S	236.7	14+212.5	5m Lt
605-14S	238.0	14+212.5	39m Lt

(Legend Continued)			
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
605-15S	236.8	14+225	21m Lt
605-16S	233.9	14+237.5	42.5m Lt
605-17S	233.8	14+250	20.5m Lt
605-18S	233.9	14+262.5	42.5m Lt
605-19S	234.0	14+275	20.5m Lt
605-20S	233.9	14+287.5	42.5m Lt
605-21S	234.0	14+300	20.5m Lt
605-22S	233.9	14+312.5	42m Lt
605-23S	234.0	14+320	8m Lt
605-24S	233.9	14+325	20.5m Lt
605-25S	233.9	14+337.5	43m Lt
605-26S	233.9	14+350	20.5m Lt
605-27S	233.9	14+350	32m Lt
605-28S	233.8	14+362.5	43m Lt
605-29S	233.9	14+370	10m Lt
605-30S	233.9	14+375	20.5m Lt
605-31S	235.6	14+387.5	44m Lt

(Legend Continued)			
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
605-32S	233.9	14+400	20.5m Lt
605-33S	238.2	14+412.5	45.5m Lt
605-34S	235.3	14+425	21m Lt
605-35S	241.8	14+437.5	47m Lt
605-36S	237.8	14+450	21m Lt
605-37S	243.8	14+462.5	44m Lt
605-38S	240.3	14+475	21.5m Lt
605-39S	247.9	14+487.5	52m Lt
605-40S	246.5	14+500	22m Lt



CONT No GWP No 312-99-00	SHEET
HIGHWAY 69 From 4 km South of Estaire to 1 km North of Hwy 537 SWAMP 605, STA. 14+086.5 TO 14+506.5 BURWASH TWP BOREHOLE LOCATIONS	



LEGEND			
●	Borehole		
⊕	Dynamic Cone Penetration Test (Cone)		
⊗	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
▽	W L at time of investigation Mar-Apr 2003		
▽	Head		
▽	ARTESIAN WATER Encountered		
—	PIEZOMETER		

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
605-1M	242.2	14+087.5	CL
605-2M	240.6	14+112.5	CL
605-3M	238.4	14+137.5	CL
605-4M	234.3	14+237.5	CL
605-5M	234.0	14+262.5	CL
605-6M	234.0	14+287.5	CL
605-7M	234.0	14+312.5	CL

(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.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED VV/CN	DATE OCT 29, 2004
DRAWN	MM	CHECKED BRG	APPROVED DWK
DWG	605-1		

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

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

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 605, STA. 14+086.5 TO 14+506.5 BURWASH TWP
SOIL STRATA

PROJECT LIMITS

SECORD TWP

MANAPITEI RIVER

SECORD RD

DILL TWP

Sudbury

C N R

HWY 537

MAKYNEN RD

69 (EXISTING)

HWY 69 (NEW)

ELBOW LAKE RD

NEPAWASSI

TROUT LAKE RD

BURWASH STATION

BURWASH TWP

Laura

ESTAIRE









LAURA TWP

SITE

KEY PLAN

SCALE

0 1 2 3 km

	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation Mar–Apr 2003
	Head
	ARTESIAN WATER
	Encountered
	PIEZOMETER

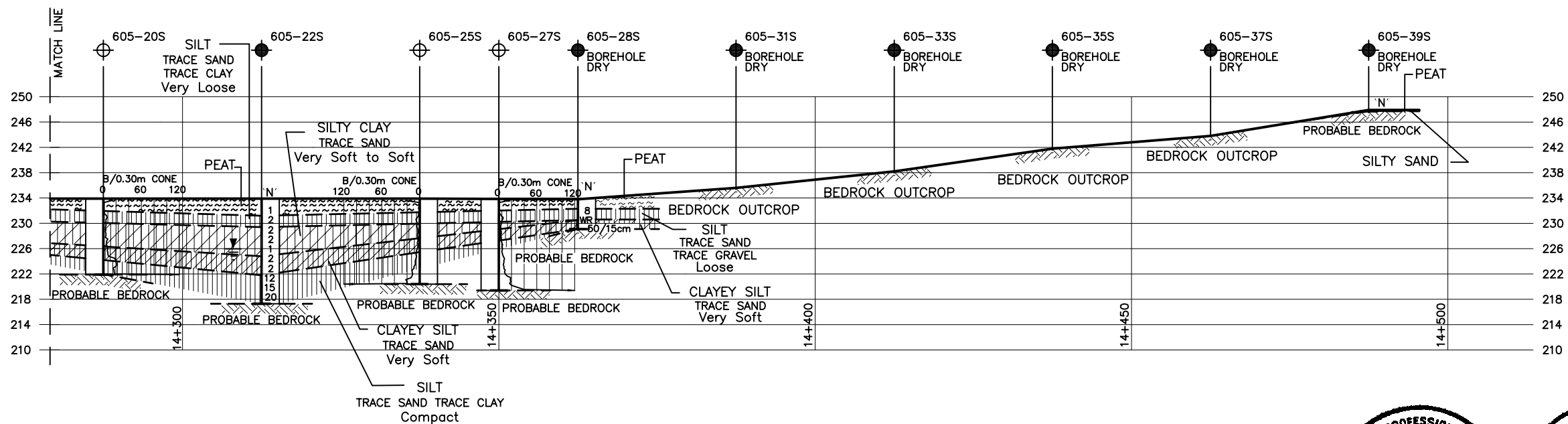
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED

Refer to drawing 605-1 for co-ordinates

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

HWY No	69	DIST	54
SUBM'D	PC	CHECKED W/CN	DATE OCT 29, 2004
DRAWN	MM	CHECKED BRG	APPROVED DWK
			DWG 605-2



SECTION
SCALE



REGISTERED PROFESSIONAL ENGINEER
D. W. KERR
PROVINCE OF ONTARIO

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

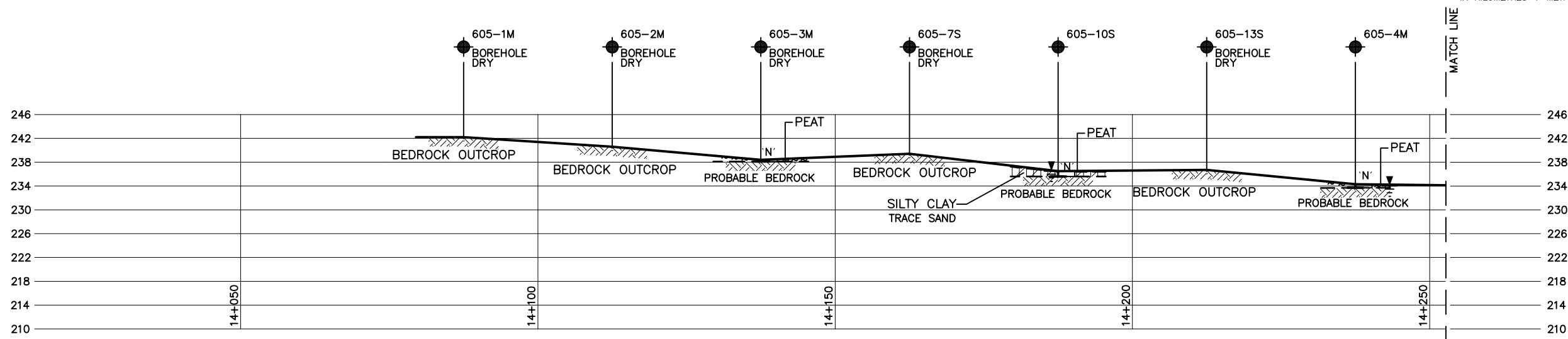
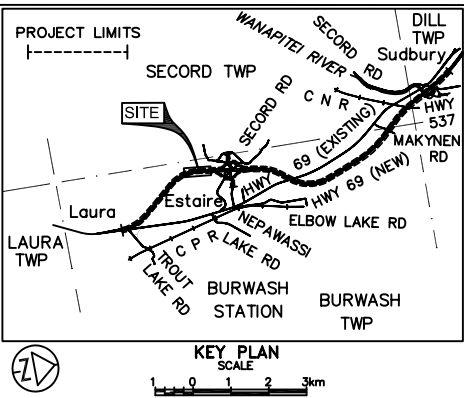
METRIC

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

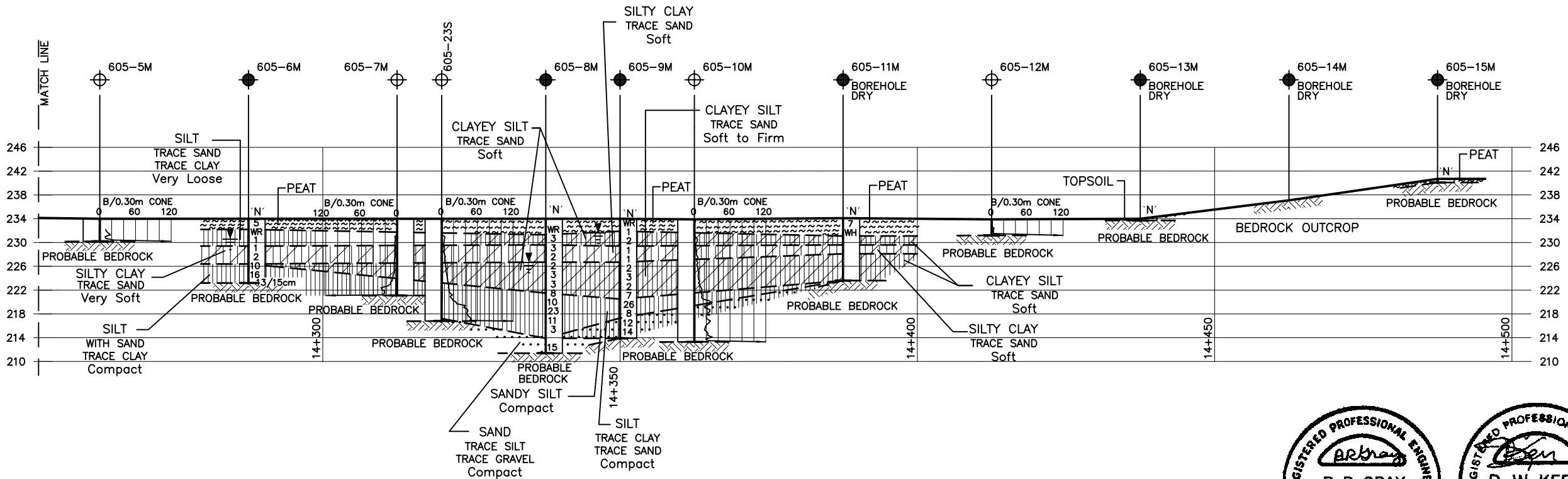
CONT No
GWP No 312-99-00

HIGHWAY 69
FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 605, STA. 14+086.5 TO 14+506.5 BURWASH TWP
SOIL STRATA

SHEET



B-B



B-B (Continued)

SECTION
SCALE



REFER TO DRAWING 605-1 FOR PLAN; 605-2 FOR SECTION
A-A; 605-4 TO 605-5 FOR SECTIONS C-C, D-D AND E-E.

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-Apr 2003
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	STA	o/s CL MED
		BURWASH TWP	
Refer to drawing 605-1 for co-ordinates			

NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.	
HWY No	69
SUBM'D	PC [CHECKED] DATE OCT 29, 2004
DRAWN	MM [CHECKED] BRG [APPROVED] DWK [DWG] 605-3

METRIC

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

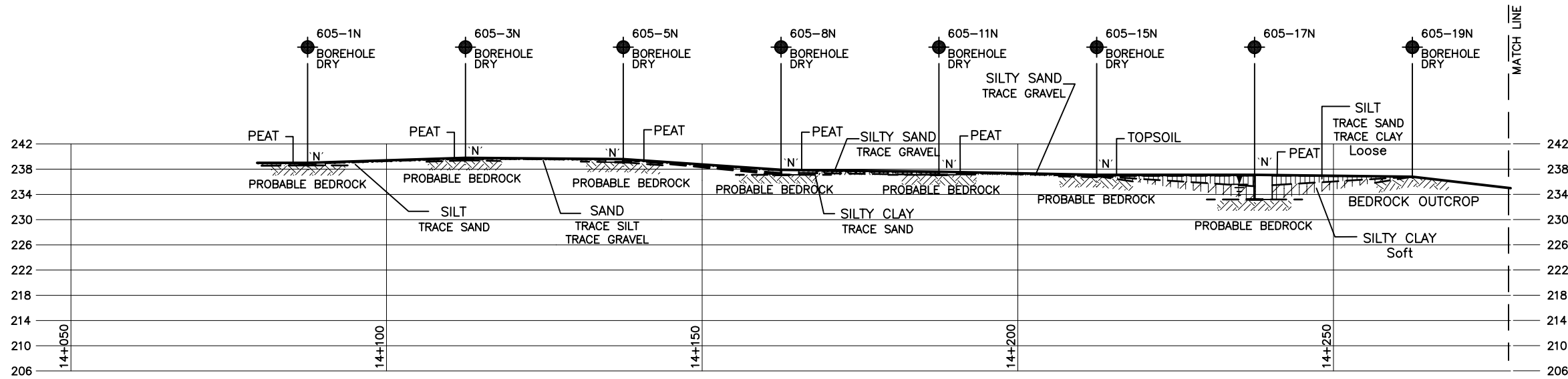
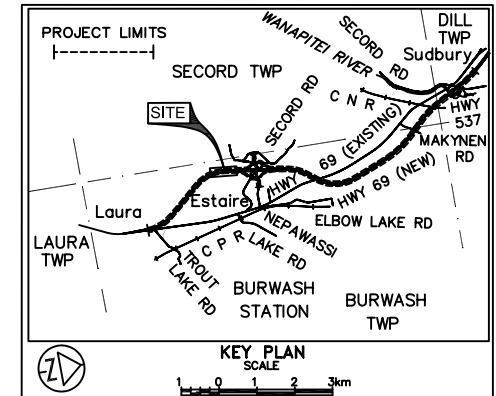
CONT No
GWP No 312-99-00

HIGHWAY 69

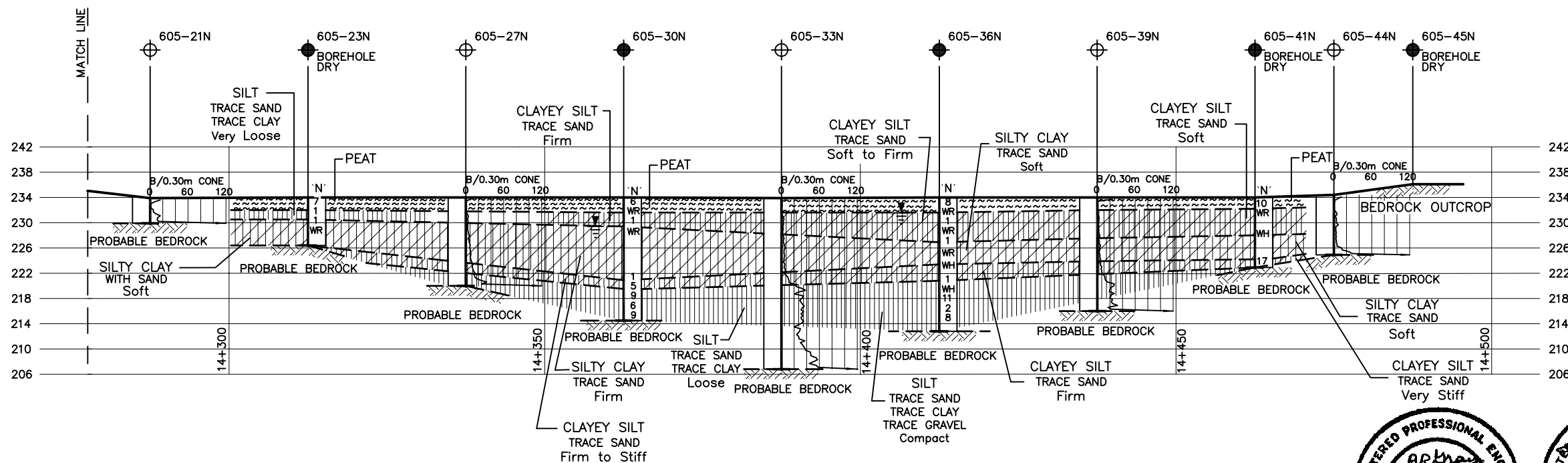
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 605, STA. 14+086.5 TO 14+506.5 BURWASH TWP

SOIL STRATA

SHEET



C-C



C-C (Continued)

SECTION
SCALE



REFER TO DRAWING 605-1 FOR PLAN; 605-2 TO 605-3 FOR
SECTIONS A-A AND B-B; 605-5 FOR SECTIONS D-D AND E-E.

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-Apr 2003
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No	ELEVATION	STA	o/s CL MED
		BURWASH TWP	
Refer to drawing 605-1 for co-ordinates			

NOTE

The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	MM
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	DATE	OCT 29, 2004
SITE		DWG	605-4

METRIC

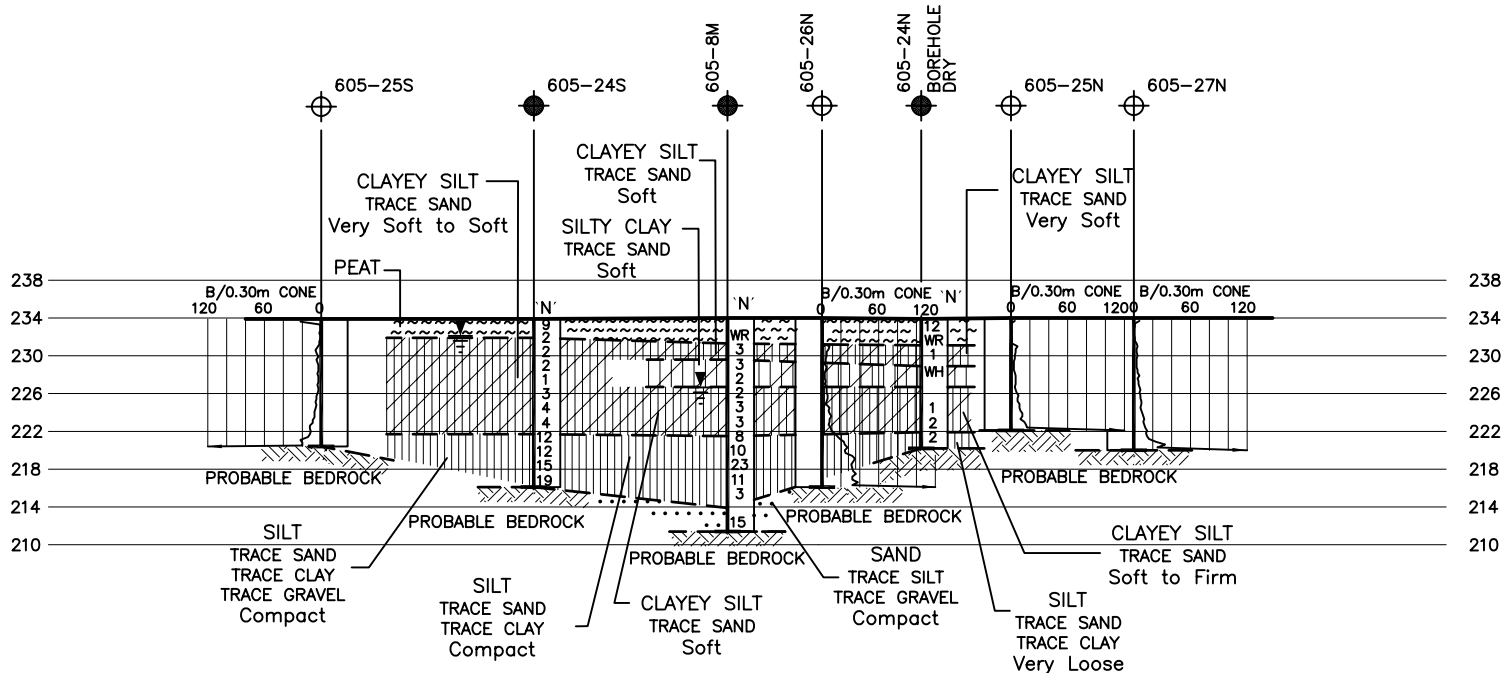
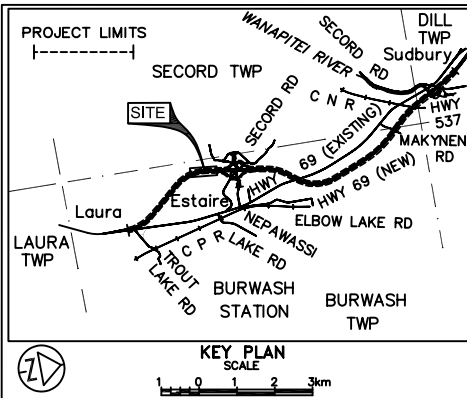
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

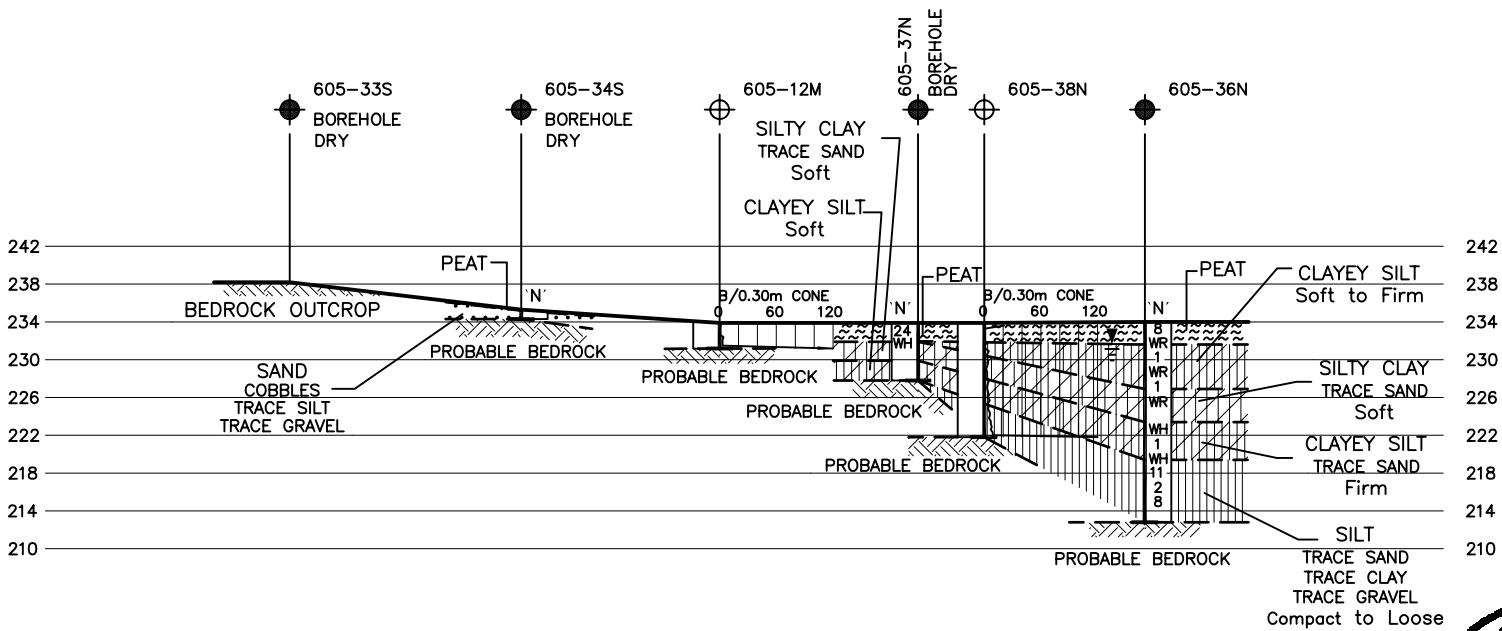
HIGHWAY 69
FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 605, STA. 14+086.5 TO 14+506.5 BURWASH TWP
SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



D-D



E-E

SECTIONS
SCALE



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Mar-Apr 2003		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
Refer to drawing 605-1 for co-ordinates			

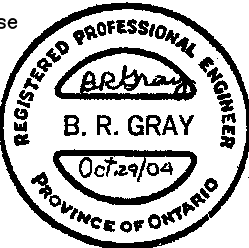
NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

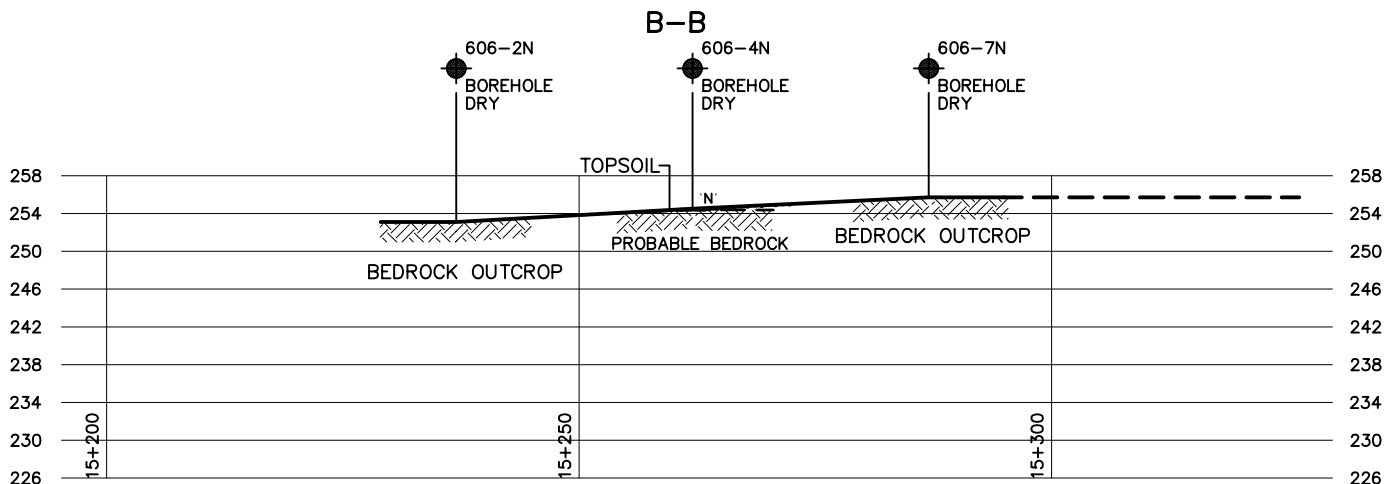
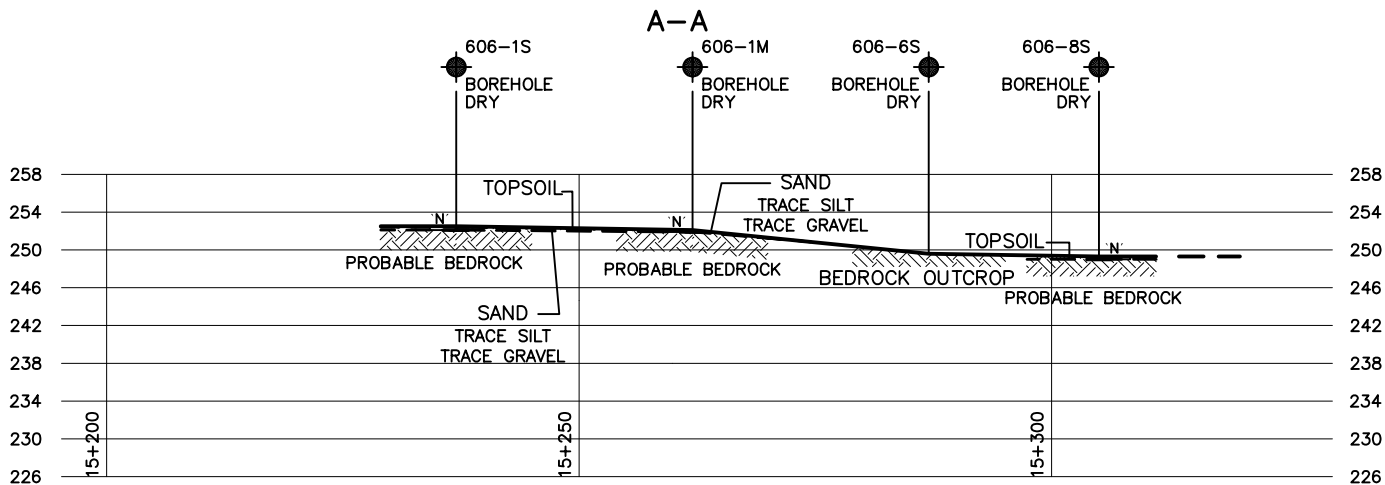
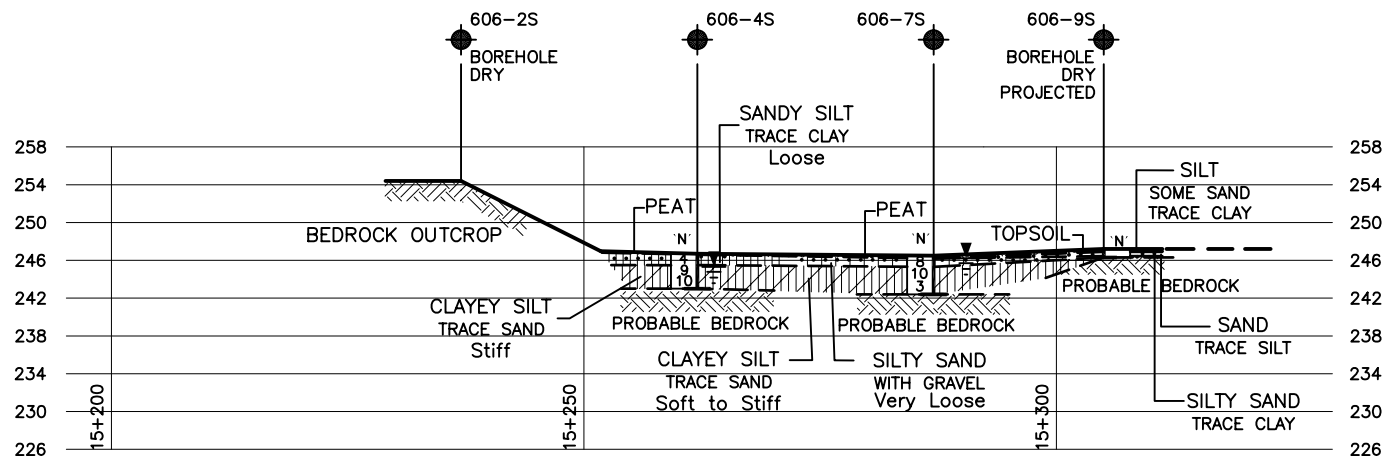
REVISIONS	DATE	BY	DESCRIPTION

Geocres No.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	DATE OCT 29, 2004
DRAWN	MM	CHECKED	APPROVED

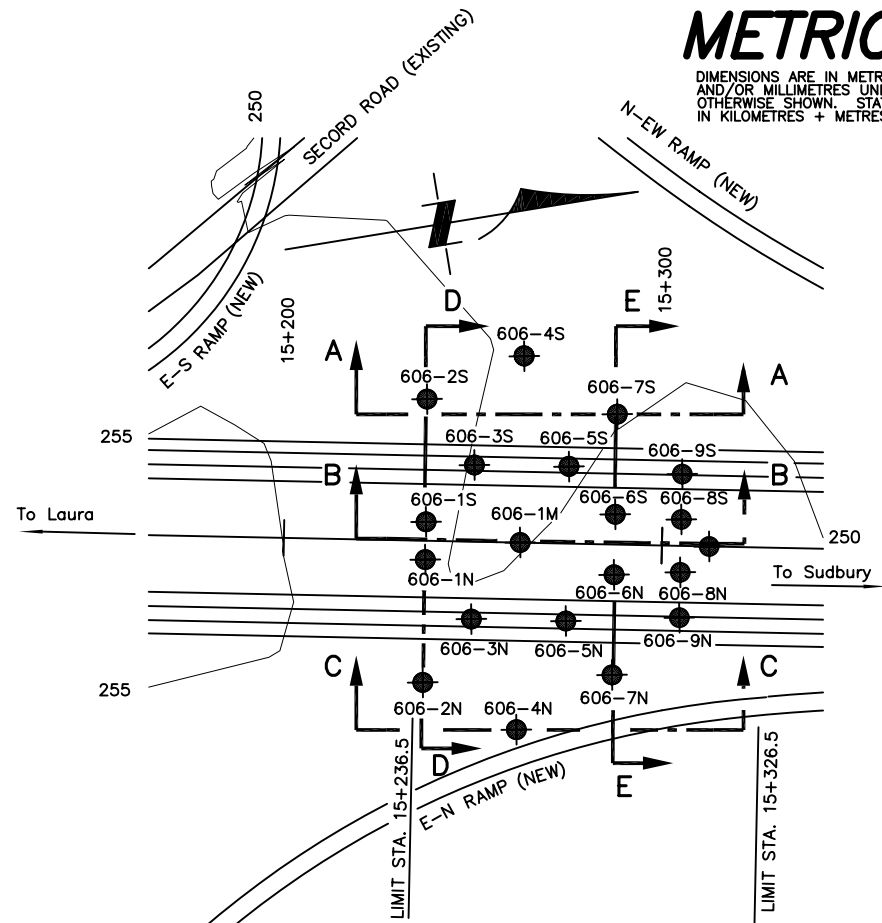
REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002



REFER TO DRAWING 605-1 FOR PLAN; DRAWINGS 605-2 TO 605-4 FOR SECTIONS A-A, B-B AND C-C.



NOTE:
REFER TO DRAWING 606-2 FOR SECTIONS D-D AND E-E



SWAMP 606

PLAN



(Legend Continued)

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
606-6N	253.5	15+287.5	8m Rt
606-7N	255.7	15+287.5	34.5m Rt
606-8N	253.9	15+305	7m Rt
606-9N	253.9	15+305	19m Rt
606-1S	252.5	15+237.5	5m Lt
606-2S	254.4	15+237.5	37.5m Lt
606-3S	248.3	15+250	20.5m Lt
606-4S	246.6	15+262.5	50m Lt
606-5S	247.2	15+275	20.5m Lt
606-6S	249.6	15+287.5	8m Lt
606-7S	246.5	15+287.5	34.5m Lt
606-8S	249.3	15+305	7m Lt
606-9S	247.2	15+305	19m Lt



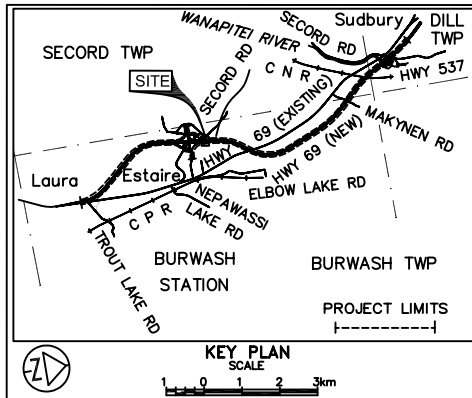
DRAFT NOTES:

- SWAMP 606 EXTENDED TO LIMIT OF SWAMP 607 DUE TO FILL OVER COMPRESSIBLE SOIL ALONG SBL.

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002

CONT No
GWP No 312-99-00

HIGHWAY 69
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 606, STA. 15+236.5 TO 15+326.5 BURWASH TWP
BOREHOLE LOCATIONS & SOIL STRATA



LEGEND			
	Borehole		Dynamic Cone Penetration Test (Cone)
	Borehole & Cone		Blows/0.3m (Std. Pen Test, 475 J / blow)
	CONE		Blows/0.3m (60 Cone, 475 J / blow)
	W.L. at time of investigation Apr-May 2003		Head
	ARTESIAN WATER Encountered		PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
606-1M	252.1	15+262.5	CL
606-1N	252.9	15+237.5	5m Rt
606-2N	253.1	15+237.5	37.5m Rt
606-3N	253.7	15+250	20.5m Rt
606-4N	254.5	15+262.5	49.5m Rt
606-5N	254.6	15+275	20.5m 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.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
SITE	DWG	606-1	

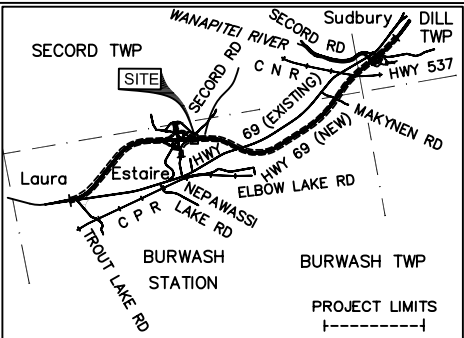
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 606, STA. 15+236.5 TO 15+326.5 BURWASH TWP
SOIL STRATA

SHEET



KEY PLAN
SCALE
1 0 1 2 3km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60 Cone, 475 J / blow)
- W L at time of investigation Apr-May 2003
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
Refer to drawing 606-1 for co-ordinates			

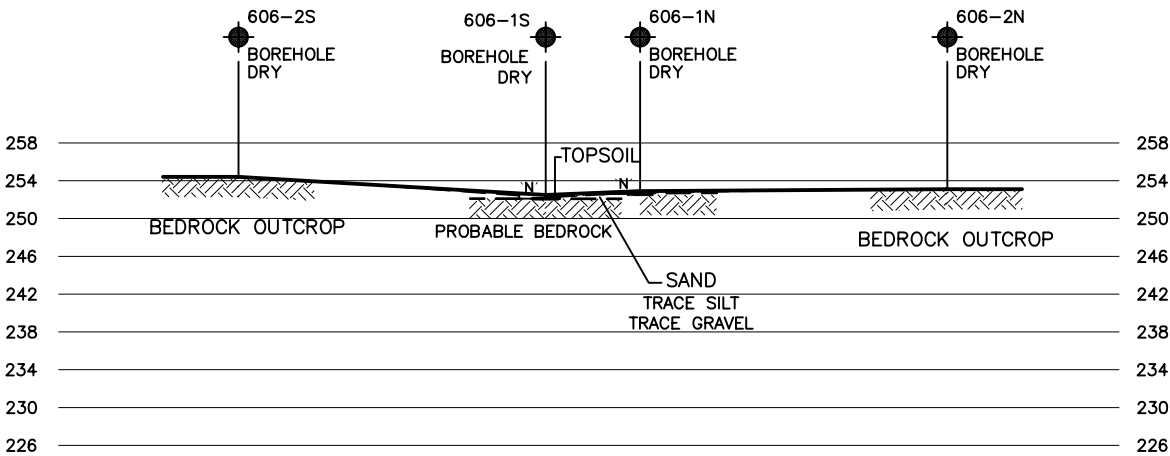
NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

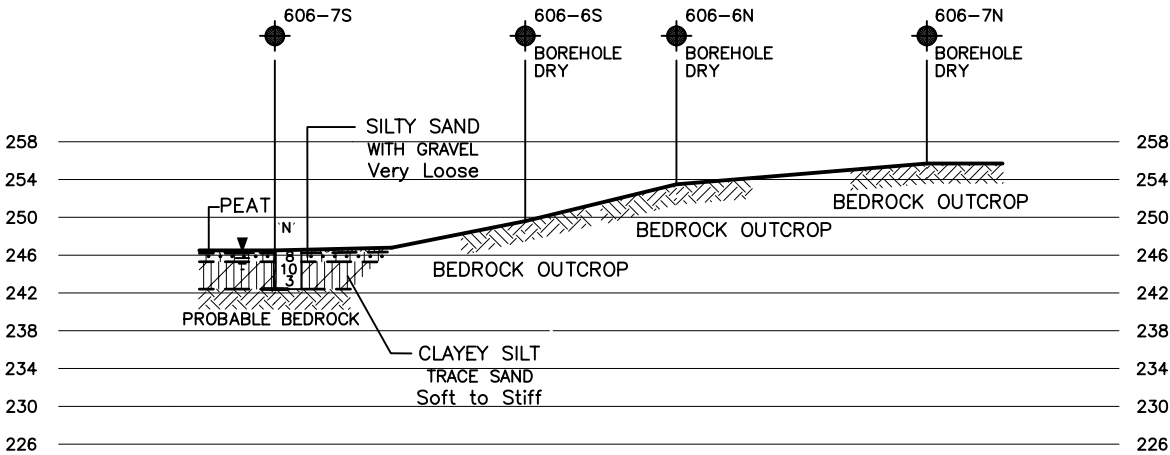
REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED CN	DATE OCT 29, 2004 SITE
DRAWN	MM	CHECKED BRG	APPROVED DWK DWG 606-2



D-D



E-E

SECTIONS

SCALE
8 4 0 8 16m

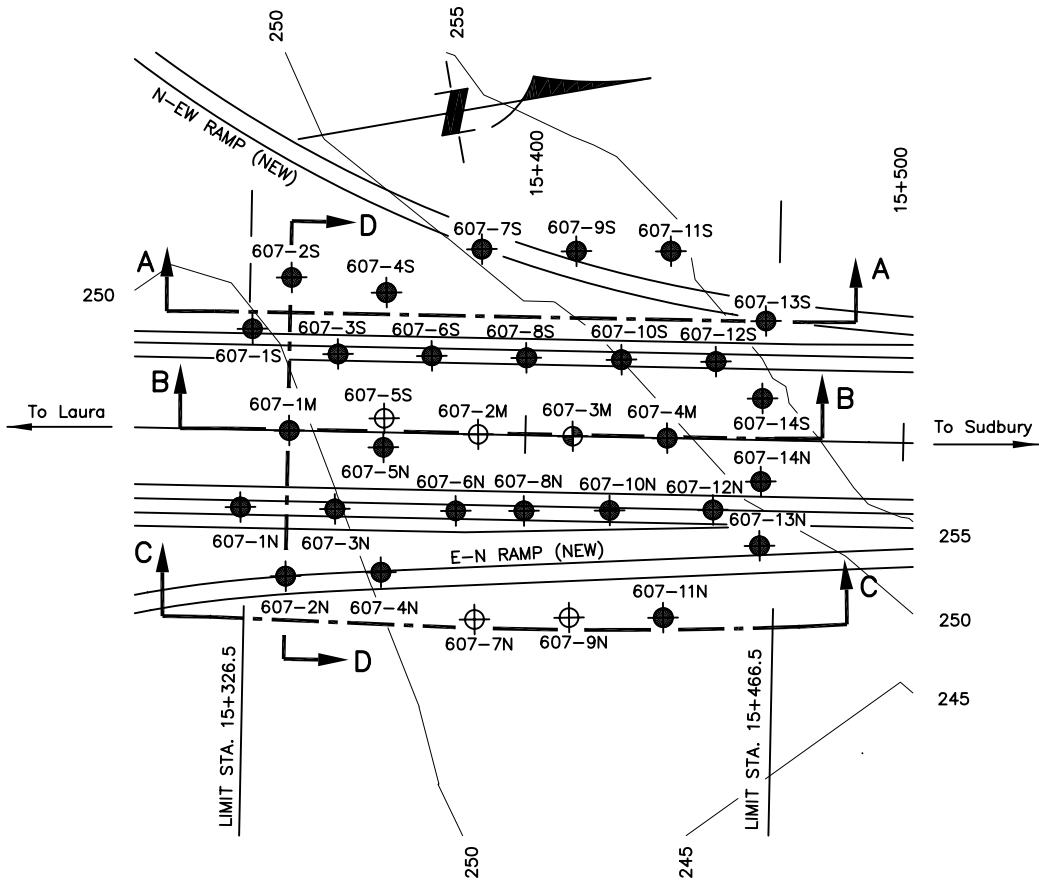
NOTE:

REFER TO DRAWING 606-1 FOR PLAN AND SECTIONS A-A, B-B
AND C-C

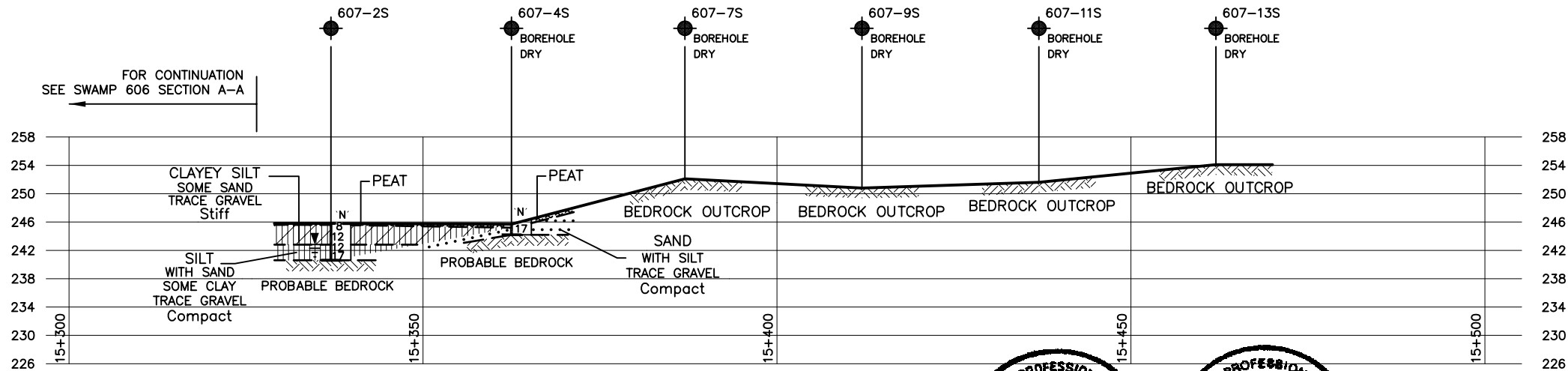


REF No E-Main69-5.dwg; 5Propty.dwg;1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

Table with 4 columns: BH No, ELEVATION, STA BURWASH TWP, o/s CL MED. It lists borehole data for various locations (e.g., 607-3N, 607-4N, etc.) with their respective elevations and stationing.



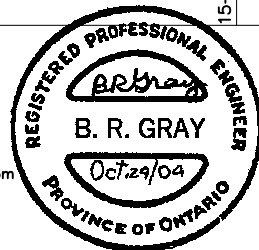
SWAMP 607
PLAN
SCALE



A-A
SECTION
SCALE



NOTE:
REFER TO DRAWING 607-2 FOR SECTIONS B-B, C-C AND D-D.

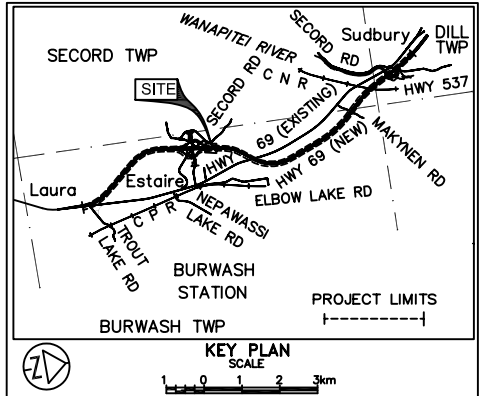


REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

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

CONT No
GWP No 312-99-00

HIGHWAY 69
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 607, STA. 15+326.5 TO 15+466.5 BURWASH TWP
BOREHOLE LOCATIONS & SOIL STRATA



- LEGEND
- Borehole
 - Dynamic Cone Penetration Test (Cone)
 - Borehole & Cone
 - N Blows/0.3m (Std. Pen Test, 475 J / blow)
 - CONE Blows/0.3m (60° Cone, 475 J / blow)
 - W L at time of investigation Mar-May 2003
 - Head
 - ARTESIAN WATER Encountered
 - PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
607-1M	246.6	15+337.5	CL
607-2M	245.0	15+387.5	CL
607-3M	245.0	15+412.5	CL
607-4M	248.0	15+437.5	CL
607-1N	251.4	15+325	20.5m Rt
607-2N	253.0	15+337.5	40.5m Rt

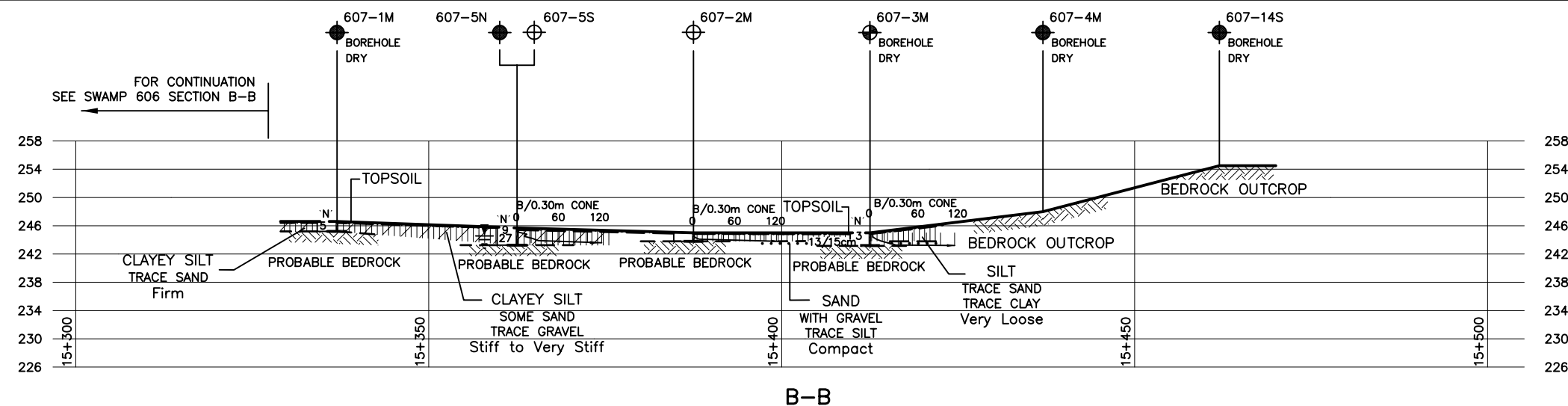
(Legend Continues)

NOTE

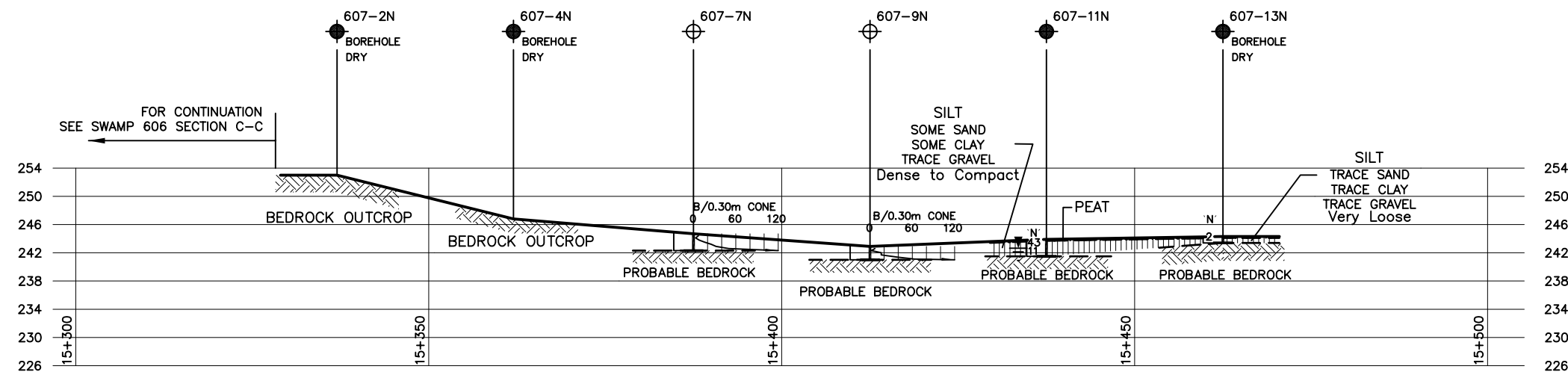
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

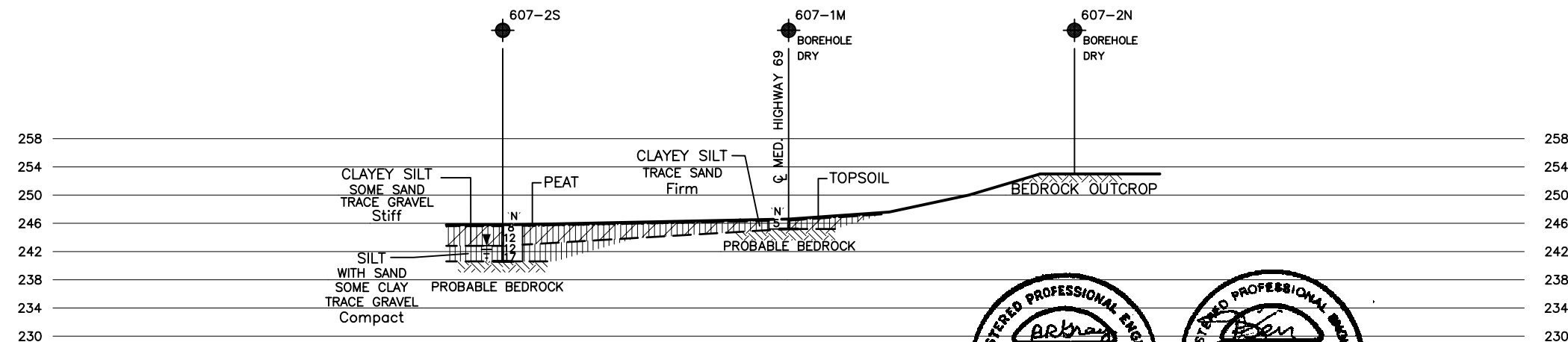
Geocres No.	
HWY No	69
SUBM'D	PC
CHECKED	CN
DATE	OCT 29, 2004
SITE	
DRAWN	MM
CHECKED	BRG
APPROVED	DWK
DWG	607-1



B-B



C-C



D-D
SECTIONS
SCALE



NOTE:
REFER TO DRAWING 607-1 FOR PLAN AND SECTION A-A.

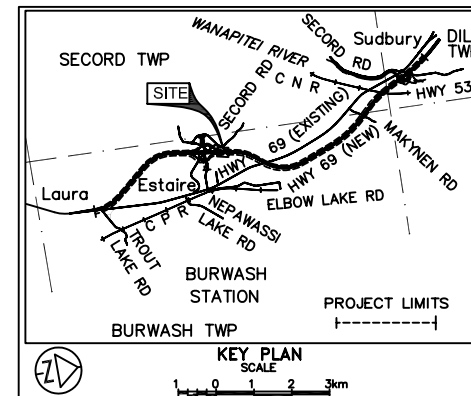
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 607, STA. 15+326.5 TO 15+466.5 BURWASH TWP
SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-May 2003
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No	ELEVATION	STA	o/s CL MED
		BURWASH TWP	
Refer to drawing 607-1 for co-ordinates			

NOTE

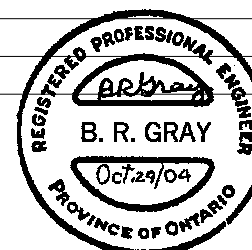
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

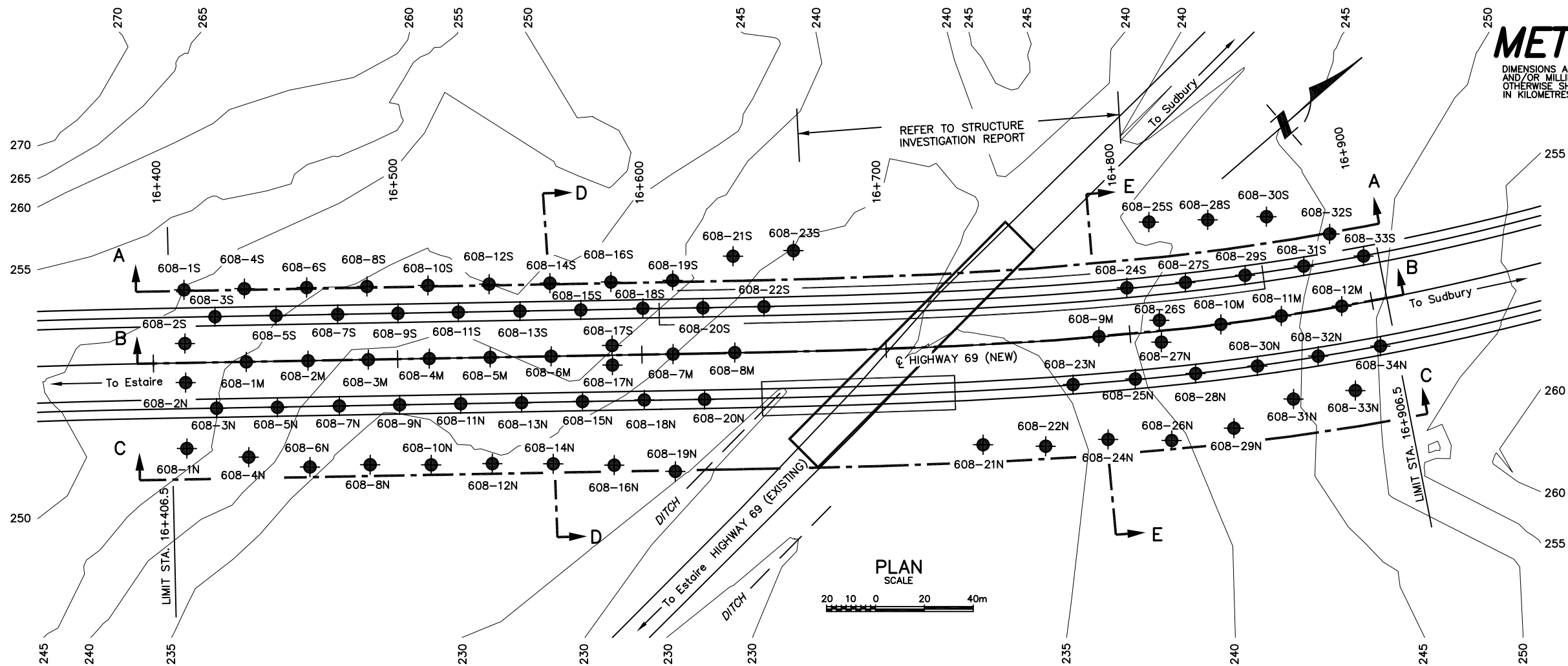
REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	607-2

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002





METRIC

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

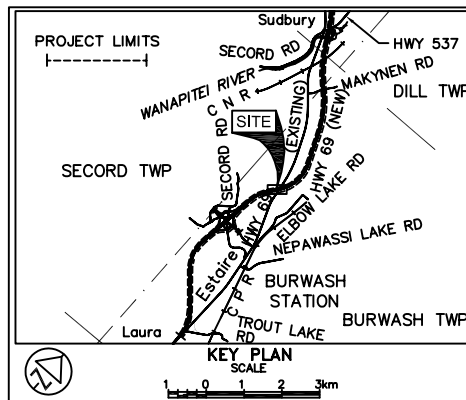
CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 608, STA. 16+406.5 TO 16+908.5 BURWASH TWP
BOREHOLE LOCATIONS



SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation April 2004
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
608-1M	243.1	16+437.5	CL
608-2M	243.0	16+462.5	CL
608-3M	240.4	16+487.5	CL
608-4M	240.2	16+512.5	CL
608-5M	236.8	16+537.5	CL
608-6M	240.5	16+562.5	CL
608-7M	234.0	16+612.5	CL
608-8M	232.5	16+637.5	CL
608-9M	236.2	16+787.5	CL

(Legend Continues)

NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	GD	CHECKED	GD
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
DWG	608-1		



NOTE:
REFER TO DRAWINGS 608-2 TO 608-4 FOR
SECTIONS A-A, B-B, C-C, D-D AND E-E.

REF No E-Hwy69-S-des.dwg; February 2004
1_bpl06.dwg; October, 2002

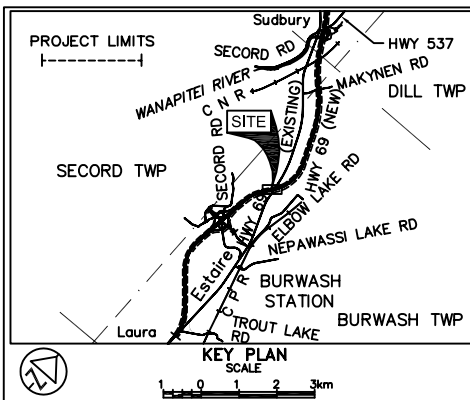
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 608, STA. 16+406.5 TO 16+906.5 BURWASH TWP
SOIL STRATA

SHEET



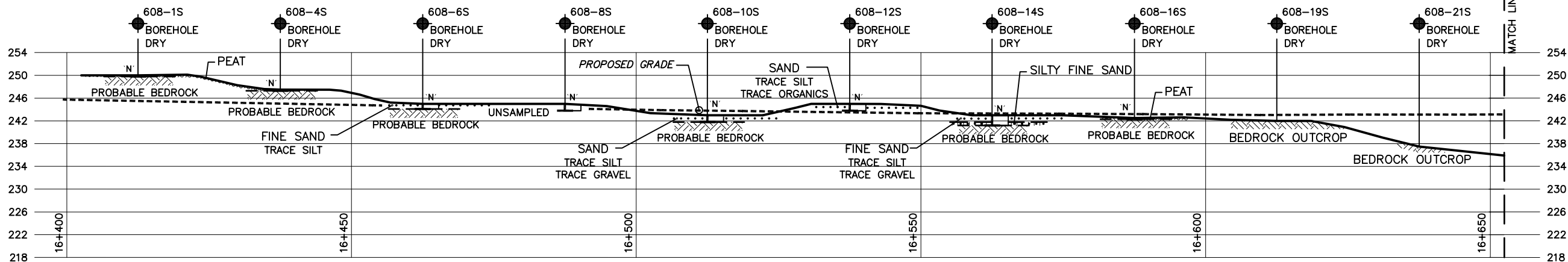
LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation April 2004
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
(Refer to drawing 608-1 for co-ordinates)			
(Legend Continues)			

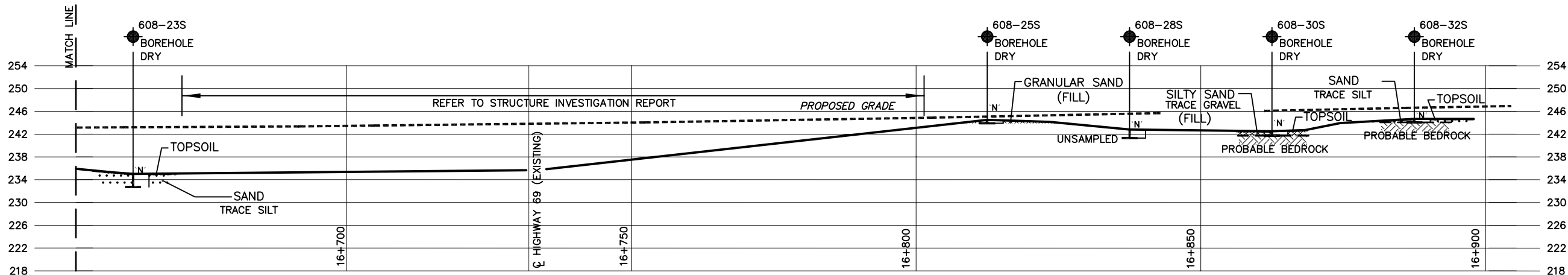
NOTE -
The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

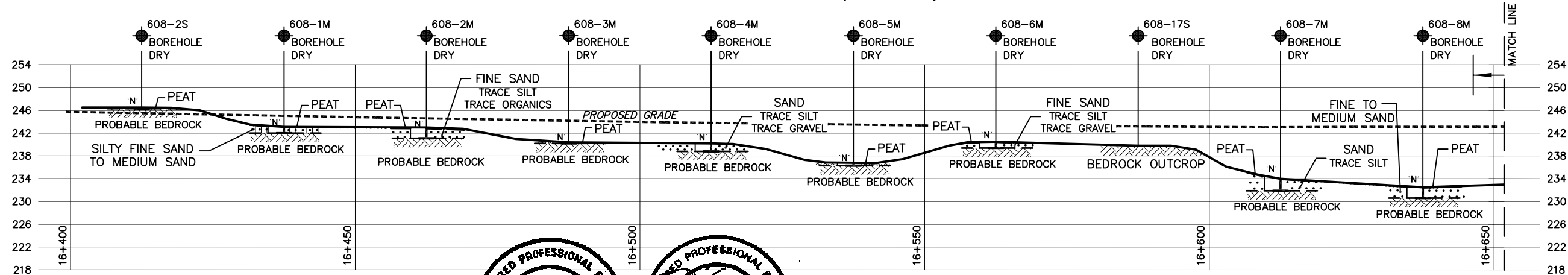
Geocres No.			
HWY No	69	DIST	54
SUBM'D	GD	CHECKED	GD
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	608-2



A-A



A-A (Continued)



B-B

SECTIONS
SCALE



NOTE:
REFER TO DRAWING 608-1 FOR PLAN, DRAWINGS 608-3
AND 608-4 FOR SECTIONS B-B (CONTINUED), C-C, D-D
AND E-E.

REF No E-Hwy69-S-des.dwg; February 2004
1_bp106.dwg; October, 2002

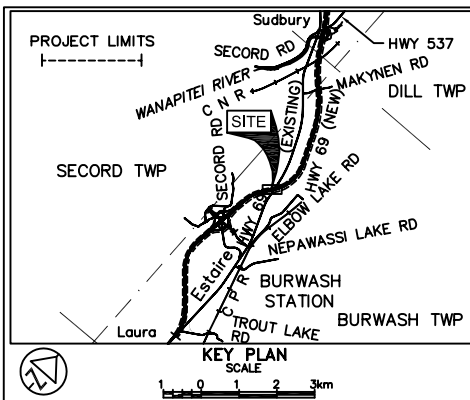
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 608, STA. 16+406.5 TO 16+906.5 BURWASH TWP
SOIL STRATA

SHEET



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation April 2004		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
(Refer to drawing 608-1 for co-ordinates)			

(Legend Continues)

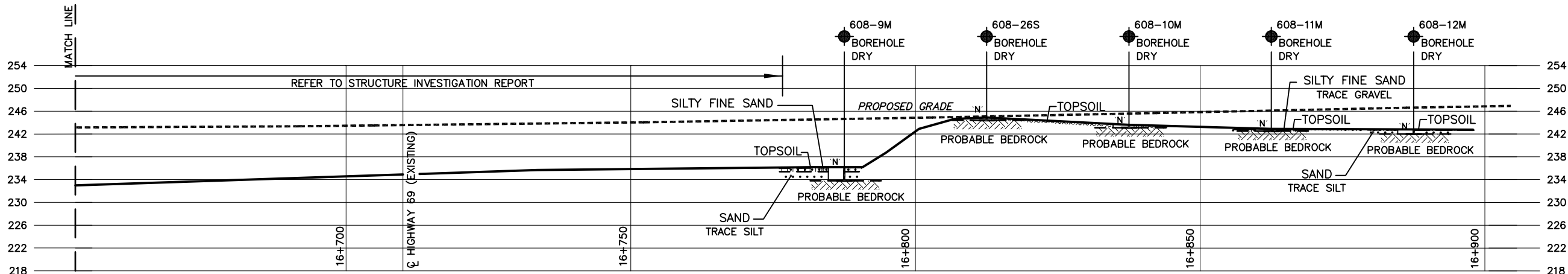
NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

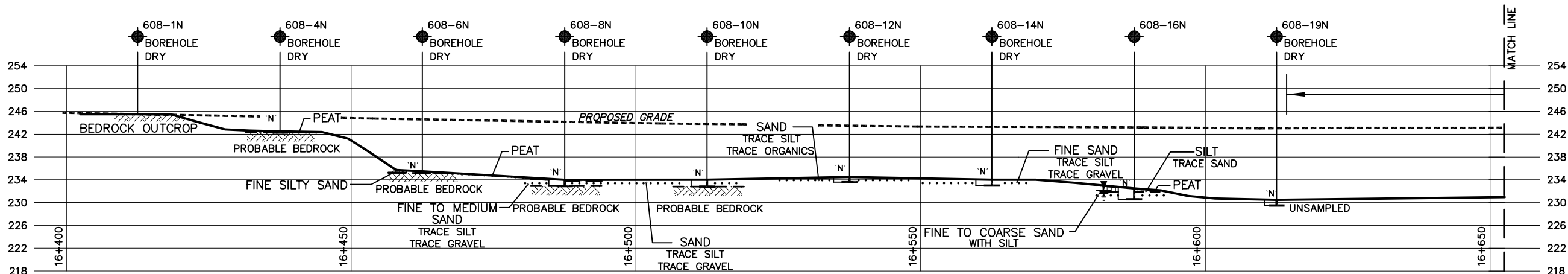
REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

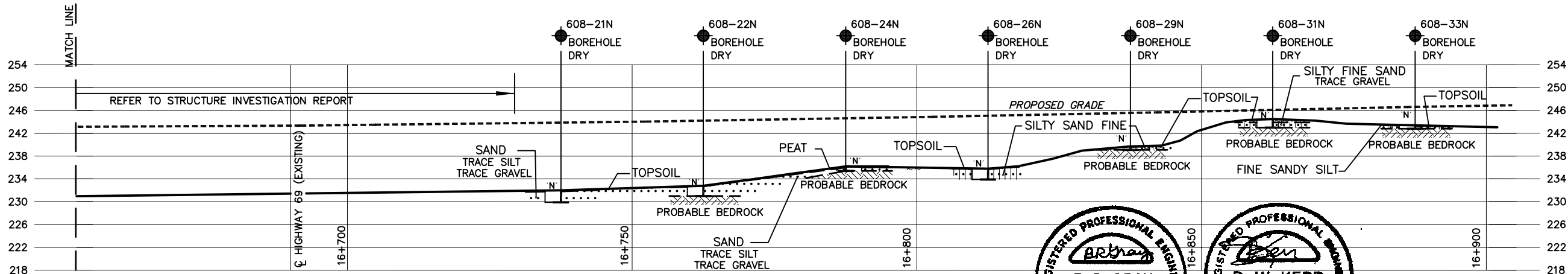
HWY No	69	DIST	54
SUBM'D	GD	CHECKED	GD
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWG
SITE			608-3



B-B (Continued)



C-C



C-C (Continued)

SECTIONS

SCALE



REF No E-Hwy69-S-des.dwg; February 2004
1_bp106.dwg; October, 2002

NOTE:
REFER TO DRAWINGS 608-1 AND 608-2 FOR PLAN,
SECTIONS A-A AND PART OF SECTION B-B, DRAWING
608-4 FOR SECTIONS D-D AND E-E.

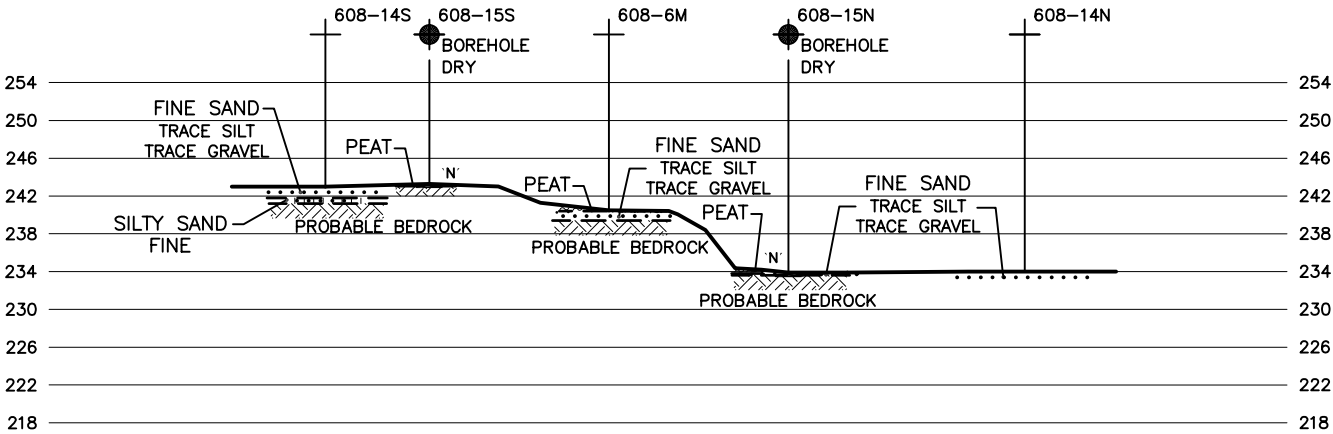
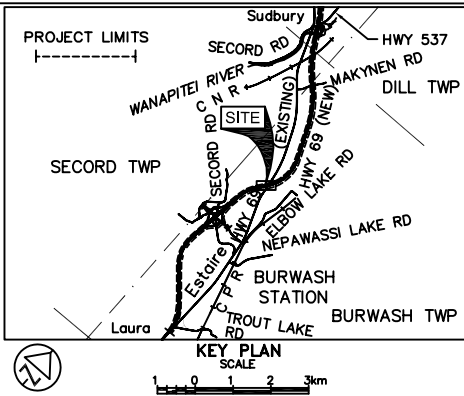
METRIC

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

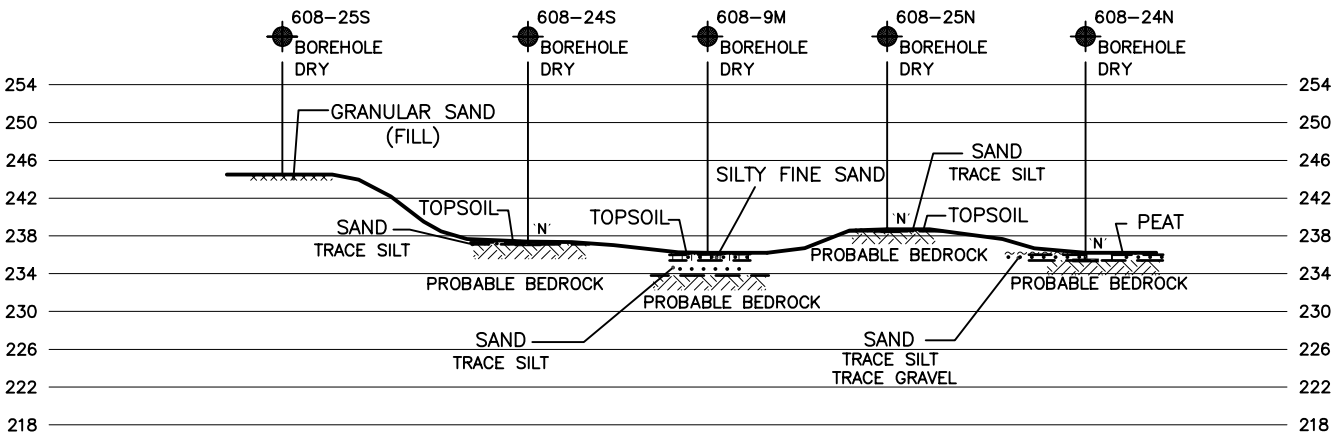
CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 608, STA. 16+406.5 TO 16+906.5 BURWASH TWP
SOIL STRATA

SHEET



D-D



E-E

SECTIONS
SCALE



NOTE:
REFER TO DRAWINGS 608-1 TO 608-3 FOR PLAN,
SECTIONS A-A, B-B AND C-C.



REF No E-Hwy69-S-des.dwg; February 2004
1_bp106.dwg; October, 2002

LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation April 2004		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		
BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
(Refer to drawing 608-1 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.

REVISIONS	DATE	BY	DESCRIPTION

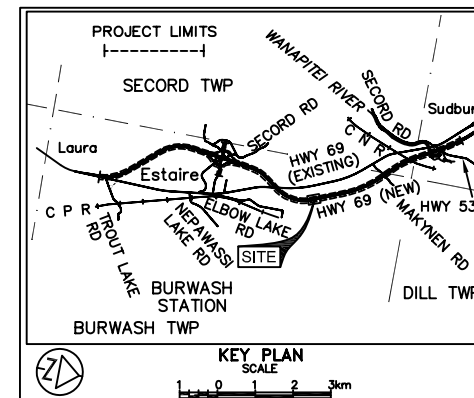
Geocres No.

HWY No	69	DIST	54
SUBM'D	GD	CHECKED	GD
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	608-4

(Legend Continued)			
BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
609-1S	249.0	17+650	19m Lt
609-2S	243.0	17+675	33.5m Lt
609-3S	246.2	17+675	19m Lt
609-4S	242.8	17+700	19m Lt
609-5S	248.4	17+725	45m Lt
609-6S	247.0	17+725	19m Lt
609-7S	247.9	17+750	19m Lt
609-8S	248.0	17+775	40m Lt
609-9S	248.4	17+775	19m Lt
609-10S	247.8	17+800	19m Lt
609-11S	249.5	17+825	40.5m Lt
609-12S	249.2	17+825	19m Lt
609-13S	245.1	17+850	19m Lt
609-14S	249.4	17+875	40m Lt
609-15S	246.3	17+875	19m Lt
609-16S	245.2	17+900	19m Lt
609-17S	250.4	17+925	33m Lt
609-18S	251.9	17+925	19m Lt
609-19S	252.2	17+950	19m Lt
609-20S	253.7	17+975	28m Lt
609-21S	251.7	17+975	19m Lt



<p><u>HIGHWAY 69</u></p> <p>WAY 69 FOUR-LANING FOR 12 km</p> <p>outh of Estaire to 1 km North of Hwy 537</p> <p>STA. 17+646.5 TO 17+966.5 BURWASH TWP</p> <p>E LOCATIONS & SOIL STRATA</p>	<p>SHE</p>
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(Legend Continues)

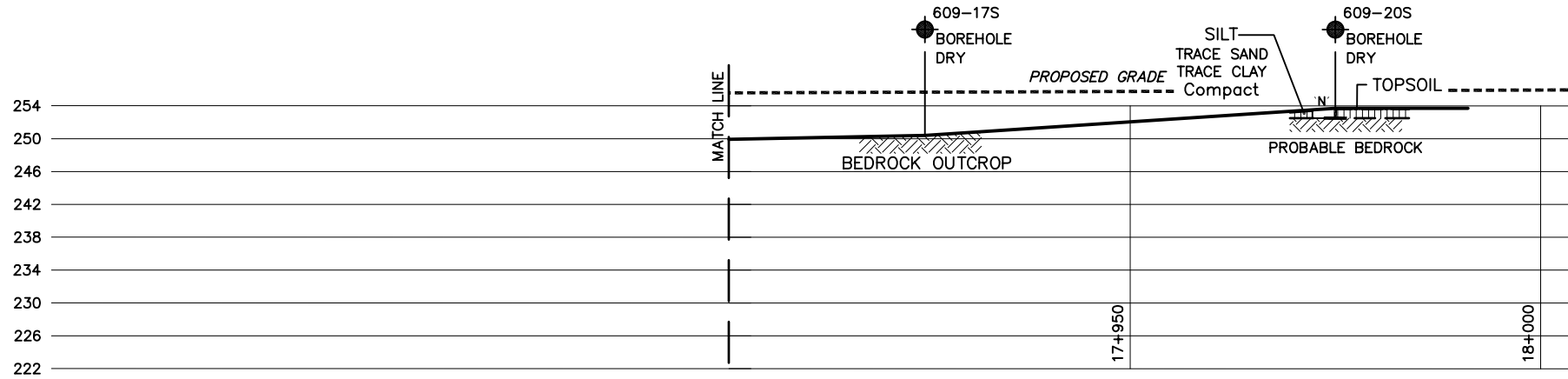
- NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

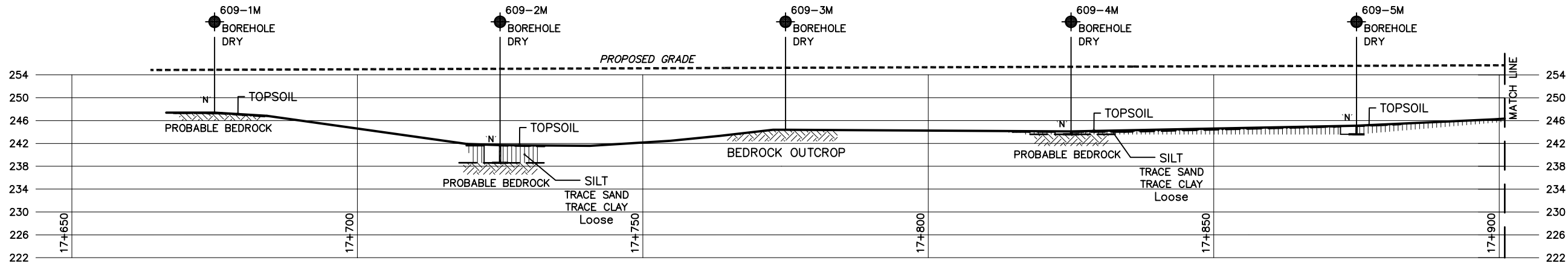
REVISIONS			
	DATE	BY	DESCRIPTION

Geocres No.

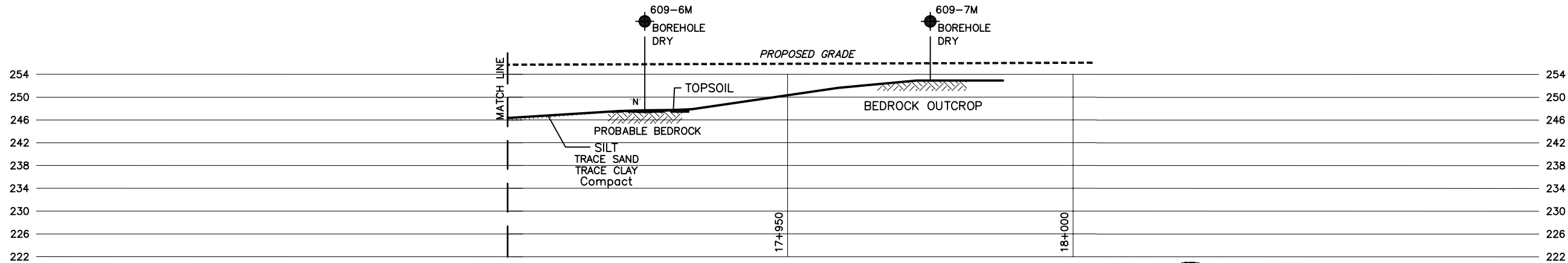
HWY No 69				DIST 54	
SUBM'D	GD	CHECKED	GD	DATE OCT 29, 2004	SITE
DRAWN	MM	CHECKED	BRG	APPROVED DWK	DWG 609-1



A-A (Continued)



B-B



B-B (Continued)

SECTIONS
SCALE



NOTE:
REFER TO DRAWING 609-1 FOR PLAN AND PART
OF SECTION A-A AND DRAWING 3 FOR SECTIONS
C-C, D-D AND E-E.



REF No E-Hwy69-S-des.dwg; February 2004
1_bpl06.dwg; October, 2002

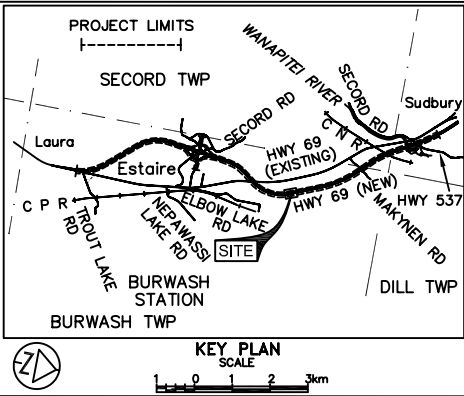
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 609, STA. 17+646.5 TO 17+966.5 BURWASH TWP
SOIL STRATA

SHEET



LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation April 2004
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
(Refer to Drawing 609-1 for co-ordinates)			

(Legend Continues)

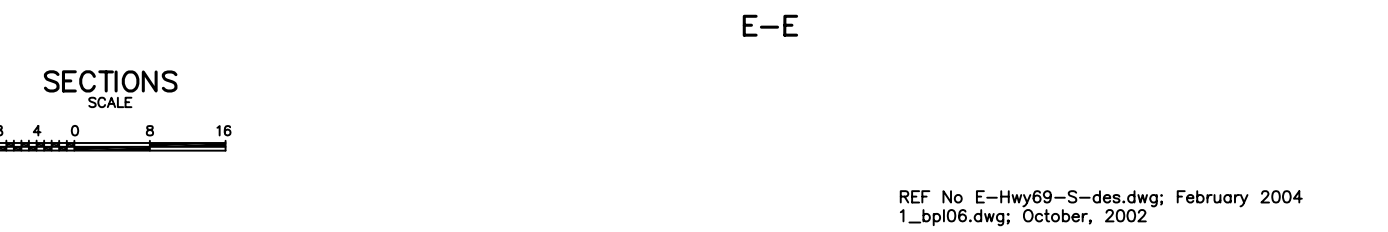
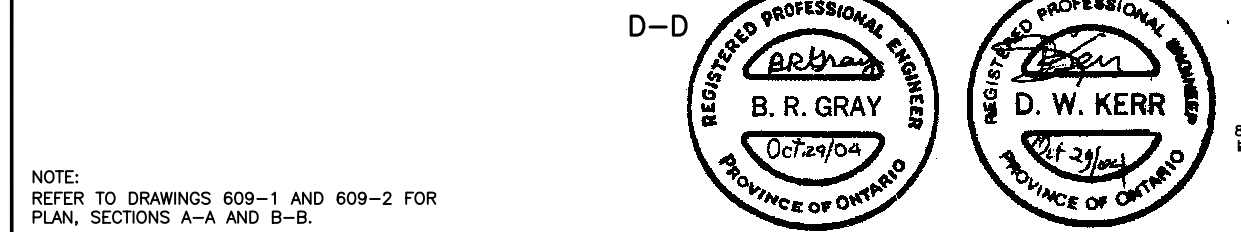
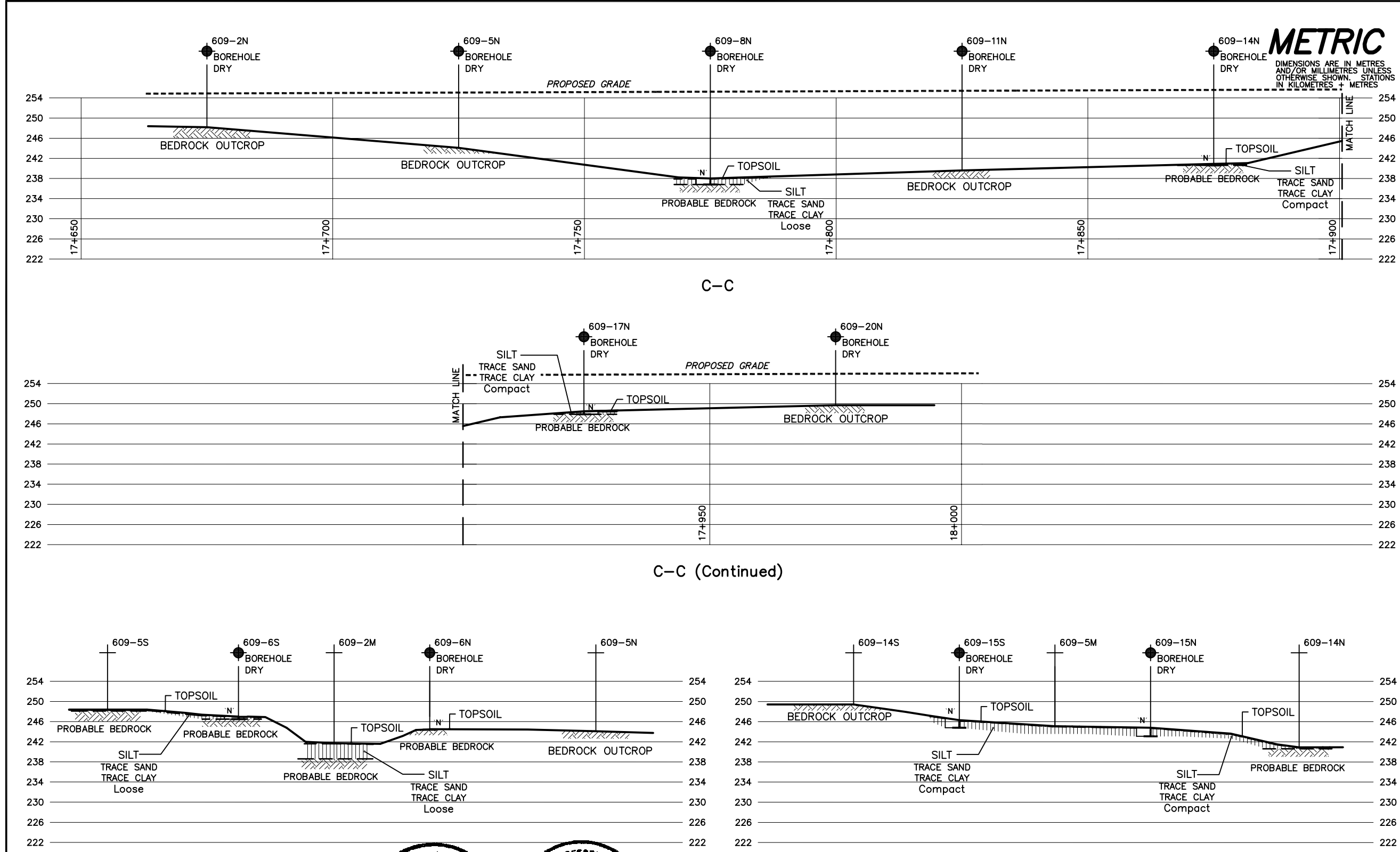
— NOTE —

The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.

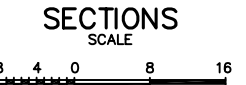
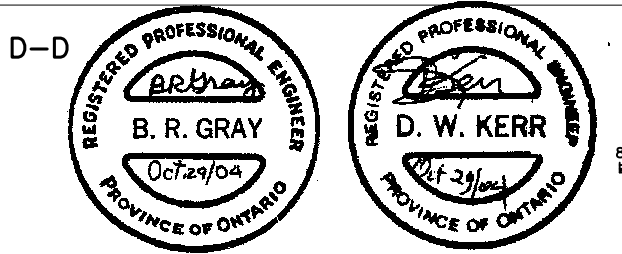
REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

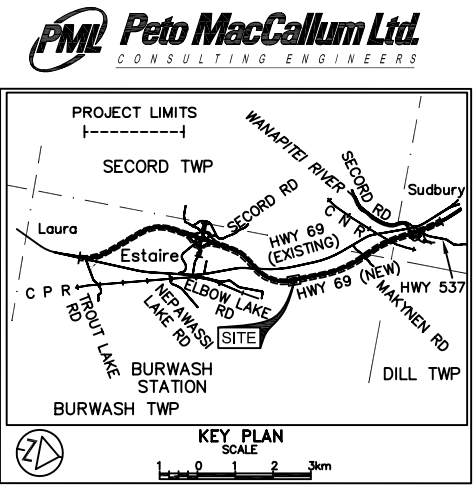
HWY No	69	CHECKED	GD	DATE	OCT 29, 2004	DIST	54
SUBM'D	GD	CHECKED	GD	DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG	APPROVED		DWG	609-2



NOTE:
REFER TO DRAWINGS 609-1 AND 609-2 FOR
PLAN, SECTIONS A-A AND B-B.



CONT No	
GWP No 312-99-00	
HIGHWAY 69	SHEET
HIGHWAY 69 FOUR-LANING FOR 12 km From 4 km South of Estaire to 1 km North of Hwy 537 SWAMP 609, STA. 17+646.5 TO 17+966.5 BURWASH TWP	
SOIL STRATA	



LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation April 2004
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
(Refer to Drawing 609-1 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.

REVISIONS	DATE	BY	DESCRIPTION

REF No E-Hwy69-S-des.dwg; February 2004
1_bpl06.dwg; October, 2002

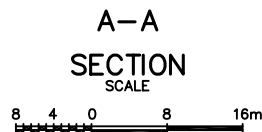
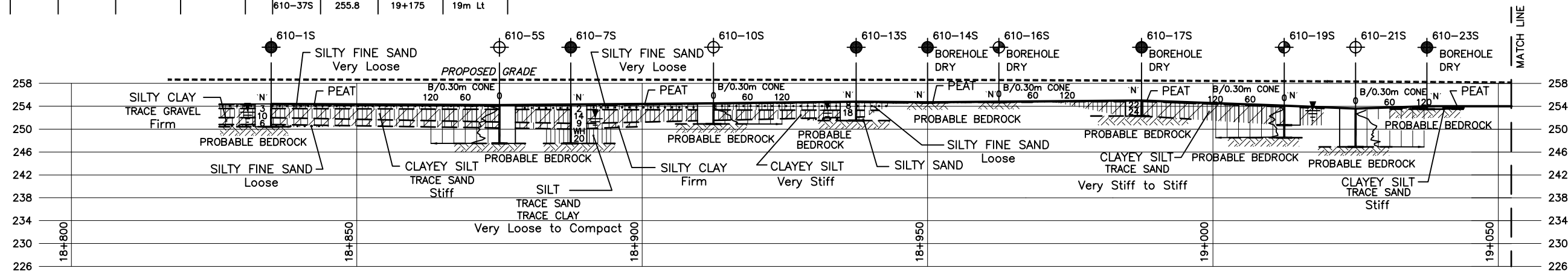
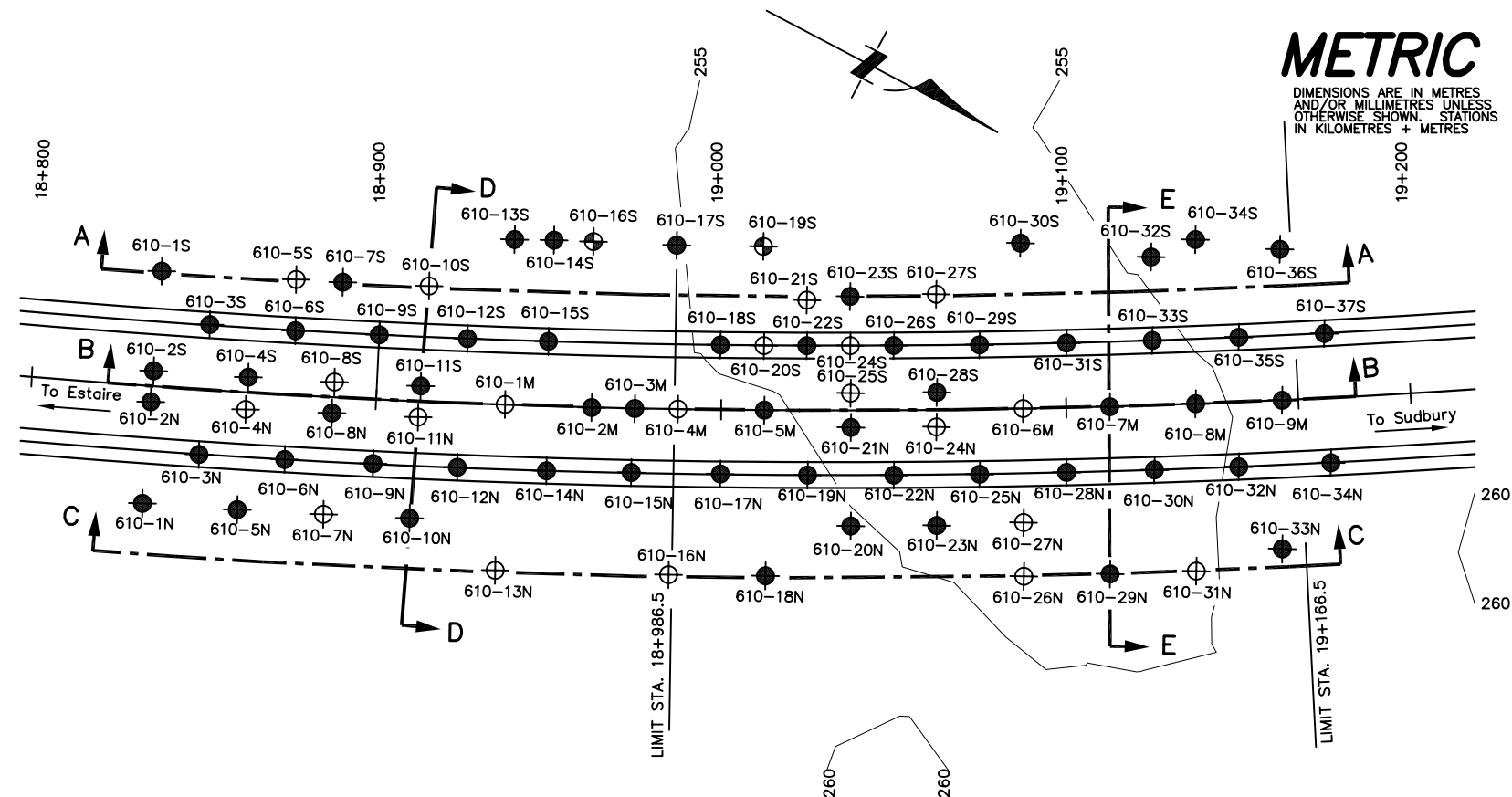
Geocres No.					
HWY No	69	GD	CHECKED	GD	DIST 54
SUBM'D	GD	CHECKED	BRG	APPROVED	DWK
DRAWN	MM	CHECKED	BRG	APPROVED	DWK
DATE OCT 29, 2004					SITE 609-3

(Legend Continued)

BH No	ELEVATION	STA	o/s CL MED
610-1N	254.3	18+835	34m Rt
610-2N	254.5	18+835	4.5m Rt
610-3N	254.2	18+850	19m Rt
610-4N	254.2	18+862.5	4.5m Rt
610-5N	254.1	18+862.5	34m Rt
610-6N	254.2	18+875	19m Rt
610-7N	254.2	18+887.5	34m Rt
610-8N	254.2	18+887.5	4.5m Rt
610-9N	254.3	18+900	19m Rt
610-10N	254.3	18+912.5	34m Rt
610-11N	254.2	18+912.5	4.5m Rt
610-12N	254.3	18+925	19m Rt
610-13N	255.0	18+937.5	48m Rt
610-14N	255.4	18+950	19m Rt
610-15N	254.7	18+975	19m Rt
610-16N	255.0	18+987.5	48m Rt
610-17N	255.4	19+000	19m Rt
610-18N	255.5	19+012.5	48m Rt
610-19N	255.1	19+025	19m Rt
610-20N	255.0	19+037.5	33.5m Rt
610-21N	253.7	19+037.5	5m Rt
610-22N	253.8	19+050	19m Rt
610-23N	253.8	19+062.5	33.5m Rt
610-24N	253.8	19+062.5	5m Rt
610-25N	253.8	19+075	19m Rt
610-26N	254.0	19+087.5	48m Rt
610-27N	253.8	19+087.5	33m Rt
610-28N	253.6	19+100	19m Rt
610-29N	254.0	19+112.5	48m Rt
610-30N	253.8	19+125	19m Rt
610-31N	254.5	19+137.5	48m Rt
610-32N	255.3	19+150	19m Rt
610-33N	255.3	19+162.5	43m Rt
610-34N	255.3	19+175	19m Rt

(Legend Continued)

BH No	ELEVATION	STA	o/s CL MED
610-1S	254.4	18+835	33.5m Lt
610-2S	254.5	18+835	4.5m Lt
610-3S	254.3	18+850	19m Lt
610-4S	254.2	18+862.5	4.5m Lt
610-5S	254.2	18+875	33.5m Lt
610-6S	254.2	18+875	19m Lt
610-7S	254.3	18+887.5	33.5m Lt
610-8S	254.2	18+887.5	4.5m Lt
610-9S	254.1	18+900	19m Lt
610-10S	254.5	18+912.5	33.5m Lt
610-11S	254.2	18+912.5	4.5m Lt
610-12S	254.2	18+925	19m Lt
610-13S	254.8	18+937.5	48m Lt
610-14S	254.7	18+950	48m Lt
610-15S	254.2	18+950	19m Lt
610-16S	254.8	18+962.5	48m Lt
610-17S	255.0	18+987.5	48m Lt
610-18S	253.9	19+000	19m Lt
610-19S	254.1	19+012.5	48m Lt
610-20S	253.8	19+012.5	19m Lt
610-21S	253.6	19+025	32m Lt
610-22S	253.7	19+025	19m Lt
610-23S	254.0	19+037.5	33m Lt
610-24S	253.8	19+037.5	19m Lt
610-25S	253.7	19+037.5	5m Lt
610-26S	253.8	19+050	19m Lt
610-27S	254.0	19+062.5	33.5m Lt
610-28S	253.8	19+062.5	5m Lt
610-29S	254.0	19+075	19m Lt
610-30S	254.5	19+087.5	48m Lt
610-31S	254.7	19+100	19m Lt
610-32S	255.3	19+125	43m Lt
610-33S	253.6	19+125	19m Lt
610-34S	255.4	19+137.5	48.5m Lt
610-35S	254.0	19+150	19m Lt
610-36S	255.7	19+162.5	43m Lt
610-37S	255.8	19+175	19m Lt



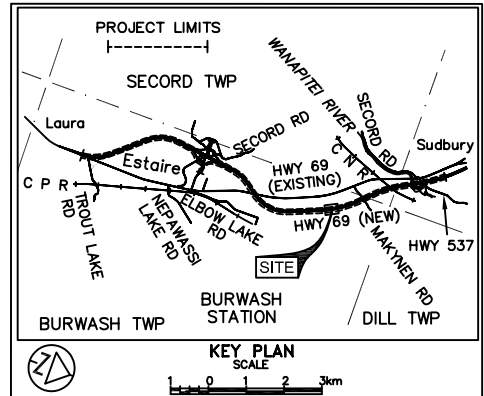
NOTE:
REFER TO DRAWINGS 610-2 AND 610-3 FOR
SECTIONS A-A (CONTINUED), B-B, C-C, D-D
AND E-E.

REF No E-Hwy69-S-des.dwg; February 2004
1_bpl06.dwg; October, 2002

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 610, STA. 18+986.5 TO 19+166.5 BURWASH TWP
BOREHOLE LOCATIONS & SOIL STRATA

SHEET



LEGEND

	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W.L. at time of investigation Feb 2004
	Head
	ARTESIAN WATER
	Encountered
	PIEZOMETER

BH No	ELEVATION	STA	o/s CL MED
610-1M	254.4	18+937.5	CL
610-2M	254.5	18+962.5	CL
610-3M	254.1	18+975	CL
610-4M	254.2	18+987.5	CL
610-5M	254.2	19+012.5	CL
610-6M	253.7	19+087.5	CL
610-7M	253.7	19+112.5	CL
610-8M	253.8	19+137.5	CL
610-9M	254.5	19+162.5	CL

(Legend Continues)
- NOTE -
The boundaries between soil strata have been established
only at Borehole locations. Between Boreholes the
boundaries are assumed from geological evidence.

DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	GD	CHECKED	GD
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	DATE	OCT 29, 2004
APPROVED	DWK	APPROVED	DWK
SITE	DWG	SITE	DWG
610-1			

METRIC

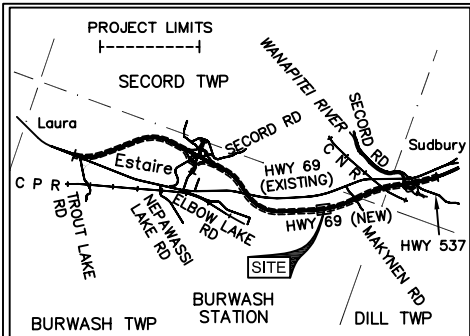
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

HIGHWAY 69
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 610, STA. 18+986.5 TO 19+168.5 BURWASH TWP
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



KEY PLAN
SCALE
0 1 2 3 km

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Feb 2004
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No ELEVATION STA BURWASH TWP p/s CL MED

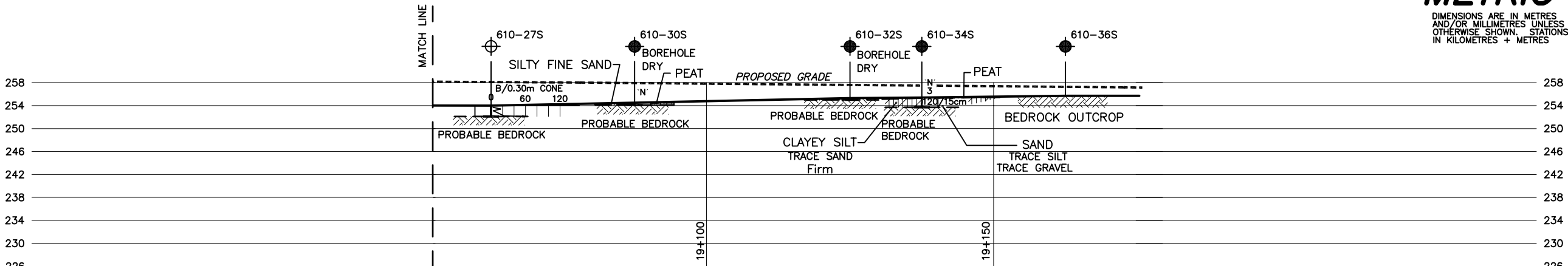
(Refer to drawing 610-1 for co-ordinates)

NOTE

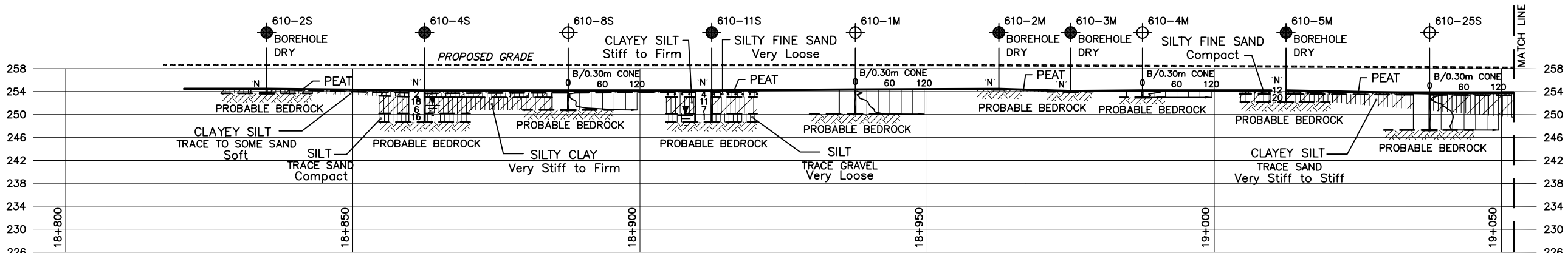
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

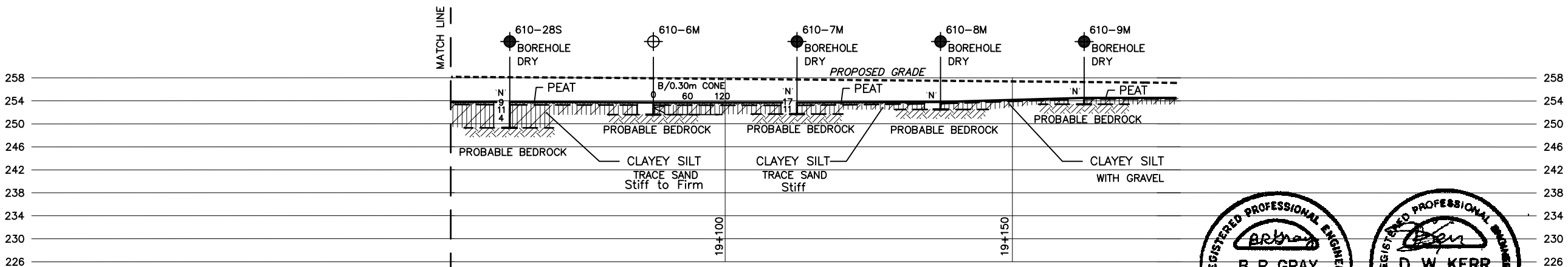
Geocres No.	
HWY No	69
SUBM'D	GD
CHECKED	GD
DATE	OCT 29, 2004
DIST	54
DRAWN	MM
CHECKED	BRG
APPROVED	DWK
SITE	
DWG	610-2



A-A (CONTINUED)



B-B



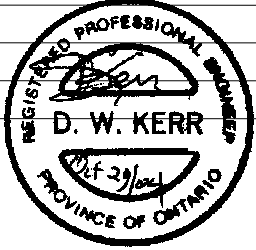
B-B (CONTINUED)

SECTIONS

SCALE



NOTE:
REFER TO DRAWING 610-1 FOR PLAN AND PART
OF SECTION A-A, DRAWING 610-3 FOR
SECTIONS C-C, D-D AND E-E.



REF No E-Hwy69-S-des.dwg; February 2004
1_bpl06.dwg; October, 2002

METRIC

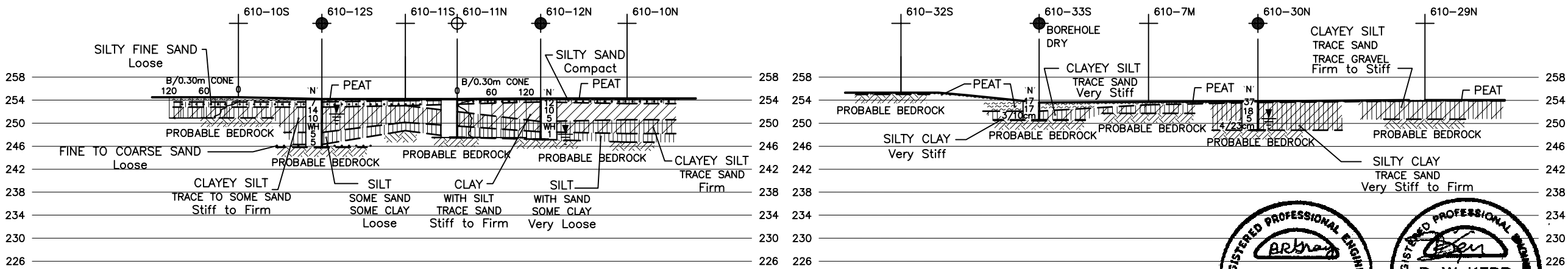
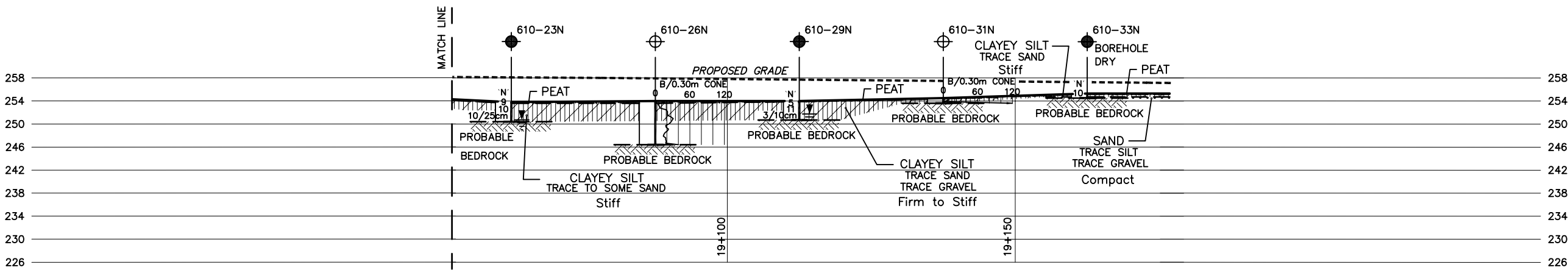
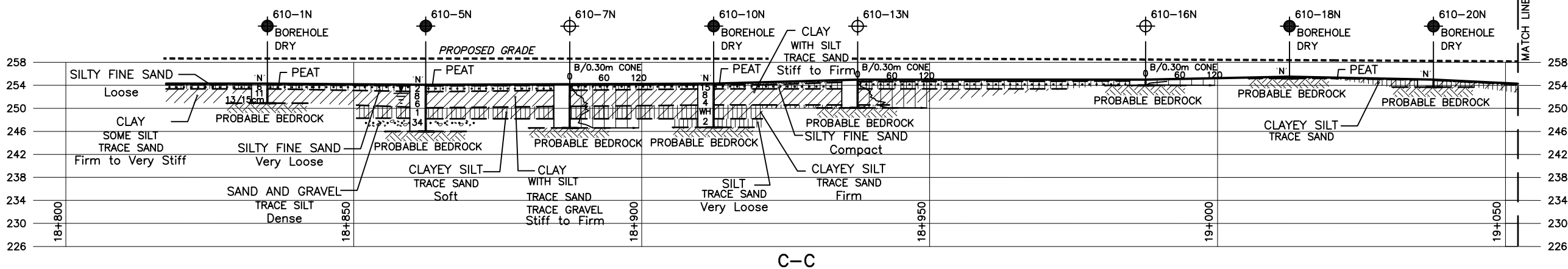
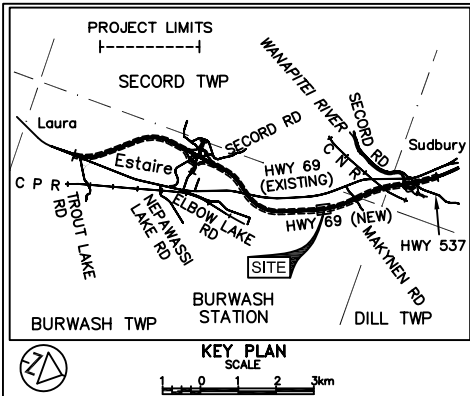
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 610, STA. 18+986.5 TO 19+166.5 BURWASH TWP
BOREHOLE LOCATIONS & SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



D-D

E-E

SECTIONS

SCALE



NOTE:
REFER TO DRAWINGS 610-1 AND 610-2 FOR
PLAN AND SECTIONS A-A AND B-B.

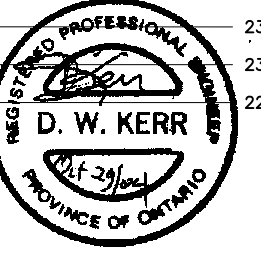
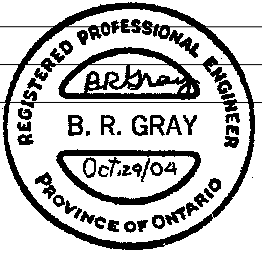
LEGEND				
	Borehole			
	Dynamic Cone Penetration Test (Cone)			
	Borehole & Cone			
N	Blows/0.3m (Std. Pen Test, 475 J / blow)			
CONE	Blows/0.3m (60° Cone, 475 J / blow)			
	W L at time of investigation Feb 2004			
	Head			
	ARTESIAN WATER Encountered			
	PIEZOMETER			

BH No	ELEVATION	STA BURWASH TWP	p/s CL MED
(Refer to drawing 610-1 for co-ordinates)			

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

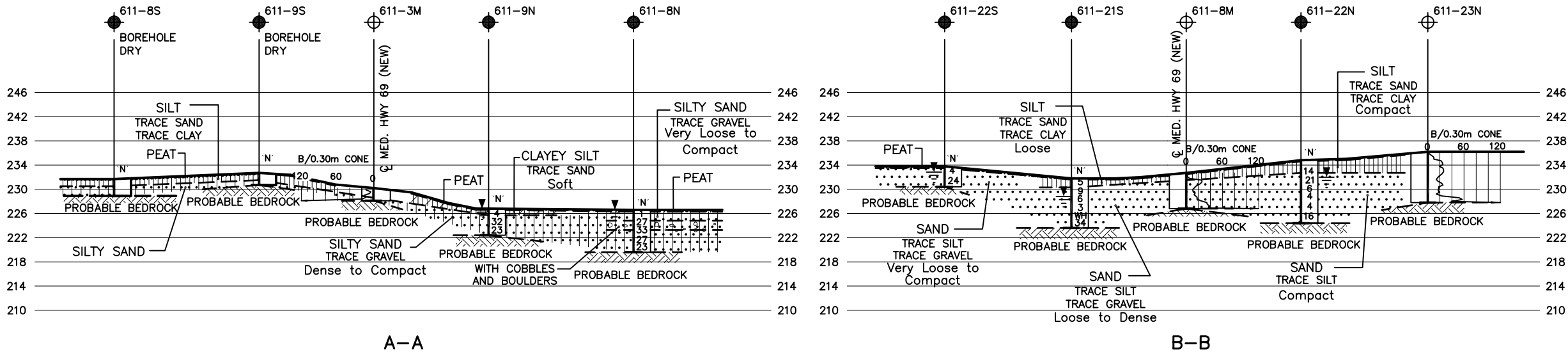
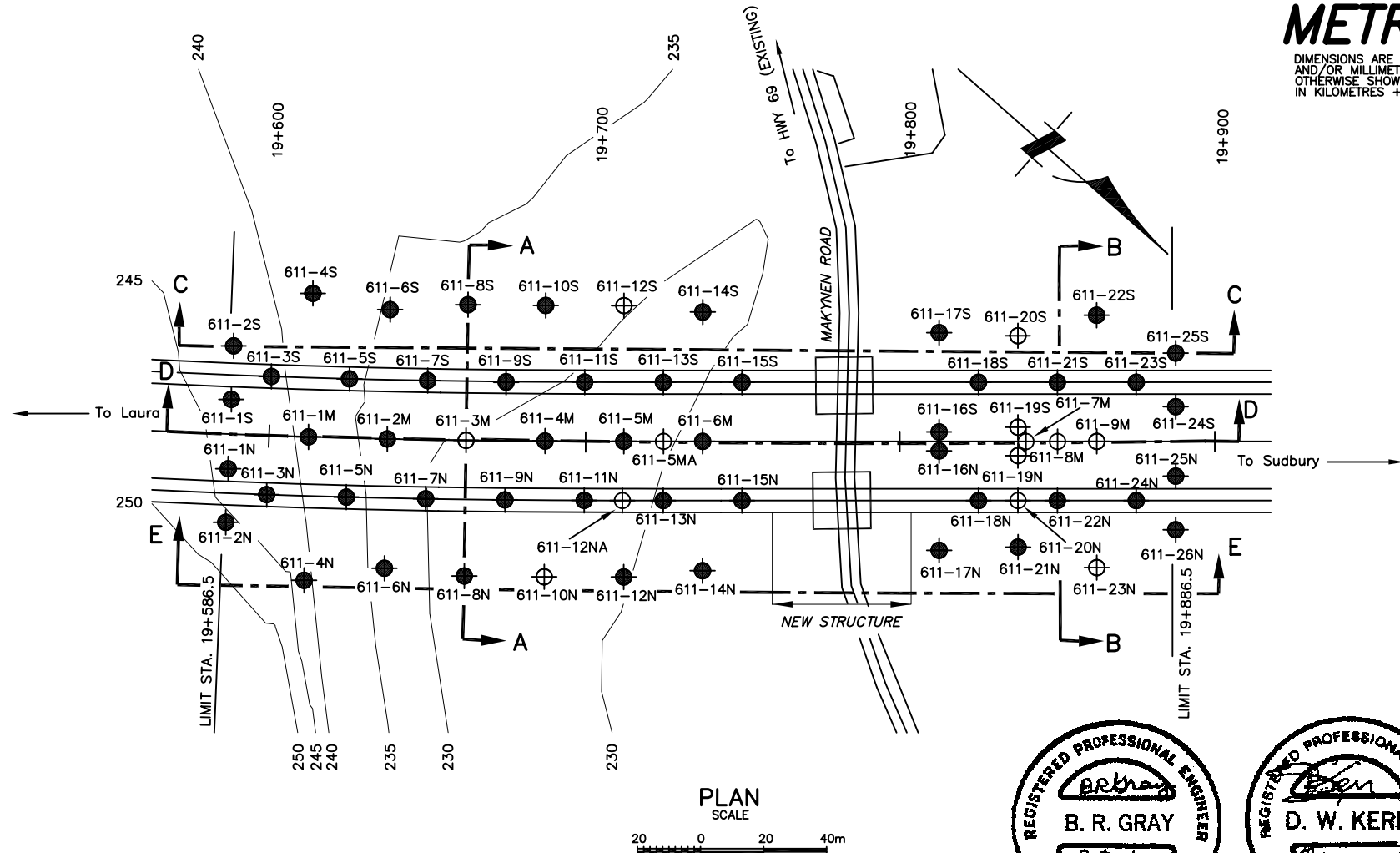
REVISIONS	DATE	BY	DESCRIPTION

Geocres No.				
HWY No	69	CHECKED	GD	DIST 54
SUBM'D	GD	CHECKED	GD	DATE OCT 29, 2004
DRAWN	MM	CHECKED	BRG	APPROVED DWK
DWG				610-3



REF No E-Hwy69-S-des.dwg; February 2004
1_bpl06.dwg; October, 2002

(Legend Continued)				(Legend Continued)			
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED	BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
611-9M	233.8	19+862.5	CL	611-1S	244.9	19+587.5	11m Lt
611-1N	247.8	19+587.5	11m Rt	611-2S	241.9	19+587.5	28m Lt
611-2N	247.3	19+587.5	28m Rt	611-3S	240.7	19+600	19m Lt
611-3N	242.0	19+600	19m Rt	611-4S	238.3	19+612.5	46m Lt
611-4N	243.1	19+612.5	46m Rt	611-5S	237.3	19+625	19m Lt
611-5N	235.9	19+625	19m Rt	611-6S	233.4	19+637.5	41m Lt
611-6N	234.9	19+637.5	41m Rt	611-7S	229.7	19+650	19m Lt
611-7N	230.0	19+650	19m Rt	611-8S	231.7	19+662.5	43m Lt
611-8N	226.6	19+662.5	43m Rt	611-9S	232.7	19+675	19m Lt
611-9N	226.8	19+675	19m Rt	611-10S	228.3	19+687.5	43m Lt
611-10N	226.5	19+687.5	43m Rt	611-11S	227.8	19+700	19m Lt
611-11N	229.2	19+700	19m Rt	611-12S	228.2	19+712.5	43m Lt
611-12N	231.9	19+712.5	43m Rt	611-13S	227.8	19+725	19m Lt
611-12NA	231.6	19+712.5	19m Rt	611-14S	228.2	19+737.5	41m Lt
611-13N	230.9	19+725	19m Rt	611-15S	229.6	19+750	19m Lt
611-14N	231.6	19+737.5	41m Rt	611-16S	233.8	19+812.5	3m Lt
611-15N	230.6	19+750	19m Rt	611-17S	232.3	19+812.5	35m Lt
611-16N	234.0	19+812.5	3m Rt	611-18S	234.1	19+825	19m Lt
611-17N	233.6	19+812.5	35m Rt	611-19S	234.1	19+837.5	5m Lt
611-18N	234.9	19+825	19m Rt	611-20S	231.5	18+837.5	34m Lt
611-19N	233.8	19+837.5	5m Rt	611-21S	231.8	19+850	19m Lt
611-20N	235.2	19+837.5	19m Rt	611-22S	233.8	19+862.5	40m Lt
611-21N	235.2	19+837.5	34m Rt	611-23S	235.8	19+875	19m Lt
611-22N	234.8	19+850	19m Rt	611-24S	237.0	19+887.5	11m Lt
611-23N	236.2	19+862.5	40m Rt	611-25S	236.7	19+887.5	28m Lt
611-24N	234.2	19+875	19m Rt				
611-25N	235.7	19+887.5	11m Rt				
611-26N	235.1	19+887.5	28m Rt				



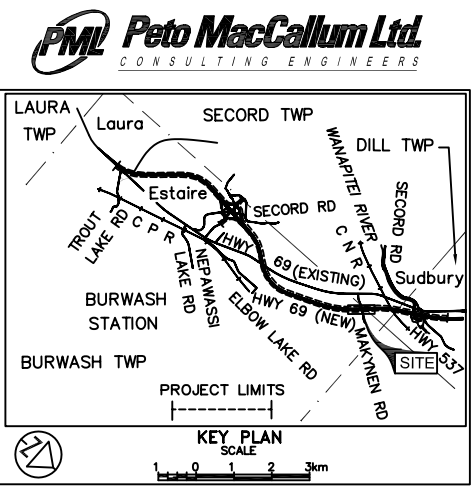
NOTE:
REFER TO DRAWINGS 611-2 TO 611-4 FOR SECTIONS C-C,
D-D AND E-E

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

CONT No
GWP No 312-99-00

HIGHWAY 69
FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 611, STA. 19+586.5 TO 19+886.5 BURWASH TWP
BOREHOLE LOCATIONS

SHEET



LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
	Blows/0.3m (Std. Pen Test, 475 J / blow)
	Blows/0.3m (60° Cone, 475 J / blow)
	W.L. at time of investigation Apr-Jun 2003
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA BURWASH TWP	o/s CL MED
611-1M	237.7	19+612.5	CL
611-2M	232.3	19+637.5	CL
611-3M	230.2	19+662.5	CL
611-4M	230.1	19+687.5	CL
611-5M	230.1	19+712.5	CL
611-5MA	230.0	19+725	CL
611-6M	230.5	19+737.5	CL
611-7M	233.8	19+840	CL
611-8M	232.7	19+850	CL

(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.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
		DATE	OCT 29, 2004
		SITE	
		DWG	611-1

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

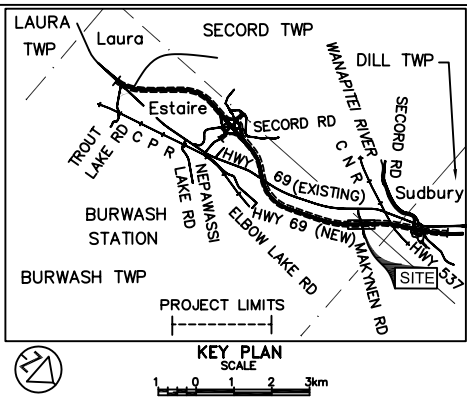
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 611, STA. 19+586.5 TO 19+886.5 BURWASH TWP
SOIL STRATA

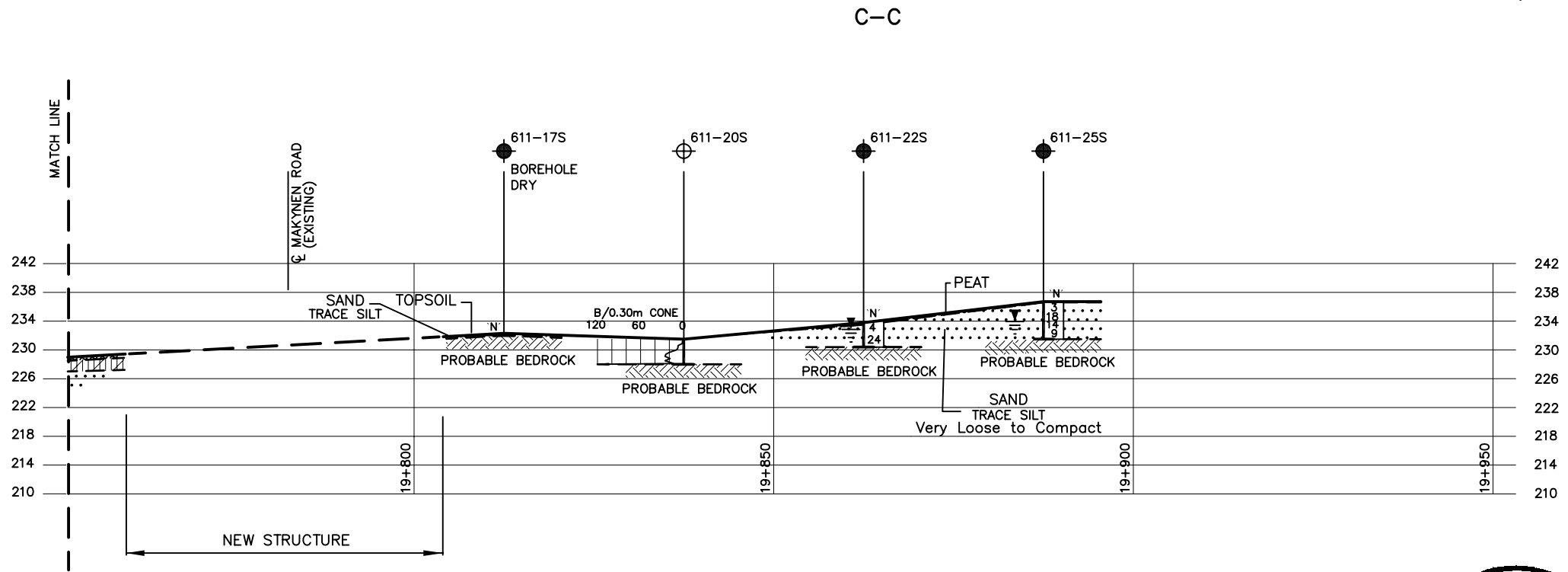
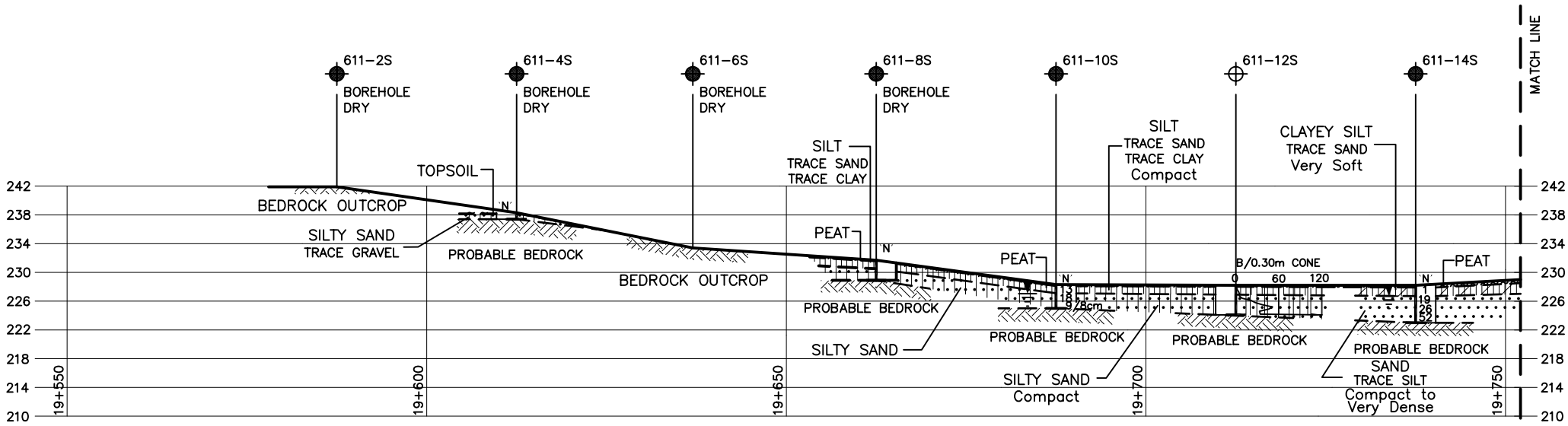
SHEET



LEGEND				
	Borehole			
	Dynamic Cone Penetration Test (Cone)			
	Borehole & Cone			
	Blows/0.3m (Std. Pen Test, 475 J / blow)			
	Blows/0.3m (60° Cone, 475 J / blow)			
	W.L. at time of investigation Apr-Jun 2003			
	Head			
	ARTESIAN WATER Encountered			
	PIEZOMETER			
BH No	ELEVATION	STA	BURWASH TWP	p/s CL MED
Refer to drawing 611-1 for co-ordinates				

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.								
HWY No	69						DIST	54
SUBM'D	PC	CHECKED	CN	DATE OCT 29, 2004			SITE	
DRAWN	MM	CHECKED	BRG	APPROVED	DWK		DWG	611-2



C-C (Continued)

SECTION
SCALE



NOTE:

REFER TO DRAWING 611-1 FOR PLAN AND SECTIONS A-A AND B-B; DRAWINGS 611-3 AND 611-4 FOR SECTIONS D-D AND E-E.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002

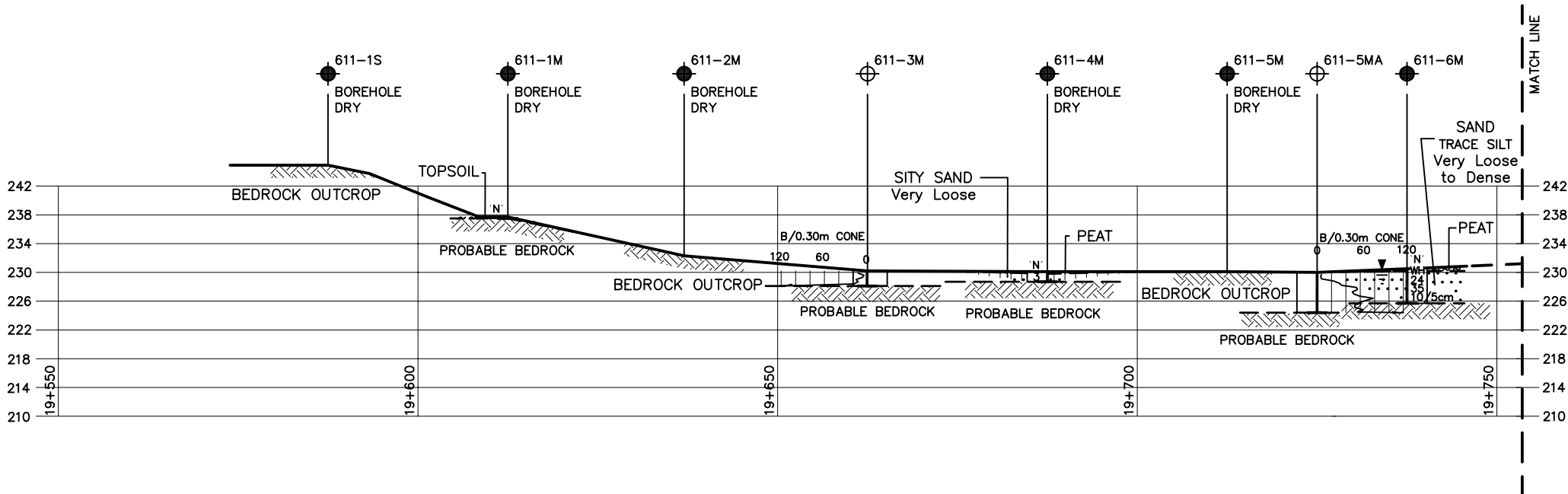
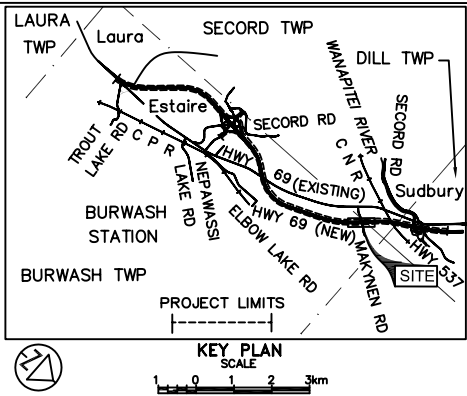
METRIC

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

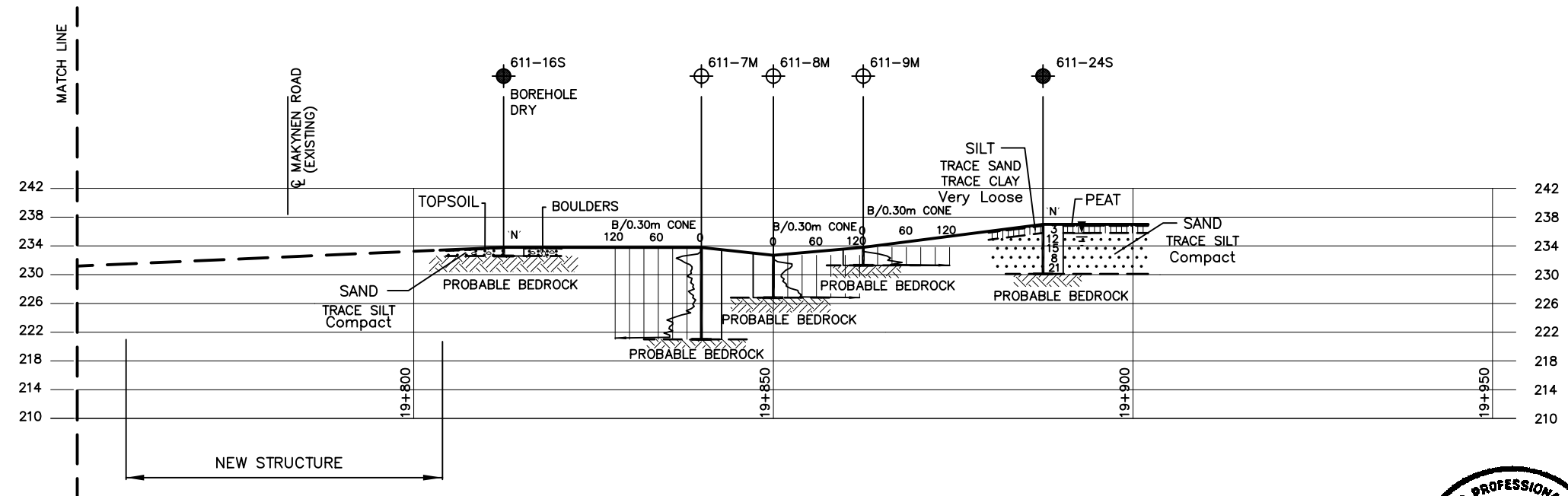
CONT No
GWP No 312-99-00

HIGHWAY 69
FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 611, STA. 19+586.5 TO 19+886.5 BURWASH TWP
SOIL STRATA

SHEET



D-D












D-D (Continued)

SECTION
SCALE



NOTE:

REFER TO DRAWINGS 611-1 AND 611-2 FOR PLAN AND
SECTIONS A-A TO C-C; DRAWING 611-4 FOR SECTION E-E.

LEGEND				
	Borehole			
	Dynamic Cone Penetration Test (Cone)			
	Borehole & Cone			
	'N' Blows/0.3m (Std. Pen Test, 475 J / blow)			
	CONE Blows/0.3m (60° Cone, 475 J / blow)			
	W L at time of investigation Apr-Jun 2003			
	Head			
	ARTESIAN WATER Encountered			
	PIEZOMETER			
BH No	ELEVATION	STA BURWASH TWP	o/s CL MED	
Refer to drawing 611-1 for co-ordinates				

NOTE

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002

REVISIONS				
DATE	BY	DESCRIPTION		
Geocres No.				
HWY No	69			DIST 54
SUBM'D	PC	CHECKED	CN	DATE OCT 29, 2004
DRAWN	MM	CHECKED	BRG	APPROVED
			DWK	DWG 611-3











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

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 611, STA. 19+586.5 TO 19+866.5 BURWASH TWP
SOIL STRATA



Peto MacCallum Ltd.
CONSULTING ENGINEERS



	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
	Blows/0.3m (Std. Pen Test, 475 J / blow)
	Blows/0.3m (60° Cone, 475 J / blow)
	W L at time of investigation Apr–Jun 2003
	Head
	ARTESIAN WATER
	Encountered
	PIEZOMETER

Refer to drawing 611-1 for co-ordinates

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

Geocres No.

HWY No 69				DIST 54	
SUBM'D	PC	CHECKED CN	DATE OCT 29, 2004		SITE
DRAWN	MM	CHECKED BRG	APPROVED DWK	DWG 611-4	



SECTION
SCALE



REFER TO DRAWINGS 611-1 TO 611-3 FOR PLAN AND SECTIONS A-A TO D-D.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

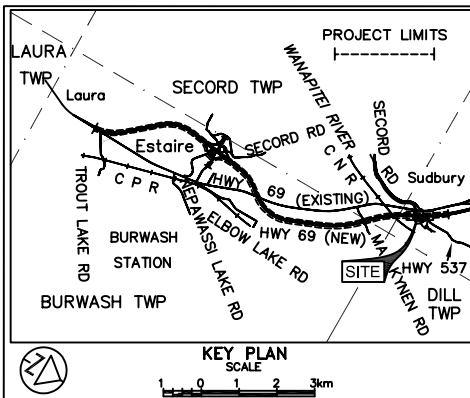
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 613, STA. 10+178 TO 10+838 DILL TWP
SOIL STRATA

SHEET



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
W L	W L at time of investigation Apr-Jun 2003 and Feb-Apr 2004		
Head	Head		
ARTESIAN WATER	ARTESIAN WATER		
Encountered	Encountered		
PIEZOMETER	PIEZOMETER		

BH No	ELEVATION	STA DILL TWP	o/s CL MED
Refer to drawing 613-1 for co-ordinates			

(Legend Continues)

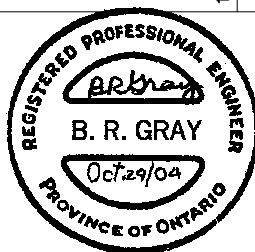
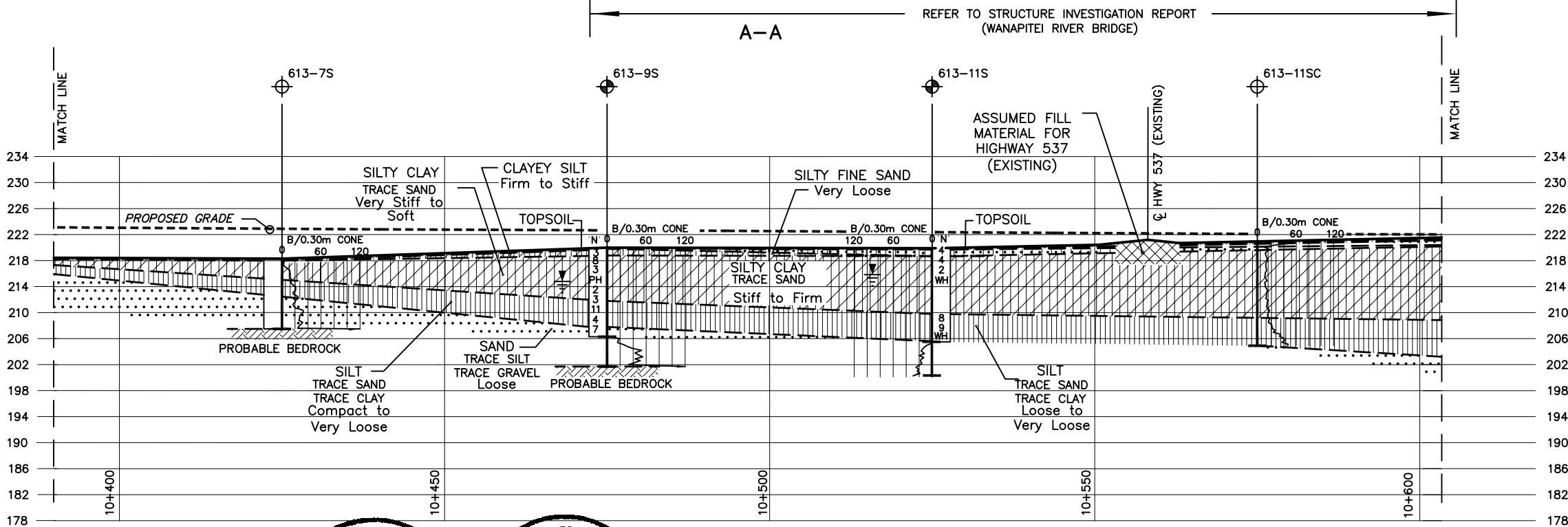
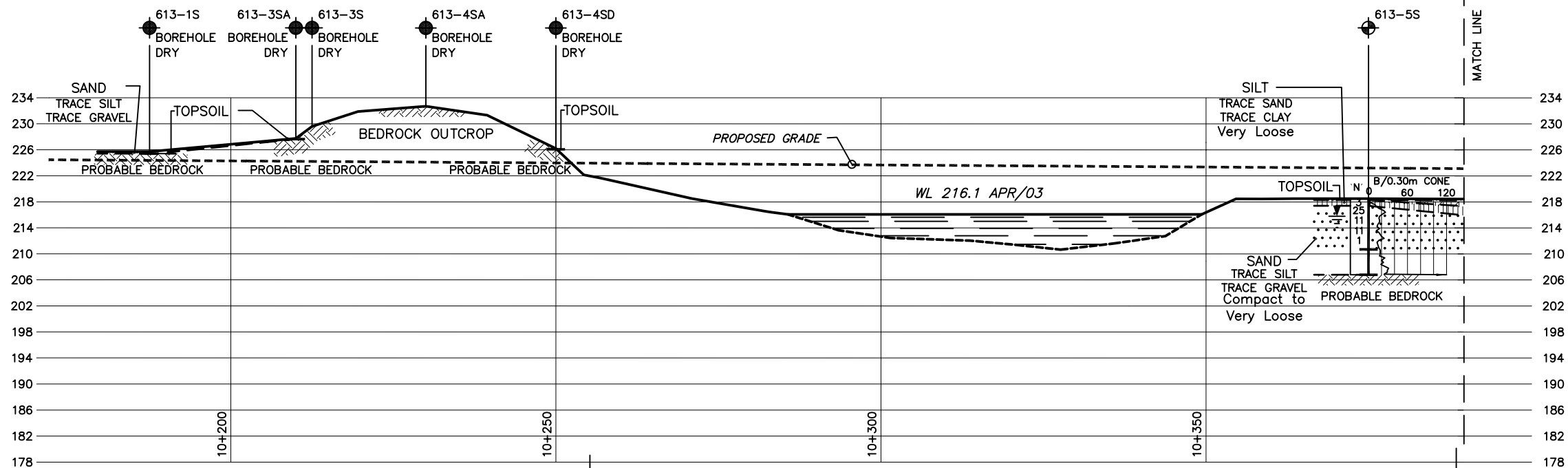
— NOTE —

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	613-2



A-A (Continued)

SECTION

SCALE

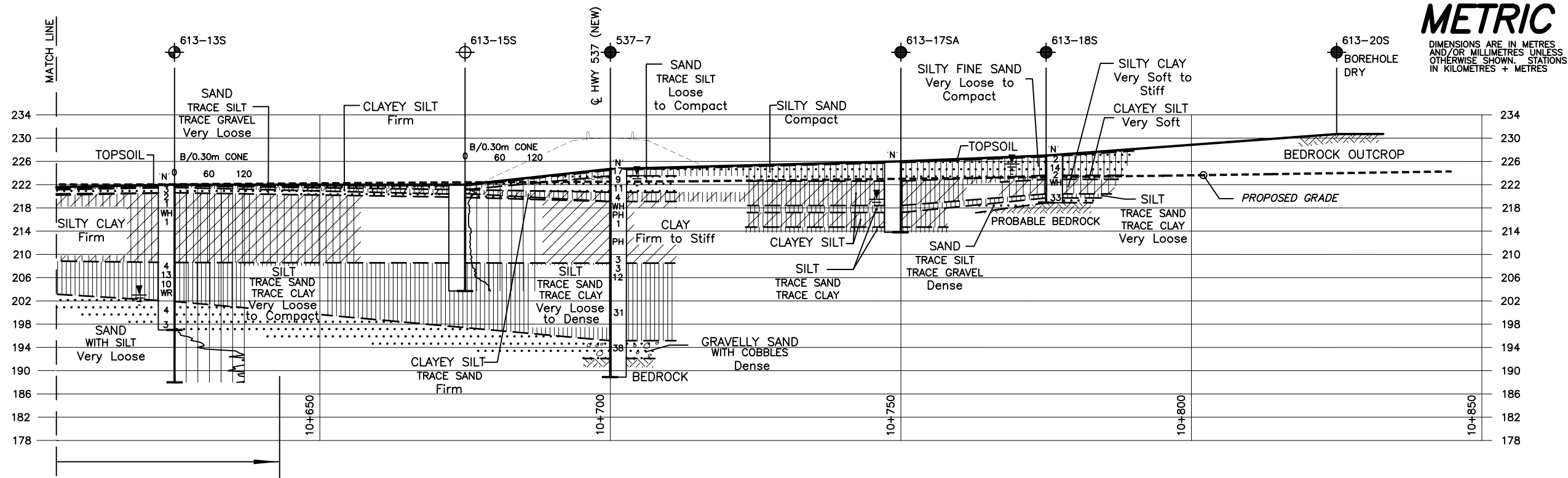


REFER TO STRUCTURE INVESTIGATION REPORT
(EXISTING HIGHWAY 537 OVERPASS)

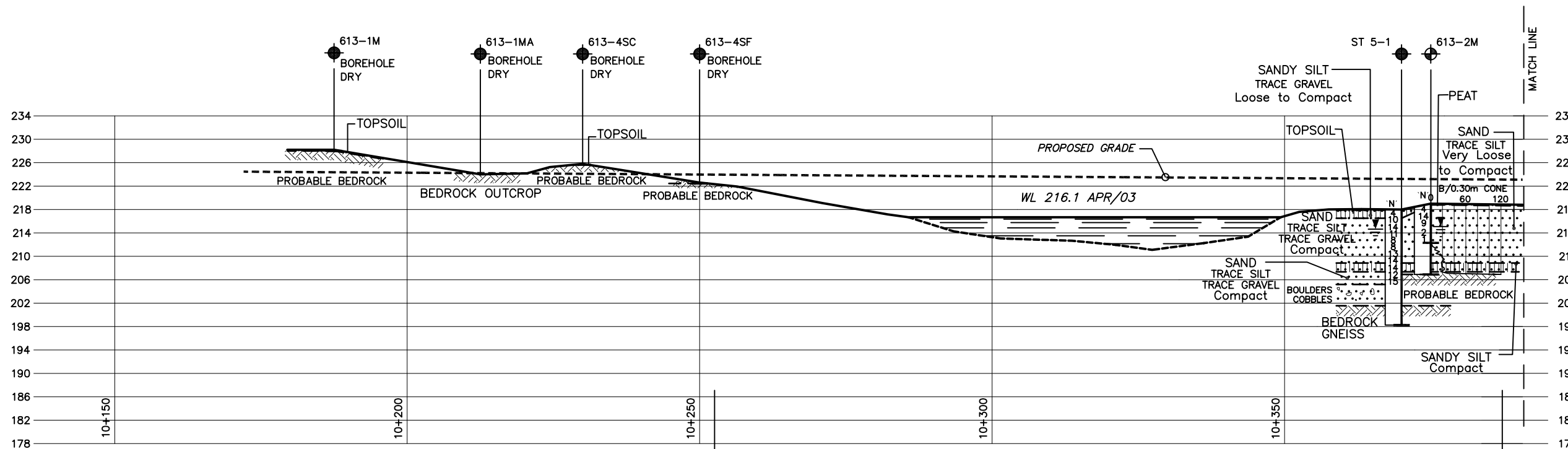
NOTE:

REFER TO DRAWING 613-1 FOR PLAN AND TO DRAWINGS 613-3 TO 613-7 FOR SECTIONS A-A (CONTINUED), B-B, C-C, D-D, E-E AND F-F.

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002



A-A (Continued)



B-B
SECTIONS
SCALE



NOTE:

REFER TO DRAWINGS 613-1 AND 613-2 FOR PLAN AND PART OF SECTION A-A, DRAWINGS 613-4 TO 613-7 FOR SECTIONS B-B (CONTINUED), C-C, D-D, E-E AND F-F.

REFER TO STRUCTURE INVESTIGATION REPORT
(WANAPITEI RIVER BRIDGE)

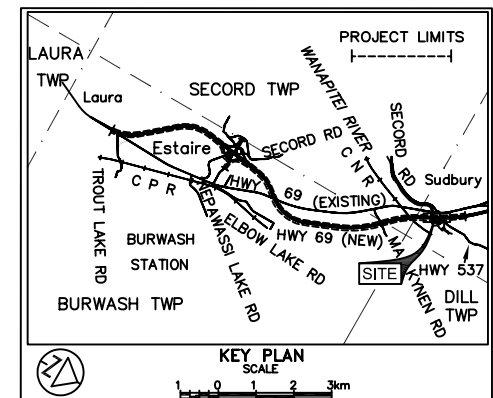
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 613, STA. 10+178 TO 10+838 DILL TWP
SOIL STRATA

SHEET



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
	N	Blows/0.3m (Std. Pen Test, 475 J / blow)	
	CONE	Blows/0.3m (60° Cone, 475 J / blow)	
	W.L.	W.L. at time of investigation Apr-Jun 2003 and Feb-Apr 2004	
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA DILL TWP	o/s CL MED
Refer to drawing 613-1 for co-ordinates			

(Legend Continues)

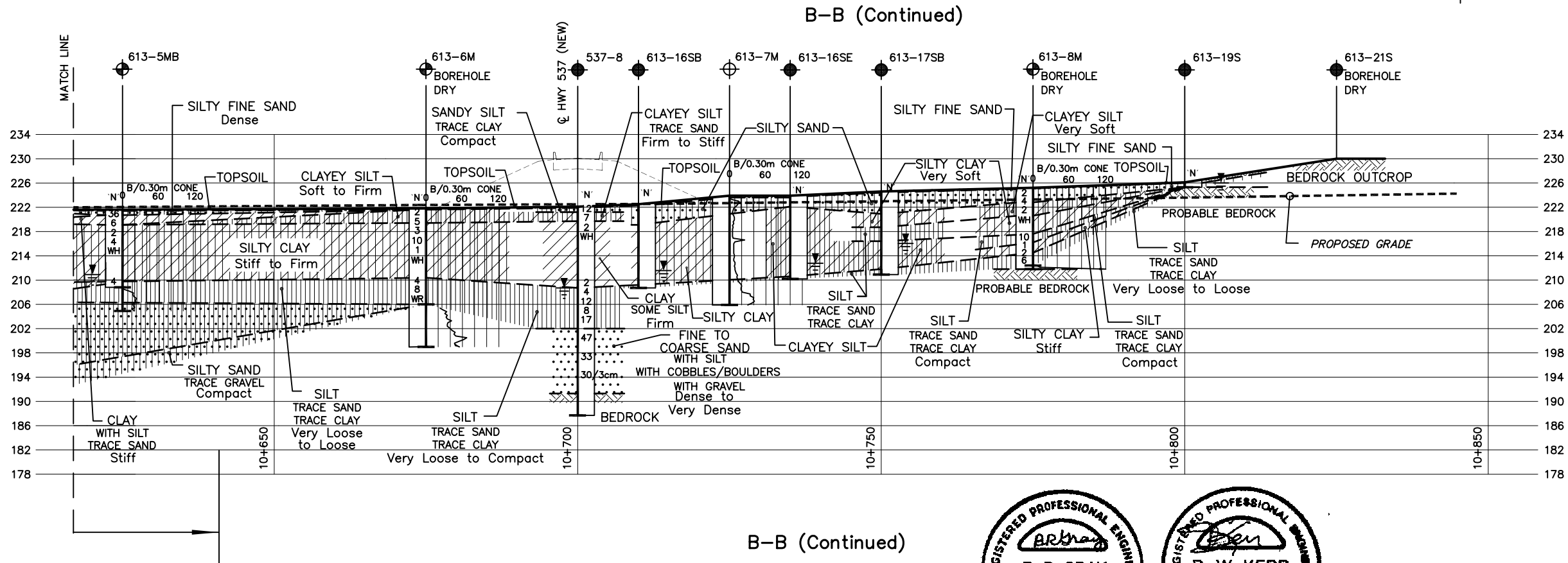
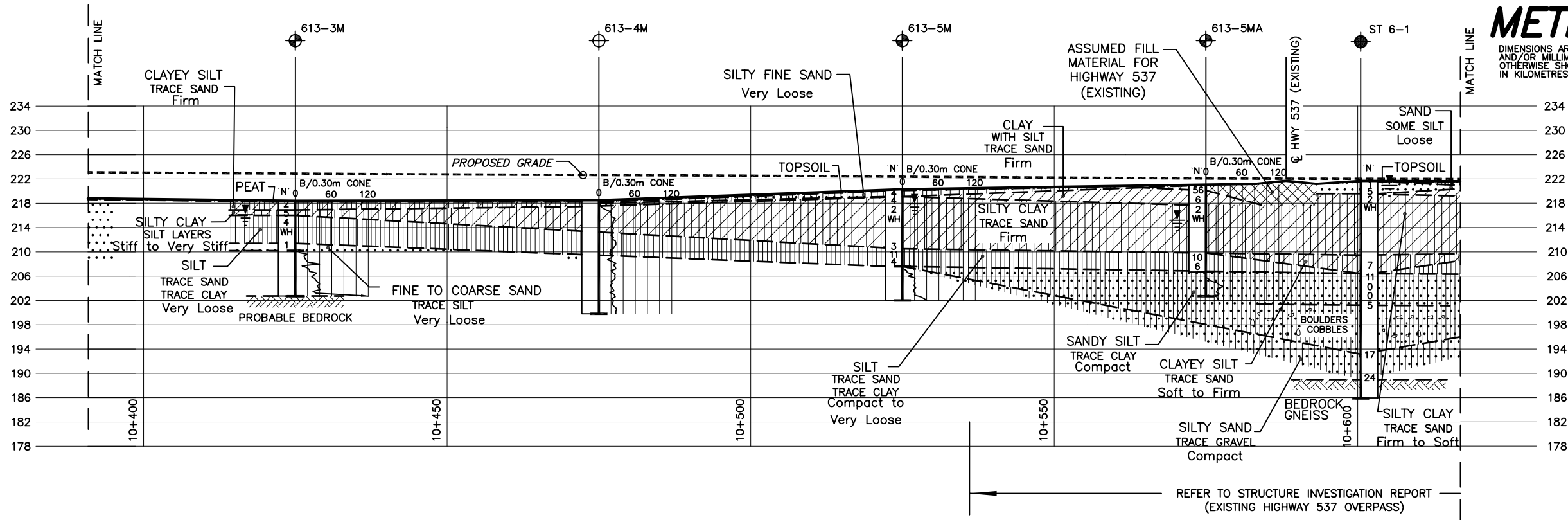
NOTE
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	613-3

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002



NOTE:
REFER TO DRAWINGS 613-1 TO 613-3 FOR PLAN, SECTION A-A AND PART OF SECTION B-B, TO DRAWINGS 613-5 TO 613-7 FOR SECTIONS C-C, D-D AND E-E.

B-B (Continued)

SECTION
SCALE



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002

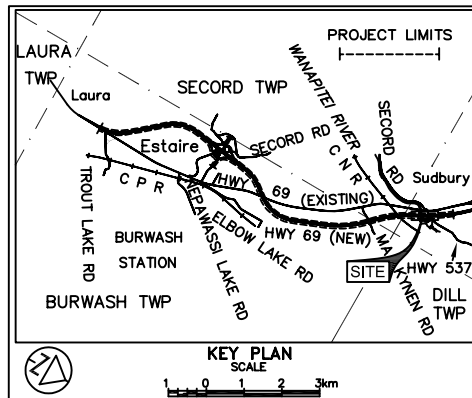
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 613, STA. 10+178 TO 10+838 DILL TWP
SOIL STRATA

SHEET



LEGEND	
	Borehole
	Dynamic Cone Penetration Test (Cone)
	Borehole & Cone
N	Blows/0.3m (Std. Pen Test, 475 J / blow)
CONE	Blows/0.3m (60° Cone, 475 J / blow)
	W.L. at time of investigation Apr-Jun 2003 and Feb-Apr 2004
	Head
	ARTESIAN WATER Encountered
	PIEZOMETER

BH No	ELEVATION	STA DILL TWP	o/s CL MED
Refer to drawing 613-1 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.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	613-4

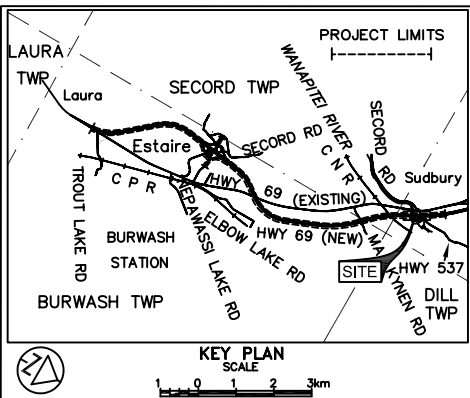
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 613, STA. 10+178 TO 10+838 DILL TWP
SOIL STRATA

SHEET



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Apr-Jun 2003 and Feb-Apr 2004		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA DILL TWP	o/s CL MED
Refer to drawing 613-1 for co-ordinates			

(Legend Continues)

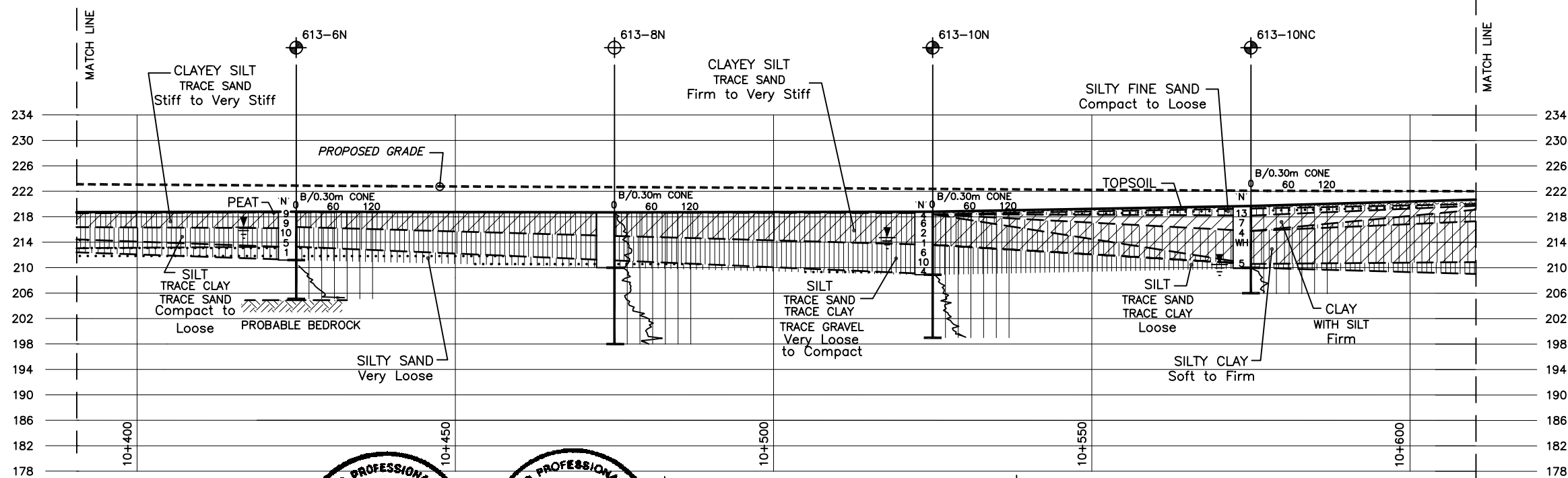
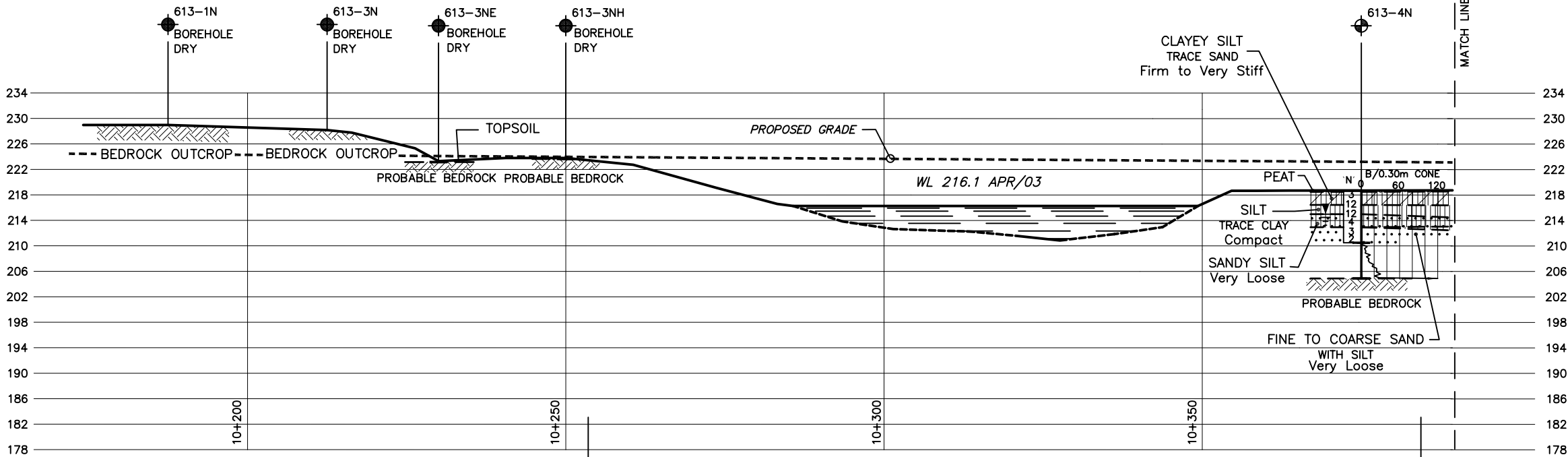
NOTE -

The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	BRG
APPROVED	DWK	DWG	613-5



C-C (Continued)

SECTION

SCALE



REFER TO STRUCTURE INVESTIGATION REPORT
(EXISTING HIGHWAY 537 OVERPASS)

NOTE:

REFER TO DRAWINGS 613-1 TO 613-4 FOR PLAN AND SECTIONS A-A AND B-B, TO DRAWINGS 613-6 AND 613-7 FOR SECTIONS C-C (CONTINUED), D-D, E-E AND F-F.

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002

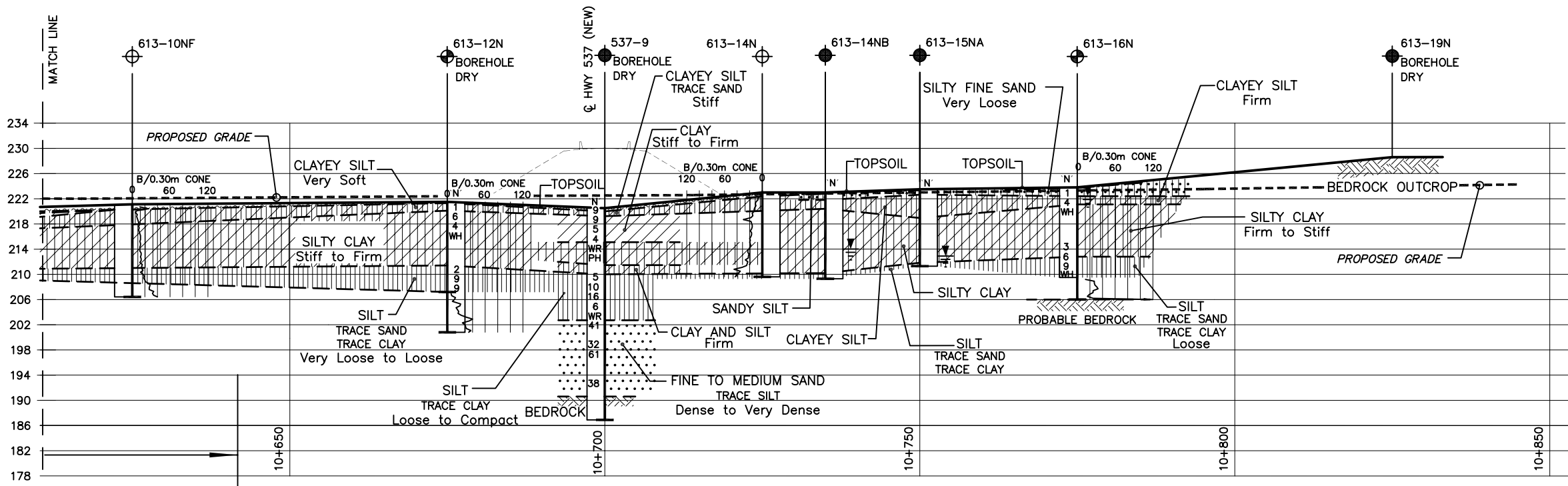
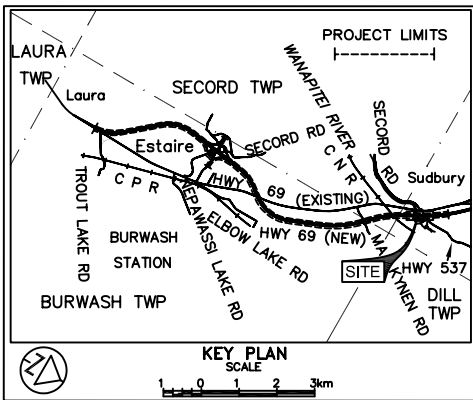
METRIC

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

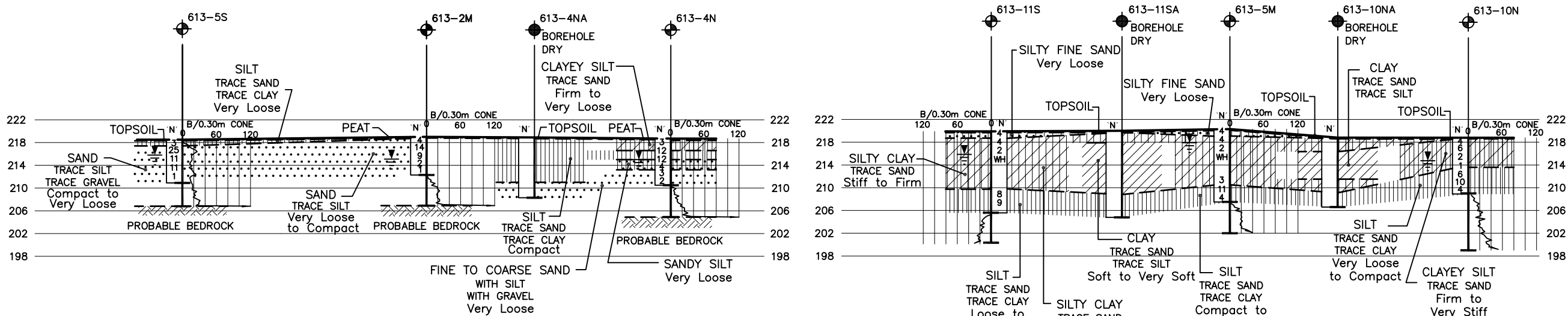
CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 613, STA. 10+178 TO 10+838 DILL TWP
SOIL STRATA

SHEET

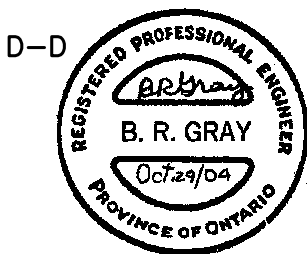


C-C (Continued)



D-D

E-E



SECTIONS
SCALE



NOTE:

REFER TO DRAWINGS 613-1 TO 613-5 FOR PLAN AND
SECTIONS A-A, B-B AND PART OF SECTION C-C,
DRAWING 613-7 FOR SECTION F-F.

LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Apr-Jun 2003 and Feb-Apr 2004
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

BH No ELEVATION STA DILL TWP o/s CL MED

Refer to drawing 613-1 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.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
DWG	613-6		

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002

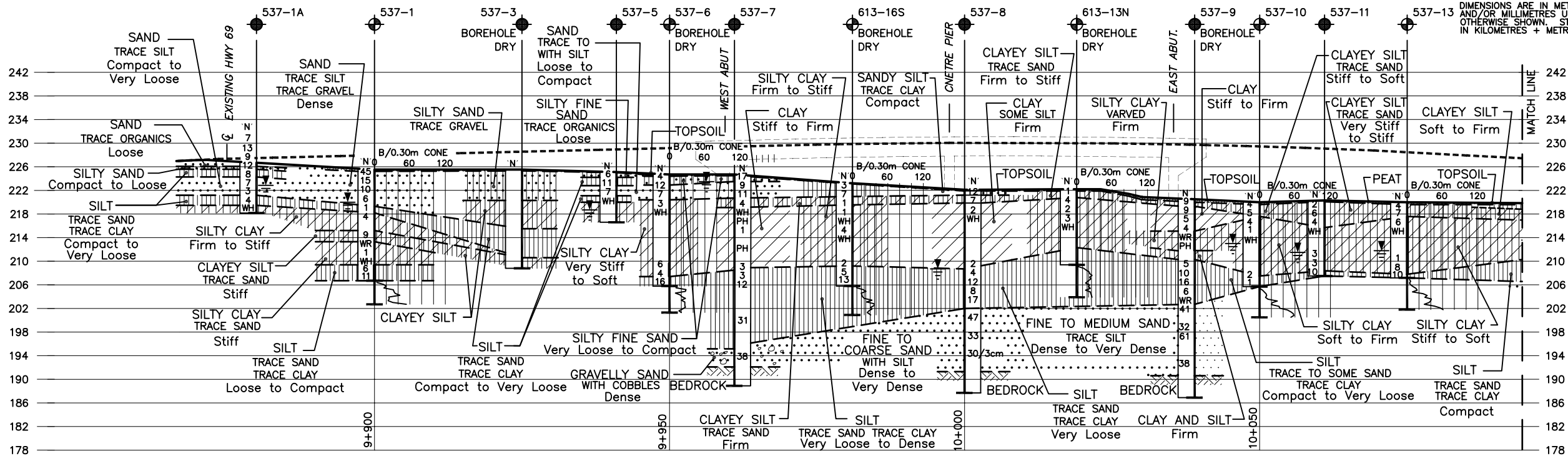
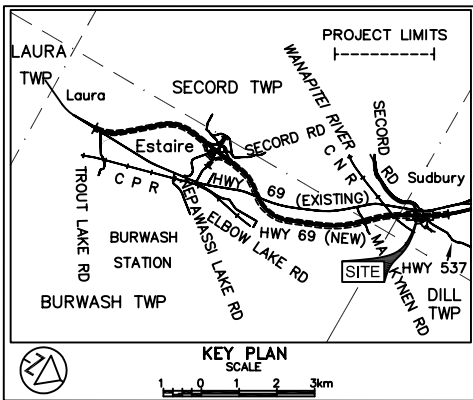
METRIC

CONT No
GWP No 312-99-00

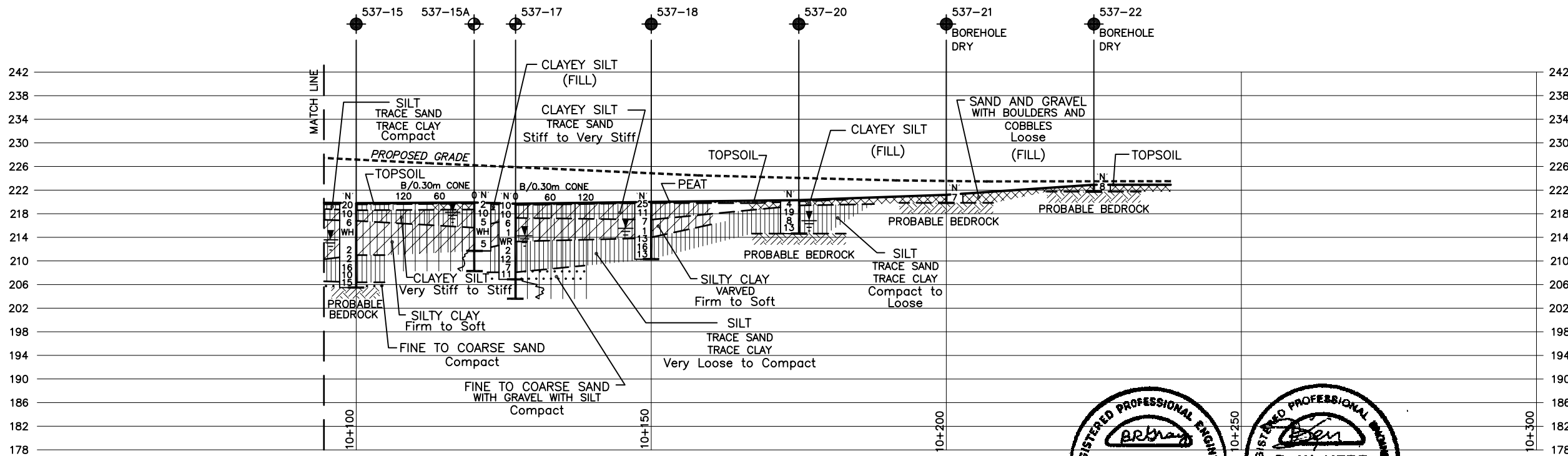
SHEET

HIGHWAY 69
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 613, STA. 10+178 TO 10+838 DILL TWP
SOIL STRATA

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



F-F



F-F (Continued)

SECTIONS
SCALE



NOTE:

REFER TO DRAWINGS 613-1 TO 613-6 FOR PLAN AND SECTIONS A-A, B-B, C-C, D-D AND E-E.

LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W.L. at time of investigation Apr-Jun 2003 and Feb-Apr 2004		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA DILL TWP	o/s CL MED
Refer to drawing 613-1 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.

REVISIONS	DATE	BY	DESCRIPTION

Geocres No.

HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
DWG	613-7		

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002



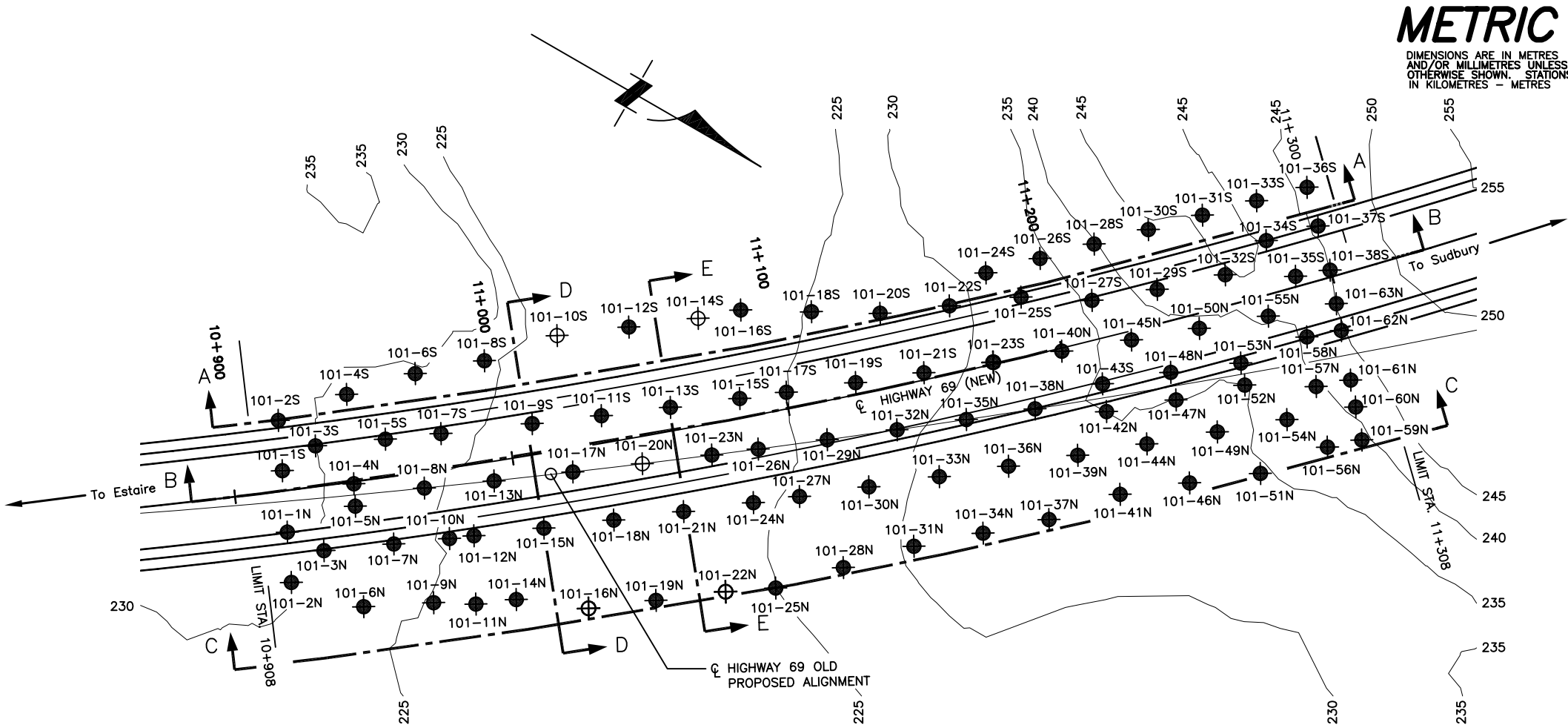
(Legend Continues)			
BH No	ELEVATION	STA DILL TWP	o/s CL Med
101-11N	221.5	10+979.5	49.5m Rt
101-12N	221.6	10+982	25m Rt
101-13N	222.6	10+992	7m Rt
101-14N	221.2	10+993.5	50m Rt
101-15N	221.0	11+007	26.5m Rt
101-16N	220.7	11+019	57m Rt
101-17N	220.8	11+020.5	8.5m Rt
101-18N	220.8	11+032	28m Rt
101-19N	221.0	11+041.5	58.5m Rt
101-20N	220.8	11+045.5	9.5m Rt
101-21N	220.7	11+057	29m Rt
101-22N	221.1	11+066	60m Rt
101-23N	220.7	11+070	11m Rt
101-24N	221.4	11+081	30.5m Rt
101-25N	225.2	11+083.5	62m Rt
101-26N	222.5	11+087	12m Rt
101-27N	227.8	11+097.5	31.5m Rt
101-28N	228.6	11+108.5	59.5m Rt
101-29N	228.6	11+111.5	13.5m Rt
101-30N	230.7	11+122	33m Rt
101-31N	232.4	11+133.5	57m Rt
101-32N	229.7	11+136.5	15.5m Rt
101-33N	231.1	11+147.5	35m Rt
101-34N	235.2	11+158	58m Rt
101-35N	231.0	11+161	17m Rt
101-36N	231.8	11+172	37m Rt
101-37N	234.3	11+181.5	58.5m Rt
101-38N	233.8	11+185.5	19m Rt
101-39N	235.0	11+196.5	38.5m Rt
101-40N	234.6	11+200	1m Rt
101-41N	232.6	11+208	56m Rt
101-42N	235.9	11+210	26m Rt
101-43N	235.5	11+211	16m Rt
101-44N	234.5	11+221	40.5m Rt
101-45N	234.5	11+225	3m Rt
101-46N	233.1	11+232	58m Rt
101-47N	235.4	11+235	28m Rt
101-48N	235.7	11+235.5	18m Rt
101-49N	235.9	11+246	42.5m Rt
101-50N	238.8	11+249.5	5m Rt
101-51N	234.0	11+257	61m Rt
101-52N	234.9	11+259.5	29m Rt
101-53N	235.4	11+260	20m Rt
101-54N	236.8	11+271	45m Rt
101-55N	238.9	11+274	7.5m Rt
101-56N	240.1	11+282	58m Rt
101-57N	240.6	11+283.5	36m Rt
101-58N	241.5	11+285	18m Rt
101-59N	238.8	11+294	59m Rt
101-60N	239.7	11+295	47m Rt
101-61N	241.8	11+296	37m Rt
101-62N	245.4	11+298	19.5m Rt
101-63N	246.0	11+299	9.5m Rt

NOTE:

REFER TO DRAWINGS 101-2 TO 101-5 FOR SECTIONS A-A, B-B, C-C, D-D AND E-E.

(Legend Continues)			
BH No	ELEVATION	STA DILL TWP	o/s CL Med
101-1S	233.2	10+918	7m Lt
101-2S	233.0	10+919	25m Lt
101-3S	228.9	10+931	14.5m Lt
101-4S	229.5	10+943	31m Lt
101-5S	227.2	10+956	13.5m Lt
101-6S	229.5	10+970	35m Lt
101-7S	226.0	10+976	13m Lt
101-8S	226.8	10+995.5	36m Lt
101-9S	220.8	11+010	11m Lt
101-10S	220.7	11+023	40.5m Lt
101-11S	220.7	11+034	10m Lt
101-12S	220.8	11+049	39.5m Lt
101-13S	220.8	11+058.5	8.5m Lt
101-14S	220.8	11+074.5	39m Lt
101-15S	221.2	11+083.5	6.5m Lt
101-16S	221.4	11+090	38.5m Lt
101-17S	224.4	11+100	5.5m Lt
101-18S	226.0	11+115	32.5m Lt
101-19S	228.2	11+125.5	4.5m Lt
101-20S	229.7	11+139	26.5m Lt
101-21S	230.3	11+150	2.5m Lt

(Legend Continues)			
BH No	ELEVATION	STA DILL TWP	o/s CL Med
101-22S	233.1	11+164.5	23.5m Lt
101-23S	232.3	11+175	1m Lt
101-24S	231.1	11+180	33m Lt
101-25S	232.7	11+190	21m Lt
101-26S	232.4	11+200	33m Lt
101-27S	232.7	11+214.5	14m Lt
101-28S	238.4	11+220	33m Lt
101-29S	239.2	11+238.5	12m Lt
101-30S	243.0	11+240	33m Lt
101-31S	246.2	11+260	33m Lt
101-32S	243.7	11+263	11m Lt
101-33S	244.0	11+280	33m Lt
101-34S	243.5	11+280	19m Lt
101-35S	243.1	11+287.5	4m Lt
101-36S	245.6	11+300	33m Lt
101-37S	246.1	11+300	19m Lt
101-38S	247.0	11+300	2.5m Lt



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

CONT No
GWP No 327-91-00

HIGHWAY 69

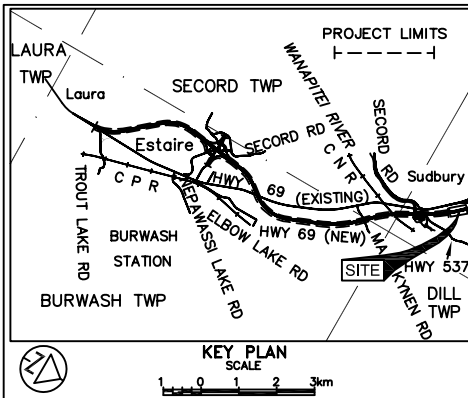
From 0.3km North of HWY 537, northerly 8.8 km
SWAMP 101, STA 10+908 TO 11+308 DILL TWP

BOREHOLE LOCATIONS



SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Feb-May 2000		
	Apr 2004		
	Head		
	ARTESIAN WATER		
	Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA DILL TWP	o/s CL Med
101-1N	231.7	10+917	15m Rt
101-2N	231.4	10+916	33m Rt
101-3N	229.7	10+929	23m Rt
101-4N	226.4	10+943	1m Rt
101-5N	227.4	10+942	9m Rt
101-6N	226.5	10+940	45m Rt
101-7N	226.6	10+954	24m Rt
101-8N	225.5	10+967.5	6m Rt
101-9N	224.0	10+965	47m Rt
101-10N	222.8	10+973.5	25m Rt

(Legend Continued)

- 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.

HWY No	69	DIST	54
SUBW'D	GD	CHECKED	GD
DRAWN	MM/NA	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
SITE		DWG	101-1



REF No E-Main69-5.dwg; 1_bpl06.dwg; October, 2002
Hwy69-S-des; February 2004

METRIC

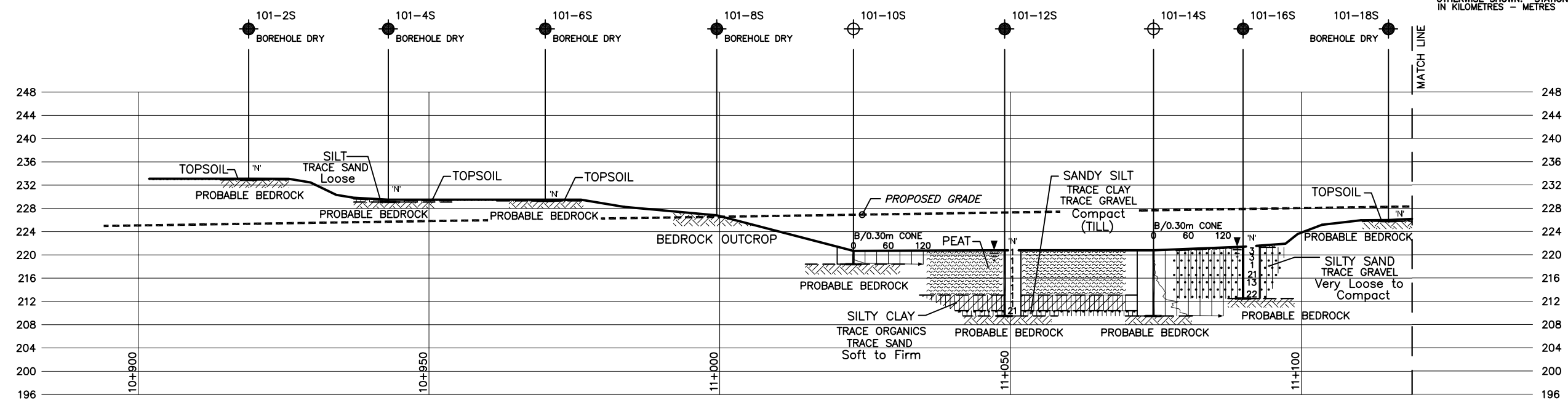
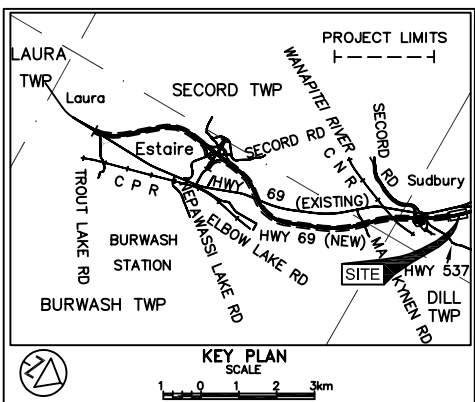
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AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES - METRES

CONT No
GWP No 327-91-00

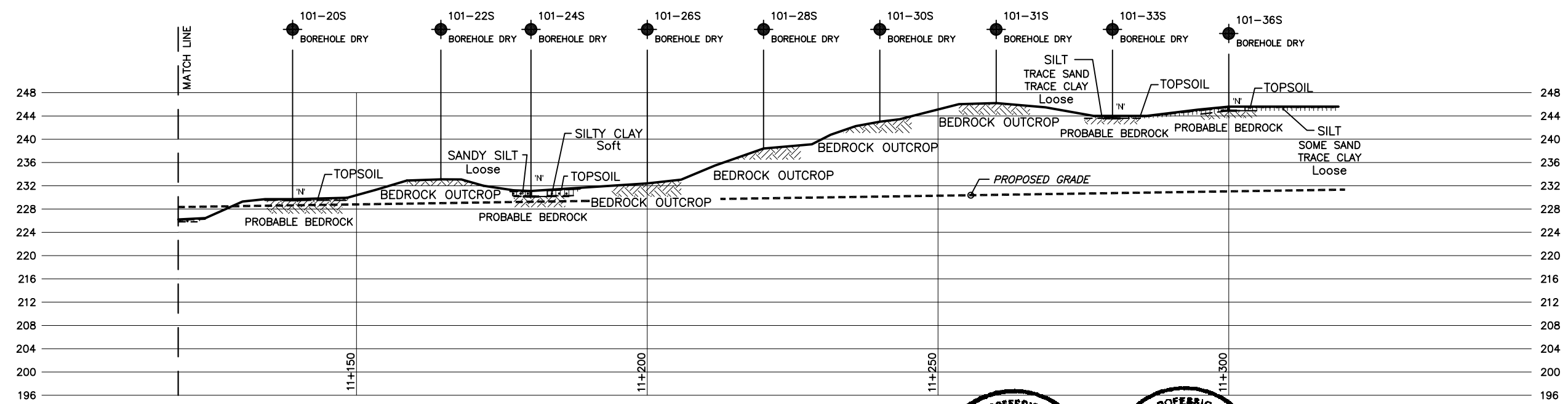
HIGHWAY 69
From 0.3km North of HWY 537, northerly 8.8 km
SWAMP 101, STA 10+808 TO 11+308 DILL TWP
SOIL STRATA

SHEET

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CONSULTING ENGINEERS

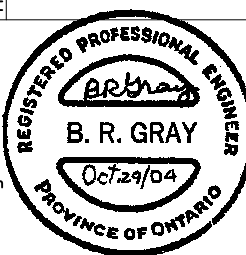


A-A



A-A (Continued)

SECTIONS
SCALE



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Feb-May 2000 Apr 2004
- Head
- ARTESIAN WATER
- Encountered
- PIEZOMETER

BH No	ELEVATION	STA DILL TWP	o/s CL Med
(Refer to drawing 101-1 for co-ordinates)			

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.			
HWY No	69	DIST	54
SUBM'D	GD	CHECKED	GD
DRAWN	MM/NA	CHECKED	BRG
DATE	OCT 29, 2004	APPROVED	DWK
SITE		DWG	101-2

NOTE:

REFER TO DRAWING 101-1 FOR PLAN; DRAWINGS 101-3 TO 101-5 FOR SECTIONS B-B, C-C, D-D AND E-E.

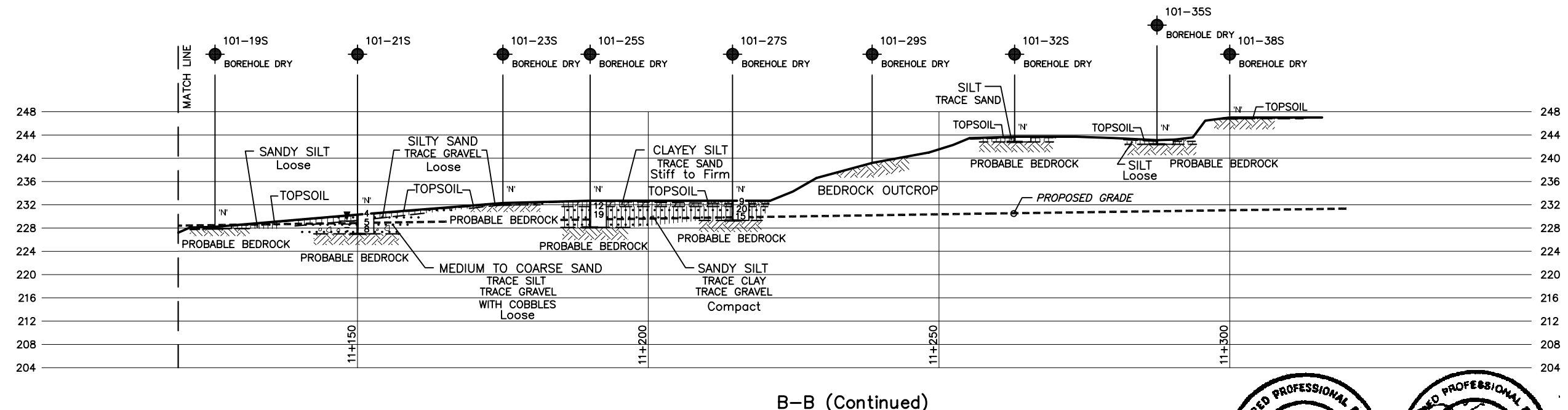
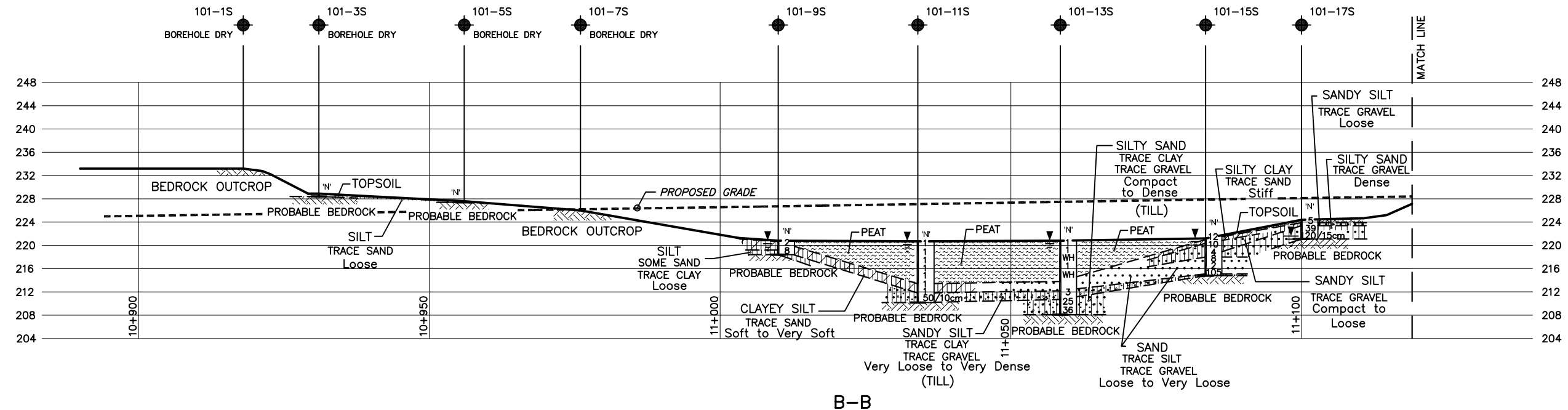
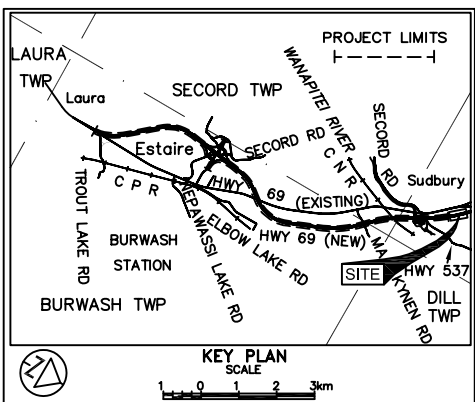
REF No E-Main69-5.dwg; 1_bpl06.dwg; October, 2002
Hwy69-S-des; February 2004

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

CONT No
GWP No 327-91-00

HIGHWAY 69
From 0.3km North of HWY 537, northerly 8.8 km
SWAMP 101, STA 10+908 TO 11+308 DILL TWP
SOIL STRATA

SHEET



- LEGEND
- Borehole
 - Dynamic Cone Penetration Test (Cone)
 - Borehole & Cone
 - N Blows/0.3m (Std. Pen Test, 475 J / blow)
 - CONE Blows/0.3m (60° Cone, 475 J / blow)
 - W L at time of investigation Feb-May 2000 Apr 2004
 - Head
 - ARTESIAN WATER
 - Encountered
 - PIEZOMETER

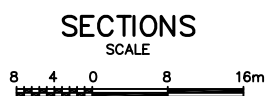
BH No	ELEVATION	STA DILL TWP	o/s CL Med
(Refer to drawing 101-1 for co-ordinates)			

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.			
HWY No	69	DIST	54
SUBM'D	GD	CHECKED	GD
DATE	OCT 29, 2004	SITE	
DRAWN	MM/NA	CHECKED	BRG
APPROVED	DWK	DWG	101-3

NOTE:
REFER TO DRAWING 101-1 FOR PLAN; DRAWING 101-2 FOR SECTION A-A; DRAWINGS 101-4 AND 101-5 FOR SECTIONS C-C, D-D AND E-E.



REF No E-Main69-5.dwg; 1_bpl06.dwg; October, 2002
Hwy69-S-des; February 2004

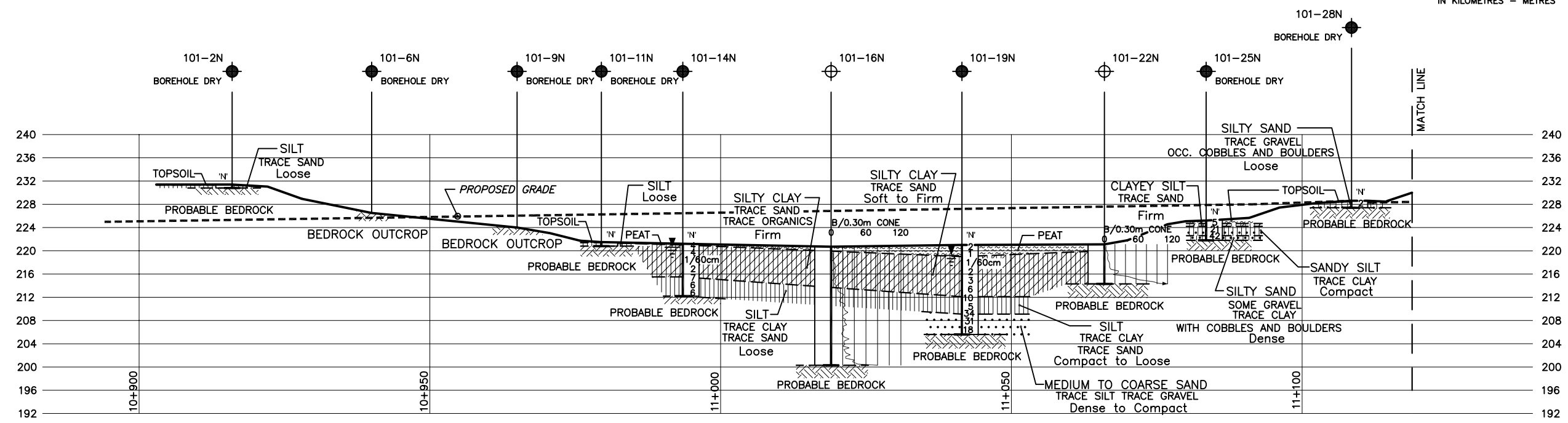
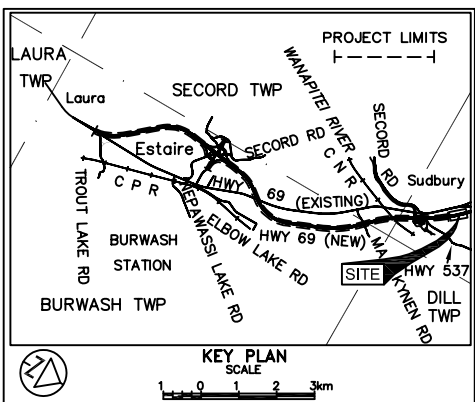
METRIC
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES - METRES

CONT No
GWP No 327-91-00

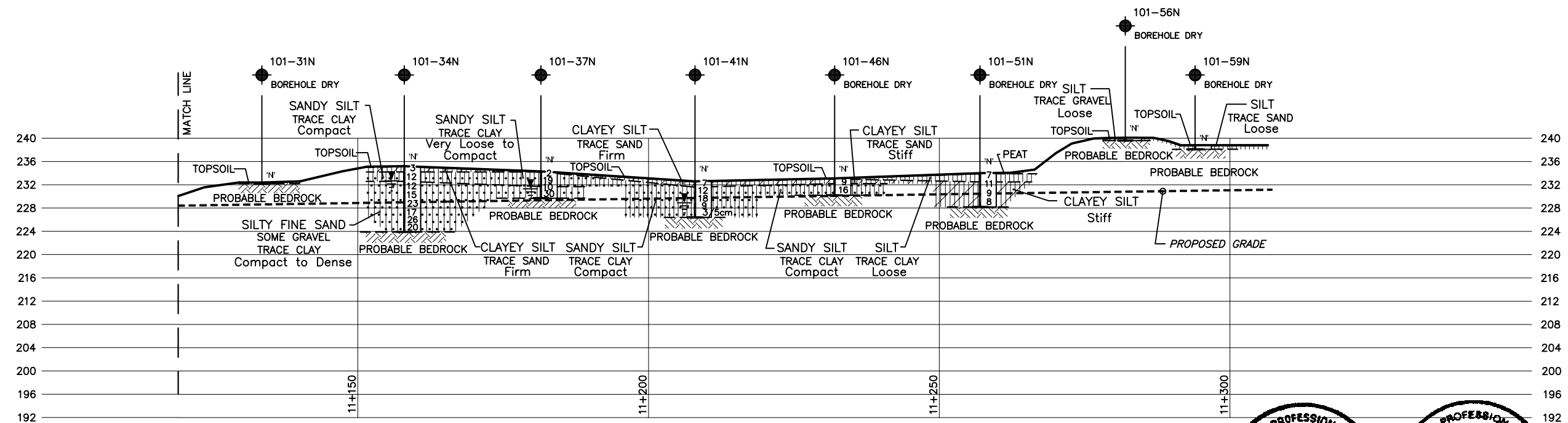
HIGHWAY 69
From 0.3km North of HWY 537, northerly 8.8 km
SWAMP 101, STA 10+908 TO 11+308 DILL TWP
SOIL STRATA

SHEET

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C-C



C-C (Continued)

SECTIONS
SCALE



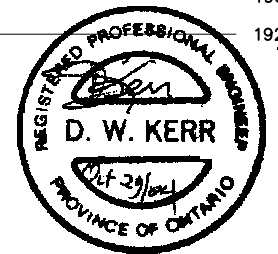
NOTE:
REFER TO DRAWINGS 101-1 TO 101-3 FOR PLAN, SECTIONS A-A
AND B-B; DRAWING 101-5 FOR SECTIONS D-D AND E-E.

LEGEND

- Borehole
- ⊕ Dynamic Cone Penetration Test (Cone)
- ⊕ Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Feb-May 2000
Apr 2004
- Head
- ARTESIAN WATER
Encountered
- PIEZOMETER

BH No	ELEVATION	STA DILL TWP	o/s CL Med
(Refer to drawing 101-1 for co-ordinates)			

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



REF No E-Main69-5.dwg; 1_bpl06.dwg; October, 2002
Hwy69-S-des; February 2004

DATE	BY	DESCRIPTION

Geocres No.	
HWY No	69
SUBM'D	GD
CHECKED	GD
DATE	OCT 29, 2004
SITE	
DRAWN	MM/NA
CHECKED	BRG
APPROVED	DWK
DWG	101-4

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

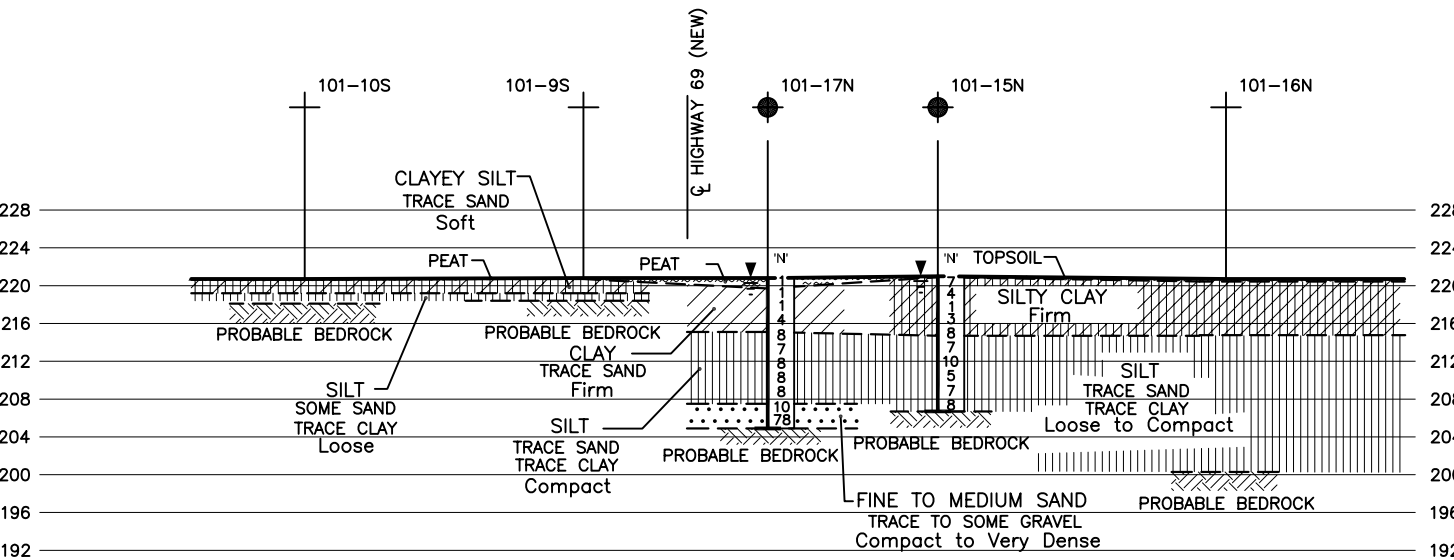
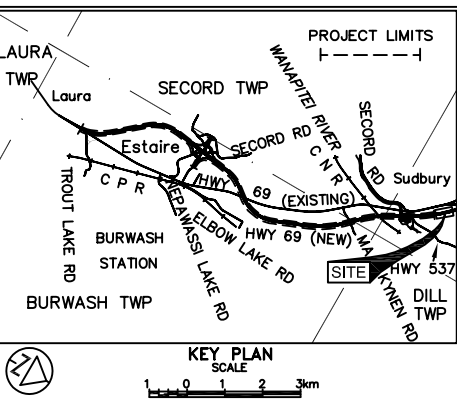
HIGHWAY 69

From 0.3km North of HWY 537, northerly 8.8 km
SWAMP 101, STA 10+908 TO 11+308 DILL TWP

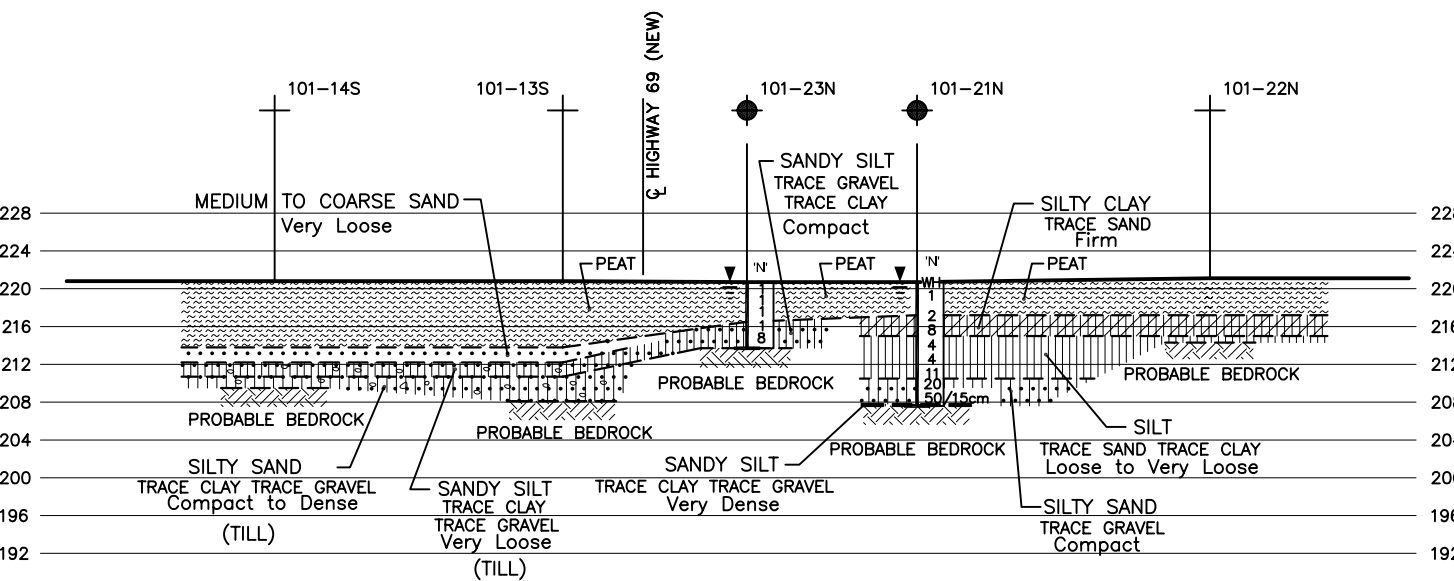
SHEET



Peto MacCallum Ltd.
CONSULTING ENGINEERS



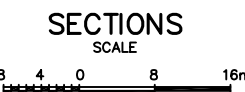
D-D



E-E

NOTE:

REFER TO DRAWINGS 101-1 TO 101-4 FOR PLAN AND SECTIONS
A-A TO C-C.



REF No E-Main69-5.dwg; 1_bpl06.dwg; October, 2002
Hwy69-S-des; February 2004

- 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.

HWY No 69				DIST 54	
UBM'D	GD	CHECKED	GD	DATE OCT 29, 2004	SITE
RAWN	MM/NA	CHECKED	BRG	APPROVED DWK	DWG 101-5

**FOUNDATION DESIGN REPORT
SWAMP AND HIGH FILL CROSSINGS
for
HIGHWAY 69 FOUR-LANING
FROM 4 KM SOUTH OF ESTAIRE TO 1 KM NORTH OF HIGHWAY 537
G.W.P. 312-99-00
DISTRICT 54, TOWNSHIPS OF BURWASH, SECORD AND DILL
SUDBURY, ONTARIO**

VOLUME 1

PETO MacCALLUM LTD.
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Index No.: 125FDR
Geocres No.: 41I-174
November 17, 2004



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Drawing A - High Fill and Swamp Crossings Key Map

Table 1 - Summary of Subsoil Conditions, Alternative Treatment Options and Recommended Treatment

Table 2 - Computed Total Settlement of Embankment Surface for Recommended Treatment Options

Table 3 - Computed Settlement for Specific Crossings

Figures 1 to 5 - Shear Strength Profiles for Specific Crossings

Figures 6 to 11 - Results of Stability Analyses

Figure 12 - Rockfill Embankments with a Stabilizing Berm

Ontario Provincial Standard Drawings - OPSD-203.010, OPSD-203.010 M1, OPSD-203.010 M2

**FOUNDATION DESIGN REPORT
SWAMP AND HIGH FILL CROSSINGS**

for
Highway 69 Four-Laning
From 4 km South of Estaire to 1 km North of Highway 537
G.W.P. 312-99-00
District 54, Townships of Burwash, Secord and Dill
Sudbury, Ontario

1. INTRODUCTION

Realignment of the 12 km long section of Highway 69 that extends from 4 km south of Estaire to about 1 km north of Highway 537, some 15 km south of Sudbury, is planned. The study corridor extends from Station 11+286.5 (Burwash Township) to 10+958 (Dill Township), Highway 69 centreline. This report was prepared for Totten Sims Hubicki Associates (TSH) on behalf of the Ministry of Transportation of Ontario (MTO).

The report provides recommendations for construction of embankments in the swamp and high fill crossings identified in the RFP for this project where special construction procedures are required to minimize postconstruction settlement of the roadway surface due to consolidation of the subgrade materials as well as comments on the stability of the embankments and construction methods. Recommendations for construction of the remaining embankments within the project limits are dealt with in the Draft Pavement Design Report that has been provided under separate cover (PML Ref.: 03TF014 dated June 14, 2004).

A total of 13 swamp and high fill crossings were identified along the study corridor in the RFP documents for this project. For ease of reference, the crossings were designated sequential numbers in the 600 series from 601 to 613. Crossing 612 was subsequently deleted from this study. Crossing 101 investigated during the study for GWP 327-91-00, (PML Ref. 01TF003, draft dated August 2001) is included in this study area. The identification number and location of each crossing are shown on the Key Map (Drawing A) and in Table 1.

The embankment height throughout the study corridor provided with the RFP documents ranged from about 2 to 14.5 m relative to the centerline median profile. The road grade was revised in January 2004 and finalized in October 2004. The revised embankment height (October 2004) typically ranges from 3 to 10 m within the designated swamp/high fill limits; some sections in swamps 608, 609 and 611 are up to 13.6, 14.5 and 22.1 m high respectively. A number of short



sections along the alignment will be cut into bedrock some 1 to 2 m, locally 4 to 8 m in swamp 602, swamp 608, high fill 613 and about 16 m in swamp 101.

It is noteworthy that the borehole locations for this investigation were in general established on the basis of the RFP. As a consequence of the grade change, the actual location of the test holes may not be at the toe of slope of the embankments at some locations.

The grade change between the RFP document and the October 2004 grade at each crossing is noted in the following table:

CROSSING	GRADE CHANGE (m)
601	-0.8 to 6.3
602	-6.3 to 0.2
603	0.5 to 6.5
604	-2.0 to -0.2
605	-2.5 to 2.6
606	-1.1 to 4.9
607	0.8 to 7.9
608 *	-2.8 to 0.8
609 *	-1.4 to 1.0
610*	-1.3 to -0.3
611	5.0 to 11.1
613	-8.2 to 0.5
101*	-1.7 to 0.0

* Relative to grades provided in January 2004

Based on a rockfill slope inclination of 1.25H:1V and the 2 m mid-height berm for embankments higher than 6 m, the actual test hole locations at some crossings are as much as 10 to 12 m from the design toe of slope.

Bedrock is exposed discontinuously within the crossings. The subsurface stratigraphy at the swamp sections typically comprised a peat/topsoil layer overlying cohesionless typically very loose to compact sandy/silty deposits and/or cohesive soft to firm clayey silt/silty clay mantling



probable bedrock. Wet sand and/or silt seams were not observed in the recovered samples of the clayey soils. A summary of the subsurface conditions for each of the swamp and high fill crossings is compiled in Table 1. A shear strength profile of the clayey material for each swamp crossing where a significant thickness of clayey soils was encountered is provided in Figures 1 to 5.

The peat/topsoil is typically 0.3 to 0.5 m thick except in some sections of swamps 601 and 101 where it is up to 3.2 and 4.2 to 7.7 m thick respectively.

The depth to the base of the clayey soils is typically less than 8 m in most swamps. However, in some sections of the alignment it reaches 12.8 m in swamp 601 (NBL Sta. 12+080 to 12+180), 15.1 to 16.0 m in swamp 602 (Sta. 12+820 to 12+966), 12.3 to 14.5 m in swamp 605 (NBL Sta. 14+280 to 14+506 and SBL Sta. 14+235 to 14+410), 14.0 m in swamp 613 (Sta. 10+475 to 10+838) and 8.9 to 10.4 m in swamp 101 (Sta. 10+980 to 11+100).

The seismic coefficient for the conditions at this site is 2.0 (Type IV soil profile as per clause 4.4.6 of the Canadian Highway Bridge Design Code (CHBDC), CAN/CSA-S6-00).

The site is located in Seismic Performance Zone 1. The liquefaction potential of the clayey soils was evaluated by consideration of the grain size distribution (% of particles < 0.005 mm size), liquid limit values and the ratio of the water content to the liquid limit (> 0.9). Based on the research by Marcuson et al (1990), we believe liquefaction of the fine grained soils (more than 35% of the soil particles passing the No. 200 sieve) is unlikely. The liquefaction potential of the silts and sands at the site was assessed using the procedure suggested by Seed and Idriss (1971) and, on this basis, it is considered that liquefaction of the granular soils is unlikely as well (clause 4.6.2 of the CHBDC).



2. SWAMP AND HIGH FILL CROSSING TREATMENTS

2.1 General

Rock fill should be employed to construct the portion of the embankment below existing grade and/or below the water level to satisfy constructability constraints (soft soils, stable base, working below the water table) as well as to minimize postconstruction settlements since it would be difficult to compact earth and/or pit-run granular materials below the water table. In addition, the magnitude of construction dewatering required to enable this work to be performed "in the dry" may not be feasible due to environmental impacts and economic constraints. Earth and/or granular material could be employed above existing grade and/or the water level, whichever is greater.

Several methods of construction of the embankment fill at the crossings were considered such as:

1. Excavation of compressible soils;
2. Preloading;
3. Partial excavation and preloading;
4. Construction of a bridge to span the swamp/compressible soil;
5. Lengthening the construction schedule and/or advance contracts to increase the time period between construction of the embankment and construction of the roadway to minimize post construction settlements;
6. Use of lightweight fill to minimize the stress imposed on the underlying soil (independently and in conjunction with surcharging and/or wick drains); and
7. Installation of wick drains to increase the rate of consolidation and minimize the magnitude of post construction settlement.



The recommended construction method for each section of the roadway embankment under consideration was established using the following criteria:

- i) Postconstruction settlement of the embankment surface due to consolidation of the rockfill and subgrade material (further comments in this regard are provided in subsequent paragraphs).

Settlement ranges of 25 to 50 mm, 50 to 100 mm and 100 to 150 mm were noted in the email provided by MTO on October 28, 2004.

- ii) Stability of the embankment fill.
- iii) Stability of excavated slopes.
- iv) The maximum practical depth of excavation for the "long stick" excavator of 12 m and the need to employ a drag line for greater depths of excavation.

The preferred treatment option will be dictated by the soil profile at a particular crossing, the accepted post construction performance (settlement), environmental considerations, design requirements, the construction schedule, construction constraints and economic considerations.

The environmental considerations primarily relate to the impact to natural systems on and adjacent to the construction corridor which is dictated in part by the depth and width of excavation required to remove the compressible soils to enable construction of the embankments, as well as a suitable area to dispose of the excavated material. This will be controlled by the engineering properties of the clayey soils which govern the natural inclination of cut slopes, the stable inclination of the rock fill slopes and the inclination of the excavated clay at the disposal site(s).

In addition, the impacts to the regional hydrogeology by changes made to the natural groundwater level by installation of wick drains could also be a consideration. Further, light weight fill is not locally available and will require a large number of trucks to travel long distances which will have an adverse impact on both air quality and nonrenewable resources. The heavy truck wheel loads will also accelerate 'ageing' of the pavement structure.

The stable inclination of the embankment fill slope as well as the magnitude of post construction settlement of the embankment surface and time required for essential completion of primary consolidation for each treatment option will be a function of the embankment height, the



composition of the subgrade soil as well as the thickness and pertinent engineering properties of the clayey subgrade soil for those options that do not call for full depth excavation.

Engineering analysis was carried out to assess the stability of the embankments of various heights to evaluate the maximum height that can be constructed without flattening the slopes or constructing stabilizing berms.

The geotechnical parameters employed during this analysis were as follows:

	Friction Angle, degrees	Cohesion, kPa	Unit Weight, kN/m³
Rockfill	42	0	18.0
Clayey silt/Silty clay	5 and 10	20	17.5
Silt/Sand	28	0	18.5
Water level	at existing ground surface		

The computed factor of safety for various slope heights is summarized below:

Embankment Height (m)	Rockfill Slope Inclination	Stabilizing Berm	Computed Factor of Safety for Friction Angle of	
			5°	10°
8	1.25H:1V	-	1.1	1.4
	1.25H:1V	H = 4 m W = 6 m	1.2	1.6
10	1.25H:1V	-	1.0	1.3
	1.25H:1V	H = 4 m W = 6 m	1.1	1.4
12	1.25H:1V	-	0.9	1.2
	1.25H:1V	H = 4 m W = 6 m	0.9	1.3
	3H:1V	-	1.0	1.4



Since the analysis was carried out considering an 'instant on' gravity situation and the mid-height berm was ignored, we conclude that rockfill embankments up to a maximum height of 8 m without a stabilizing berm will be stable. Flattening of the slope or construction of a stabilizing berm (height and width of 0.4 and 0.6 times the height of embankment, respectively) will be required for embankment heights between 8 and 10 m. For an embankment height in excess of 10 m, staged construction with a stabilizing berm and slope inclination of 2H:1V should be employed. The first stage height should be 6 m and successive stages 4 m to the design height of embankment, with a 4 to 6 month period allowed between placement of each successive lift. Alternatively, a stabilizing berm with an overall average slope inclination of 3.5H:1V would be required. Piezometers should be installed to monitor the rate of pore pressure dissipation to confirm the anticipated time period for placement of successive lifts of fill is appropriate. Refer to Figures 6 to 12 for details in this regard.

The minimum factor of safety for the short-term construction period and the above conditions exceeds 1.3.

Engineering analysis was also carried out to evaluate the magnitude of post construction settlement due to consolidation of the subgrade soils and the rockfill. Refer to Section 3 for detailed comments in this regard.

Settlement resulting from consolidation of the rock fill was based on the following criteria established from review of research documents prepared by MTO (RR229 dated March 1983) and discussions with the Pavement and Foundation Section of MTO.

- Rock Fill Above Grade

Total settlement is about 0.5% of the rock fill height provided the fill is placed in accordance with SP 206S03 dated January 2004.

- Rock Fill Below Grade

Total settlement up to 2% of the rock fill thickness since the rock fill is end dumped and placed in relatively large lift thicknesses with minimal or no compaction effort.



- Rate of Rock Fill Settlement

About 50% of the total settlement occurs during the first year following placement of the rock fill and the remaining 50% at a progressively decreasing rate during the following 5 to 10 year period.

- Clayey Subgrade Soils

Settlement resulting from consolidation of the clayey subgrade soils was computed using the classic Terzaghi equation factored to account for the conservative estimate of settlements yielded by the equation.

The consolidation parameters employed during this computation, deduced from the consolidation testing and index tests conducted on representative samples, were as follows:

$$\begin{aligned} C_c &= 0.50 \\ C_r &= 0.06 \\ e_o &= 1.50 \\ p_c &= 300 \text{ kPa} \end{aligned}$$

The above values were deduced from the following laboratory tests:

Consolidation Parameters

Borehole, Sample	C_c	C_r	e_o	p_c, kPa
602-31N, 5A	0.46	0.05	1.35	280
612-10M, 13	0.42	0.03	0.93	400
612-18N, 18	1.00	0.12	1.36	800
612-12S, 16	0.83	0.07	1.45	250
612-18S, 15	0.75	0.06	1.09	800
496-2, 6 (Highway 537)	0.50	0.06	1.59	300



Atterberg Limits Tests

Crossing	No. of Tests	Liquid Limit	Plastic Limit	Moisture Content, %	C_c (estimated)
601	4	28 - 31	19 - 21	23 - 32	0.2
602	9	28 - 56	19 - 23	17 - 58	0.4
605	14	24 - 49	18 - 21	21 - 63	0.3
607	7	28 - 35	18 - 20	19 (one sample)	0.2
610	10	23 - 57	16 - 24	21 - 37	0.4
611	2	16 - 24	14 - 18	-	0.1
612	36	24 - 58	12 - 24	10 - 61	0.4
613	13	24 - 69	18 - 25	24 - 74	0.5

2.2 Excavation of Compressible Soil

The method of construction of embankments normally employed by MTO in areas where low strength compressible soils exist is to excavate these poor quality soils to firm bottom where "practical" and backfill the excavation with rock fill following the procedures noted in OPSD-203.010, OPSD-203.010 M1, OPSD-203.010 M2. A copy of the Ontario Provincial Standard Drawings (OPSD) is provided with the report.

The practical depth of excavation is normally considered to be 12 m for the "long stick" excavator; substantially greater depths of excavation have been employed on some projects, however, using a drag line.

For the purposes of this report, "firm bottom" was generally defined as loose to compact cohesionless sands or silts ($N > 7$ blows/0.30 m) and/or stiff cohesive clays ($C_u > 50$ kPa) cognizant of the embankment height and expected settlements. Further comments in this regard are provided in subsequent paragraphs.

The existing peat, topsoil and soft to very soft cohesive soils are highly compressible and generally not capable of supporting the weight of embankment fill to be placed. The cohesionless deposits of sand/silt with variable clay content that underlie the clay are deemed to be competent and capable of supporting the proposed rockfill embankments. The underlying loose to very loose



cohesionless soils are considered suitable taking into account the local embankment height, since settlement of these materials occurs rapidly during construction.

Excavation for construction of the rock fill embankments using this treatment option would extend through the peat and 5 to 7 m (typically) into the clay.

Advantages

- minimal post construction settlement due to consolidation of the clayey subgrade soils

Disadvantages

- disposal of large quantities of clayey soil
- width of area impacted by excavation
- environmental impacts
- significant post construction settlement of rock fill

2.3 Preloading

This treatment option involves excavation of the surficial peat and placement of the rock fill embankment and surcharge directly on the clayey soil. The suitability of this treatment option is to a large degree dictated by the height of the surcharge required to achieve the requisite consolidation within the construction schedule and the inclination of the slopes required to maintain stability of the embankment.

Advantages

- ease of construction
- excavation and off-site disposal of clayey soils not required
- environmental impact less than option 2.2
- minimal post construction settlement of rock fill

Disadvantages

- potential for post construction settlement of clayey soil
- time period required for consolidation

2.4 Partial Excavation and Preloading

This treatment option involves excavation of the surficial peat and clayey soil to a selected depth followed by placement of the rock fill and surcharge. The excavation depth and surcharge height are strategically selected to achieve the requisite consolidation within the time period available for



construction. Consequently, the depth of excavation/height of surcharge load is optimized in locations where an extensive thickness of peat and soft clay exists.

This treatment method is particularly suitable for crossings where the base of the clay is more than 12 m below grade, the practical depth of excavation for the "long stick" excavator.

Advantages

- an engineered solution to optimize excavation depth, surcharge height and minimize environmental impacts
- reduced depth of excavation ⁽¹⁾
- reduced post construction settlement due to consolidation of clayey soil ⁽²⁾
- reduced post construction settlement due to "consolidation" of rock fill ⁽¹⁾
- reduced volume of excavated soil for disposal ⁽¹⁾
- reduced environmental impact ⁽¹⁾
- limited post construction settlement

⁽¹⁾ relative to full depth excavation of compressible soils

⁽²⁾ relative to preloading

Disadvantages

- potential post construction settlement of clayey soil

2.5 Construction of a Bridge

This treatment option involves construction of a structure to span the area of soft compressible soils.

Advantages

- negligible post construction settlements
- cost effective in some instances
- construction schedule less weather dependent
- rockfill not required
- minimal environmental impacts
- no need for disposal of excavated clay

Disadvantages

- cost
- need for particular care during construction of approach embankments to minimize post construction settlement at the bridge abutments



2.6 Lengthened Construction Schedule and Advance Contracts

This treatment option would normally be employed in conjunction with options 2.3 and 2.4. It involves selective scheduling of the time for construction of embankments in the swamp/high fill crossings within the overall roadway construction period to allow for consolidation of the subgrade material below the fill or issuing advance contracts for this work to be carried out prior to issuance of the contract for construction of the overall roadway.

Advantages

Same as options 2.3 and 2.4

Disadvantages

Same as options 2.3 and 2.4

2.7 Lightweight Fill

Use of lightweight fill to reduce the pressure imposed on the subgrade soils and thereby reduce the magnitude of post construction settlements is also a suitable treatment option in some situations.

Advantages

- reduced settlement due to consolidation of clayey soil
- potential for reduced depth of excavation
- potential for reduced volume of rockfill
- potential for reduced settlement due to consolidation of fill

Disadvantages

- lightweight fill not locally available
- ready supply of good quality rockfill
- environmental impacts during transportation to site
- impact to existing pavement system during transportation to site
- time required for consolidation
- cost



2.8 Wick Drains

Installation of wick drains to increase the rate of consolidation could be a treatment option, particularly in certain sections of crossings where the base of the clay is more than 8 to 12 m below grade.

Advantages

- excavation of clayey soil not required
- no requirement for disposal of excavated soil
- minimal post construction settlement of clayey soil
- potential for reduction in post construction settlement due to consolidation of rock fill

Disadvantages

- potential for adverse impact on hydrogeology
- need for specialist equipment and contractor
- providing access for construction equipment in swampy terrain and/or over soft ground
- difficult to install during frozen ground conditions
- need for a local source of sand to place on the ground surface to protect the drains
- cost
- need for engineering services to design the wick drain system as well as install and monitor instruments to confirm predicted performance of the drains

3. RECOMMENDED TREATMENT

The preferred treatment option will be dictated by the soil profile at a particular crossing, the accepted post construction performance (settlement), environmental considerations, design requirements, the construction schedule, construction constraints and economic considerations.

It is recommended that the embankments be constructed with rockfill.

A brief discussion of the suitability of the treatment options noted in the previous sections for each crossing along with the recommended treatment option(s) is provided in Table 1. Excavation of the surficial peat and organic deposits is a requirement for all treatment options.



The suggested excavation type for selected sections in each crossing is also provided - swamp excavation or earth excavation. Earth excavation is considered to be appropriate where a substantial proportion of the excavation depth (approximately 75%) consists of clayey soil that will essentially act as a solid or the peat is relatively thin with a low moisture content. Swamp excavation is considered to be appropriate if a substantial proportion of the excavation depth (approximately 25%) consists of peaty soils that will essentially act as a slurry.

Detailed design of wick drains can be conducted if the wick drain option is selected. For preliminary planning and design purposes, it is expected that drains with an effective diameter of about 100 mm and an approximate spacing of 1.5 m will be required. Installation of piezometers and settlement plates will also be required to monitor the rate of pore pressure dissipation during and following placement of the embankment fill.

Embankments constructed on firm ground should be constructed in accordance with OPSD-201.010, OPSD-201.020, OPSD-202.010, the OPSD-203.010 series and SP 206S03 dated January 2004. The side slopes of the embankments should be inclined no steeper than 2H:1V for earth fill and 1.25H:1V for rock fill. For erosion control and slope maintenance purposes, a 2 m wide mid-height berm should be provided so that no uninterrupted slope is greater than 6 m high as specified in the Northeastern Region Pavement Design Practices and Guidelines.

Excavated swamp and/or inorganic soil could be placed on the rock fill below grade if the inclination of the slope flattening material is not steeper than 3.5H:1V.

It is considered that the rock fill embankments constructed in accordance with these recommendations will be stable. The factor of safety for the critical short-term conditions is computed to be at least 1.3 and higher for long term conditions.

Some settlement of the embankment fill surface, both during and following completion of construction, due to consolidation of the subgrade soils and "consolidation" of the rock fill is likely to occur. For embankments constructed on rock, settlement of the subgrade will be negligible; settlement of embankments constructed on silty/sandy subgrade soil is expected to be in the



order of 20 to 40 mm and be completed within 2 to 4 months following construction of the embankments; embankments constructed on clayey soils will experience greater settlements. The magnitude of total settlement of the rock fill embankments is summarized in Table 2 for the recommended treatment at each crossing. The settlement for various treatment options where the clayey subgrade soils remain in place is provided in Table 3.

Some "loss of rock fill" is likely to occur as a result of the rock fill "punching" into the very loose to loose silty and/or sandy soil below the recommended excavation depths. For volume calculation purposes, the "loss of rock fill" should be considered to be 300 mm.

It is noted from Table 2 that total settlement of the embankment surface during the five year period following completion of construction is generally expected to be within 120 mm.

The width of the embankment platform should be widened a minimum of 2 m on each side if constructed on native inorganic soil according to Northern Region Engineering Directive NRE 98-200 dated October 28, 1998 (1 m if founded on bedrock). The anticipated post construction settlement of the embankment due to "consolidation" of the rock fill and subgrade material, the slope flattening specified by MTO and the minimum requirements called for in NRE 98-200 that include accommodation of a 200 mm thick pavement overlay in future should be considered. Refer to the Pavement Design Report for additional comments in this regard.



4. CLOSURE

This report was prepared by Mr. G.O. Degil, PhD., P.Eng., Senior Foundation Engineer, and was reviewed by Mr. D.W. Kerr, MEng, P.Eng., Chief Foundation Engineer. Mr. B.R. Gray, MEng, P.Eng., MTO Designated Contact, conducted an independent review of the report.

Yours very truly,

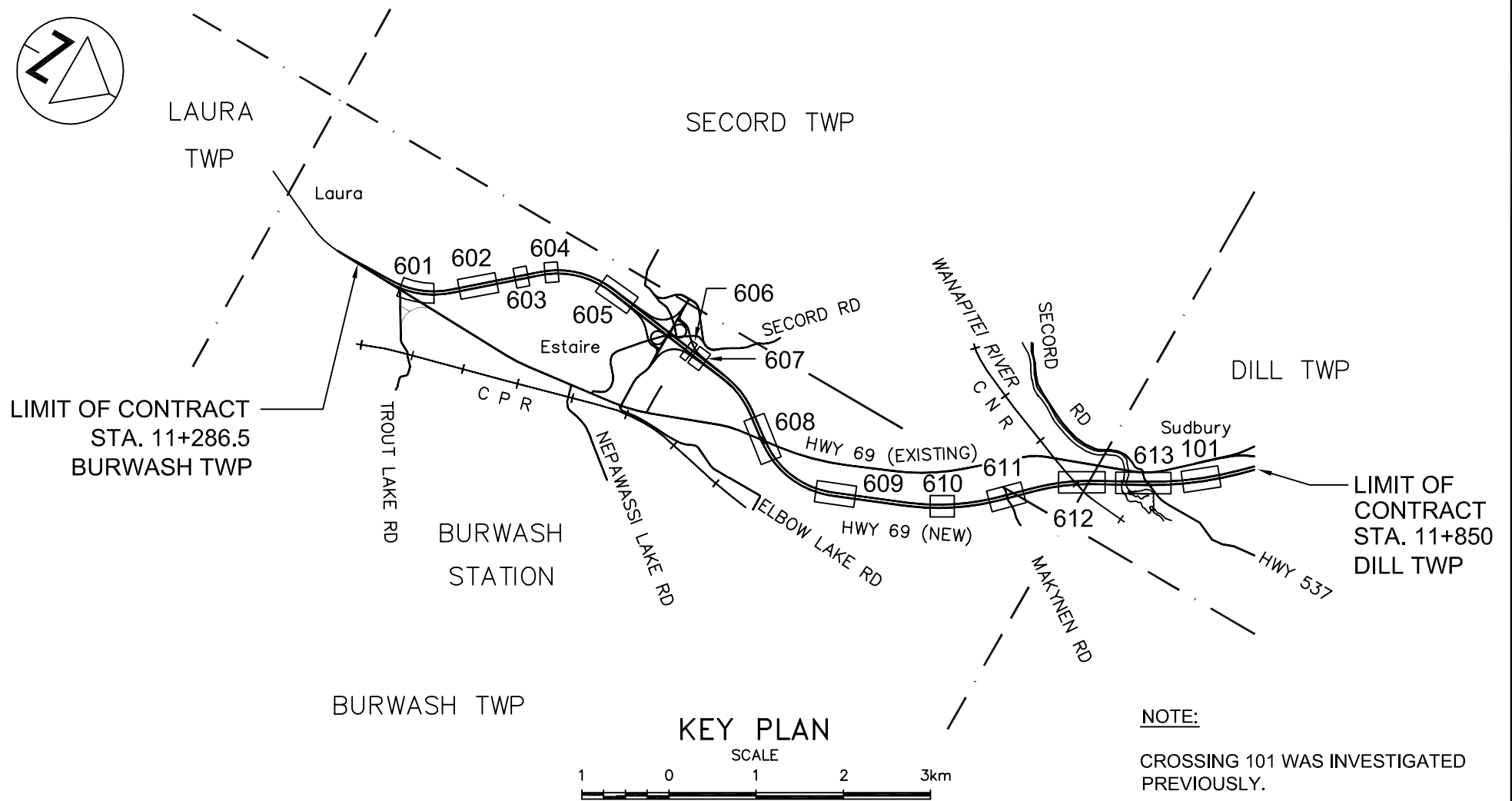
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MTO Designated Contact

DG/DWK:dg-lad-mi



HIGH FILL AND SWAMP CROSSINGS KEY MAP

Highway 69 Four-Laning For 12km
From 4km South of Estaire to 1km North of Highway 537
G.W.P. 312-99-00

613 LEGEND:
 CROSSING LOCATION

DRAWING NO.

A

REV.



TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAV -ATION PROCE -DURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
Swamp 601 Twp of Burwash Sta. 11+786.5 to 12+236.5 Hwy 69 Mainline	<u>Hwy 69 NBL</u> Sta. 11+786.5 to 12+080	1.6 - 9.1 ¹ (1.5 - 3.0) ²	0.0 - 5.5	Very loose to dense cohesionless sandy/silty deposits extending to bedrock.	0.0 - 17.7 (El. 207.3 - 225.5)	SE	1. Excavation of compressible soil	Suitable treatment option	Excavation of compressible soil
	Sta. 12+080 to 12+180	9.0 - 9.8 ¹ (3.0 - 5.5) ²	3.7 - 9.0, locally 12.8	Very loose to compact cohesionless sand/silt extending to bedrock.	6.9 - 22.4 (El. 200.0 - 215.6)	SE	2. Preloading	Possible treatment option from Sta. 12+100 to 12+150 in conjunction with option 5.	
	Sta. 12+180 to 12+236.5	2.7 - 9.0 ¹ (0.0 - 6.0) ²	0.3	Loose to compact sand mantling bedrock.	1.6 - 6.6 (El. 217.2 - 224.4)	SE	3. Partial excavation/ surcharge	Possible treatment option from Sta. 12+100 to 12+150 in conjunction with option 5.	
	<u>Hwy 69 SBL</u> Sta. 11+786.5 to 11+910	5.1 - 6.6 ¹ (1.5 - 3.0) ²	0.0 - 1.0, locally 2.0	Very loose to compact sandy deposits extending to bedrock.	0.0 - 11.7 (El. 212.8 - 224.5)	SE	4. Bridge	Not cost effective	
	Sta. 11+910 to 12+020	6.6 - 8.3 ¹ (1.5 - 2.0) ²	3.1 - 5.7	Cohesionless very loose to dense sandy/silty deposits.	Over 8.1 - 19.9 (El. 203.1 - under 214.9)	EE	5. Lengthen construction schedule/advance contract	Possible treatment option in conjunction with option 2 or 3	
	Sta. 12+020 to 12+236.5	-0.8 (cut) - 9.7 ¹ (0.0 - 6.0) ²	0.0 - 3.2	Exposed bedrock or very loose to compact sand and/or silt extending to probable bedrock.	0.0 - over 19.5 (El. under 203.2 - 232.5)	SE	6. Lightweight Fill	Not cost effective	
							7. Wick Drains	Not cost effective	

SE Swamp Excavation
EE Earth Excavation



TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAV -ATION PROCE -DURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
Swamp 602 Twp of Burwash Sta. 12+586.5 to 12+966.5 Hwy 69 Mainline	Hwy. 69 NBL Sta. 12+586.5 to 12+655	-4.0 (cut) - 0.5 ¹ (0.5 - 4.0) ²	0.1 - 0.3	Very loose to compact cohesionless silt and/or sand extending to bedrock.	0.8 - 5.7 (El. 229.8 - 233.4)	SE	1. Excavation of compressible soil	Suitable treatment option although from Sta. 12+805 to 12+966 clayey soil extends to a depth of 16.3 m	Excavation of compressible soil except from Sta. 12+805 to 12+966
	Sta. 12+655 to 12+720	0.0 - 3.3 ¹ (3.0 - 5.5) ²	3.5 - 7.0, locally 1.2	Cohesionless very loose to compact silt extending to bedrock.	4.1 - 11.4 (El. 221.7 - 228.7)	EE	2. Preloading	Suitable treatment option where clay is less than 5 m deep if time is available for consolidation	From Sta. 12+805 to 12+966
	Sta. 12+720 to 12+820	-2.1 (cut) - 0.2 ¹ (0.5 - 3.0) ²	0.1 - 3.0	Very loose to compact silt extending to bedrock.	0.2 - 4.5 (El. 230.6 - 235.1)	EE	3. Partial excavation/ surcharge	Not a suitable treatment option except from Sta. 12+805 to 12+966 where the clay extends to a depth of 16.3 m	Partial excavation/ surcharge AND/OR Wick drains.
	Sta. 12+820 to 12+966.5	-0.3 (cut) - 2.1 ¹ (0.0 - 2.0) ²	0.2 - 15.1	Very loose to dense cohesionless silt, locally cohesive stiff to very stiff silty clay, extending to bedrock.	1.9 - 26.8 (El. 206.4 - 234.0)	EE	4. Bridge	Possible treatment option between Sta. 12+805 to 12+966	For option 3, excavation should extend to 12 m and 2 m surcharge maintained for one year.
	Hwy 69 SBL Sta. 12+586.5 to 12+620	-5.8 (cut) - -1.4 (cut) ¹ (0.5 - 2.0) ²	0.1 - 0.2	Very loose to compact silt extending to bedrock.	0.4 - over 3.8 (El. under 230.9 - 236.4)	SE	5. Lengthen construction schedule/advance contract	Suitable treatment option	
	Sta. 12+620 to 12+720	-1.4 (cut) - 2.9 ¹ (2.0 - 5.5) ²	1.9 - 7.9	Very loose to compact cohesionless silt/sandy silt, locally cohesive stiff silty clay, extending to bedrock.	1.9 - 14.8 (El. 216.7 - 231.1)	EE	6. Lightweight Fill	Possible treatment option between Sta. 12+805 to 12+966	
	Sta. 12+720 to 12+805	-1.8 (cut) - 0.2 ¹ (0.5 - 3.0) ²	0.1 - 0.2	Loose to compact silt/silty sand extending to bedrock.	0.1 - 4.9 (El. 230.2 - 235.5)	SE	7. Wick Drains	Possible treatment option between Sta. 12+805 to 12+966	
	Sta. 12+805 to 12+966.5	0.2 - 2.0 ¹ (0.0 - 2.0) ²	2.4 - 11.0, locally 16.0	Very loose to compact silt/sand extending to bedrock.	3.7 - 27.7 (El. 205.6 - 231.5)	EE			



TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAVATION PROCEDURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
Swamp 603 Twp of Burwash Sta. 13+156.5 to 13+316.5 Hwy 69 Mainline	<u>Hwy 69 NBL</u>	0.5 - 16.0 ¹ (0.0 - 9.5) ²	0.0 - 0.2	Exposed bedrock or sand extending to probable bedrock.	0.0 - 1.8 (El. 219.7 - 233.7)	SE	1. Excavation of compressible soil 2. Preloading 3. Partial excavation/surcharge 4. Bridge	Suitable treatment option Not applicable Not applicable Not cost effective	Excavation of compressible soil
	<u>Hwy 69 SBL</u>	2.6 - 16.0 ¹ (0.0 - 9.5) ²	0.0 - 0.1	Exposed bedrock or sand/silt extending to probable bedrock.	0.0 - 0.9 (El. 219.8 - 231.9)	SE	5. Lengthen construction schedule/advance contract 6. Lightweight Fill 7. Wick Drains	Not applicable Not applicable Not applicable	
Swamp 604 Twp of Burwash Sta. 13+526.5 to 13+686.5 Hwy 69 Mainline	<u>Hwy 69 NBL</u>	-0.2 (cut) - 10.9 ¹ (0.0 - 11.5) ²	0.0 - 0.9	Exposed bedrock or sand extending to probable bedrock.	0.0 - 0.9 (El. 228.8 - 238.6)	SE	1. Excavation of compressible soil 2. Preloading 3. Partial excavation/surcharge 4. Bridge	Suitable treatment option Not applicable Not applicable Not cost effective	Excavation of compressible soil
	<u>Hwy 69 SBL</u>	-2.0 (cut) - 9.5 ¹ (0.0 - 11.5) ²	0.0 - 0.2	Exposed bedrock or sand extending to probable bedrock.	0.0 - 0.9 (El. 229.9 - 240.0)	SE	5. Lengthen construction schedule/advance contract 6. Lightweight Fill 7. Wick Drains	Not applicable Not applicable	



TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAV -ATION PROCE -DURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
Swamp 605 Twp of Burwash Sta. 14+086.5 to 14+506.5 Hwy 69 Mainline	<u>Hwy 69 NBL</u> Sta. 14+086.5 to 14+230	3.7 - 6.2 ¹ (1.5 - 8.0) ²	0.0 - 4.9	Exposed bedrock or sandy/silty deposits extending to probable bedrock.	0.0 - over 4.9 (El. under 231.9 - 242.2)	SE	1. Excavation of compressible soil 2. Preloading	Suitable treatment option Suitable treatment option between 14+086 to 14+230 NBL only	Excavation of compressible soil except from 14+410 to 14+506 NBL and 14+245 to 14+400 SBL. Between these Stations partial excavation/ surcharge OR wick drains. Excavation should extend to 12 m and 2 m surcharge maintained for one year.
	Sta. 14+230 to 14+280	6.2 - 9.9 ¹ (7.5 - 8.0) ²	0.0 - 0.2	Exposed bedrock or very loose to compact silt extending to probable bedrock.	0.0 - 3.8 (El. 230.2 - 236.8)	EE	3. Partial excavation/ surcharge	Suitable treatment option between 14+410 to 14+506 in NBL and 14+245 to 14+400 in SBL	
	Sta. 14+280 to 14+506.5	2.6 - 11.8 ¹ (0.0 - 10.0) ²	0.0 - 14.5	Exposed bedrock and/or very loose to compact silt over probable bedrock.	0.0 - 27.1 (El. 206.8 - 241.7)	SE	4. Bridge	Possible treatment option from 14+ 410 to 14+506 in NBL and 14+245 to 14+400 in SBL	
	<u>Hwy 69 SBL</u> Sta. 14+086.5 to 14+245	-1.0 (cut) - 9.6 ¹ (1.5 - 8.0) ²	0.0 - 0.9	Exposed bedrock or sand extending to probable bedrock.	0.0 - 1.0 (El. 235.6 - 246.7)	EE	5. Lengthen construction schedule/advance contract	Possible treatment option from 14+ 410 to 14+506 in NBL and 14+245 to 14+400 in SBL	
	Sta. 14+245 to 14+410	9.6 - 11.3 ¹ (7.5 - 9.0) ²	0.0 - 12.3	Exposed bedrock or very loose to compact silt extending to probable bedrock.	0.0 - 17.8 (El. 216.1 - 235.6)	SE	6. Lightweight Fill	Not cost effective	
	Sta. 14+410 to 14+506.5	-1.1 (cut) - 11.2 ¹ (0.0 - 10.0) ²	0.0 - 0.1	Exposed bedrock or sand/silty sand extending to probable bedrock.	0.0 - 1.1 (El. 234.2 - 247.7)	EE	7. Wick Drains	Suitable treatment option between 14+410 to 14+506 in NBL and 14+245 to 14+400 in SBL	
Swamp 606 Twp of Burwash Sta. 15+236.5 to 15+326.5 Hwy 69 Mainline	<u>Hwy 69 NBL</u>	-1.6 (cut) - 2.8 ¹ (-0.5 (cut) - 3.0) ²	0.0 - 0.2	Exposed bedrock or sand extending to probable bedrock.	0.0 - 0.2 (El. 251.9 - 255.7)	EE	1. Excavation of compressible soil 2. Preloading 3. Partial excavation/ surcharge 4. Bridge	Suitable treatment option Not applicable Not applicable	Excavation of compressible soil
	<u>Hwy 69 SBL</u>	1.8 - 7.9 ¹ (-0.5 (cut) - 3.0) ²	0.0 - 4.1	Exposed bedrock or very loose to loose sandy/silty deposits extending to probable bedrock.	0.0 - 4.1 (El. 242.4 - 254.4)	SE	5. Lengthen construction schedule/advance contract 6. Lightweight Fill 7. Wick Drains	Not cost effective Not applicable Not applicable	

TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAV -ATION PROCE -DURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
Swamp 607 Twp of Burwash Sta. 15+326.5 to 15+466.5 Hwy 69 Mainline	<u>Hwy 69 NBL</u>	2.8 - 10.5 ¹ (0.0 - 5.0) ²	0.0 - 2.7	Exposed bedrock or very loose to dense silt/sand extending to probable bedrock.	0.0 - 2.7 (El. 241.0 - 253.0)	SE	1. Excavation of compressible soil 2. Preloading 3. Partial excavation/surcharge	Suitable treatment option Not applicable Not applicable	Excavation of compressible soil
	<u>Hwy 69 SBL</u> Sta. 15+326.5 to 15+405	7.9 - 9.7 ¹ (0.0 - 5.0) ²	0.0 - 3.0	Exposed bedrock or compact silt/sand extending to probable bedrock.	0.0 - 5.2 (El. 240.6 - 252.1)	SE	4. Bridge 5. Lengthen construction schedule/advance contract 6. Lightweight Fill 7. Wick Drains	Not cost effective Not applicable Not applicable Not applicable	
	Sta. 15+405 to 15+466.5	0.8 - 9.4 ¹ (0.0 - 4.0) ²	0.0 - 0.1	Exposed bedrock or topsoil mantling bedrock.	0.0 - 0.1 (El. 247.0 - 254.5)	EE			
Swamp 608 Twp of Burwash Sta. 16+406.5 to 16+906.5	<u>Hwy 69 NBL</u>	-1.1 (cut) - 13.6 ¹	0.0 - 0.6	Exposed bedrock or sand extending to probable bedrock	0.0 - 2.2 (El. 229.3 - 245.5)	EE	1. Excavation of compressible soil 2. Preloading 3. Partial excavation/surcharge 4. Bridge	Suitable treatment option Not applicable Not applicable Not cost effective	Excavation of compressible soil
	<u>Hwy 69 SBL</u>	-3.8 (cut) - 12.3 ¹	0.0 - 0.2	Exposed bedrock or sand extending to probable bedrock	0.0 - over 2.3 (El. 231.9 - 249.8)	EE	5. Lengthen construction schedule/advance contract 6. Lightweight Fill 7. Wick Drains	Not applicable Not applicable Not applicable	
High Fill 609 Twp of Burwash Sta. 17+646.5 to 17+966.5	<u>Hwy 69 NBL</u>	2.4 - 14.5 ¹	0.0 - 0.1	Exposed bedrock or silt extending to probable bedrock	0.0 - 3.1 (El. 236.8 - 252.9)	EE	1. Excavation of compressible soil 2. Preloading 3. Partial excavation/surcharge 4. Bridge	Suitable treatment option Not applicable Not applicable Not cost effective	Excavation of compressible soil
	<u>Hwy 69 SBL</u>	3.0 - 12.1 ¹	0.0 - 0.1	Exposed bedrock or silt extending to probable bedrock	0.0 - 1.5 (El. 241.9 - 252.5)	EE	5. Lengthen construction schedule/advance contract 6. Lightweight Fill 7. Wick Drains	Not applicable Not applicable Not applicable	

TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAV -ATION PROCE -DURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
Swamp 610 Twp of Burwash Sta. 18+986.5 to 19+166.5	<u>Hwy 69 NBL</u>	1.8 - 4.0 ¹	0.0 - 6.4	Exposed bedrock or loose sandy/silty soils extending to probable bedrock	0.0 - 8.1 (El. 246.0 - 255.3)	SE	1. Excavation of compressible soil 2. Preloading 3. Partial excavation/surcharge 4. Bridge	Suitable treatment option Not suitable treatment option Possible treatment option Not cost effective	Excavation of compressible soil
	<u>Hwy 69 SBL</u>	1.2 - 4.3 ¹	0.0 - 7.9	Exposed bedrock or loose sandy/silty soils extending to probable bedrock	0.0 - 8.4 (El. 245.4 - 255.7)	SE	5. Lengthen construction schedule/advance contract 6. Lightweight Fill 7. Wick Drains	Possible treatment option in conjunction with Option 2 Not cost effective Not cost effective	
Swamp 611 Twp of Burwash Sta. 19+586.5 to 19+886.5	<u>Hwy 69 NBL</u>	3.0 - 22.1 ¹ (-2.0 (cut) - 11.0) ²	0.0 - 1.1	Exposed bedrock or very loose to very dense sandy/silty deposits extending to probable bedrock.	0.0 - 12.6 (El. 219.4 - 247.8)	EE	1. Excavation of compressible soil 2. Preloading	Suitable treatment option Not applicable	Excavation of compressible soil
	<u>Hwy 69 SBL</u> Sta.19+586.5 to 19+720	7.3 - 21.0 ¹ (-2.0 (cut) - 11.0) ²	0.0 - 0.3	Exposed bedrock or loose to compact silt and/or sand/silty sand extending to probable bedrock.	0.0 - 4.1 (El. 224.1 - 244.9)	EE	3. Partial excavation/surcharge 4. Bridge	Not applicable Not cost effective	
	Sta. 19+720 to 19+750	18.1 - 20.4 ¹ (8.0 - 10.0) ²	1.1 - 2.4	Very loose to very dense sand/silt extending to bedrock.	4.4 - 5.2 (El. 223.0 - 225.2)	EE	5. Lengthen construction schedule/advance contract 6. Lightweight Fill	Not applicable Not applicable	
	Sta. 19+810 to 19+886.5	8.7 - 14.0 ¹ (0.0 - 7.0) ²	0.0 - 0.3	Very loose to dense silt and/or sand extending to bedrock.	0.3 - 8.2 (El. 223.6 - 232.9)	EE	7. Wick Drains	Not applicable	
Swamp 612 Twp of Secord Sta. 10+368.8 to 10+760.8 and Twp of Dill Sta. 10+000 to 10+108.0	DELETED FROM THIS STUDY								



TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAV -ATION PROCE -DURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
High Fill 613 Twp of Dill Sta. 10+178.0 to 10+838.0	Hwy 69 NBL Sta. 10+178 to 10+250 (Wanapitei River)	-6.1 (cut) - 5.5 ¹ (0.0 - 5.0) ²	0.0 - 2.0	Exposed bedrock	0.0 - 2.0 (El. 217.0 - 232.6)	EE	1. Excavation of compressible soil	Suitable treatment option south of Wanapitei River and from Sta. 10+780 to 10+838	Excavation of compressible soil south of the Wanapitei River and Sta. 10+780 to Sta. 10+838.
	Sta. 10+350 to 10+475	4.2 - 4.9 ¹ (4.0 - 5.0) ²	0.3 - 5.8	Loose to compact sand and silt overlying probable bedrock	12.1 - 21.1 (El. 197.3 - 206.9)	EE	2. Preloading	Suitable treatment option on north side of River to Sta. 10+425	Preloading from north side of Wanapitei River to Sta. 10+425 (2 m surcharge).
	Sta. 10+475 to 10+838	-5.9 (cut) - 4.2 ¹ (0.0 - 4.0) ²	0.0 - 14.0	Loose to compact silt and silty sand, exposed bedrock at north end	0.0 - over 22.9 (El. under 198.9 - 228.8)	EE	3. Partial excavation/ surcharge	Suitable treatment option from Sta. 10+425 to 10+780	
	Hwy 69 SBL Sta. 10+178 to 10+250 (Wanapitei River)	-3.6 (cut) - 3.1 ¹ (0.0 - 5.0) ²	0.0 - 1.0	Exposed bedrock or probable bedrock under shallow topsoil cover	0.0 - 1.0 (El. 222.5 - 232.7)	EE	4. Bridge	Possible treatment option	Preloading in conjunction with wick drains at the Hwy 537 structure; refer to Hwy 537 High Fill.
	Sta. 10+350 to 10+475	4.1 - 5.4 ¹ (4.0 - 5.0) ²	0.1 - 10.3	Compact silty sand and loose silt. Probable bedrock contacted in several boreholes	Over 9.8 - 18.3 (El. 201.6 - under 208.5)	EE	5. Lengthen construction schedule/advance contract	Suitable treatment option from Sta. 10+425 to 10+780	Exclusive of the Hwy 537 structure and adjacent embankments (Sta. 9+925 to 10+100), partial excavation and surcharge from Sta. 10+425 to 10+780 or wick drains.
	Sta. 10+475 to 10+838	-8.2 (cut) - 4.1 ¹ (0.0 - 4.0) ²	0.0 - 14.0	Silty sand and loose silt. Probable bedrock contacted in several boreholes	0.0 - over 34.0 (El. under 188.0 - 230.7)	EE	6. Lightweight Fill	Possible treatment option from Sta. 10+425 to 10+780	Excavation should extend to a depth of 12 m and 2 m surcharge maintained for one year.
							7. Wick Drains		



TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAVATION PROCEDURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
Swamp 101 Sta. 10+908.0 to 11+308.0	<u>Hwy 69 NBL</u>	-16.5 (cut) - 7.0 ¹	0.0 - 8.9	Loose to dense silty/sandy soils extending to probable bedrock	0.0 - 20.4 (El. 200.3 - 245.7)	EE SE between Sta. 10+980 and 11+100	1. Excavation of compressible soil	Suitable treatment option	Excavation of compressible soil
	<u>Hwy 69 SBL</u>	-15.4 (cut) - 7.0 ¹	0.0 - 10.4	Loose to dense silty/sandy soils extending to probable bedrock	0.0 - 12.7 (El. 208.1 - 246.8)	EE SE between Sta. 11+000 and 11+120	2. Preloading	Possible treatment option	
							3. Partial excavation/surcharge	Possible treatment option	
							4. Bridge	Not cost effective	
							5. Lengthen construction schedule/advance contract	Possible treatment option	
							6. Lightweight Fill	Not cost effective	
							7. Wick Drains	Not cost effective	



TABLE 1
SUMMARY OF SUBSOIL CONDITIONS, ALTERNATIVE TREATMENT OPTIONS
AND RECOMMENDED TREATMENT

SWAMP/HIGH FILL NO.	ROAD COMPONENT	FILL HEIGHT (m)	DEPTH TO "FIRM BOTTOM" (m) ³	UNDERLYING MATERIAL	DEPTH TO PROBABLE BEDROCK (m) ³	EXCAV -ATION PROCE -DURE	TREATMENT OPTION AND DISCUSSION		RECOMMENDED TREATMENT
Hwy 537 High Fill Sta. 9+900 to 10+200	<u>Hwy 537</u>	1.0 - 10.0 m	0.0 - 18.0	Silt and sand layers extending to bedrock	1.2 - 32.6 (El. 190.6 - 221.7)	EE	1. Excavation of compressible soil 2. Preloading	Suitable treatment option Suitable from Sta. 9+900 to 9+925 where fill height is less than 3 m and subgrade soil is silty sand and sand to a depth of about 5 m; suitable treatment option from Sta. 9+925 to 10+100 within the limits of the proposed structure and adjacent embankments since preconsolidation of the area may be required to limit lateral movement along the alignment of the structure below the abutments induced by stress imposed by the embankment; possible treatment option from Sta. 10+100 to 10+200 since Hwy. 537 is a secondary highway and some settlement is tolerable	Preloading Wick drains could be installed from Sta. 9+925 to 10+100 within the limits of the proposed structure and approach fill embankments.
							3. Partial excavation/surcharge	Possible treatment option from Sta. 9+925 to 10+100 but will require backfilling with Granular B Type II to enable installation of piles to support structure.	
							4. Bridge	Possible treatment option from Sta. 9+925 to 10+100	
							5. Lightweight Fill	Not cost effective	
							6. Wick Drains	Possible treatment option from Sta. 9+925 to 10+100	

NOTES: (1) Fill height along centerline median provided in October 2004.
(2) Fill height along centerline median provided with the RFP documents.
(3) Depth to probable firm bottom and probable bedrock was based on borehole and dynamic core penetration test data.



TABLE 2
COMPUTED TOTAL SETTLEMENT OF EMBANKMENT SURFACE
FOR RECOMMENDED TREATMENT OPTIONS ^{(1) (2)}

COMPONENT OF HIGHWAY 69	RECOMMENDED TREATMENT OPTIONS	FILL HEIGHT (m)	ROCKFILL SETTLEMENT (mm)
Swamp 601 Twp of Burwash Sta. 11+786.5 to 12+236.5	Excavation of compressible soil	-0.8 (cut) - 9.8	0 - 110
Swamp 602 Twp of Burwash Sta. 12+586.5 to 12+966.5	Excavation of compressible soil	-5.8 (cut) - 3.3	5 - 85
----- Except Sta. 12+805 to 12+966	Partial excavation/surcharge or wick drains	-0.7 (cut) - 2.1	Refer to Table 3(b)
Swamp 603 Twp of Burwash Sta. 13+156.5 to 13+316.5	Excavation of compressible soil	0.5 - 16.0	5 - 45
Swamp 604 Twp of Burwash Sta. 13+526.5 to 13+686.5	Excavation of compressible soil	-2.0 (cut) - 10.9	0 - 35
Swamp 605 Twp of Burwash Sta. 14+086.5 to 14+506.5	Excavation of compressible soil	-1.1 (cut) - 11.2	0 - 65
----- Except Sta. 14+410 to 14+500 NBL Sta. 14+245 to 14+410 SBL	Partial excavation/surcharge or wick drains	2.6 - 11.8 9.6 - 11.3	Refer to Table 3(c) Refer to Table 3(c)
Swamp 606 Twp of Burwash Sta. 15+236.5 to 15+326.5	Excavation of compressible soil	-1.6 (cut) - 7.9	0 - 60
Swamp 607 Twp of Burwash Sta. 15+326.5 to 15+466.5	Excavation of compressible soil	0.8 - 10.5	5 - 55



TABLE 2
COMPUTED TOTAL SETTLEMENT OF EMBANKMENT SURFACE
FOR RECOMMENDED TREATMENT OPTIONS ⁽¹⁾ ⁽²⁾

COMPONENT OF HIGHWAY 69	RECOMMENDED TREATMENT OPTIONS	FILL HEIGHT (m)	ROCKFILL SETTLEMENT (mm)
Swamp 608 Twp of Burwash Sta. 16+406.5 to 16+906.5	Excavation of compressible soil	-3.8 (cut) - 13.6	0 - 40
High Fill 609 Twp of Burwash Sta. 17+646.5 to 17+966.5	Excavation of compressible soil	2.4 - 14.5	10 - 40
Swamp 610 Twp of Burwash Sta. 18+986.5 to 19+166.5	Excavation of compressible soil	1.2 - 4.3	5 - 75
Swamp 611 Twp of Burwash Sta. 19+586.5 to 19+886.5	Excavation of compressible soil	3.0 - 22.1	10 - 75
Swamp 612 Sta. 10+368.8 (Twp of Secord) to Sta. 10+108.0 (Twp of Dill)	DELETED FROM THIS STUDY		
High Fill 613 Twp of Dill Sta. 10+178.0 to 10+838.0	Excavation of compressible soil	-8.2 (cut) - 5.5	0 - 35
Except North side of Wanapitei River to Sta. 10+425 Sta. 10+425 to 10+780	Preloading Partial excavation/surcharge or wick drains	4.2 - 5.4 -2.3 (cut) - 4.8	Refer to Table 3(e) Refer to Table 3(e)
Swamp 101 Twp of Dill Sta. 10+908.0 to 11+308.0	Excavation of compressible soil	-16.5 (cut) - 7.0	0 - 120

NOTES: (1) Does not include settlement due to consolidation of subgrade material. Settlement is expected to be in the order of 20 to 40 mm and be completed within 2 to 4 months following placement of rockfill.
(2) Expected completion 5 to 10 years after placement of rockfill.

TABLE 3(a)
COMPUTED SETTLEMENT FOR SPECIFIC CROSSINGS
Swamp 601
NBL Sta. 11+786 to 12+080 / NBL Sta. 12+080 to 12+180

TREATMENT OPTION		SUBGRADE SOIL		ROCKFILL SETTLEMENT, mm	FUTURE SETTLEMENT, mm
		TOTAL SETTLEMENT, mm	TIME FOR CONSOLIDATION, Months		
Excavation to 'firm bottom'		-	-	-	75 / 110
Preloading	2 m	75 / 105	9 / 25	30 / 75	50 / 45
	4 m	75 / 105	7 / 22	25 / 65	55 / 55
	6 m	75 / 105	6 / 20	20 / 60	60 / 60
Partial excavation and surcharge		Not practical			
Wick drains		- / 105	- / 12	- / 50	- / 70

TABLE 3(b)
COMPUTED SETTLEMENT FOR SPECIFIC CROSSINGS

Swamp 602

NBL Sta. 12+655 to 12+720 / NBL Sta. 12+820 to 12+966 and SBL Sta. 12+805 to 12+966

TREATMENT OPTION		SUBGRADE SOIL		ROCKFILL SETTLEMENT, mm	FUTURE SETTLEMENT, mm
		TOTAL SETTLEMENT, mm	TIME FOR CONSOLIDATION, Months		
Excavation to 'firm bottom'		-	-	-	75 / -
Preloading	2 m	65 / 70	15 / 60	20 / 25	40 / 75
	4 m	65 / 70	12 / 40	15 / 20	45 / 80
	6 m	65 / 70	10 / 30	10 / 15	50 / 85
Partial excavation (to 12 m) and surcharge (2m)		- / 25	- / 10	- / 120	- / 180
Wick drains		65 / 70	12 / 12	15 / 15	45 / 90

TABLE 3(c)
COMPUTED SETTLEMENT FOR SPECIFIC CROSSINGS
Swamp 605
NBL Sta. 14+280 to 14+506 / SBL Sta. 14+245 to 14+410

TREATMENT OPTION		SUBGRADE SOIL		ROCKFILL SETTLEMENT, mm	FUTURE SETTLEMENT, mm
		TOTAL SETTLEMENT, mm	TIME FOR CONSOLIDATION, Months		
Excavation to 'firm bottom'		-	-	-	- / 150
Preloading	2 m	170 / 150	70 / 50	90 / 75	40 / 30
	4 m	170 / 150	50 / 40	75 / 65	55 / 40
	6 m	170 / 150	30 / 30	60 / 55	70 / 50
Partial excavation (to 12 m) and surcharge (2m)		50 / -	3 / -	70 / -	250 / -
Wick drains		170 / 150	12 / 12	50 / 50	120 / 105

TABLE 3(d)
COMPUTED SETTLEMENT FOR SPECIFIC CROSSINGS
Swamp 610
Both NBL and SBL

TREATMENT OPTION		SUBGRADE SOIL		ROCKFILL SETTLEMENT, mm	FUTURE SETTLEMENT, mm
		TOTAL SETTLEMENT, mm	TIME FOR CONSOLIDATION, Months		
Excavation to 'firm bottom'		-	-	-	75
Preloading	2 m	80	20	20	30
	4 m	80	15	15	35
	6 m	80	12	10	40
Partial excavation (to 12 m) and surcharge (2m)		Not practical			
Wick drains		80	12	10	40

TABLE 3(e)
COMPUTED SETTLEMENT FOR SPECIFIC CROSSINGS
 High Fill 613
 Both NBL and SBL - Sta. 10+350 to 10+838

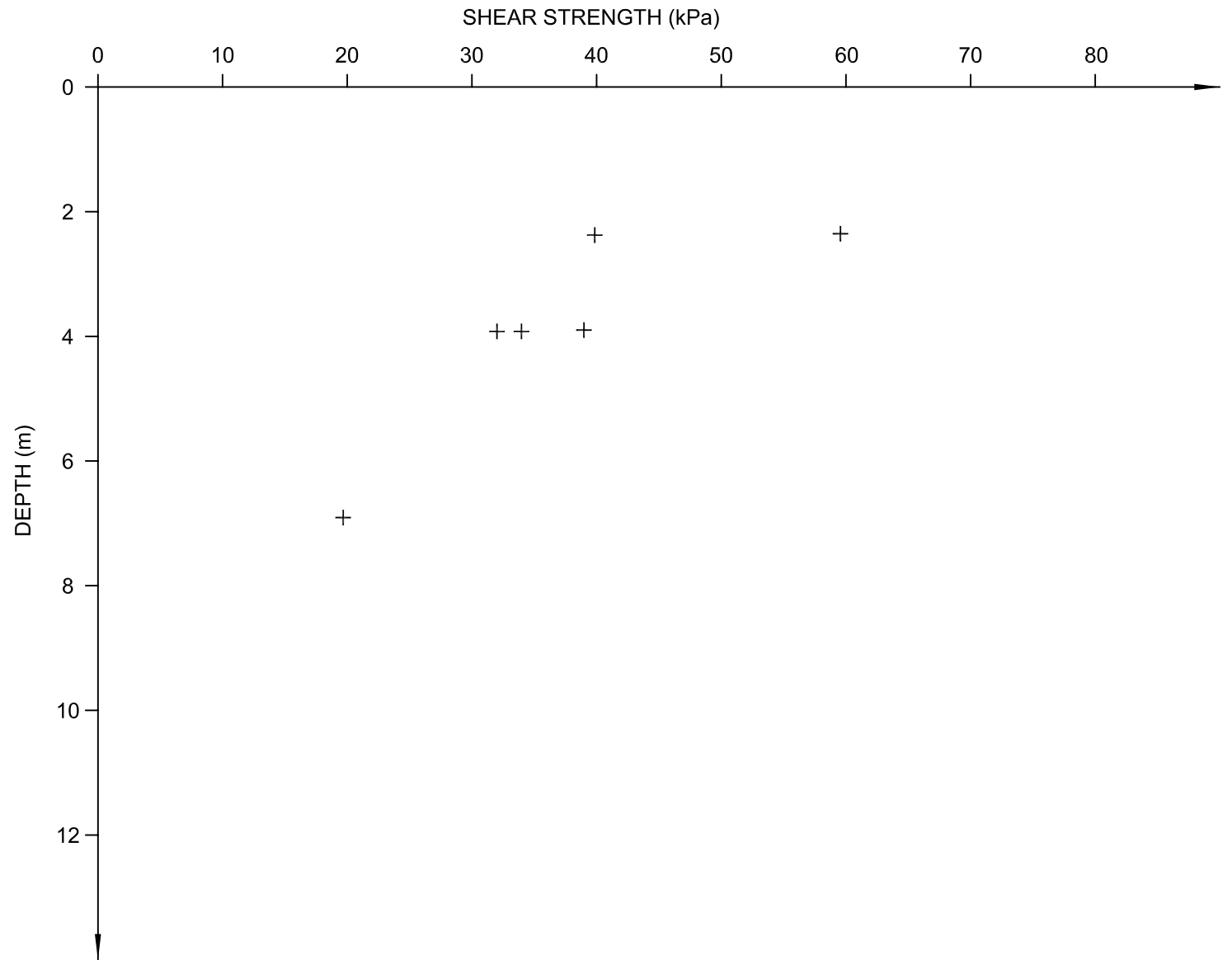
TREATMENT OPTION		SUBGRADE SOIL		ROCKFILL SETTLEMENT, mm	FUTURE SETTLEMENT, mm
		TOTAL SETTLEMENT, mm	TIME FOR CONSOLIDATION, Months		
Excavation to 'firm bottom'		-	-	-	-
Preloading	2 m	150	90	20	80
	4 m	150	70	15	85
	6 m	150	60	10	90
Partial excavation (to 12 m) and surcharge (2m)		20	3	50	240
Wick drains		150	12	10	90

TABLE 3(f)
COMPUTED SETTLEMENT FOR SPECIFIC CROSSINGS
Swamp 101
NBL / SBL

TREATMENT OPTION		SUBGRADE SOIL		ROCKFILL SETTLEMENT, mm	FUTURE SETTLEMENT, mm
		TOTAL SETTLEMENT, mm	TIME FOR CONSOLIDATION, Months		
Excavation to 'firm bottom'		-	-	-	110 / 120
Preloading	2 m	60 / 25	12 / 6	50 / 50	80 / 125
	4 m	60 / 25	10 / 5	40 / 40	90 / 135
	6 m	60 / 25	9 / 4	35 / 35	95 / 140
Partial excavation and surcharge		Not practical			
Wick drains		Not practical			

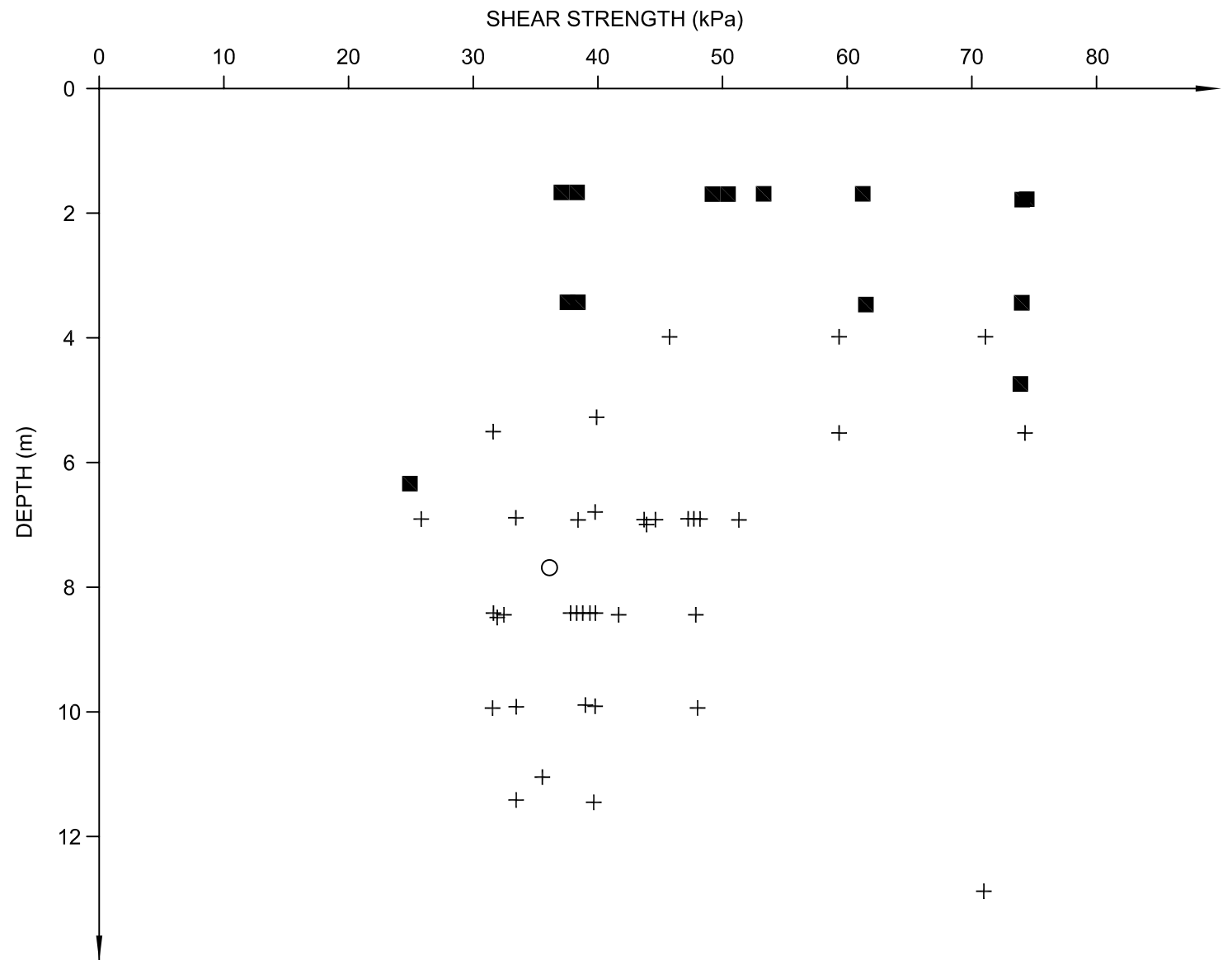
TABLE 3(g)
COMPUTED SETTLEMENT FOR SPECIFIC CROSSINGS
 High Fill 537

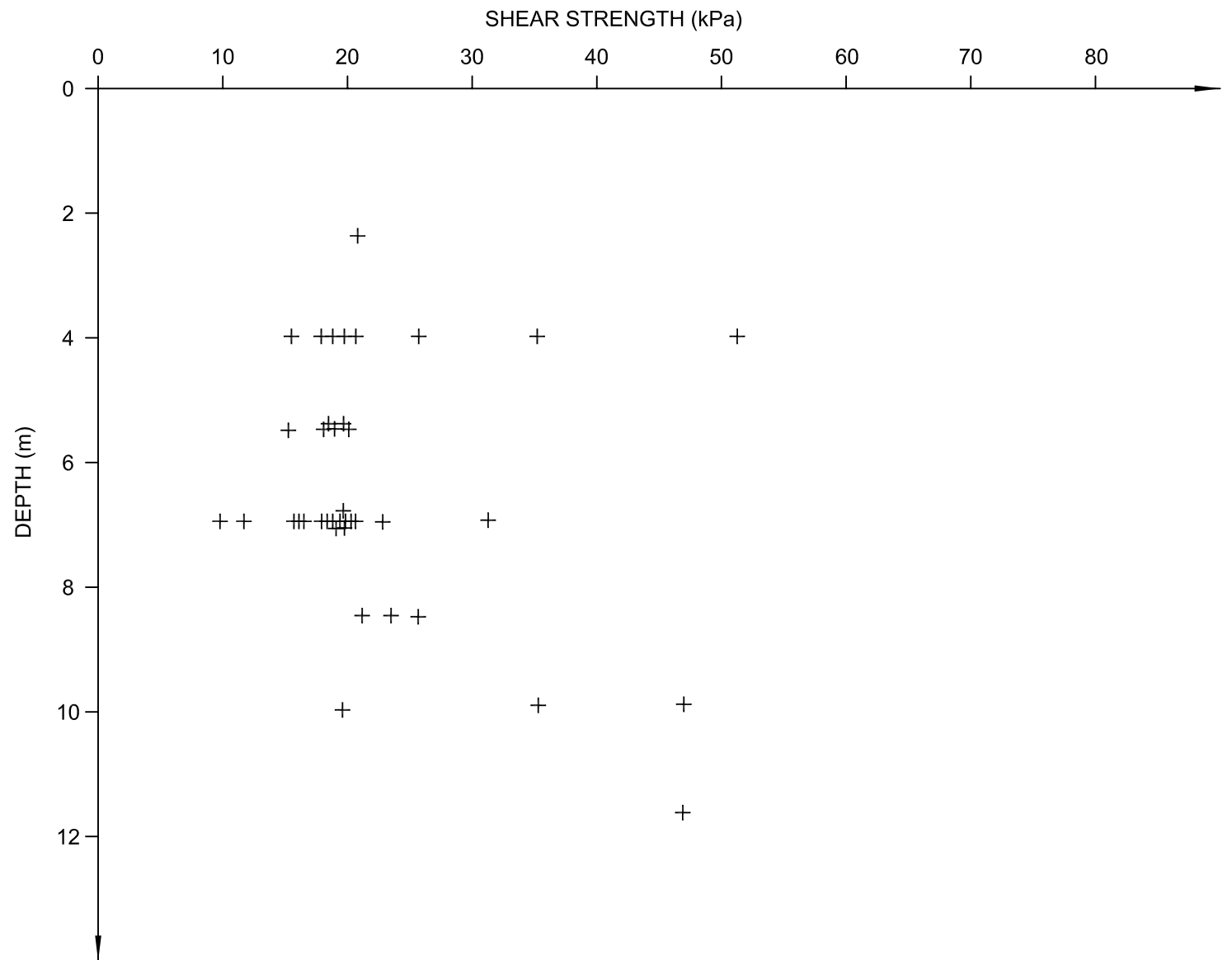
TREATMENT OPTION		SUBGRADE SOIL		ROCKFILL SETTLEMENT, mm	FUTURE SETTLEMENT, mm
		TOTAL SETTLEMENT, mm	TIME FOR CONSOLIDATION, Months		
Excavation to 'firm bottom'		-	-	-	-
Preloading	2 m	180	50	45	30
	4 m	180	40	40	35
	6 m	180	30	35	40
Partial excavation (to 12 m) and surcharge (2m)		85	22	175	140
Wick drains		180	12	25	80



LEGEND:

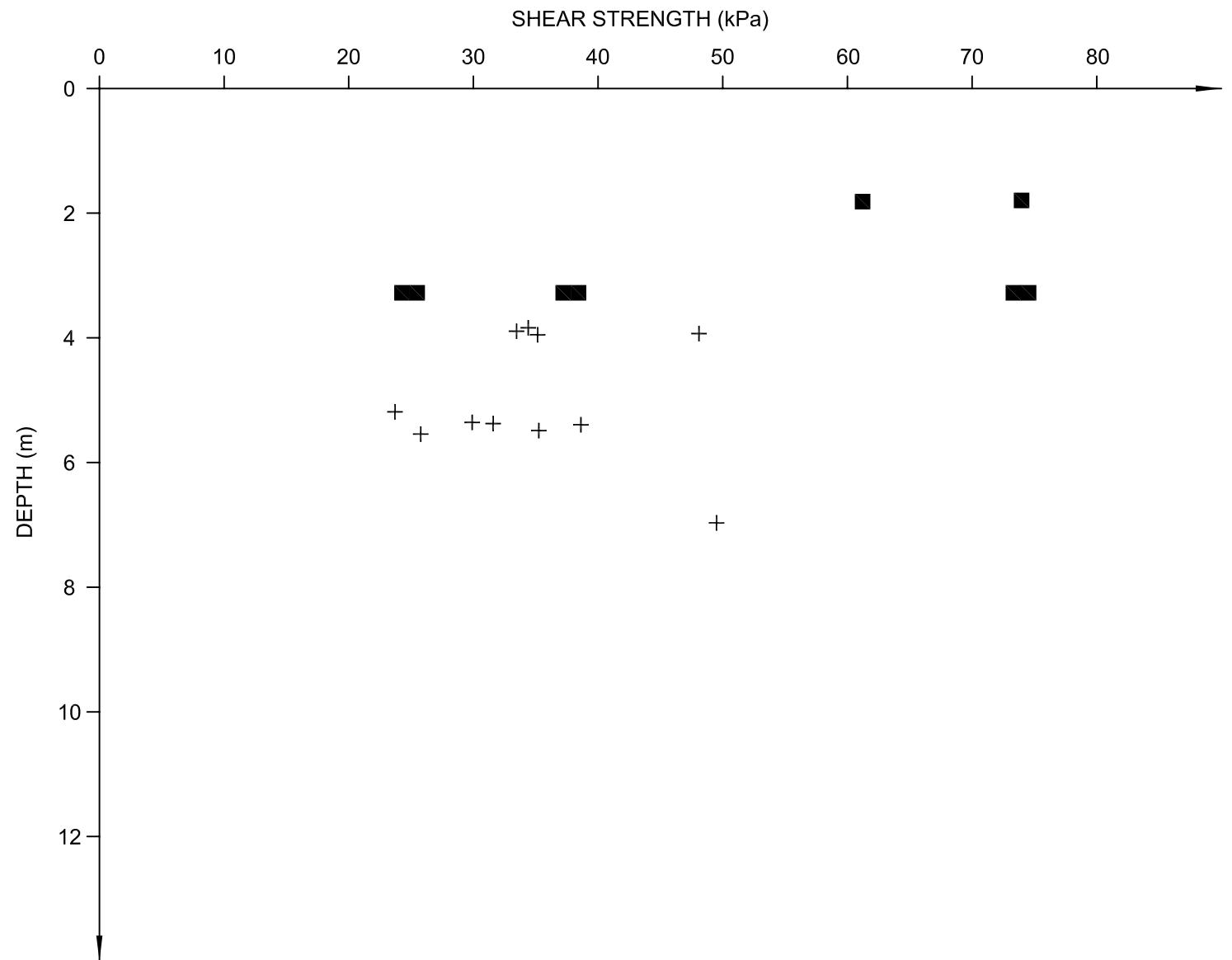
+ Field Vane

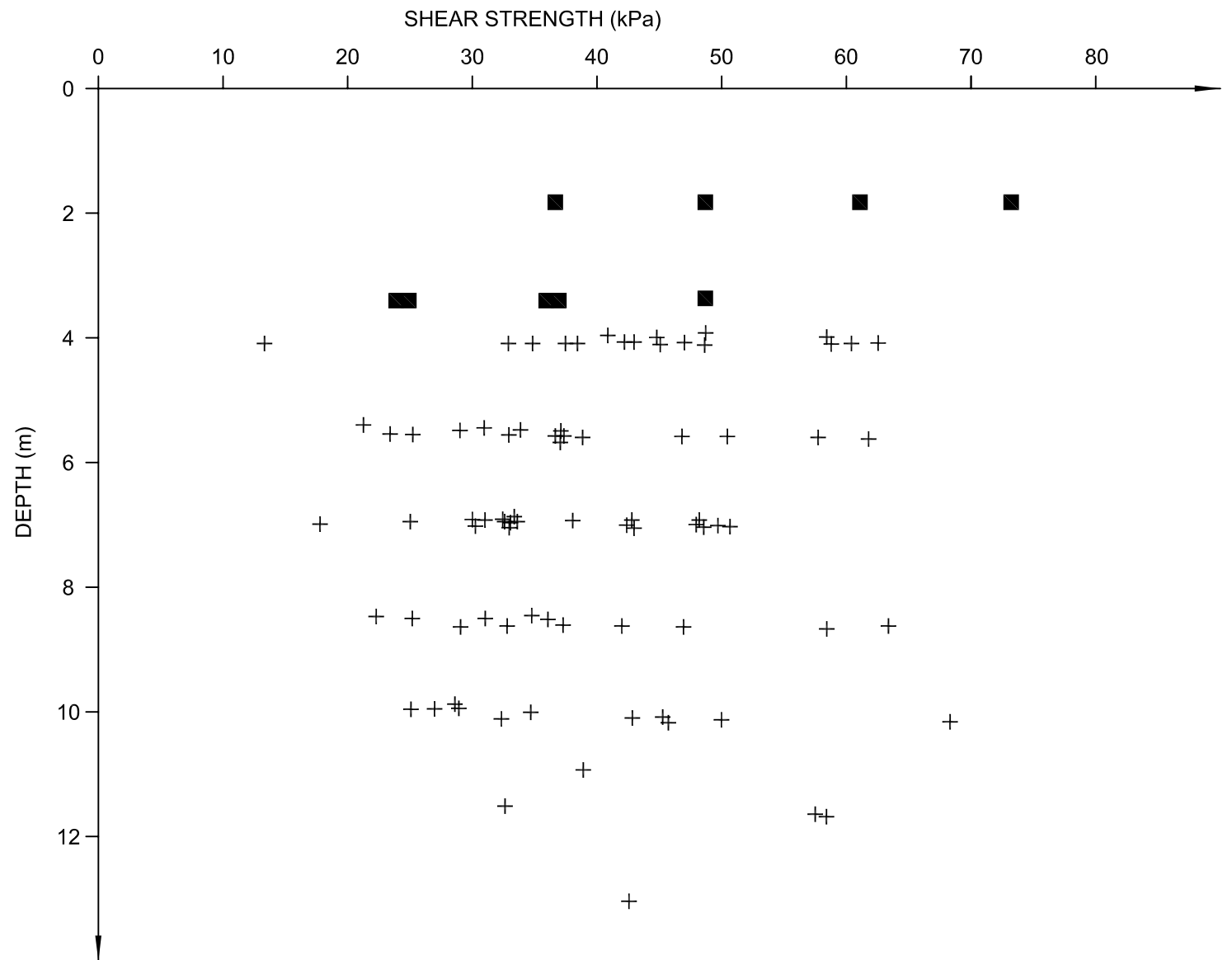




LEGEND:

+ Field Vane





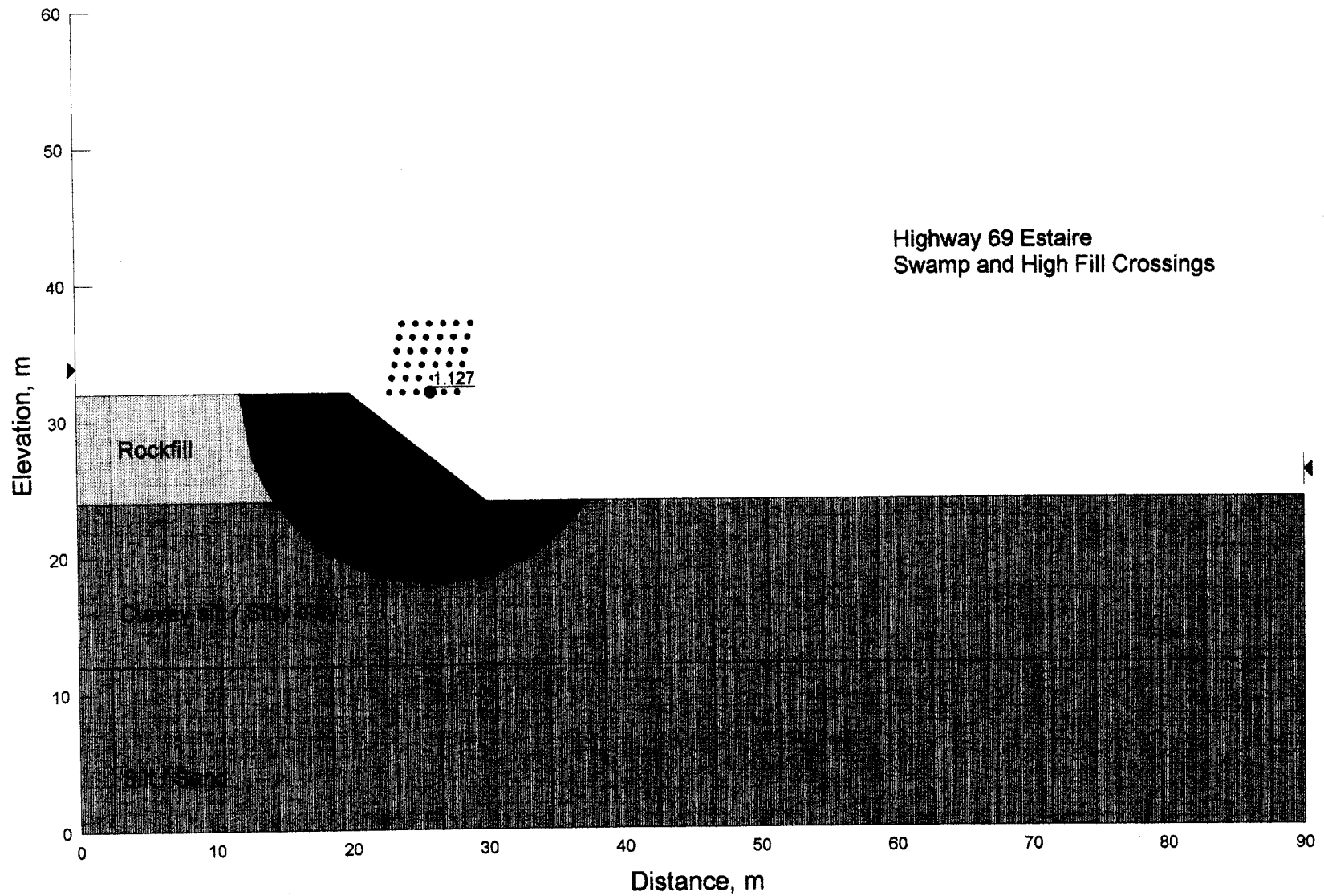


FIGURE 6. Results of Stability Analysis (8 m high embankment; 1.25H:1V; $\phi = 5^\circ$)

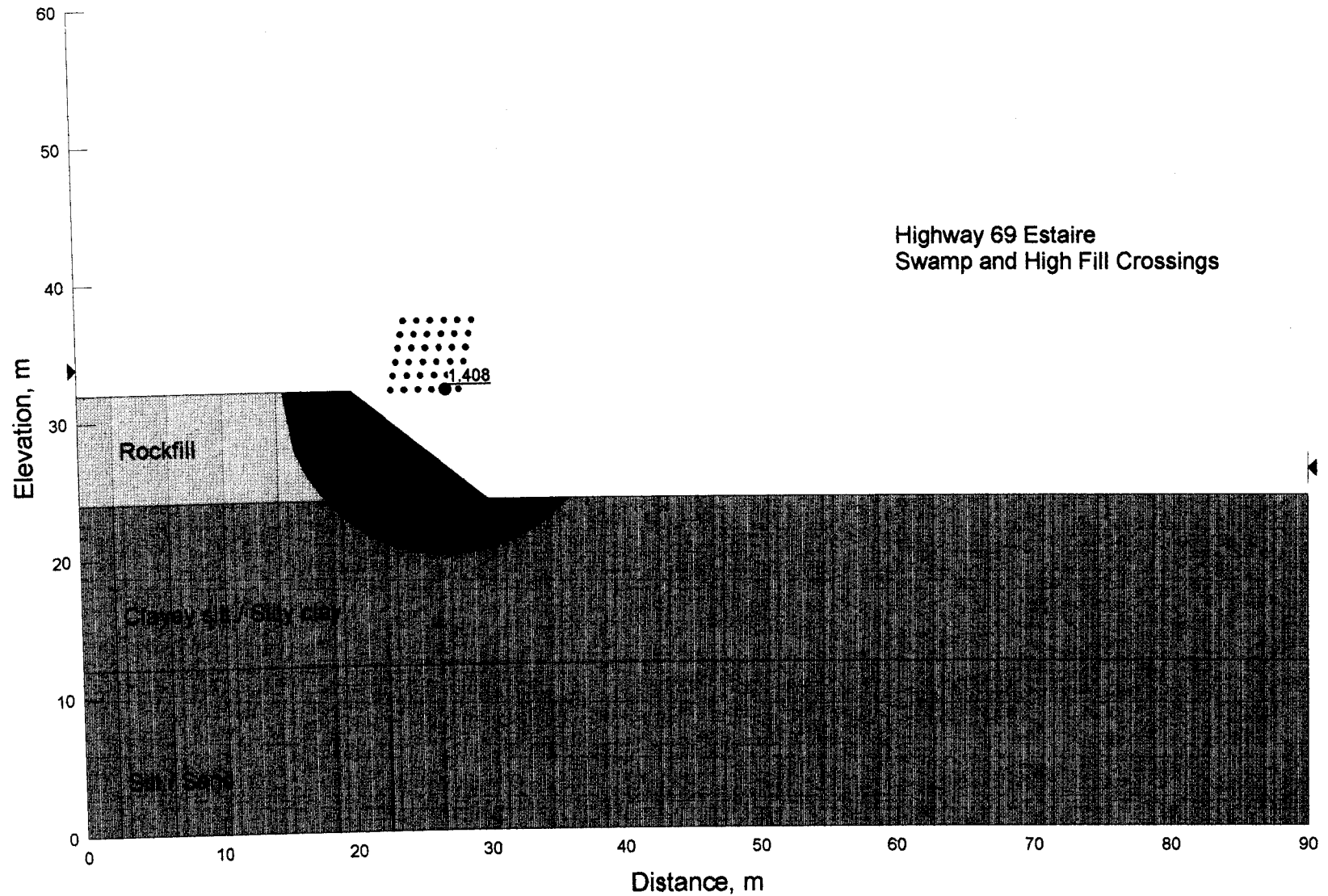


FIGURE 7. Results of Stability Analysis (8 m high embankment; 1.25H:1V; $\phi = 10^\circ$)

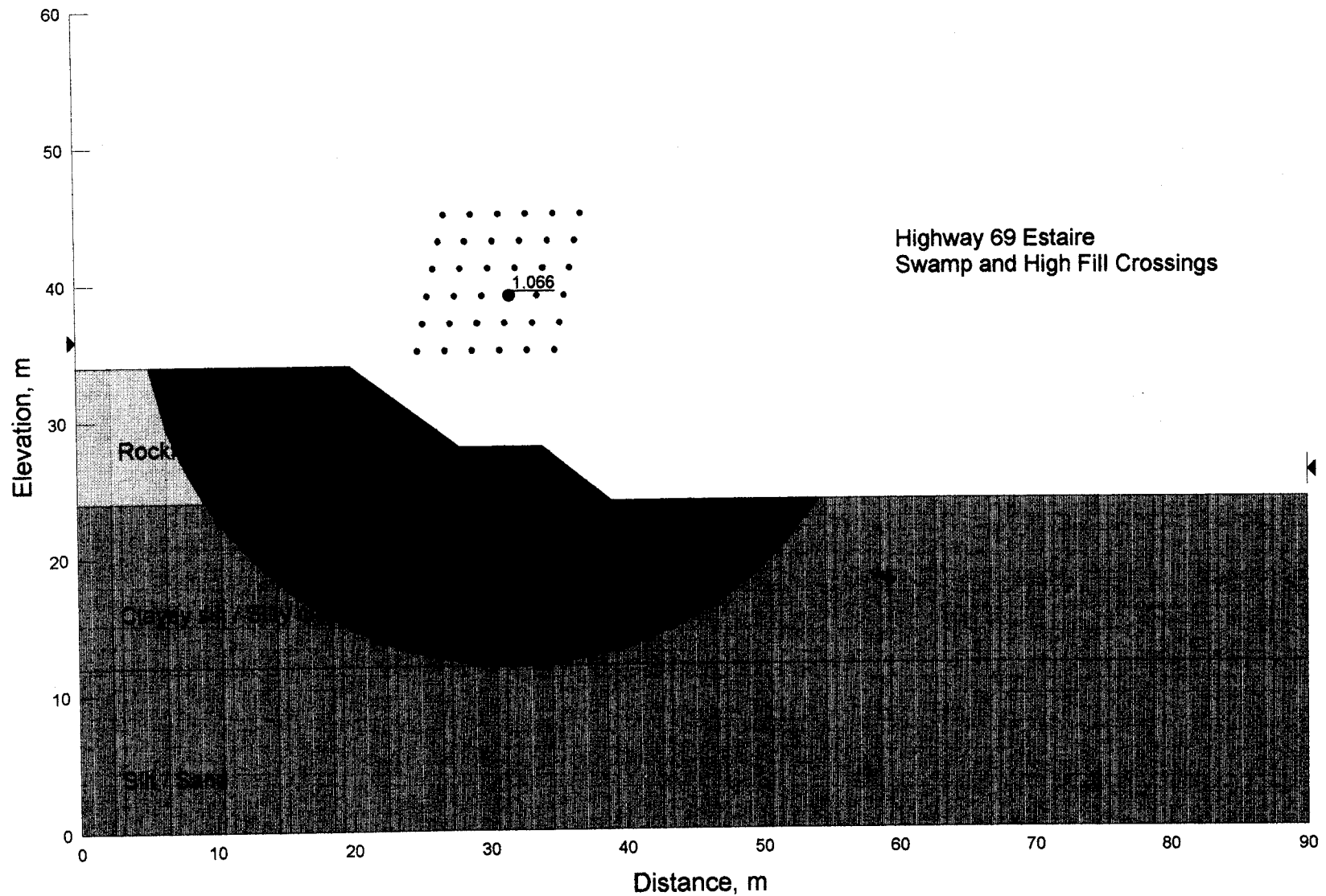


FIGURE 8. Results of Stability Analysis (10 m high embankment with a stabilizing berm; 1.25H:1V; $\phi = 5^\circ$)

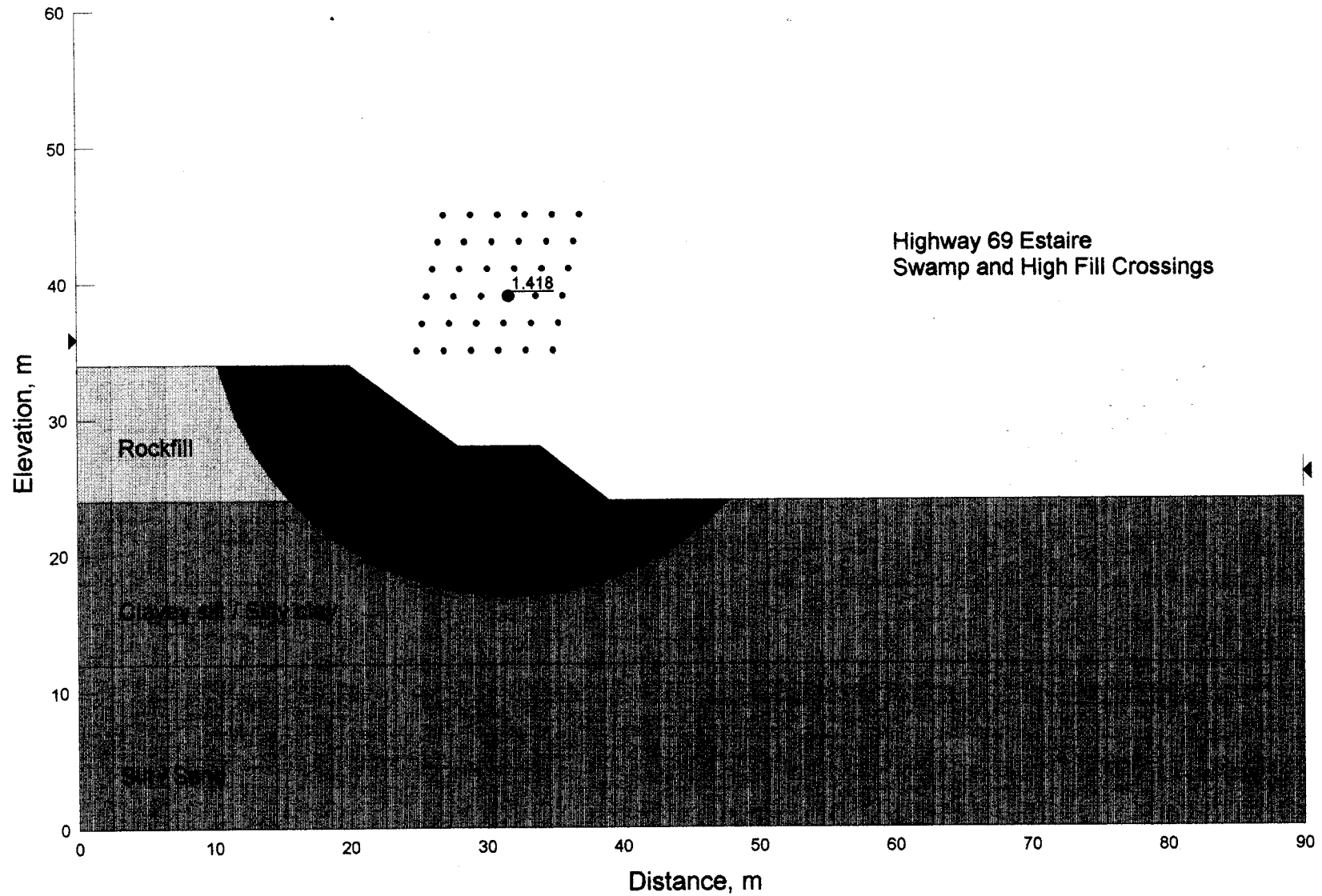


FIGURE 9. Results of Stability Analysis (10 m high embankment with a stabilizing berm; 1.25H:1V; $\phi = 10^\circ$)

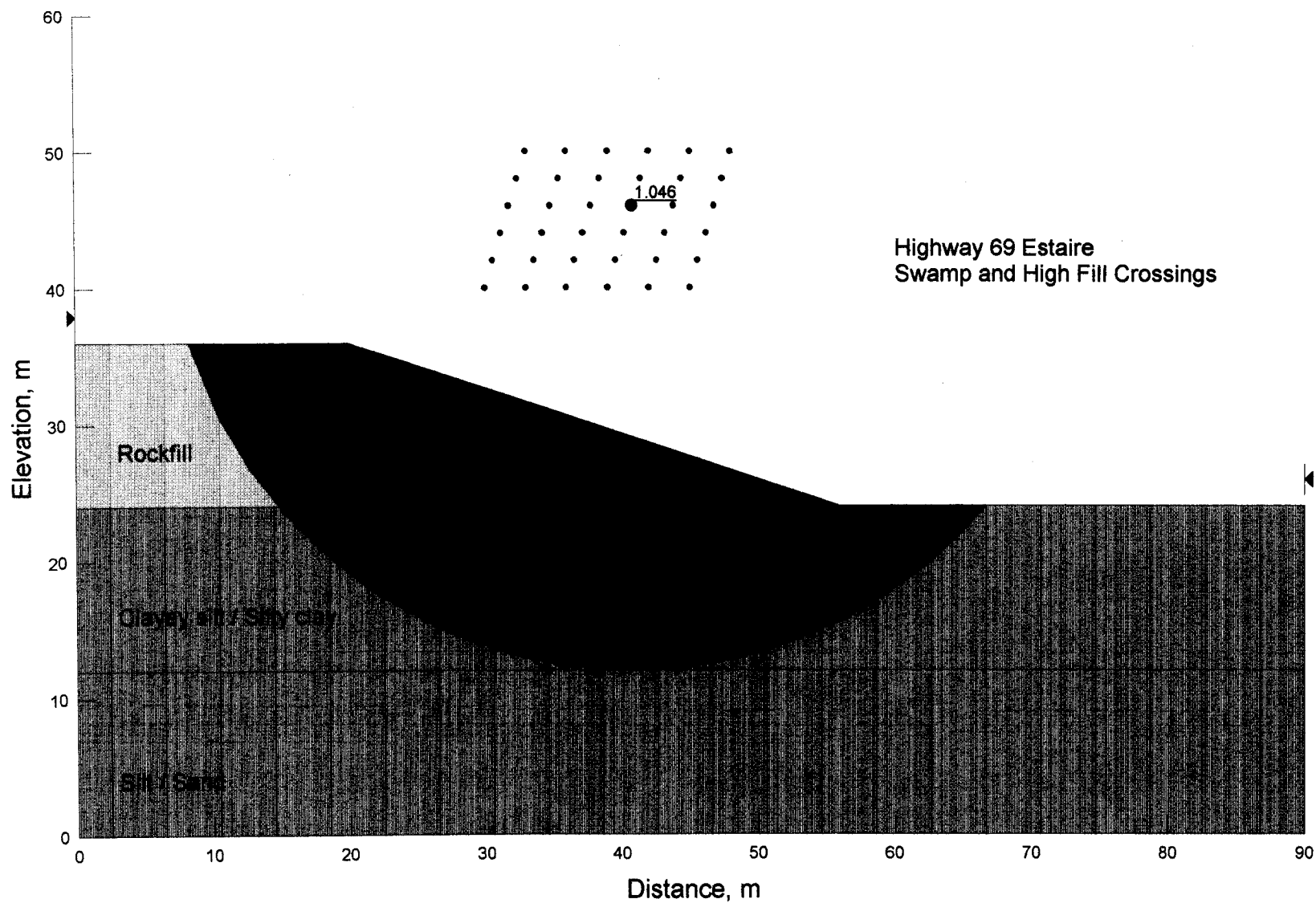


FIGURE 10. Results of Stability Analysis (12 m high embankment; 3H:1V; $\phi = 5^\circ$)

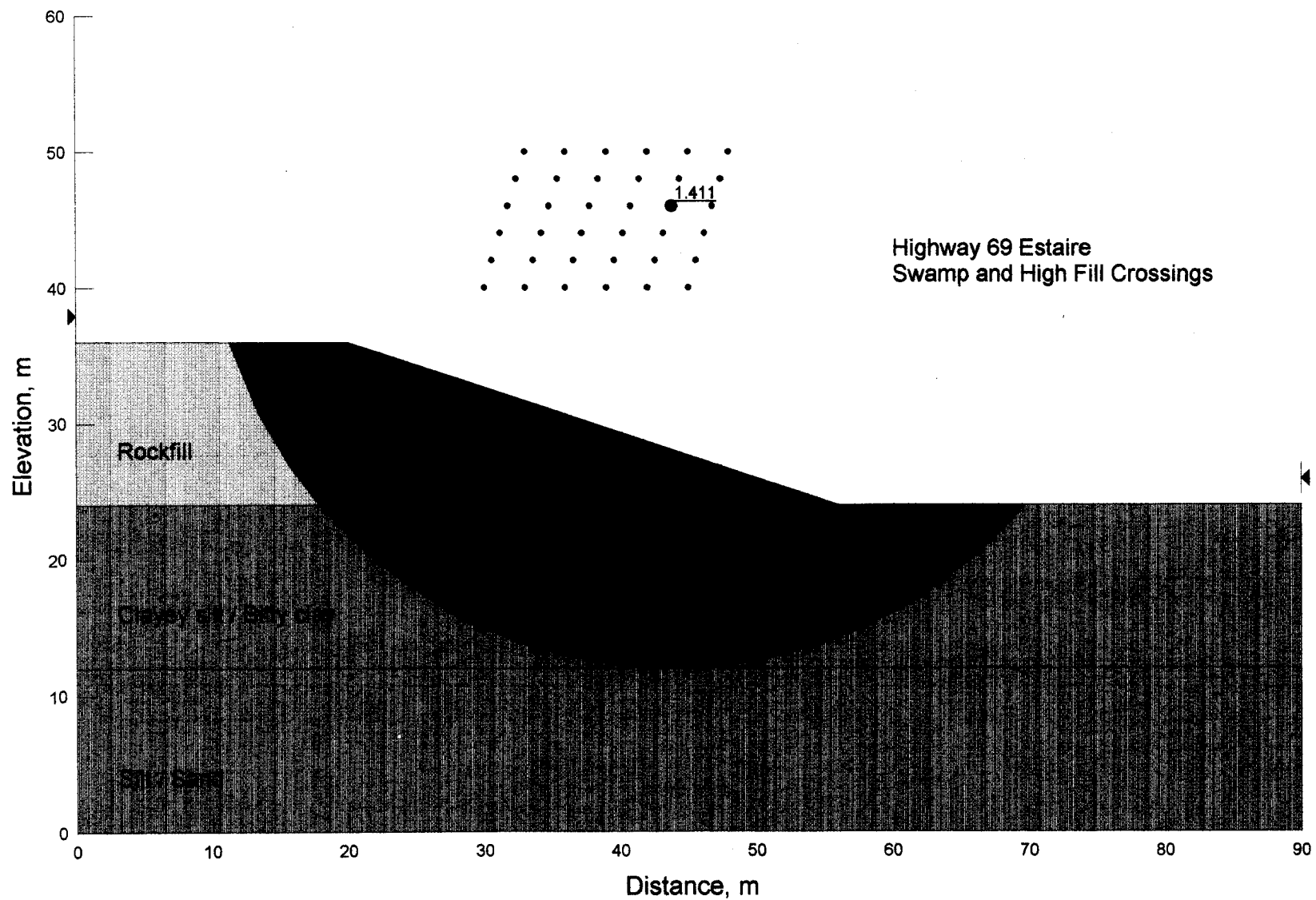
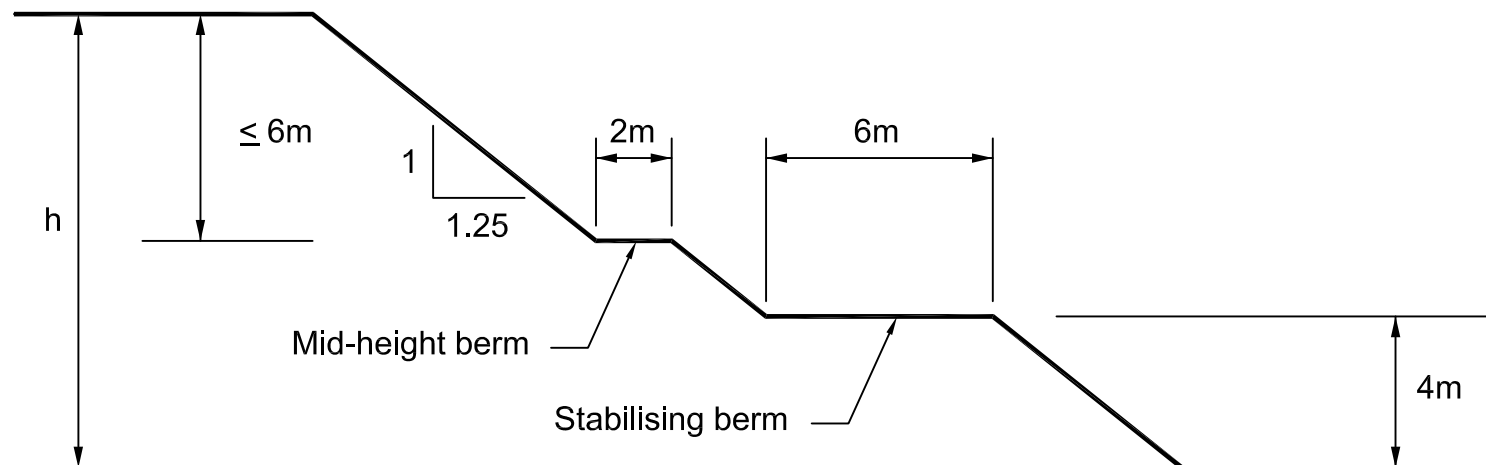


FIGURE 11. Results of Stability Analysis (12 m high embankment; 3H:1V; $\phi = 10^\circ$)

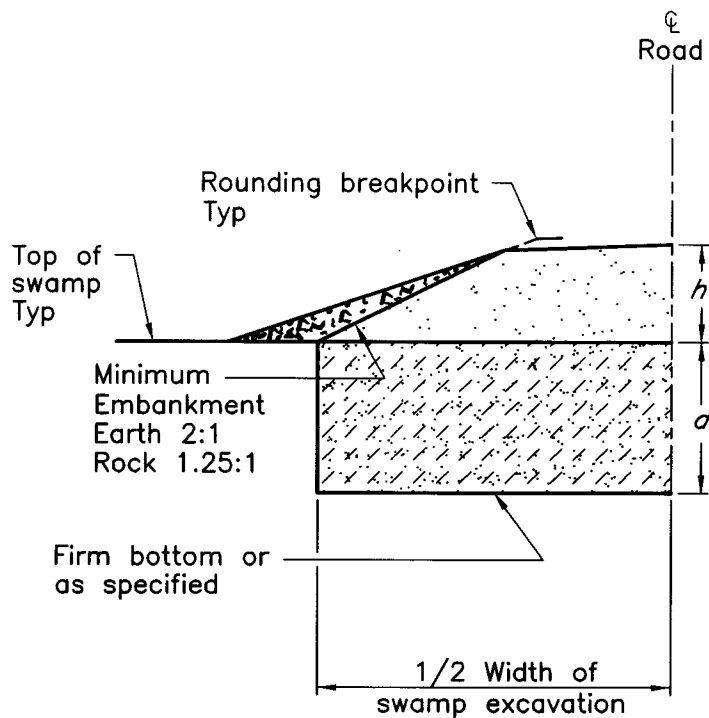


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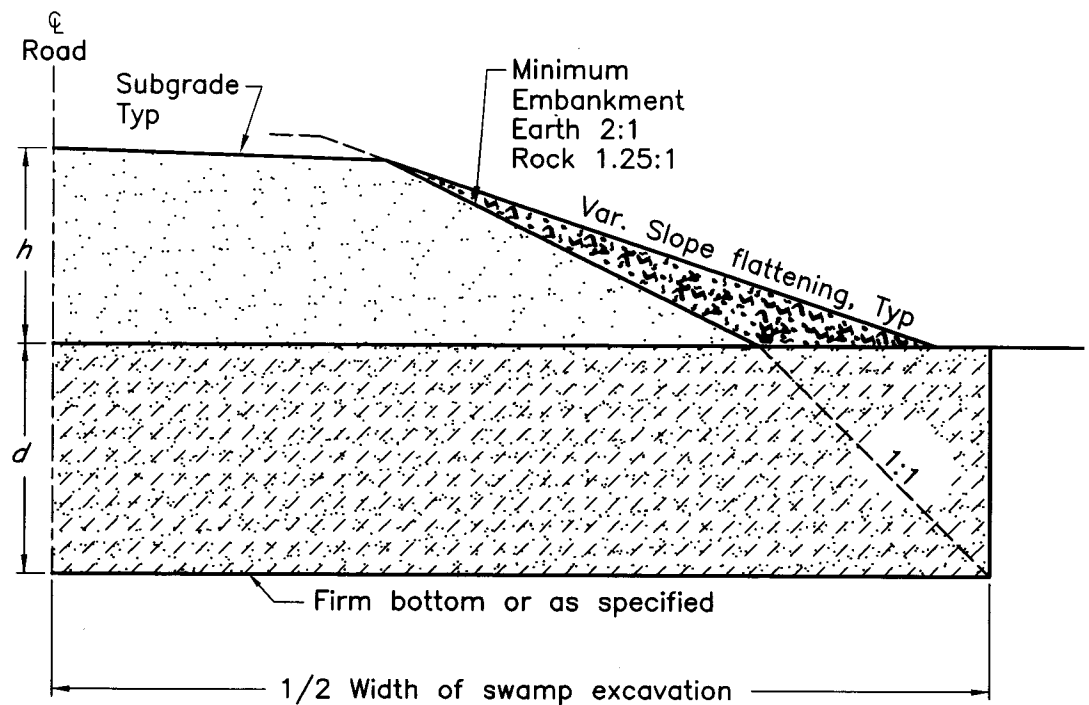
h - Height of embankment

NOTE:

2m wide mid-height berm required for $h > 10\text{m}$



Where:
 $h \leq 1.5\text{m}$
 $d \leq 3.0\text{m}$



Where:
 $h \leq 3.0\text{m}$
 $d \leq 6.0\text{m}$

NOTES:

- For given limits of height h and depth d , both requirements must be met in order to apply.
- Height of fill is the vertical difference between top of subgrade and top of swamp elevation measured at new road centreline.
- For divided roads with median < 10 metres, excavate swamp material full width.
- For divided roads with median ≥ 10 metres, excavate swamp material to limits shown.
- All dimensions are in millimetres or metres unless otherwise shown.

LEGEND:

- | | |
|--|-----------------------------------|
| | Embankment materials as specified |
| | Excavated swamp material |
| | Excavate and backfill |

h - Height of fill
 d - Depth of swamp

ONTARIO PROVINCIAL STANDARD DRAWING

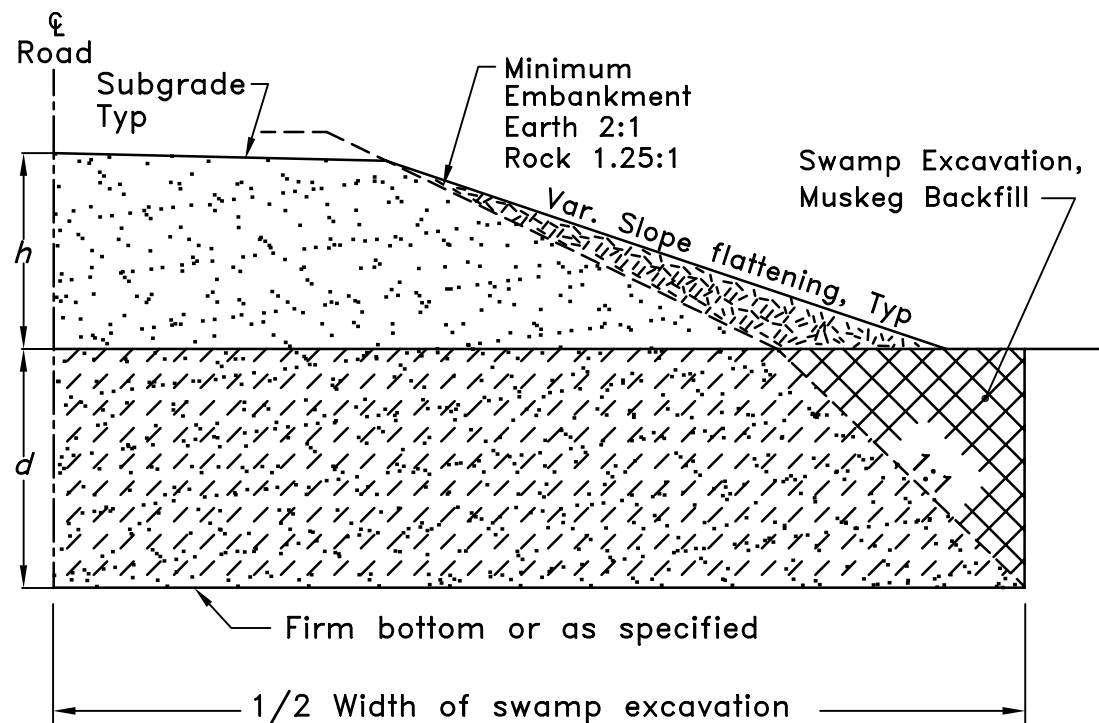
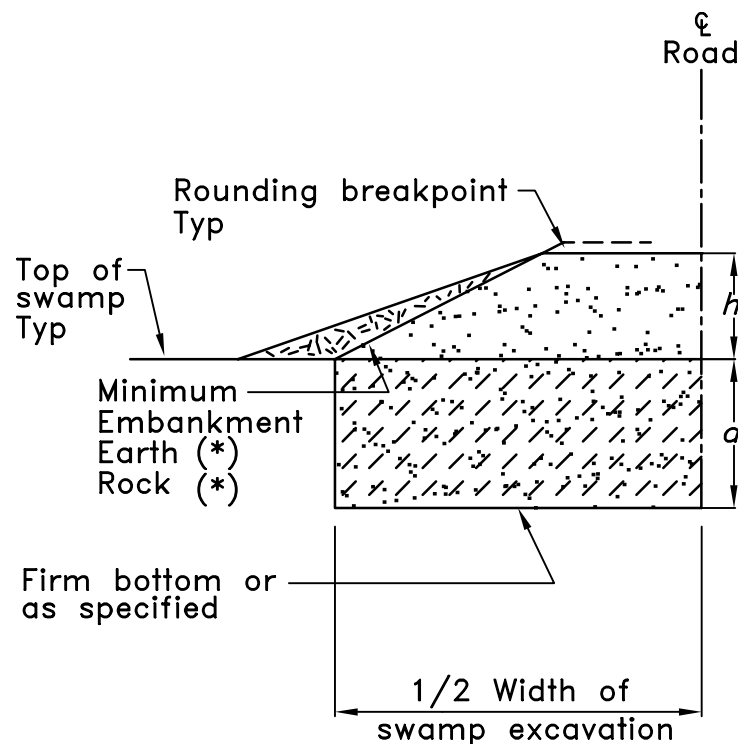
EMBANKMENTS OVER SWAMP NEW CONSTRUCTION

1998 03 01

Rev



OPSD - 203.010



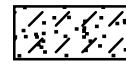
LEGEND:



Embankment Materials as specified



Excavated Swamp material



Excavate and backfill with rock



Excavate and backfill with muskeg

h - Height of fill

d - Depth of swamp

NOTES:

- For given limits of height h and depth d , both requirements must be met in order to apply.
- Height of fill is the vertical difference between top of subgrade and top of swamp elevation measured at new road centreline.
- For divided roads with median < 10 metres, excavate swamp material full width.
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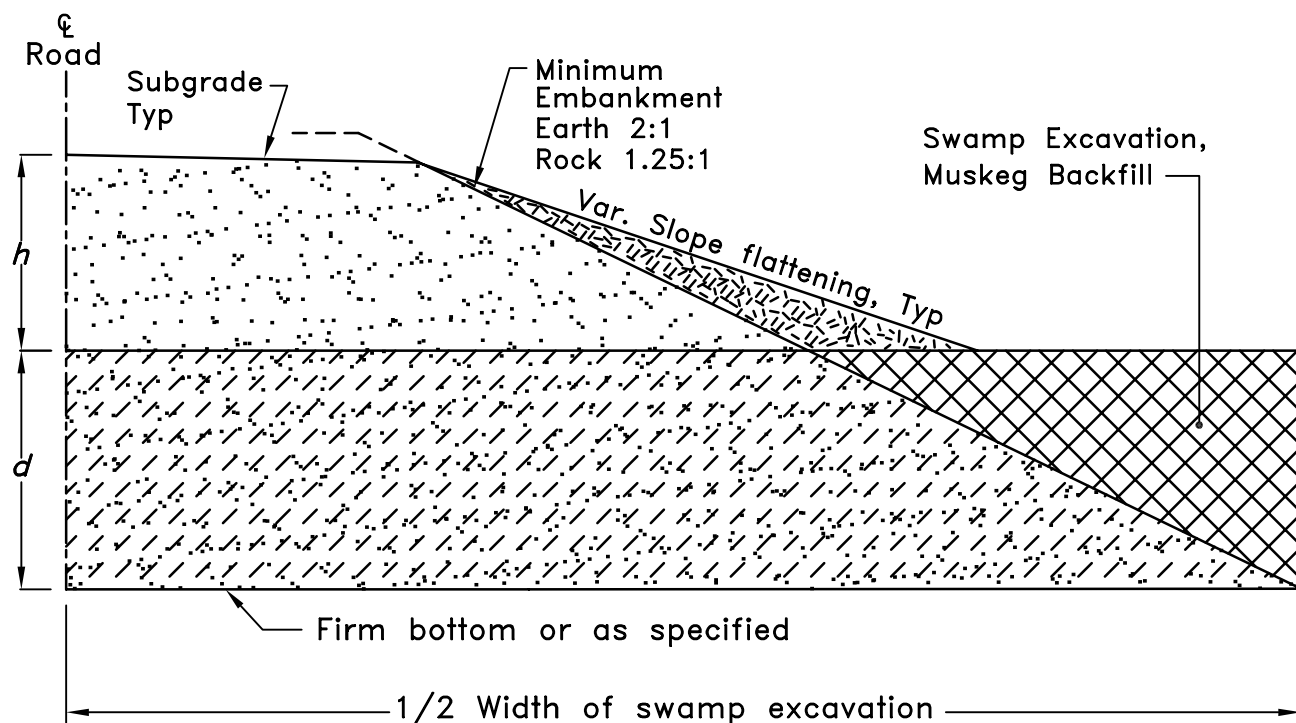
ONTARIO PROVINCIAL STANDARD DRAWING

1998 03 01 Rev

EMBANKMENTS OVER SWAMP
NEW CONSTRUCTION

OPSD-203.010 M1







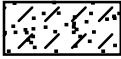

Where:
 $h \leq 3.0\text{m}$
 $d \geq 6.0\text{m}$

h - Height of fill
 d - Depth of swamp

NOTES:

- A For given limits of height h and depth d , both requirements must be met in order to apply.
- B Height of fill is the vertical difference between top of subgrade and top of swamp elevation measured at new road centreline.
- C For divided roads with median < 10 metres, excavate swamp material full width.
- D For divided roads with median ≥ 10 metres, excavate swamp material to limits shown.
- E All dimensions are in millimetres or metres unless otherwise shown.

LEGEND:

-  Embankment Materials as specified
-  Excavated Swamp material
-  Excavate and backfill with rock
-  Excavate and backfill with muskeg

ONTARIO PROVINCIAL STANDARD DRAWING

1998 03 01 Rev

EMBANKMENTS OVER SWAMP
 NEW CONSTRUCTION

OPSD-203.010 M2



FOUNDATION INVESTIGATION REPORT
SWAMP AND HIGH FILL CROSSINGS
for
HIGHWAY 69 FOUR-LANING
FROM 4 KM SOUTH OF ESTAIRE TO 1 KM NORTH OF HIGHWAY 537
G.W.P. 312-99-00
DISTRICT 54, TOWNSHIPS OF BURWASH, SECORD AND DILL
SUDBURY, ONTARIO

VOLUME 2

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PML Ref.: 03TF013
Index No.: 124FIR
Geocres No.: 41I-174
November 17, 2004

FOUNDATION INVESTIGATION REPORT
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November 17, 2004



VOLUME 2

APPENDIX C

Explanation of Terms Used in Report

Record of Borehole Sheets: Swamps 601 to 604

Record of Penetration Test Sheets: Swamps 601 to 604

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 (RQD), 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

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
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	e	1, %	VOID RATIO	e_{\min}	1, %	VOID RATIO IN DENSEST STATE
γ_s	kN/m^3	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	I_D	1	DENSITY INDEX = $\frac{e_{\max} - e}{e_{\max} - e_{\min}}$
ρ_w	kg/m^3	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
γ_w	kN/m^3	UNIT WEIGHT OF WATER	S_r	%	DEGREE OF SATURATION	D_n	mm	n PERCENT - DIAMETER
ρ	kg/m^3	DENSITY OF SOIL	w_L	%	LIQUID LIMIT	C_u	1	UNIFORMITY COEFFICIENT
γ	kN/m^3	UNIT WEIGHT OF SOIL	w_p	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
ρ_d	kg/m^3	DENSITY OF DRY SOIL	w_s	%	SHRINKAGE LIMIT	q	m^3/s	RATE OF DISCHARGE
γ_d	kN/m^3	UNIT WEIGHT OF DRY SOIL	I_p	%	PLASTICITY INDEX = $w_L - w_p$	v	m/s	DISCHARGE VELOCITY
ρ_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_L	1	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$	i	1	HYDRAULIC GRADIENT
γ_{sat}	kN/m^3	UNIT WEIGHT OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$	k	m/s	HYDRAULIC CONDUCTIVITY
ρ'	kg/m^3	DENSITY OF SUBMERGED SOIL	e_{\max}	1, %	VOID RATIO IN LOOSEST STATE	j	kN/m^2	SEEPAGE FORCE
γ'	kN/m^3	UNIT WEIGHT OF SUBMERGED SOIL						

RECORD OF BOREHOLE No 601-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+825, o/s 21m Lt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
225.1	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous Dark brown		1	SS	1		225													
224.1							224													
1.0	Sand, trace silt trace clay Loose Brown Moist		2	SS	8		223													
222.5																				
2.6	End of borehole Refusal on probable bedrock * 2003 03 17 Water level observed during drilling Water level measured after drilling																			

RECORD OF BOREHOLE No 601-2M

1 of 2

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 11+925, o/s 16.4m Lt. Burwash Twp.
Hwy 69 Sta. 11+925, CL Med. Burwash Twp.

ORIGINATED BY CB

DIST 54 HWY 69

BOREHOLE TYPE

C.F.H.S.A. & Dynamic Cone Penetration Test

COMPILED BY PC

DATUM Geodetic

DATE

March 17, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)	
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE							× LAB VANE
223.7	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	6	▼* ▼*											
0.3	Dark brown																
	Sand, trace silt trace clay																
	Loose Brown Moist																
	Grey		2	SS	9												
221.0	Silty clay, trace sand																
2.7	Firm Grey Wet		3	SS	1												
219.5	Sandy silt trace clay																
4.2	Loose Grey Wet		4	SS	5												
			5	SS	8												
	Compact		6	SS	14												
214.7	End of borehole**																
9.0																	
209.3	End of dynamic cone penetration test Cont'd																
14.4																	

RECORD OF BOREHOLE No 601-2M

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+925, o/s 16.4m Lt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
208.7	Cont'd Refusal on probable bedrock																
	* 2003 03 17																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																
	** Sand backed-up to 5.5m from 9.0m depth inside augers																

RECORD OF BOREHOLE No 601-3M

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 11+975, o/s 14.1m Lt. Burwash Twp.
Hwy 69 Sta. 11+975, CL Med. Burwash Twp.

ORIGINATED BY CB

DIST 54 HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers





COMPILED BY PC

DATUM Geodetic

DATE

March 16, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	W _p	W	W _L			
222.8	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	16		222										
222.2	Dark brown						221										
0.6	Sandy silt trace clay						220										
	Very loose Grey Moist		2	SS	2		219										
	Wet		3	SS	1		218										
218.9	Silty sand trace clay						217										
3.9	Loose Grey Wet		4	SS	7		216										
217.7	Silt, trace sand trace clay																
5.1	Loose Grey Wet		5	SS	8												
215.5	End of borehole																
7.3	Refusal on probable bedrock																
	* 2003 03 16																
	 Water level observed during drilling																
	 Water level measured after drilling																

1 of 1 METRIC


















(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 601-5M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+075, o/s 9.4m Lt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 15, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE							
222.5	Ground Surface						20	40	60	80	100							
0.0	Peat, fine fibrous Dark brown		1	SS	4	4*	222									692		
							221											218
			2	SS	WR**		220											
219.8							219											
2.7	Sand, coarse trace silt trace clay Very loose Grey Wet		3	SS	WR		218											
							217											
							216											
							215											
			4	SS	3		214											
4.8	Silt, trace sand trace clay Loose Grey Wet to compact						213											
																		
			5	SS	8													
																		
			6	SS	8													
																		
212.9			7	SS	11													
9.6	End of borehole																	

* 2003 03 15

▽ Water level observed
during drilling

▽ Water level measured
after drilling

WR** Refers to penetration
under the weight of
rods only

1 of 2 **METRIC**

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 601-6M

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+125, o/s 7m Lt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 13, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
207.5	Cont'd													
207														
206														
205														
204														
203														
202														
201.4 21.1	End of dynamic cone penetration test Refusal on probable bedrock								120/10cm					

RECORD OF BOREHOLE No 601-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+800, o/s 4.2m Lt. Burwash Twp. ORIGINATED BY MR/PC
DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
226.3	Ground Surface																
0.0	Peat, fine fibrous																
	Dark brown																
0.1	Silty sand, fine																
	Compact Brown Moist																
	Dry																

RECORD OF BOREHOLE No 601-1NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+800, o/s 17.9m Rt Burwash Twp. ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY F.P.
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR SA SI CL			
225.5 0.0	Ground Surface Sand trace silt trace gravel trace organics with cobbles Loose Brown Moist	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div><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METRIC

G.W.P. <u>312-99-00</u>	LOCATION <u>New Hwy 69 Sta. 11+825, o/s 31m Rt Burwash Twp. Hwy 69 Sta. 11+825, o/s 52m Rt Burwash Twp.</u>	ORIGINATED BY <u>F.P.</u>
DIST <u>54</u> HWY <u>69</u>	BOREHOLE TYPE <u>Continuous Flight Hollow Stem Augers</u>	COMPILED BY <u>F.P.</u>
DATUM <u>Geodetic</u>	DATE <u>April 13, 2004</u>	CHECKED BY _____

[illegible]

RECORD OF BOREHOLE No 601-2NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+825, o/s 2.5m Lt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
225.5 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 601-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+850, o/s 1.3m Lt. Burwash Twp ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE LIQUID LIMIT LIMIT CONTENT LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)										
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					w _p w w _L										
223.7	Ground Surface							20	40	60	80	100											
0.0	Peat, fine fibrous Dark brown		1	SS	1		223										279						
222.5																							
1.2	Sand, trace silt trace clay Loose Brown Moist		2	SS	7			222								○							
	_____								221														
	Dense Wet									220									○				
			3	SS	33						219												
												218											
	with silt _____																						
	Loose		4	SS	9															○			
217.8																							
5.9	End of borehole Refusal on probable bedrock																						
	* 2003 03 10																						
	Water level measured after drilling																						

RECORD OF BOREHOLE No 601-3NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+850, o/s 17.6m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY F.P.
DATUM Geodetic DATE April 12, 2004 CHECKED BY _____

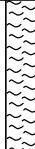


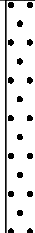

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	W _p	W	W _L			
225.5	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous Dark brown		1	SS	8	V*											
0.3	Silty sand, trace organics						225										
	Loose Brown Moist																
224.0	Sandy silt	2	SS	14	224												
1.5	Compact Brown Moist																
	Grey				223												
			3	SS	20	V*											
					222												
221.4	Sand, trace silt				221												
4.1	Compact Brown Wet to dense		4	SS	25												
						220											
			5	SS	33												
218.9	End of borehole						219										
6.6	Refusal on probable bedrock																
	* 2004 04 12																
	Water level observed during drilling																
	Water level measured after drilling																

RECORD OF BOREHOLE No 601-4N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+875, o/s 26.8m Rt. Burwash Twp ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
223.6	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous Dark brown		1	SS	WR**		223													
222.1	Sand and silt, trace clay Loose Grey Moist		2	SS	5		222									0 48 45 7				
1.5	Wet		3	SS	6	▼*	221													
219.4	Sand trace silt trace clay Compact Grey Wet		4	SS	18		219									0 91 7 2				
4.2			5	SS	23		218													
217.0	End of borehole Refusal on probable bedrock						217													
6.6	<div>* 2003 03 10</div> <div>▼ Water level measured after drilling</div> <div>WR** Refers to penetration under the weight of rods only</div>																			

RECORD OF BOREHOLE No 601-4NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+875, o/s 14.7m Lt. Burwash Twp ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
223.6	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous Dark brown		1	SS	WR**	↓*	223													
222.1																				
1.5	Sand, trace silt trace clay Loose Brown/ Wet grey		2	SS	7		222													
							221													
220.3																				
3.3	End of borehole Refusal on probable bedrock																			
	<div>* 2003 03 10</div> <div> Water level measured after drilling</div> <div>WR** Refers to penetration under the weight of rods only</div>																			

RECORD OF BOREHOLE No 601-4NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+875, o/s 0.8m Lt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						x LAB VANE		
223.7	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, fine fibrous Amorphous Dark brown Wet																			
221.6																				
2.1	Sand and silt, trace organics																			
221.3																				
2.4	Grey Saturated Sand, trace silt trace organics Grey Saturated																			
217.9	End of borehole Refusal on probable bedrock																			
5.8																				
<div>* 2003 03 20</div> <div> Water level measured after drilling</div>																				

* 2003 03 20

Water level measured
after drilling

RECORD OF PENETRATION TEST No 601-4NC

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+875, o/s 33.2m Rt Burwash Twp. ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY F.P.
 DATUM Geodetic DATE April 12, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p w W _L	WATER CONTENT (%)			
223.7 0.0	Ground Surface													
223														
222														
221														
220														
219.4 4.3	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 601-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+900, o/s 0.8m Rt. Burwash Twp ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT							PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											
								○ UNCONFINED			+ FIELD VANE								
224.8	Ground Surface						20	40	60	80	100								
0.0	Peat, fine fibrous		1	SS	4														
0.3	Dark brown																		
	Sand, trace silt trace clay																		
	Very loose Brown Moist																		
222.7	Loose Grey Wet		2	SS	9														
2.1	End of borehole																		
	Refusal on probable bedrock																		
	* 2003 03 10																		
	Water level measured after drilling																		

RECORD OF BOREHOLE No 601-5NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+900, o/s 17.4m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY F.P.
DATUM Geodetic DATE April 12, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)									
223.7	Ground Surface																					
0.0	Peat, coarse fibrous Dark brown		1	SS	4		223											GR	SA	SI	CL	
0.3	Silty sand, trace organics																					
	Very loose to compact																					
	trace gravel		2	SS	11																	
220.6							221															
3.1	Sandy silt Compact Grey Wet		3	SS	24		220															
219.8																						
3.9	End of borehole Refusal on probable bedrock																					
	<div>* 2004 04 12</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div>																					

RECORD OF BOREHOLE No 601-6N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+925, o/s 17m Rt. Burwash Twp ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
225.0	Ground Surface													
0.0	Peat, fine fibrous		1	SS	16									
0.3	Dark brown Sand, coarse trace silt trace clay Compact Brown Moist to loose		2	SS	8									
	Grey Wet													
221.9														
3.1	Silt, with sand trace clay Very loose Grey Moist		3	SS	2									
			4	SS	1									
	Wet													
			5	SS	5									
217.8														
7.2	Sand, fine to medium trace silt trace clay Very loose Grey Wet		6	SS	2									
215.9														
9.1	End of borehole													

RECORD OF BOREHOLE No 601-6N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+925, o/s 17m Rt. Burwash Twp ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
210.0	Cont'd																
209																	
208																	
207.3																	
17.7	End of dynamic cone penetration test Refusal on probable bedrock * 2003 03 11 ▼ Water level measured after drilling																

1 of 1 METRIC

CHECKED BY _____

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 601-6NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+925, o/s 1.7m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL									× LAB VANE		
224.1	Ground Surface							20	40	60	80	100											
0.0	Sand, trace silt trace organics Brown Moist						224																
							223																
222.2	medium to coarse						222																
1.9	Silt, with sand trace clay trace gravel Grey Saturated						221																
							220																
							219																
							218																
217.5																							
6.6	End of borehole Refusal on probable bedrock * 2003 03 20 ▼ Water level measured after drilling																						

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 601-7N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+950, o/s 3.3m Rt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 16, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
							20	40	60	80	100									
223.7	Ground Surface																			
0.0	Peat, fine fibrous																			
0.2	Dark brown		1	SS	3															
	Sand, trace silt trace clay																			
222.5	Very loose Brown Moist																			
1.2	Silt, with sand trace clay																			
	Very loose Grey Moist		2	SS	5															
			3	SS	3															
	Loose Wet																			
			4	SS	6															
			5	SS	7															
215.6			6	SS	9															
8.1	Sand, trace silt trace clay																			
	Compact Grey Wet																			
			7	SS	WR**															
213.7																				
10.0	End of borehole**																			

RECORD OF BOREHOLE No 601-7N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+950, o/s 3.3m Rt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 16, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa																
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																
208.7									20	40	60	80	100									
	Cont'd																					
	End of dynamic cone penetration test																					
	Refusal on probable bedrock																					
	* 2003 03 16																					
	▽ Water level observed during drilling																					
	▼ Water level measured after drilling																					
	WR** Refers to penetration under the weight of rods only																					
	*** Sand backed-up to 6.5m from 9.5m depth inside augers																					

RECORD OF BOREHOLE No 601-7NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+950, o/s 18.8m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
DATUM Geodetic DATE April 12, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
							20	40	60	80	100						
224.8	Ground Surface																
0.0	Peat, coarse fibrous		1	SS	22												
0.1	Sandy silt, trace organics																
223.6	Compact Brown Moist																
1.2	Sand																
	Loose Brown Moist		2	SS	9												
	Grey																
222.4	Silt, with clayey silt seams																
2.4	Very Grey Wet loose to loose		3	SS	4												
			4	SS	2												
			5	SS	6												
			6	SS	9												
			7	SS	10												
215.1	End of borehole																
9.7																	
213.8	End of dynamic cone penetration test																
11.0	Refusal on probable bedrock																

1 of 1 METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

1 of 1

METRIC

ON MOT VER3 SWAMP 601-JULY 16, 2003.GPJ ON MOT.GDT 21/07/2004 12:15:03.PM

5:03 PM
+⁷, ×⁵:

Numbers refer to
Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

1 of 1 **METRIC**

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

CHECKED BY

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 601-9N

2 of 2

METRIC

W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+000, o/s 5.5m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								20	40	60	80	100					20	40	60				
208.8																							
208.6																							
15.2	Cont'd																						
	End of dynamic cone penetration test																						
	* 2003 03 17																						
	▽ Water level observed during drilling																						
	▼ Water level measured after drilling																						
	** Sand backed-up to 7.0m from 8.0m depth inside augers																						

RECORD OF BOREHOLE No 601-9NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+000, o/s 18.8m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
DATUM Geodetic DATE April 12, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	w	W _L		
223.8	Ground Surface																
0.0	Peat, fine fibrous Dark brown		1	SS	5												
0.3	Silty sand																
222.9	Very loose Brown Moist																
0.9	Silt with clayey silt seams																
	Loose Grey Moist to wet very loose		2	SS	9												
	trace clay																
			3	SS	4												
			4	SS	5												
			5	SS	WR**												
216.2	End of borehole																
7.6																	
214.0	End of dynamic cone penetration test																
9.8																	

* 2004 04 12

▽ Water level observed during drilling

▼ Water level measured after drilling

WR** Refers to penetration under weight of rods only

METRIC

CHECKED BY

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 601-10NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+025, o/s 6.6m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
223.0 0.0	Ground Surface Sand, with organics trace silt <u>Dark brown Wet</u> silty, trace organics Grey Wet																
220.7																	
2.3	Silt, trace sand trace clay Grey Wet																
214.5																	
8.5	Sandy silt, trace clay Grey Wet																
213.8																	
9.2	Sand, some silt trace clay Grey Wet																
210.8	<u>fine to medium</u>																
12.2	End of borehole																
	<div>* 2003 03 21</div> <div> Water level measured after drilling</div>																

METRIC

ORIGINATED BY F.P.

COMPILED BY F.P.

____ CHECKED BY _____

[illegible]

RECORD OF BOREHOLE No 601-10NB 2 of 2 METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+025, o/s 48m Rt Burwash Twp. ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
 DATUM Geodetic DATE April 12, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
208.3	Cont'd ▽ Water level observed during drilling ▼ Water level measured after drilling																

RECORD OF BOREHOLE No 601-11N

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+050, o/s 8.2m Rt. Burwash Twp.
Hwy 69 Sta. 12+050, o/s 19m Rt. Burwash Twp.

ORIGINATED BY AJS

DIST 54 HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

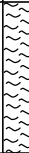


COMPILED BY PC

DATUM Geodetic

DATE

March 15, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE										○		
								● QUICK TRIAXIAL × LAB VANE												
222.7	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous Dark brown Wet																			
221.2																				
1.5	Sand, fine to medium trace silt trace clay Compact Grey Wet		1	SS	12															
219.5																				
3.2	Silt, trace sand trace clay Loose to Grey Wet compact		2	SS	7															
			3	SS	9															
			4	SS	9															
			5	SS	13															
			6	SS	10															
213.1	End of borehole																			
9.6	* Borehole dry on completion of drilling																			

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC











20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 601-12NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+075, o/s 9.1m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE						
222.6	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous Dark brown Wet						222										
221.8	Sand, fine to medium trace silt Brown Wet						221										
0.8	coarse Grey						220										
218.8	Silt, trace sand trace clay Grey Wet						219										
3.8							218										
							217										
							216										
							215										
							214										
213.5	End of borehole																
9.1																	
	<div>* 2003 03 21</div> <div> Water level measured after drilling</div>																

* 2003 03 21



Water level measured
after drilling

RECORD OF PENETRATION TEST No 601-12NB

1 of 1 **METRIC**

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+075, o/s 48m Rt Burwash Twp.

Hwy 69 Sta. 12+075, o/s 57m Rt Burwash Twp.

ORIGINATED BY F.P.

DIST 54 HWY 69

BOREHOLE TYPE

Dynamic Cone Penetration Test

COMPILED BY F.P.

DATUM Geodetic

DATE _____

April 08, 2004

CHECKED BY

SOIL PROFILE					SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT			NATURAL MOISTURE CONTENT			LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					W _p			w			W _L								
						○ UNCONFINED	● QUICK TRIAXIAL			+	×	WATER CONTENT (%)													
222.6 0.0	Ground Surface																								
214.1 8.5	End of dynamic cone penetration test																								

RECORD OF BOREHOLE No 601-13N

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+100, o/s 10.7m Rt. Burwash Twp.
Hwy 69 Sta. 12+100, o/s 19m Rt. Burwash Twp.

ORIGINATED BY AJS

DIST 54

HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

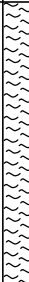



COMPILED BY PC

DATUM Geodetic

DATE

March 14, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
222.4	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Peat, fine fibrous Dark brown Wet																
			1	SS	2												
219.6	Silty clay, trace sand																
2.8	Very soft Grey Wet		2	SS	1												
218.7	Sand, trace silt trace clay																
3.7	Very loose Grey Wet																
217.9	Silt, trace sand trace clay																
4.5	Loose Grey Wet		3	SS	7												
	Compact Grey Wet																
			4	SS	15												
			5	SS	12												
			6	SS	14												
212.8	End of borehole																
9.6	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 601-13NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+100, o/s 18.8m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
DATUM Geodetic DATE April 08, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
222.4	Ground Surface																
0.0	Peat, coarse fibrous Dark brown fine fibrous amorphous		1	SS	17	K*	222										
							221										
			2	SS	WH**		220										
219.9	Clayey silt						219										
2.5	Very soft Grey Moist		3	SS	WH		218										
							217										
218.1	Silt, trace sand trace clay					↓*	216										
4.3	Loose Grey Wet		4	SS	5		215										
							214										
	trace gravel		5	SS	9		213										
214.2			6	SS	9		212										
8.2	End of borehole						211										
210.5	End of dynamic cone penetration test																
11.9																	

RECORD OF BOREHOLE No 601-13NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+100, o/s 43.7m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
222.4	Ground Surface																
0.0	Peat, coarse fibrous Dark brown fine fibrous		1	SS	32	4*	222										
							221										
			2	SS	WH**												
220.1							220										
2.3	Silty clay with clayey silt seams Very Grey Wet soft to soft		3	SS	WH		219										
			4	SS	3		218										
216.9							217										
5.5	Silt, trace sand with clayey silt seams Loose Grey Wet		5	SS	5		216										
							215										
			6	SS	6		214										
	trace clay Compact		7	SS	10		213										
							212										
			8	SS	11		211										
211.1																	
11.3	End of borehole																
210.2																	
12.2	End of dynamic cone penetration test																
	* 2004 04 07																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																
	WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 601-14N

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+125, o/s 38.8m Rt. Burwash Twp.
Hwy 69 Sta. 12+125, o/s 45.5m Rt. Burwash Twp.

ORIGINATED BY CB

DIST 54 HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

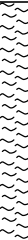






COMPILED BY PC

DATUM Geodetic

DATE

March 14, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L				
								○ UNCONFINED + FIELD VANE											
								● QUICK TRIAXIAL × LAB VANE											
WATER CONTENT (%)																			
222.4	Ground Surface							20	40	60	80	100							
0.0	Peat, fine fibrous Dark brown		1	SS	4		222												
							221												
			2	SS	1														
220.0								220											
2.4	Sand, fine to medium trace silt trace clay Very loose Grey Wet		3	SS	4			219											
								218											
217.6			4	SS	1			217											
4.8	Silty clay trace sand Very soft Grey Wet to soft							216											
			5	SS	2			215											
215.2																			
7.2	Clayey silt trace sand Firm Grey Wet		6	SS	5		214												
	Stiff						213												
			7	SS	9		212												
							211												
			8	SS	9		210												
209.6			9	SS	10														
12.8	End of borehole																		
	* 2003 03 14																		
	 Water level observed during drilling																		
	 Water level measured after drilling																		

RECORD OF BOREHOLE No 601-14NA 2 of 2 METRIC

W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+125, o/s 11.6m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____


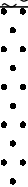



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
207.4								20	40	60	80	100								
207.2	Cont'd																			
15.2	End of dynamic cone penetration test																			
	<div>* 2003 03 21</div> <div>▼ Water level measured after drilling</div>																			

RECORD OF BOREHOLE No 601-14NB

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+125, o/s 18.8m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								20 40 60 80 100					Wp w Wl				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
222.4	Ground Surface					↓*											
0.0	Peat, coarse fibrous Dark brown fine fibrous		1	SS	4	↓*	222										
							221										
2	SS	WH**	220														
220.0	Sand, fine to coarse with silt Very Grey Wet loose		3	SS	WH		219										
							218										
218.1	Clayey silt with silt lenses Very Grey Wet soft		4	SS	1		217										
216.9	Silty clay with clayey silt seams Very Grey Wet soft to firm		5	SS	WH		216										
5.5	silt lenses						215										
			6	SS	2		214										
			7	SS	4		213										
212.3	Silt, trace sand trace clay Loose Grey Wet		8	SS	8		212										
211.1	End of borehole						211										
11.3																	

RECORD OF BOREHOLE No 601-14NB 2 of 2 METRIC

W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+125, o/s 18.8m Rt Burwash Twp. ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

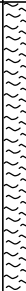




SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100					
207.4																	
205.0	Cont'd																
15.2	End of dynamic cone penetration test																
	* 2004 04 07																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																
	WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 601-15N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+150, o/s 13.1m Rt. Burwash Twp ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 12, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT		UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		W _p	W			W _L	WATER CONTENT (%)	
222.4 0.0	Ground Surface Peat, fine fibrous Dark brown		1	SS	WR**		222							GR SA SI CL		
							221									
			2	SS	WR											
					220											
219.5 2.9	Sand, fine to medium trace silt Very loose Grey Wet		3	SS	2		219									
							218									
218.2 4.2	Clayey silt, trace sand Very soft Grey Wet		4	SS	WR											0 2 56 42
							217									
			5	SS	WR	216										
						215										
			6	SS	1								0 4 66 30			
						214										
213.4 9.0	Silt, some to trace clay trace sand Loose Grey Wet to compact		7	SS	8											
						213										
						212										
			8	SS	8											
						211										
			9	SS	8								0 1 85 14			
						210										
						209										
			10	SS	12											
						208										
Cont'd																

Cont'd

RECORD OF BOREHOLE No 601-15N

2 of 2

METRIC

G.W.P. 312-99-00

LOCATION

Hwy 69 Sta. 12+150, o/s 13.1m Rt. Burwash Twp
Hwy 69 Sta. 12+150, o/s 19m Rt. Burwash Twp

ORIGINATED BY CB

DIST 54 HWY 69

BOREHOLE TYPE

C.F.H.S.A. & Dynamic Cone Penetration Test

COMPILED BY PC

DATUM Geodetic

DATE

March 12, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
207.4	Cont'd		11	SS	9		207										0 1 91 8
205.9 16.5	End of borehole						206										
							205										
							204										
							203										
							202										
							201										
200.0 22.4	End of dynamic cone penetration test Refusal on probable bedrock						200										
	* 2003 03 12																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																
	WR** Refers to penetration under the weight of rods only																

RECORD OF BOREHOLE No 601-15NA

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+150, o/s 18.9m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							
								○ UNCONFINED	+	FIELD VANE					
							● QUICK TRIAXIAL	×	LAB VANE						
222.4	Ground Surface					▼*	20	40	60	80	100	20	40	60	GR SA SI CL
0.0	Peat, coarse fibrous		1	SS	16	▼*	222								
	Dark brown						221								
	fine fibrous														
		2	SS	WH**											
220.1	Silty sand						220								
2.3	Very loose Grey Wet														
			3	SS	3	219									
218.4	Silt trace sand trace clay with clayey silt seams					218									
4.0	Very loose Grey Wet					217									
			4	SS	4										
						216									
215.7	End of borehole		5	SS	2	215									
6.7						214									
						213									
						212									
						211									
						210									
						209									
						208									
207.4	Cont'd														

RECORD OF BOREHOLE No 601-15NA

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+150, o/s 18.9m Rt Burwash Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. + Dynamic Cone Penetration Test COMPILED BY F.P.
DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
207.4																	
15.0	Cont'd						207										
206.6																	
15.8	End of dynamic cone penetration test																
	* 2004 04 07																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																
	WH** Refers to penetration under weight of rods and hammer																

1 of 2 **METRIC**

(%) STRAIN AT FAILURE

RECORD OF PENETRATION TEST No 601-16N

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta, 12+175, o/s 35.4m Rt. Burwash Twp ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 12, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
207.5	Cont'd													
207														
206														
205														
204.1														
18.4	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 601-16NA

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+175, o/s 0.5m Lt. Burwash Twp.
Hwy 69 Sta. 12+175, o/s 4m Rt. Burwash Twp.

ORIGINATED BY CB

DIST 54

HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

COMPILED BY PC

DATUM Geodetic

DATE

March 13, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE						WATER CONTENT (%)						
222.5	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous		1	SS	1	▽* ▽* ▼*	222													
0.3	Dark brown Sandy silt, trace clay																			
221.5	Very Dark Moist loose brown																			
1.0	Sand, trace silt trace gravel Loose Brown Wet		2	SS	6		221													
							220													
219.5	Silty clay, trace sand Firm Grey Wet		3	SS	1		219													
3.0																				
			4	SS	1		218													
217.1	Silt, trace sand trace clay Very Grey Wet loose						217													
5.4			5	SS	4		216													
215.6	End of borehole Refusal on probable bedrock																			
6.9	<div>* 2003 03 13</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div>																			

* 2003 03 13

▽ Water level observed
during drilling

▼ Water level measured
after drilling

RECORD OF BOREHOLE No 601-16NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+175, o/s 13.9m Rt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
222.5	Ground Surface						20	40	60	80	100	W _p	W	W _L			
0.0	Peat, fine fibrous																
222.1	Dark brown Wet																
0.4	Sand, trace silt trace organics																
	Brown Wet to grey																
	fine to medium, trace gravel																
218.7	Clayey silt, with silty clay seams																
3.8	Firm Grey Wet		1	SS	4												
215.8	Silt, trace sand, trace clay																
6.7	Grey Wet																
214.6	Clayey silt, with sandy silt seams																
7.9	Grey Wet																
213.1	Silt, trace clay																
9.4	Grey Wet																
210.6	trace sand, trace gravel																
11.9	End of borehole																
	Refusal on probable bedrock																
	* 2003 03 20																
	Water level measured after drilling																

RECORD OF BOREHOLE No 601-17N

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+200, o/s 15.4m Rt. Burwash Twp
Hwy 69 Sta. 12+200, o/s 19m Rt. Burwash Twp

ORIGINATED BY CB

DIST 54 HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

COMPILED BY PC

DATUM Geodetic

DATE

March 12, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
223.8	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous		1	SS	7	4*														
0.3	Dark brown Sand, fine to medium trace silt trace clay						223													
	Loose Brown Moist to compact		2	SS	10		222													
							221													
			3	SS	5		220													
	Grey Wet					4*	219													
			4	SS	7		218													
			5	SS	6															
217.2	End of borehole																			
6.6	Refusal on probable bedrock																			
	* 2003 03 12																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 601-18N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+225, o/s 32.3m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20					40	60	80				
225.1	Ground Surface																						
0.0	Peat, fine fibrous		1	SS	7		225																
0.3	Dark brown																						
	Sand, trace silt trace clay						224																
	Loose Brown Moist to compact		2	SS	13																		
222.7							223																
2.4	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																						

RECORD OF PENETRATION TEST No 601-18NA 1 of 1 METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+225, o/s 2.7m Rt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 13, 2003 CHECKED BY _____




SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
226.5 0.0	Ground Surface													
224.3 2.2	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 601-18NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+225, o/s 16.4m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
226.0	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous																
0.3	Dark brown Wet Sand, trace silt trace organics																
	Brown Wet						225										
224.4	End of borehole																
1.6	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 601-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+800, o/s 40.8m Lt. Burwash Twp. ORIGINATED BY MR/PC
DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							
								○ UNCONFINED	+	FIELD VANE					
224.4	Ground Surface						20	40	60	80	100				
0.0	Peat, fine fibrous														
0.1	Dark brown Silty sand, fine														
	Brown Moist Wet														

RECORD OF PENETRATION TEST No 601-2S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+825, o/s 58.4m Lt. Burwash Twp ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa			w _p	w	w _L						
								○ UNCONFINED + FIELD VANE	WATER CONTENT (%)										
							● QUICK TRIAXIAL × LAB VANE												
223.4 0.0	Ground Surface																		

RECORD OF BOREHOLE No 601-2SA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+825, o/s 40m Lt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
DATUM Geodetic DATE March 21, 2003 CHECKED BY _____



SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
224.5 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 601-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+850, o/s 38.6m Lt. Burwash Twp ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
223.6 0.0	Ground Surface Peat, fine fibrous Dark brown		1	SS	WR**																		
223.0 0.6	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling WR** Refers to penetration under the weight of rods only						223																

RECORD OF BOREHOLE No 601-4S

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 11+875, o/s 64.1m Lt. Burwash Twp
Hwy 69 Sta. 11+875, o/s 45.5m Lt. Burwash Twp

ORIGINATED BY CB

DIST 54 HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers





COMPILED BY PC

DATUM Geodetic

DATE

March 11, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED			+ FIELD VANE										
223.6	Ground Surface							20	40	60	80	100									
0.0	Peat, fine fibrous Dark brown		1	SS	4	 *	223											622			
							222														
221.6			2	SS	5																
2.0	Sand and gravel Loose Grey Wet						221														
			3	SS	5																
							220														
219.4																					
4.2	End of borehole Refusal on probable bedrock																				
<div>* 2003 03 11</div> <div> Water level measured after drilling</div>																					

RECORD OF BOREHOLE No 601-4SA 1 of 1 METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+875, o/s 22.7m Lt. Burwash Twp ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)			
223.6	Ground Surface							20	40	60	80	100									
0.0	Peat, fine fibrous Dark brown		1	SS	35		223														
222.6																					
1.0	End of borehole Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 601-4SB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+875, o/s 37.8m Lt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
223.6 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 601-5S

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 11+900, o/s 35.9m Lt. Burwash Twp
Hwy 69 Sta. 11+900, o/s 19m Lt. Burwash Twp

ORIGINATED BY CB

DIST 54 HWY 69

BOREHOLE TYPE

C.F.H.S.A. & Dynamic Cone Penetration Test

COMPILED BY PC

DATUM Geodetic

DATE

March 10, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)
224.5	Ground Surface							20	40	60	80	100					
0.0	Peat, amorphous		1	SS	5		224										
0.2	Dark brown Sand, some silt trace clay Very loose Grey/ Moist to compact brown		2	SS	12		223										
							222										
							221										0 81 17 2
220.9			3	SS	4		220										0 45 53 2
3.6	Sand and silt, trace clay Very loose Grey Wet loose to compact		4	SS	20		219										
							218										
217.9			5	SS	1		217										
6.6	Sand, coarse trace silt trace clay Very loose Grey Wet						216										
216.6							215										
7.9	End of borehole**						214										
							213										
212.8							212										
11.7	End of dynamic cone penetration test Refusal on probable bedrock						211										
	* 2003 03 10						210										
	▼ Water level measured after drilling						209										
	** Sand backed-up inside auger						208										

* 2003 03 10

▼ Water level measured
after drilling

** Sand backed-up inside
auger

1 of 2 METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 601-6S

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+925, o/s 49.9m Lt. Burwash Twp ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	20 40 60			
208.0	Cont'd													
207														
206														
205														
204														
203.1 19.9	End of dynamic cone penetration test Refusal on probable bedrock								120/10cm					

METRIC

G.W.P.	<u>312-99-00</u>	LOCATION	<u>New Hwy 69 Sta. 11+950, o/s 34m Lt. Burwash Twp. Hwy 69 Sta. 11+950, o/s 19m Lt. Burwash Twp.</u>	ORIGINATED BY	<u>AJS</u>
DIST	<u>54</u>	HWY	<u>69</u>	BOREHOLE TYPE	<u>Continuous Flight Hollow Stem Augers</u>
DATUM	<u>Geodetic</u>	DATE	<u>March 17, 2003</u>	COMPILED BY	<u>PC</u>
				CHECKED BY	

[illegible]

RECORD OF BOREHOLE No 601-8S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+975, o/s 51m Lt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 16, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								20 40 60 80 100					w _p w w _L				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
222.9	Ground Surface																
0.0	Peat, fine fibrous		1	SS	2	V*											
0.3	Dark brown																
	Sand, trace silt trace clay																
	Very loose Grey Wet																
221.6																	
1.3	Sandy silt trace clay		2	SS	2												
	Very loose Grey Wet																
220.4																	
2.5	Clayey silt trace sand		3	SS	1												
	Very soft Grey Wet																
	Stiff		4	SS	8												
217.2																	
5.7	Sandy silt trace clay		5	SS	4												
	Very loose Grey Wet																
	Loose to compact		6	SS	9												
213.3			7	SS	10												
9.6	Sand, trace silt trace clay																
	Compact Grey Wet																
211.8			8	SS	WR**												
11.1	End of borehole**																
	Cont'd																

RECORD OF BOREHOLE No 601-8S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+975, o/s 51m Lt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 16, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	w	W _L		
207.9	Cont'd																
207																	
206																	
205																	
204.6	End of dynamic cone penetration test																
18.3	<p>* 2003 03 16</p> <p>▽ Water level observed during drilling</p> <p>** Sand backed-up to 6.0m from 11.0m depth inside augers</p> <p>WR** Refers to penetration under the weight of rods only</p>																

RECORD OF BOREHOLE No 601-8SA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 11+975, o/s 33.1m Lt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20						40	60	80
223.0	Ground Surface																			
0.0 0.1	Peat, coarse fibrous Dark brown Wet Sand, coarse to medium trace silt trace organics Brown Wet																			
221.3	Grey						222													
1.7	Silty clay, trace sand Grey Wet						221													
							220													
							219													
218.4																				
4.6	Silty sand, trace clay Grey Wet						218													
217.4																				
5.6	Sandy silt, trace clay Grey Wet						217													
							216													
							215													
214.2																				
8.8	Sand, trace silt Grey Wet						214													
							213													
							212													
210.8							211													
12.2	End of borehole Refusal on probable bedrock * 2003 03 20 Water level measured after drilling																			

RECORD OF BOREHOLE No 601-9S

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+000, o/s 31.7m Lt. Burwash Twp.
Hwy 69 Sta. 12+000, o/s 19m Lt. Burwash Twp.

ORIGINATED BY AJS

DIST 54 HWY 69

BOREHOLE TYPE

C.F.H.S.A. & Dynamic Cone Penetration Test

COMPILED BY PC

DATUM Geodetic

DATE

March 16, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)
								○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL						
223.0	Ground Surface															
0.0	Peat, fine fibrous															
222.4	Dark brown Wet															
0.6	Silty clay, sand seams															
	Firm Grey Wet		1	SS	2											
219.9																
3.1	Silty sand trace clay		2	SS	6											
	Loose Grey Wet															
218.4																
4.6	Sand and silt trace clay		3	SS	8											
	Loose Grey Wet															
216.9																
6.1	Sand, trace silt trace clay		4	SS	22											
	Compact Grey Wet															
			5	SS	20											
213.9																
9.1	End of borehole															
209.3																
13.7	End of dynamic cone penetration test															
	* Borehole dry on completion of drilling															

1 of 2 **METRIC**

20
15 — 5 (%) STRAIN AT FAILURE
10

2 of 2 **METRIC**

MOT DCPT LINE OVER BDRY SWAMP 601- MARCH 17, 2003.GPJ ON_MOT.GDT 10/29/04 11:12:27 AM

+ , X⁵: Numbers refer to Sensitivity

20
15 — 5
10

(%) STRAIN AT FAILURE

METRIC

CHECKED BY _____

ON MOT VER3 SWAMP 601-JULY 16, 2003.GPJ ON MOT.GDT 21/07/2004 12:12:57 PM

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 601-10SA 2 of 2 METRIC

W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+025, o/s 30.8m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100					
207.8	Cont'd																
207.3	End of dynamic cone penetration test																
15.5																	
	* 2003 03 21																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 601-11S

1 of 2

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+050, o/s 29.2m Lt. Burwash Twp.
Hwy 69 Sta. 12+050, o/s 19m Lt. Burwash Twp.

ORIGINATED BY AJS

DIST 54

HWY 69

BOREHOLE TYPE

C.F.H.S.A. & Dynamic Cone Penetration Test

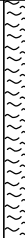


COMPILED BY PC

DATUM Geodetic

DATE

March 15, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
							WATER CONTENT (%)										
222.7	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Peat, fine fibrous Dark brown Wet																
			1	SS	1												
220.3																	
2.4	Sand, fine to medium trace silt Very loose Grey Wet		2	SS	5												
			3	SS	4												
217.2																	
5.5	Sand and silt trace clay Loose Grey Wet		4	SS	5												
216.1																	
6.6	End of borehole																
			</														

RECORD OF BOREHOLE No 601-11S

2 of 2

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+050, o/s 29.2m Lt. Burwash Twp.
Hwy 69 Sta. 12+050, o/s 19m Lt. Burwash Twp.

ORIGINATED BY AJS

DIST 54

HWY 69

BOREHOLE TYPE

C.F.H.S.A. & Dynamic Cone Penetration Test

COMPILED BY PC

DATUM Geodetic

DATE

March 15, 2003

CHECKED BY

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
207.7	Cont'd																	
207																		
206																		
205																		
204																		
203.2	End of dynamic cone penetration test																	
19.5	* Borehole dry on completion of drilling																	

METRIC

CHECKED BY _____

(%) STRAIN AT FAILURE

METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 601-12SA

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+075, o/s 28.4m Lt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
207.6	Cont'd																
207																	
206																	
205																	
204.3																	
18.3	End of dynamic cone penetration test																
	* 2003 03 21																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 601-13S

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+100, o/s 26.8m Lt. Burwash Twp.
Hwy 69 Sta. 12+100, o/s 19m Lt. Burwash Twp.

ORIGINATED BY AJS

DIST 54

HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

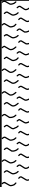



COMPILED BY PC

DATUM Geodetic

DATE

March 14, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED + FIELD VANE												
								● QUICK TRIAXIAL × LAB VANE												
					WATER CONTENT (%)															
222.5	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, fine fibrous Dark Wet brown																			
220.6			1	SS	6								○							
1.9	Sand, trace silt trace clay Loose Grey Wet																			
219.4																				
3.1	Silt, trace sand trace clay Compact Grey Wet		2	SS	10								○							
			3	SS	16								○							
			4	SS	8								○							
			5	SS	12								○							
			6	SS	16															
212.9																				
9.6	End of borehole																			

1 of 1 METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 601-15S

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+150, o/s 24.5m Lt. Burwash Twp.
Hwy 69 Sta. 12+150, o/s 19m Lt. Burwash Twp.

ORIGINATED BY CB

DIST 54

HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers




















COMPILED BY PC

DATUM Geodetic

DATE

March 13, 2003

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	W _p	W	W _L			
222.7	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	4	 	222										
0.3	Dark brown						221										
	Sand, trace silt trace clay						220										
	Very loose Brown Moist						219										
	Loose Wet						218										
220.0							217										
2.7	Silt, trace sand trace clay		3	SS	6	216											
	Loose Grey Moist					215											
																	
																	
214.7	End of borehole		4	SS	4												
8.0	Refusal on probable bedrock		5	SS	5												
																	
																	
																	
	* 2003 03 13																
	 Water level observed during drilling																
	 Water level measured after drilling																

RECORD OF BOREHOLE No 601-16S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+175, o/s 44.5m Lt. Burwash Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
224.9 0.0	Ground Surface 																							

RECORD OF PENETRATION TEST No 601-16SA 1 of 1 METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+175, o/s 8.5m Lt. Burwash Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE March 13, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100		
222.7 0.0	Ground Surface													
216.9 5.8	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 601-16SB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+175, o/s 23.6m Lt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
224.5	Ground Surface							20	40	60	80	100									
0.0	Peat, fine fibrous																				
	Amorphous																				
223.7	Dark brown Wet						224														
0.8	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 601-17S

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+200, o/s 22.1m Lt. Burwash Twp.
Hwy 69 Sta. 12+200, o/s 19m Lt. Burwash Twp.

ORIGINATED BY MR

DIST 54

HWY 69

BOREHOLE TYPE

Excavator

COMPILED BY PC

DATUM Geodetic

DATE

March 10, 2003

CHECKED BY

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
225.1 0.0	Ground Surface Bedrock at Surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 601-18S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+225, o/s 33.8m Lt. Burwash Twp. ORIGINATED BY CB/RE
DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
232.5 0.0	Ground Surface					20			40	60	80	100	20					40	60					
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 601-18SA 1 of 1 METRIC

G.W.P. 312-99-00 LOCATION New Hwy 69 Sta. 12+225, o/s 7.3m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
226.5 0.0	Ground Surface <																				

RECORD OF BOREHOLE No 601-18SB

1 of 1

METRIC

G.W.P. 312-99-00

LOCATION

New Hwy 69 Sta. 12+225, o/s 21m Lt. Burwash Twp.
Hwy 69 Sta. 12+225, o/s 19m Lt. Burwash Twp.

ORIGINATED BY FP

DIST 54 HWY 69

BOREHOLE TYPE

Manual Hand Sampling

COMPILED BY PC

DATUM Geodetic

DATE

March 18, 2003

CHECKED BY

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
226.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 602-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+612.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
235.7	Ground Surface							20	40	60	80	100								
0.0 0.1	Peat, coarse fibrous Dark brown		1	SS	16		235													
	Silt, trace sand trace clay																			
	Compact Light Moist brown						234													
233.9 1.8	Sand, trace silt with gravel		2	SS	27															
233.3 2.4	Compact Brown Moist																			
	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF PENETRATION TEST No 602-2M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+637.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
233.9 0.0	Ground Surface																
231.6 2.3	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 602-3M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+712.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								20 40 60 80 100										20 40 60		
232.8	Ground Surface																			
0.0	Peat, coarse fibrous		1	SS	3															
0.3	Dark brown Silt, trace clay trace fine sand																			
	Very loose Grey/brown Moist																			
	Compact Grey		2	SS	16															
				3	SS	12														
228.7																				
4.1	End of borehole Refusal on probable bedrock																			
	* 2003 03 21																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 602-4M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+737.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
235.3	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous																			
0.2	Dark brown Silt, trace clay trace fine sand		1	SS	18															
	Compact Light Dry brown																			
233.8	Silty clay, trace sand																			
1.5	Firm Grey/ Moist brown		2	SS	7															
232.3																				
3.0	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling ■ Penetrometer test																			

RECORD OF BOREHOLE No 602-5M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+812.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20					40	60	80				
234.3	Ground Surface																						
0.0	Peat, coarse fibrous																						
0.2	Dark brown		1	SS	4		234																
	Silt, trace clay trace sand																						
	Very loose Grey/ Dry						233																
	loose brown																						
	Compact Brown Moist		2	SS	20																		
231.9							232																
2.4	End of borehole Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF PENETRATION TEST No 602-6M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+837.5, CL Med. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.4 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
223.3 10.1	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF PENETRATION TEST No 602-7M

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+900, CL Med. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.3 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
							219							
218.6 14.7	Cont'd													

RECORD OF PENETRATION TEST No 602-7M

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+900, CL Med. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
218.3	Cont'd End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF PENETRATION TEST No 602-1N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+587.5, o/s 8m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
237.3 0.0	Ground Surface													
237														
236														
235														
234														
233														
232.2 5.1	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 602-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+587.5, o/s 31m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
237.1	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous		1	SS	5		237										
0.2	Dark brown						236										
	Silt, trace sand trace clay						235										
	Loose Brown Moist to compact		2	SS	11		234										
	Clayey silt layers																
233.4			3	SS	13												
3.7	End of borehole																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 602-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+600, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL									x LAB VANE		
236.1	Ground Surface						20	40	60	80	100	20	40	60									
0.0	Peat, coarse fibrous																						
0.2	Dark brown		1	SS	3																		
	Silt, trace sand trace clay																						
	Loose Brown/ Moist																						
	Clayey silt layers																						
	Compact Wet		2	SS	12																		
			3	SS	13																		
231.2																							
4.9	Sand and gravel, trace silt		4	SS	21																		
230.9																							
5.2	Compact Brown Wet																						
	End of borehole																						

* 2003 03 23

Water level measured after drilling

RECORD OF PENETRATION TEST No 602-4N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+612.5, o/s 37m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L				
235.5 0.0	Ground Surface													
235														
234														
233														
232														
231														
230														
229.8 5.7	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 602-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+625, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE											● QUICK TRIAXIAL		
234.5	Ground Surface							20	40	60	80	100		20	40	60								
0.0	Peat, coarse fibrous		1	SS	5		234																	
0.1	Dark brown																							
	Silt, trace sand trace clay						233																	
	Loose Brown Moist																							
	Trace gravel thin partings of fine sand		2	SS	16																			
	Compact Grey Wet																							
232.0																								
2.5	End of borehole Refusal on probable bedrock																							
	* 2003 03 23																							
	Water level measured after drilling																							

RECORD OF BOREHOLE No 602-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+637.5, o/s 46m Rt. Burwash Twp. ORIGINATED BY PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 26, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
233.5	Ground Surface							20	40	60	80	100									
0.0	Peat, fine fibrous																				
0.1	Dark brown																				
232.7	Silt, trace sand trace clay						233														
0.8	Compact Brown Moist																				
	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 602-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+650, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
234.2	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous		1	SS	3								○							
0.3	Dark brown Silt, trace sand trace clay																			
	Very loose Brown Moist Compact Grey Wet																			
			2	SS	20								○							
231.9																				
2.3	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																			

RECORD OF PENETRATION TEST No 602-8N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+662.5, o/s 4.5m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.1 0.0	Ground Surface						233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
221.7 11.4	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 602-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+662.5, o/s 33.5m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE		● QUICK TRIAXIAL × LAB VANE		W _p w W _L					
230.8	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	10	▽*											
0.2	Dark brown Silty clay trace sand																
	Stiff Brown Moist																
229.6	Silt, trace sand trace clay		2	SS	11												
1.2	Compact Brown Wet																
	Grey		3	SS	11												
226.6																	
4.2	End of borehole																
	Refusal on probable bedrock																
	* 2003 03 18																
	▽ Water level observed during drilling																

RECORD OF BOREHOLE No 602-10N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+675, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
230.3	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse fibrous		1	SS	7	↓*	230													
0.2	Dark brown																			
	Silt, trace sand trace clay																			
229.1	Loose Brown Moist																			
1.2	Silty clay, trace sand		2	SS	6															
	Firm Brown Moist																			
							228													
	Soft Wet																			
226.8			3	SS	2		227													
3.5	Silt, trace sand trace clay																			
	Loose Brown Wet						226													
	Grey		4	SS	8															
							225													
			5	SS	7		224													
223.1							223													
7.2	Sandy silt trace clay trace gravel																			
	Very loose Grey Wet		6	SS	3															
221.8							222													
8.5	End of borehole Refusal on probable bedrock																			
	* 2003 03 23																			
	▼ Water level measured after drilling																			
	■ Penetrometer test																			

* 2003 03 23

▼ Water level measured after drilling

■ Penetrometer test

RECORD OF BOREHOLE No 602-11N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+687.5, o/s 4m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____







SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		
230.4	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, fine fibrous		1	SS	8	∇^*														
0.1	Dark brown Silty clay, trace sand																			
	Firm Brown Moist																			
	Wet																			
			2	SS	7															
						\blacktriangledown^*														
			3	SS	3															
226.2	Clayey silt, trace sand																			
4.2	Stiff Grey Wet		4	SS	7															
225.0																				
5.4	End of borehole Refusal on probable bedrock																			
	* 2003 03 18																			
	∇ Water level observed during drilling																			
	\blacktriangledown Water level measured after drilling																			

RECORD OF BOREHOLE No 602-12N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+687.5, o/s 34.5m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								<div><div><div>○ UNCONFINED</div><div>● QUICK TRIAXIAL</div></div><div><div>+ FIELD VANE</div><div>× LAB VANE</div></div></div>					<div><div>W_p</div><div>W</div><div>W_L</div></div>				
230.3	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous Dark brown		1	SS	31	<div><div>∇^*</div><div>∇</div></div>	230										
229.1																	
1.2	Clayey silt, trace sand Stiff Grey Wet		2	SS	10		229										
227.6							228										
2.7	Silty clay, trace sand Stiff Grey Wet		3	SS	9		227										
225.8							226										
4.5	Silt, trace sand trace clay Loose Grey Wet		4	SS	8		225								Non-plastic		
							224										
			5	SS	5										Non-plastic		
223.1																	
7.2	End of borehole Refusal on probable bedrock * 2003 03 18  Water level observed during drilling  Water level measured after drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 602-14N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+712.5, o/s 46m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
230.0 0.0	Ground Surface													
221.8 8.2	End of dynamic cone penetration test													

RECORD OF BOREHOLE No 602-15N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+725, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED			+ FIELD VANE										
234.0	Ground Surface							20	40	60	80	100									
0.0	Peat, coarse fibrous																				
0.2	Dark brown		1	SS	1																
	Silt, trace sand trace clay																				
	Very loose Brown Moist																				
	Compact Grey Wet		2	SS	17																
230.6			3	SS	9/15cm																
3.4	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 602-16N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+737.5, o/s 37m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
233.4	Ground Surface							20	40	60	80	100		20	40	60				
0.0	Peat, coarse fibrous		1	SS	3		233													
0.2	Dark brown																			
	Silt, trace sand trace clay																			
	Loose Brown Moist		2	SS	17		232													
	Compact Wet																			
231.1																				
2.3	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 602-17N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+750, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
235.9	Ground Surface							20	40	60	80	100											
0.0	Peat, coarse fibrous		1	SS	6																		
0.2	Dark brown																						
	Silt, trace sand trace clay																						
	Loose Brown Moist																						
	Compact Grey Wet		2	SS	19																		
			3	SS	19																		
231.4																							
4.5	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 602-18N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+762.5, o/s 31m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
234.9	Ground Surface					*														
0.0	Peat, coarse fibrous		1	SS	6															
0.1	Dark brown																			
	Silt, trace sand trace clay						234													
	Loose Brown Moist																			
	Compact Grey Wet		2	SS	17		233													
							232													
			3	SS	10															
230.9							231													
4.0	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 602-19N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+762.5, o/s 8m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE	20	40				
236.2	Ground Surface							20	40	60	80	100											
0.0	Peat, coarse fibrous																						
0.2	Dark brown		1	SS	18		236																
	Silt, trace clay trace sand																						
	Compact Brown/ Moist grey						235																
	Light brown		2	SS	22										Non-plastic			0	2	88	10		
							234																
			3	SS	26		233								Non-plastic			0	4	90	6		
231.9							232																
4.3	End of borehole Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 602-20N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+775, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
235.8	Ground Surface							20	40	60	80	100											
0.0	Peat, coarse fibrous		1	SS	2																		
0.1	Dark brown																						
	Silt, trace sand trace clay						235																
	Very loose Brown Moist																						
	Compact Grey Wet		2	SS	15		234																
			3	SS	20		233																
							232																
231.3	End of borehole																						
4.5	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 602-21N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+787.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY DR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
235.4	Ground Surface																
0.0 0.1	Peat, fine fibrous Dark brown																
	Silt, trace sand trace clay																
	Grey Moist																
233.9																	
1.5	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 602-22N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+787.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE															
235.8	Ground Surface							20	40	60	80	100		20	40	60							
0.0	Peat, fine fibrous																						
0.2	Dark brown																						
235.1	Silt, with sand trace clay																						
0.7	Brown Moist																						
	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 602-23N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+800, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
234.8	Ground Surface					*														
0.0	Peat, fine fibrous																			
0.2	Dark brown End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 602-24N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+812.5, o/s 40m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
233.8	Ground Surface																
0.0	Peat, coarse fibrous		1	SS	5												
0.2	Dark brown																
	Silt, trace sand trace clay																
232.3	Loose Brown Moist						233										
1.5	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 602-25N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+825, o/s 19m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								20 40 60 80 100										20 40 60		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
234.0	Top of Ice																			
0.0	Snow/Ice																			
0.1	Topsoil		1	SS	11															
0.3	Silt, trace sand trace clay																			
	Compact Light Dry grey/brown						233													
232.5																				
1.5	Silty clay, trace sand, layered		2	SS	7															
	Firm Brown Moist						232													
231.3																				
2.7	Silt, trace sand trace clay																			
	Compact Brown Wet		3	SS	11		231													
229.9																				
4.1	End of borehole						230													
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF PENETRATION TEST No 602-26N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+837.5, o/s 37m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa											
						○ UNCONFINED			+ FIELD VANE	● QUICK TRIAXIAL	× LAB VANE	WATER CONTENT (%)					
233.6 0.0	Ground Surface						20 40 60 80 100				20 40 60						

RECORD OF BOREHOLE No 602-27N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+850, o/s 19m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
233.4	Top of Ice						20	40	60	80	100	20	40	60			
0.0	Snow/Ice																
0.3																	
233.0	Peat, fine fibrous		1	SS	5							o					
0.4	Dark brown																
	Silt, trace sand trace clay																
	Loose Light Dry grey/brown																
	Brown Moist		2	SS	8								o				
230.5																	
2.9	Silty clay, trace sand																
	Firm Brown Moist		3	SS	7								o				
228.7																	
4.7	Silt, trace sand trace clay		4	SS	5								o				
	Loose Grey Wet																
227.6																	
5.8	Silty clay trace sand																
	Firm Grey/ brown Wet		5	SS	WH**									o			
	Grey																
			6	SS	WH									o			
224.6																	
8.8	Silt, trace sand trace clay																
	Loose Grey Wet		7	SS	7								o				
			8	SS	6									o			
221.0			9	SS	1/15cm									o			
12.4	End of borehole																
	Refusal on probable bedrock																
	* 2003 03 18																
	▼ Water level measured after drilling																
	WH** Refers to penetration under the weight of rods and hammer.																

* 2003 03 18

Water level measured after drilling

WH** Refers to penetration under the weight of rods and hammer.

RECORD OF PENETRATION TEST No 602-28N

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

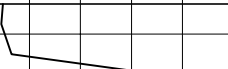
SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
233.3 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
							219							

Cont'd

RECORD OF PENETRATION TEST No 602-28N

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa			WATER CONTENT (%)						GR	SA	SI	CL
218.3	Cont'd						218											
217.5	End of dynamic cone penetration test																	
15.8	Refusal on probable bedrock																	

RECORD OF PENETRATION TEST No 602-28NA

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.3 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
							219							

Cont'd

RECORD OF PENETRATION TEST No 602-28NA

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
218.3																								
	Cont'd																							
217.7									218															
15.6	End of dynamic cone penetration test Refusal on probable bedrock																							

RECORD OF BOREHOLE No 602-29N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY SH
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
233.3	Top of Ice					4*											
0.0	Snow/Ice																
232.9			1	SS	3		233										
0.4	Peat, amorphous																
232.8	Dark brown																
0.5	Silt, trace sand trace clay																
	Loose Light brown Wet							232									
	Compact Brown/ grey Moist		2	SS	10												
								231									
230.3																	
3.0	Silty clay trace sand		3	SS	8			230									
	Firm Brown Moist to wet																
								229									
228.5																	
4.8	Silt, trace clay trace sand		4	SS	4			228									
	Loose Grey Wet																
			5	SS	2		227										
226.4																	
6.9	Silty clay trace sand						226										
	Firm Grey Wet		6	SS	WH**												
							225										
			7	SS	WH		224										
							223										
222.8																	
10.5	Silt, trace sand trace clay trace gravel		8	SS	8												
	Loose Grey Wet						222										
221.7																	
11.6	End of borehole																
	Refusal on probable bedrock																
	* 2003 03 19																
	▽ Water level observed during drilling																
	WH** Refers to penetration under the weight of rods and hammer																

RECORD OF BOREHOLE No 602-30N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+875, o/s 19m Rt. Burwash Twp. ORIGINATED BY SH
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
233.2 0.0	Top of Ice Snow/Ice		1	SS	5	▼*	233													
0.3	Topsoil																			
232.7 0.5	Silt, with sand trace clay Loose Brown/ Moist grey						232													
		2	SS	8			231													
230.2 3.0	Silty clay, trace sand Firm Grey Wet	3	SS	4			230													
							229													
228.7 4.5	Silt, trace sand trace clay Compact Grey Moist	4	SS	12			228													
							227													
226.8 6.4	Silty clay trace sand Firm Grey Wet	5	SS	4			226													
		6	SS	WH**			225													
						224														
		7	SS	WH		223														
						222														
		8	SS	WH		221														
221.3 11.9	Silt, trace sand trace clay Very loose to loose Grey Wet	9	SS	1		220														
						219														
	Cont'd		10	SS	6															

RECORD OF BOREHOLE No 602-30N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+875, o/s 19m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								<div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div><div></div><div></div><div></div><div></div><div></div></div></div>	<div><div><div></div><div></div><div></div><div></div><div></div></div></div>		
218.2																	
	Cont'd Dense		11	SS	36												
	Compact		12	SS	12												
		13	SS	13													
	Very loose		14	SS	WH												

METRIC

RECORD OF BOREHOLE No 602-31N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+887.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)													
						○ UNCONFINED			+ FIELD VANE			○													
						● QUICK TRIAXIAL			× LAB VANE																
218.2	Cont'd Silt, trace sand trace clay Loose Grey Wet																								
218.1			10	SS	9																				
15.1																									
					11	SS	7																		
			12	SS	8																				

RECORD OF PENETRATION TEST No 602-32N

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+887.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.2 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
							219							

Cont'd

RECORD OF PENETRATION TEST No 602-32N

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+887.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100		
218.2	Cont'd						218							
							217							
							216							
							215							
214.6 18.6	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 602-33N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+900, o/s 19m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										WATER CONTENT (%)
233.2	Top of Ice																	
0.0	Snow/Ice																	
0.2 0.3	Peat, coarse fibrous		1	SS	1		233											
	Dark brown																	
	Silt, trace clay trace sand																	
	Loose Brown Moist	2	SS	7	232													
							231											
230.5																		
2.7	Silty clay trace sand																	
	Stiff Brown Wet		3	SS	10		230											

	Firm Grey		4	SS	5	229												
						228												
			5	SS	WH**	227												
						226												
			6	SS	WH	225												
			7	SS	WH	224												
						223												
222.7																		
10.5	Clayey silt trace sand																	
	Firm Grey Wet		8	SS	WH	222												
221.2																		
12.0	Silt, trace clay trace sand																	
	Very Grey Wet loose		9	SS	4	221												

	Loose		10	SS	8	220												
						219												
	Cont'd																	

RECORD OF BOREHOLE No 602-33N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+900, o/s 19m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
218.2								20	40	60	80	100									
	Cont'd	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div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RECORD OF PENETRATION TEST No 602-34N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+912.5, o/s 8m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.4 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
224.0 9.4	End of dynamic cone penetration test Refusal on probable bedrock						224							

RECORD OF PENETRATION TEST No 602-34NA

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+912.5, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
233.2 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
223.3 9.9	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 602-35N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+912.5, o/s 31m Rt. Burwash Twp. ORIGINATED BY SH
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
					20 40 60 80 100					20 40 60							
233.2	Top of Ice					*											
0.0	Snow/Ice		1	SS	1		233										
232.3																	
0.9	Peat, amorphous																
232.0	Dark brown Clayey silt, trace sand						232										
1.2	Firm Brown/ Moist grey		2	SS	8		231										
230.4																	
2.8	Silty clay trace sand						230										
	Stiff Light Wet brown		3	SS	10												
							229										
	Varved																
	Firm Grey		4	SS	3		228										
			5	SS	1		227										
							226										
225.2			6	SS	WH**		225										
8.0	Clayey silt trace sand																
	Firm Grey Wet																
224.0							224										
9.2	Silt, trace sand trace clay		7	SS	4												
	Very loose Grey Wet to compact						223										
			8	SS	10		222										
							221										
			9	SS	4												
							220										
219.5																	
13.7	End of borehole																
	Refusal on probable bedrock																
	Cont'd																

RECORD OF BOREHOLE No 602-35N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+912.5, o/s 31m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
218.2	Cont'd																
	* Borehole dry on completion of drilling																
	WH** Refers to penetration under the weight of rods and hammer.																

RECORD OF BOREHOLE No 602-36N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+925, o/s 19m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
233.3	Top of Ice						20	40	60	80	100						
0.0	Snow/Ice		1	SS	2	145											
0.3	Clayey silt trace sand																
	Soft Brown/ Moist to stiff grey																

	Brown		2	SS	8								145				
230.4	Silty clay, trace sand																
2.9	Stiff Brown Moist		3	SS	9												

228.2	Soft		4	SS	4												
5.1	End of borehole																
	Refusal on probable bedrock																

RECORD OF BOREHOLE No 602-37N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+937.5, o/s 11m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
233.8	Ground Surface					*														
0.0 0.1	Topsoil Silt, trace sand trace clay Compact Light Moist brown brown		1	SS	11		233													
232.3																				
1.5	Clayey silt trace sand Firm Light Moist brown brown		2	SS	9		232													
							231													
			3	SS	6															
230.0	Silty clay, trace sand trace silt Very Light Wet stiff brown						230													
3.8			4	SS	16															
229.1																				
4.7	End of borehole Refusal on probable bedrock 																			

RECORD OF PENETRATION TEST No 602-38N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+937.5, o/s 28m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa			w _p	w	w _L	GR SA SI CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
						○ UNCONFINED + FIELD VANE			● QUICK TRIAXIAL × LAB VANE	WATER CONTENT (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
233.8 0.0	Ground Surface																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

RECORD OF BOREHOLE No 602-39N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+950, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL	× LAB VANE									
235.1	Ground Surface							20	40	60	80	100								
0.0	Peat, coarse fibrous		1	SS	6		235													
0.2	Dark brown Clayey silt, trace sand						234													
233.9	Firm Brown Moist						233													
1.2	Silty clay, trace sand		2	SS	7		232													
	Firm Brown Moist						231													
232.5	Silt, trace sand with thin clay layers		3	SS	7		230													
2.6	Loose Grey Wet																			
	With thin sand partings trace gravel		4	SS	8															
229.3	End of borehole																			
5.8	Refusal on probable bedrock																			
	* 2003 03 21																			
	▼ Water level measured after drilling																			
	■ Penetrometer test																			

RECORD OF BOREHOLE No 602-40N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+962.5, o/s 11m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT								PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED				+ FIELD VANE								
235.9	Top of Ice							20	40	60	80	100								
0.0	Snow/Ice																			
0.1	Topsoil		1	SS	21															
0.2	Silt, trace sand trace clay																			
	Compact Brown Moist						235													
	trace gravel																			
234.0	Loose		2	SS	8		234													
1.9	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 602-41N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+962.5, o/s 28m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						w _p	w	w _L		GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
235.5	Ground Surface							20	40	60	80	100									
0.0	Topsoil																				
0.2	Silt, trace sand trace clay		1	SS	9		235														
234.9	Loose Brown Moist Silty clay, trace sand																				
0.6	Stiff Brown Moist						234														
233.5			2	SS	8																
2.0	Silt, trace sand trace clay						233														
	Compact Brown Moist																				
			3	SS	13		232														
231.6																					
3.9	End of borehole Refusal on probable bedrock <																				

RECORD OF BOREHOLE No 602-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+587.5, o/s 8m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____






SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20					40	60	80				
237.3	Ground Surface																						
0.0	Peat, coarse fibrous		1	SS	14																		
0.1	Dark brown																						
	Silt, trace sand trace clay																						
	Compact Brown Moist																						
	Grey		2	SS	26																		
			3	SS	17																		
233.6																							
3.7	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 602-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+587.5, o/s 31m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
236.8	Ground Surface																			
0.0	Peat, coarse fibrous		1	SS	5															
0.2	Dark brown																			
236.4	Silt, trace sand trace clay																			
0.4	Loose Brown Moist																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 602-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+600, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE												
236.2	Ground Surface							20	40	60	80	100											
0.0	Peat, coarse fibrous		1	SS	1		236																
0.1	Dark brown Silt, trace fine sand trace clay trace gravel																						
234.7	Very Orange/ Moist loose brown						235																
1.5	End of borehole Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF PENETRATION TEST No 602-4S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+612.5, o/s 37m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
234.7 0.0	Ground Surface													
234														
233														
232														
231														
230.9 3.8	End of dynamic cone penetration test													

RECORD OF BOREHOLE No 602-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+625, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
234.0	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous		1	SS	9												
0.2	Dark brown Silt, trace fine sand trace clay																
	Loose Orange/ Moist brown																
232.5																	
1.5	Silty clay		2	SS	10												
	Stiff Brown Moist																
231.1																	
2.9	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 602-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+637.5, o/s 46m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED	+ FIELD VANE														
231.7	Ground Surface																						
0.0	Peat, coarse fibrous																						
0.2	Dark brown		1	SS	16																		
	Silt, trace fine sand						231																
230.6	Compact Brown/ Dry																						
1.1	grey																						
	Silty clay, trace sand trace silt																						
	Firm Brown Moist		2	SS	6		230																
228.7							229																
3.0	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						
	■ Penetrometer test																						

RECORD OF BOREHOLE No 602-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+650, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
232.9	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous		1	SS	4	 ▽* ▽* 											

RECORD OF PENETRATION TEST No 602-8S

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+650, o/s 45m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE LIQUID LIMIT LIMIT CONTENT CONTENT LIMIT w_p w w_L			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE		WATER CONTENT (%)				
231.5 0.0	Ground Surface													
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
							219							
							218							
							217							
216.7 14.8	Cont'd													

RECORD OF PENETRATION TEST No 602-8S

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+650, o/s 45m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
216.5	Cont'd End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 602-9S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+662.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE												
								● QUICK TRIAXIAL × LAB VANE												
231.1	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, coarse fibrous		1	SS	1	↓*														
0.1	Dark brown																			
	Silt, trace sand trace clay																			
229.9	Very loose Brown/ Dry																			
1.2	Silty clay trace sand																			
	Firm Brown/ Moist		2	SS	8															
	Brown																			
228.4																				
	Clayey silt, trace sand																			
2.7	Stiff Grey Moist		3	SS	3															
			4	SS	2															
224.9	Silt, trace fine sand trace clay		5	SS	6															
6.2	Loose Grey Moist																			
	Compact		6	SS	11															
			7	SS	12															
			8	SS	6															
219.5	Sandy silt, trace clay trace gravel																			
11.6	Very loose Brown Moist		9	SS	4															
217.7																				
13.4	End of borehole																			
	Refusal on probable bedrock																			
	Cont'd																			

RECORD OF BOREHOLE No 602-9S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+662.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
216.1	Cont'd																
	* 2003 03 22  Water level observed during drilling  Water level measured after drilling  Penetrometer test																

RECORD OF BOREHOLE No 602-10S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+662.5, o/s 4.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								20 40 60 80 100									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
WATER CONTENT (%)																	
20 40 60																	
233.1	Ground Surface																
0.0	Peat, coarse fibrous						233										
0.2	Dark brown		1	SS	3												
	Silt, trace sand trace clay																
231.9	Very loose Orange/ Moist						232										
1.2	Silty clay																
	Stiff Light brown Moist		2	SS	14												
							231										
229.9	Clayey silt, trace sand		3	SS	8		230										
3.2	Firm Red/ Moist to stiff brown																
							229										
	Light brown		4	SS	2		228										
							227										
226.9	Silt, trace clay trace sand		5	SS	5												
6.2	Loose Brown Wet to compact						226										
			6	SS	14												
							225										
			7	SS	12		224										
							223										
222.4	Sandy silt, trace clay trace gravel		8	SS	6		222										
10.7	Loose Brown Wet																
221.2	End of borehole																
11.9	Refusal on probable bedrock																
	* 2003 03 23																
	Water level measured after drilling																
	Penetrometer test																

RECORD OF BOREHOLE No 602-11S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+675, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE										○		
								● QUICK TRIAXIAL × LAB VANE												
231.1 0.0	Ground Surface						20	40	60	80	100									
0.1	Peat, coarse fibrous		1	SS	8								○							
	Dark brown																			
230.2 0.9	Silt, trace clay trace sand																			
	Loose Grey/ Dry																			
	Silty clay, trace sand																			
	Firm Grey/ Moist		2	SS	8									○		0 1 52 47				
228.1 3.0	Clayey silt trace sand		3	SS	1									○						
	Stiff Brown Moist																			
			4	SS	3											0 3 67 30				
225.8 5.3	Silt, trace sand trace clay																			
	Loose Grey Moist to wet compact		5	SS	7									○						
			6	SS	9									○ Non-plastic		0 1 89 10				
			7	SS	12															
			8	SS	5															
218.8 12.3	Sandy silt trace clay trace gravel		9	SS	15											9 31 57 3				
	Compact Brown Moist																			
216.9 14.2	End of borehole																			
	Cont'd																			

RECORD OF BOREHOLE No 602-11S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+675, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
216.1	Cont'd Refusal on probable bedrock * Borehole dry on completion of drilling ■ Penetrometer test																	

RECORD OF PENETRATION TEST No 602-11SA

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+687.5, o/s 4m Lt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L				
230.4 0.0	Ground Surface													
221.9 8.5	End of dynamic cone penetration test													

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 602-13S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+700, o/s 19m Lt. Burwash Twp. ORIGINATED BY PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 26, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
230.8	Ground Surface																
0.0	Peat, fine fibrous																
0.1	Dark brown Clayey silt, trace sand																
	Very Brown Moist																
	stiff																
	Wet																
228.9			1	AS													
1.9	End of borehole																
	Refusal on probable bedrock																
	* 2003 06 26																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 602-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+712.5, o/s 46m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		× LAB VANE
235.0	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse fibrous		1	SS	16								○							
0.1	Dark brown Silt, trace clay trace fine sand																			
233.8	Compact Grey/ Dry brown																			
1.2	Silty clay, trace sand																			
232.7	Stiff Grey/ Moist brown		2	SS	6					■			○							
2.3	Silt, trace sand trace clay																			
2.3	Compact Light Moist brown		3	SS	15								○							
															</					

RECORD OF BOREHOLE No 602-15S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+725, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
235.1	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous																
0.2	Dark brown		1	SS	15												
	Silt, trace clay trace sand																
	Compact Grey/ Dry																
	brown																
	Moist		2	SS	19												
			3	SS	19												

RECORD OF PENETRATION TEST No 602-16S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+737.5, o/s 37m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
235.3 0.0	Ground Surface																
231.9 3.4	End of dynamic cone penetration test Refusal on probable bedrock						235										
							234										
							233										
							232										

RECORD OF BOREHOLE No 602-17S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+750, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
235.4	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous		1	SS	12												
0.1	Dark brown Silt, trace clay trace fine sand																
	Compact Light Dry brown																
	Moist		2	SS	22												
232.8																	
2.6	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF PENETRATION TEST No 602-18S

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+762.5, o/s 8m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
236.2 0.0	Ground Surface													
231.8 4.4	End of dynamic cone penetration test Refusal on probable bedrock													

Cont'd

2 of 2 **METRIC**

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 602-19S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+762.5, o/s 31m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
235.2	Ground Surface					*		20	40	60	80	100								
0.0	Peat, coarse fibrous		1	SS	16		235													
0.1	Dark Brown																			
	Silt, trace clay trace sand						234													
	Compact Light Dry																			
	brown																			
	Moist																			
			2	SS	24		233													
			3	SS	26		232													
230.9							231													
4.3	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 602-20S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+775, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa															
								○ UNCONFINED			+ FIELD VANE											● QUICK TRIAXIAL	
235.5	Ground Surface							20	40	60	80	100											
0.0	Peat, coarse fibrous		1	SS	6		235																
0.2	Dark brown Silt, trace clay trace fine sand																						
	Loose Grey/ brown Dry																						
234.1																							
1.4	End of borehole Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 602-21S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+787.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY DR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____






SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
235.6	Ground Surface					*		20	40	60	80	100					
0.0	Peat, fine fibrous																
0.1	Dark brown																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 602-22S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+787.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY DR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
233.6	Ground Surface					*											
0.0	Peat, fine fibrous																
0.2	Dark brown																
233.1	Silty sand, trace gravel																
0.5	Brown Dry																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 602-23S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+800, o/s 19m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
233.7	Ground Surface							20	40	60	80	100									
0.0	Peat, coarse fibrous																				
0.2	Dark brown		1	SS	6																
	Silt, trace sand trace clay						233														
	Loose Brown Moist																				
	Compact Grey Wet																				
			2	SS	21		232														
231.5																					
2.2	End of borehole Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 602-24S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+812.5, o/s 40m Lt. Burwash Twp. ORIGINATED BY AS
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	WATER CONTENT (%)												
233.5	Ground Surface							20	40	60	80	100									
0.0	Peat, fine fibrous		1	SS	39		233														
0.3	Dark brown Clay, trace sand																				
	Hard Grey/ Moist brown																				
232.0							232														
1.5	Silty clay trace sand		2	SS	4																
	Soft Brown Moist						231														

RECORD OF BOREHOLE No 602-25S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+825, o/s 19m Lt. Burwash Twp. ORIGINATED BY AS
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20						40	60	80
233.5	Ground Surface																			
0.0	Peat, fine fibrous																			
0.2	Dark brown Silt, trace sand trace clay		1	SS	10		233													
232.3	Loose to Grey/ Moist compact brown																			
1.2	Clay, trace sand																			
	Firm Brown Wet		2	SS	6		232									0 1 29 70				
							231													
			3	SS	4		230													
229.5	Silty clay, trace sand																			
4.0	Firm Brown Wet		4	SS	1		229									0 1 52 47				
							228													
			5	SS	3		227													
							226													
225.9	Silt, trace sand trace clay		6	SS	7											0 2 90 8				
7.6	Loose Grey Wet to compact						225													
			7	SS	8		224													
							223													
			8	SS	11															
221.9	Sand, trace silt trace gravel						222													
11.6	Compact Grey Wet																			
221.3	End of borehole		9	SS	21/15cm															
12.2	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF PENETRATION TEST No 602-25SA

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+825, o/s 30m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
233.4 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
219.4 14.0	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 602-26S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+837.5, o/s 37m Lt. Burwash Twp. ORIGINATED BY AJS
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa				w_p	w	w_L					
								<div>○ UNCONFINED + FIELD VANE</div> <div>● QUICK TRIAXIAL x LAB VANE</div>	WATER CONTENT (%)										
233.3 0.0 0.1	Ground Surface Peat, fine fibrous Dark brown Clay, trace sand Soft Grey Wet Firm Brown																		
228.7 4.6	Silt, trace sand trace clay Compact Grey Wet		1	SS	2		233												
227.2 6.1	Silty clay, trace sand Firm Grey Wet		2	SS	8		232												
							231												
			3	SS	6		230												
							229												
							228												
							227												
							226												
							225												
							224												
							223												
222.3 11.0	Silt, trace sand trace clay Very Grey Wet loose		4	SS	27		229												
							228												
							227												
							226												
							225												
							224												
							223												
							222												
							221												
							220												
218.9 14.4	Sand, trace silt trace gravel Cont'd		5	SS	1		227												
							226												
							225												
							224												
							223												
							222												
							221												
							220												
							219												

RECORD OF BOREHOLE No 602-26S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+837.5, o/s 37m Lt. Burwash Twp. ORIGINATED BY AJS
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																
218.3								20	40	60	80	100		20	40	60								
	Cont'd	•••••					218																	
	Very loose Grey Wet	•••••	11	SS	1																			
		•••••																						
216.9		•••••					217																	
16.4	End of borehole Refusal on probable bedrock <																							

RECORD OF BOREHOLE No 602-27S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+850, o/s 19m Lt. Burwash Twp. ORIGINATED BY AS
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 18, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	WATER CONTENT (%)					
233.4	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	6												
0.3	Dark brown Clay, trace sand						233										
	Firm to Brown Moist stiff		2	SS	8		232										
							231										
			3	SS	6		230										
							229										
228.5	Silt, trace sand trace clay		4	SS	21		228										
4.9	Compact Grey Moist						227										
227.6	Silty clay, trace sand		5	SS	4		226										
5.8	Soft to Grey Wet firm		6	SS	1		225										
							224										
			7	SS	3												
223.6																	
9.8	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																
	■ Penetrometer test																

RECORD OF BOREHOLE No 602-28S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT		UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W		
233.3	Ground Surface												
0.0	Peat, fine fibrous		1	SS	5		233						
0.2	Black Silt, trace fine sand trace clay						232						
	Loose Grey Moist												
231.5	Silty clay, trace sand		2	SS	6								
1.8	Stiff Brown Moist						231						
230.3	Silt, trace clay trace sand		3	SS	10		230						
3.0	Loose Grey/brown Moist to compact		4	SS	9		229						
							228						
227.2	Silty clay, trace sand		5	SS	2		227						
6.1	Soft Grey Wet						226						
	Firm		6	SS	WH**		225						
			7	SS	WH		224						
							223						
			8	SS	WH		222						
221.1	Silt, trace sand trace clay		9	SS	4		221						
12.2	Very Grey Wet loose to compact		10	SS	8		220						
							219						
	Cont'd												

RECORD OF BOREHOLE No 602-28S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE														
218.3								20	40	60	80	100											
				11	SS	4		218															
				12	SS	11		216															
				13	SS	8		215															
209.2 24.1	End of borehole Refusal on probable bedrock * 2003 03 20 ▽ Water level observed during drilling ▼ Water level measured after drilling WH** Refers to penetration under the weight of rods and hammer ■ Penetration test																						

RECORD OF PENETRATION TEST No 602-28SA

1 of 2 **METRIC**

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 12+862.5, o/s 19m Lt. Burwash Twp.	ORIGINATED BY	MR
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	March 21, 2003	CHECKED BY	PC

SOIL PROFILE					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES	N° VALUES	GROUND WATER CONDITIONS
233.3 0.0	Ground Surface				
	Unsampled				
227.2 6.1	End of borehole				
218.3	Cont'd				

RECORD OF PENETRATION TEST No 602-28SA

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 19m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100		
218.3 15.0	Dynamic Cone Penetration Test Cont'd						218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							
							209							
							208							
							207							
							206							
205.6 27.7	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF PENETRATION TEST No 602-29S

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY AJS
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.4 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
							219							

Cont'd

RECORD OF PENETRATION TEST No 602-29S

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+862.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY AJS
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
218.4	Cont'd						218										
							217										
							216										
215.7 17.7	End of dynamic cone penetration test																

RECORD OF BOREHOLE No 602-30S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+875, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT		UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p w W _L	WATER CONTENT (%)		
233.3	Ground Surface												
0.0	Peat, coarse fibrous												
0.2	Dark brown Silty clay, trace sand		1	AS	2		233						
	Stiff Grey/ Moist brown												
			2	SS	9		232						
	Brown						231						
			3	SS	8		230						
	Grey						229						
			4	SS	11		228						
	Firm to stiff Wet		5	SS	8		227						
	Varved						226						
	Red/grey		6	SS	1		225						
	Grey		7	SS	1		224						
			8	SS	WR**		223						
	clayey silt lenses						222						
			9	SS	3		221						
	Trace gravel		10	SS	7		220						
218.7							219						
14.6													
	Cont'd												

RECORD OF BOREHOLE No 602-30S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+875, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)							
218.3								20	40	60	80	100	20	40	60					
217.0 16.3	Cont'd						218													
	Clayey silt, trace sand with silt seams		11	SS	1															
	Very loose Grey Wet																			
	End of borehole						217													
	Refusal on probable bedrock																			
	<div>* 2003 03 17</div> <div> Water level observed during drilling</div> <div> Water level measured after drilling</div> <div>WR** Refers to penetration under the weight of rods only</div> <div> Penetrometer test</div>																			

RECORD OF PENETRATION TEST No 602-31S

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+887.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.3 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
							219							

Cont'd

RECORD OF PENETRATION TEST No 602-31S

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+887.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
218.3	Cont'd						218							
							217							
							216							
							215							
214.3 19.0	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF PENETRATION TEST No 602-31SA

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+887.5, o/s 19m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.3 0.0	Ground Surface													
							233							
							232							
							231							
							230							
							229							
							228							
							227							
							226							
							225							
							224							
							223							
							222							
							221							
							220							
							219							

Cont'd

RECORD OF PENETRATION TEST No 602-31SA

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+887.5, o/s 19m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
218.3	Cont'd						218										
							217										
216.0							216										
17.3	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 602-32S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+887.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY AJS
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								20 40 60 80 100					W _p W W _L				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
233.4	Ground Surface																
0.0	Peat, fine fibrous																
0.3	Dark brown Silty clay, trace sand Firm to Brown Moist stiff						233										
							232										
			1	SS	7		231										
							230										
			2	SS	9		229										
228.5	Clayey silt, trace sand		3	SS	5		228										
4.9	Loose Grey Wet						227										
227.3	Silty clay, trace sand		4	SS	3		226										
6.1	Firm Grey Wet						225										
			5	SS	2		224										
							223										
			6	SS	1		222										
							221										
222.4	Silt, trace sand trace clay		7	SS	1		220										
11.0	Compact Grey Wet																
			8	SS	26												
			9	SS	14												
219.1	End of borehole																
14.3	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 602-33S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+900, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE										
233.4 0.0	Ground Surface Peat, coarse fibrous		1	AS	5	▽*									98.6					
232.8 0.6	Dark brown																			
	Silty clay, trace sand																			
	Firm Grey/ Moist to brown stiff			2	SS		10													
				3	SS		7													
	Grey																			
			4	SS	10															

RECORD OF BOREHOLE No 602-34S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+912.5, o/s 8m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 20, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
233.4	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous																
0.2	Dark Wet brown																
	Silty clay, trace sand																
	Firm Brown Moist		1	SS	8												
231.0																	
2.4	Silt, trace sand		2	SS	6												
	trace clay trace gravel																
	Loose Brown Moist																
												</					

RECORD OF PENETRATION TEST No 602-35S

1 of 1 **METRIC**

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 12+912.5, o/s 31m Lt. Burwash Twp.	ORIGINATED BY	AJS
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DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test	COMPILED BY	PC
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DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

[illegible]

RECORD OF BOREHOLE No 602-36S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+925, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								
233.7	Ground Surface															
0.0	Peat, coarse fibrous		1	SS	6											
0.1	Dark brown Silty clay, trace sand															
	Firm Grey/ Moist brown															
	Brown		2	SS	6											
230.6																
3.1	Clayey silt, trace sand		3	SS	7											
	Firm Brown Wet															
229.2	Silt, trace sand trace clay		4	SS	13											
4.5	Compact Grey Wet															
227.3	End of borehole		5	SS	4/15cm											
6.4	Refusal on probable bedrock															

RECORD OF PENETRATION TEST No 602-37S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+937.5, o/s 11m Lt. Burwash Twp. ORIGINATED BY AJS
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.6 0.0	Ground Surface													
229.7 3.9	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 602-38S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+937.5, o/s 28m Lt. Burwash Twp. ORIGINATED BY AJS
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
233.8	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous		1	SS	6									o			
0.3	Dark brown Silty clay, trace sand						233										
	Firm Brown Moist																
231.7			2	SS	5		232							o			
2.1	Clayey silt, trace sand																
	Stiff Brown Wet						231										
230.3			3	SS	12									o			
3.5	Sandy silt trace clay						230										
	Loose Green/ Moist grey																
	Grey Wet		4	SS	7		229							o			
228.6	Sand, trace silt trace gravel																
5.2	Loose Grey Wet						228										
228.0	End of borehole																
5.8	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 602-40S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+962.5, o/s 11m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL									x LAB VANE		
235.2	Ground Surface						20	40	60	80	100												
0.0	Peat, coarse fibrous																						
0.2	Dark brown		1	SS	10																		
	Silt, trace sand trace clay																						
234.0	Compact Brown Moist																						
1.2	Silty clay, trace sand																						
	Stiff Brown Moist		2	SS	7																		
232.6	Clayey silt, trace sand																						
2.6	Compact Brown Moist																						
			3	SS	11																		
231.5																							
3.7	End of borehole																						
	Refusal on probable bedrock																						
	* 2003 03 21																						
	Water level measured after drilling																						
	Penetrometer test																						

RECORD OF BOREHOLE No 602-41S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 12+962.5, o/s 28m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
234.7	Ground Surface							20	40	60	80	100					
0.0	Peat, coarse fibrous																
0.2	Dark brown		1	SS	5		234										
	Silt, trace sand trace clay																
233.5	Loose Brown Moist																
1.2	Silty clay, trace sand																
	Stiff Brown Moist		2	SS	6		233										
							232										
231.3	Clayey silt, trace sand		3	SS	7		231										
3.4	Firm Brown Moist																
230.5	Silt, trace sand trace clay						230										
4.2	Loose Brown Wet		4	SS	7												
	fine sand layers						229										
			5	SS	5												
228.0	End of borehole						228										
6.7	Refusal on probable bedrock																
<div>* 2003 03 21</div> <div><div>▼</div>Water level measured after drilling</div> <div><div>■</div>Penetrometer test</div>																	

* 2003 03 21

▼ Water level measured after drilling

■ Penetrometer test

RECORD OF BOREHOLE No 603-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+187.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
228.9	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil																
0.1	Silty sand, trace gravel																
0.2	Brown Moist End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 603-2M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+237.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
225.4 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 603-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+162.5, o/s 11m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
233.2 0.0	Ground Surface <																				

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 603-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+175, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE												
231.9 0.0	Ground Surface <																								

RECORD OF BOREHOLE No 603-4N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+187.5, o/s 48m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
228.2 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 603-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+200, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL		
225.0 0.0	Ground Surface					20			40	60	80	100		20					40	60				
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 603-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+212.5, o/s 33.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
223.9 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 603-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+212.5, o/s 4.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
225.0 0.0	Ground Surface					20			40	60	80	100		20					40	60					
	* Borehole dry on completion of drilling																								

RECORD OF BOREHOLE No 603-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+225, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
227.0	Ground Surface																							
0.0	Bedrock at surface																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 603-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+237.5, o/s 40m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE						LAB VANE		
223.8	Ground Surface							20	40	60	80	100		20	40	60				
0.0	Topsoil	•																		
0.1	Sand, trace silt trace gravel	•																		
0.2	Brown Moist End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 603-10N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+250, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____


SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
220.4 0.0	Ground Surface <																				

RECORD OF BOREHOLE No 603-11N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+275, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)			
220.6	Ground Surface							20	40	60	80	100		20	40	60					
0.0	Topsoil																				
0.2	Sand, silt, trace gravel, Brown Moist boulders						220														
219.7	End of borehole																				
0.9	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 603-12N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+287.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
222.6	Ground Surface							20	40	60	80	100												
0.0	Topsoil	•																						
0.1	Sand, trace silt trace gravel	•																						
0.3	Brown Moist End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 603-13N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+287.5, o/s 4m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		WATER CONTENT (%)	GR	SA	SI
223.6	Ground Surface					*														
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 603-14N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+300, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
226.0	Ground Surface							20	40	60	80	100					
0.0	Topsoil	•															
0.1	Sand, trace silt trace gravel	•															
	Brown Moist	•															
		•															
		•															
		•															
		•															
		•															
224.2		•															
1.8	End of borehole																
	Refusal on probable bedrock																
	 * Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 603-15N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+312.5, o/s 28m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
227.4	Ground Surface							20	40	60	80	100					
0.0	Topsoil	•••••					227										
0.1	Sand, trace silt trace gravel	•••••															
226.7	Brown Moist	•••••															
0.7	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 603-16N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+312.5, o/s 11m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L					
229.7	Ground Surface							20	40	60	80	100								
0.0 0.1	Topsoil Sand, trace silt trace gravel, boulders	•••••																		
228.8	Brown Moist	•••••					229													
0.9	End of borehole Refusal on probable bedrock 																			

RECORD OF BOREHOLE No 603-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+162.5, o/s 11m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
231.4 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 603-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+175, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE										
227.6 0.0	Ground Surface <																						

RECORD OF BOREHOLE No 603-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+187.5, o/s 48m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
225.0 0.0	Ground Surface <																							

RECORD OF BOREHOLE No 603-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+200, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
222.4	Ground Surface																
0.0 0.1	Peat, coarse to amorphous																
	Dark brown																
221.6 0.8	Silt, trace sand trace clay																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 603-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+212.5, o/s 33.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE										
223.2 0.0	Ground Surface 																						

RECORD OF BOREHOLE No 603-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+212.5, o/s 4.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
225.0 0.0	Ground Surface					20			40	60	80	100	20					40	60					
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 603-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+225, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
228.5 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 603-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+237.5, o/s 40m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						w _p w w _L			WATER CONTENT (%)	GR	SA		SI	CL			
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
222.7 0.0	Ground Surface <																						

RECORD OF BOREHOLE No 603-10S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+250, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
221.5	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 603-11S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+275, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
220.7	Ground Surface							20	40	60	80	100					
0.0	Topsoil	••															
0.1	Sand, trace silt trace gravel, boulders	•••••															
219.8	Brown Moist	•••••					220										
0.9	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 603-12S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+287.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
223.7	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 603-13S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+287.5, o/s 4m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
224.4	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 603-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+300, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
227.5	Ground Surface					*		20	40	60	80	100		20	40	60				
0.0	Topsoil	•																		
0.1	Sand, trace silt trace gravel	•																		
0.2	Brown Moist End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 603-15S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+312.5, o/s 28m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
232.8	Ground Surface							20	40	60	80	100						
0.0	Topsoil	•																
0.1	Sand, trace silt trace gravel	•																
231.9	Brown Moist	•																
0.9	End of borehole	•					232											
	Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 604-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+562.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	FIELD VANE	×	LAB VANE										
233.2 0.0	Ground Surface 																						

RECORD OF BOREHOLE No 604-2M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+587.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
230.8	Ground Surface																
0.0	Topsoil																
0.1	Sand, trace silt trace gravel																
230.2																	
0.6	Loose Brown Moist																
229.9	Clayey silt,																
0.9	Soft Grey Wet End of borehole																
	Refusal on probable bedrock																
	* 2003 04 29																
	▽ Water level observed during drilling																

RECORD OF BOREHOLE No 604-3M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+612.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
230.9	Ground Surface					*		20	40	60	80	100								
0.0	Peat, coarse fibrous																			
0.1	Dark brown																			
230.4	Sand, trace silt trace gravel																			
0.5	Loose Orange/ Moist brown																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 604-5M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+662.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED			+ FIELD VANE										
231.2	Ground Surface							20	40	60	80	100									
0.0	Topsoil	•					231														
0.1	Sand, trace silt trace gravel	•																			
230.3	Loose Orange/ Moist brown	•																			
0.9	End of borehole	•																			
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 604-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+525, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
237.4	Ground Surface							20	40	60	80	100								
0.0	Topsoil	•					237													
0.1	Sand, trace silt trace gravel	•••																		
236.6	Loose Brown Moist	•••																		
0.8	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 604-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+537.5, o/s 28m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	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			SHEAR STRENGTH kPa									
236.7	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 604-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+562.5, o/s 48m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
235.9 0.0	Ground Surface <																				

RECORD OF BOREHOLE No 604-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+575, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE												
232.2 0.0	Ground Surface 																								

RECORD OF BOREHOLE No 604-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+587.5, o/s 39m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____





SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
229.5	Ground Surface					*											
0.0	Topsoil																
0.2	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 604-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+600, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
229.8	Ground Surface					*											
0.0	Peat, coarse fibrous																
0.1	Sand, trace silt trace gravel																
0.3	Loose Brown Moist End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 604-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+612.5, o/s 42.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
230.0 0.0	Ground Surface Bedrock at surface					○ UNCONFINED ● QUICK TRIAXIAL			+	FIELD VANE × LAB VANE													
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 604-10N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+625, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
228.8 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 604-13N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+662.5, o/s 40m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
231.7	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil	•																		
0.1	Sand, trace silt trace gravel	• •																		
231.2	Loose Brown Moist End of borehole																			
0.5	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 604-14N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+675, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE								● QUICK TRIAXIAL		
232.5	Ground Surface							20	40	60	80	100									
0.0	Topsoil	•																			
0.1	Sand, trace silt trace gravel	•••																			
231.7	Loose Brown Moist	•••					232														
0.8	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 604-15N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+687.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
238.0	Ground Surface					*														
0.0	Topsoil	•																		
0.1	Sand, trace silt trace gravel	•																		
0.2	Loose Brown Moist End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 604-16N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+687.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE										
238.6 0.0	Ground Surface 																						

RECORD OF BOREHOLE No 604-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+525, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
235.9	Ground Surface																							
0.0	Topsoil																							
0.1	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 604-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+537.5, o/s 28m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
236.6 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 604-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+537.5, o/s 11m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
236.4 0.0	Ground Surface <																				

RECORD OF BOREHOLE No 604-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+550, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
235.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 604-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+562.5, o/s 48m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
232.2	Ground Surface					*																		
0.0	Topsoil																							
0.2	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 604-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+575, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
230.8	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous																
0.1	Dark brown																
229.9	Sand, trace silt trace gravel																
0.9	Loose Dark Moist brown						230										
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 604-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+587.5, o/s 39m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT								PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa																WATER CONTENT (%)		
								○ UNCONFINED				+ FIELD VANE														
231.7	Ground Surface							20	40	60	80	100														
0.0	Topsoil	•																								
0.1	Sand, trace silt trace gravel	•••																								
231.1	Loose Brown Moist	•																								
0.6	End of borehole	•																								
	Refusal on probable bedrock																									
	* Borehole dry on completion of drilling																									

RECORD OF BOREHOLE No 604-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+600, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
231.5	Ground Surface					*														
0.0	Peat, coarse fibrous																			
0.1	Dark brown																			
0.3	Sand, trace silt trace gravel																			
	Loose Orange/ Moist brown																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 604-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+612.5, o/s 42.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						w _p w w _L			WATER CONTENT (%)	kN/m ³	GR		SA	SI	CL		
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
231.3 0.0	Ground Surface <																						

RECORD OF BOREHOLE No 604-11S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+637.5, o/s 44m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT								PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa															
								○ UNCONFINED				+ FIELD VANE											
230.9	Ground Surface							20	40	60	80	100											
0.0	Topsoil																						
0.1	Sand, trace silt trace gravel																						
230.4	Loose Brown Moist End of borehole																						
0.5	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 604-13S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+662.5, o/s 40m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
232.3	Ground Surface							20	40	60	80	100								
0.0	Topsoil	•					232													
0.1	Sand, trace silt trace gravel	•																		
231.4	Loose Orange/ Moist brown	•																		
0.9	End of borehole	•																		
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 604-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+675, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
235.9 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 604-15S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+687.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
240.0	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 604-16S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 13+687.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL		
239.2 0.0	Ground Surface					20			40	60	80	100		20					40	60				
	* Borehole dry on completion of drilling																							

FOUNDATION INVESTIGATION REPORT
SWAMP AND HIGH FILL CROSSINGS
for
HIGHWAY 69 FOUR-LANING
FROM 4 KM SOUTH OF ESTAIRE TO 1 KM NORTH OF HIGHWAY 537
G.W.P. 312-99-00
DISTRICT 54, TOWNSHIPS OF BURWASH, SECORD AND DILL
SUDBURY, ONTARIO

VOLUME 3

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VOLUME 3

APPENDIX C

Explanation of Terms Used in Report

Record of Borehole Sheets: Swamps 605 to 608, High Fill 609, Swamps 610 and 611

Record of Penetration Test Sheets: Swamps 605 to 608, High Fill 609, Swamps 610 and 611

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 (RQD), 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

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
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	e	1, %	VOID RATIO	e_{\min}	1, %	VOID RATIO IN DENSEST STATE
γ_s	kN/m^3	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	I_D	1	DENSITY INDEX = $\frac{e_{\max} - e}{e_{\max} - e_{\min}}$
ρ_w	kg/m^3	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
γ_w	kN/m^3	UNIT WEIGHT OF WATER	S_r	%	DEGREE OF SATURATION	D_n	mm	n PERCENT - DIAMETER
ρ	kg/m^3	DENSITY OF SOIL	w_L	%	LIQUID LIMIT	C_u	1	UNIFORMITY COEFFICIENT
γ	kN/m^3	UNIT WEIGHT OF SOIL	w_p	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
ρ_d	kg/m^3	DENSITY OF DRY SOIL	w_s	%	SHRINKAGE LIMIT	q	m^3/s	RATE OF DISCHARGE
γ_d	kN/m^3	UNIT WEIGHT OF DRY SOIL	I_p	%	PLASTICITY INDEX = $w_L - w_p$	v	m/s	DISCHARGE VELOCITY
ρ_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_L	1	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$	i	1	HYDRAULIC GRADIENT
γ_{sat}	kN/m^3	UNIT WEIGHT OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$	k	m/s	HYDRAULIC CONDUCTIVITY
ρ'	kg/m^3	DENSITY OF SUBMERGED SOIL	e_{\max}	1, %	VOID RATIO IN LOOSEST STATE	j	kN/m^2	SEEPAGE FORCE
γ'	kN/m^3	UNIT WEIGHT OF SUBMERGED SOIL						

RECORD OF BOREHOLE No 605-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+087.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.2 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-2M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+112.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____


SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
240.6 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-3M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+137.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
238.4	Ground Surface					*		20	40	60	80	100		20	40	60				
0.0	Peat, fine fibrous																			
0.3	Dark brown End of borehole Refusal on probable bedrock 																			

RECORD OF BOREHOLE No 605-4M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+237.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 17, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE													
								● QUICK TRIAXIAL x LAB VANE													
WATER CONTENT (%)						20 40 60 80 100						20 40 60									
234.3	Ground Surface																				
0.0	Peat, fine fibrous					▼*	234														
233.7	Black Wet																				
0.6	End of borehole																				
	Refusal on probable bedrock																				
	* 2003 03 17																				
	▼ Water level measured after drilling																				

RECORD OF PENETRATION TEST No 605-5M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+262.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 07, 2003 CHECKED BY _____





SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
234.0 0.0	Ground Surface (Unsampled)																
232.2 1.8	End of borehole																
230.2 3.8	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 605-6M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+287.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 06, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
234.0	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, amorphous Black to brown		1	SS	5*											* Frozen				
232.2			2	SS	WR**															
1.8	Silt, trace sand trace clay Very loose Grey Moist																			
			3	SS	1															
229.4																				
4.6	Silty clay, trace sand Very soft Grey Moist		4	SS	1															
			5	SS	2															
										</										

1 of 1 **METRIC**

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 605-8M

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+337.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
234.0	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous Black/ Moist brown		1	AS	-											366				
			2	SS	WR**											412				
231.3	Clayey silt, trace sand Soft Grey Moist		3	SS	3								○							
2.7																				
229.6	Silty clay, trace fine sand Soft Grey Moist		4	SS	3									○						
4.4																				
			5	SS	2									○						
226.7	Clayey silt trace fine sand Soft Brown Moist		6	SS	2									○						
7.3																				
			7	SS	3									○						
			8	SS	3									○						
221.5	Silt, trace clay trace sand Compact Grey Wet		9	SS	8									○						
12.5																				
			10	SS	10									○						
	Cont'd																			

RECORD OF BOREHOLE No 605-8M

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+337.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 13, 2003 CHECKED BY _____






SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						w _p	w	w _L											
						○ UNCONFINED + FIELD VANE						w _p w w _L													
						● QUICK TRIAXIAL × LAB VANE						WATER CONTENT (%)													
219.0									20	40	60	80	100		20	40	60				GR	SA	SI	CL	
	Cont'd		11	SS	23		218									○									
			12	SS	11												○								
	Sandy		13	SS	3		215									○									
213.9	Sand, trace silt trace gravel Compact Brown Wet						214																		
20.1																									
			14	SS	15		213										○								
211.4	End of borehole						212																		
22.6																									
	Refusal on probable bedrock																								
	* 2003 03 13																								
	Water level observed during drilling																								
	Water level measured after drilling																								
	WR** Refers to penetration under the weight of rods only																								

RECORD OF BOREHOLE No 605-9M

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+350, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 06, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		
234.0	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, amorphous Black		1	SS	WR**															
			2	SS	1										410					
231.9																				
2.1	Clayey silt, trace sand Soft Grey Wet																			
			3	SS	2															
229.4																				
4.6	Silty clay trace sand Very Brown Wet soft /grey		4	SS	1															
	With silt seams		5	SS	1															
226.7																				
7.3	Clayey silt, trace fine sand Soft Grey Moist		6	SS	2															
			7	SS	3															
			8	SS	2															
	Firm																			
			9	SS	7															
220.5																				
13.5	Silt, trace clay trace sand Compact Grey Moist		10	SS	26															
	Cont'd																			

RECORD OF BOREHOLE No 605-9M

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+350, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 06, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL								
ELEV DEPTH	DESCRIPTION			STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa																	
									○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																		
219.0									20	40	60	80	100	WATER CONTENT (%)													
217.3 16.7	Cont'd				11	SS	8		218																		
	Sandy silt Compact Grey Wet				12	SS	12																				
213.9 20.1					13	SS	14		215																		
213.9 20.1	End of borehole								214																		
	Refusal on probable bedrock																										
* 2003 03 06																											
▽ Water level observed during drilling																											
▼ Water level measured after drilling																											
WR** Refers to penetration under the weight of rods only																											

RECORD OF PENETRATION TEST No 605-10M

1 of 2 METRIC

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 14+362.5, CL Med. Burwash Twp.	ORIGINATED BY	FP
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	March 11, 2003	CHECKED BY	PC

SOIL PROFILE					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	SAMPLES	N° VALUES	GROUND WATER CONDITIONS
			NUMBER	TYPE	
233.9 0.0	Ground Surface				
<div>DYNAMIC CONE PENETRATION RESISTANCE PLOT</div> <div>SHEAR STRENGTH kPa<ul style="list-style-type: none">○ UNCONFINED + FIELD VANE● QUICK TRIAXIAL × LAB VANE</div> <div>WATER CONTENT (%) $w_p \quad w \quad w_L$</div> <div>UNIT WEIGHT γ kN/m³</div> <div>REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL</div>					
<div><div>233</div><div>232</div><div>231</div><div>230</div><div>229</div><div>228</div><div>227</div><div>226</div><div>225</div><div>224</div><div>223</div><div>222</div><div>221</div><div>220</div><div>219</div></div> <div></div>					
Cont'd					

MTD_DCPT SWAMP 605- MARCH 12, 2003.GPJ ON MOT.GDT 7/21/04 1:53:04 PM

 $+^7, \times^5:$

Numbers refer to
Sensitivity

(%) STRAIN AT FAILURE

RECORD OF PENETRATION TEST No 605-10M

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+362.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
218.9	Cont'd													
218														
217														
216														
215														
214														
213.3 20.6	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 605-11M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+387.5, CL Med. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		
234.1	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous Dark brown Amorphous Wet		1	SS	7										918					
			2	SS	WH**															
231.1																				
3.0	Clayey silt, trace sand Soft Grey Wet		3	SS	WH															
229.6																				
4.5	Silty clay, trace sand Soft Grey Wet		4	SS	WH											0 3 47 50				
228.1																				
6.0	Clayey silt trace sand Soft Grey Wet Trace gravel		5	SS	WH											0 6 57 37				
			6	SS	WH															
			7	SS	WH															
223.6																				
10.5	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			
	WH** Refers to penetration under the weight of rods and hammer																			

RECORD OF PENETRATION TEST No 605-12M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+412.5, CL Med. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
233.9 0.0	Ground Surface																
231.2 2.7	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 605-13M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+437.5, CL Med. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
234.0	Ground Surface																							
0.0	Topsoil		1	SS	9																			
0.3	End of borehole Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 605-14M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+462.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____



SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
237.1 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-15M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+487.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
240.7 0.0	Ground Surface Peat, fine fibrous							20	40	60	80	100								
240.1 0.6	Dark brown																			
	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 605-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+087.5, o/s 37m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			GR
239.0	Ground Surface					*														
0.0	Peat, fine fibrous	○																		
0.1	Dark brown Sand, trace silt	●																		
0.3	Brown Moist End of borehole	×																		
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 605-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+100, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
238.7	Ground Surface																
0.0	Peat, fine fibrous																
0.3	Dark brown Silty clay																
	Brown Wet																
237.2																	
1.5	End of borehole Refusal on probable bedrock																
	* 2003 06 02																
	Water level measured after drilling																

RECORD OF BOREHOLE No 605-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+112.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE													
239.8	Ground Surface																							
0.0	Peat, fine fibrous																							
0.1	Dark brown																							
0.3	Sand, trace silt trace gravel																							
	Brown Moist																							
	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 605-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+137.5, o/s 46m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
239.6	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Peat, fine fibrous																
0.1	Dark brown																
239.1	Sand, trace silt trace gravel																
0.5	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+150, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
237.6	Ground Surface																
0.0	Peat, fine fibrous																
0.3	Dark brown Silty clay																
	Soft Brown Wet																
234.9																	
2.7	End of borehole Refusal on probable bedrock																
	* 2003 06 02																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 605-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+162.5, o/s 6.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
239.3 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+162.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
237.9	Ground Surface					*														
0.0	Peat, fine fibrous																			
0.1	Dark brown																			
237.3	Silty sand, trace gravel																			
0.6	Brown Moist																			
237.0	Silty clay, trace sand																			
0.9	Brown Moist																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 605-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+175, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								<div><div></div><div></div><div></div><div></div><div></div></div> <div><div></div><div></div><div></div><div></div><div></div></div>															
237.1	Ground Surface					▼*																	
0.0	Peat, fine fibrous						237																
0.3	Dark brown																						
	Silty clay																						
	Soft Brown Wet																						
235.6							236																
1.5	End of borehole																						
	Refusal on probable bedrock																						
	* 2003 06 02																						
	▼ Water level measured after drilling																						

RECORD OF BOREHOLE No 605-10N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+187.5, o/s 6m Rt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____






SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
236.8	Ground Surface																
0.0	Peat, fine fibrous																
0.1	Dark brown Silty clay, trace sand																
	Soft Brown Moist																
	Wet																
231.9	End of borehole																
4.9																	
	* 2003 06 02																
	Water level measured after drilling																

RECORD OF BOREHOLE No 605-11N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+187.5, o/s 35m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____







SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT							PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE											WATER CONTENT (%)			
237.6	Ground Surface					*																
0.0	Peat, fine fibrous																					
0.1	Dark brown																					
237.1	Silty sand, trace gravel																					
0.5	Brown Moist																					
	End of borehole																					
	Refusal on probable bedrock																					
	* Borehole dry on completion of drilling																					

RECORD OF BOREHOLE No 605-12N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+200, o/s 5m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____







SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
236.7	Ground Surface							20	40	60	80	100									
0.0	Peat, fine fibrous																				
236.3	Dark brown																				
0.4	Silt, trace sand trace clay																				
	Brown Moist																				
234.5																					
2.2	End of borehole																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 605-13N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+200, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		WATER CONTENT (%)				
236.4	Ground Surface					*								
0.0	Peat, fine fibrous						236							
0.1	Dark brown Sandy silt, trace clay													
235.5	Brown Moist													
0.2	Silty clay, trace sand													
235.2	Brown Moist													
1.2	End of borehole													
	Refusal on probable bedrock													
	* Borehole dry on completion of drilling													

RECORD OF BOREHOLE No 605-14N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+212.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE								
237.3	Ground Surface															
0.0	Peat, fine fibrous						237									
0.1	Dark brown															
	Silt, trace sand trace clay															
236.4	Brown Moist						236									
0.9	Silty clay, trace sand															
	Soft Brown Moist						235									
	Wet						234									
233.5	End of borehole															
3.8	Refusal on probable bedrock															
	* 2003 06 02															
	▼ Water level measured after drilling															

RECORD OF BOREHOLE No 605-15N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+212.5, o/s 35m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
236.9	Ground Surface							20	40	60	80	100												
0.0	Topsoil																							
0.1	Sandy silt, trace gravel																							
0.2	Brown Moist End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 605-16N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+225, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
237.3	Ground Surface							20	40	60	80	100		20	40	60				
0.0	Peat, fine fibrous						237													
0.1	Dark brown																			
236.4	Silt, trace sand trace clay																			
0.9	Brown Moist																			
236.1	Silty clay																			
1.2	Brown Wet																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 605-17N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+237.5, o/s 40m Rt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
237.1	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous						237													
0.1	Dark brown																			
	Silt, trace sand trace clay						236													
	Loose Brown Moist																			
235.3	Silty clay						235													
1.8	Soft Brown Wet																			
233.2							234													
3.9	End of borehole																			
	Refusal on probable bedrock																			
	 * 2003 06 02																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 605-18N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+250, o/s 20m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE								● QUICK TRIAXIAL		
234.0	Ground Surface							20	40	60	80	100									
0.0	Topsoil																				
0.2	Silt, with sand trace clay trace gravel Loose Light Moist brown		1	SS	5																
							233														
232.3			2	SS	2																
1.7	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 605-19N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+262.5, o/s 41m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
236.8 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-20N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+275, o/s 20m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
234.2	Ground Surface																			
0.0	Topsoil		1	SS	7		234													
0.1	Silt, trace sand trace clay																			
	Loose Light Moist brown						233													
	trace gravel		2	SS	15															
231.9	Compact						232													
2.3	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF PENETRATION TEST No 605-21N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+287.5, o/s 41m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
233.9 0.0	Ground Surface																
233																	
232																	
231																	
230																	
229.9 4.0	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 605-22N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+300, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY SH
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	WATER CONTENT (%)					
233.9	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous Light brown		1	SS	24										614		
	Amorphous with silt Brown		2	SS	1										310		
231.0																	
2.9	Silt, trace sand trace clay		3	SS	3												
230.4	Very Grey Wet loose																
3.5	Silty clay trace sand Soft Grey Moist																
	Trace gravel		4	SS	WH**												
227.9																	
6.0	Clayey silt trace sand Soft Grey Wet		5	SS	WH											0 3 59 38	
			6	SS	WR**												
			7	SS	3												
224.1																	
9.8	Silt, trace sand trace clay Loose Grey Wet																
222.8			8	SS	5												
11.1	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																
	WH** Refers to penetration under the weight of rods and hammer																
	WR** Refers to penetration under the weight of rods only																

RECORD OF BOREHOLE No 605-23N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+312.5, o/s 42m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
234.0	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse to fine fibrous		1	SS	7															
	Dark brown																			
	amorphous		2	SS	1															
232.0	Moist to wet																			
2.0	Silt, trace sand trace clay																			
	Very loose Light brown Moist																			
	Grey Wet		3	SS	1															
230.5	Silty clay, with sand																			
3.5	Soft Grey Wet																			
	Silt layers		4	SS	WR**															
			5	SS	WR															
227																				

RECORD OF BOREHOLE No 605-24N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+325, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY SH
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE							
233.9	Ground Surface							20	40	60	80	100						
0.0	Peat, fine fibrous Dark brown		1	SS	12													
			2	SS	WH**													
231.1																		
2.8	Clayey silt Very soft Brown Moist		3	SS	1												0 0 68 32	
			4	SS	WH													
228.9																		
5.0	Silty clay, trace sand Soft Grey Wet																0 2 50 48	
			5	SS	WH													
226.7																		
7.2	Clayey silt trace sand Soft Grey Wet to firm		6	SS	WH												0 1 64 33	
			7	SS	1													
			8	SS	2												0 2 74 24	
221.9																		
12.0	Silt trace sand trace clay Very loose Grey Wet		9	SS	2													
220.2																		
13.7	End of borehole Refusal on probable bedrock																	
	Cont'd																	

RECORD OF BOREHOLE No 605-24N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+325, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
218.9	Cont'd * Borehole dry on completion of drilling WH** Refers to penetration under the weight of rods and hammer																

1 of 1 **METRIC**

MTO_DCPT SWAMP 605- MARCH 17, 2003.GPJ ON_MOT.GDT 7/21/04 2:08:43 PM

1 of 2 **METRIC**

(%) STRAIN AT FAILURE

RECORD OF PENETRATION TEST No 605-26N

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+330, o/s 10m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 14, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
219.0	Cont'd																	
216.1																		
17.9	End of dynamic cone penetration test Refusal on probable bedrock																	

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 605-28N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+350, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
219.0								20	40	60	80	100								
	Cont'd	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div></div>	11	SS	1		218													
			12	SS	5			217												
			13	SS	WH**				216											
								215												
			14	SS	8				214											
213.0																				
21.0	End of borehole						213													
Refusal on probable bedrock																				
* Borehole dry on completion of drilling																				
WH** Refers to penetration under the weight of rods and hammer																				
WR** Refers to penetration under the weight of rods only																				

RECORD OF PENETRATION TEST No 605-29N

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+350, o/s 30m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 14, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
234.0 0.0	Ground Surface													
219.2 14.8	Continued													

2 of 2 **METRIC**

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 14+350, o/s 30m Rt. Burwash Twp.	ORIGINATED BY	RE
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DYNAMIC CONE PENETRATION TEST		DATE		MARCH 14, 2003	
DATUM	Geodetic	CHECKED BY			

[illegible]

RECORD OF BOREHOLE No 605-30N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+362.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
234.0	Ground Surface					V*											
0.0	Peat, coarse fibrous Dark brown		1	SS	6												
		2	SS	WR**													
231.6																	
2.4	Clayey silt, trace sand Firm Brown Moist																
			3	SS	1												
229.4																	
4.6	Silty clay, trace sand clayey silt seams Firm Grey Wet		4	SS	WR												
			5	SS	WR												
			6	SS	WR												
		7	SS	WR													

RECORD OF BOREHOLE No 605-30N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+362.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEV DEPTH	DESCRIPTION			STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa						w _p	w						w _L
										○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE						WATER CONTENT (%)							
219.0									20	40	60	80	100		20	40	60						
	Cont'd Loose Grey Wet								218														
					12	SS	6			217													
											216												
					13	SS	9			215													
214.5 19.5	End of borehole Refusal on probable bedrock																						
* 2003 03 11 ▽ Water level observed during drilling ▼ Water level measured after drilling WR** Refers to penetration under the weight of rods only																							

RECORD OF BOREHOLE No 605-31N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+375, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 09, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE						
234.0	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous Dark brown		1	SS	3										747		
			2	SS	1												
231.3																	
2.7	Clayey silt, trace sand Very Grey Wet soft		3	SS	1												
229.8																	
4.2	Silty clay, trace sand Soft Grey Wet		4	SS	WR**												
			5	SS	WR												
			6	SS	1												
225.5																	
8.5	Clayey silt, trace sand Soft Grey Wet		7	SS	WR												
			8	SS	WR												
			9	SS	2												
220.7																	
13.3	Silt, trace sand trace clay Compact Grey Wet		10	SS	16												
	Cont'd																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

1 of 1 **METRIC**

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 14+380, o/s 10m Rt. Burwash Twp.	ORIGINATED BY	RE
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	March 13, 2003	COMPILED BY	PC
				CHECKED BY	

[illegible]

RECORD OF PENETRATION TEST No 605-33N

1 of 2 **METRIC**

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 14+387.5, o/s 44m Rt. Burwash Twp.	ORIGINATED BY	FP
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	March 11, 2003	CHECKED BY	PC

[illegible]

MTO_DCPT SWAMP 605- MARCH 12, 2003.GPJ ON MOT.GDT 7/21/04 2:13:55 PM

 $+^7, \times^5:$

Numbers refer to
Sensitivity

(%) STRAIN AT FAILURE

2 of 2 METRIC

(%) STRAIN AT FAILURE

1 of 2 METRIC

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 14+390, o/s 30m Rt. Burwash Twp.	ORIGINATED BY	RE
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DYNAMIC CONE PENETRATION TEST		DATE		MARCH 13, 2003	
DATUM	Geodetic	CHECKED BY			

[illegible]

RECORD OF PENETRATION TEST No 605-34N

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+390, o/s 30m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 13, 2003 CHECKED BY _____

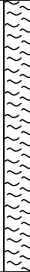



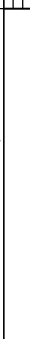
SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
218.9	Cont'd																
216.4																	
17.5	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 605-35N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+400, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 09, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED		+ FIELD VANE							
234.0	Ground Surface																
0.0	Peat, fine fibrous Dark brown		1	SS	6												
				2	SS	1											
231.3	Silt, trace sand trace clay																
2.7	Very loose Grey Wet			3	SS	WR**											
229.8	Silty clay, Soft Grey Wet																
4.2				4	SS	WR											
				5	SS	WR											
				6	SS	WR											
225.3	Clayey silt, trace sand																
8.7	Soft Grey Wet			7	SS	2											
			8	SS	WH**												
222.8	End of borehole																
11.2	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																
	WR** Refers to penetration under the weight of rods only																
	WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 605-36N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+412.5, o/s 45m Rt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
234.0	Ground Surface							20	40	60	80	100								
0.0	Peat, coarse fibrous Dark brown		1	SS	8	V*	233													
			2	SS	WR**		232													
231.6	Clayey silt						231													
2.4	Soft Grey Wet to firm		3	SS	1		230										0 0 68 32			
	trace sand		4	SS	WR		229													
			5	SS	1		228										0 3 57 40			
226.9	Silty clay trace sand						227													
7.1	Soft Grey Wet		6	SS	WR		226													
			7	SS	WR		225													
223.4	Clayey silt trace sand						224													
10.6	Firm Grey Wet		8	SS	WH**	223										0 1 72 27				
			9	SS	1	222														
220.8	Silt, trace sand trace clay					221														
13.2	Compact Brown Wet to loose		10	SS	WH	220										0 7 70 23				
	Cont'd																			

RECORD OF BOREHOLE No 605-36N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+412.5, o/s 45m Rt. Burwash Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						WATER CONTENT (%)							
								○ UNCONFINED + FIELD VANE						w _p w w _L							
								● QUICK TRIAXIAL × LAB VANE													
219.0								20	40	60	80	100									
	trace gravel			11	SS	11		218											Non-plastic	3 8 81 8	
			12	SS	2																
	sandy silt seams																				
			13	SS	8		215														
								214													
							213														
212.8 21.2	End of borehole Refusal on probable bedrock																				
	<div>▽ Water level observed during drilling</div> <div>WR** Refers to penetration under the weight of rods only</div> <div>WH** Refers to penetration under weight of rods and hammer</div>																				

RECORD OF BOREHOLE No 605-37N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+425, o/s 21m Rt. Burwash Twp. ORIGINATED BY SH
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
233.9	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous Dark brown		1	SS	24															
							233													
231.9	Amorphous		2	SS	WH**															
2.0	Black Wet Silty clay, trace sand						232													
	Soft Grey Wet																			
			3	SS	WH		231													
229.9	Clayey silt						230													
4.0	Soft Grey Wet		4	SS	WH															
							229													
227.8	End of borehole						228													
6.1	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			
	WH** Refers to penetration under the weight of rods and hammer																			

1 of 1 **METRIC**

(%) STRAIN AT FAILURE

RECORD OF PENETRATION TEST No 605-39N

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+437.5, o/s 47m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L				
219.0	Cont'd																		
218																			
217																			
216.0	End of dynamic cone penetration test																		
18.0	Refusal on probable bedrock																		

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 605-41N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+462.5, o/s 44m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE										○		
								● QUICK TRIAXIAL × LAB VANE												
234.0	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse fibrous Dark brown		1	SS	10															
232.2			2	SS	WR**															
1.8	Clayey silt, trace sand Soft Grey Wet																			
			3	SS	WR															
			4	SS	WH**															
228.0																				
6.0	Silty clay trace sand Soft Grey Wet		5	SS	WH															
	Trace gravel		6	SS	WH															
			7	SS	WH															
224.2																				
9.8	Clayey silt trace sand Very stiff Grey Wet																			
222.9			8	SS	17															
11.1	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			
	WR** Refers to penetration under the weight of rods only																			
	WH** Refers to penetration under the weight of rods and hammer																			

RECORD OF BOREHOLE No 605-42N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+475, o/s 21.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20					40	60	80	100				
234.5	Ground Surface																							
0.0	Peat, fine fibrous																							
0.1	Dark brown																							
0.2	Sand, trace silt trace gravel																							
	Brown Moist																							
	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF PENETRATION TEST No 605-43N

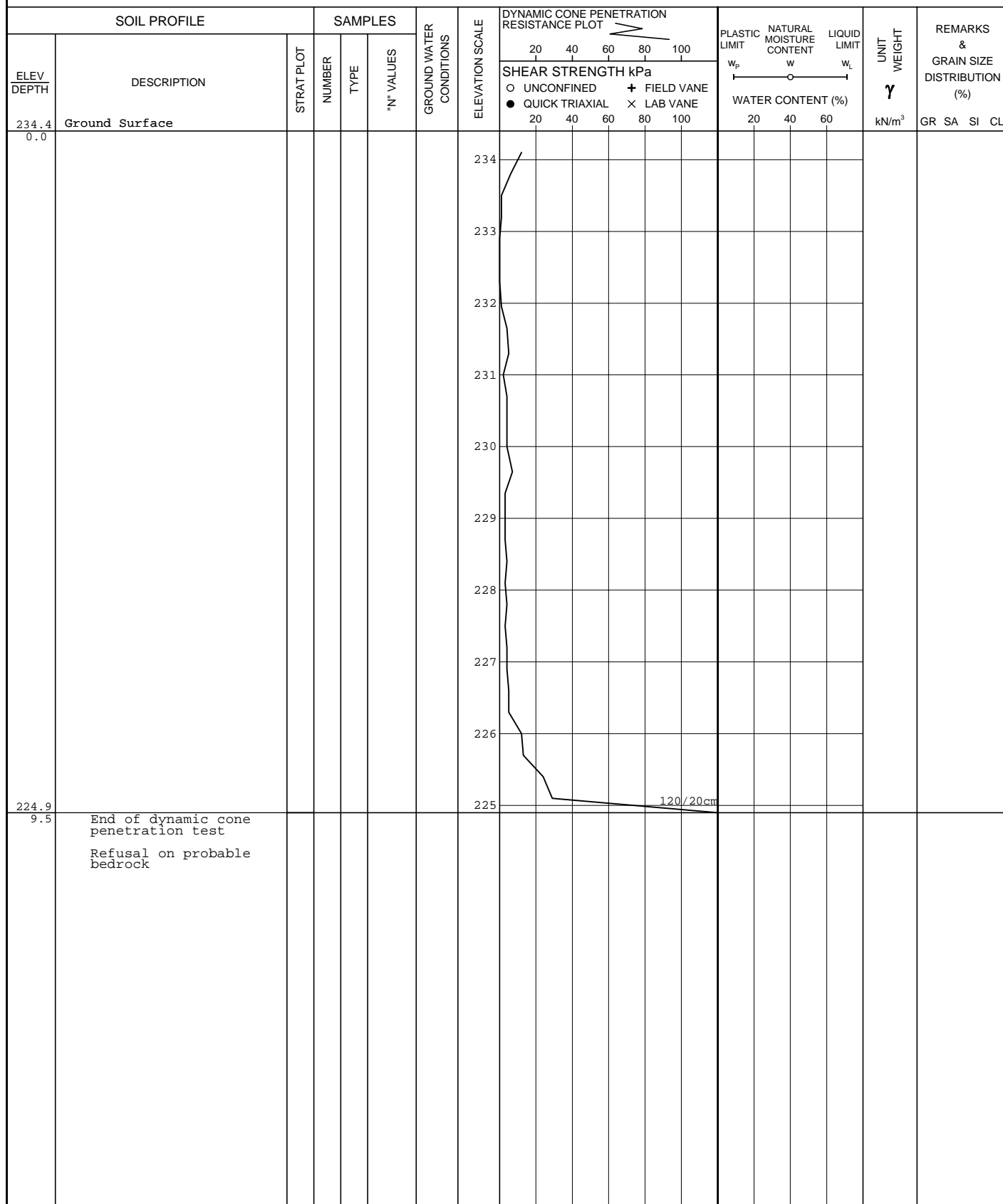
1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+475, o/s 32m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 14, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
234.5 0.0	Ground Surface													
234														
233														
232														
231														
230														
229.2 5.3	End of dynamic cone penetration test Refusal on probable bedrock													

1 of 1 **METRIC**

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 14+475, o/s 45m Rt. Burwash Twp.	ORIGINATED BY	FP
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	March 10, 2003	COMPILED BY	PC
				CHECKED BY	



RECORD OF BOREHOLE No 605-45N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+487.5, o/s 46m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
236.1	Ground Surface																
0.0	Peat, coarse fibrous		1	SS	43												
235.6	Dark brown																
0.5	Silty clay trace sand																
235.0	Hard Brown Moist																
1.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-46N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+500, o/s 22m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
241.7	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+087.5, o/s 37m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.2 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+100, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
241.5	Ground Surface							20	40	60	80	100					
0.0	Topsoil	•															
0.1	Sand, trace silt trace gravel	•••															
240.7	Brown Moist	•••					241										
0.8	End of borehole Refusal on probable bedrock 																

RECORD OF BOREHOLE No 605-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+112.5, o/s 43m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
244.5	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+125, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+137.5, o/s 47.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
246.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+150, o/s 20m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
241.5	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+162.5, o/s 6.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
239.4 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+162.5, o/s 37m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
241.6	Ground Surface							20	40	60	80	100					
0.0	Topsoil	••															
0.1	Sand, trace silt trace gravel	•••															
240.6	Loose Brown Wet	•••					241										
1.0	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+175, o/s 21m lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
238.1	Ground Surface							20	40	60	80	100									
0.0	Topsoil	•					238														
0.1	Sand, trace silt trace gravel	•																			
237.3	Brown Moist	•																			
0.8	End of borehole	•																			
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 605-10S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+187.5, o/s 6m Lt. Burwash Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
236.5	Ground Surface					▼*		20	40	60	80	100					
0.0	Peat, fine fibrous																
0.1	Dark brown Silty clay, trace sand						236										
235.6	Brown Moist																
0.9	End of borehole																
	Refusal on probable bedrock																
	* 2003 06 02																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 605-11S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+187.5, o/s 38m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
241.4	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-12S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+200, o/s 21m lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
238.7 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-13S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+212.5, o/s 5.0m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
236.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+212.5, o/s 39m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
238.0	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-15S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+225, o/s 21m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 30, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
236.8 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF PENETRATION TEST No 605-16S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+237.5, o/s 42.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 12, 2003 CHECKED BY _____

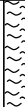

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
233.9 0.0	Ground Surface													
228.6 5.3	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 605-17S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+250, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 12, 2003 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
233.8	Ground Surface							20	40	60	80	100								
0.0	Peat, sand seams Brown Moist		1	AS		▼*	233													
232.7							232													
1.1	Silt, with fine sand trace clay trace gravel		2	SS	2		231													
	Very loose Grey Moist																			
	Loose		4	SS	6	230														
228.3							229													
5.5	End of borehole Refusal on probable bedrock																			
	* 2003 03 12																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 605-18S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+262.5, o/s 42.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 12, 2003 CHECKED BY _____

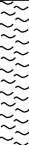




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100					w _p	w	w _L		
								SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
233.9	Ground Surface																
0.0	Peat, fine fibrous to amorphous Black Moist /brown		1	SS	9	▼* <											

RECORD OF BOREHOLE No 605-19S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+275, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 07, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
234.0	Ground Surface						20	40	60	80	100									
0.0	Peat, amorphous Black		1	AS	-		233									0 2 33 65				
232.5							232													
1.5	Silt, with fine sand trace clay Loose Grey Wet		2	SS	5		231													
230.8							230													
3.2	Silty clay, trace sand Very soft Brown Moist		3	SS	1		229													
	Wet		4	SS	2		228													
228.0							228									0 1 89 10				
6.0	Clayey silt, trace sand Soft Brown Wet		5	SS	5	227														
226.3			6	SS	50/10cm															
7.7	End of borehole Refusal on probable bedrock																			
	* 2003 03 07																			
	 Water level measured after drilling																			

1 of 1 **METRIC**

(%) STRAIN AT FAILURE

METRIC

RECORD OF BOREHOLE No 605-22S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+312.5, o/s 42m Lt. Burwash Twp. ORIGINATED BY RE
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 12, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
233.9	Ground Surface							20	40	60	80	100	PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L		
0.0	Peat, amorphous Black/ Moist brown		1	AS	-		233										
							232										
			2	SS	1												
231.2							231										
2.7	Silt, trace sand trace clay Very loose Grey Moist		3	SS	2		230										
229.4							229										
4.5	Silty clay, trace sand Very soft to Grey Wet soft		4	SS	2		228										
							227										
							226										
			5	SS	2		225										
							224										
							223										
			6	SS	1		222										
224.8							221										
9.1	Clayey silt, trace sand Very soft Grey Wet		7	SS	2		220										
							219										
			8	SS	2												
221.8																	
12.1	Silt trace sand trace clay Compact Grey Wet		9	SS	12												
			10	SS	15												
	Cont'd																

RECORD OF BOREHOLE No 605-22S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+312.5, o/s 42m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 12, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL	
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	WATER CONTENT (%)									
218.9							20	40	60	80	100										
217.3 16.6	Cont 'd		11	SS	20	218									Non-plastic			0	7	84	9
	End of borehole Refusal on probable bedrock																				
	* 2003 03 12																				
	▼ Water level measured after drilling																				

1 of 2 METRIC

(%) STRAIN AT FAILURE

RECORD OF PENETRATION TEST No 605-23S

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+320, o/s 8m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 14, 2003 CHECKED BY _____



SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
219.0	Cont'd																
218																	
217																	
216.8	End of dynamic cone penetration test																
17.2	Refusal on probable bedrock																

RECORD OF BOREHOLE No 605-24S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+325, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
233.9 0.0	Ground Surface						20	40	60	80	100	20	40	60						
231.9 2.0	Peat, amorphous Black/ brown		1	AS	9	▽*														
			2	SS	2															
			4	SS	2															
221.7 12.2	Clayey silt trace sand Very soft to Grey Moist soft					▽*														
			3	SS	2															
			4	SS	2															

RECORD OF BOREHOLE No 605-24S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+325, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE															
218.9								20	40	60	80	100		20	40	60							
	Cont'd	<div><div></div><div></div><div></div><div></div></div>					218																
			11	SS	15																		
			12	SS	19																		
216.1 17.8	End of borehole Refusal on probable bedrock * 2003 03 11 <div><div>▽</div>Water level observed during drilling</div> <div><div>▼</div>Water level measured after drilling</div>																						

1 of 1 METRIC

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 14+337.5, o/s 43m Lt. Burwash Twp.	ORIGINATED BY	RE
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	March 11, 2003	COMPILED BY	PC
				CHECKED BY	

[illegible]

RECORD OF BOREHOLE No 605-26S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+350, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
233.9	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Peat, fine fibrous Black/ Moist brown		1	AS	11										445		
232.1			2	SS	1												
1.8	Silt, trace sand trace clay Very Grey Moist loose																
			3	SS	2												
229.3																	
4.6	Clayey silt, trace medium sand Very soft Grey Wet to soft		4	SS	1												
			5	SS	1												
				</													

RECORD OF BOREHOLE No 605-26S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+350, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										
218.9								20	40	60	80	100						
	Cont'd						218											
			11	SS	26													
217.2							217											
16.7	Sand, trace silt trace gravel Compact Brown Wet		12	SS	21													
216.2																		
17.7	End of borehole Refusal on probable bedrock * 2003 03 11 ▼ Water level measured after drilling																	

1 of 1 **METRIC**

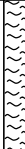


20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 605-28S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+362.5, o/s 43m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 12, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
233.8	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous Black/ Moist brown		1	AS	-		233													
232.3																				
1.5	Silt, trace sand trace gravel Loose Grey Moist		2	SS	8		232													
							231													
230.6	Clayey silt, trace sand Very Brown Moist soft		3	SS	WH**		230													
229.1			4	SS	50/15cm															
4.7	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling WH** Refers to penetration under the weight of rods and hammer																			

1 of 1 **METRIC**

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 605-30S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+375, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		
								○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL	× LAB VANE						
233.9	Ground Surface						20	40	60	80	100						
0.0	Peat, amorphous/ fine fibrous Black/ Moist brown		1	AS													
232.1			2	SS	3												
1.8	Silt, trace sand trace clay Very Grey Moist loose																
230.9			3	SS	2												
3.0	Clayey silt, trace sand Very Grey Wet soft																
				4	SS	1											
227.9																	
6.0	End of borehole Refusal on probable bedrock * 2003 03 11 Water level measured after drilling																

RECORD OF BOREHOLE No 605-31S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+387.5, o/s 44m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____







SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
235.6 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-32S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+400, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE													
								● QUICK TRIAXIAL x LAB VANE													
						WATER CONTENT (%)															
233.9	Ground Surface						20	40	60	80	100	20	40	60							
0.0	Peat, amorphous Black/ brown		1	AS																	
233.0	Clayey silt, trace sand																				
0.9	Firm Blue/ grey Moist		2	SS	5																
	trace gravel																				
	Very Brown Wet		3	SS	19																
230.4	End of borehole																				
3.5	Refusal on probable bedrock																				
	* 2003 03 11																				
	 Water level measured after drilling																				

RECORD OF BOREHOLE No 605-33S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+412.5, o/s 45.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
238.2 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-34S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+425, o/s 21m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
235.3	Ground Surface					*		20	40	60	80	100						
0.0	Peat, fine fibrous						235											
0.1	Dark brown Sand, cobbles trace silt trace gravel																	
234.2	Brown Moist																	
1.1	End of borehole Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 605-35S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+437.5, o/s 47m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
241.8 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-36S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+450, o/s 21m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT								PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa															
								○ UNCONFINED				+ FIELD VANE											
237.8	Ground Surface							20	40	60	80	100											
0.0	Peat, fine fibrous																						
0.1	Dark brown Silty sand, fine																						
236.9	Brown Moist						237																
0.9	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 605-37S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+462.5, o/s 44m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
243.8 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-38S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+475, o/s 21.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
240.3 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 605-39S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+487.5, o/s 52m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
247.9	Ground Surface					*																	
0.0	Peat, fine fibrous																						
0.1	Dark brown																						
0.2	Silty sand																						
	Brown Moist																						
	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 605-40S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 14+500, o/s 22m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
246.5	Ground Surface					*		20	40	60	80	100								
0.0	Peat, fine fibrous																			
0.1	Dark brown End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 606-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+262.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
252.1	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil	•					252										
0.1	Sand	•															
0.2	trace silt trace gravel																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 606-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+237.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
252.9	Ground Surface																							
0.0	Topsoil	•																						
0.1	Sand	•																						
0.2	trace silt trace gravel																							
	Brown Moist																							
	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 606-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+237.5, o/s 37.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE										
253.1 0.0	Ground Surface <																						

RECORD OF BOREHOLE No 606-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+250, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
253.7	Ground Surface																							
0.0	Topsoil																							
0.2	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 606-4N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+262.5, o/s 49.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
254.5	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 606-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+275, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
254.6 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 606-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+287.5, o/s 8m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
253.5 0.0	Ground Surface					20			40	60	80	100	20					40	60				
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 606-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+287.5, o/s 34.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
255.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 606-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+305, o/s 7m Rt. Burwash Twp. ORIGINATED BY GW
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY GW
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
253.9	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 606-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+305, o/s 19m Rt. Burwash Twp. ORIGINATED BY GW
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY GW
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			GR
253.9	Ground Surface					*														
0.0	Topsoil																			
0.2	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 606-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+237.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE											● QUICK TRIAXIAL		
252.5	Ground Surface							20	40	60	80	100		20	40	60								
0.0	Topsoil	•																						
0.1	Sand	•																						
252.0	trace silt trace gravel	•																						
0.5	Brown Moist	•					252																	
	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 606-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+237.5, o/s 37.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
254.4 0.0	Ground Surface <																				

RECORD OF BOREHOLE No 606-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+250, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						x LAB VANE		
248.3	Ground Surface							20	40	60	80	100								
0.0	Topsoil	•																		
0.1	Sand	•					248													
247.8	trace silt trace gravel	•																		
0.5	Brown Moist	•																		
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 606-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+262.5, o/s 50m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED			+ FIELD VANE							
								● QUICK TRIAXIAL			× LAB VANE							
246.6	Ground Surface						20	40	60	80	100							
0.0	Peat, fine fibrous		1	SS	4	▽*	246											
0.1	Dark brown Sandy silt, trace clay																	
	Loose Brown Wet																	
245.4	Clayey silt, trace sand		2	SS	9		245											
1.2	Stiff Brown Wet						244											
			3	SS	10													
242.9	End of borehole						243											
3.7	Refusal on probable bedrock																	
	* 2003 04 22																	
	▽ Water level observed during drilling																	

RECORD OF BOREHOLE No 606-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+275, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE											● QUICK TRIAXIAL		x LAB VANE
247.2	Ground Surface							20	40	60	80	100											
0.0	Peat, fine fibrous		1	SS	2	▽*	247																
0.1	Dark brown Sandy silt, trace clay																						
246.0	Very loose Brown Wet						246																
1.2	Clayey silt, trace sand		2	SS	20																		
	Very stiff Brown Wet						245																
	Grey																						
243.9			3	SS	6/10cm		244																
3.3	End of borehole																						
	Refusal on probable bedrock																						
	* 2003 04 22																						
	▽ Water level observed during drilling																						

RECORD OF BOREHOLE No 606-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+287.5, o/s 8m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL
249.6 0.0	Ground Surface <																					

RECORD OF BOREHOLE No 606-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta.15+287.5, o/s 34.5m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL
246.5	Ground Surface																			
0.0	Peat, fine fibrous		1	SS	8**	▽*												** Frozen		
0.3	Dark brown Silty sand, fine with gravel						246													
245.3	Very loose Brown Wet						245													
1.2	Clayey silt, trace sand																			
	Stiff Brown Wet		2	SS	10		244													
	Soft Grey						243													
			3	SS	3															
242.4																				
4.1	End of borehole																			
	Refusal on probable bedrock																			
	* 2003 04 22																			
	▽ Water level observed during drilling																			

RECORD OF BOREHOLE No 606-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+305, o/s 7m Lt. Burwash Twp. ORIGINATED BY GW
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY GW
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
249.3	Ground Surface																							
0.0	Topsoil																							
0.3	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 606-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+305, o/s 19m Lt. Burwash Twp. ORIGINATED BY GW
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY GW
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE						LAB VANE		
247.2	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Topsoil																			
0.2	Silt, some sand																			
0.3	trace clay																			
246.5	Grey Moist																			
0.7	Sand, trace silt																			
246.3	Brown Moist																			
0.9	Silty sand, trace clay																			
	Moist																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 607-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+337.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
246.6	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
0.2	Clayey silt trace sand		1	SS	5		246										
	Firm Brown Moist																
245.2																	
1.4	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF PENETRATION TEST No 607-2M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+387.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100			W _p
245.0 0.0	Ground Surface														
243.8 1.2	End of dynamic cone penetration test Refusal on probable bedrock						244								

RECORD OF BOREHOLE No 607-3M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+412.5, CL Med. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
245.0	Ground Surface					*											
0.0	Topsoil																
0.2	Silt, trace sand trace clay		1	SS	3												
243.8	Very loose Light brown Moist						244										
1.2	Sand, with gravel trace silt																
243.2	Compact Brown Moist		2	SS	13/15cm												
1.8																	
	End of borehole																
	End of dynamic cone penetration test																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 607-4M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+437.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
248.0 0.0	Ground Surface 																						

RECORD OF BOREHOLE No 607-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+325, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
251.4 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 607-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+337.5, o/s 40.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						w _p w w _L			WATER CONTENT (%)	kN/m ³	GR		SA	SI	CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
253.0	Ground Surface					*				20	40	60	80	100		20	40	60																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				</

RECORD OF BOREHOLE No 607-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+350, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100					
247.0	Ground Surface					*											GR SA SI CL
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 607-4N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+362.5, o/s 37m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____


SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
246.8 0.0	Ground Surface 																							

RECORD OF BOREHOLE No 607-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+362.5, o/s 4m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____







SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE								
246.0	Ground Surface																			
0.0	Topsoil																			
0.1	Clayey silt, some sand trace gravel		1	SS	9	 *														
	Stiff Light Dry																			
	brown																			
	Very Moist																			
	stiff		2	SS	27															
243.3	End of borehole																			
2.7	Refusal on probable bedrock																			

RECORD OF BOREHOLE No 607-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+382, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)								
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)							
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE								
245.0	Ground Surface																								
0.0	Peat, fine fibrous		1	SS	8																				
244.5	Dark brown																								
0.5	Silt, trace sand																								
244.1	Loose Brown Wet																								
0.9	End of borehole																								
	Refusal on probable bedrock																								
	* Borehole dry on completion of drilling																								

RECORD OF PENETRATION TEST No 607-7N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+387.5, o/s 49m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
244.7 0.0	Ground Surface													
242.3 2.4	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 607-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+400, o/s 20.5m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								20	40	60	80	100					

RECORD OF PENETRATION TEST No 607-9N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+412.5, o/s 48m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.9 0.0	Ground Surface																
241.0 1.9	End of dynamic cone penetration test Refusal on probable bedrock						242										
							241										

RECORD OF BOREHOLE No 607-10N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+423, o/s 19.5m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
244.7	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous																
0.2	Dark brown		1	SS	4												
	Silt, trace sand trace clay																
243.5	Very loose Brown Moist																
1.2	End of borehole																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 607-11N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+437.5, o/s 47.5m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
243.9	Ground Surface																
0.0	Peat, fine fibrous		1	SS	43												
0.2	Dark brown Silt, some sand some clay trace gravel																
	Dense Brown Wet to compact		2	SS	11												
241.5	End of borehole																
2.4	Refusal on probable bedrock																

* 2003 03 19

▽ Water level observed
during drilling





▽ Water level measured
after drilling

RECORD OF BOREHOLE No 607-12N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+450, o/s 19.5m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE March 18, 2003 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
245.3	Ground Surface							20	40	60	80	100								
0.0	Topsoil						245													
0.3	Silt, trace sand trace clay																			
244.6	Loose Red/ Moist brown																			
0.7	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 607-13N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+462.5, o/s 28m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
244.3	Ground Surface					*	244													
0.0	Peat, fine fibrous		1	SS	2															
0.2	Dark brown Silt, trace sand trace clay trace gravel																			
243.4	Very loose Brown Wet																			
0.9	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 607-14N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+462.5, o/s 11m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
249.8 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 607-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+325, o/s 27m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
246.3	Ground Surface							20	40	60	80	100											
0.0	Topsoil																						
0.2	Clayey silt, trace sand		1	SS	11		246																
	Stiff Light Dry																						
	brown																						
245.2																							
1.1	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 607-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+337.5, o/s 40.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
245.8	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous																			
0.2	Dark brown Clayey silt, some sand trace gravel Stiff Brown Moist		1	SS	8															
			2	SS	12															
242.8																				
3.0	Silt, with sand some clay trace gravel Compact Grey Moist		3	SS	12															
			4	SS	17															
240.6																				
5.2	End of borehole Refusal on probable bedrock																			
	* 2003 03 19																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 607-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+350, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____





SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
245.8	Ground Surface							20	40	60	80	100								
0.0	Topsoil																			
0.1	Clayey silt, some sand trace gravel		1	SS	7															
	Stiff Brown Dry						245													
	Very stiff Moist																			
			2	SS	16		244						11				2 11 63 24			
243.5																				
2.3	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 607-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+362.5, o/s 37m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED			+ FIELD VANE										
245.7	Ground Surface							20	40	60	80	100									
0.0	Peat, amorphous		1	SS	17										o						
245.2	Dark brown																				
0.5	Sand, with silt trace gravel						245														
244.2	Compact Brown Moist																				
1.5	End of borehole Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF PENETRATION TEST No 607-5S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+362.5, o/s 4m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
245.7 0.0	Ground Surface																
243.6 2.1	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 607-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+375, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
245.3	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
0.1	Clayey silt, trace sand trace gravel		1	SS	1		245										
	Very soft Brown Moist																
243.8							244										
1.5	End of borehole																
	Refusal on probable bedrock																
	 <																

RECORD OF BOREHOLE No 607-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+387.5, o/s 49m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____






SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
252.1 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 607-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+400, o/s 20.5 m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 19, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE	20	40				
245.5	Ground Surface																						
0.0	Topsoil																						
0.2	Clayey silt, trace sand trace gravel		1	SS	7		245																
	Firm Brown Wet																						
244.3	End of borehole																						
1.2	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 607-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+412.5, o/s 49m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
250.8 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 607-10S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+425, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
247.0	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 607-11S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+437.5, o/s 49.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
251.6 0.0	Ground Surface <																				

RECORD OF BOREHOLE No 607-12S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+450, o/s 20.5m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
252.8	Ground Surface																							
0.0	Topsoil																							
0.1	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 607-13S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+462.5, o/s 31m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.1 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 607-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 15+462.5, o/s 11m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 01, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.5	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+437.5, CL Med. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
243.1	Ground Surface					*											
0.0	Peat, fine fibrous		1	AS			243										
0.1	Dark Dry		2	AS													
242.2	Silty fine sand to medium sand																
0.9	Light Dry to wet																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-2M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+462.5, CL Med. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
243.0	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	AS													
0.2	Black Dry																
	Sand, fine		2	AS													
	trace silt, trace																
	organics																
	Orange Moist		3	AS													
	to light to wet																
	brown																
241.4	Silty																
1.7	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-3M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+487.5, CL Med. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
240.4	Ground Surface							20	40	60	80	100		20	40	60							
0.0	Peat, fine fibrous																						
0.2	Black End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

METRIC





20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 608-5M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+537.5, CL Med. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
236.8	Ground Surface					*														
0.0	Peat, fine fibrous																			
0.3	Black Dry																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 608-6M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+562.5, CL Med. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
240.5	Ground Surface																
0.0	Peat, fine fibrous																
0.1	Dark brown		1	AS													
239.6	Sand, fine trace silt trace gravel		2	AS													
0.9	Orange Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-7M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+612.5, CL Med. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
234.0	Ground Surface					*											
0.0 0.1	Peat, fine fibrous Moist Sand, trace silt Orange/brown Medium sand, no silt Brown																
232.1	End of borehole																
1.9	Refusal on probable bedrock * Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-8M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+637.5, CL Med. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED			+ FIELD VANE							
232.5	Ground Surface							20	40	60	80	100						
0.0	Peat, fine fibrous																	
0.1	Dark brown																	
	Sand, fine to medium						232											
	Orange/ Wet																	
	brown																	
	Becoming silty																	
230.8							231											
1.7	End of borehole																	
	Refusal on probable bedrock																	
	 <																	

RECORD OF BOREHOLE No 608-9M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+787.5, CL Med. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						x LAB VANE		
236.2	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Topsoil, sandy						236													
0.1	Dark brown Moist Silty sand, fine																			
235.4	Brown Moist	1	AS				235													
0.8	Sand, trace silt Brown Moist	2	AS																	
	Medium sand																			
234.0																				
2.2	End of borehole						234													
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 608-10M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+837.5, CL Med. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
243.6	Ground Surface					*																		
0.0	Topsoil, sandy Dark brown Moist																							
0.3	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 608-11M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+862.5, CL Med. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
242.9	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil, sandy																
0.1	Dark brown Moist																
0.2	Silty sand, fine trace gravel																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-12M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+887.5, CL Med. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.8	Ground Surface																
0.0	Topsoil, sandy																
0.1	Dark brown Moist																
242.2	Sand, trace silt																
0.6	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+412.5, o/s 35m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
245.5	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 608-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+412.5, o/s 8m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
246.0	Ground Surface		1	AS													
0.0	Peat, fine fibrous		2	AS													
0.2	Black Sand, fine trace silt Orange Moist Silty		3	AS													
244.6	Light Wet brown																
1.4	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+425, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____


SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
245.4	Ground Surface					*															
0.0	Bedrock at surface																				
	* Borehole dry																				

RECORD OF BOREHOLE No 608-4N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+437.5, o/s 39m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			GR
242.5	Ground Surface					*														
0.0	Peat, fine fibrous																			
0.2	Dark brown End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 608-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+450, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
241.0	Ground Surface					*		20	40	60	80	100					
0.0	Peat, fine fibrous																
0.1	Black Dry																
0.3	Silty sand, fine																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+462.5, o/s 43.5m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
235.5	Ground Surface					*											
0.0	Peat, fine fibrous																
0.2	Black Dry																
0.3	Silty sand, fine																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+475, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
238.0	Ground Surface					*										GR	SA	SI	CL	
0.0	Peat, fine fibrous																			
0.2	Black End of borehole Refusal on probable bedrock <																			

RECORD OF BOREHOLE No 608-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+487.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
234.0	Ground Surface					*											
0.0	Peat, fine fibrous																
0.2	Black Dry Sand, fine to medium, trace silt trace gravel																
233.0	Brown Moist to wet						233										
1.1	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+500, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
234.9	Ground Surface					*											
0.0	Peat, fine fibrous		1	AS													
0.1	Black Dry																
	Silty sand, fine																
233.9	Brown Moist to wet		2	AS													
1.1	End of borehole						234										
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-10N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+512.5, o/s 43.5m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																
234.0 0.0	Sand, trace silt trace gravel Brown Moist	•• •• •• •• •• •• ••						20	40	60	80	100		20	40	60								
232.8 1.2	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling	••					233																	

RECORD OF BOREHOLE No 608-11N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+525, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
233.1 0.0	Ground Surface Sand trace silt, trace organics	•• •• •• •• •• •• •• ••					233	20	40	60	80	100					
231.9 1.2	End of borehole	••					232										
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-12N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+537.5, o/s 43.5m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
234.5	Ground Surface	•••															
0.0	Sand trace silt, trace organics	•••															
233.6		•••															
0.9	End of borehole																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-13N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+550, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
234.9 0.0	Ground Surface Sand trace silt, trace organics	• 																					

RECORD OF BOREHOLE No 608-14N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+562.5, o/s 44m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)			
234.0	Ground Surface	••						20	40	60	80	100									
0.0	Sand, fine trace silt trace gravel	•••••																			
233.0	End of borehole	••					233														
1.0	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 608-15N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+575, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
233.9	Ground Surface					*											
0.0	Peat, fine fibrous																
0.1	Black																
0.3	Sand, fine trace silt, trace gravel																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-16N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+587.5, o/s 45m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
232.5	Ground Surface																
0.0	Peat, fine fibrous		1	AS													
0.1	Dark Moist		2	AS													
231.9	Silt, trace sand		3	AS													
0.6	Brown Moist																
	Sand, fine to coarse with silt																
	Grey Wet																
230.6	Brown																
1.9	End of borehole																
<p>* 2004 04 13</p> <p>▼ Water level measured after drilling</p>																	

RECORD OF BOREHOLE No 608-17N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+587.5, o/s 4m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa					W _p	W		
238.0	Ground Surface															
0.0	Topsoil, sandy with organic inclusions															
0.1	Black End of borehole															
	Refusal on probable bedrock															
	* Borehole dry on completion of drilling															

RECORD OF BOREHOLE No 608-18N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+600, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
231.3	Ground Surface																
0.0	Peat, fine fibrous																
0.1	Sand, trace silt <i>Moist</i>																
	Orange/ brown																
	Medium sand																
229.9	Brown																
1.4	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-19N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+612.5, o/s 48.5m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
230.5 0.0	Ground Surface Unsampled						230										
229.5 1.0	End of borehole * Borehole dry																

RECORD OF BOREHOLE No 608-20N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+625, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
230.8	Ground Surface																
0.0	Peat, fine fibrous																
0.3	Moist Sand, fine to coarse with gravel																
	Grey Wet																
229.3																	
1.5	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-21N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+737.5, o/s 41m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 12, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
232.0	Ground Surface																
0.0	Topsoil, sandy		1	AS													
0.2	Dark brown Moist Sand, trace silt																
	Brown Moist																
	Medium sand, trace gravel		2	AS													
229.9																	
2.1	End of borehole																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-22N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+762.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
232.8	Ground Surface																
0.0	Topsoil, sandy		1	AS													
0.1	Sand, trace silt		2	AS													
	Brown Moist																
231.0	End of borehole																
1.8	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-23N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+775, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
236.4	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Topsoil, sandy	•															
0.1	Dark brown Moist	•															
	Sand, trace silt	•															
	Orange/ Moist	•															
	brown	•															
	Medium sand	•															
	Brown	•															
234.2		•															
2.2	End of borehole	•															
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-24N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+787.5, o/s 40m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								\circ UNCONFINED	\bullet QUICK TRIAXIAL	$+$ FIELD VANE	\times LAB VANE												
236.2	Ground Surface							20	40	60	80	100		20	40	60							
0.0	Peat, fine fibrous						236																
0.2	Dark brown Moist Sand trace silt, trace gravel																						
235.4	Brown Moist																						
0.8	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 608-26N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+812.5, o/s 45m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
235.8	Ground Surface																
0.0	Topsoil, sandy																
0.1	Dark brown Moist Silty sand, fine																
	Brown Moist																
233.9							235										
1.9	End of borehole						234										
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-27N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+812.5, o/s 4.5m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
241.6	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 608-28N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+825, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.1 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 608-29N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+837.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
239.7	Ground Surface							20	40	60	80	100								
0.0	Topsoil, sandy	•																		
0.1	Dark brown Moist	•																		
239.1	Silty sand, fine																			
0.6	Orange/ Moist brown																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 608-30N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+850, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
240.7	Ground Surface					*											
0.0	Topsoil, sandy Dark brown Moist		1	AS													
239.6	Silty sand, fine Brown Moist																
239.3	Sand trace silt		2	AS													
1.4	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-31N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+862.5, o/s 34.5m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED			+ FIELD VANE							
244.5	Ground Surface							20	40	60	80	100						
0.0	Topsoil, sandy		1	AS														
243.9	Dark brown Moist						244											
0.6	Silty sand, fine trace gravel																	
243.0	Brown Moist		2	AS														
1.5	End of borehole						243											
	Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 608-32N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+875, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
240.7	Ground Surface					*											
0.0	Topsoil, sandy																
0.3	Dark brown Moist Sandy silt, fine																
239.6	Brown Moist Sand, trace silt																
1.1	Brown Moist End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-33N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+887.5, o/s 35m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								<div><div>20406080100</div><div>○ UNCONFINED + FIELD VANE</div><div>● QUICK TRIAXIAL × LAB VANE</div></div>										
243.4	Ground Surface					*												
0.0	Topsoil, sandy																	
0.1	Dark brown Moist						243											
242.8	Sandy silt, fine																	
0.6	Brown Moist																	
	End of borehole																	
	Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 608-34N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+900, o/s 19m Rt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
244.2	Ground Surface																
0.0	Topsoil, sandy																
0.1	Dark brown Moist																
	Sandy silt, fine																
	Brown Moist																
242.5																	
1.8	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+412.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
250.0	Ground Surface							20	40	60	80	100		20	40	60				
0.0	Peat, fine fibrous																			
0.2	Dark brown End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 608-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+412.5, o/s 8m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
246.5	Ground Surface							20	40	60	80	100		20	40	60							
0.0	Peat, fine fibrous																						
0.2	Black Dry End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 608-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+425, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____


SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
246.9	Ground Surface									20	40	60	80	100		20	40	60					
0.0	Bedrock at surface																						
	* Borehole dry																						

RECORD OF BOREHOLE No 608-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+437.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
247.5	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous																
0.2	Dark Dry brown																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+450, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
244.5	Ground Surface																				
0.0	Bedrock at surface																				
	* Borehole dry																				

RECORD OF BOREHOLE No 608-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+462.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
245.0	Ground Surface																
0.0	Peat, fine fibrous		•														
0.2	Dark brown Sand, fine trace silt	•															
244.1	Orange/ light brown Moist to wet	•															
0.9	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+475, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
243.0	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous	•	1	AS													
0.1	Black Dry	•															
242.4	Sand, fine trace silt trace gravel	•	2	AS													
0.6	Orange Wet	•															
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+487.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

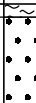
SOIL PROFILE				SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE												
245.0	Ground Surface																								
0.0	Unsampled																								
243.8	End of borehole																								
1.2																									
	* Borehole dry																								

RECORD OF BOREHOLE No 608-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+500, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
242.1	Ground Surface					*		20	40	60	80	100					
0.0	Peat, fine fibrous						242										
0.1	Black Sand, fine trace silt																
241.1	Orange/ Dry to Light moist brown																
1.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-10S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+512.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____




SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
243.0 0.0	Sand, trace silt trace gravel Brown Moist	•••••																						
241.8 1.2	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling	•••••																						

RECORD OF BOREHOLE No 608-11S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+525, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
239.8	Ground Surface							20	40	60	80	100												
0.0 0.1	Peat, fine fibrous Black Dry																							
	Sand trace silt, trace organics																							
238.6	Orange Moist to wet						239																	
1.2	End of borehole																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 608-12S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+537.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
245.0	Ground Surface	•••						20	40	60	80	100					
0.0	Sand trace silt, trace organics	••• ••• ••• ••• ••• ••• ••• •••															
243.8		•••					244										
1.2	End of borehole	•••															
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-13S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+550, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.6	Ground Surface																
0.0	Peat, fine fibrous																
0.2	Black																
241.9	Sand, fine trace silt, boulders					242											
0.8	Brown Wet																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+562.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
243.0	Ground Surface					*		20	40	60	80	100								
0.0	Sand, fine trace silt trace gravel Orange Moist to brown	•••••	1	AS			242													
241.8		•••••																		
1.2	Silty sand, fine dilatant	•••••																		
241.2	Brown Moist	•••••	2	AS																
1.8	End of borehole Refusal on probable bedrock <																			

RECORD OF BOREHOLE No 608-15S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+575, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 07, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
243.3	Ground Surface					*														
0.0	Peat, fine fibrous																			
0.2	Dark brown End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 608-16S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+587.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa					W _p	W		
						20	40	60	80	100						
242.5	Ground Surface															
0.0	Peat, fine fibrous															
0.2	Dark brown End of borehole Refusal on probable bedrock															
	* Borehole dry on completion of drilling															

RECORD OF BOREHOLE No 608-17S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+587.5, o/s 4m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
240.0	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 608-18S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+600, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
241.9	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 608-19S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+612.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.0	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 608-20S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+625, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								<div>○ UNCONFINED + FIELD VANE</div> <div>● QUICK TRIAXIAL × LAB VANE</div>												
235.0	Ground Surface					*														
0.0	Peat, fine fibrous						234													
0.1	Sand, trace silt Moist Orange/brown		1	AS																
	Medium sand		2	AS																
	Brown																			
233.1	End of borehole																			
1.9	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 608-21S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+637.5, o/s 39.5m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
237.5	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 608-22S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+650, o/s 19m Lt. Burwash Twp.. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
233.7	Ground Surface							20	40	60	80	100					
0.0	Topsoil, sandy																
0.2	Black Moist Sand, trace silt						233										
	Brown Moist to grey Medium sand																
231.9	End of borehole						232										
1.8	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-23S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+662.5, o/s 41.5m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 12, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			SHEAR STRENGTH kPa					W _p	W	W _L		
235.0	Ground Surface						20 40 60 80 100 ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)				
0.0	Topsoil, sandy	•	1	AS												
	Dark brown Moist Sand, trace silt	•														
	Orange Moist to to brown wet	•	2	AS		234										
		•														
		•	3	AS												
232.7		•				233										
2.3	End of borehole															
	* Borehole dry on completion of drilling															

RECORD OF BOREHOLE No 608-24S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+800, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
237.4	Ground Surface																							
0.0	Topsoil, sandy	• •	1	AS																				
0.1	Dark brown Moist Sand, trace silt																							
0.3	Brown Moist End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 608-25S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+812.5, o/s 45m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES		SHEAR STRENGTH kPa					W _p	W	W _L		
244.5	Ground Surface						20	40	60	80	100					
0.0	Granular sand		1	AS												
243.9	(FILL) Moist					244										
0.6	End of borehole															
	* Borehole dry on completion of drilling															

RECORD OF BOREHOLE No 608-26S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+812.5, o/s 4.5m Lt. Burwash Twp. ORIGINATED BY RE/ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY RE/ME
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
244.9	Ground Surface																							
0.0	Topsoil, sandy		1	AS																				
0.3	Dark brown Moist End of borehole Refusal on probable bedrock 																							

RECORD OF BOREHOLE No 608-27S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+825, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.7	Ground Surface					*											
0.0	Topsoil, sandy																
0.1	Dark brown Moist																
0.3	Sand, trace silt																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-28S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+837.5, o/s 43m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.8 0.0	Ground Surface Unsampled					*											
241.3 1.5	End of borehole * Borehole dry						242										

RECORD OF BOREHOLE No 608-29S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+850, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
243.9	Ground Surface					*											
0.0	Topsoil, sandy																
0.1	Dark brown Moist																
0.2	Silty sand, fine																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-30S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+862.5, o/s 41m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.5	Ground Surface																
0.0	Topsoil, sandy																
241.7	Dark brown Moist																
0.8	Silty sand trace gravel																
	Brown Moist																
	(FILL)																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-31S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+875, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
243.4	Ground Surface																							
0.0	Bedrock at surface																							
	* Borehole dry																							

RECORD OF BOREHOLE No 608-32S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+887.5, o/s 30m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
244.7	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil, sandy																
0.1	Dark brown Moist Sand, trace silt																
244.1	Brown Moist Sand, trace silt																
0.6	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 608-33S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 16+900, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
243.1	Ground Surface					*		20	40	60	80	100					
0.0	Topsoil, sandy	••					243										
0.1	Dark brown Moist																
0.3	Sand, fine to coarse trace silt																
	Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 609-2M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+725, CL Med. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		○
241.7	Ground Surface							20	40	60	80	100								
0.0	Topsoil																			
0.1	Silt, trace sand, trace clay																			
	Loose Brown Wet																			
							241													
							240													
							239													
238.6																				
3.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 609-3M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+775, CL Med. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
244.4 0.0	Ground Surface Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 609-4M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+825, CL Med. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
244.1	Ground Surface						20	40	60	80	100						
0.0	Topsoil		1	AS	-												
0.1	Silt, trace sand, trace clay		2	AS	-												
243.6	Loose Brown Moist End of borehole																
0.5	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 609-5M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+875, CL Med. Burwash Twp. Med. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
245.1	Ground Surface		1	AS	-	*	245										
0.0	Topsoil																
0.1	Silt		2	AS	-												
	trace sand trace clay																
	Compact Brown Moist																
243.6							244										
1.5	End of borehole																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 609-6M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+925, CL Med. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
247.7	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil																
0.1	Silt																
0.3	trace sand trace clay																
	Compact Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of augering																

RECORD OF BOREHOLE No 609-7M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+975, CL Med. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
252.9 0.0	Ground Surface Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 609-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+650, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
251.8 0.0	Ground Surface Bedrock at surface					*															
	* Borehole dry																				

RECORD OF BOREHOLE No 609-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+675, o/s 43m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
248.2 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+675, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
248.5	Ground Surface																							
0.0	Topsoil																							
0.1	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 609-4N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+700, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE						w _p	w	w _L		WATER CONTENT (%)			
246.7	Ground Surface							20	40	60	80	100									
0.0	Topsoil																				
0.1	Silt, trace sand, trace clay																				
	Loose Brown Wet						246														
245.3																					
1.4	End of borehole																				
	Refusal on probable bedrock																				
	 * Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 609-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+725, o/s 52m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
244.1 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+725, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL
244.5	Ground Surface					*														
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 609-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+750, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
241.0	Ground Surface					*		20	40	60	80	100					GR SA SI CL	
0.0	Topsoil																	
0.1	Silt, trace sand, trace clay																	
240.1	Loose Brown Wet																	
0.9	End of borehole																	
	Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 609-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+775, o/s 49.5m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL							× LAB VANE		
238.0	Ground Surface					*		20	40	60	80	100									
0.0	Topsoil		1	AS	-																
0.1	Silt, trace sand, trace clay		2	AS	-																
	Loose Brown Wet																				
236.8							237														
1.2	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 609-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+775, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		WATER CONTENT (%)	GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
242.8	Ground Surface					*		20	40	60	80	100									
0.0	Topsoil																				
0.1	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 609-10N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+800, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
244.6	Ground Surface																							
0.0	Topsoil																							
0.1	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 609-11N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+825, o/s 49.5m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____


SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
239.6 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-12N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+825, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									WATER CONTENT (%)			
244.3	Ground Surface					*														
0.0	Topsoil																			
0.1	Silt, trace sand, trace clay																			
0.2	Loose Brown Moist End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 609-13N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+850, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
244.4	Ground Surface																							
0.0	Topsoil																							
0.1	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 609-14N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+875, o/s 48.5m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
240.9	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil																
0.1	Silt																
0.3	trace sand trace clay																
	Compact Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 609-15N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+875, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
244.8	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Silt trace sand trace clay																
	Compact Brown Moist						244										
243.1																	
1.7	End of borehole																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 609-16N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+900, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
244.6	Ground Surface					*		20	40	60	80	100					
0.0	Topsoil																
0.1	Silt trace sand trace clay																
	Compact Brown Moist						244										
243.1																	
1.5	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of augering																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 609-18N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+925, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
246.1	Ground Surface					*																		
0.0	Topsoil																							
0.1	Silt																							
0.2	trace sand trace clay																							
	Compact Brown Moist																							
	End of borehole																							
	Refusal on probable bedrock																							
							</																	

RECORD OF BOREHOLE No 609-19N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+950, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
249.1 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-20N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+975, o/s 48m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
249.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-21N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+975, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
248.9 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-1S

1 of 1

METRIC

G.W.P. 312-99-00	LOCATION	Hwy 69 Sta. 17+650, o/s 19m Lt. Burwash Twp.	ORIGINATED BY	ME/GE
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DIST	54	HWY	69	BOREHOLE TYPE	Manual Hand Auger	COMPILED BY	ME/GE
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DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

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RECORD OF BOREHOLE No 609-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+675, o/s 33.5m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
243.0	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 609-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+675, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
246.2 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+700, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
242.8	Ground Surface		1	AS	-												
0.0 0.1	Topsoil Silt, trace sand, trace clay		2	AS	-												
241.9	Loose Brown Wet																
0.9	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 609-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+725, o/s 45m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
248.4	Ground Surface							20	40	60	80	100					
0.0	Topsoil		1	AS	-												
0.1	Silt, trace sand, trace clay		2	AS	-												
0.3	Loose Brown Moist End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 609-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+725, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
247.0	Ground Surface					*											
0.0	Topsoil																
0.1	Silt, trace sand, trace clay																
246.5	Loose Brown Moist End of borehole																
0.5	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 609-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+750, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
247.9	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil																
0.1	Silt, trace sand, trace clay																
247.3	Loose Brown Wet																
0.6	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 609-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+775, o/s 40m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
248.0	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 609-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+775, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		WATER CONTENT (%)	GR	SA	SI
248.4	Ground Surface					*														
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 609-10S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+800, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L						
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE									LAB VANE
247.8	Ground Surface					*			20	40	60	80	100		20	40	60				
0.0	Topsoil																				
0.1	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 609-11S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+825, o/s 40.5m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
249.5	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 609-12S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+825, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	FIELD VANE	×					LAB VANE							
249.2	Ground Surface																							
0.0	Topsoil																							
0.1	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 609-13S

1 of 1

METRIC

G.W.P. 312-99-00	LOCATION	Hwy 69 Sta. 17+850, o/s 19m Lt. Burwash Twp.	ORIGINATED BY	ME/GE
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DIST	54	HWY	69	BOREHOLE TYPE	Manual Hand Auger	COMPILED BY	ME/GE
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DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

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RECORD OF BOREHOLE No 609-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+875, o/s 40m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
249.4 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-15S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+875, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
246.3	Ground Surface							20	40	60	80	100									
0.0	Topsoil						246														
0.1	Silt trace sand trace clay																				
	Compact Brown Moist																				
244.8							245														
1.5	End of borehole																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 609-16S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+900, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED			+ FIELD VANE										
245.2	Ground Surface							20	40	60	80	100									
0.0	Topsoil						245														
0.1	Silt trace sand trace clay																				
244.4	Compact Brown Moist																				
0.8	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 609-17S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+925, o/s 33m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
250.4 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-18S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+925, o/s 19m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
251.9 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 609-19S

1 of 1

METRIC

G.W.P. 312-99-00	LOCATION	Hwy 69 Sta. 17+950, o/s 19m Lt. Burwash Twp.	ORIGINATED BY	ME/GE
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DIST	54	HWY	69	BOREHOLE TYPE	Manual Hand Auger	COMPILED BY	ME/GE
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DATUM Geodetic DATE April 16, 2004 CHECKED BY _____



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RECORD OF BOREHOLE No 609-20S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 17+975, o/s 28m Lt. Burwash Twp. ORIGINATED BY ME/GE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY ME/GE
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL								
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa																		
253.7	Ground Surface					*	253																			
0.0	Topsoil																									
0.1	Silt trace sand trace clay Compact Brown Moist																									
252.5	End of borehole																									
1.2	Refusal on probable bedrock																									
	* Borehole dry on completion of drilling																									

RECORD OF BOREHOLE No 609-21S

1 of 1

METRIC

G.W.P.	<u>312-99-00</u>	LOCATION	<u>Hwy 69 Sta. 17+975, o/s 19m Lt. Burwash Twp.</u>	ORIGINATED BY	<u>ME/GE</u>
DIST	<u>54</u> HWY <u>69</u>	BOREHOLE TYPE	<u>Manual Hand Auger</u>	COMPILED BY	<u>ME/GE</u>
DATUM	<u>Geodetic</u>	DATE	<u>April 16, 2004</u>	CHECKED BY	

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RECORD OF PENETRATION TEST No 610-1M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+937.5, C/L Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
254.4 0.0	Ground Surface													
250.1 4.3	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 610-2M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+962.5, CL Med. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)							GR	SA	SI	CL
254.5	Ground Surface					*															
0.0	Peat, coarse fibrous																				
0.1	Dark Brown																				
	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 610-3M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+975, CL Med. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
254.1	Ground Surface					*		20	40	60	80	100								
0.0	Peat, coarse fibrous																			
0.1	Dark Brown																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF PENETRATION TEST No 610-4M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+987.5, C/L Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.2 0.0	Ground Surface						254										
253.0 1.2	End of dynamic cone penetration test Refusal on probable bedrock						253	120/0cm									

RECORD OF BOREHOLE No 610-5M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+012.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
254.2	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous																
0.2	Silty sand, fine		1	SS	12												
253.6	Compact Brown Moist																
0.6	Clayey silt, trace sand, Stiff Brown Moist																
	Silt lenses		2	SS	20												
252.2	Very stiff																
2.0	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF PENETRATION TEST No 610-6M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+087.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____










SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
253.7 0.0	Ground Surface																
251.6 2.1	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 610-7M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+112.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				GR	SA	SI	CL
								\circ UNCONFINED	\bullet QUICK TRIAXIAL	$+$ FIELD VANE	\times LAB VANE									
253.7	Ground Surface																			
0.0	Peat, <u>coarse fibrous</u>																			
253.2	Peat, fine fibrous																			
0.5	Clayey silt, trace sand		1	SS	17															
	Stiff Brown Moist																			
																				
251.7	With silt lenses, trace gravel		2	SS	11															
2.0	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 610-8M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+137.5, CL Med. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
253.8	Ground Surface																
0.0	Peat, coarse fibrous																
0.3	Dark Brown Clayey silt, trace sand Brown																
252.5																	
1.3	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 610-9M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+162.5, CL Med. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
254.5	Ground Surface					*											
0.0	Peat, coarse fibrous																
0.2	Dark Brown Clayey silt, with gravel							254									
253.4	Brown																
1.1	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 610-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+835, o/s 34m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
254.3	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous																
0.2	Silty sand, fine		1	SS	6		254										
	Loose Brown Moist																
253.4																	
0.9	Clay, some silt, trace sand						253										
	Firm Brown Moist to very stiff		2	SS	11							138					
							252										
250.9			3	SS	13/15cm		251										
3.4	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																
	■ Penetrometer test																

RECORD OF BOREHOLE No 610-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+835, o/s 4.5m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
254.5	Ground Surface																							
0.0	Peat, coarse fibrous																							
0.2	Dark Brown																							
253.9	Sandy silt, trace clay																							
0.6	Brown																							
	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 610-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+850, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
254.2	Ground Surface					*														
0.0	Peat, coarse fibrous		1	SS	7		254													
0.2	Sand						253													
253.7	Loose Grey Wet Clayey silt, trace sand, Stiff Mottled Moist grey/brown						252													
0.5							251													
252.4	Silty clay, trace sand		2	SS	16															
1.8	Very Brown Moist stiff TILL																			
	Firm		3	SS	4															
250.4	End of borehole																			
3.8	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			
	■ Penetrometer test																			

RECORD OF PENETRATION TEST No 610-4N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+862.5, o/s 4.5m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.2 0.0	Ground Surface						254										
							253										
							252										
							251										
							250										
							249										
248.3 5.9	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 610-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+862.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
								20	40	60	80	100						20	40	60
254.1	Ground Surface																			
0.0	Peat, coarse fibrous		1	SS	2															
0.2	Silty sand, fine																			
	Very loose Wet																			
252.9																				
1.2	Clay, some silt, trace sand, trace gravel		2	SS	8															
	Stiff Red/ Moist brown															1 3 19 77				
	Firm Brown		3	SS	6															
250.1																				
4.0	Clayey silt, trace sand		4	SS	1															
	Soft Grey Wet															0 6 62 32				
248.3																				
5.8	Sand and gravel, trace silt		5	SS	34															
	Dense Brown Wet																			
	occ. cobbles																			
			6	AS	-															
246.0																				
8.1	End of borehole																			
	Refusal on probable bedrock																			
	* 2004 02 17																			
	▽ Water level observed before drilling																			
	▼ Water level measured after drilling																			
	■ Penetrometer test																			

RECORD OF BOREHOLE No 610-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+875, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20						40	60	80
254.2	Ground Surface																			
0.0	Peat, coarse fibrous					↓*	254									Top 0.3m frozen				
0.2	Clayey silt, trace sand, mottled		1	SS	16															
	Very Grey/ Moist stiff brown						253													
	Stiff		2	SS	14															
251.8	Silty clay					▽*	252													
2.4	Firm Grey Wet																			
			3	SS	4															
			4	SS	WH**															
							249													
							248													
247.8	Silt, trace sand, trace clay		5	SS	WH	▽*														
6.4	Grey Wet																			
247.0	Sand and gravel, trace silt, occ. cobble						247													
7.2	Brown Wet																			
246.6	End of borehole																			
7.6	Refusal on probable bedrock																			
			</																	

RECORD OF PENETRATION TEST No 610-7N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+887.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.2 0.0	Ground Surface																
							254										
							253										
							252										
							251										
							250										
							249										
							248										
							247										
246.6 7.6	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 610-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+887.5, o/s 4.5m Rt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		× LAB VANE
254.2	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, coarse fibrous																			
0.2	Silty sand, fine		1	SS	6															
	Loose Grey/ Moist brown																			
253.0	Clayey silt, trace gravel																			
1.2	Stiff Grey/ Moist brown		2	SS	10															
251.5	Silty clay, trace gravel,																			
2.7	Firm Brown/ Moist Grey		3	SS	6															
249.2	Clayey silt, trace gravel		4	SS	2															
5.0	Soft Grey Wet																			
248.4	Sand fine to medium with gravel with silt		5	SS	10/5cm															
5.8	Grey wet																			
248.1	End of borehole																			
6.1	Refusal on probable bedrock																			
<div>* 2004 02 18</div> <div>▼ Water level measured after drilling</div> <div>■ Penetrometer test</div>																				

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

SOIL PROFILE	SAMPLES			DYNAMIC CONE PENETRATION			
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ON_MOT VER3 610 FEBRUARY 20 2004.GPJ ON_MOT.GDT 7/22/04 2:04:45 PM

RECORD OF PENETRATION TEST No 610-11N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+912.5, o/s 4.5m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
254.2 0.0	Ground Surface													
							254							
							253							
							252							
							251							
							250							
							249							
							248							
247.5 6.7	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 610-12N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+925, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
							WATER CONTENT (%)										
							20 40 60 80 100					20 40 60					
254.3	Ground Surface																
0.0	Peat, coarse fibrous																
0.2	Silty sand		1	SS	12		254										
253.7	Compact Brown Moist Clay with silt, trace sand																
0.6	Stiff Brown Moist to firm		2	SS	10		253										
							252										
			3	SS	5		251										
250.3	Clayey silt, trace sand																
4.0	Firm Grey Wet		4	SS	WH**		250										
							249										
248.5	Silt, with sand, some clay																
5.8	Very Grey Wet loose		5	SS	1		248										
247.2	End of borehole																
7.1	Refusal on probable bedrock																
* 2004 02 18																	
▽ Water level observed before drilling																	
▼ Water level measured after drilling																	
■ Penetrometer test																	
WH** Refers to penetration under weight of rods and hammer																	

RECORD OF PENETRATION TEST No 610-13N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+937.5, o/s 48m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
255.0 0.0	Ground Surface													
254														
253														
252														
251														
250.1 4.9	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 610-14N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+950, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
255.4	Ground Surface					*														
0.0	Peat, coarse fibrous Dark Brown Sand, some silt Brown	●					255													
0.1		●																		
		●																		
254.4		●																		
1.0	End of borehole Refusal on probable bedrock <																			

RECORD OF BOREHOLE No 610-15N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+975, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																
	Rock outcrop visible 0.5m south and 0.5m north of location																

RECORD OF PENETRATION TEST No 610-16N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+987.5, o/s 48m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100			W _p
255.0 0.0	Ground Surface														
254.0 1.0	End of dynamic cone penetration test Refusal on probable bedrock						254								

RECORD OF BOREHOLE No 610-17N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+000, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
255.4	Ground Surface							20	40	60	80	100					
0.0	Peat, coarse fibrous																
0.1	Silty sand, fine		1	SS	13		255										
254.5	Compact Brown Moist																
0.9	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 610-18N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+012.5, o/s 48m Rt. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
255.5	Ground Surface							20	40	60	80	100					
0.0	Peat, coarse fibrous	⋈⋈⋈															
0.3	Dark Brown	⋈⋈⋈															
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 610-19N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+025, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 14, 2004 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
255.1	Ground Surface							20	40	60	80	100								
0.0	Peat, coarse fibrous	●					255													
254.7	Dark Brown																			
0.4	Silty sand																			
	Brown Dry																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 610-20N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+037.5, o/s 33.5m Rt. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
255.0	Ground Surface							20	40	60	80	100												
0.0 0.1	Peat, coarse fibrous																							
	Dark Brown Clayey silt, trace sand																							
	Brown																							
253.7							254																	
1.3	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 610-21N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+037.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL								
253.7	Ground Surface							20	40	60	80	100								
0.0	Peat, <u>coarse fibrous</u>		1	SS	8															
253.2	Fine fibrous																			
0.5	Clayey silt, trace sand, mottled						253													
	Stiff Grey/ Wet to brown firm		2	SS	9		252						137							
							251													
			3	SS	3		250													
249.7	End of borehole																			
4.0	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			
	■ Penetrometer test																			

RECORD OF BOREHOLE No 610-22N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+050, o/s 19m Rt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
253.8	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous, Dark brown		1	SS	9															
0.2	Clayey silt, trace sand, mottled						253													
	Stiff Brown Moist to very stiff																			
			2	SS	16		252													
	Silt layers						251													
			3	SS	7															
250.0	End of borehole						250													
3.8	Refusal on probable bedrock																			

RECORD OF BOREHOLE No 610-23N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+062.5, o/s 33.5m Rt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
253.8	Ground Surface																
0.0	Peat, fine fibrous, Dark Brown		1	SS	9												
0.2	Clayey silt, trace sand, mottled																
	Stiff Brown Moist																
			2	SS	10												
250.4	Some sand		3	SS	10/25cm*												
3.4	Brown Wet End of borehole Refusal on probable bedrock																

* 2004 02 23

▼ Water level measured
after drilling

■ Penetrometer test

RECORD OF PENETRATION TEST No 610-24N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+062.5, o/s 5m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
253.8 0.0	Ground Surface													
251.4 2.4	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 610-25N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+075, o/s 19m Rt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
253.8	Ground Surface																			
0.0	Peat, fine fibrous, Dark Brown Silty sand, fine Compact Brown Moist		1	SS	15															
0.2																				
252.3	Silty clay, trace gravel Very Brown Moist stiff Fine sand layers Stiff		2	SS	23															
1.5																				
				3	SS	4														
				4	FV															
249.2																				
4.6	End of borehole Refusal on probable bedrock * 2004 02 17 ▼ Water level measured after drilling																			

1 of 1 **METRIC**

MTO_DCPT 610 FEBRUARY 23 SET 2, 2004.GPJ ON_MOT.GDT 7/22/04 2:14:01 PM

1 of 1 METRIC

G.W.P.	<u>312-99-00</u>	LOCATION	<u>Hwy 69 Sta. 19+087.5, o/s 33m Rt. Burwash Twp.</u>	ORIGINATED BY	<u>RM</u>
DIST	<u>54</u> HWY <u>69</u>	BOREHOLE TYPE	<u>Dynamic Cone Penetration Test</u>	COMPILED BY	<u>RM</u>
DATUM	<u>Geodetic</u>	DATE	<u>February 23, 2004</u>	CHECKED BY	

SOIL PROFILE					SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)								
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p W W _L								
253.8 0.0	Ground Surface																		
							253												
							252												
							251												
							250												
							249												
248.3 5.5	End of dynamic cone penetration test Refusal on probable bedrock																		

RECORD OF BOREHOLE No 610-28N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+100, o/s 19m Rt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE															
253.6	Ground Surface							20	40	60	80	100											
0.0	Peat, fine fibrous, Dark Brown		1	SS	27																		
0.3	Clayey silt, trace sand						253																
	Very Brown Moist stiff																						
252.1																							
1.5	Silty sand, fine, trace clay		2	SS	23		252																
251.6	Compact Brown Moist																						
2.0	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						
	■ Penetrometer test																						

RECORD OF BOREHOLE No 610-29N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+112.5, o/s 48m Rt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
254.0	Ground Surface																
0.0	Peat, fine fibrous, Dark Brown		1	SS	5												
0.1	Clayey silt, trace sand, mottled																
	Firm Brown Moist																
	Stiff Wet		2	SS	11												
250.7	Trace gravel		3	SS	3/10cm												
3.3	End of borehole																
	Refusal on probable bedrock																
	* 2004 02 23																
	▼ Water level measured after drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 610-31N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+137.5, o/s 48m Rt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.5 0.0	Ground Surface																
253.6 0.9	End of dynamic cone penetration test Refusal on probable bedrock						254										

RECORD OF BOREHOLE No 610-32N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+150, o/s 19m Rt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 14, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
255.3	Ground Surface					20			40	60	80	100	20					40	60					
0.0	Bedrock at surface																							
	* Borehole dry																							

RECORD OF BOREHOLE No 610-33N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+162.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
255.3	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous, Dark brown		1	SS	10		255													
0.1	Clayey silt, trace sand,																			
254.7	Stiff Mottled Moist brown																			
0.6	Sand, trace silt, trace gravel																			
254.5	Compact Brown Moist																			
0.8	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 610-34N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+175, o/s 19m Rt. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
255.3	Ground Surface																							
0.0	Peat, coarse fibrous																							
0.3	Dark Brown																							
	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 610-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+835, o/s 4.5m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.5	Ground Surface																
0.0	Peat, coarse fibrous																
0.1	Dark Brown																
253.7	Clayey silt, some sand																
0.8	Brown																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 18+862.5, o/s 4.5m Lt. Burwash Twp.	ORIGINATED BY	RE
DIST	54	HWY	69	BOREHOLE TYPE	Continuous Flight Hollow Stem Augers
DATUM	Geodetic	DATE	February 18, 2004	COMPILED BY	RE
				CHECKED BY	

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RECORD OF PENETRATION TEST No 610-5S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+875, o/s 33.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____













SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
254.2 0.0	Ground Surface						254										
							253										
							252										
							251										
							250										
							249										
							248										
247.5 6.7	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 610-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+875, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
254.2	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse fibrous		1	SS	8		254													
253.7																				
0.5	Silty sand, fine																			
253.0	Loose Grey Moist																			
1.2	Clayey silt, varved																			
	Stiff Brown/ Moist grey		2	SS	14							125								
251.3							252													
2.9	Silty clay																			
251.3	Soft Grey Wet		3	SS	2		251													
250.2																				
4.0	Silty sand, fine		4	AS	-	 *	250													
249.9																				
4.3	Loose Grey Wet End of borehole Refusal on probable bedrock * 2004 02 17  Water level measured after drilling Penetrometer test																			

* 2004 02 17

▼ Water level measured after drilling
 Penetrometer test

RECORD OF BOREHOLE No 610-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+887.5, o/s 33.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								<div>○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE</div>												
254.3	Ground Surface						20	40	60	80	100									
0.0	Peat, coarse fibrous																			
0.2	Silty sand, fine		1	SS	2															
253.4	Very loose Grey Moist																			
0.9	Clayey silt, trace sand																			
	Stiff Grey/brown Moist		2	SS	14															
251.0			3	SS	9															
3.3	Silty clay																			
	Firm Grey Moist																			
250.0																				
4.3	Silt, trace sand trace clay																			
	Very loose Grey Moist to compact		4	SS	WH**															
247.5			5	SS	20															
6.8	End of borehole																			
	Refusal on probable bedrock																			
	 * 2004 02 17																			
	 ▼ Water level measured after drilling																			
	WH** Refers to penetration under weight of rods and hammer																			

RECORD OF PENETRATION TEST No 610-8S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+887.5, o/s 4.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
254.2 0.0	Ground Surface						254							
250.8 3.4	End of dynamic cone penetration test Refusal on probable bedrock						251							

RECORD OF BOREHOLE No 610-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+900, o/s 19m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED		+ FIELD VANE							
254.1	Ground Surface																
0.0	Peat, coarse to fine fibrous		1	SS	9												
253.6	Silty sand, fine																
0.5	Loose Grey Moist																
253.2	Clayey silt trace gravel, varved																
0.9	Compact Grey/ Brown Moist		2	SS	13												
251.4																	
2.7	Silty clay, silt layers Firm Grey Wet		3	SS	5												
249.8																	
4.3	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF PENETRATION TEST No 610-10S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+912.5, o/s 33.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L				
254.5 0.0	Ground Surface													
250.9 3.6	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 610-11S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+912.5, o/s 4.5m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 18, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
254.2	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous		1	SS	4	☼ ↓	254													
0.2	Silty sand, fine																			
	Very loose Brown Moist																			
253.1																				
1.1	Clayey silt trace organic		2	SS	11															
	Stiff Grey/brown Wet																			
	Firm Grey Wet		3	SS	7															
250.2	Silt, trace gravel						250													
4.0	Very loose Grey Wet		4	SS	1															
248.7							249													
5.5	End of borehole																			
	Refusal on probable bedrock																			
	* 2004 02 18																			
	▼ Water level measured after drilling																			
	■ Penetrometer test																			

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 610-13S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+937.5, o/s 48m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
254.8	Ground Surface						20	40	60	80	100						
0.0 0.1	Peat, coarse fibrous Silty sand, fine Loose Grey/ Moist brown	● ●															

* 2004 02 17

▼ Water level measured
after drilling

■ Penetrometer test

RECORD OF BOREHOLE No 610-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+950, o/s 48m Lt. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
254.7	Ground Surface					*		20	40	60	80	100								
0.0	Peat, coarse fibrous																			
0.1	Dark Brown																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 610-15S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+950, o/s 19m Lt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
254.2	Ground Surface																			
0.0	Peat, fine fibrous, Dark Brown Silty sand, fine Very Brown Moist loose		1	SS	4		254													
0.1							253													
252.7							252													
1.5	Clayey silt, trace sand, mottled Stiff Brown Moist		2	SS	8		251													
251.2	250																			
3.0	Silty clay, silt layers, mottled Very Grey Wet stiff						3	SS	24	254										
249.9	253																			
4.3	End of borehole Refusal on probable bedrock * 2004 02 23 Water level measured after drilling Penetrometer test																			

RECORD OF BOREHOLE No 610-16S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+962.5 o/s 48m Lt. Burwash Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers & Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)	
								○ UNCONFINED	+ FIELD VANE						● QUICK TRIAXIAL	× LAB VANE
254.8	Ground Surface					*										
0.0	Peat, coarse fibrous															
0.1	Dark brown End of borehole															
	Refusal on probable bedrock															
	* Borehole dry on completion of drilling															

RECORD OF BOREHOLE No 610-17S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+987.5, o/s 48m Lt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
255.0	Ground Surface					*														
0.0	Peat, fine fibrous																			
0.2	Dark Brown Clayey silt, trace sand, mottled		1	SS	22															
	Very Brown Moist stiff																			
			2	SS	24															
252.3																				
2.7	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 610-18S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+000, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
253.9	Ground Surface					*														
0.0	Peat, coarse fibrous		1	SS	7															
0.3	Clayey silt, trace sand, mottled Stiff Grey/ brown Moist																			
			2	SS	9															
250.9																				
3.0	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling ■ Penetrometer test																			

RECORD OF BOREHOLE No 610-19S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+012.5, o/s 48m Lt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY RM
 DATUM Geodetic DATE February 16 & 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
254.1	Ground Surface													
0.0 0.1	Peat, coarse fibrous Dark brown Clayey silt, trace sand Brown/ grey						254							
							253							
							252							
							251							
250.7 3.4	End of borehole						250							
							249							
248.5 5.6	End of dynamic cone penetration test Refusal on probable bedrock													
	* 2004 02 23 ▼ Water level measured after drilling													

RECORD OF PENETRATION TEST No 610-20S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+012.5, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
253.8 0.0	Ground Surface													
248.0 5.8	End of dynamic cone penetration test Refusal on probable bedrock						248							

1 of 1 METRIC

G.W.P.	<u>312-99-00</u>	LOCATION	<u>Hwy 69 Sta. 19+025, o/s 32m Lt. Burwash Twp.</u>	ORIGINATED BY	<u>FP</u>
DIST	<u>54</u>	HWY	<u>69</u>	BOREHOLE TYPE	<u>Dynamic Cone Penetration Test</u>
DATE				<u>February 23, 2004</u>	CHECKED BY
DATUM		<u>Geodetic</u>			

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RECORD OF BOREHOLE No 610-22S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+025, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)		
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE									
253.7	Ground Surface						20	40	60	80	100							
0.0	Peat, coarse fibrous		1	SS	7	V*												
259.2	Silty sand, fine																	
0.5	Loose Brown Moist Silty clay, trace sand																	
	Stiff Brown Moist to firm		2	SS	12						125					0 2 46 52		
			3	SS	4													
249.7	Clayey silt, trace sand, trace gravel																	
4.0	Firm Grey Wet		4	SS	1											1 1 67 31		
			5	SS	WH**													
	silt lenses																	
245.8	Sand and gravel, trace silt		6	SS	5													
7.9	Loose Brown Wet																	
245.4	End of borehole																	
8.3	Refusal on probable bedrock																	
* 2004 02 23																		
▽ Water level observed during drilling																		
■ Penetrometer test																		
WH** Refers to penetration under weight of rods and hammer																		

* 2004 02 23

▽ Water level observed
during drilling

■ Penetrometer test







WH** Refers to penetration
under weight of rods
and hammer

RECORD OF BOREHOLE No 610-23S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+037.5, o/s 33m Lt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
254.0	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous		1	SS	9												
0.2	Dark Brown																
253.5	Clayey silt, trace sand, mottled																
0.5	Stiff Brown Moist																
	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF PENETRATION TEST No 610-24S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+037.5, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
253.8 0.0	Ground Surface													
253														
252														
251														
250														
249.7 4.1	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF PENETRATION TEST No 610-25S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+037.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____






SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L				
253.7 0.0	Ground Surface													
253														
252														
251														
250														
249														
248														
247.3 6.4	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 610-26S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+050, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																
253.8	Ground Surface							20	40	60	80	100												
0.0	Peat, coarse fibrous		1	SS	11																			
0.3	Clayey silt, trace sand						253																	
	Stiff Brown Moist																							
252.1			2	SS	11		252																	
1.7	Sand and gravel, trace silt																							
251.8																								
2.0	Compact Brown Wet End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF PENETRATION TEST No 610-27S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+062.5, o/s 33.5m Lt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____









SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
254.0 0.0	Ground Surface																
253																	
252.1 1.9	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 610-28S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+062.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
253.8	Ground Surface							20	40	60	80	100					
0.0	Peat, <u>coarse fibrous</u> Fine fibrous		1	SS	9												
253.3																	
0.5	Clayey silt, trace sand						253										
	Stiff Brown Moist to firm		2	SS	11		252										
																	
							251										
			3	SS	4												
							250										
249.3	End of borehole																
4.5	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																
	■ Penetrometer test																

RECORD OF BOREHOLE No 610-29S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+075 o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						x LAB VANE		
254.0	Ground Surface							20	40	60	80	100								
0.0	Peat, coarse fibrous																			
0.2	Silty sand, fine		1	SS	8															
253.6	Loose Brown Moist Clayey silt, trace sand																			
0.5	Stiff Brown Moist to firm																			
			2	SS	11															
	Silt lenses																			
250.4			3	SS	6															
3.6	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			
	■ Penetrometer test																			

RECORD OF BOREHOLE No 610-30S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 18+087.5, o/s 48m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			GR
254.5	Ground Surface					*														
0.0	Peat, coarse fibrous																			
0.1	Dark Brown																			
254.1	Silty sand, fine																			
0.4	Brown Dry																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 610-31S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+100, o/s 19m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 14, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
254.7 0.0	Ground Surface					20			40	60	80	100													
	Bedrock at surface																								
	* Borehole dry																								

RECORD OF BOREHOLE No 610-32S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+125, o/s 43m Lt. Burwash Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY ME
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
255.3	Ground Surface							20	40	60	80	100		20	40	60							
0.0	Peat, coarse fibrous	⋈⋈⋈																					
0.3	Dark Brown																						
	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 610-33S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+125, o/s 19m Lt. Burwash Twp. ORIGINATED BY RM
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														
								○ UNCONFINED + FIELD VANE														
								● QUICK TRIAXIAL × LAB VANE														
										WATER CONTENT (%)												
										20	40	60	80	100	20	40	60					
253.6	Ground Surface																					
0.0	Peat, fine fibrous, to black with wood pieces		1	SS	17		253										Frozen first 0.3m					
252.1							252															
1.5	Clayey silt, trace sand mottled		2	SS	17																	
	Very Brown/ Moist stiff Grey						251															
250.6			3	SS	3/10cm																	
2.0	Silty clay																					
250.5	Very Grey Wet stiff																					
3.1	End of borehole Refusal on probable bedrock																					
	* Borehole dry on completion of drilling																					

RECORD OF BOREHOLE No 610-35S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+150, o/s 19m Lt. Burwash Twp. ORIGINATED BY RM
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RM
 DATUM Geodetic DATE February 23, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
254.0	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous, Dark Brown		1	SS	7															
0.2	Sand, trace silt, trace gravel																			
	Loose Brown Moist						253													
252.5																				
1.5	Silt, some sand, trace gravel		2	SS	2/3cm															
252.3	Compact Brown Moist																			
1.7	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 610-36S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+162.5, o/s 43m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 17, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
255.7 0.0	Ground Surface Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 610-37S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+175, o/s 19m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY MR
 DATUM Geodetic DATE February 14, 2004 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
255.8	Ground Surface																
0.0	Peat, coarse fibrous																
0.2	Dark Brown Sandy silt, fine, trace clay																
254.7	Brown						255										
1.1	End of borehole Refusal on probable bedrock <																

RECORD OF BOREHOLE No 611-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+612.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
237.7	Ground Surface					*		20	40	60	80	100		20	40	60				
0.0	Topsoil																			
0.2	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 611-2M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+637.5, CL Med. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
232.3 0.0	Ground Surface					20			40	60	80	100													
	* Borehole dry on completion of drilling																								

RECORD OF PENETRATION TEST No 611-3M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+662.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
230.2 0.0	Ground Surface						230										
228.1 2.1	End of dynamic cone penetration test Refusal on probable bedrock						229										

RECORD OF BOREHOLE No 611-4M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+687.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										
230.1	Ground Surface						20	40	60	80	100							
0.0	Peat, fine fibrous		1	SS	3		230											
0.3	Dark brown Silty sand, Very loose Grey/ Moist brown						229											
228.7																		
1.4	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 611-5M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+712.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE												
230.1 0.0	Ground Surface <																								

RECORD OF PENETRATION TEST No 611-5MA

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+725, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 26, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L				
230.0 0.0	Ground Surface													
224.4 5.6	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 611-6M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+737.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE											○		
230.5	Ground Surface						20	40	60	80	100												
0.0	Peat, fine fibrous		1	SS	WH**	4*	230																
0.3	Dark brown Sand, trace silt						229																
	Very loose						228																
	Brown						227																
	Wet						226																
	Compact		2	SS	24																		
	Dense		3	SS	35																		
225.7	End of borehole		4	SS	10/5cm																		
4.8	Refusal on probable bedrock																						
	* 2003 04 23																						
	▽ Water level observed during drilling																						
	WH** Refers to penetration under weight of rods and hammer																						

RECORD OF PENETRATION TEST No 611-8M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+850, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 25, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
232.7 0.0	Ground Surface													
226.8 5.9	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF PENETRATION TEST No 611-9M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+862.5, CL Med. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L				
233.8 0.0	Ground Surface													
231.3 2.5	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 611-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+587.5, o/s 11m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
247.8 0.0	Ground Surface <																				

RECORD OF BOREHOLE No 611-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+587.5, o/s 28m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100					
247.3	Ground Surface					*											GR SA SI CL
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 611-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+600, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE										
242.0	Ground Surface																						
0.0	Bedrock at surface																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 611-4N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+612.5, o/s 46m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL		
243.1 0.0	Ground Surface					20			40	60	80	100												
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 611-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+625, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT							PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)				GR	SA	SI	CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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235.9	Ground Surface																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

RECORD OF BOREHOLE No 611-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+637.5, o/s 41m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
234.9 0.0	Ground Surface					20			40	60	80	100													
	* Borehole dry on completion of drilling																								

RECORD OF BOREHOLE No 611-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+650, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
230.0 0.0	Ground Surface <																						

RECORD OF BOREHOLE No 611-8N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+662.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
226.6	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Peat, fine fibrous		1	SS	1	▽*											
0.3	Dark brown Silty sand, trace gravel						226										
	Very loose Brown Wet						225										
	Compact		2	SS	27		224										
	with cobbles and boulders						223										
	Dense Grey to compact		3	SS	33		222										
							221										
							220										
				4	SS	27											
219.6	End of borehole																
7.0	Refusal on probable bedrock																
	* 2003 04 22																
	▽ Water level measured after drilling																
	▼ Water level observed during drilling																

RECORD OF BOREHOLE No 611-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+675, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
226.8	Ground Surface					▼*														
0.0	Peat, fine fibrous																			
0.2	Dark brown Clayey silt, trace sand		1	SS	4															
225.7	Soft Brown Moist					▽*	226													
1.1	Silty sand, trace gravel																			
	Dense Grey/ Wet brown		2	SS	32		225													
							224													
	Compact		3	SS	23															
							223													
222.4	End of borehole																			
4.4	Refusal on probable bedrock																			
	* 2003 04 22																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

RECORD OF PENETRATION TEST No 611-10N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+687.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100		
226.5 0.0	Ground Surface													
226														
225														
224														
223														
222														
221														
220														
219.4 7.1	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 611-11N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+700, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE												
229.2 0.0	Ground Surface 																								

RECORD OF BOREHOLE No 611-12N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+712.5, o/s 43m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
231.9	Ground Surface							20	40	60	80	100									
0.0	Peat, fine fibrous																				
0.2	Dark brown Sandy silt, trace clay		1	SS	16	▽*	231								○						
	Compact Brown Moist																				
230.4																					
1.5	Sand, trace silt		2	SS	31												○				
	Dense Brown Moist																				
									</												

RECORD OF PENETRATION TEST No 611-12NA

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+712.5, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 26, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
231.6 0.0	Ground Surface													
229.1 2.5	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 611-13N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+725, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)									
						○ UNCONFINED			+ FIELD VANE			● QUICK TRIAXIAL								× LAB VANE	
230.9	Ground Surface					20	40	60	80	100	20	40	60								
0.0	Peat, fine fibrous		1	SS	2									○							
0.3	Dark brown Sandy silt, trace clay																				
	Very loose Brown Moist loose																				
229.4	Sand, trace silt		2	SS	26									○							
1.5	Compact Brown Wet																				
	Loose Grey		3	SS	8									○							
	Dense		4	SS	30									○							
225.7	End of borehole																				
5.2	Refusal on probable bedrock																				
	* 2003 04 23																				
	▽ Water level observed during drilling																				
	▼ Water level measured after drilling																				

RECORD OF BOREHOLE No 611-14N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+737.5, o/s 41m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE											● QUICK TRIAXIAL		
231.6	Ground Surface							20	40	60	80	100		20	40	60								
0.0	Peat, fine fibrous		1	SS	1	▽*	231																	
0.3	Dark brown Sandy silt, trace clay																							
	Very loose Brown Moist																							
230.1						▽*	230																	
1.5	Sand, trace gravel silty sand seams, Dense Brown Moist to very dense		2	SS	62																			
			3	SS	41																			
							228																	
227.5																								
4.1	End of borehole Refusal on probable bedrock <																							

RECORD OF BOREHOLE No 611-15N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+750, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa															
								○ UNCONFINED + FIELD VANE															
								● QUICK TRIAXIAL × LAB VANE															
					WATER CONTENT (%)																		
230.6	Ground Surface						20	40	60	80	100	20	40	60		GR	SA	SI	CL				
0.0	Peat, fine fibrous		1	SS	8	▽*											0	88	(12)				
0.3	Dark brown Sandy silt, Loose Brown Moist						230																
229.4			2	SS	20		229																
1.2	Sand, some to with silt Compact Brown Moist						228																
	Wet		3	SS	14		227																
	Loose		4	SS	9		226																
							225																
			5	SS	5		224																
223.4	End of borehole																						
7.2	Refusal on probable bedrock																						
	* 2003 04 23																						
	▽ Water level observed during drilling																						
	▼ Water level measured after drilling																						

RECORD OF BOREHOLE No 611-16N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+812.5, o/s 3m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
234.0	Ground Surface																
0.0 0.1	Topsoil Sand, trace silt Loose Brown Moist																
232.2							233										
1.8	End of borehole Refusal on probable bedrock * 2003 04 08 Water level measured after drilling																

RECORD OF BOREHOLE No 611-17N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+812.5, o/s 35m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
233.6	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Sand, trace silt																
	Loose Brown Moist						233										
232.4																	
1.2	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 611-18N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+825, o/s 19m Rt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
234.9	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Sand, trace silt																
	Brown Moist boulders						234										
233.4																	
1.5	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 611-20N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+837.5, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 26, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
235.2 0.0	Ground Surface													
232.6 2.6	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 611-21N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+837.5, o/s 34m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
235.2	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous					▽*	235													
0.3	Dark brown					▼*	234													
	Silty sand, with sand seams						233													
	Loose Brown Wet to compact		1	SS	9															
231.5			2	SS	10		232													
3.7	End of borehole																			
	Refusal on probable bedrock																			
	* 2003 04 23																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

METRIC[illegible]

RECORD OF PENETRATION TEST No 611-23N

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+862.5, o/s 40m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____


SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
236.2 0.0	Ground Surface													
							236							
							235							
							234							
							233							
							232							
							231							
							230							
							229							
							228							
227.8 8.4	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 611-24N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+875, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
234.2	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous		1	SS	4	V _u *	234													
0.2	Dark brown Silt, trace sand trace clay						233													
	Very loose Brown Moist																			
232.4	Sand, trace silt trace gravel	2	SS	18			232													
1.8	Compact Brown Wet				V _u *															
		3	SS	17		231														
	cobbles and boulders					230														
		4	SS	22		229														
	Very dense					228														
227.5	End of borehole																			
6.7	Refusal on probable bedrock																			
	* 2003 04 24																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 611-25N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+887.5, o/s 11m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____









SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
								WATER CONTENT (%)												
235.7	Ground Surface							20	40	60	80	100		20	40	60				
0.0	Peat, fine fibrous		1	SS	1		235													
0.3	Dark brown Silt, trace sand trace clay																			
	Very loose Brown Moist																			
234.2																				
1.5	Sand trace silt Dense Brown Wet		2	SS	33		234													
232.8							233													
2.9																				
	End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 611-26N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+887.5, o/s 28m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100					w _p	w	w _L		
								SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
235.1	Ground Surface					▼*											
0.0	Peat, fine fibrous		1	SS	1	▽*	235										
0.3	Dark brown Silt, trace sand trace clay						234										
233.7	Very loose Brown Moist						233										
1.4	Sand, trace silt trace gravel		2	SS	32		232										
	Dense Brown Wet																
	boulders																
231.4			3	SS	52												
3.7	End of borehole																
	Refusal on probable bedrock																
	* 2003 04 24																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 611-27N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+900, o/s 19m Rt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)			GR	SA	SI	CL
								<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div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RECORD OF BOREHOLE No 611-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+587.5, o/s 11m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
244.9	Ground Surface					*																		
0.0	Bedrock at surface																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 611-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+587.5, o/s 28m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						w _p w w _L			WATER CONTENT (%)	GR	SA		SI	CL			
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
241.9 0.0	Ground Surface 																						

RECORD OF BOREHOLE No 611-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+600, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
240.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 611-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+612.5, o/s 46m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
238.3	Ground Surface							20	40	60	80	100					
0.0	Topsoil						238										
0.1	Silty sand, trace gravel																
237.4	Brown Wet																
0.9	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 611-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+625, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						WATER CONTENT (%)							GR	SA	SI	CL
237.3 0.0	Ground Surface <																					

RECORD OF BOREHOLE No 611-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+637.5, o/s 41m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
233.4 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 611-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+650, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
229.7 0.0	Ground Surface <																				

RECORD OF BOREHOLE No 611-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+662.5, o/s 43m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
231.7	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous																
0.1	Dark brown																
	Silt, trace sand trace clay						231										
230.5	Brown Wet																
1.2	Silty sand,						230										
	Brown Wet																
228.9							229										
2.8	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 611-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+675, o/s 19m Lt. Burwash Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Mechanical Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										
232.7	Ground Surface							20	40	60	80	100						
0.0 0.1	Peat, fine fibrous Dark brown																	
	Silt, trace sand trace clay						232											
231.5	Brown Moist																	
1.2	Silty sand, Grey Moist						231											
230.7																		
2.0	End of borehole Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 611-10S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+687.5, o/s 43m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
228.3	Ground Surface					▼*	20	40	60	80	100						
0.0	Peat, fine fibrous					▼*											
0.2	Dark brown		1	SS	13												
	Silt, trace sand trace clay																
227.1	Compact Brown Moist																
1.2	Silty sand,																
	Compact Brown Wet		2	SS	18												
225.0			3	SS	9/8cm												
3.3	End of borehole																
	Refusal on probable bedrock																
	* 2003 04 23																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 611-11S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+700, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
227.8	Ground Surface					▼*	20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	5	▽*											
0.3	Dark brown Silty sand, fine						227										
	Loose Grey/ Wet Brown																
226.3																	
1.5	Sand, trace silt		2	SS	17	226											
	Compact Brown Wet																
225.1																	
2.7	End of borehole Refusal on probable bedrock * 2003 04 22 ▽ Water level observed during drilling ▼ Water level measured after drilling																

RECORD OF PENETRATION TEST No 611-12S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+712.5, o/s 43m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
228.2 0.0	Ground Surface													
228														
227														
226														
225														
224.1 4.1	End of dynamic cone penetration test Refusal on probable bedrock													

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 611-14S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+737.5, o/s 41m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)												
						○ UNCONFINED			+ FIELD VANE			● QUICK TRIAXIAL										x LAB VANE	
228.2	Ground Surface						20	40	60	80	100		20	40	60								
0.0	Peat, fine fibrous		1	SS	1	<div>▽*</div> <div>▼*</div>	228																
0.3	Dark brown Clayey silt, trace sand						227																
	Very Grey Moist soft						226																
226.7	Sand, trace silt		2	SS	19		225																
1.5	Compact Grey/ Brown					224																	
	Brown		3	SS	26																		
	trace gravel																						
	Very dense		4	SS	52																		
223.0	End of borehole						223																
5.2	Refusal on probable bedrock																						
	<div>* 2003 04 23</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div>																						

RECORD OF BOREHOLE No 611-15S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+750, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL	
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	WATER CONTENT (%)									
229.6	Ground Surface							20	40	60	80	100									
0.0	Peat, fine fibrous																				
0.2	Dark brown Silty sand, fine		1	SS	3	V*	229														
	Very loose Brown Moist																				
228.4	Clayey silt, trace sand																				
1.2	Soft Brown Moist		2	SS	4		228							H						0 4 77 19	
227.2	Silt, some sand some clay						227														
2.4	Very loose Brown Wet		3	SS	3								H						0 20 65 15		
							226														
225.2	End of borehole																				
4.4	Refusal on probable bedrock																				
	* 2003 04 23																				
	▽ Water level observed during drilling																				

RECORD OF BOREHOLE No 611-16S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+812.5, o/s 3m Lt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
233.8	Ground Surface							20	40	60	80	100					
0.0	Topsoil	•															
0.1	Sand, trace silt boulders	•															
	Compact Brown Moist	•															
232.6		•					233										
1.2	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 611-17S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+812.5, o/s 35m Lt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
232.3	Ground Surface					*														
0.0	Topsoil																			
0.2	Sand, trace silt																			
0.3	Brown Moist																			
	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 611-18S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+825, o/s 19m Lt. Burwash Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
234.1 0.0	Ground Surface Sand, trace silt Compact Brown Moist boulders — — —	<div><div>•••••</div><div>•••••</div><div>•••••</div><div>•••••</div><div>•••••</div></div>					234										
232.9 1.2	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling	<div><div>•••••</div><div>•••••</div><div>•••••</div><div>•••••</div><div>•••••</div></div>					233										

RECORD OF PENETRATION TEST No 611-19S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+837.5, o/s 5m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
234.1 0.0	Ground Surface						234							
232.9 1.2	End of dynamic cone penetration test Refusal on probable bedrock						233							

RECORD OF PENETRATION TEST No 611-20S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+837.5, o/s 34m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 25, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa			WATER CONTENT (%)									
						○ UNCONFINED			● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE							
231.5 0.0	Ground Surface																	
															</			

RECORD OF BOREHOLE No 611-21S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+850, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 25, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20						40	60	W _p
231.8	Ground Surface																			
0.0	Peat, fine fibrous		1	SS	5	V [*]	231													
0.2	Dark brown Silt, trace sand trace clay Loose Brown Wet																			
230.3	Sand, trace silt Loose Brown Wet		2	SS	9			230												
1.5							229													
			3	SS	6			228												
								227												
			4	SS	3			226												
								225												
	trace gravel Dense		5	SS	WH**			224												
223.6			6	SS	34															
8.2	End of borehole Refusal on probable bedrock																			
	<p>* 2003 04 25</p> <p>▽ Water level observed during drilling</p> <p>▼ Water level measured after drilling</p> <p>WH** Refers to penetration under weight of rods and hammer</p>																			

RECORD OF BOREHOLE No 611-22S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+862.5, o/s 40m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 25, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE								● QUICK TRIAXIAL		
233.8	Ground Surface							20	40	60	80	100		20	40	60					
0.0	Peat, fine fibrous		1	SS	4	<div><div>∇^*</div><div>\blacktriangledown^*</div></div>															
0.3	Dark brown Sand, trace silt																				
	Very loose																				
	Brown Moist Compact Wet		2	SS	24																
230.4	End of borehole																				
3.4	Refusal on probable bedrock																				
	<div>* 2003 04 25</div> <div>∇ Water level observed during drilling</div> <div>\blacktriangledown Water level measured after drilling</div>																				

RECORD OF BOREHOLE No 611-23S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+875, o/s 19m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 25, 2003 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
235.8	Ground Surface																			
0.0	Peat, fine fibrous		1	SS	4	▽*														
0.2	Dark brown Silt, trace sand trace clay Very loose Brown Moist																			
234.0			2	SS	20															
1.8	Sand, trace silt trace gravel Compact Brown Wet cobbles and boulders						▽*													
			3	SS	12/15cm															
231.8							232													
4.0	End of borehole Refusal on probable bedrock * 2003 04 25 ▽ Water level observed during drilling ▽ Water level measured after drilling																			

RECORD OF BOREHOLE No 611-24S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+887.5, o/s 11m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL		× LAB VANE			
237.0	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	3	▽*											
0.2	Dark brown Silt, trace sand trace clay																
235.8	Very loose Brown Moist						236										
1.2	Sand, trace silt																
	Compact Brown Wet to loose		2	SS	12												
						235											
				3	SS	15											
						▽*											
	Grey						233										
			4	SS	8		232										
	trace gravel cobbles						231										
			5	SS	21												
230.1																	
6.9	End of borehole																
	Refusal on probable bedrock																
	* 2003 04 24																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 611-25S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 19+887.5, o/s 28m Lt. Burwash Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	20						40	60	80
236.7	Ground Surface																			
0.0	Peat, fine fibrous		1	SS	3	V _u *										0 93 (7)				
0.1	Dark brown Sand, trace silt																			
	Very loose Brown Moist																			
	Compact to loose Wet		2	SS	18									Non-plastic						
	With silty sand seams					V _u *														
			3	SS	14															
	Grey																			
			4	SS	9											0 90 (10)				
231.5	End of borehole																			
5.2	Refusal on probable bedrock																			
	* 2003 04 24																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

FOUNDATION INVESTIGATION REPORT
SWAMP AND HIGH FILL CROSSINGS
for
HIGHWAY 69 FOUR-LANING
FROM 4 KM SOUTH OF ESTAIRE TO 1 KM NORTH OF HIGHWAY 537
G.W.P. 312-99-00
DISTRICT 54, TOWNSHIPS OF BURWASH, SECORD AND DILL
SUDBURY, ONTARIO

VOLUME 4

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November 17, 2004



VOLUME 4

APPENDIX C

Explanation of Terms Used in Report

Record of Borehole Sheets: High Fill 613 (incl. Highway 537 High Fill) and Swamp 101

Record of Penetration Test Sheets: High Fill 613 (incl. Highway 537 High Fill) and Swamp 101

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 (RQD), 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

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
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	e	1, %	VOID RATIO	e_{\min}	1, %	VOID RATIO IN DENSEST STATE
γ_s	KN/m^3	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	I_D	1	DENSITY INDEX = $\frac{e_{\max} - e}{e_{\max} - e_{\min}}$
ρ_w	kg/m^3	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
γ_w	KN/m^3	UNIT WEIGHT OF WATER	S_r	%	DEGREE OF SATURATION	D_n	mm	n PERCENT - DIAMETER
ρ	kg/m^3	DENSITY OF SOIL	w_L	%	LIQUID LIMIT	C_u	1	UNIFORMITY COEFFICIENT
γ	KN/m^3	UNIT WEIGHT OF SOIL	w_p	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
ρ_d	kg/m^3	DENSITY OF DRY SOIL	w_s	%	SHRINKAGE LIMIT	q	m^3/s	RATE OF DISCHARGE
γ_d	KN/m^3	UNIT WEIGHT OF DRY SOIL	I_p	%	PLASTICITY INDEX = $w_L - w_p$	v	m/s	DISCHARGE VELOCITY
ρ_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_L	1	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$	i	1	HYDRAULIC GRADIENT
γ_{sat}	KN/m^3	UNIT WEIGHT OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$	k	m/s	HYDRAULIC CONDUCTIVITY
ρ'	kg/m^3	DENSITY OF SUBMERGED SOIL	e_{\max}	1, %	VOID RATIO IN LOOSEST STATE	j	KN/m^2	SEEPAGE FORCE
γ'	KN/m^3	UNIT WEIGHT OF SUBMERGED SOIL						

RECORD OF BOREHOLE No 613-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+187.5, CL Med. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
228.2	Ground Surface					*																		
0.0	Topsoil																							
0.2	End of borehole																							
	Refusal on probable bedrock/boulder																							
	* Borehole dry on completion of drilling																							

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 613-3M

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+425, CL Med. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE								WATER CONTENT (%)
218.4	Ground Surface					▽*										
0.0	Peat, fine fibrous															
0.2	Dark brown Clayey silt, trace sand Varved		1	SS	2											
	Firm Brown Moist															
216.9																
1.5	Silty clay, silt layers		2	SS	5											
	Stiff Grey Wet to very															
216.0	stiff															
2.4	Silt, trace sand, trace clay clayey silt seams															
	Very Grey Wet loose		3	SS	4											
			4	SS	WH**											
			5	SS	WH											
211.4																
7.0	Sand, fine to coarse trace silt															
	Very Grey Wet loose		6	SS	1											
210.2																
8.2	End of borehole															

Cont'd

RECORD OF BOREHOLE No 613-3M

2 of 2

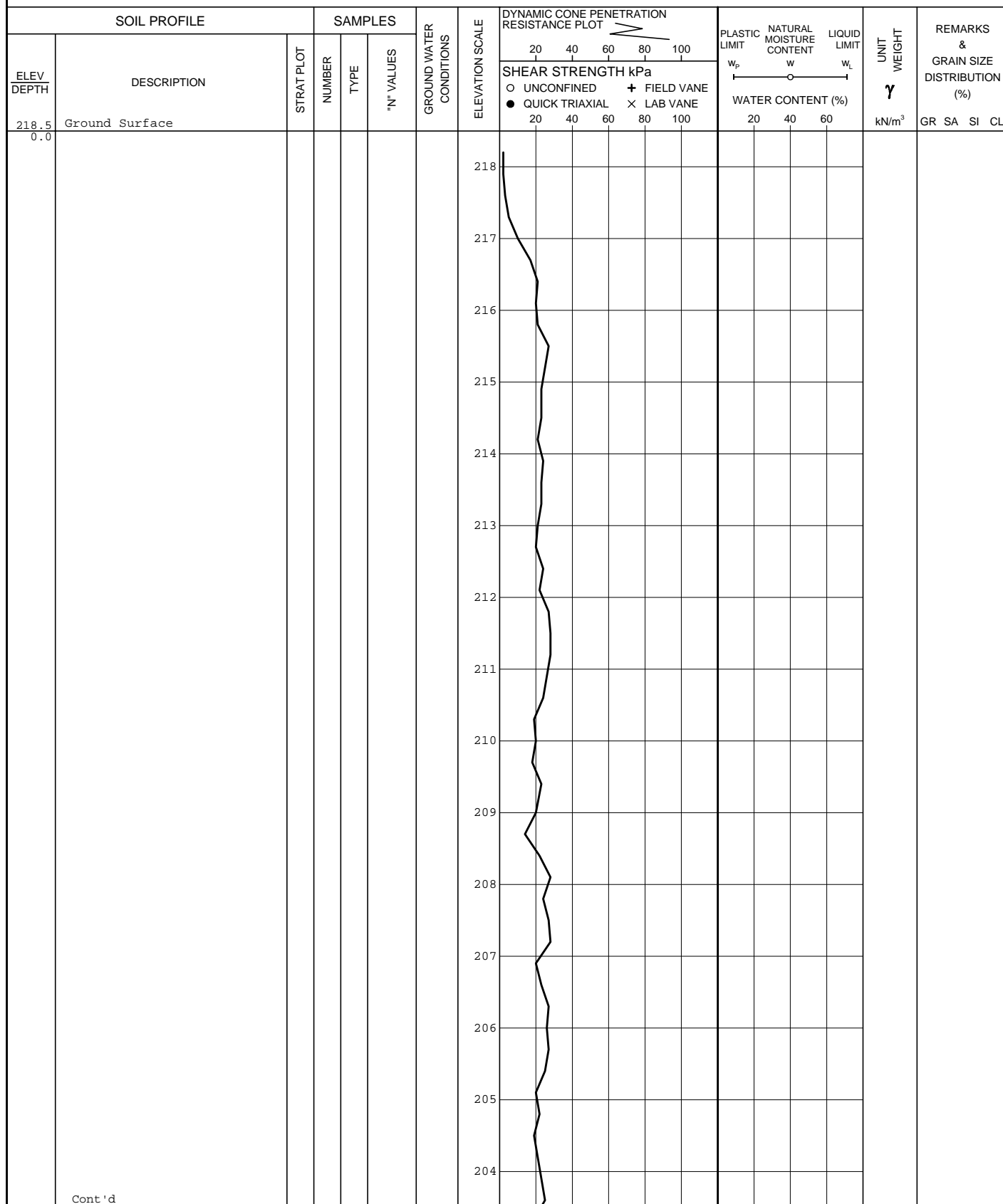
METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+425, CL Med. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 08, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)							GR	SA	SI	CL
203.4																					
202.7							203														
15.7	End of dynamic cone penetration test Refusal on probable bedrock <																				

1 of 2 **METRIC**

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 10+475, CL Med. Dill Twp.	ORIGINATED BY	FP
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	May 06, 2003	CHECKED BY	PC



RECORD OF PENETRATION TEST No 613-4M

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+475, CL Med. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 06, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
203.5																	
199.8																	
18.7	End of dynamic cone penetration test																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 613-5MA

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+575, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 15 and 16, 2004 CHECKED BY _____



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE									
							20	40	60	80	100								
221.0	Ground Surface																		
0.0	Clayey silt, with topsoil and sandy silt inclusions		1	SS	56														
220.1	Brown																		
0.9	(FILL) Clay, with silt trace sand																		
	Firm Grey Wet		2	SS	6														
218.3																			
2.7	Silty clay, varved																		
	Firm Grey Wet		3	SS	2														
				FV															
			4	SS	WH**														
				FV															
			5	SS	WH														
				FV															
			6	SS	WH														
				FV															
			7	SS	WH														
				FV															

RECORD OF BOREHOLE No 613-5MA

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+575, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 15 and 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
206.0 15.0	Cont'd																	
202.7 18.3	End of dynamic cone penetration test																	
	* 2004 02 15/16  Water level observed during drilling  Water level measured after drilling WH** Refers to penetration under weight of rods and hammer																	

RECORD OF BOREHOLE No 613-5MB

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+625, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
221.6	Ground Surface						20	40	60	80	100									
0.0	Topsoil																			
0.2	Silty sand, fine		1	SS	36															
	Dense Brown Moist																			
220.7																				
0.9	Clay, with silt, trace sand		2	SS	6															
	Stiff Grey Wet																			
219.0																				
2.6	Silty clay		3	SS	2															
	Stiff Grey			FV																
	Varved																			
	Firm		4	SS	4															
				FV																
			5	SS	WH**															
				FV																
			6	SS	WH															
				FV																
			7	SS	WH															
				FV																
			8	SS	WH															
				FV																
209.4																				
12.2	Silt trace sand trace clay		9	SS	4															
208.8	Very Grey Wet																			
12.8	loose End of borehole																			
206.6	Cont'd																			

RECORD OF BOREHOLE No 613-5MB

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+625, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
206.6 15.0																	
204.9 16.7	End of dynamic cone penetration test																
	* 2004 02 16 ▽ Water level observed during drilling ▼ Water level measured after drilling ■ Penetrometer test WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 613-6M

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, CL Med. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20						40	60	80
221.8	Ground Surface																			
0.0	Topsoil																			
0.2	Clayey silt, silty clay layers		1	SS	2															
	Soft to Brown Moist firm						221													
			2	SS	5		220													
219.4	Silty clay, Varved																			
2.4	Stiff Brown/ grey Wet		3	SS	3		219													
							218													
	Silt layer		4	SS	10		217													
							216													
			5	SS	1		215													
							214													
	Firm		6	SS	WH		213													
							212													
			7	SS	WH		211													
							210													
210.2	Silt, trace sand trace clay						209													
11.6	Loose Grey Wet		9	SS	4		208													
							207													
	Cont'd		10	SS	8															

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

1 of 2 **METRIC**

MOT DCPT SWAMP 613- MAY 26, 2003.GPJ ON_MOT.GDT 21/07/2004 4:32:09 PM

+7, X⁵: Numbers refer to Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 613-7M

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+725, CL Med. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 25, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
208.9																	
205.9																	
18.0	End of dynamic cone penetration test																

RECORD OF BOREHOLE No 613-8M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+775, CL Med. Dill Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE May 26, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE	W _p	W		
225.2	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
0.1	Silty fine sand, Very Brown Moist loose		1	SS	2												
	Wet		2	SS	4												
222.8	Clayey silt																
2.4	Very soft Grey Wet		3	SS	2												
221.1	Silty clay, Varved																
4.1	Very soft Grey Wet		4	SS	WH												
	Not varved		5	SS	WH												
218.2	Silt, trace sand trace clay																
7.0	Compact Grey Wet		6	SS	10												
216.7	Silty clay, Varved																
8.5	Stiff Grey Wet		7	SS	1												
	Silt layers																
214.2	Silt, trace sand trace clay		8	SS	2												
11.0	Very loose Grey Wet																
	Loose		9	SS	6												
212.4	End of borehole																
12.8																	
211.8	End of dynamic cone penetration test																
13.4	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+187.5, o/s 43m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
229.0 0.0	Ground Surface					20			40	60	80	100	20					40	60				
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 613-1NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+180, o/s 19m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE	20	40				
228.5	Ground Surface					*																	
0.0	Topsoil																						
0.2	End of borehole																						
	Refusal on probable bedrock																						
	* Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 613-1NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+190, o/s 19m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
232.8	Ground Surface					*											
0.0	Topsoil																
0.2	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+200, o/s 19m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
229.4 0.0	Ground Surface 																				

RECORD OF BOREHOLE No 613-3N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+212.5, o/s 46m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
228.2 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-3NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+210, o/s 33m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
223.6	Ground Surface																
0.0	Topsoil																
0.3	End of borehole Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-3NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+210, o/s 19m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
224.1	Ground Surface					*											
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-3NC

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+210, o/s 7m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
224.2	Ground Surface																
0.0	Topsoil																
0.1	Clayey silt trace sand																
	Brown Moist																
222.2																	
2.0	End of borehole																
	Refusal on probable bedrock																
	* 2003 05 21																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-3ND

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+210, o/s 2m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
224.1	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
0.1	Clayey silt trace sand					▼*											
	Brown Moist																
	Grey																
222.1																	
2.0	End of borehole																
	Refusal on probable bedrock																
	 * 2003 05 21																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-3NE

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+230, o/s 33m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
223.3	Ground Surface					*											
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-3NF

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+230, o/s 19m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
223.3	Ground Surface																
0.0	Topsoil																
0.1	Clayey silt																
	Brown Wet																
221.3																	
2.0	End of borehole																
	Refusal on probable bedrock																
	2003 05 21																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-3NG

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+230, o/s 7m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
223.5	Ground Surface																
0.0 0.1	Topsoil Clayey silt Brown Wet						223										
222.5 1.0	End of borehole Refusal on probable bedrock * 2003 05 21 ▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-3NH

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+250, o/s 38m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
223.8	Ground Surface					*											
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-3NI

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+250, o/s 33m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
219.0	Ground Surface																
0.0	Topsoil																
0.1	Clayey silt																
	Brown Wet																
	Grey																
217.0																	
2.0	End of borehole																
	Refusal on probable bedrock																
	* 2003 05 21																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-3NJ

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+250, o/s 19m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
219.2	Ground Surface																
0.0	Topsoil						219										
0.1	Clayey silt																
0.3	Brown Wet End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-3NK

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+250, o/s 7m Rt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
221.9	Ground Surface					*											
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-4N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+375, o/s 43m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE										○		
								● QUICK TRIAXIAL × LAB VANE										—		
218.7	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, fine fibrous		1	SS	3	V*	218													
0.2	Dark brown Clayey silt, trace sand						217													
	Firm Brown Moist to very stiff		2	SS	12		216													
216.6	Silt, trace clay clayey silt seams						215													
2.1	Compact Brown/ Moist grey		3	SS	12		214													
215.0	Sandy silt						213													
3.7	Very Grey Wet loose		4	SS	4		212													
213.2	Sand, fine to coarse with silt silty sand lenses						211													
5.5	Very Grey Wet loose		5	SS	3		210													
210.5			6	SS	2		209													
8.2	End of borehole						208													
							207													
							206													
							205													
204.9							204													
13.8	End of dynamic cone penetration test						203													
	Refusal on probable bedrock						202													
	Cont'd						201													

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

[illegible]

METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 613-5N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+400, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 08, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa			WATER CONTENT (%)							
						○ UNCONFINED ● QUICK TRIAXIAL			+ FIELD VANE × LAB VANE							
204.1																
	Cont'd						204									
							203									
							202									
201.6	End of dynamic cone penetration test															
17.5	Refusal on probable bedrock															
	* 2003 05 08															
	▽ Water level observed during drilling															
</																

RECORD OF BOREHOLE No 613-6N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+425, o/s 43m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 08, 2003 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)		
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE									
218.8	Ground Surface																	
0.0	Peat, fine fibrous		1	SS	9													
0.1	Dark brown Clayey silt, trace sand silt lenses																	
	Stiff Brown Moist to very stiff		2	SS	9										0 1 80 19			
216.4																		
2.4	Silt, trace clay trace sand																	
	Compact Grey Moist to loose		3	SS	10										0 1 92 7			
			4	SS	5													
213.3																		
5.5	Silty sand, Very Grey Wet loose																	
			5	SS	1										0 67 (33)			
211.2																		
7.6	End of borehole																	

RECORD OF BOREHOLE No 613-6N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+425, o/s 43m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 08, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
203.8	* 2003 05 08  Water level observed during drilling																

RECORD OF BOREHOLE No 613-7N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+450, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE May 09, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)
								<div>○ UNCONFINED ● QUICK TRIAXIAL</div>	<div>+ FIELD VANE × LAB VANE</div>						
218.4	Ground Surface							<div>20 40 60 80 100</div>							
0.0	Peat, fine fibrous														
0.2	Dark brown Clayey silt, trace sand		1	SS	3		218				○				
	Stiff Dark Moist brown														
	Varved		2	SS	4		217				○				
							216								
215.2	Silt, trace sand trace clay clay seams		3	SS	3		215				○				
3.2	Very loose Grey Wet						214								
			4	SS	5		213				○				
	silty fine sand lenses						212				○				
			5	SS	4		211								
211.4	Sand, fine to coarse trace silt						210								
7.0	Very loose Grey Wet		6	SS	WH**		209				○				
							208								
			7	SS	3		207								
208.6	End of borehole						206								
9.8							205								
							204								
	Cont'd														

RECORD OF BOREHOLE No 613-7N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+450, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 09, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa											
									○ UNCONFINED	● QUICK TRIAXIAL	+	×					
203.4																	
																	</

1 of 2 **METRIC**

MOT DCPT SWAMP 613- MAY 12, 2003.GPJ ON_MOT.GDT 21/07/2004 4:25:22 PM

+7, X⁵: Numbers refer to Sensitivity

20
15 — 5
10

(%) STRAIN AT FAILURE

RECORD OF PENETRATION TEST No 613-8N

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+475, o/s 42m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 09, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
203.7														
198.0														
20.7	End of dynamic cone penetration test													

RECORD OF BOREHOLE No 613-9N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+500, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 09, 2003 CHECKED BY _____



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)		
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE									
218.7 0.0	Ground Surface Topsoil							20 40 60 80 100										
0.2	Silt, trace sand trace clay		1	SS	5		218											
217.8 0.9	Loose Brown Moist																	
	Silty clay, trace sand Varved																	
	Stiff Brown Moist to firm		2	SS	5		217											
							216											
			3	SS	3		215											
	Grey Wet						214											
			4	SS	1		213											
212.9 5.8	Silt, trace sand trace clay clayey silt seams		5	SS	2		212											
	Very Grey Wet loose						211											
	sandy silt lenses						210											
	Loose		6	SS	9		209											
							208											
208.0 10.7	End of borehole		7	SS	8		207											
							206											
							205											
							204											
	Cont'd																	

RECORD OF BOREHOLE No 613-9N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+500, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 09, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
203.7																		
198.9																		
19.8	End of dynamic cone penetration test																	
	* 2003 05 09  Water level observed during drilling  Water level measured after drilling																	

RECORD OF BOREHOLE No 613-10N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+525, o/s 42m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 09, 2003 CHECKED BY _____



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)	
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE							× LAB VANE
218.8	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
0.2	Clayey silt, trace sand		1	SS	4												
	Firm Brown Moist to very stiff																
	Varved		2	SS	6												
			3	SS	2												
	silt lenses																
	Grey Wet		4	SS	1												
213.6	Silt, trace sand trace clay clayey silt seams																
5.2	Loose Grey Wet to compact		5	SS	6												
	sand seams																
			6	SS	10												
	Cobbles and boulders																
	trace gravel																
	Very loose		7	SS	4												
209.0	End of borehole																
9.8																	
													</				

RECORD OF BOREHOLE No 613-10N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+525, o/s 42m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 09, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
203.8																		
199.0																		
19.8	End of dynamic cone penetration test																	
	* 2003 05 09  Water level observed during drilling  Water level measured after drilling																	

RECORD OF BOREHOLE No 613-10NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+525, o/s 19m Rt. Dill Twp. ORIGINATED BY RE
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
219.4	Ground Surface						20	40	60	80	100									
0.0	Topsoil, silty																			
0.2	Silty clay																			
	Firm Brown Wet		1	AS	-															
216.7	Clay																			
2.7	trace sand trace silt																			
	Brown Moist		2	AS	-															
212.1	Silty clay																			
7.3	Brown Wet																			
			3	AS	-															
209.7	Silt																			
9.7	trace sand trace clay																			
	Brown Moist		4	AS	-															
207.2	End of borehole																			
12.2																				
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 613-10NB

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+550, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
DATUM Geodetic DATE February 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE										○		
								● QUICK TRIAXIAL × LAB VANE												
219.8	Ground Surface		1	SS	50/0.15	γ _s	20	40	60	80	100	20	40	60						
0.0	Sandy silt, trace topsoil						219													
	Brown						218													
218.9	(FILL)						217													
0.9	Clay trace sand trace silt		2	SS	5		216													
	Firm Brown Moist						215													
	(TILL)						214													
			3	SS	5		213													
216.1							212													
3.7	Silty clay, varved		4	SS	WH**		211													
	Firm Grey Wet			FV			210													
			5	SS	WH		209													
				FV			208													
	Soft		6	SS	WH		207													
				FV			206													
	Firm		7	SS	2		205													
				FV																
209.1	Silt trace sand trace clay		8	SS	11															
10.7	Compact Grey Wet																			
	Loose		9	SS	6															
207.0	End of borehole																			
12.8																				
204.8	Cont'd																			

RECORD OF BOREHOLE No 613-10NB

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+550, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
204.8 15.0																	
203.0 16.8	End of dynamic cone penetration test * 2004 02 14 ▽ Water level observed during drilling ■ Penetrometer test WH** Refers to penetration under weight of rods and hammer																

METRIC

SOIL PROFILE	SAMPLES			DYNAMIC CONE PENETRATION			
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ON_MOT VER3 03TF013_FEB2004_SET1.GPJ ON_MOT.GDT 21/07/2004 3:56:21 PM

RECORD OF BOREHOLE No 613-10NC

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+575, o/s 41m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
204.6	* 2004 02 16  Water level observed during drilling  Water level measured after drilling  Penetrometer test WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 613-10ND

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+575, o/s 19m Rt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p		w	w _L	GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE								
220.2	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Sand and gravel																			
	____ (FILL) ____																			
	Sand, fine to medium trace silt, trace gravel		1	AS	-															
219.1	Wet																			
219.0	(FILL)																			
1.2	Peat, fine fibrous																			
	Dark brown																			
	Silty clay with fine sand		2	AS	-															
	Soft Brown/ Wet Grey																			

RECORD OF BOREHOLE No 613-10ND

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+575, o/s 19m Rt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20 40 60 80 100			20 40 60 80 100	W _p	W	W _L						
205.2																		
205.0	Silt trace sand trace clay																	
15.2	Grey Moist (Contd.) End of borehole																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 613-10NE

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+610, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa				w _p	w	w _L					
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE								
221.4 0.0	Ground Surface																		
220.9 0.5	Topsoil		1	SS	6		221												
	Clayey silt, trace sand						220												
	Stiff Brown Wet																		
	Varved		2	SS	5														
							219												
							218												
			3	SS	2														
				FV															
	Firm						217												
			4	SS	WH**														
				FV			216												
							215												
			5	SS	WH														
				FV															
							214												
			6	SS	WH														
				FV			213												
							212												
							211												
210.3 11.1	Silt trace sand, with clayey silt seams		8	SS	WH														
	Loose Grey Wet						210												
							209												
			9	SS	9														
							208												
207.1 14.3	End of borehole		10	SS	12		207												
	Cont'd																		

RECORD OF BOREHOLE No 613-10NE

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+610, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
206.4																	
206																	
205																	
204																	
203																	
202																	
201.6 19.8	End of dynamic cone penetration test																
	* 2004 04 16  Water level observed during drilling  Water level measured after drilling  Penetrometer test WH** Refers to penetration under weight of rods and hammer																

RECORD OF PENETRATION TEST No 613-10NF

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+625, o/s 36m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
221.1 0.0	Ground Surface						221							
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							
							209							
							208							
							207							
206.5 14.6	End of dynamic cone penetration test													

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 613-10NG

2 of 2

METRIC

G.W.P. 312-99-00	LOCATION	Hwy. 69 Sta. 10+625, o/s 19m Rt. Dill Twp.	ORIGINATED BY	RE
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DIST	54	HWY	69	BOREHOLE TYPE	Continuous Flight Solid Stem Augers	COMPILED BY	RE
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DATUM Geodetic DATE February 15, 2004 CHECKED BY _____

SOIL PROFILE						SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)									
						○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL			x LAB VANE		W _p	w	W _L					
206.4	Silt																			
15.0	trace sand trace clay																			
206.2	(Contd.) Grey Moist																			
15.2	End of borehole																			
	* Borehole dry on completion of drilling																			

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC


(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 613-12N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 40.5m Rt. Dill Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE May 23, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION			STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa								WATER CONTENT (%)				GR	SA	SI	CL
221.5	Ground Surface																								
0.0	Topsoil																								
0.2	Clayey silt			1	SS	1	221																		
	Very soft Brown Moist																								
220.1							220																		
1.4	Silty clay, silt layers			2	SS	6																			
	Stiff Brown Moist																								
	Grey Wet			3	SS	4	219																		
							218																		
	Varved Firm			4	SS	WH**	217																		
							216																		
				5	SS	WH	215																		
							214																		
				6	SS	WH	213																		
	silt layers						212																		
				7	SS	WH	211																		
211.4							210																		
10.1	Silt, trace sand trace clay						209																		
	Very loose Grey Wet to loose			8	SS	2	208																		
							207																		
				9	SS	9																			
207.2				10	SS	9																			
14.3	End of borehole																								
	Cont'd																								

RECORD OF BOREHOLE No 613-12N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 40.5m Rt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 23, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
206.5	Cont'd																	
206																		
205																		
204																		
203																		
202																		
201																		
200.8	End of dynamic cone penetration test																	
20.7																		
	* Borehole dry on completion of drilling																	
	WH** Refers to penetration under weight of rods and hammer																	

RECORD OF BOREHOLE No 613-13N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+700, o/s 19m Rt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa			w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE	WATER CONTENT (%)									
222.2	Ground Surface							20 40 60 80 100										
0.0	Topsoil		1	SS	1		222											
0.3	Clayey silt, Firm Brown Wet																	
220.8							221											
1.4	Silty clay Stiff Brown Moist		2	SS	4													

	Grey		3	SS	2		219											

	Silt layer		4	SS	3		218											

	_____						217											

	Varved		5	SS	WH**		216											
	Firm																	
	_____		6	SS	WH		215											
	_____						214											

	_____		7	SS	WH		213											

211.8							212											
10.4	Silt, trace sand trace clay		8	SS	WH													
	Very Grey Wet						211											
	loose																	
	_____						210											
209.4			9	SS	WH													
12.8	End of borehole						209											
	Cont'd						208											

RECORD OF BOREHOLE No 613-13N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+700, o/s 19m Rt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
207.2							207										
							206										
							205										
203.9							204										
18.3	End of dynamic cone penetration test																
	* Borehole dry on completion of drilling																
	WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 613-13NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+710, o/s 2m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
222.5	Ground Surface																
0.0	Topsoil																
0.3	Silty sand, fine <div>Brown Moist</div>						222										
220.7							221										
1.8	Clayey silt <div>Brown Moist</div> <div>Grey Wet</div>						220										
							219										
							218										
							217										
							216										
							215										
	silt lenses up to 8.8 m depth						214										
							213										
							212										
	silt lenses						211										
							210										
208.8							209										
13.7	End of borehole																
	* 2004 04 14																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																

1 of 1 **METRIC**

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 613-14NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+725, o/s 19m Rt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								<div>○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE</div>												
223.4	Ground Surface																			
0.0	Topsoil, silty					*	223													
0.2	Sand, fine to medium trace silt trace gravel Wet		1	AS	-		222													
221.4	Clayey silt trace fine sand Brown Moist		2	AS	-		221							○						
2.0					220															
					219															
218.2	Silty clay trace fine sand Brown/grey Wet	3	AS	-	218								○							
5.2					217															
					216															
					215															
					214															
213.4	Silt, trace clay Grey Wet	4	AS	-	213															
10.0					212															
211.2	End of borehole																			
12.2																				
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 613-14NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+735, o/s 38m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
223.0	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.2	Sandy silt																
	Brown Moist																
221.8	Clayey silt						222										
1.2	Grey Wet						221										
220.4	Silty clay						220										
2.6	Grey Wet						219										
							218										
							217										
							216										
							215										
							214										
							213										
							212										
							211										
210.2	Silt, trace clay						210										
12.8	trace sand																
	Grey Wet																
209.3	End of borehole																
13.7	* 2004 04 14 ∇ Water level observed during drilling ▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-14NC

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+735, o/s 19m Rt. Dill Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
222.4	Ground Surface							20	40	60	80	100								
0.0	Topsoil																			
0.3	Clayey silt						▽*													
	Brown Wet																			
219.7	Silty clay																			
2.7	Grey Wet																			
														</						

RECORD OF BOREHOLE No 613-14ND

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+735, o/s 2m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE	W _p	w		
223.8	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.2	Silty sand, fine																
	Brown Moist																
	Wet																
222.0	Clayey silt																
1.8	Brown Wet																
220.1	Silty clay																
3.7	Grey Wet																
	silt layers																
	Mottled Wet grey/brown																
210.7	Silt, trace sand trace clay																
13.1	Grey Wet																
210.1	End of borehole																
13.7	* 2004 04 14																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-15N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+750, o/s 19m Rt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 25, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														
								UNCONFINED										FIELD VANE				
								QUICK TRIAXIAL										LAB VANE				
224.6	Ground Surface						20	40	60	80	100											
0.0	Topsoil																					
0.2	Silt, with sand trace clay		1	SS	2																	
	Very loose Brown Wet																					
			2	SS	3											0 21 70 9						
222.2																						
2.4	Clay, with silt																					
	Firm Grey Wet		3	SS	WH**																	
			4	SS	WH											0 0 23 77						
219.2																						
5.4	Silt, trace sand trace clay																					
	Compact Grey Wet		5	SS	19																	
217.6	Clay																					
7.0	Stiff Grey Wet		6	SS	1																	
	Varved																					
	Firm		7	SS	WH											0 0 32 68						
			8	SS	WH																	
213.0																						
11.6	Silt, some clay																					
	Very loose to loose Grey Wet		9	SS	3											0 1 83 16						
			10	SS	7																	
210.3	Silty clay layers																					
14.3	End of borehole																					
	Cont'd																					

RECORD OF BOREHOLE No 613-15N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+750, o/s 19m Rt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 25, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100	20 40 60 80 100		
209.6														
209														
208														
207														
206														
205														
204.8 19.8	End of dynamic cone penetration test Refusal on probable bedrock * Borehole dry on completion of drilling WH** Refers to penetration under weight of rods and hammer													

METRIC

SOIL PROFILE	SAMPLES			DYNAMIC CONE PENETRATION			
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ON_MOT VER3 03TF013_FEB2004_SET2.GPJ ON_MOT.GDT 21/07/2004 4:06:51 PM

RECORD OF BOREHOLE No 613-15NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+750, o/s 2m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	w	W _L		
							20	40	60	80	100						
224.5	Ground Surface																
0.0	Topsoil																
0.2	Silty sand, fine Brown Moist																
	Wet																
221.1	Silty clay																
3.4	Grey Wet																
217.8	Silt, trace sand trace clay																
6.7	Grey Wet																
216.9	Clayey silt																
7.6	Grey Wet																
	silt lenses																
211.1	Silt trace sand trace clay																
13.4	Grey Wet																
210.8	End of borehole																
13.7	* 2004 04 14																
	Water level observed during drilling																
	Water level measured after drilling																

RECORD OF BOREHOLE No 613-16N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+775, o/s 35.5m Rt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 26, 2003 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)
								○ UNCONFINED + FIELD VANE										
								● QUICK TRIAXIAL × LAB VANE										
223.8	Ground Surface						20	40	60	80	100							
0.0 0.1	Topsoil Silty fine sand, Very Brown Wet loose		1	SS	1		223											
222.4																		
1.4	Clayey silt, thin silty sand layers Firm Brown Wet		2	SS	4		222											
221.1																		
2.7	Silty clay, Varved Firm Grey Wet		3	SS	WH		221											
							220											
			4	SS	WH		219											
	Stiff						218											
			5	SS	WH		217											
			6	SS	WH		216											
							215											
	silt layers		7	SS	3		214											
							213											
212.8			8	SS	6		212											
11.0	Silt, trace sand trace clay Loose Grey Wet																	
			9	SS	9		211											
			10	SS	WH		210											
209.5																		
14.3	End of borehole																	
	Cont'd						209											

RECORD OF BOREHOLE No 613-16N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+775, o/s 35.5m Rt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 26, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
208.8																	
206.0																	
17.8	End of dynamic cone penetration test Refusal on probable bedrock * 2003 05 26  Water level measured after drilling																

RECORD OF BOREHOLE No 613-16NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+775, o/s 38m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
223.7 0.0	Ground Surface Silty sand Brown Wet																
221.9 1.8	Clayey silt Brown Wet																
221.0 2.7	Silty clay Grey Wet																
	silt layers																
213.6 10.1	Silt, trace sand trace clay Grey Wet																
211.5 12.2	End of borehole																

RECORD OF BOREHOLE No 613-16NB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+775, o/s 19m Rt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 20, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
224.8	Ground Surface																			
0.0	Topsoil, silty																			
0.2	Silty sand, fine to medium trace silt trace gravel Brown Moist		1	AS	-															
221.5																				
3.3	Silty clay trace fine sand Grey Wet		2	AS	-															
213.9																				
10.9	Clayey silt trace fine sand Grey Moist		3	AS	-															
211.4																				
13.4	Silt trace clay trace sand Grey Wet		4	AS	-															
211.1																				
13.7	End of borehole																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 613-16NC

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+775, o/s 7m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
224.9	Ground Surface																
0.0	Topsoil																
0.2	Silty sand																
	Brown Moist																
	Wet																
222.5	Clayey silt																
2.4	Grey Wet																
221.2	Silty clay																
3.7	Grey Wet																
	silt layers																
213.6	Silt, trace sand trace clay																
11.3																	
212.7																	
12.2																	
	* 2004 04 13																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-17N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+800, o/s 19m Rt. Dill Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 26, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
225.0	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Silty fine sand, Brown Wet																
224.2																	
0.8	End of borehole Refusal on probable bedrock * 2003 05 26 ▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-18N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION Hwy 69 Sta. 10+825, o/s 5m Rt. Dill Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 04, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
228.8 0.0	Ground Surface Bedrock at Surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-19N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION Hwy 69 Sta. 10+825, o/s 34m Rt. Dill Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 04, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
228.6 0.0	Ground Surface Bedrock at Surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+187.5, o/s 43m Lt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
225.7	Ground Surface					*																		
0.0	Topsoil	• •																						
0.1	Sand, trace silt trace gravel																							
0.3	Brown Moist End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 613-1SA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+180, o/s 19m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
227.6 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-1SB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+190, o/s 19m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa					W _p	W		
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)					
						20	40	60	80	100						
226.6	Ground Surface															
0.0	Topsoil															
0.1	End of borehole															
	Refusal on probable bedrock															
	* Borehole dry on completion of drilling															

RECORD OF BOREHOLE No 613-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+200, o/s 19m Lt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
224.9	Ground Surface							20	40	60	80	100								
0.0	Topsoil	• •																		
0.1	Sand, trace silt trace gravel																			
0.3	Brown Moist End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 613-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+212.5, o/s 46m Lt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
229.6 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-3SA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+210, o/s 33m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
227.7	Ground Surface					*											
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-3SB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+210, o/s 19m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
226.3	Ground Surface																
0.0	Topsoil																
0.2	Sandy silt trace clay Brown Moist																
225.5	Clayey																
0.8	End of borehole																
	Refusal on probable bedrock																
	* 2003 05 21																
	Water level measured after drilling																

RECORD OF BOREHOLE No 613-3SC

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+210, o/s 7m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
224.2	Ground Surface																
0.0	Topsoil																
0.2	Clayey silt, trace sand Brown Moist																
223.2																	
1.0	End of borehole Refusal on probable bedrock																
	* 2003 05 21																
	Water level measured after drilling																

RECORD OF BOREHOLE No 613-4S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+225, o/s 19m Lt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
226.6 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-4SA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+230, o/s 33m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
232.7 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-4SB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+230, o/s 19m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
230.4	Ground Surface							20	40	60	80	100		20	40	60								
0.0	Topsoil																							
0.1	Silt, trace sand trace clay																							
0.2	Brown Moist End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 613-4SC

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+230, o/s 7m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
225.8	Ground Surface					*											
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-4SD

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+250, o/s 33m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa					W _p	W		
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)					
						20	40	60	80	100						
226.2	Ground Surface															
0.0	Topsoil															
0.1	End of borehole															
	Refusal on probable bedrock															
	* Borehole dry on completion of drilling															

RECORD OF BOREHOLE No 613-4SE

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+250, o/s 19m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
224.7	Ground Surface					*											
0.0	Topsoil																
0.2	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-4SF

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+250, o/s 7m Lt. Dill Twp. ORIGINATED BY ME
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
222.6	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil							○ UNCONFINED			+	FIELD VANE								
0.1	End of borehole							● QUICK TRIAXIAL			x	LAB VANE								
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 613-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+375, o/s 43m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 07, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE						
218.5	Ground Surface							20 40 60 80 100							
0.0	Topsoil														
0.2	Silt, trace sand trace clay		1	SS	3	* ▽	218								
	Very loose Brown Moist						217								
217.4							216								
1.1	Sand, trace silt trace gravel		2	SS	25		215								
	Compact Brown Moist						214								
	No gravel Wet		3	SS	11		213								
	No silt Grey						212								
			4	SS	11		211								
							210								
	Very loose		5	SS	1		209								
							208								
							207								
210.9	End of borehole														
7.6															
206.8	End of dynamic cone penetration test														
11.7	Refusal on probable bedrock														
	* 2003 05 07														
	▽ Water level observed during drilling														
	▼ Water level measured after drilling														

RECORD OF BOREHOLE No 613-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+400, o/s 19m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE May 07, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
218.4	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous		1	SS	3	☒* ☒*	218													
0.3	Dark brown Clayey silt, trace sand						217													
	Firm Brown Moist to very stiff																			
	silt layers		2	SS	8						150		H			0 1 76 23				
216.3							216													
2.1	Silt, trace sand trace clay clayey silt seams		3	SS	7		215							Non-plastic		0 1 91 8				
	Loose Grey Wet		4	SS	6		214													
							213													
212.9	Silty sand						212													
5.5	Loose Grey Moist to very loose		5	SS	9												0 67 (33)			
			6	SS	WH**	211														
						210														
209.3	Sand, trace silt trace gravel		7	SS	18		209									4 89 (7)				
9.1	Compact Grey Moist						208													
							207													
206.8																				
11.6	End of borehole																			
	Refusal on probable bedrock																			
	* 2003 05 07																			
	☒ Water level observed during drilling																			
	☒ Water level measured after drilling																			
	WH** Refers to penetration under weight of rods and hammer																			

RECORD OF PENETRATION TEST No 613-7S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+425, o/s 43m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 07, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
218.3 0.0	Ground Surface													
							218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							
							209							
							208							
207.5 10.8	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 613-8S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+450, o/s 19m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 07, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)	
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE							
218.3	Ground Surface						20	40	60	80	100							
0.0	Peat, fine fibrous		1	SS	3	<div>▽*</div> <div>▽*</div>	218											
0.3	Dark brown Silty clay, trace sand						217											
	Stiff Brown Moist to very stiff		2	SS	5		216											
	Varved						215											
	clayey silt seams		3	SS	3		214											
	Soft						213											
214.0	Silt, trace sand trace clay clayey silt seams		4	SS	5		212											
4.3	Loose Grey Wet to very loose						211											
			5	SS	2		210											
211.3	Sand, trace silt						209											
7.0	Very Grey Moist loose		6	SS	WH**													
			7	SS	WH													
208.5	End of borehole																	
9.8																		
	<div>* 2003 05 07</div> <div>▽* Water level observed during drilling</div> <div>▽* Water level measured after drilling</div> <div>WH** Refers to penetration under weight of rods and hammer</div>																	

RECORD OF BOREHOLE No 613-9S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+475, o/s 42m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
220.0	Ground Surface						20	40	60	80	100									
0.0	Topsoil		1	SS	3	V*														
0.3	Clayey silt, Firm Grey/ brown Moist to stiff						219													
218.8	Silty clay, trace sand Varved		2	SS	8		218					125								
1.2	Very Red/ brown Moist stiff to stiff						217													
	Firm Red/ grey		3	SS	3		216													
			4	TW	PH		215													
	Grey Wet						214													
	Soft		5	SS	2		213													
	silt seams		6	SS	3		212													
211.8	Silt, trace sand trace clay						211													
8.2	Compact Grey Wet to very loose		7	SS	11	210														
			8	SS	4	209														
	sand seams					208														
207.8	Sand, trace silt trace gravel		9	SS	7	207														
12.2	Loose Grey Wet					206														
206.3	End of borehole																			
13.7																				
	Cont'd																			

RECORD OF BOREHOLE No 613-9S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+475, o/s 42m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE April 28, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
205.0														
201.7														
18.3	End of dynamic cone penetration test Refusal on probable bedrock * 2003 04 28 ▽ Water level observed during drilling													

RECORD OF BOREHOLE No 613-9SA

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+475, o/s 19m Lt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
218.9	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Topsoil, sandy																
0.3	Silty clay																
	Firm Brown Wet		1	AS	-												
216.3																	
2.6	Clay trace sand trace silt																
	Brown Moist		2	AS	-												
211.9	Clayey silt																
7.0	trace fine sand																
	Brown/ Wet																
	Grey																
			3	AS	-												
												</					

RECORD OF BOREHOLE No 613-9SA

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+475, o/s 19m Lt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa					W _p	W		
						20	40	60	80	100						
203.9																
15.0	Sand, fine to coarse	• •														
203.7	(Contd.) Grey Wet															
15.2	End of borehole															
	* Borehole dry on completion of drilling															

RECORD OF BOREHOLE No 613-10S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+500, o/s 19m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE							
219.2	Ground Surface																	
0.0	Topsoil		1	SS	4	▽*	219											
0.2	Clay						219											
	Firm Brown Moist to stiff																	
	Very Grey/ stiff brown		2	SS	6		218											
							217											
	Varved		3	SS	3		216											
	Firm Red/ Wet grey						215											
			4	SS	WH**		214											
							213											
			5	TW	PH		212											
		211																
	Grey		6	SS	WH	210												
						209												
210.1	Clayey silt silty sand seams		7	SS	4	208												
9.1	Firm Grey Wet to stiff					207												
			8	SS	13	206												
						205												
207.4	Silt trace sand trace clay		9	SS	8	204												
11.8	Loose Grey Wet					203												
						202												
						201												
206.1	Sand, trace silt trace gravel					200												
13.1	Compact Grey Wet					199												
			10	SS	11	198												
						197												
	coarse sand, fine gravel Cont'd					196												

RECORD OF BOREHOLE No 613-10S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+500, o/s 19m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE April 29, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE											● QUICK TRIAXIAL		× LAB VANE
204.2							20	40	60	80	100		20	40	60								
198.5 20.7	Compact		11	SS	13		204												0 91 (9)				
							203																
			12	SS	18		202																
							201																
			13	SS	23		200																
							199																
198.5 20.7	End of borehole Refusal on probable bedrock																						
	* 2003 04 29 ▽ Water level observed during drilling WH** Refers to penetration under weight of rods and hammer																						

RECORD OF BOREHOLE No 613-11S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+525, o/s 42m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 06, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
219.9	Ground Surface													
0.0	Topsoil		1	SS	4		219							
0.3	Silty fine sand, Very loose Brown Moist													
218.7														
1.2	Silty clay, trace sand Varved Stiff Brown Moist to firm		2	SS	4		218							
			3	SS	2		217							
	Grey						216							
			4	SS	WH**		215							
			5	SS	WH		214							
							213							
			6	SS	WH		212							
	silt seams						211							
			7	SS	WH		210							
209.8							209							
10.1	Silt, trace sand trace clay Loose Grey Wet		8	SS	8		208							
			9	SS	9		207							
	sand seams Very loose													
							206							
			10	SS	WH		205							
205.6														
14.3	End of borehole													
	Cont'd													

RECORD OF BOREHOLE No 613-11S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+525, o/s 42m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 06, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
204.9																		
204																		
203																		
202																		
201																		
200.1 19.8	End of dynamic cone penetration test																	
	* 2003 04 06																	
	▽ Water level observed during drilling																	
	WH** Refers to penetration under weight of rods and hammer																	

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC


20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 613-13S

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, o/s 40.5m Lt Dill Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE May 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa		w _p	w	w _L		
222.0	Ground Surface													
0.0	Topsoil							○ UNCONFINED + FIELD VANE						
0.2	Clayey silt		1	SS	3			● QUICK TRIAXIAL × LAB VANE						
221.5	Firm Brown Wet Sand trace silt trace gravel						221							
0.5	Very loose Brown Wet						220							
220.6	Silty clay, silt layers		2	SS	2		219							
1.4	Firm Grey Wet						218							
	Varved						217							
			4	SS	WH**		216							
							215							
			5	SS	1		214							
							213							
			6	SS	WH		212							
							211							
			7	SS	WH		210							
							209							
			8	SS	WH		208							
208.6	Silt, trace sand trace clay													
13.4	Very loose Grey Wet		10	SS	4									
	Cont'd													

METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 613-14S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+650, o/s 19m Lt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE May 22, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
221.7	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Sand, trace silt		1	SS	7		221										
	Loose Brown Wet																
220.3																	
1.4	Clayey silt,		2	SS	4		220										
	Firm Grey Wet																
219.2																	
2.5	Silty clay						219										
	Firm Grey Wet		3	SS	WH**												
							218										
			4	SS	WH		217										
							216										
			5	SS	1												
							215										
	Varved																
			6	TW	PH		214										
							213										
			7	SS	WH		212										
							211										
							210										
							209										
208.0							208										
13.7	Silt, trace sand trace clay		10	SS	6												
	Loose Grey Wet to compact																
	Cont'd						207										

RECORD OF BOREHOLE No 613-14S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+650, o/s 19m Lt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE May 22, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa					W _p	W		
							20	40	60	80	100					
206.7			11	SS	13											
204.3			12	SS	8											
17.4	End of borehole															
	* Borehole dry on completion of drilling															
	WH** Refers to penetration under weight of rods and hammer															

1 of 2 **METRIC**

G.W.P. <u>312-99-00</u>	LOCATION <u>Hwy 69 Sta. 10+675, o/s 40.5m Lt. Dill Twp.</u>	ORIGINATED BY <u>MR</u>
DIST <u>54</u> HWY <u>69</u>	BOREHOLE TYPE <u>Dynamic Cone Penetration Test</u>	COMPILED BY <u>PC</u>
DATUM <u>Geodetic</u>	DATE <u>May 24, 2003</u>	CHECKED BY _____

[illegible]

RECORD OF PENETRATION TEST No 613-15S

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 40.5m Lt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 24, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
207.0																	
206																	
205																	
204																	
203.7 18.3	End of dynamic cone penetration test																

RECORD OF BOREHOLE No 613-16S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+695, o/s 19m Lt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE						LAB VANE		
223.2	Ground Surface							20	40	60	80	100	20	40	60					
0.0	Topsoil																			
0.1	Silt, trace sand trace clay		1	SS	3															
	Very loose Brown Moist																			
	Fine sand layers																			
	Loose		2	SS	7															
220.6	Clayey silt, trace sand																			
2.6	Firm Grey Wet		3	SS	1															
219.2	Silty clay																			
4.0	Firm Grey Wet		4	SS	1															
	Silt layer																			
	Stiff		6	SS	4															
	Varved																			
	Firm		7	SS	WH															
			8	SS	WH															
			9	SS	WH															
209.2	Silt, trace sand trace clay		10	SS	2															
14.0	Very loose Grey Wet																			
	Cont'd																			

RECORD OF BOREHOLE No 613-16S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+695, o/s 19m Lt. Dill Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
DATUM Geodetic DATE May 24, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
208.2	Loose		11	SS	5		208										
							207										
205.8	Compact		12	SS	13		206										
17.4	End of borehole						205										
							204										
							203										
							202										
200.9							201										
22.3	End of dynamic cone penetration test																
	* Borehole dry on completion of drilling																
	WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 613-16SA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+710, o/s 19m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
223.8	Ground Surface						20	40	60	80	100									
0.0	Topsoil																			
0.2	Silty sand																			
	Brown Moist																			
	Wet																			
221.1	Silty clay																			
2.7	Grey Wet																			
	silt layers up to 8.2 m depth																			
	silt layers up to 11.9 m depth																			
210.5	Silt																			
13.3	Grey Wet																			
210.1	End of borehole																			
13.7	* 2004 04 15																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

METRIC

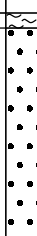

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 613-16SC

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+725, o/s 19m Lt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa															
								○ UNCONFINED + FIELD VANE															
								● QUICK TRIAXIAL × LAB VANE															
										WATER CONTENT (%)													
										20 40 60 80 100					20 40 60								
225.0	Ground Surface																						
0.0	Topsoil, sandy																						
0.2	Sand, fine to medium trace silt trace gravel Brown Wet		1	AS	-			224															
					223																		
222.7					222																		
2.3	Clayey silt trace fine sand Brown Moist	2	AS	-	221																		
					220																		
219.5					219																		
5.5	Clay, trace fine sand trace silt Grey Wet	3	AS	-	218																		
					217																		
					216																		
					215																		
214.1					214																		
10.9	Silt, trace clay Grey Moist	4	AS	-	213																		
212.8																							
12.2	End of borehole																						
	* Borehole dry on completion of drilling																						

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 613-17S

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+750, o/s 19m Lt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 25, 2003 CHECKED BY _____

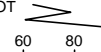


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														
								UNCONFINED										FIELD VANE				
								QUICK TRIAXIAL										LAB VANE				
					WATER CONTENT (%)																	
225.5	Ground Surface							20	40	60	80	100										
0.0	Topsoil																					
0.2	Clayey silt, with sand		1	SS	1		225							o								
	Firm Brown Wet																					
224.1																						
1.4	Silty fine sand						224															
	Compact Brown Moist		2	SS	11									o								
	to very loose																					
	Wet						223															
			3	SS	2									o								
221.5																						
4.0	Silty clay, silt layers						221															
	Stiff Grey Wet		4	SS	1										o							
	to firm																					
							220															
			5	SS	WH											o						
218.3																						
7.2	Silt, trace sand trace clay						218															
	Compact Grey Wet		6	SS	10										o							
							217															
216.1			7	SS	13		216									o						
9.4	Clayey silt																					
	Stiff Grey Wet																					
	Varved						215															
			8	SS	2											o						
213.6							214															
11.9	Silty clay																					
213.0	Firm Grey Wet		9	SS	3		213									o						
12.5	Silt, trace sand trace clay																					
	Very loose Grey Wet						212									o						
			10	SS	4																	
211.2							211															
14.3	End of borehole																					
	Cont'd																					

RECORD OF BOREHOLE No 613-17S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+750, o/s 19m Lt. Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE May 25, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		WATER CONTENT (%)			
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
210.5																				
	Cont'd						210													
208.8							209													
16.7	End of dynamic cone penetration test Refusal on probable bedrock * Borehole dry on completion of drilling																			

METRIC

SOIL PROFILE	SAMPLES			DYNAMIC CONE PENETRATION			
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ON MOT VER3 03TF013 FEB2004 SET2.GPJ ON MOT.GDT 21/07/2004 4:08:19 PM

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 613-17SB

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+750, o/s 2m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
224.6	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.2	Silty sand																
	Brown Moist																
	Wet																
220.9	Silty clay																
3.7	Grey Wet																
218.7	Silt, trace sand trace clay																
5.9	Grey Wet																
216.4	Clayey silt																
8.2	Grey Wet																

RECORD OF BOREHOLE No 613-18S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+775, o/s 35.5m Lt. Dill Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE May 26, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	WATER CONTENT (%)					
227.0	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
0.2	Silty fine sand, Very loose Brown Moist		1	SS	2												
	Compact Wet		2	SS	14												
223.6	Clayey silt		3	SS	2												
3.4	Very soft Grey Wet																
222.9	Silty clay																
4.1	Very soft Grey Wet																
	silt layers																
	Stiff Grey Wet																
220.4			5	SS	WH												
6.6	Silt, trace sand trace clay																
219.7	Very loose Grey Wet																
7.3	Sand, trace silt trace gravel																
218.9	Dense Brown Moist		6	SS	33												
8.1	End of borehole																
	Refusal on probable bedrock																
	2003 05 26																
	Water level measured after drilling																
	WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 613-18SA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+775, o/s 38m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
227.0	Ground Surface																
0.0	Topsoil																
0.2	Silty sand																
	Brown Moist																
	Wet																
223.6	Clayey silt																
3.4	Grey Wet																
	silt lenses																
220.0	Silt, trace sand trace clay																
7.0	Grey Wet																
	sand layers																
218.5	End of borehole																
8.5																	
	* 2004 04 14																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																

METRIC

G.W.P.	312-99-00	LOCATION	Hwy. 69 Sta. 10+775, o/s 19m Lt. Dill Twp.	ORIGINATED BY	RE
DIST	54	HWY	69	BOREHOLE TYPE	Continuous Flight Solid Stem Augers
				COMPILED BY	RE
DATUM	Geodetic	DATE	February 14, 2004	CHECKED BY	

SOIL PROFILE			SAMPLES		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES
225.9	Ground Surface				
0.0 - 0.1	Topsoil				
	Sand, fine to medium trace silt trace gravel				
	Brown Wet		1	AS	-
	Grey				
223.2	Silty clay trace fine sand				
2.7	Brown/Grey Wet		2	AS	-
	Silt, trace clay				
6.7	Grey Wet		3	AS	-
8.1	End of borehole Refusal on probable bedrock				
* Borehole dry on completion of drilling					

RECORD OF BOREHOLE No 613-18SC

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+775, o/s 7m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	20 40 60	20 40 60	20 40 60					
225.5	Ground Surface																
0.0	Topsoil																
0.2	Silty sand Brown Moist																
	Wet																
222.8	Clayey silt Grey Wet																
2.7																	
221.5	Silty clay Grey Wet																
4.0																	
218.8	Silt, trace sand trace clay clayey silt seams Grey Wet																
6.7																	
217.6	Silty clay Grey Wet																
7.9																	
214.2	Silt, trace sand trace clay Grey Wet																
11.3																	
213.3	End of borehole																
12.2																	

* 2004 04 14

▽ Water level observed during drilling

▼ Water level measured after drilling

RECORD OF BOREHOLE No 613-19S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+800, o/s 19m Lt. Dill Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE May 26, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					
226.1	Ground Surface						20	40	60	80	100						
0.0	Topsoil						226										
0.1	Silty fine sand, Brown Moist																
225.3																	
0.8	End of borehole Refusal on probable bedrock * 2003 05 26 ▼ Water level measured after drilling																

RECORD OF BOREHOLE No 613-20S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION Hwy 69 Sta. 10+825, o/s 34m Lt. Dill Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 04, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
230.7 0.0	Ground Surface Bedrock at Surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 613-20SA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy. 69 Sta. 10+825, o/s 19m Lt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Solid Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 16, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
230.5 0.0	Ground Surface Bedrock at surface					*											
	* Borehole dry																

RECORD OF BOREHOLE No 613-21S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION Hwy 69 Sta. 10+825, o/s 5m Lt. Dill Twp. ORIGINATED BY MR/PC
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Auger COMPILED BY PC
 DATUM Geodetic DATE June 04, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
230.0	Ground Surface																
0.0	Bedrock at Surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 537-1

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+900, CL Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 13 and 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														
								UNCONFINED										FIELD VANE				
								QUICK TRIAXIAL										LAB VANE				
					WATER CONTENT (%)																	
225.5	Ground Surface							20	40	60	80	100										
0.0	Topsoil, sandy, organic		1	SS	45	V*	225							o								
0.3	Sand, trace silt trace gravel						224								o							
	Dense Orange/ brown						223															
	Silty						222							o								
	Compact Brown		2	SS	15		221								o							
							220															
	Loose Wet		4	SS	6		219									o						
219.3	Silt, trace sand trace clay		5	SS	1		218															
6.2	Very loose Grey Wet						217									o						
218.2	Silty clay						216										o					
7.3	Firm Grey Wet		6	SS	4	215																
						214																
	Stiff		7	SS	WR***	213										o						
215.2	Clayey silt trace fine sand					212																
10.3	Stiff Grey Wet		8	SS	9	211										o						
213.3	Silty clay trace fine sand		9	SS	WR																	
12.2	Stiff Grey Wet																					
	Varved		10	SS	1																	
210.5	Cont'd																					

RECORD OF BOREHOLE No 537-1

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+900, CL Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 13 and 14, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
210.5 15.0	Silty clay trace fine sand Stiff Grey Wet		11	SS	WH**									
209.4 16.1	Silt, trace sand trace clay Loose Grey Wet		12	SS	6									
206.7 18.8	Compact		13	SS	11									
202.7 22.8	End of borehole													
	End of dynamic cone penetration test													
	<p>* 2004 02 14</p> <p>▽ Water level observed during drilling</p> <p>■ Penetrometer test</p> <p>WH** Refers to penetration under weight of rods and hammer</p> <p>WR*** Refers to penetration under weight of rods</p>													

RECORD OF BOREHOLE No 537-1A

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+880, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
226.7	Ground Surface							20	40	60	80	100								
0.0	Sand, trace organics		1	SS	7	▽*	226							○						
226.1	Loose Brown Moist																			
0.6	Silty sand		2	SS	13										○					
225.6	Compact Brown Moist																			
1.1	to loose																			
	Silt, trace sand trace clay		3	SS	9											○				
	silty sand lenses																			
	trace silt lenses																			
	Loose Brown Moist																			
224.3	to compact																			
2.4	Sand, trace silt		4	SS	12	▽*	224													
	Compact Grey Wet																			
	to very loose		5	SS	8											○				
			6	SS	7											○				
			7	SS	3											○				
221.2	Silt, trace sand trace clay						221													
5.5	Very Grey Wet																			
	loose		8	SS	4										○					
219.5	Silty clay, clayey silt seams						220													
7.2	Firm Grey Wet																			
							219								○					
218.2	End of borehole																			
8.5																				
									</											

RECORD OF BOREHOLE No 537-2

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+925, o/s 16m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						
225.0	Ground Surface							20 40 60 80 100						
0.0	Topsoil							○ UNCONFINED + FIELD VANE						
0.2	Silty sand, fine		1	SS	11			● QUICK TRIAXIAL × LAB VANE						
	Compact Brown Moist							20 40 60 80 100						
			2	SS	10									
222.6														
2.4	Sand, fine to coarse trace silt													
	Loose Brown Wet		3	SS	7									
	Grey													
			4	SS	3									
	Very loose													
219.5														
5.5	Clayey silt with silt lenses		5	SS	3									
	Soft Grey Wet													
218.3														
6.7	Silty clay, varved													
	Firm Grey Wet to stiff		6	SS	1									
			7	SS	WH**									
	Silt lenses		8	SS	1									
			9	SS	WH									
	Silt lenses		10	SS	WH									
210.0	Cont'd													

RECORD OF BOREHOLE No 537-2

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+925, o/s 16m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
210.0																	
15.0	Silty clay, varved Firm Grey Wet		11	SS	WH												
	Silt lenses		12	SS	4												
207.0																	
18.0	Silt, trace sand trace clay Compact Grey Wet		13	SS	10												
206.1																	
18.9	End of borehole																

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 537-3

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+925, CL Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL
					○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					WATER CONTENT (%)										
210.5								20	40	60	80	100								
14.9 15.0	Clayey silt Grey Wet	<div><div></div><div></div><div></div><div></div></div>					210													
			4	AS										○						
							209													
208.8 16.7	End of borehole * Borehole dry on completion of drilling	<div><div></div><div></div><div></div><div></div></div>																		

RECORD OF PENETRATION TEST No 537-4

1 of 2 **METRIC**

G.W.P.	312-99-00	LOCATION	Hwy 537 Sta. 9+925, o/s 16m Lt. Dill Twp.	ORIGINATED BY	FP
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	February 14, 2004	COMPILED BY	FP
				CHECKED BY	

[illegible]

Cont 'd

RECORD OF PENETRATION TEST No 537-4

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+925, o/s 16m Lt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 14, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
210.0																	
209																	
208																	
207																	
206																	
205.5 19.5	End of dynamic cone penetration test																

RECORD OF BOREHOLE No 537-5

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.9+941, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE March 28, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED		+ FIELD VANE							
225.1	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
0.1	Silty sand, fine trace organics		1	SS	6								○				
224.2	Loose Brown Wet																
0.9	Silt, trace sand trace clay																
224.2	Compact Brown Moist to wet		2	SS	11								○				
222.8																	
2.3	Sand, trace silt																
2.3	Loose Brown Wet																
221.1																	
4.0	Silt, trace sand trace clay																
221.1	Very loose Grey Wet																
220.0			4	SS	WH**								○				
5.1	Silty clay																
5.1	Very stiff to soft																
220.0																	
			5	SS	WH									○			
			6	SS	WH										○		
217																	
216.6																	
8.5	End of borehole																
* 2004 03 28																	
▽ Water level observed during drilling																	
▼ Water level measured after drilling																	
WH** Refers to penetration under weight of rods and hammer																	

RECORD OF BOREHOLE No 537-6

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+950, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____



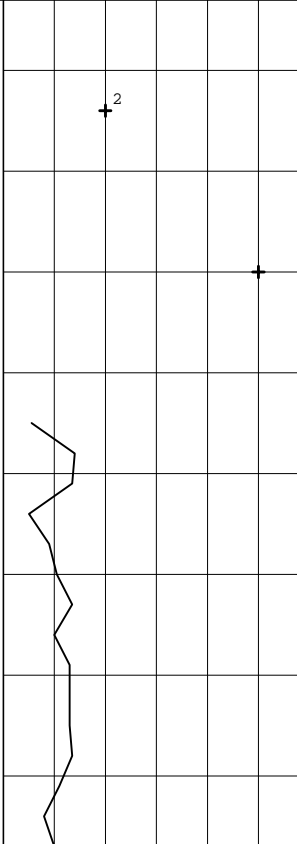

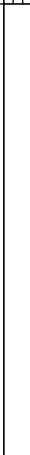
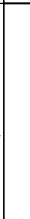
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								
224.7	Ground Surface															
0.0	Topsoil		1	SS	4											
0.3	Silty sand, fine Very loose Brown Moist						224									
222.9			2	SS	12		223									
1.8	Sand, fine to coarse with silt Compact Brown Moist						222									
	Loose		3	SS	7		221									
220.4							220									
4.3	Silty clay, silt layers Firm Grey Moist		4	SS	3		219									
	Varved		5	SS	WH**		218									
			6	SS	WH		217									
			7	SS	WH		216									
	Stiff		8	SS	WH		215									
			9	SS	WH		214									
			10	SS	WH		213									
	Silt lenses Firm						212									
209.7	Cont'd						211									
							210									

RECORD OF BOREHOLE No 537-6

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 9+950, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa			w_p	w	w_L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE										
209.7 15.0	Silty clay, with silt lenses Firm silt layers Wet																	
			11	SS	6			209										
									208									
207.4 17.3				12	SS			4	207									
	Silt, trace sand, trace clay Compact Grey Wet																	
									206									
205.8 18.9	End of borehole																	
								205										
								204										
								203										
								202										
201.3 23.4	End of dynamic cone penetration test																	
	* Borehole dry on completion of drilling																	
	■ Penetrometer test																	
	WH** Refers to penetration under weight of rods and hammer																	

RECORD OF BOREHOLE No 537-7

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.9+961, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A., NW Casing & Wash Boring COMPILED BY FP
 DATUM Geodetic DATE March 28, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
224.7	Ground Surface						20	40	60	80	100									
0.0	Topsoil																			
0.2	Silty sand, fine trace organics		1	SS	17	V*								○			0 92 (8)			
	Compact Brown Moist to wet																			
223.5																				
1.2	Sand, trace silt																			
	Loose Brown Wet to compact		2	SS	9										○					
			3	SS	11										○					
220.7																				
4.0	Clayey silt, trace sand varved																			
	Firm Grey Wet		4	SS	4									○						
219.1																				
5.6	Clay, varved																			
	Firm Grey Wet																			
			5	SS	WH**									○						
			6	TW	PH															
			7	SS	WH									○						
	Silt lense																			
	Stiff																			
			8	SS	1										○					
			9	SS	WH										○					
	Firm		10	TW	PH									○						
			11	SS	WH									○						
			12	SS	WH									○						
209.7	Cont'd																			

RECORD OF BOREHOLE No 537-7

2 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.9+961, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A., NW Casing & Wash Boring COMPILED BY FP
 DATUM Geodetic DATE March 28, 2004 CHECKED BY _____

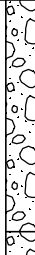
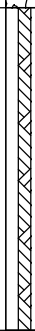
SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								<div><div><div>○ UNCONFINED</div><div>● QUICK TRIAXIAL</div></div><div><div>+ FIELD VANE</div><div>× LAB VANE</div></div></div>	20	40	60	80					100	20	40	60			
209.7																							
15.0	Cont'd																						
	Clay		13	SS	3									○									
	clayey silt seams																						
	Firm Grey Wet																						
208.5																							
16.2	Silt, trace sand trace clay with clayey silt seams																						
	Very Grey Wet loose to dense		14	SS	3									○				0	2				
			15	SS	12									○									
			16	SS	WH																		

RECORD OF BOREHOLE No 537-7

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.9+961, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A., NW Casing & Wash Boring COMPILED BY FP
 DATUM Geodetic DATE March 28, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
194.7							20	40	60	80	100									
30.0	Cont'd Gravelly sand with cobbles Dense Grey		18	SS	38		194													
							193													
							192													
192.1	boulders/cobbles						192													
32.6	Bedrock		19	RC NQ	REC 93		191										RQD 100			
			20	RC NQ	REC 87		190										RQD 100			
			21	RC NQ	REC 83		189										RQD 50			
188.9																				
35.8	End of borehole																			
	<div>* 2004 03 28</div> <div>▽ Water level observed during drilling</div> <div>■ Penetrometer test</div> <div>WH** Refers to penetration under weight of rods and hammer</div>																			

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 537-8

2 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+000, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A., NW Casing & Wash Boring COMPILED BY FP
 DATUM Geodetic DATE April 05, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w_p	w	w_L					
207.1 15.0	Cont'd Silt, trace sand trace clay with clayey silt seams Very loose Grey Wet to compact Sandy silt lenses																			
202.0 20.1	Sand, fine to coarse with silt Dense Grey Wet <																			

METRIC






















20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 537-9

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+039, CL Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A., NW Casing & Wash Boring COMPILED BY MR
 DATUM Geodetic DATE March 29, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE						
220.5 0.0	Ground Surface Topsoil		1	SS	9										
220.0 0.5	Clayey silt, trace sand Stiff Brown														
219.3 1.2	Clay, with occasional thin silt partings Stiff Brown Moist to firm		2	SS	9										
															
			3	SS	5									0 0 28 72	
															
			4	SS	4										
215.1 5.4	Silty clay, varved occasional thin silt partings Firm Brown/ Wet grey														
			5	SS	WR**										
															
			6	TW	PH									0 0 43 57	
															
211.8 8.7	Layered clay and silt Firm Grey Wet		7	SS	WR										
															
210.3 10.2	Silt, trace clay Loose Grey Wet to compact		8	SS	5										
															
			9	SS	10									0 0 91 9	
															
			10	SS	16										
															
205.5	Cont'd														

RECORD OF BOREHOLE No 537-9

2 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+039, CL Dill Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A., NW Casing & Wash Boring COMPILED BY MR
DATUM Geodetic DATE March 29, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					w _p	w	w _L		GR	SA	SI	CL
205.5 15.0	Cont'd Silt, trace to some sand Loose Grey Wet to very loose	<div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> 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RECORD OF BOREHOLE No 537-9

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+039, CL Dill Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A., NW Casing & Wash Boring COMPILED BY MR
 DATUM Geodetic DATE March 29, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED + FIELD VANE												
								● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
190.5							20	40	60	80	100						GR	SA	SI	CL
29.9 30.0	Cont'd Bedrock		17	RC NQ	REC 86		190											RQD	100	
			18	RC NQ	REC 97		189													73
			19	RC NQ	REC 100		188													100
186.9 33.6	End of borehole						187													
	* Borehole dry on completion of drilling																			
	■ Penetrometer test																			
	WR** Refers to penetration under weight of rods only																			

RECORD OF BOREHOLE No 537-10

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+050, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 12, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL				
ELEV DEPTH	DESCRIPTION			STRAT PLOT	NUMBER	TYPE			"N" VALUES	SHEAR STRENGTH kPa									WATER CONTENT (%)			
										○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
220.0	Ground Surface																					
0.0	Topsoil				1	SS	4	V _u *														
219.6																						
0.4	Clayey silt																					
	Firm	Brown/	Moist																			
		Grey			2	SS	5															
217.6	Silty clay																					
2.4	Firm	Brown	Moist		3	SS	4															
	Varved																					
		Grey	Wet		4	SS	1															
					5	SS	WH**															
					6	SS	WH															
					7	SS	WH															
					8	SS	WH															
	Silt layers																					

RECORD OF BOREHOLE No 537-10

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+050, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 12, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
205.0 15.0																	
200.5 19.5	End of dynamic cone penetration test * 2004 02 12 ▽ Water level observed during drilling ▼ Water level measured after drilling ■ Penetrometer test WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 537-11

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+059, CL Dill Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
DATUM Geodetic DATE March 27, 2004 CHECKED BY _____




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
							20 40 60 80 100					WATER CONTENT (%)					
220.3	Ground Surface																
0.0	Peat, coarse fibrous																
0.2	Dark brown Clayey silt, trace sand		1	SS	2												
	Very Brown Wet stiff																
	Stiff		2	SS	6												
			3	SS	4												
215.7	Silty clay		4	SS	WH**												
4.6	Firm Grey Wet																
			5	SS	WH												
			6	SS	WH												
	with silt layers, and clayey silt seams		7	SS	3												
			8	SS	3												
208.4	Silt, trace sand trace clay																
11.9	Compact Grey Wet		9	SS	10												
207.5																	
12.8	End of borehole																
	Cont'd																

RECORD OF BOREHOLE No 537-11



2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+059, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE March 27, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
205.3	* 2004 03 27  Water level observed during drilling  Water level measured after drilling  Penetrometer test WH** Refers to penetration under weight of rods and hammer																

METRIC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT 	PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT w_p w w_L 	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT.PLOT	NUMBER	TYPE	"N" VALUES						
220.0	Ground Surface										



[illegible]

RECORD OF BOREHOLE No 537-12

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+075, o/s 22m Rt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 12, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT. PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100						
205.0 15.0																		
201.8 18.2	End of dynamic cone penetration test																	
	* 2004 02 12  Water level measured after drilling  Penetrometer test WR** Refers to penetration under weight of rods																	

METRIC




20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 537-13

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+075, CL Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE February 12, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
205.0																		
204																		
203																		
202																		
201.8 18.2	End of dynamic cone penetration test																	
	* 2004 02 12  Water level observed during drilling  Water level measured after drilling  Penetrometer test WH** Refers to penetration under weight of rods and hammer																	

1 of 1 **METRIC**

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 537-15

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+100, CL Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L			
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE							
219.8	Ground Surface							20	40	60	80	100						
0.0	Topsoil		1	SS	20													
0.2	Silt, trace sand, trace clay																	
	Compact Light/ Dry brown																	
218.6																		
1.2	Clayey silt, varved		2	SS	10													
	Stiff Brown Moist																	
216.8																		
3.0	Silty clay, varved		3	SS	6													
	Firm Brown Moist																	
	Grey Wet		4	SS	WH**													
	Silt layers		5	SS	WH													
			6	SS	2													
211.0																		
8.8	Silt, trace sand trace clay		7	SS	2													
	Very Grey Wet loose																	
	Compact		8	SS	16													
			9	SS	10													
206.4																		
13.4	Sand, fine to coarse		10	SS	15													
	Compact Grey Wet																	
205.5																		
14.3	End of borehole Refusal on probable bedrock Cont'd																	

RECORD OF BOREHOLE No 537-15

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+100, CL Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
204.8	* 2004 02 13  Water level measured after drilling  Penetrometer test WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 537-15A

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 10+120, o/s 10m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY FP
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE										○		
								● QUICK TRIAXIAL × LAB VANE										W _p W W _L		
219.9	Ground Surface						20	40	60	80	100									
0.0	Topsoil					V*														
0.2	Clayey silt		1	SS	2															
	Grey (FILL)																			
218.7	Clayey silt						219													
1.2	Very Brown Moist stiff to stiff		2	SS	10		218													
							217													
			3	SS	5		216													
215.6	Silty clay						215													
4.3	Firm Grey Wet		4	SS	WH**		214													
	Soft						213													
			5	SS	WH	212														
211.7			6	SS	5	211														
8.2	End of borehole					210														
						209														
208.3	End of dynamic cone penetration test																			
11.6	* 2004 04 16 ▽ Water level observed during drilling ■ Penetrometer test WH** Refers to penetration under weight of rods and hammer																			

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 537-16

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+125, o/s 16m Lt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								20	40	60	80	100					○ UNCONFINED	+ FIELD VANE	● QUICK TRIAXIAL				
204.8						▽*																	
204.0																							
15.2	End of dynamic cone penetration test																						
	* 2004 02 13																						
	▽ Water level observed during drilling																						
	▼ Water level measured after drilling																						
	■ Penetrometer test																						
	WH** Refers to penetration under weight of rods and hammer																						

RECORD OF BOREHOLE No 537-17

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+127, CL Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	w	W _L		
219.7	Ground Surface													
0.0	Topsoil, silty organics													
0.2	Clayey silt, trace fine sand, trace organics		1	SS	10		219							
	Stiff Brown/ Moist grey													
	Varved		2	SS	10		218							
217.3	Silty clay, varved													
2.4	Firm Brown Moist		3	SS	6		217							
	Grey		4	SS	1		216							
	Silt layers		5	SS	WR***		215							
	Wet						214							
211.9	Silt, trace sand, trace clay		6	SS	2		213							
7.8	Very loose Grey Wet						212							
	Compact		7	SS	12		211							
	Loose		8	SS	7		210							
208.1	Sand, fine to coarse, with gravel, with silt						209							
11.6	Compact Grey Wet		9	SS	11		208							
206.9	End of borehole						207							
12.8							206							
							205							
204.7	Cont'd													

RECORD OF BOREHOLE No 537-17

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+127, CL Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 13, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
204.7 15.0																		
203.6 16.1	End of dynamic cone penetration test																	
	* 2004 02 13  Water level measured after drilling  Penetrometer test WR*** Refers to penetration under weight of rods																	

RECORD OF BOREHOLE No 537-18

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+150, CL Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY RE
 DATUM Geodetic DATE February 12, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL x LAB VANE									
					WATER CONTENT (%)												
220.0	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Peat, fine fibrous																
0.2	Dark brown		1	SS	25												
	Clayey silt																
	trace fine sand																
	trace gravel																
	Very stiff																
	Brown																
	Moist																
			2	SS	11												
217.0	Silty clay, varved		3	SS	7												
3.0	Firm																
	Brown																
	Moist																
			4	SS	1												
	Soft																
	Grey																
213.9	Silt, trace clay		5	SS	13												
6.1	Compact																
	Grey																
	Wet																
	Trace fine sand		6	SS	16												
			7	SS	13												
210.3	End of borehole																
9.7																	
				</													

RECORD OF PENETRATION TEST No 537-19

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 537 Sta.10+175, o/s 10m Lt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY RE
 DATUM Geodetic DATE February 12, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
221.7 0.0	Ground Surface													
221														
220														
219														
218														
217														
216														
215.6 6.1	End of dynamic cone penetration test													

RECORD OF BOREHOLE No 537-20

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 10+175, o/s 4m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
220.3	Ground Surface						20	40	60	80	100									
0.0	Topsoil					V*	220													
0.2	Clayey silt		1	SS	4															
	Grey																			
219.4	(FILL)																			
0.9	Silt, trace sand trace clay						219													
	Compact Grey Moist to loose		2	SS	19															
							218													
							217													
	silty sand lenses		3	SS	8															
	Wet						216													
	sand lenses		4	SS	13															
214.6	End of borehole						215													
5.7	Refusal on probable bedrock																			
	* 2004 04 16																			
	▽ Water level observed during drilling																			

RECORD OF BOREHOLE No 537-21

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 10+200, o/s 8m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
221.4	Ground Surface							20	40	60	80	100					
0.0	SAND and GRAVEL, with boulders and cobbles Loose Brown Dry (FILL)	X	1	SS	7		221										
220.0		X															
1.4	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling						220										

RECORD OF BOREHOLE No 537-22

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 537 Sta. 10+225, o/s 2m Rt. Dill Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP
 DATUM Geodetic DATE April 16, 2004 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
222.9	Ground Surface		1	SS	8		222	20	40	60	80	100	20	40	60					
0.0	Topsoil																			
0.2	SAND and GRAVEL, with boulders and cobbles																			
	Loose Brown Dry																			
221.7	(FILL)																			
1.2	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-1N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+917, o/s 15m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
231.7	Ground Surface					*														
0.0	Topsoil																			
0.1	Silt, trace sand																			
231.0	Loose Brown Moist																			
0.7	End of borehole Refusal on probable bedrock						231													
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-2N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+916, o/s 33m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
231.4	Ground Surface						231										
0.0	Topsoil																
0.1	Silt, trace sand																
230.8	Loose Brown Moist																
0.6	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-3N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+929, o/s 23m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
229.7	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Silt, trace sand																
0.3	Loose Brown Moist End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-4N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+943, o/s 1m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)
226.4	Ground Surface					*		20	40	60	80	100					GR SA SI CL	
0.0	Topsoil						226											
0.1	Silt, trace sand																	
225.9	Loose Brown Moist																	
0.5	Silty sand																	
225.6																		
0.8	Grey Wet																	
	End of borehole																	
	Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 101-5N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+942, o/s 9m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
227.4	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-6N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+940, o/s 45m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
226.5	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 101-7N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+954, o/s 24m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)			
226.6	Ground Surface							20	40	60	80	100									
0.0	Topsoil																				
0.1	Silt, trace sand																				
225.9	Loose Brown Moist						226														
0.7	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 101-8N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+967.5, o/s 6m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
225.5	Ground Surface					*																		
0.0	Topsoil																							
225.1	Silt, trace sand																							
0.4	Loose Brown Moist End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 101-9N

1 of 1


METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+965, o/s 47m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					w _p	w	w _L	WATER CONTENT (%)	GR	SA		SI	CL			
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																
224.0	Ground Surface					*			20	40	60	80	100									
0.0	Bedrock at surface																					
	* Borehole dry																					


RECORD OF BOREHOLE No 101-10N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+973.5, o/s 25m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
222.8	Ground Surface					*											
0.0	Topsoil																
0.1	Silt, trace sand																
222.3	Loose Brown Moist																
0.5	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-11N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+979.5, o/s 49.5m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
221.5	Ground Surface							20	40	60	80	100						
0.0	Topsoil																	
0.1	Silt,																	
220.8	Loose Grey Moist						221											
0.7	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 101-12N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+982, o/s 25m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY F.P.
DATUM Geodetic DATE February 16, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE															
221.6	Ground surface							20	40	60	80	100											
0.0	Peat, amorphous																						
0.2	Dark brown Sandy silt, trace clay		1	SS	8		221																
	Loose Brown Moist																						
220.4																							
1.2	Silty clay, trace fine sand		2	SS	10		220																
	Stiff Mottled Moist grey/brown																						
218.9							219																
2.7	Sandy silt, trace medium sand		3	SS	50/3cm																		
218.6																							
3.0	Very Grey Moist dense End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																						

RECORD OF BOREHOLE No 101-13N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+992, o/s 7m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
222.6 0.0	Ground Surface Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 101-14N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+993.5, o/s 50m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY F.P.
 DATUM Geodetic DATE February 16, 2001 COMPILED BY FP/DH
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
221.2	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous																			
0.2	Dark brown Silty clay, trace sand trace organics Firm Brown Wet Blue/grey		1	SS	4		221													
			2	SS	4		220													
							219													
	Mottled grey/brown		3	SS	1/60cm		218													
							217													
	Interbedded clayey silt seams		4	SS	2		216													
215.5							215													
5.7	Silt, trace clay trace sand Loose Grey Wet		5	SS	7		214													
			6	SS	6		213													
212.2			7	SS	6															
9.0	End of borehole																			
	Refusal on probable bedrock																			
	* 2001 02 16																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 101-15N

1 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+007, o/s 26.5m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH
DATUM Geodetic DATE February 15 & 16, 2001 CHECKED BY _____




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE					
								WATER CONTENT (%)								
221.0	Ground Surface															
0.0	Topsoil															
0.1	Silty clay		1	SS	7											
	Firm Brown Moist															
	Grey Wet															
	Interbedded clayey silt seams															
			2	SS	4											
			3	SS	1											
			4	SS	3											
			5	SS	8											
214.7																
6.3	Silt, trace sand, trace clay															
	Interbedded clayey silt seams															
	Loose Grey Wet to compact		6	SS	7											
			7	SS	10											
			8	SS	5											
			9	SS	7											
	Interbedded silty sand seams		10	SS	8											
206.7																
14.3	End of borehole															
	Refusal on probable bedrock															

RECORD OF BOREHOLE No 101-15N

2 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+007, o/s 26.5m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH
 DATUM Geodetic DATE February 15 & 16, 2001 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
206.0	Cont'd * 2001 02 15 & 16  Water level observed during drilling  Water level measured after drilling  Penetrometer test																

1 of 2 METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 101-16N

2 of 2 **METRIC**

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+019, o/s 57m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test ORIGINATED BY F.P.
 DATUM Geodetic DATE February 20, 2001 COMPILED BY F.P.
 CHECKED BY _____

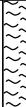
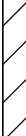




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
205.7 15.0								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE								
200.3 20.4	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 101-17N

1 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+020.5, o/s 8.5m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY D.H.
DATUM Geodetic DATE February 15, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS ▼* ▼*	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N VALUES			SHEAR STRENGTH kPa									
220.8	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous Dark brown		1	SS	1		220										
219.7							219										
1.1	Clay, trace sand Firm Grey Wet		2	SS	1		218										0 2 32 66
							217										
	Interbedded silt seams		3	SS	1		216										
							215										
							214										
215.1	Silt, trace sand trace clay Compact Grey Wet		5	SS	8**		213										0 5 90 5
5.7							212										
							211										
							210										0 10 82 8
							209										
							208										
207.5	Sand, fine to medium trace gravel Compact Grey Wet		10	SS	10		207										
13.3							206										
205.8	Cont'd																

RECORD OF BOREHOLE No 101-17N

2 of 2

METRIC

G.W.P. 327-91-00

LOCATION

New Hwy 69 Sta. 11+020.5, o/s 8.5m Rt. CL Med. Dill Twp.
Hwy 69 Sta. 11+020.5, CL Med. Dill Twp. ORIGINAL

ORIGINATED BY F.P.

DIST 54 HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

COMPILED BY D.H.

DATUM Geodetic

DATE _____

February 15, 2001

CHECKED BY _____

[illegible]

RECORD OF BOREHOLE No 101-18N

1 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+032, o/s 28m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY D.H.
DATUM Geodetic DATE February 16, 2001 CHECKED BY _____



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)				GR	SA	SI	CL
								\circ UNCONFINED	\bullet QUICK TRIAXIAL	$+$ FIELD VANE	\times LAB VANE					w_p	w	w_L					
220.8	Ground Surface							20	40	60	80	100											
0.0	Peat, coarse fibrous		1	AS	2																		
0.2	Dark brown Silty clay, trace sand		2	SS	1																		
	Firm Grey Wet																						
	Interbedded silt seams		3	SS	1/60cm																		
			4	SS	1																		
			5	SS	2																		
214.1	Silt, trace sand, trace clay		6	SS	8																		
6.7	Loose Grey Wet to compact		7	SS	10																		
			8	SS	5																		
			9	SS	8																		
	silty sand seams		10	SS	9																		
			11	SS	10																		
205.8	Cont'd																						

RECORD OF BOREHOLE No 101-18N

2 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+032, o/s 28m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY D.H.
 DATUM Geodetic DATE February 16, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
205.8 15.0	Cont'd Silt, trace sand, trace clay Compact Grey Wet																
204.7 16.1	End of borehole Refusal on probable bedrock						205										
	* 2001 02 16  Water level measured after drilling  Penetrometer test																

RECORD OF BOREHOLE No 101-19N

1 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+041.5, o/s 58.5 m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY F.P.
 DATUM Geodetic DATE February 19, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
221.0	Ground Surface						20	40	60	80	100						GR SA SI CL			
0.0	Peat, fine fibrous Dark brown soft clay layers		1	SS	2															
			2	SS	1															
219.0																				
2.0	Silty clay, trace sand Soft Grey Wet																			
			3	SS	1/60cm															

RECORD OF BOREHOLE No 101-19N

2 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+041.5, o/s 58.5 m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY F.P.
 DATUM Geodetic DATE February 19, 2001 COMPILED BY FP/DH
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						WATER CONTENT (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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RECORD OF PENETRATION TEST № 101-20N

1 of 2 **METRIC**

G.W.P. 327-91-00

LOCATION

New Hwy 69 Sta. 11+045.5, o/s 9.5m Rt. CL Med. Dill Twp.
Hwy 69 Sta. 11+045.5, CL Med. Dill Twp. **ORIGINAL**

ORIGINATED BY F.P.

DIST 54 HWY 69

BOREHOLE TYPE

Dynamic Cone Penetration Test

COMPILED BY F.P.

DATUM Geodetic

DATE _____

February 18, 2001

CHECKED BY

[illegible]

RECORD OF PENETRATION TEST No 101-20N

2 of 2 **METRIC**

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+045.5, o/s 9.5m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY F.P.
 DATUM Geodetic DATE February 18, 2001 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
205.8 15.0																	
204.3 16.5	End of dynamic cone penetration test																

RECORD OF BOREHOLE No 101-21N

1 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+057, o/s 29m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH
DATUM Geodetic DATE February 14, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
220.7	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Peat, fine fibrous Dark brown very soft clay layers		1	AS	WH**	4*											
			2	SS	1										404		
			3	SS	WH										268		
217.2	Silty clay, trace sand Firm Grey Wet Interbedded silt seams		4	SS	2												
3.5																	
215.0	Silt, trace sand, trace clay Loose Grey Wet to very loose		5	SS	8												
5.7			6	SS	4												
	Interbedded sand seams		7	SS	4												
210.5	Silty sand, trace gravel Compact Grey Wet		8	SS	11												
10.2			9	SS	20												
207.8	Sandy silt, trace clay, trace gravel		10	SS	50/15cm												
207.8	Very dense Grey Moist (TILL) End of borehole Refusal on probable bedrock																
13.1	Cont'd																

RECORD OF BOREHOLE No 101-21N

2 of 2

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+057, o/s 29m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH
DATUM Geodetic DATE February 14, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
205.7	Cont'd * 2001 02 14 ▽ Water level observed during drilling ▼ Water level measured after drilling ■ Penetrometer test WH** Refers to penetration under weight of rods and hammer																	

RECORD OF PENETRATION TEST No 101-22N

1 of 1 **METRIC**

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+066, o/s 60m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test ORIGINATED BY F.P.
 DATUM Geodetic DATE February 20, 2001 COMPILED BY F.P.
 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p w W _L				
221.1 0.0	Ground Surface						221							
							220							
							219							
							218							
							217							
							216							
							215							
214.3 6.8	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 101-23N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+070, o/s 11m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY D.H.
DATUM Geodetic DATE February 14, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	'N' VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE						
220.7	Ground Surface					▼*		20	40	60	80	100					
0.0	Peat, fine fibrous Dark brown		1	SS	1	4*	220										
			2	SS	1		219										
							218										
			3	SS	1		217										
							216										
216.5							215										
4.2	Sandy silt, trace gravel trace clay Compact Grey Wet		4	SS	1**		214										
			5	SS	8**												
213.7	End of borehole																
7.0	Refusal on probable bedrock																
	<div>* 2001 02 14</div> <div>▽ Water level observed during drilling</div> <div>▼ Water level measured after drilling</div> <div>** Low 'N' value due to hydraulic disturbance</div> <div>Ground frozen to 0.3 m depth</div> <div>At 4.0m water added to augers to equalize pressure</div>																

RECORD OF BOREHOLE No 101-24N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+081, o/s 30.5m Rt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY FP/DH
DATUM Geodetic DATE February 19, 2001 CHECKED BY _____








SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
								20 40 60 80 100				20 40 60								
221.4	Ground Surface					▽* ▼*	221													
0.0	Topsoil																			
0.2	Silty clay, trace sand rootlets Stiff Brown Moist		1	SS	6															
	Interbedded clayey silt seams		2	SS	19															
	Interbedded sand seams		3	SS	7															
218.3							219													
3.1	Gravelly sand		4	SS	16	218														
	Compact Grey Wet																			
216.8			5	SS	50/3cm	217														
4.6	End of borehole Refusal on probable bedrock * 2001 02 19 ▽ Water level observed during drilling ▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 101-25N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+083.5, o/s 62m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 29, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED			+ FIELD VANE										
225.2 0.0	Ground Surface							20	40	60	80	100		20	40	60					
224.7 0.5	Topsoil		1	SS	5		225														
224.2 1.0	Clayey silt, trace sand						224														
	Firm Brown Moist						223														
	Sandy silt, trace clay		2	SS	21																
	Compact Brown Wet																				
222.6 2.6	Silty sand some gravel trace clay with cobbles and boulders						222														
221.8 3.4	Dense Brown Wet		3	SS	42																
	End of borehole																				
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 101-26N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+087, o/s 12m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
DATUM Geodetic DATE May 29, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE											● QUICK TRIAXIAL		
222.5	Ground Surface							20	40	60	80	100												
0.0	Topsoil																							
0.1	Silty sand																							
	Brown Wet						222																	
	with _____ boulders, cobbles						221																	
220.3	End of borehole																							
2.2	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 101-27N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+097.5, o/s 31.5m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 29, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		
227.8	Ground Surface							20	40	60	80	100								
0.0	Topsoil		1	SS	8															
227.3	Silty sand, some gravel						227													
0.5	Loose Brown Moist to dense to wet																			
			2	SS	31		226													
	trace silt						225													
			3	SS	39															
224.2	End of borehole																			
3.6	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-28N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+108.5, o/s 59.5m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
228.6	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Silty sand, trace gravel occasionally cobbles and boulders		1	SS	2		228										
227.4	Loose Brown Moist																
1.2	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-29N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+111.5, o/s 13.5m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 29, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT							PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa														
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE														
228.6	Ground Surface							20	40	60	80	100										
0.0	Topsoil		1	SS	4		228															
0.1	Silty sand, trace gravel																					
	Loose Brown Wet																					









	with cobbles		2	SS	28		227															
226.5																						
2.1	End of borehole																					
	Refusal on probable bedrock																					
	* Borehole dry on completion of drilling																					

RECORD OF BOREHOLE No 101-30N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+122, o/s 33m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 29, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										
230.7 0.0	Ground Surface							20	40	60	80	100						
230.2 0.5	Topsoil		1	SS	2													
229.7 1.0	Sandy silt, trace clay						230											
	Loose Brown Moist																	
	Silty sand, fine																	
	Compact Brown Wet		2	SS	22		229											
																		
																		
227.9 2.8	End of borehole						228											
	Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	


RECORD OF BOREHOLE No 101-31N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+133.5, o/s 57m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

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

RECORD OF BOREHOLE No 101-32N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+136.5, o/s 15.5m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
229.7	Ground Surface					*											
0.0	Topsoil																
229.3	Sandy silt																
0.4	Loose Brown Wet End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-33N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+147.5, o/s 35m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
231.1	Ground Surface					*	231	20	40	60	80	100								
0.0	Topsoil																			
0.2	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-34N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+158, o/s 58m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 30, 2001 COMPILED BY B.S.
 CHECKED BY _____











SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								● QUICK TRIAXIAL		× LAB VANE
235.2	Ground Surface						20	40	60	80	100	20	40	60						
0.0 0.1	Topsoil Clayey silt, trace sand Firm Brown Moist		1	SS	3		235													
234.2							234													
1.0	Sandy silt, trace clay Compact Brown Wet		2	SS	12		233													
232.6							232													
2.6	Silty sand, fine Compact Brown Wet		3	SS	12		231													
	some gravel, trace clay		4	SS	15		230													
			5	SS	23		229													
							228													
			6	SS	17		227													
	Grey						226													
			7	SS	26		225													
	medium to coarse sand layers																			
			8	SS	20															
223.9							224													
11.3	End of borehole Refusal on probable bedrock																			
	* 2001 05 30																			
	Water level measured after drilling																			

RECORD OF BOREHOLE No 101-35N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+161, o/s 17m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 30, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
231.0	Ground Surface						○	+									
0.0	Topsoil		1	SS	4												
230.5	Sandy silt, trace clay																
0.5																	
230.0	Loose Brown Moist																
1.0	Sand, some silt trace gravel with cobbles, boulders																
	Compact Brown Wet		2	SS	29												
																	
																	
228.3			3	SS	4												
2.7	End of borehole																
	Refusal on probable bedrock																
	 * 2001 05 30																
	 Water level measured after drilling																

RECORD OF BOREHOLE No 101-36N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+172, o/s 37m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
231.8	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Silty sand		1	SS	8		231										
	Loose <u>Brown</u> <u>Wet</u> <u>trace gravel</u>		2	SS	10												
230.4																	
1.4	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-37N 1 of 1 METRIC

New Hwy 69 Sta. 11+181.5, o/s 58.5m Rt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION Hwy 69 Sta. 11+187.5, o/s 40m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 30, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED	+	FIELD VANE										
234.3	Ground Surface						● QUICK TRIAXIAL	×	LAB VANE	WATER CONTENT (%)										
0.0	Topsoil						20	40	60	80	100	20	40	60						
0.1	Sandy silt, trace clay		1	SS	2	▼*														
	Very loose to compact																			
	Grey Moist/wet		2	SS	19															
231.7	Silty sand, fine																			
2.6	Compact Grey Wet		3	SS	10															
	Dense		4	SS	30															
229.7	End of borehole																			
4.6	Refusal on probable bedrock																			
	* 2001 05 30																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 101-38N

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+185.5, o/s 19m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
DATUM Geodetic DATE May 30, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
233.8	Ground Surface							20	40	60	80	100								
0.0	Topsoil		1	SS	7		233													
	Clayey silt, trace sand																			
	Firm Brown Moist																			
232.8	Sandy silt, trace clay		2	SS	10		232													
1.0	Compact Brown Wet																			
							231													
			3	SS	17		230													
	Dense		4	SS	35		229													
228.6	End of borehole																			
5.2	Refusal on probable bedrock																			
	* 2001 05 30																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 101-39N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+196.5, o/s 38.5m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 31, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE		● QUICK TRIAXIAL						× LAB VANE		○
235.0	Ground Surface						20	40	60	80	100									
0.0	Topsoil																			
0.1	Silty clay, trace sand		1	SS	7															
	Stiff Brown Moist																			
			2	SS	8															
232.4	Clayey silt, trace sand																			
2.6	Firm Brown Wet																			
			3	SS	5															
231.4	Sandy silt, fine trace clay																			
3.6	Loose Brown Wet																			
			4	SS	6															
229.8	End of borehole																			
5.2	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-40N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+200, o/s 1m Rt. CL Med. Dill Twp. ORIGINATED BY DJB
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
DATUM Geodetic DATE May 30, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	+ FIELD VANE											
							● QUICK TRIAXIAL	× LAB VANE												
234.6	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Topsoil		1	SS	5															
0.1	Clayey silt, trace sand																			
	Firm Brown Moist																			
	Stiff Wet		2	SS	13															
232.0	Sandy silt, fine trace clay																			
2.6	Compact Brown Wet		3	SS	17															
229.9			4	SS	18															
4.7	End of borehole																			
	Refusal on probable bedrock																			
	* 2001 05 30																			
	▼ Water level measured after drilling																			

RECORD OF BOREHOLE No 101-41N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+208, o/s 56m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 30, 2001 COMPILED BY B.S.
 CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE								● QUICK TRIAXIAL		
232.6	Ground Surface						20	40	60	80	100										
0.0	Topsoil																				
0.1	Clayey silt, trace sand		1	SS	7																
	Firm Brown Moist																				
231.6	Sandy silt, trace clay																				
1.0	Compact Brown Wet																				
			2	SS	12																
			3	SS	18																
			4	SS	9																
226.4	End of borehole		5	SS	3/5cm																
6.2	Refusal on probable bedrock																				
	<div>* 2001 05 30</div> <div>▼ Water level measured after drilling</div>																				


RECORD OF BOREHOLE No 101-42N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+210, o/s 26m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 31, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa											WATER CONTENT (%)		
								○ UNCONFINED			+ FIELD VANE								● QUICK TRIAXIAL		
235.9 0.0	Ground Surface Topsoil		1	SS	5																
0.3 234.9	Clayey silt, trace sand Firm Brown Moist																				
1.0 233.3	Silt, some clay some fine sand Compact Brown Moist		2	SS	13																
2.6	End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 101-43N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+211, o/s 16m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 31, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa																	
								○ UNCONFINED			+ FIELD VANE											● QUICK TRIAXIAL			x LAB VANE
235.5	Ground Surface						235																		
0.0	Topsoil		1	SS	6																				
0.2	Clayey silt, trace sand																								
	Firm Brown Moist																								
234.5							234																		
1.0	Sandy silt, fine trace clay																								
	Compact Brown Moist		2	SS	23																				
232.9							233																		
2.6	Silty sand, some gravel																								
	Compact Grey Moist																								
232.1			3	SS	120/15cm																				
3.4	End of borehole																								
	Refusal on probable bedrock																								
	* Borehole dry on completion of drilling																								

1 of 1

Hwy 69 Sta. 11+225, o/s 19m Rt. CL Med. Dill Twp.

Hwy 69 Sta. 11+225, o/s 19m Rt. CL Med. Dill Twp. ORIGINATED BY DJB

COMPILED BY B.S.





CHECKED BY

ON MOT VER3 03TF003 101 AP.GPJ ON MOT.GDT 21/07/2004 10:08:19 AM

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 101-45N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+225, o/s 3m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 30, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	W	W _L		
							20	40	60	80	100						
234.5	Ground Surface																
0.0	Topsoil		1	SS	7												
234.0	Sandy silt, fine trace clay																
0.5	Loose Brown Wet																
	Dense		2	SS	37												
232.5	End of borehole																
2.0	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-46N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+232, o/s 58m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 30, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
233.1	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil						233													
0.1	Clayey silt, trace sand		1	SS	9															
	Stiff Brown Moist																			
232.2	Sandy silt, trace clay						232													
0.9	Compact Brown Wet																			
			2	SS	16		231													
230.2	End of borehole																			
2.9	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

1 of 1

New Hwy 69 Sta. 11+235, o/s 28m Rt. CL Med. Dill Twp.

LOCATION

Hwy 69 Sta. 11+237.5, o/s 5m Rt. CL Med. Dill Twp.

ORIGINATED BY DJB

DIST 54

69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

COMPILED BY B.S.

DATUM Geodetic

DATE _____

May 31, 2001

CHECKED BY

ON MOT VER3 03TF003 101 AP.GPJ ON MOT.GDT 21/07/2004 10:08:39 AM

+⁷, ×⁵: Numbers refer to Sensitivity

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 101-48N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+235.5, o/s 18m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 30, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													
								○ UNCONFINED			+ FIELD VANE										
235.7	Ground Surface							20	40	60	80	100									
0.0	Topsoil		1	SS	7		235														
0.1	Clayey silt, trace sand																				
	Firm Brown Moist																				
234.7	Sandy silt, trace clay						234														
1.0	Compact Brown Moist		2	SS	18																
							233														
							232														
			3	SS	12																
231.7	End of borehole																				
4.0	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 101-49N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+246, o/s 42.5m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
235.9	Ground Surface		1		6		235										
0.0	Topsoil																
0.2	Silt																
0.3	Loose Brown Moist Clayey silt, some sand																
234.7	Stiff Mottled Moist grey/brown																
1.2	Silt, trace clay silty sand seams																
	Compact Brown Wet	2		14	234												
						233											
			3		19	232											
231.3	Gravelly sand		4		25/8cm	▼*											
231.2	Very Grey Saturated dense																
4.7	End of borehole																
	Refusal on probable bedrock																
	* 2001 05 31																
	▼ Water level measured after drilling																

* 2001 05 31

▼ Water level measured
after drilling

RECORD OF BOREHOLE No 101-50N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+249.5, o/s 5m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
238.8 0.0	Ground Surface Bedrock at surface																
	* Borehole dry																

1 of 1

METRIC

New Hwy 69 Sta. 11+257. o/s 61m Rt. CL Med. Dill Twp.

DYNAMIC CONE PENETRATION
RESISTANCE PLOT

20 40 60 80 100
SHEAR STRENGTH kPa

PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT
w_p	w	w_L

UNIT
WEIGHT

REMARKS
&
GRAIN SIZE
DISTRIBUTION
(%)

RECORD OF BOREHOLE No 101-52N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+259.5, o/s 29m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
234.9	Ground Surface							20	40	60	80	100					
0.0	Peat, fine fibrous																
0.1	Dark brown Sandy silt, trace clay		1	SS	6		234										
	Loose Mottled Dry grey/brown																
	Compact Moist		2	SS	14		233										
232.1																	
2.8	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-53N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+260, o/s 20m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
235.4	Ground Surface					*											
0.0	Topsoil																
0.2	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-54N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+271, o/s 45m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										
								○ UNCONFINED + FIELD VANE										
								● QUICK TRIAXIAL × LAB VANE										
								WATER CONTENT (%)										
								20	40	60	80	100	20	40	60			
236.8	Ground Surface																	
0.0	Peat, fine fibrous																	
0.1	Dark brown		1	SS	5													
0.3	Silty fine sand, trace organics																	
	Loose Brown Moist Clayey silt, some sand						236											
	Firm Brown Moist to very stiff		2	SS	24		235											
234.3	Sandy silt, trace clay						234											
2.5	Compact Mottled Dry grey/brown						233											
233.7	Silty fine sand, trace clay		3	SS	11		232											
3.1	Compact Mottled Moist grey/brown																	
	Loose Wet		4	SS	9													
231.1	End of borehole																	
5.7	Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

RECORD OF BOREHOLE No 101-55N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+274, o/s 7.5m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
238.9 0.0	Ground Surface Bedrock at surface					20			40	60	80	100	20					40	60					
	* Borehole dry																							

RECORD OF BOREHOLE No 101-56N 1 of 1 METRIC

New Hwy 69 Sta. 11+282, o/s 58m Rt. CL Med. Dill Twp.

G.W.P.	327-91-00	LOCATION	Hwy 69 Sta. 11+287.5, o/s 31m Rt. CL Med. Dill Twp.	ORIGINATED BY	B.S.
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DIST	54	HWY	69	BOREHOLE TYPE	Manual Hand Augers	COMPILED BY	B.S.
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DATUM Geodetic DATE May, 2001 CHECKED BY _____

[illegible]


RECORD OF BOREHOLE No 101-57N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+283.5, o/s 36m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
240.6	Ground Surface					*		20	40	60	80	100					
0.0	Topsoil																
240.2	Silt, numerous boulders																
0.4	Loose Grey Moist End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-58N 1 of 1 METRIC


G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+285, o/s 18m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE									
241.5	Ground Surface							20	40	60	80	100					
0.0	Topsoil																
0.1	Silt, numerous boulders																
241.0	Loose Grey Moist						241										
0.5	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-59N 1 of 1 METRIC


New Hwy 69 Sta. 11+294, o/s 59m Rt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION Hwy 69 Sta. 11+300, o/s 30.5m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
238.8	Ground Surface					*														
0.0	Topsoil																			
0.1	Silt, trace sand																			
238.1	Loose Brown Moist																			
0.7	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			


RECORD OF BOREHOLE No 101-60N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+295, o/s 47m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
239.7	Ground Surface							20	40	60	80	100		20	40	60				
0.0	Topsoil																			
0.2	Silt, trace sand																			
239.1	Loose Brown Moist																			
0.6	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-61N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+296, o/s 37m Rt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
241.8	Ground Surface							20	40	60	80	100		20	40	60				
0.0	Topsoil																			
249.4	Silt, trace sand																			
0.4	Loose Grey Moist End of borehole Refusal on probable bedrock																			
<div>* Borehole dry on completion of drilling</div>																				

RECORD OF BOREHOLE No 101-62N

1 of 1


METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+298, o/s 19.5m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
245.4	Ground Surface							20	40	60	80	100								
0.0	Topsoil																			
249.8	Silt, occasional boulders																			
0.4	Loose Dark Moist grey End of borehole						245													
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-63N 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+299, o/s 9.5m Rt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
246.0	Ground Surface					*										GR SA SI CL	
0.0	Topsoil																
0.1	Silt,																
0.3	Loose Dark Moist grey End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

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

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+918, o/s 7m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL			
						○ UNCONFINED			● QUICK TRIAXIAL	+	×	FIELD VANE	LAB VANE											
233.2 0.0	Ground Surface Bedrock at surface																							
	* Borehole dry																							

RECORD OF BOREHOLE No 101-2S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+919, o/s 25m Lt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
233.0	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil																
0.1	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-3S

1 of 1


METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+931, o/s 14.5m Lt. CL Med. Dill Twp.
Hwy 69 Sta. 10+930, o/s 19m Lt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
228.9	Ground Surface					*											
0.0	Topsoil																
0.1	Silt, trace sand																
228.4	Loose Brown Moist																
0.5	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-4S 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+943, o/s 31m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
229.5	Ground Surface					*														
0.0	Topsoil																			
229.1	Silt, trace sand																			
0.4	Loose Brown Moist End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-5S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+956, o/s 13.5m Lt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
227.2	Ground Surface					*		20	40	60	80	100		20	40	60	
0.0	Topsoil						227										
0.1	Silt, trace sand																
0.2	Loose Brown Moist End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-6S 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+970, o/s 35m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			GR
229.5	Ground Surface					*														
0.0	Topsoil																			
0.2	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-7S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+976, o/s 13m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
226.0	Ground Surface					*															
0.0	Bedrock at surface																				
	* Borehole dry																				

RECORD OF BOREHOLE No 101-8S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 10+995.5, o/s 36m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL
226.8 0.0	Ground Surface Bedrock at surface					*															
	* Borehole dry																				

RECORD OF BOREHOLE No 101-9S 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+010, o/s 11m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE February 15, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED	+	FIELD VANE							
220.8	Ground Surface						○	+									
0.0	Peat, amorphous		1	SS	2		●	×									
0.1	Dark brown Clayey silt, trace sand																
	Soft Mottled Wet brown/grey																
219.2																	
1.6	Silt, some sand trace clay		2	SS	8												
218.4	Loose Mottled Wet grey/brown																
2.4	End of borehole																
	Refusal on probable bedrock																
			</														

RECORD OF PENETRATION TEST No 101-10S

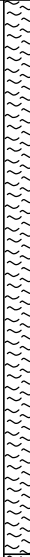



1 of 1 **METRIC**

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+023, o/s 40.5m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test ORIGINATED BY F.P.
 DATUM Geodetic DATE February 20, 2001 COMPILED BY F.P.
 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	w	W _L		
							20	40	60	80	100						
220.7 0.0	Ground Surface																
218.1 2.6	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 101-11S 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+034, o/s 10m Lt. CL Med. Dill Twp. ORIGINATED BY F.P.
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY D.H.
DATUM Geodetic DATE February 18, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL
220.7 0.0	Ground Surface Peat, fine fibrous Dark brown		1	AS	1		220										386			
				2	SS			1												259
			3	SS	1														511	
			4	SS	1														713	
	amorphous																			
			5	SS	1														336	
213.4 7.3	Clayey silt, trace sand Very soft Grey/ Wet green		6	SS	1		213										135			
211.8 8.9	Sandy silt, trace clay, trace gravel Very loose Grey Wet to to very dense (TILL)		7	SS	1		211													
210.2 10.5	End of borehole Refusal on probable bedrock <																			


* 2001 02 18

▼ Water level measured after drilling

RECORD OF BOREHOLE No 101-12S

1 of 1 **METRIC**

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+049, o/s 39.5m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY F.P.
 DATUM Geodetic DATE February 18, 2001 COMPILED BY F.P./D.H.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
220.8	Ground Surface					▽* ▽*		20	40	60	80	100								
0.0	Peat, fine fibrous Dark brown		1	SS	1		220													
			2	SS	1			219												

RECORD OF BOREHOLE No 101-13S

1 of 1

METRIC

G.W.P. 327-91-00

LOCATION

New Hwy 69 Sta. 11+058.5, o/s 8.5m Lt. CL Med. Dill Twp.

Hwy 69 Sta. 11+058, o/s 19m Lt. CL Med. Dill Twp. ORIGINATED BY F.P.

DIST 54 HWY 69

BOREHOLE TYPE

Continuous Flight Hollow Stem Augers

COMPILED BY F.P./D.H.

DATUM Geodetic

DATE

February 16, 2001

CHECKED BY

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	w	W _L								
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	WATER CONTENT (%)											
220.8	Ground Surface					▼* ▲*		20	40	60	80	100					GR	SA	SI	CL			
0.0	Peat, fine fibrous Dark brown		1	SS	1		220																
			2	SS	1			219															
									218														
			3	SS	WH**																		
										217													
			4	SS	1																		
			216																				
				215																			
					214																		
						213																	
							212																
			211																				
				210																			
					209																		

RECORD OF PENETRATION TEST No 101-14S

1 of 1 **METRIC**

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+074.5, o/s 39m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test ORIGINATED BY F.P.
 DATUM Geodetic DATE February 20, 2001 COMPILED BY F.P.
 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa			w _p	w	w _L	GR SA SI CL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
						○ UNCONFINED + FIELD VANE			● QUICK TRIAXIAL × LAB VANE	WATER CONTENT (%)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
220.8 0.0	Ground Surface																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								

METRIC

New Hwy 69 Sta. 11+090, o/s 38.5m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION Hwy 69 Sta. 11+087.5, o/s 50m Lt. CL Med. Dill Twp. ORIGINATED BY DJB

DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.

DATUM Geodetic DATE May 29, 2001 CHECKED BY _____

[illegible]

RECORD OF BOREHOLE No 101-17S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+100, o/s 5.5m Lt. CL Med. Dill Twp. ORIGINATED BY DJB
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
DATUM Geodetic DATE May 29, 2001 CHECKED BY _____


SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
224.4	Ground Surface																
0.0	Topsoil		1	SS	5												
223.9																	
0.5	Sandy silt, fine trace gravel, organics																
223.4	Loose Brown Wet																
1.0	Silty sand, fine trace gravel																
	Dense Brown Moist		2	SS	39												

RECORD OF BOREHOLE No 101-18S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+115, 32.5m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
226.0	Ground Surface					*		20	40	60	80	100					GR SA SI CL
0.0	Topsoil																
0.1	Silty sand, trace gravel																
0.2	Compact Grey Wet End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-19S

1 of 1


METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+125.5, o/s 4.5m Lt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
228.2	Ground Surface					*		20	40	60	80	100					
0.0	Topsoil						228										
0.1	Sandy silt																
0.3	Loose Brown Wet End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-20S 1 of 1 METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+139, o/s 26.5m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			GR
229.7	Ground Surface					*														
0.0	Topsoil																			
0.2	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-21S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+150, o/s 2.5m Lt. CL Med. Dill Twp. ORIGINATED BY DJB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 30, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
230.3	Ground Surface						20	40	60	80	100						
0.0 0.1	Topsoil Silty sand Loose Brown Wet		1	SS	4	 *	230										
229.3							229										
1.0	Sand, medium to coarse trace silt trace gravel Loose Brown Moist with cobbles Grey		2	SS	5		228										
227.0 3.3	End of borehole Refusal on probable bedrock * 2001 05 30  Water level measured after drilling		3	SB	8		227										

RECORD OF BOREHOLE No 101-22S 1 of 1 METRIC

New Hwy 69 Sta. 11+164.5, o/s 23.5m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION Hwy 69 Sta. 11+162.5, o/s 41m Lt. CL Med. Dill Twp. ORIGINATED BY B.S.

DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.

DATUM Geodetic DATE May, 2001 CHECKED BY

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
233.1 0.0	Ground Surface Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 101-23S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+175, o/s 1m Lt. CL Med. Dill Twp. ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May, 2001 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
232.3	Ground Surface					*														
0.0	Topsoil																			
0.1	Silty sand, trace gravel						232													
0.3	Loose Brown Moist End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-24S

1 of 1

METRIC

New Hwy 69 Sta. 11+180, o/s 33m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY DJB
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								20	40	60	80	100					
231.1	Topsoil																
0.0	Sandy silt																
230.3	Loose Brown Moist																
230.3	Silty clay																
230.8	Soft Brown APL																
1.0	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-25S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+190, o/s 21m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 30, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa						w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
232.7	Ground Surface							20	40	60	80	100									
0.0 0.1	Topsoil		1	SS	12		232														
	Clayey silt, trace sand																				
	Stiff Brown Moist																				
231.7																					
1.0	Sandy silt, trace clay																				
	Compact Brown Wet		2	SS	19		231														
											</										

RECORD OF BOREHOLE No 101-26S

1 of 1

METRIC

New Hwy 69 Sta. 11+200, o/s 33m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE						
232.4 0.0	Bedrock at surface																						
	* Borehole dry																						

RECORD OF BOREHOLE No 101-27S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+214.5, o/s 14m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers ORIGINATED BY DJB
 DATUM Geodetic DATE May 30, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						w _p	w	w _L		GR	SA	SI	CL
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
232.7 0.0	Ground Surface							20	40	60	80	100									
232.2 0.5	Topsoil		1	SS	9		232														
	Clayey silt, trace sand																				
231.7 1.0	Firm Brown Moist																				
	Fine sandy silt, trace clay																				
	Compact Brown Wet		2	SS	20		231														
							230														
229.3 3.4	End of borehole		3	SS	15																
	Refusal on probable bedrock																				
	* Borehole dry on completion of drilling																				

RECORD OF BOREHOLE No 101-28S

1 of 1

METRIC

New Hwy 69 Sta. 11+220, o/s 33m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
						○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE																	
238.4 0.0	Bedrock at surface																						
	* Borehole dry																						

RECORD OF BOREHOLE No 101-29S

1 of 1 **METRIC**

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+238.5, o/s 12m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100					
239.2 0.0	Ground Surface Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 101-30S

1 of 1

METRIC

New Hwy 69 Sta. 11+240, o/s 33m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)					
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)							GR	SA	SI	CL		
243.0 0.0																							
	Bedrock at surface																						
	* Borehole dry																						

RECORD OF BOREHOLE No 101-31S

1 of 1

METRIC

New Hwy 69 Sta. 11+260, o/s 33m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
246.2 0.0	Bedrock at surface																
	* Borehole dry																

RECORD OF BOREHOLE No 101-32S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+263, o/s 11m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
243.7	Ground Surface							20	40	60	80	100								
0.0	Topsoil																			
0.1	Silt, trace sand																			
	Brown Moist																			
242.8							243													
0.9	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-33S

1 of 1

METRIC

New Hwy 69 Sta. 11+280, o/s 33m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
244.0								20	40	60	80	100					
0.0	Topsoil																
0.1	Silt, trace sand, trace clay																
243.6	Loose Brown Moist																
0.4	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-34S

1 of 1

METRIC

New Hwy 69 Sta. 11+280, o/s 19m Lt. CL Med. Dill Twp.


G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
243.5																	
0.0	Topsoil																
0.1	Silt, some sand, trace clay																
243.0																	
0.5	Loose Brown Moist End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 101-35S

1 of 1 **METRIC**

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+287.5, o/s 4m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
243.1	Ground Surface							20	40	60	80	100		20	40	60				
0.0	Topsoil								○ UNCONFINED	+	FIELD VANE									
242.2	Silt, numerous boulders								● QUICK TRIAXIAL	×	LAB VANE									
0.4	Loose Grey Moist End of borehole Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 101-36S

1 of 1

METRIC

New Hwy 69 Sta. 11+300, o/s 33m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
245.6								20	40	60	80	100					
0.0	Topsoil																
0.1	Silt, some sand, trace clay																
244.9	Loose Brown Moist						245										
0.7	End of borehole																
	Refusal on probable bedrock																
	* Borehole dry on completion of drilling																


RECORD OF BOREHOLE No 101-37S

1 of 1

METRIC

New Hwy 69 Sta. 11+300, o/s 19m Lt. CL Med. Dill Twp.

G.W.P. 327-91-00 LOCATION _____ ORIGINATED BY B.S.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers COMPILED BY B.S.
 DATUM Geodetic DATE May 15, 2004 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	20	40					60	80	100	20				
246.1 0.0	Topsoil						246																		
0.1	Silt, some sand, trace clay																								
245.2 0.9	Loose Brown Moist																								
	End of borehole																								
	Refusal on probable bedrock																								
	* Borehole dry on completion of drilling																								

RECORD OF BOREHOLE No 101-38S

1 of 1

METRIC

G.W.P. 327-91-00 LOCATION New Hwy 69 Sta. 11+300, o/s 2.5m Lt. CL Med. Dill Twp.
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Augers ORIGINATED BY B.S.
 DATUM Geodetic DATE May, 2001 COMPILED BY B.S.
 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L			
247.0	Ground Surface																	
0.0	Topsoil																	
0.2	End of borehole																	
	Refusal on probable bedrock																	
	* Borehole dry on completion of drilling																	

FOUNDATION INVESTIGATION REPORT
SWAMP AND HIGH FILL CROSSINGS
for
HIGHWAY 69 FOUR-LANING
FROM 4 KM SOUTH OF ESTAIRE TO 1 KM NORTH OF HIGHWAY 537
G.W.P. 312-99-00
DISTRICT 54, TOWNSHIPS OF BURWASH, SECORD AND DILL
SUDBURY, ONTARIO

VOLUME 5

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November 17, 2004

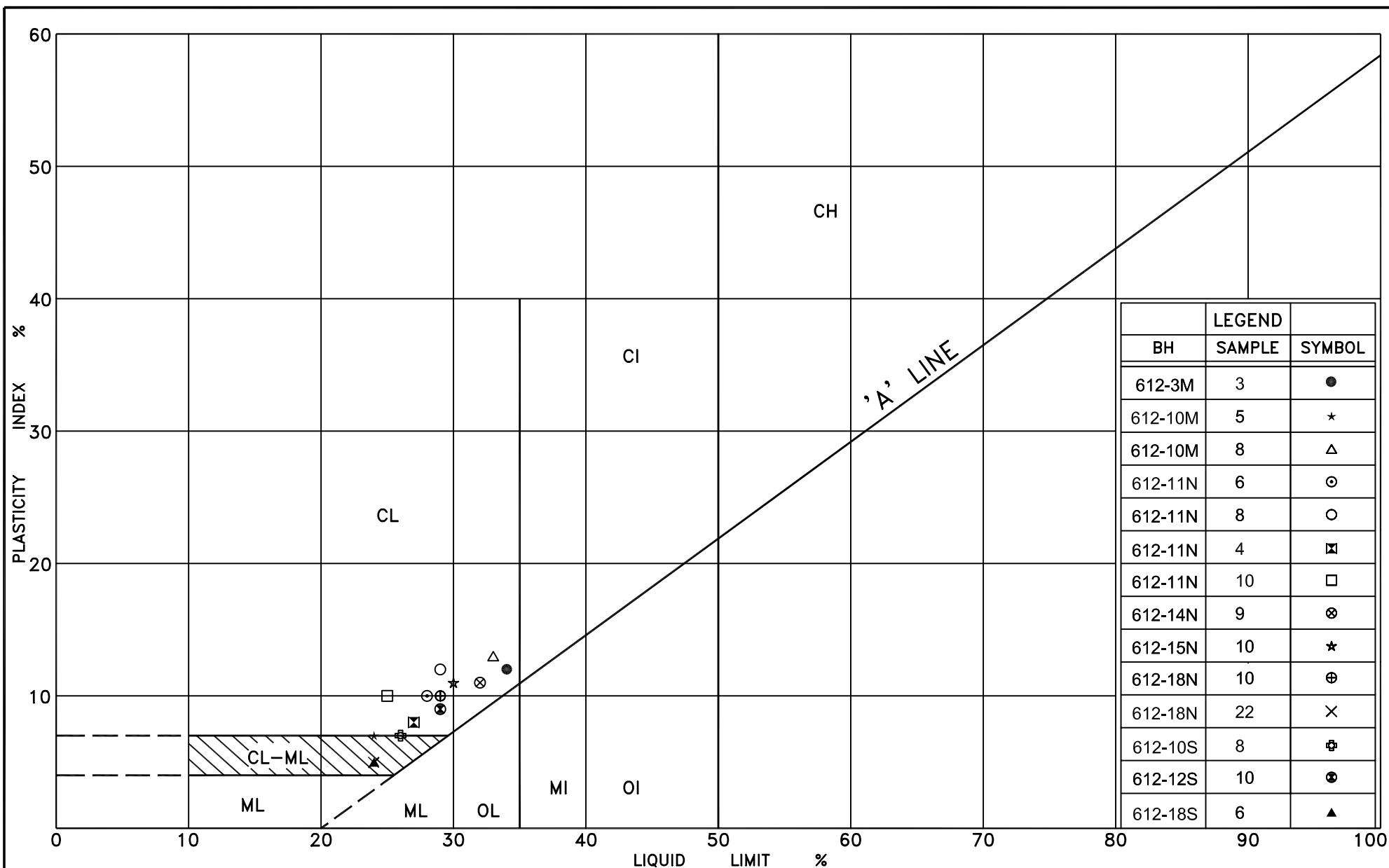


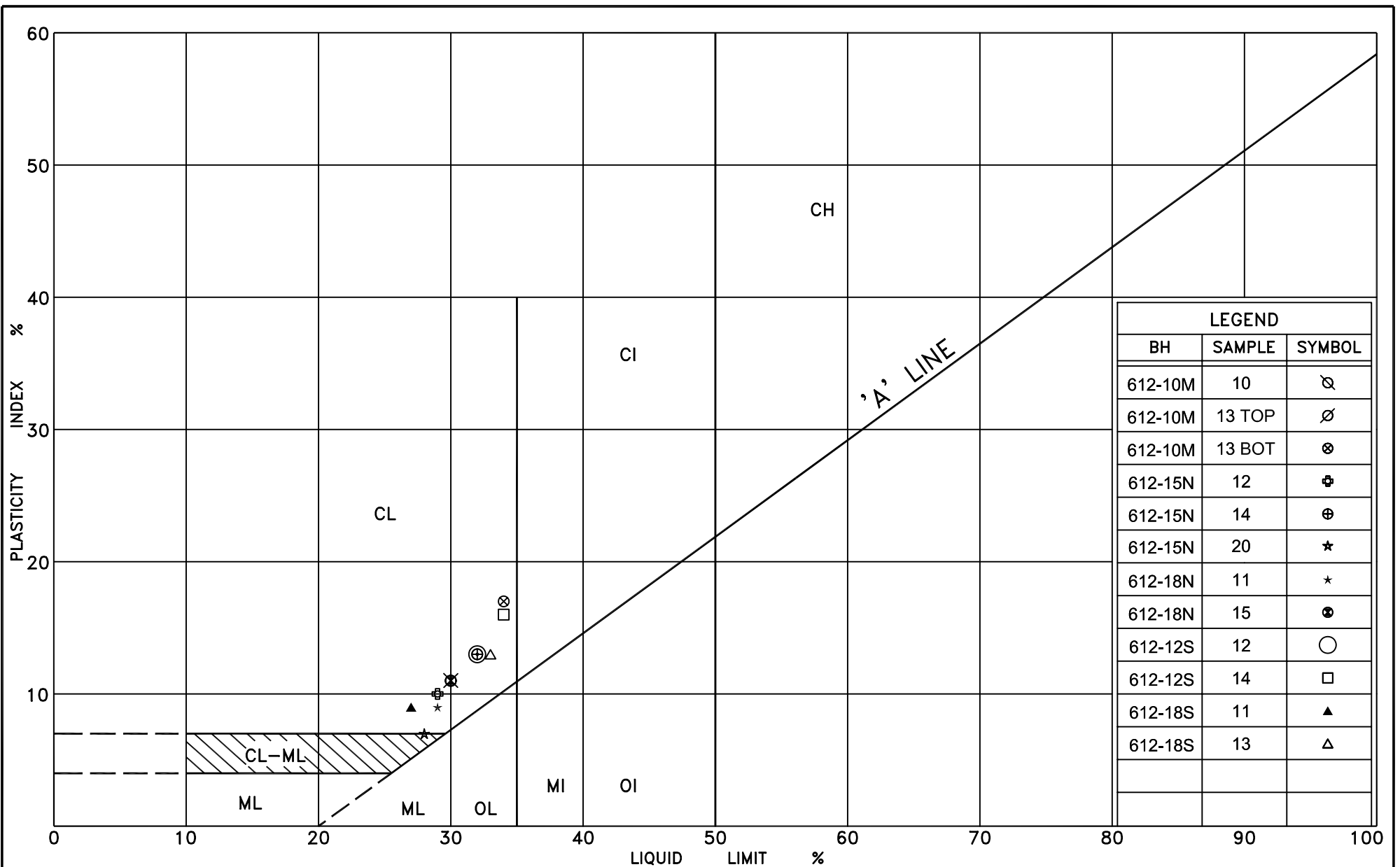
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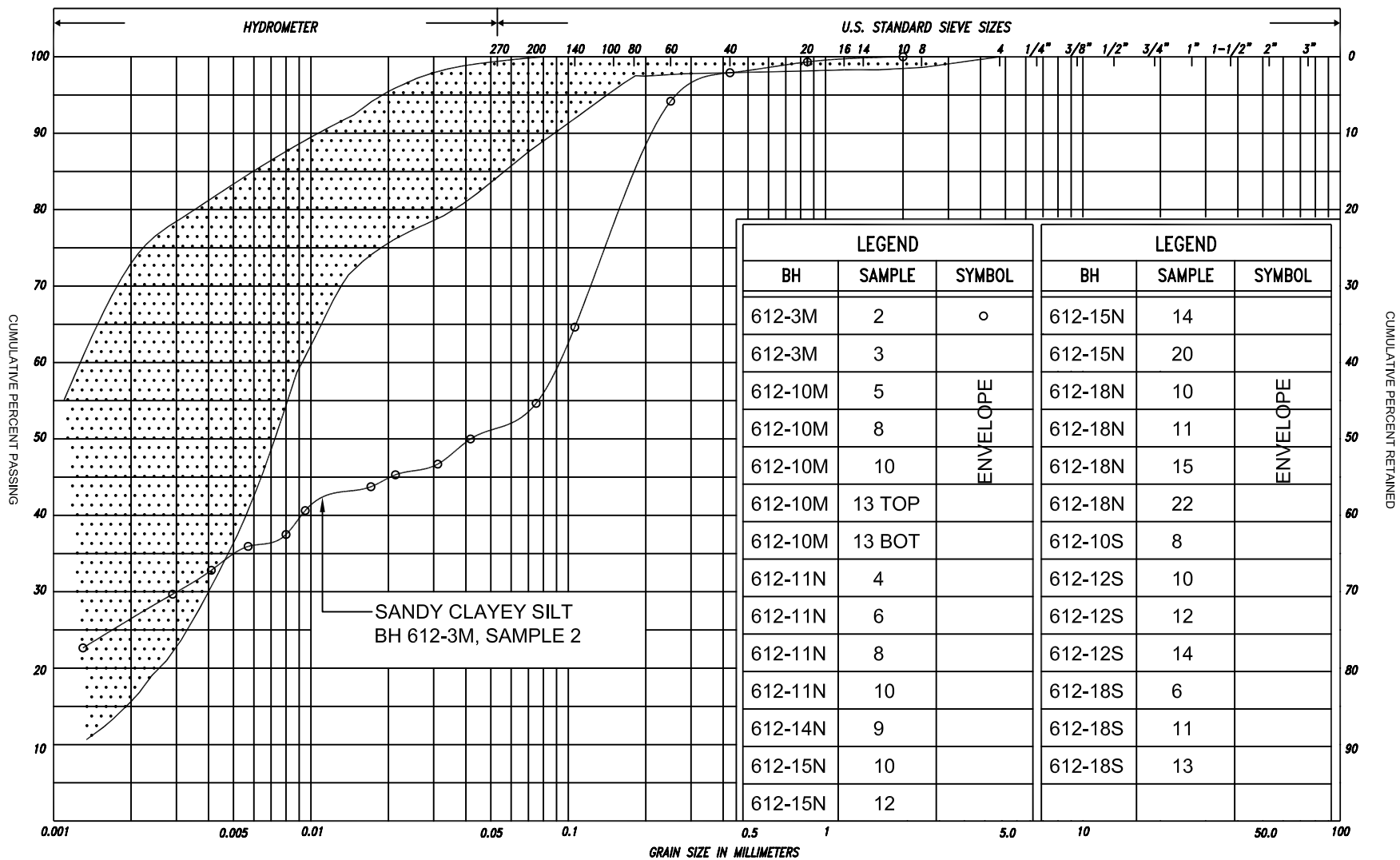
APPENDIX D

FACTUAL DATA FOR SWAMP CROSSING 612

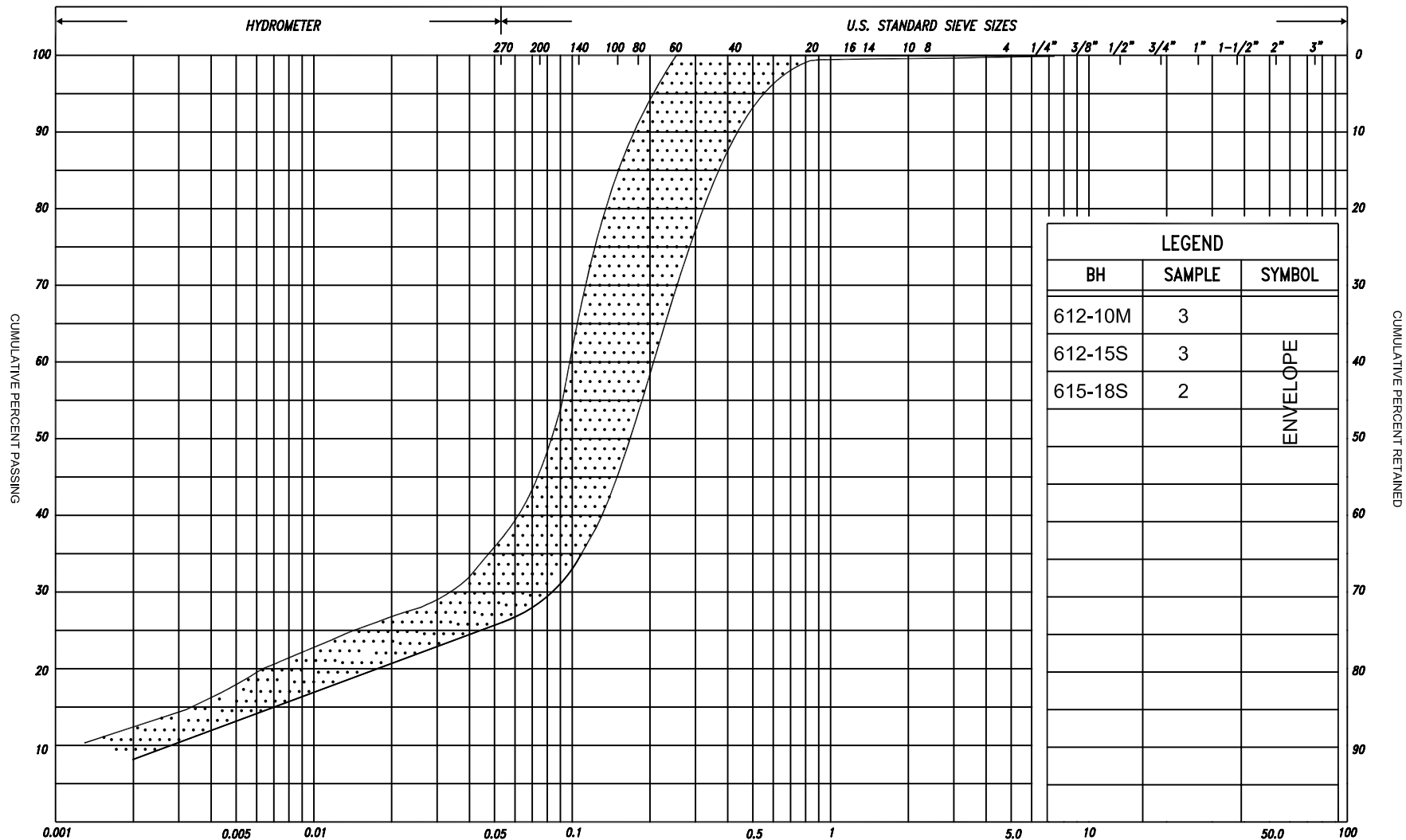
Figures 612-1 to 612-3 - Plasticity Charts
Figures 612-4 to 612-9 - Grain Size Distribution Curves
Figures 612-10 to 612-13 - Consolidation Test Results
Explanation of Terms Used in Report
Record of Borehole Sheets: Swamp 612
Record of Penetration Test Sheets: Swamp 612
Drawings 612-1 to 612-5 - Borehole Locations and Soil Strata







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

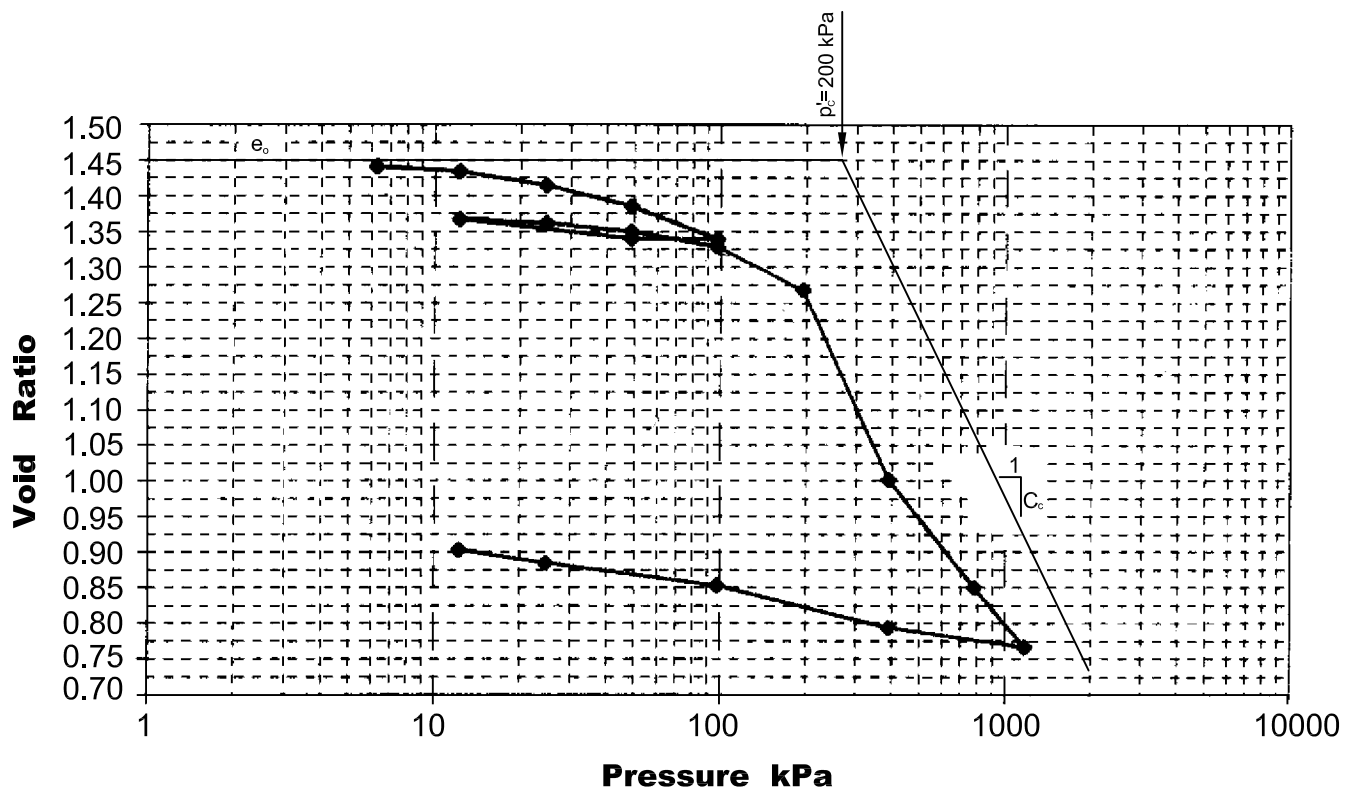


Laboratory Consolidation Test Result

Highway 69
 G.W.P. 312-99-00
 District 54, Townships of Secord and Dill
 Sudbury, Ontario

BOREHOLE 612-12S, SAMPLE 16

Void Ratio versus Log of Pressure



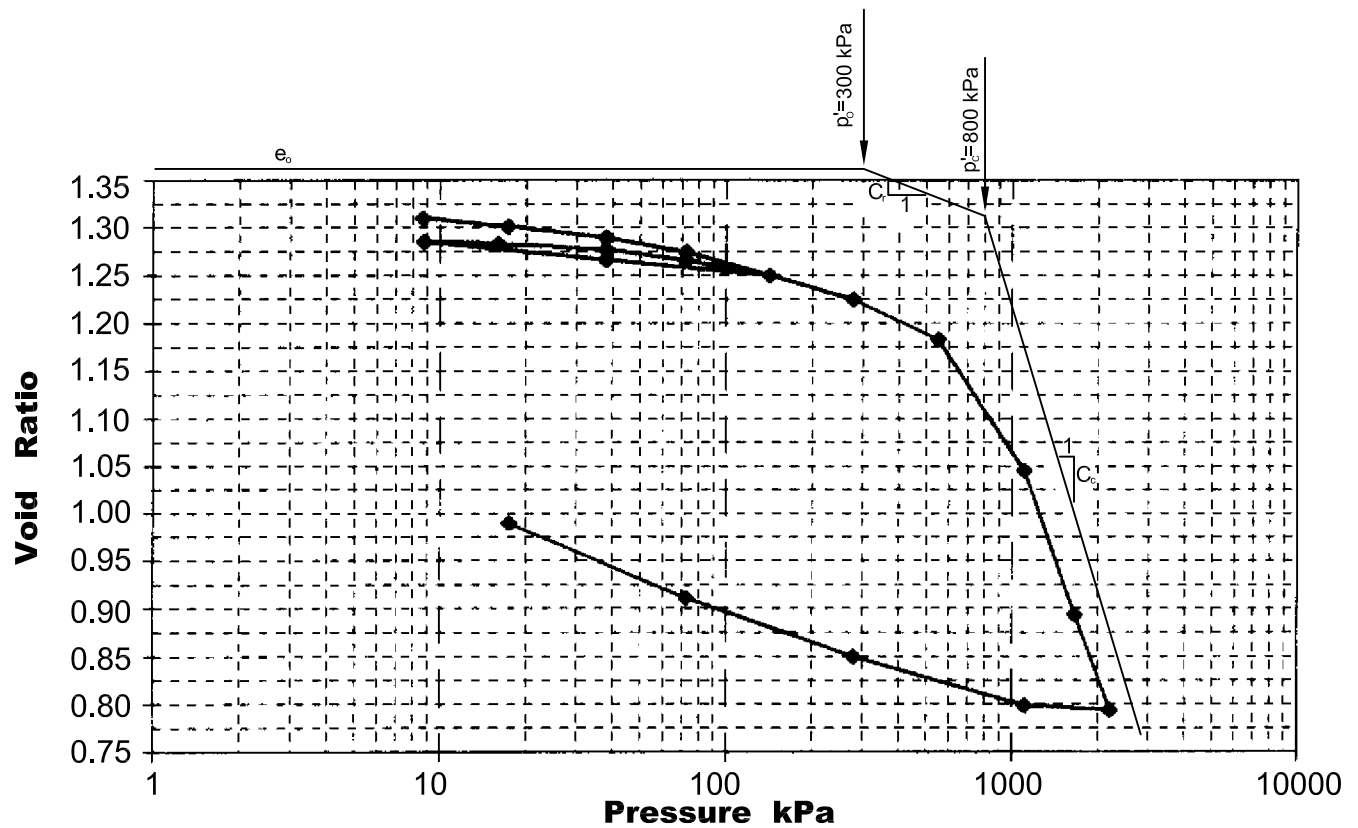
SOIL TYPE: CLAY		DEPTH: 27.4 - 27.9 m
$e_o = 1.45$	$p'_o = 250$ kPa	FIGURE 612-10
$w_o = 53\%$	$p'_c = 250$ kPa	HIGHWAY 69 (New)
$\gamma = 17.3$ kN/m ³	$C_c = 0.83$	TOWNSHIPS OF SECORD and DILL
$W_L = 56$ $W_P = 23$ $PI = 33$	$C_r = 0.07$	G.W.P. 312 - 99 - 00

Laboratory Consolidation Test Result

Highway 69
G.W.P. 312-99-00
District 54, Townships of Secord and Dill
Sudbury, Ontario

BOREHOLE 612-18N, SAMPLE 18

Void Ratio versus Log of Pressure



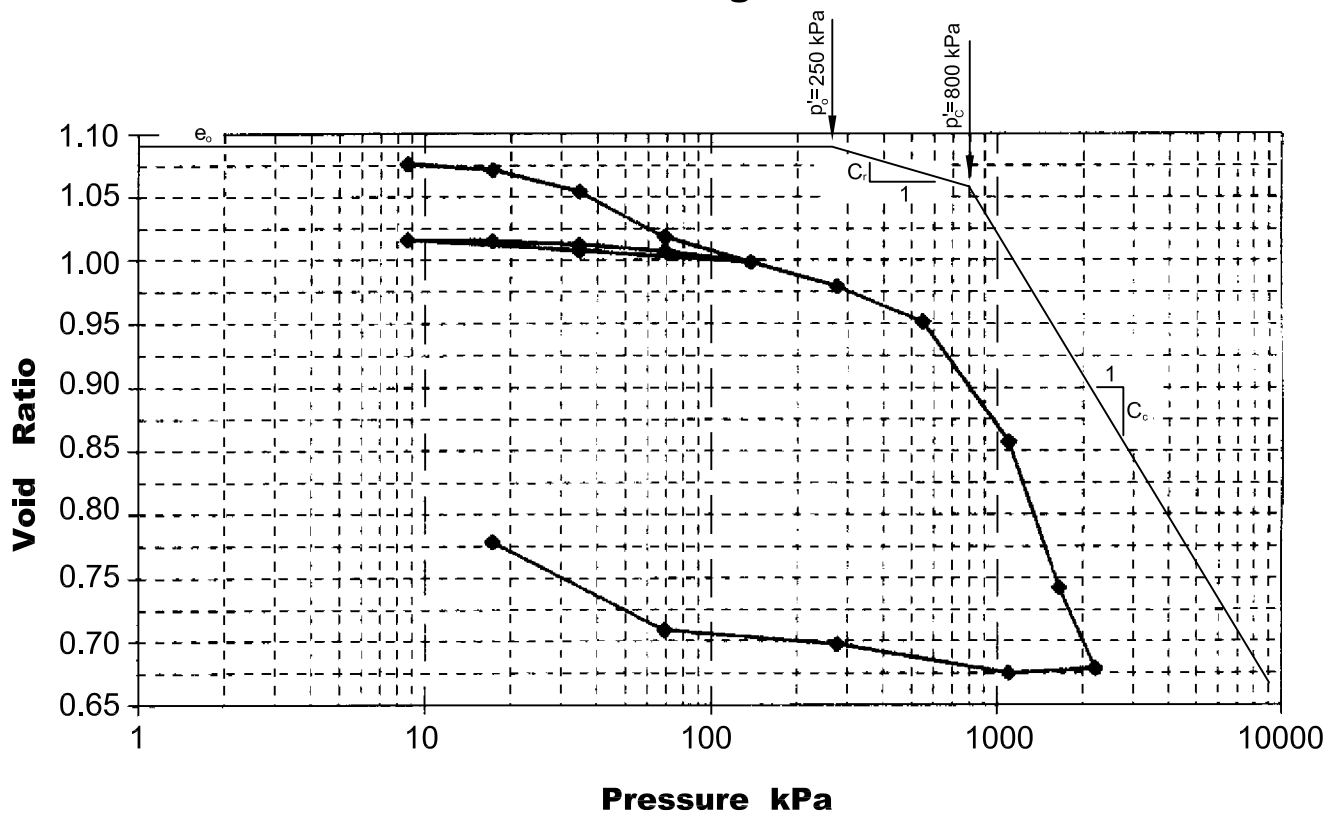
SOIL TYPE: CLAY		DEPTH: 33.5 m
e _o = 1.36	p' _o = 300 kPa	FIGURE 612-11
w _o = 50%	p' _c = 800 kPa	HIGHWAY 69 (New)
γ = 17.5 kN/m ³	C _c = 1.00	TOWNSHIPS OF SECORD and DILL
W _L = 58 W _P = 24 PI = 34	C _r = 0.12	G.W.P. 312 - 99 - 00

Laboratory Consolidation Test Result

Highway 69
G.W.P. 312-99-00
District 54, Townships of Secord and Dill
Sudbury, Ontario

BOREHOLE 612-18S, SAMPLE 15

Void Ratio versus Log of Pressure



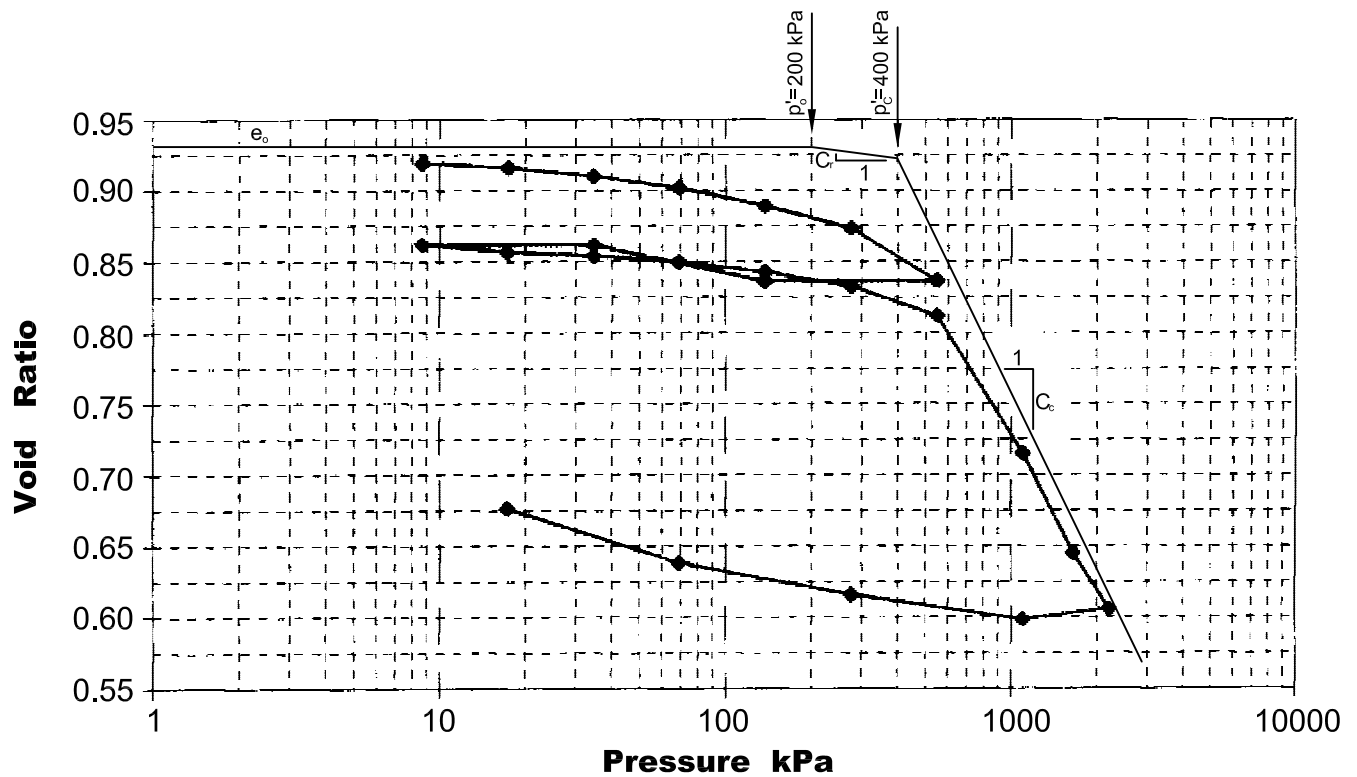
SOIL TYPE: SILTY CLAY		DEPTH: 24.4 - 24.9 m
$e_o = 1.09$	$p'_o = 250 \text{ kPa}$	FIGURE 612-12
$w_o = 38\%$	$p'_c = 800 \text{ kPa}$	HIGHWAY 69 (New)
$\gamma = 18.5 \text{ kN/m}^3$	$C_c = 0.75$	TOWNSHIPS OF SECORD and DILL
$W_L = 39 \quad W_P = 19 \quad PI = 20$	$C_r = 0.06$	G.W.P. 312 - 99 - 00

Laboratory Consolidation Test Result

Highway 69
 G.W.P. 312-99-00
 District 54, Townships of Secord and Dill
 Sudbury, Ontario

BOREHOLE 612-10M, SAMPLE 13

Void Ratio versus Log of Pressure



SOIL TYPE: CLAYEY SILT		DEPTH: 18.3 - 18.9 m
$e_o = 0.93$	$p'_o = 200$ kPa	FIGURE 612-13
$w_o = 35\%$	$p'_c = 400$ kPa	HIGHWAY 69 (New)
$\gamma = 19.1$ kN/m ³	$C_c = 0.42$	TOWNSHIPS OF SECORD and DILL
$W_L = 34$ $W_P = 17$ $PI = 17$	$C_r = 0.03$	G.W.P. 312 - 99 - 00

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 (RQD), 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

STRESS AND STRAIN

u_w	kPa	PORE WATER PRESSURE
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	e	1, %	VOID RATIO	e_{\min}	1, %	VOID RATIO IN DENSEST STATE
γ_s	KN/m^3	UNIT WEIGHT OF SOLID PARTICLES	n	1, %	POROSITY	I_D	1	DENSITY INDEX = $\frac{e_{\max} - e}{e_{\max} - e_{\min}}$
ρ_w	kg/m^3	DENSITY OF WATER	w	1, %	WATER CONTENT	D	mm	GRAIN DIAMETER
γ_w	KN/m^3	UNIT WEIGHT OF WATER	S_r	%	DEGREE OF SATURATION	D_n	mm	n PERCENT - DIAMETER
ρ	kg/m^3	DENSITY OF SOIL	w_L	%	LIQUID LIMIT	C_u	1	UNIFORMITY COEFFICIENT
γ	KN/m^3	UNIT WEIGHT OF SOIL	w_p	%	PLASTIC LIMIT	h	m	HYDRAULIC HEAD OR POTENTIAL
ρ_d	kg/m^3	DENSITY OF DRY SOIL	w_s	%	SHRINKAGE LIMIT	q	m^3/s	RATE OF DISCHARGE
γ_d	KN/m^3	UNIT WEIGHT OF DRY SOIL	I_p	%	PLASTICITY INDEX = $w_L - w_p$	v	m/s	DISCHARGE VELOCITY
ρ_{sat}	kg/m^3	DENSITY OF SATURATED SOIL	I_L	1	LIQUIDITY INDEX = $\frac{w - w_p}{I_p}$	i	1	HYDRAULIC GRADIENT
γ_{sat}	KN/m^3	UNIT WEIGHT OF SATURATED SOIL	I_C	1	CONSISTENCY INDEX = $\frac{w_L - w}{I_p}$	k	m/s	HYDRAULIC CONDUCTIVITY
ρ'	kg/m^3	DENSITY OF SUBMERGED SOIL	e_{\max}	1, %	VOID RATIO IN LOOSEST STATE	j	KN/m^2	SEEPAGE FORCE
γ'	KN/m^3	UNIT WEIGHT OF SUBMERGED SOIL						

RECORD OF BOREHOLE No 612-1M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+387.5, CL Med. Second Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
232.5 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-2M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+412.5, CL Med. Second Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____



SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
225.0	Ground Surface					*											
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-3M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+437.5, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE	20						40	60	80
220.3	Ground Surface																			
0.0	Peat, fine fibrous		1	SS	16	 *  *	220										0 45 28 27			
219.9	Dark brown						219													
0.4	Sandy clayey silt						218													
	Stiff Brown Moist						217													
							216													
	Firm Grey Wet		2	SS	6		215													
217.9	Clayey silt, trace sand						214													
2.4	Varved						213													
	Soft Grey Wet		3	SS	3															
	to firm																			
			4	SS	8															
214.5	Silt, some sand																			
5.8	trace clay and gravel																			
	Loose Brown		5	SS	9															
213.0	End of borehole																			
7.3	Refusal on probable bedrock																			

RECORD OF PENETRATION TEST No 612-4M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+462.5, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
220.3 0.0	Ground Surface													
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
212.6 7.7	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF PENETRATION TEST No 612-5M

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+475, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
220.3 0.0	Ground Surface													
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							
							209							
208.5 11.8	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF PENETRATION TEST No 612-6M

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+487.5, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	20 40 60			
220.4 0.0	Ground Surface													
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							
							209							
							208							
							207							
							206							

Cont'd

RECORD OF PENETRATION TEST No 612-6M

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+487.5, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
205.4																		
205																		
204																		
203.2																		
17.2	End of dynamic cone penetration test Refusal on probable bedrock																	

RECORD OF BOREHOLE No 612-7M

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, CL Med. Second Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								UNCONFINED + FIELD VANE									
								QUICK TRIAXIAL × LAB VANE									
							WATER CONTENT (%)										
225.0	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Topsoil																
0.1	Silty sand, fine		1	SS	11	V _s *											
	Compact Brown Dry																
	fine sand layers																
	trace silt		2	SS	13												
	silt layers trace sand																
			3	SS	11												
221.0																	
4.0	Silt, trace sand trace clay																
	silty clay layers		4	SS	6												
	Loose Brown Wet																
	fine sand layers																
	Very loose		5	SS	2												
	Loose																
			6	SS	6												
216.6																	
8.4	Sand, with silt fine																
	Very loose Brown Wet																
	to compact		7	SS	3												
			8	SS	12												
212.8																	
12.2	Silty clay,																
	Firm Grey Wet		9	SS	2												
	to stiff																
			10	TW	PH												

Cont'd

RECORD OF BOREHOLE No 612-7M

2 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, CL Med. Second Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
210.0														
			11	TW	PH									
							209							
			12	TW	PH									
							208							
							207							
			13	SS	WH**									
							206							
							205							
							204							
			14	TW	PH									
							203							
							202							
							201							
							200							
							199							
							198							
			15	SS	1									
							197							
			16	TW	PH									
							196							

layered silt partings
Brown

Cont'd

RECORD OF BOREHOLE No 612-7M

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, CL Med. Second Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
195.0			17	SS	3												
							194										
							193										
							192										
			18	SS	3		191										
							190										
							189										
			19	SS	2		188										
							187										
186.9							186										
38.1	Silt, trace sand trace clay Compact Grey Wet		20	SS	10		185										
							184										
							183										
			21	SS	31		182										
181.7																	
43.3	End of borehole * 2003 04 13 ∇ Water level observed during drilling WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 612-8M

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 16, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
225.6	Ground Surface						20	40	60	80	100						
0.0	Topsoil		1	SS	3												
0.3	Silty sand, Loose Brown Moist to compact																
			2	SS	11												
			3	SS	10												
			4	SS	8												
			5	SS	8												
			6	SS	7												
217.1																	
8.5	Silty clay, silt layers																
	Firm Grey Wet		7	SS	4												
215.5																	
10.1	Sand, trace silt																
	Compact Brown Moist		8	SS	19												
			9	SS	18												
	Grey																
212.5																	
13.1	Silty clay,																
	Firm Grey Wet to stiff		10	SS	2												
	Cont'd																

Cont'd

RECORD OF BOREHOLE No 612-8M

2 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 16, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT. PLT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	W _p W W _L	20 40 60				
210.6														
210														
209														
208														
207														
206														
205														
204														
203														
202														
201														
200														
199														
198														
197														
196														

Cont'd

RECORD OF BOREHOLE No 612-8M

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 16, 2003 CHECKED BY _____





SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE					○							
								● QUICK TRIAXIAL x LAB VANE					WATER CONTENT (%)							
195.6							20	40	60	80	100	20	40	60						
185.4 40.2	Varved Very stiff Red/grey		11	SS	1															
180.8 44.8	Silt, trace sand trace clay Compact Grey Wet		13	SS	14															
Cont'd																				

RECORD OF BOREHOLE No 612-8M

4 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 16, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
	End of borehole																	
	* Borehole dry on completion of drilling																	
	<u>Borehole Backfill Legend:</u>																	
	 Native Backfill																	
	 Bentonite Seal																	
	 Filter Sand																	
	 Screen																	
	<u>Well Readings</u>																	
	Deep- 7.5m																	

RECORD OF BOREHOLE No 612-9M

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L
227.1	Ground Surface							20	40	60	80	100					
0.0	Topsoil		1	SS	13	V^*	227										
0.3	Silty sand, with fine sand partings and seams Compact Brown Moist to loose						226										
			2	SS	10		225										
							224										
			3	SS	6		223										
							222										
			4	SS	7												
	_____ Wet _____						221										
			5	SS	6		220										
219.8							219										
7.3	Sand, fine to coarse trace silt Compact Brown Wet			6	SS	17	218										
218.9							217										
8.2	Silty clay, silt layers Firm Brown Wet to stiff			7	SS	7	216										
							215										
							214										
	_____ with sand _____		8	SS	12	213											
215.8																	
11.3	Sand, fine to coarse trace silt Compact Grey Wet to dense						215										
				9	SS	25	214										
							213										
		10		SS	39												
212.5																	
14.6	Silty clay,																
	Cont'd																

RECORD OF BOREHOLE No 612-9M

2 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
212.1	Firm Grey Wet to stiff		11	SS	1		212							
							211		+					
			12	SS	1		210							
							209		+					
			13	TW	PH		208				o			
							207							
							206							
			14	TW	PH		205				o			
							204							
							203							
			15	SS	2		202							
							201							
							200							
			16	TW	PH		199				o			
							198							
	Varved													

RECORD OF BOREHOLE No 612-9M

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	20 40 60			
197.1	Red/ grey		17	TW	PH									
	silt layers													
	Grey		18	SS	8									
			19	TW	PH									
			20	SS	2									
185.6 41.5	Silt, with clayey silt seams trace sand trace clay Compact Grey Wet		21	SS	11									

Cont'd

RECORD OF BOREHOLE No 612-9M

4 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, CL Med. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
180.9			22	SS	27		182										
46.2	End of borehole Refusal on probable bedrock * 2003 04 13 ∇ Water level observed during drilling						181										

RECORD OF BOREHOLE No 612-10M

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+725, CL Med. Second Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○ QUICK TRIAXIAL		
224.7	Ground Surface						20	40	60	80	100	20	40	60	kN/m ³	GR SA SI CL				
0.0	Topsoil		1	SS	4	V*														
0.3	Silt, some to with sand trace clay						224													
	Loose Brown Moist to compact		2	SS	16		223										0 17 74 9			
							222													
221.3			3	SS	19		221										0 68 (32)			
3.4	Silty sand, fine to medium trace clay and gravel						220													
	Compact Brown Wet						219													
220.1	Clayey silt, trace sand		4	SS	4		218													
4.6	Firm Brown Wet						217													
	Grey		5	SS	2		216										0 1 74 25			
217.4						215														
7.3	Sand, fine trace silt trace clay		6	SS	15	214														
	Compact Grey Wet					213										0 87 (13)				
	Silty					212														
215.3			7	SS	10	211														
9.4	Clayey silt, trace fine sand					210														
	Soft Grey Wet		8	SS	3											0 0 58 42				
	With silt partings		9	SS	3															
			10	SS	2											0 0 65 35				

Cont'd

RECORD OF BOREHOLE No 612-10M

2 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+725, CL Med. Second Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa			w _p	w	w _L		GR SA SI CL				
209.7								20 40 60 80 100											
	Firm to stiff		11	SS	4		209		+	2									
			12	SS	5		208												
							207												
			13	TW	PH		206		○	■									
			14	SS	5														
							205			+									
							204												
203.4																			
21.3	Silty clay varved		15	SS	8		203												
	Stiff Grey Wet						202												
							201												
			16	SS	10		200												
							199												
							198												
			17	SS	9		197												
							196		+	1									
							195												

Cont'd

RECORD OF BOREHOLE No 612-10M

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+725, CL Med. Second Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
194.7							20	40	60	80	100									
191.2 33.5	Silt trace clay layered Compact Grey Wet Trace sand Dense Grey Wet		18	SS	9												0 0 37 63			
186.3 38.4	End of borehole Refusal on probable bedrock * 2003 04 01 ▽ Water level observed during drilling ■ Penetrometer Test																			

RECORD OF PENETRATION TEST No 612-11M

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+002, CL Med. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 25, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
222.3 0.0	Ground Surface													
							222							
							221							
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							
							209							
							208							

Cont'd

2 of 2 METRIC

G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 10+002, CL Med. Dill Twp.	ORIGINATED BY	RE
DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test
DATUM	Geodetic	DATE	March 25, 2003	COMPILED BY	PC
				CHECKED BY	

[illegible]

RECORD OF BOREHOLE No 612-12M

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+062.5, CL Med. Dill Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE March 26, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)			
223.2	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous						223													
0.2	Dark brown																			
222.6	Sand, trace silt trace gravel																			
0.6	Brown Moist																			
	End of Test Pit																			
	Refusal on probable bedrock																			
	* 2003 03 26																			
	Water level measured after drilling																			

RECORD OF BOREHOLE No 612-1N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+375, o/s 19m Rt. Secord Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
237.0	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-2N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+387.5, o/s 35.5m Rt. Second Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
232.0	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-3N

1 of 1

METRIC

G.W.P.	312-99-00	LOCATION	Hey 69 Sta. 10+400, o/s 19m Rt. Secord Twp.	ORIGINATED BY	CB/RE
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DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC

DATUM Geodetic DATE May 05, 2003 CHECKED BY _____

[illegible]

METRIC

ON_MOT LINES OVER BDRY SWAMP 612- MAY 06, 2003.GPJ ON_MOT.GDT 11/16/04 4:21:31 PM

RECORD OF BOREHOLE No 612-5N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+425, o/s 19m Rt. Secord Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		WATER CONTENT (%)	GR	SA	SI
222.9	Ground Surface					*														
0.0	Topsoil																			
0.1	End of borehole																			
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 612-6N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+437.5, o/s 51m Rt. Second Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____







SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			
221.2	Ground Surface					*		20	40	60	80	100								
0.0	Topsoil							○ UNCONFINED			+	FIELD VANE								
0.1	End of borehole							● QUICK TRIAXIAL			×	LAB VANE								
	Refusal on probable bedrock																			
	* Borehole dry on completion of drilling																			

RECORD OF BOREHOLE No 612-7N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+450, o/s 19m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa												
								○ UNCONFINED + FIELD VANE												
								● QUICK TRIAXIAL × LAB VANE												
					WATER CONTENT (%)															
220.4	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, fine fibrous		1	AS		▽*	220													
0.3	Dark brown Silty clay, trace sand					▼*	219													
	Stiff Grey/ Wet to firm brown		2	SS	4		218													
	With silty sand partings		3	SS	2		217													
	With clayey silt seams and sandy silt partings		4	SS	2		216													
				5	SS		20/5cm	215												
214.3	End of borehole																			
6.1	Refusal on probable bedrock																			
	* 2003 03 24																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			

RECORD OF PENETRATION TEST No 612-8N

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+462.5, o/s 50m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
220.3 0.0	Ground Surface													
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							
							209							
							208							
							207							
							206							

Cont'd

RECORD OF PENETRATION TEST No 612-8N

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+462.5, o/s 50m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY GD



SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
205.3							205							
203.5							204							
16.8	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 612-9N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+475, o/s 19m Rt. Secord Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 22, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
220.3	Top of Ice					▼*														
0.0	Ice/Snow																			
0.3	Peat, fine fibrous Dark Brown		1	SS	2	▼*	220													
			2	SS	1		219													
218.3																				
2.0	Silty clay, trace sand Firm Grey Wet to soft						218													
			3	SS	WR**		217													
							216													
							215													
							214													
			4	SS	WR		213													
							212													
							211													
							210													
	With silt seams					209														
5		SS	1		208															
	With sand and silty sand partings and seams																			
			6	SS	2															
			7	SS	3															
	Stiff		8	SS	9															
	With fine to medium sand seams																			
207.8			9	SS	12/7cm		208													
12.5	End of borehole																			
	Refusal on probable bedrock																			
	* 2003 03 22																			
	▽ Water level observed during drilling																			
	▼ Water level measured after drilling																			
	WR** Refers to penetration under the weight of rods only																			

RECORD OF BOREHOLE No 612-10N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+487.5, o/s 49m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY GD



SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
220.2	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Peat, coarse fibrous Dark brown		1	AS			220										
	Fine fibrous		2	SS	1		219										
	Brown						218										
216.8			3	SS	WR**		217										
3.4	Silty clay, trace sand Soft Blue/ Wet to firm grey						216										
	Varved Grey		4	SS	2	215											
			5	SS	5	214											
	With silty sand partings and seams					213											
			6	SS	4	212											
			7	SS	2	211											
						210											
209.5	Clayey silt, trace sand Stiff Grey Wet		8	SS	8	209											
10.7	With silty sand partings and seams		9	SS	10	208											
						207											
206.8	Silty sand, trace gravel Very Brown Moist dense		10	SS	59	206											
205.7	End of borehole Refusal on probable Cont'd																
14.5																	

RECORD OF BOREHOLE No 612-10N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+487.5, o/s 49m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
205.2	bedrock																
	* 2003 03 23  Water level observed during drilling  Water level measured after drilling WR** Refers to penetration under the weight of rods only																

RECORD OF BOREHOLE No 612-11N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+500, o/s 19m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)
								○ UNCONFINED	+ FIELD VANE						
								● QUICK TRIAXIAL	× LAB VANE						
220.2	Ground Surface						20 40 60 80 100		20 40 60						
0.0	Peat, fine fibrous Dark brown Amorphous		1	AS		4*	220					560			
							219						651		
			2	SS	WR**		218								
							217						534		
216.7	Clayey silt		3	SS	1		216								
3.5	Firm Grey Wet						215							0 0 72 28	
			4	SS	WR		214								
							213							0 0 64 36	
			5	TW	PH		212								
			6	SS	1		211							0 6 51 43	
							210								
			7	SS	4	209									
						208							0 12 55 33		
			8	SS	3	207									
						206									
			9	SS	2										
			10	SS	2										
207.2	Silty clay, trace sand varved														
13.0	Firm Red/grey Wet		11	SS	4										
									</						

Cont'd

+ , X⁵ :

Numbers refer to
Sensitivity

20
15 0 5
10

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 612-11N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+500, o/s 19m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 23, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)		
								○ UNCONFINED	+	FIELD VANE								
205.2								20	40	60	80	100						
							205											
			12	SS	4		204											
			13	SS	5		203											
							202											
201.6			14	SS	6/15cm													
18.6	End of borehole Refusal on probable bedrock * 2003 03 23 ▽ Water level observed during drilling ▼ Water level measured after drilling WR** Refers to penetration under the weight of rods only																	

RECORD OF BOREHOLE No 612-12N

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+562.5, o/s 19m Rt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	20 40 60			
223.3	Ground Surface													
0.0	Sand, trace silt Loose Brown Dry		1	SS	8									
221.6														
1.7	Clayey silt, trace sand Stiff Grey Moist		2	SS	14									
220.8														
2.5	Silt, trace sand silty clay layers Loose Brown Wet		3	SS	5									
	Sandy Compact		4	SS	12									
217.0														
6.3	Silty sand, fine trace gravel Compact Brown Wet		5	SS	12									
			6	SS	1***									
			7	SS	2***									
213.1														
10.2	Silty clay, trace sand Firm Grey Wet		8	SS	1									
			9	SS	WR**									
			10	SS	1									

Cont'd

METRIC

(%) STRAIN AT FAILURE

METRIC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W _p W W _L ————— WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV. DEPTH	DESCRIPTION	STRAT.PLOT	NUMBER	TYPE	"N" VALUES			20	40				60	80	100
208.3									SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100						

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	W _p W W _L	WATER CONTENT (%)				
								SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE						
208.3							208							
	No sand Stiff		11	TW	PM		207							
			12	SS	WR		206							
			13	SS	2		205							
			14	SS	5		204							
			15	SS	3		203							
			16	SS	4		202							
			17				201							
			18				200							
			19				199							
			20				198							
	Layered						197							
							196							
							195							
							194							
							193							
							192							
							191							
							190							
							189							
							188							

RECORD OF BOREHOLE No 612-12N

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+562.5, o/s 19m Rt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
193.3							193										
			17	SS	5		192										
							191										
	Varved						190										
			18	SS	7		189										
							188										
187.6							187										
35.7	Clayey silt, trace sand Firm Grey Wet to stiff		19	SS	7		186										
							185										
184.9							184										
38.4	Silt, trace fine sand Compact Grey Wet		20	SS	10		183										
							182										
	Fine sand partings						181										
			21	SS	19		180										
							179										

Cont'd

RECORD OF BOREHOLE No 612-13N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, o/s 19m Rt. Secord Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
DATUM Geodetic DATE April 13, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
					WATER CONTENT (%)												
225.0	Ground Surface						20	40	60	80	100						
0.0	Topsoil																
0.1	Silty sand, fine		1	SS	13	V*											
	Compact Brown Dry																
			2	SS	14												
221.8	Silt, trace sand trace clay		3	SS	11												
3.2	Loose to Grey Dry compact																
	_____ Wet																
			4	SS	6												
	Sand layers trace silty clay																
			5	SS	11												
			6	SS	12												
216.5	Sand, with silt fine																
8.5	Loose Brown Wet																
			7	SS	10												
	_____ Grey																
			8	SS	8												
213.4	Silty clay, Firm Grey Wet																
11.6			9	SS	WH												
211.7	End of borehole																
13.3																	
	* 2003 04 13																
	▽ Water level observed during drilling																

RECORD OF BOREHOLE No 612-14N

1 of 4


METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, o/s 42m Rt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa						
222.3	Ground Surface							20 40 60 80 100		20 40 60				
0.0	Silty sand, fine		1	SS	11		222							
	Compact Brown Moist													
	silt layers		2	SS	11		221							
	Thin partings clay						220							
	Very loose Wet		3	SS	4		219							
218.3	Silt, trace sand trace clay						218							
4.0	Compact Brown Wet to loose		4	SS	10		217							
216.9	Sand, fine trace silt						216							
5.4	Loose Brown Wet		5	SS	7		215							
	with silt		6	SS	1		214							
	Very loose Grey						213							
213.5	Silt, trace sand trace clay		7	SS	2		212							
8.8	Very loose Grey Wet						211							
212.2	Clayey silt, Firm to stiff Grey Wet		8	SS	WH**		210							
10.1	Silt layers		9	TW	PH		209							
			10	SS	WH		208							
	Cont'd													

Cont'd

METRIC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT	NATURAL MOISTURE CONTENT	LIQUID LIMIT	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT.PLOT	NUMBER	TYPE	*N" VALUES									
								SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE						
207.3							20 40 60 80 100 20 40 60 80 100	w _p ————— w ————— w _L WATER CONTENT (%) 20 40 60					GR SA SI C	

[illegible]

RECORD OF BOREHOLE No 612-14N

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, o/s 42m Rt. Secord Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
DATUM Geodetic DATE April 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)
								○ UNCONFINED	+	×						
								● QUICK TRIAXIAL								
192.3							20	40	60	80	100					
187.3 35.0	Silt, trace sand trace clay Compact Grey Wet		17	TW	PM											
			18	SS	3											
			19	SS	10											
177.9 44.4	End of borehole															
										</						

Cont'd

+ , X⁵

Numbers refer to
Sensitivity

20
15 — 5
10






(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 612-14N

4 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, o/s 42m Rt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	20			40	60	80	100	W _p	W	W _L			
	Refusal on probable bedrock * 2003 04 11  Water level observed during drilling WH** Refers to penetration under the weight of rods and hammer <u>Borehole Backfill</u> <u>Legend:</u>  Native Backfill  Bentonite Seal  Filter Sand  Screen <u>Well Readings</u> April 29, 2003 DEEP - 5.1m SHALLOW - 5.5m April 14, 2003 DEEP - 5.95m SHALLOW - 5.52m																	

RECORD OF BOREHOLE No 612-15N

2 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+600, o/s 19m Rt. Secord Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 03, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	20 40 60			
210.4														
			11	SS	WR		210							
							209							
			12	SS	1		208							0 0 64 36
							207							
			13	SS	1		206							
							205							
			14	SS	WR		204							0 0 59 41
							203							
							202							
							201							
	Varved		15	SS	WR		200							
							199							
							198							
			16	SS	1		197							
							196							

Cont'd

METRIC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT W _p W W _L ————— WATER CONTENT (%) 20 40 60	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV. DEPTH	DESCRIPTION	STRAT.PLOT	NUMBER	TYPE	"N" VALUES			20	40				60	80	100
195.4									SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE 20 40 60 80 100						GR SA SI C

[illegible]

RECORD OF BOREHOLE No 612-17N

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, o/s 39m Rt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 15, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		
224.2	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous					V _s *											
0.2	Dark brown Sand, trace silt		1	SS	5												
	Loose Brown Dry																
223.0																	
1.2	Silty sand, fine																
	Compact Brown Moist		2	SS	14												
221.8																	
2.4	Silt, with sand																
	Compact Brown Dry		3	SS	12												
	Fine sand layers																
	Loose Wet		4	SS	5												
218.8																	
5.4	Sand, trace silt																
	Compact Brown Dry																
			5	SS	23												
217.2																	
7.0	Clayey silt																
	Stiff Grey Wet																
			6	SS	9												
215.7																	
8.5	Sand, trace silt																
	Very Brown Wet																
	loose to																
	loose		7	SS	4												
			8	SS	9												
212.6																	
11.6	Silty clay																
	Firm Grey Wet																
	to stiff		9	SS	WH**												
			10	TW	PH												

Cont'd

METRIC

ON_MOT VER3 SWAMP 612- APRIL 21, 2003.GPJ ON_MOT.GDT 11/16/04 3:45:11 PM
 +, X⁵: Numbers refer to Sensitivity 20 15 10 5 0
 (%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 612-17N

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, o/s 39m Rt. Secord Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
DATUM Geodetic DATE April 15, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE										○		
								● QUICK TRIAXIAL × LAB VANE												
194.2							20	40	60	80	100	20	40	60						
	with silt layers Grey Wet		15	SS	2		194													
							193													
							192													
							191													
							190													
							189													
							188													
							187													
							186													
							185													
186.1 38.1	Silt, trace sand trace clay Grey Wet		18	SS	16		184													
Compact																				
183.1 41.1	End of borehole Refusal on probable bedrock																			
	* 2003 04 15																			
	▽ Water level observed during drilling																			
	WH** Refers to penetration under the weight of rods and hammer																			

RECORD OF BOREHOLE No 612-18N

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta.10+650, o/s 19m Rt. Secord Twp. ORIGINATED BY CB
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
DATUM Geodetic DATE April 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)	
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)
								20 40 60 80 100										
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE										
226.6	Ground Surface																	
0.0	Peat, fine fibrous		1	SS	4	Ψ*	226									GR SA SI CL		
0.3	Dark brown Sand, fine to coarse with silt						225											
	Very loose Grey Moist		2	SS	6		224											
	Loose						223											
	Compact		3	SS	12		222											
222.0							221											
4.6	Silt, with sand trace clay		4	SS	11		220											
	Very loose Wet		5	SS	3		219											
	Compact Brown Wet		6	SS	28		218											
	Some clay Grey		7	SS	18		217											
216.4							216											
10.2	Sand, fine to medium trace silt		8	SS	27		215											
	Compact Grey Wet		9	SS	26		214											
213.5							213											
13.1	Clayey silt, Stiff Grey Wet to firm		10	SS	2		212											

Cont'd

Cont'd

RECORD OF BOREHOLE No 612-18N

2 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta.10+650, o/s 19m Rt. Secord Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa					w _p	w	w _L						
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE													
211.6							20	40	60	80	100										
	Trace silt <																				


Cont'd

RECORD OF BOREHOLE No 612-18N

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta.10+650, o/s 19m Rt. Secord Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa								
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE					
196.6							20	40	60	80	100					
185.8 40.8	Trace sand		17	SS	1											
			18	TW	PH											
			19	SS	1											
			20	SS	2											
							</									

Cont'd

METRIC

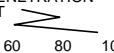
20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 612-20N

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 40m Rt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES								W _p	w	W _L					
								SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
226.7	Ground Surface																			
0.0	Topsoil																			
0.1	Silty sand, fine		1	SS	2															
	Loose Brown Dry to compact																			
							226													
			2	SS	9		225													
							224													
			3	SS	10		223													
222.7																				
4.0	Silt, trace sand trace clay clayey silt layers																			
	Loose Brown Moist to compact		4	SS	5		222													
							221													
			5	SS	12		220													
219.7																				
7.0	Sand, trace silt																			
	Compact Brown Dry																			
							219													
218.6			6	SS	11															
8.1	Clayey silt, Stiff Brown Wet						218													
			7	SS	9		217													
216.6																				
10.1	Sand, trace silt																			
	Loose Brown Wet to very loose						216													
							215													
			9	SS	3		214													
213.7																				
13.0	Silty sand, fine																			
	Compact Grey Wet																			
							213													
			10	SS	19															
212.1																				
14.6	Silty clay,						212													
	Cont'd																			

METRIC

ON_MOT VER3 SWAMP 612- APRIL 22, 2003.GPJ ON_MOT.GDT 11/16/04 3:45:54 PM

RECORD OF BOREHOLE No 612-20N

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 40m Rt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 21, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE								
196.7								20	40	60	80	100								
	Layered 																			

RECORD OF BOREHOLE No 612-21N

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+700, o/s 19m Rt. Secord Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
226.8	Ground Surface																
0.0	Topsoil																
0.1	Sand, with silt trace gravel		1	AS													
	Very loose Brown Wet						226										
225.1																	
1.7	Silt, trace sand trace clay		2	SS	18		225										
	Compact Grey Dry with fine sand																
	Brown Moist						224										
			3	SS	12		223										
			4	SS	21		222										
							221										
220.4																	
6.4	Sand, fine trace silt trace gravel		5	SS	26		220										
	Compact Brown Moist																
219.2																	
7.6	Silty clay, with silt layers trace sand		6	SS	9		219										
	Stiff Brown Wet						218										
217.7																	
9.1	Sand, fine trace silt trace gravel		7	SS	21		217										
	Compact Brown Wet to dense																
			8	SS	30		216										
							215										
			9	SS	25		214										
							213										
213.4																	
13.4	Silty clay, Firm Grey Moist to stiff		10	SS	5		212										
		Cont'd															

Cont'd

RECORD OF BOREHOLE No 612-21N

2 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+700, o/s 19m Rt. Secord Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
211.8																	
			11	SS	8												
							211										
							210										
			12	SS	8												
							209										
			13	SS	7												
							208										
							207										
							206										
							205										
			14	SS	5												
							204										
							203										
							202										
			15	SS	10												
							201										
							200										
							199										
			16	SS	15												
							198										
							197										

RECORD OF BOREHOLE No 612-21N

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+700, o/s 19m Rt. Secord Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	*N* VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)			GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE												
196.8								20	40	60	80	100											
			17	SS	12		196							○									
							195																
							194																
193.3																							
33.5	Silt, trace sand																						
193.0	trace clay		18	SS	50/5cm		193							○									
33.8	Dense Grey Wet End of borehole Refusal on probable bedrock 																						

RECORD OF BOREHOLE No 612-23N

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+725, o/s 34m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 15, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
							20	40	60	80	100	20	40	60						
226.2	Ground Surface																			
0.0	Peat, fine fibrous		1	SS	4															
0.3	Dark brown Sand, trace silt																			
	Very Brown Moist loose to loose																			
	with silty sand seams		2	SS	18															
	Compact																			
			3	SS	11															
			4	SS	21															
	with sandy silt and silt seams																			
	Wet		5	SS	16															
			6	SS	10															
	Loose																			
			7	SS	8															
216.1																				
10.1	Silty clay																			
	Stiff Grey Wet		8	SS	2															
			9	TW	PH															
			10	SS	2															

Cont'd

METRIC





ON_MOT VER3 SWAMP 612- APRIL 16, 2003.GPJ ON_MOT.GDT 11/16/04 3:44:19 PM

RECORD OF BOREHOLE No 612-23N

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+725, o/s 34m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 15, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
196.2	<p><u>Borehole Backfill</u> <u>Legend:</u></p> <p> Native Backfill</p> <p> Bentonite Seal</p> <p> Filter Sand</p> <p> Screen</p> <p><u>Well Readings</u></p> <p>Deep- 6.1m</p>																

RECORD OF PENETRATION TEST No 612-24N

1 of 3 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+737.5, o/s 4m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 25, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
224.1 0.0	Ground Surface						224							
							223							
							222							
							221							
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							

Cont'd

2 of 3 METRIC

Cont 'd

RECORD OF PENETRATION TEST No 612-24N

3 of 3 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+737.5, o/s 4m Rt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 25, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L		
194.1							194							
							193							
							192							
							191							
							190							
							189							
188.3 35.8	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 612-26N

1 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+002, o/s 19m Rt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NQ Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 04, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									WATER CONTENT (%)
223.4	Ground Surface																
0.0	Peat, coarse fibrous		1	SS	8	▽*	223										
0.1	Dark brown Silt, trace fine sand trace clay						222										
	Loose Brown Wet Moist		2	SS	6		221										
220.4							220										
3.0	Sand, fine to medium with silt trace gravel		3	SS	4		219										
	Very loose Grey Wet to compact		4	SS	13		218										
217.9							217										
5.5	Silty clay, trace fine sand		5	SS	2		216										
	Firm Grey Wet						215										
	Silt partings		6	SS	1		214										
						213											
			7	SS	3	212											
						211											
			8	SS	2	210											
						209											
	Varved		9	SS	5												
			10	SS	4												

Cont'd

RECORD OF BOREHOLE No 612-26N

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+002, o/s 19m Rt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NQ Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 04, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
208.4			11	SS	6		208										
207.4	Trace gravel																
16.0	End of borehole Refusal on probable bedrock * 2003 04 04 ▽ Water level observed during drilling																

1 of 1 **METRIC**

MOT DCPT SWAMP 612- MARCH 29, 2003.GPJ ON_MOT.GDT 11/16/04 3:54:06 PM

RECORD OF BOREHOLE No 612-28N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+012.5, o/s 35m Rt. Dill Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
223.3	Ground Surface						20	40	60	80	100									
0.0	Peat, fine fibrous																			
0.2	Dark brown Silty sand, trace gravel		1	SS	WH															
	Very Brown Moist loose to compact																			
	Wet																			
			2	SS	11															
			3	SS	4															
218.8																				
4.5	Clay, trace sand trace silt																			
	Firm Grey Wet		4	SS	2															
217.9																				
5.4	End of borehole																			
	Refusal on probable bedrock																			

RECORD OF BOREHOLE No 612-30N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+037.5, o/s 4m Rt. Dill Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					w _p w w _L				
223.0	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	1	4*											
0.2	Dark brown																
	Sand, trace silt trace gravel																
221.8	Very loose Brown Wet						222										
1.2	Sand and gravel, trace silt		2	SS	14		221										
	Compact Brown Wet						220										
219.7	Clay, trace sand trace silt		3	SS	WH**		219										
3.3	Soft to Grey Wet firm						218										
	Silt layers		4	SS	1		217										
217.3	Sand, layers clay trace silt trace gravel						216										
5.7	Very loose Grey Wet		5	SS	1	215											
215.8	Clay, trace sand trace silt																
7.2	Soft Grey Wet		6	SS	WH												
214.6	End of borehole																
8.4	Refusal on probable bedrock																
	* 2003 03 31																
	∇ Water level observed during drilling																
	WH** Refers to penetration under weight of rods and hammer																

RECORD OF BOREHOLE No 612-30NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+037.5, o/s 34m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____









SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100					
224.2 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-31N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+050, o/s 18.75m Rt. Dill Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
222.1	Ground Surface						20	40	60	80	100	20	40	60						
0.0	Peat, fine fibrous Dark brown		1	SS	24	  WR** WH**	222													
220.9							221													
1.2	Silty clay, trace sand Stiff Grey Wet to firm		2	SS	2		220													
							219													
			3	SS	WR**		218													
							217													
216.4	Clayey silt, trace sand Firm Grey Wet		4	SS	WH**		216													
214.9							215													
7.2	Sand and gravel, trace silt Compact Grey Wet		6	SS	26		214													
213.7																				
8.4	End of borehole Refusal on probable bedrock																			
	* 2003 03 31																			
	 Water level observed during drilling																			
	 Water level measured after drilling																			
	WR** Refers to penetration under weight of rods only																			
	WH** Refers to penetration under weight of rods and hammer																			

RECORD OF BOREHOLE No 612-31NA

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+062.5, o/s 46m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
224.2 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-32N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+075, o/s 19m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
223.2	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-33N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+087.5, o/s 5m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
228.3 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-34N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+087.5, o/s 34m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
223.3	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-35N

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+100, o/s 19m Rt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
227.9	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-1S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+375, o/s 19m Lt. Secord Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
235.5	Ground Surface																
0.0	Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-2S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+387.5, o/s 35.5m Lt. Second Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
231.9 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-3S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+400, o/s 19m Lt. Secord Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 05, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
229.4 0.0	Ground Surface Bedrock at surface																
	* Borehole dry on completion of drilling																

RECORD OF BOREHOLE No 612-5S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+430, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD




SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE												
220.3	Ground Surface							20	40	60	80	100								
0.0	Peat, fine fibrous																			
0.2	Dark brown		1	AS		▽* ▽*														
	Silt, trace sand trace clay																			
	Compact Grey/ brown Moist																			
	With silty sand seams		2	SS	14															
	Brown Wet																			
216.8			3	SS	14															
3.5	End of borehole																			
	Refusal on probable bedrock																			
	* 2003 03 24																			
	▽ Water level observed during drilling																			
	▽ Water level measured after drilling																			

RECORD OF BOREHOLE No 612-6S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+437.5, o/s 51m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 22, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL x LAB VANE															
220.3	Ground Surface							20	40	60	80	100		20	40	60							
0.0	Peat, fine fibrous Dark brown		1	SS		 *	220																
219.4							219																
0.9	Silty clay, trace sand Firm Grey Wet to soft		2	SS	8		218																
							217																
			3	SS	1																		
215.9	End of borehole Refusal on probable bedrock						216																
4.4																							
							</																

* 2003 03 22
 ▼ Water level measured
 after drilling
 ■ Penetrometer test

RECORD OF BOREHOLE No 612-7S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+450, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
DATUM Geodetic DATE March 22, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					WATER CONTENT (%)				
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE	W _p	W	W _L			
220.3	Ground Surface						20	40	60	80	100						
0.0	Peat, fine fibrous		1	SS	1	* ↓	220										
219.7	Dark brown																
0.6	Silty clay, trace sand						219										
	Stiff Grey Wet to soft			2	SS		6	218									
	Clayey silt seams			3	SS	1	217										
216.2																	
4.1	End of borehole																
	Refusal on probable bedrock																
	* 2003 03 22																
	Water level observed during drilling																
	Water level measured after drilling																
	Penetrometer test																

RECORD OF PENETRATION TEST No 612-8S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+460, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

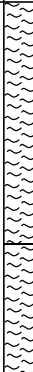






SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
220.3 0.0	Ground Surface													
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
							212							
211.5 8.8	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF BOREHOLE No 612-9S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+470, o/s 19m Lt. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE Continuous Flight Hollow Stem Augers COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE									
								● QUICK TRIAXIAL × LAB VANE									
							WATER CONTENT (%)										
220.3	Ground Surface						20	40	60	80	100	20	40	60			
0.0	Peat, fine fibrous Dark brown		1	AS		 	220										
							219										
			2	SS	WR**		218										
	Brown						217										
216.6			3	SS	1		216										
3.7	Silty clay, trace sand Soft Grey Wet to firm						215										
			4	SS	2		214										
							213										
							212										
			5	SS	2		211										
			6	SS	2		210										
	Silty sand partings		7	SS	3												
209.2		8	SS	11/18cm													
11.1	End of borehole Refusal on probable bedrock																
	* 2003 03 24																
	 Water level observed during drilling																
	 Water level measured after drilling																
	WR** Refers to penetration under the weight of rods only																

RECORD OF BOREHOLE No 612-10S

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+525, o/s 49m Lt. Secord Twp. ORIGINATED BY MR
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								20 40 60 80 100									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
WATER CONTENT (%)																	
20 40 60																	
222.0	Ground Surface																
0.0	Clayey silt, Stiff Grey Wet		1	SS	7	▽*											
	Sand layers Brown		2	SS	8												
219.3																	
2.7	Sand, trace silt Loose Brown Wet		3	SS	6												
	With silt Very loose Grey		4	SS	3												
216.3																	
5.7	Silt, with sand Very loose Grey Wet		5	SS	2												
214.8																	
7.2	Clayey silt, trace sand Firm Grey Wet		6	SS	WH**												
			7	SS	WH												
			8	TW	PH												
			9	SS	WH												
			10	SS	WH												
													</				

Cont'd

+ , X⁵ :

Numbers refer to
Sensitivity

20
15—○—5
10

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 612-10S

2 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+525, o/s 49m Lt. Second Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
207.0														
	Stiff		11	SS	WH									
206														
205				12	SS	WH								
204														
203				13	SS	WH								
202														
201														
200			14	SS	WH									
199														
198														
197			15	SS	2									
196														
195														
194			16	TW	PH									
193														

Cont'd

RECORD OF BOREHOLE No 612-10S

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+525, o/s 49m Lt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
192.0							20	40	60	80	100												
186.9 35.1	Varved		17	SS	WH		191																
		18	SS	2	188																		
	Silt, trace sand trace clay Loose Grey Wet						187																
							186																
		19	SS	6	185																		
					184																		
183.8 38.2	End of borehole Refusal on probable bedrock 																						

RECORD OF BOREHOLE No 612-11S

1 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+530, o/s 19m Lt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
221.2	Ground Surface						20	40	60	80	100						
0.0	Peat, coarse fibrous						20	40	60	80	100						
0.2	<div><div>Brown</div><div>Silty sand, fine trace gravel layered silts and clays</div><div>Very Grey Wet loose</div></div>		1	SS	3												
			2	SS	4												
	<div>With silt</div> <div>Loose Rusty brown /grey</div>																
			3	SS	6												
			4	SS	8												
215.7																	
5.5	<div>Silt, trace sand trace clay</div> <div>Very Grey Wet loose</div>																
			5	SS	1												
214.6																	
6.6	<div>Silty clay,</div> <div>Firm Grey Wet</div>																
			6	SS	WH**												
			7	SS	WH												
			8	SS	1												
			9	SS	WH												
			10	SS	1												

Cont'd

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 612-11S

3 of 3

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+530, o/s 19m Lt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 01, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE									
191.2							20	40	60	80	100						
	Varved with thin partings of silt		18	SS	WH		191										
							190										
							189										
							188										
			19	SS	WH		187										
							186										
							185										
184.6 36.6	End of borehole Refusal on probable bedrock																
	<div>* 2003 04 01</div> <div> Water level measured after drilling</div> <div>WH** Refers to penetration under weight of rods and hammer</div> <div>WR** Refers to penetration under weight of rods only</div>																

Varved
with thin partings of
silt

* 2003 04 01

▼ Water level measured
after drilling

WH** Refers to penetration
under weight of rods
and hammer

WR** Refers to penetration
under weight of rods
only

RECORD OF BOREHOLE No 612-12S

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+550, o/s 19m Lt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)		
224.3	Ground Surface						20 40 60 80 100											
0.0	Peat, fine fibrous		1	SS	7	k _v *	224											
0.3	Dark brown Sand, fine some silt trace clay Loose Brown Moist to compact						223											
			2	SS	19												0 84 (16)	
221.9							222											
2.4	Silt, some clay trace sand clayey silt seams Compact Brown Wet		3	SS	12		221											
							220											
			4	SS	3		219										0 5 78 17	
							218											
			5	SS	10		217											
217.3							216											
7.0	Sand, fine trace silt Loose Brown Wet to compact		6	SS	7		215											
						214												
			7	SS	10	213										0 93 (7)		
						212												
						211												
			8	SS	16	210												
213.3																		
11.0	Silt, Very loose Grey Wet		9	SS	2													
212.6	Clayey silt, Firm Grey Wet																	
11.7																		
			10	SS	3											0 0 65 35		
			11	SS	WR**													

RECORD OF BOREHOLE No 612-12S

2 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+550, o/s 19m Lt. Secord Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)	
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE							
209.3								20 40 60 80 100		20 40 60						
	Stiff						209	+	2					0 0 55 45		
			12	SS	3		208									
							207									
			13	SS	WR		206						○			
							205									
							204									
							203									
			14	SS	5		202									
							201									
							200								○	
199.9 24.4	Clay, trace sand Firm Grey Wet		15	SS	5		199							17.3 0 1 24 75		
							198									
							197						○			
			16	TW	PH		196									
							195									

Cont'd

RECORD OF BOREHOLE No 612-12S

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+550, o/s 19m Lt. Second Twp. ORIGINATED BY MR
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa							WATER CONTENT (%)	
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE							
194.3								20 40 60 80 100								
190.8 33.5	Silty clay Stiff Grey Wet		17	SS	3											
182.9 41.4	Silt, some clay trace sand Compact Grey Wet		18	SS	8											

Cont'd

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF BOREHOLE No 612-14S

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, o/s 42m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE										○		
								● QUICK TRIAXIAL × LAB VANE												
221.8	Ground Surface						20	40	60	80	100									
0.0	Topsoil		1	SS	17	* ↓														
221.4																				
0.4	Sand, trace silt																			
	Compact Brown Moist to loose																			
			2	SS	8															
	Silty																			
			3	SS	13															
	_____ Wet																			
			4	SS	4															
216.3																				
5.5	Silt, trace sand trace clay sandy silt partings and seams																			
	Compact Brown Wet to loose		5	SS	14															
			6	SS	8															
212.3			7	SS	21															
9.5	Sand, trace silt																			
	Compact Brown Wet																			
			8	SS	20															

	Loose Grey		9	SS	6															
208.7																				
13.1	Silty clay, silt layers																			
	Stiff Grey Wet		10	SS	2															
	Cont'd																			

Cont'd

RECORD OF BOREHOLE No 612-14S

2 of 4



METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, o/s 42m Lt. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	W	W _L		
206.8			11	SS	2									
							206		+					
			12	SS	2		205							
							204		+					
			13	SS	1		203							
							202							
							201							
			14	SS	1		200							
							199							
							198							
			15	TW	PH		197							
							196							
							195							
	Varved		16	SS	1		194							
							193							
							192							

Cont'd

METRIC

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT.PLOT	NUMBER	TYPE	*N* VALUES							
								SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE				
191.8												

[illegible]

RECORD OF BOREHOLE No 612-14S

4 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+575, o/s 42m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 10, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L					
								<div><div>○ UNCONFINED</div><div>● QUICK TRIAXIAL</div></div> <div><div>+ FIELD VANE</div><div>× LAB VANE</div></div>												
								20	40	60	80	100								
172.4 49.4	Dense With sandy silt seams and sand partings						176													
			22	SS	35															
			23	SS	36															
	End of borehole 																			

RECORD OF BOREHOLE No 612-15S

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+600, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p w W _L	20 40 60			
225.3 0.0	Ground Surface Topsoil		1	SS	11	V*	225							0 59 (41)
224.8 0.5	Silty sand, trace clay Compact Brown Moist		2	SS	12		224							
							223							
			3	SS	15		222							
221.6 3.7	Sand, trace silt Loose Brown Wet		4	SS	7		221							
							220							
	Brown Moist		5	SS	8		219							
			6	SS	9		218							
							217							
							216							
	Compact Grey		7	SS	21	215								
			8	SS	29	214								
						213								
	Loose		9	SS	6	212								
212.2 13.1	Clayey silt, trace sand Firm Grey Wet		10	SS	5	211								

Cont'd

RECORD OF BOREHOLE No 612-15S

2 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+600, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p w W _L	20 40 60			
210.3														
210.1														
15.2	Silty clay, trace sand Stiff Grey Wet		11	SS	1		210							
							209							
			12	SS	WR**		208							
							207							
			13	SS	WR		206							
							205							
			14	SS	2		204							
							203							
							202							
	Varved Layered Soft to firm Red/grey		15	SS	1		201							
							200							
							199							
			16	SS	2		198							
							197							
							196							



Cont'd

RECORD OF BOREHOLE No 612-15S

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+600, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT				PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)		
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE										
195.3																			
	Clayey silt seams Grey		17	SS	2														
185.7 39.6	Clayey silt, trace sand Firm Grey Wet to very stiff		20	SS	WR														
			21	SS	11														

Cont'd

RECORD OF BOREHOLE No 612-15S

4 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+600, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE March 31, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					W _p	w	W _L		
							20	40	60	80	100						
			22	SS	22												
			23	SS	27												
			24	SS	24												
171.0																	
54.3	Silty sand, trace gravel Loose Grey Wet		25	SS	6												
168.6																	
56.7	End of borehole Refusal on probable bedrock																
	* 2003 03 31																
	▽ Water level observed during drilling																
	▼ Water level measured after drilling																
	■ Penetrometer test																
	WR** Refers to penetration under the weight of rods only																

RECORD OF BOREHOLE No 612-17S

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, o/s 39m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE								○		
								● QUICK TRIAXIAL		× LAB VANE										
225.5	Ground Surface							20	40	60	80	100								
0.0	Topsoil		1	SS	4	▽*	225							○						
0.3	Silty sand						224							○						
	Compact Brown Moist						223													
			2	SS	11		222							○						
							221							○						
							220													
	Wet						219							○						
			4	SS	15		218							○						
	Clayey silt seams						217													
							216							○						
218.8			5	SS	11	215								○						
6.7	Silt, trace sand trace clay					214								○						
	Compact Brown Wet					213								○						
			6	SS	11	212														
						211														
		Silty clay seams				210								○						
	Loose Grey					209														
			7	SS	6	208								○						
215.1						207														
10.4	Sand, fine to medium trace silt					206								○						
	Very Brown Moist					205								○						
	loose to compact					204														
						203								○						
		Coarse sand				202								○						
	Dense Wet		10	SS	32	201														
210.6						200														

METRIC

ON_MOT VER3 SWAMP 612- APRIL 10, 2003.GPJ ON_MOT.GDT 11/16/04 3:39:20 PM

+ , X⁵ : Numbers refer to Sensitivity

20
15 ○ 5 (% STRAIN AT FAILURE)
10

RECORD OF BOREHOLE No 612-17S

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, o/s 39m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE															
195.5							20	40	60	80	100	20	40	60									
184.0 41.5	Varved <																						


Cont'd

RECORD OF BOREHOLE No 612-17S

4 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+625, o/s 39m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 08, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
179.2			24	SS	13		180										
46.3	End of borehole																
	* 2003 04 08  Water level observed during drilling WR** Refers to penetration under weight of rods only																

METRIC

(%) STRAIN AT FAILURE

RECORD OF BOREHOLE No 612-18S

2 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+650, o/s 19m Lt. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)				
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa					w _p	w	w _L		GR	SA	SI	CL	
								○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE												
210.9																					
210.7																					
15.2	Clayey silt, Stiff Grey Wet		11	SS	1														0 0 70 30		
					12	SS	1														
					13	SS	1														
			14	SB	1																
																</					

Cont'd

RECORD OF BOREHOLE No 612-18S

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+650, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
DATUM Geodetic DATE April 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT			PLASTIC LIMIT W _p	NATURAL MOISTURE CONTENT W	LIQUID LIMIT W _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL	
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa								WATER CONTENT (%)
								○ UNCONFINED	+ FIELD VANE							
								● QUICK TRIAXIAL	× LAB VANE							
195.9							20 40 60 80 100									
	Stiff		18	TW	PH											
			19	SS	8											
193.9																
32.0	Sandy silt, with fine sand seams trace clay Compact Grey Wet															
			20	SS	11											
191.4																
34.5	Silty clay Stiff Grey															
			21	SS	6											
			22	SS	8											
	Trace sand															
			23	SS	3											
181.1																
44.8	End of borehole	Cont'd														

RECORD OF BOREHOLE No 612-18S

4 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+650, o/s 19m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 02, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
	Refusal on probable bedrock * 2003 04 02 ▽ Water level observed during drilling ▼ Water level measured after drilling																

RECORD OF BOREHOLE No 612-20S

1 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 48m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 11, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL		
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa					WATER CONTENT (%)									
						○ UNCONFINED			+ FIELD VANE			● QUICK TRIAXIAL							× LAB VANE	
223.7	Ground Surface																			
0.0	Topsoil		1	SS	5															
0.3	Silty sand																			
	Loose Brown Moist																			
221.3			2	SS	8															
2.4	Silt, trace sand trace clay silty sand partings and seams																			
	Very loose Brown Wet		3	SS	4															
219.7																				
4.0	Sand, trace silt																			
	Compact Brown Moist		4	SS	12															
218.5																				
5.2	Silt, trace sand trace clay																			
	Loose Brown Wet																			
217.3																				
6.4	Silty clay, silt layers		5	SS	5															
	Firm Grey Wet to stiff																			
214.2			6	SS	3															
214.2			7	SS	19															
9.5	Sand, trace silt																			
	Compact Grey Wet																			
210.3																				
13.4	Silty clay																			
	Stiff Grey Wet		10	SS	2															

Cont'd

RECORD OF BOREHOLE No 612-20S

2 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 48m Lt. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 11, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC NATURAL LIQUID LIMIT MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p	w	W _L		
208.7														
			11	SS	1		208							
			12	TW	PH		207							
							206							
			13	SS	WH**		205							
							204							
							203							
			14	SS	1		202							
							201							
							200							
			15	SS	1		199							
							198							
							197							
			16	TW	PH		196							
							195							
							194							

Cont'd

RECORD OF BOREHOLE No 612-20S

3 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 48m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 11, 2003 CHECKED BY _____





SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	+ FIELD VANE	× LAB VANE									
193.7							20	40	60	80	100	20	40	60						
	silt layers Varved Red/ grey		17	SS	1		193													
							192													
							191													
							190													
			18	SS	1		189													
							188													
							187													
			19	SS	9		186													
							185													
							184													
184.1 39.6	Silt, trace sand trace clay Compact Grey Wet		20	SS	13		183													
					182															
					181															
180.4 43.3	End of borehole * 2003 04 11 ▽ Water level observed during drilling WH** Refers to penetration under weight of rods and hammer Cont'd																			

RECORD OF BOREHOLE No 612-20S

4 of 4

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+675, o/s 48m Lt. Secord Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 11, 2003 CHECKED BY _____

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
	<p><u>Borehole Backfill</u> <u>Legend:</u></p> <p> Native Backfill</p> <p> Bentonite Seal</p> <p> Filter Sand</p> <p> Screen</p> <p><u>Well Readings</u> Shallow - 6.5m Deep- 6.1m</p>																

1 of 3 METRIC

MOT DCPT SWAMP 612- MARCH 29, 2003.GPJ ON_MOT.GDT 11/16/04 3:51:22 PM

2 of 3 **METRIC**

Cont 'd

RECORD OF PENETRATION TEST No 612-21S

3 of 3 METRIC


G.W.P.	312-99-00	LOCATION	Hwy 69 Sta. 10+687.5, o/s 45.5m Lt. Second Twp.	ORIGINATED BY	RE
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DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test	COMPILED BY	PC
------	----	-----	----	---------------	-------------------------------	-------------	----

DATUM Geodetic DATE March 24, 2003 CHECKED BY GD

[illegible]

METRIC

SOIL PROFILE			SAMPLES			GROUND WATER * CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT	PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)
ELEV. DEPTH	DESCRIPTION	STRAT.PLOT	NUMBER	TYPE	"N" VALUES								
								SHEAR STRENGTH kPa					
224.7	Ground Surface					* ○ UNCONFINED ● QUICK TRIAXIAL	+ FIELD VANE × LAB VANE						GR SA SI C

[illegible]

METRIC

ON_MOT VER3 SWAMP 612- APRIL 02, 2003.GPJ ON_MOT.GDT 11/16/04 3:30:14 PM
 +, X⁵: Numbers refer to Sensitivity 20 15 10 5 0 5 10 15 20
 (%) STRAIN AT FAILURE

METRIC

20
15 — 5 (%) STRAIN AT FAILURE
10

RECORD OF PENETRATION TEST No 612-23S

1 of 3 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+712.5, o.s 4m Lt. Secord Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 25, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE LIQUID LIMIT CONTENT CONTENT CONTENT w_p w w_L			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE		WATER CONTENT (%)				
224.7 0.0	Ground Surface													
221.7 3.0	Auger to 3m													
215.9 8.8	Auger to 8.8m													
209.8	Cont'd													

RECORD OF PENETRATION TEST No 612-23S

2 of 3 **METRIC**

G.W.P. 312-99-00	LOCATION	Hwy 69 Sta. 10+712.5, o.s 4m Lt. Second Twp.	ORIGINATED BY	RE
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DIST	54	HWY	69	BOREHOLE TYPE	Dynamic Cone Penetration Test	COMPILED BY	PC
------	----	-----	----	---------------	-------------------------------	-------------	----

DATUM Geodetic DATE March 25, 2003 CHECKED BY GD

[illegible]

Cont 'd

3 of 3 METRIC

[illegible]

METRIC

SOIL PROFILE	SAMPLES				DYNAMIC CONE PENETRATION			
--------------	---------	--	--	--	--------------------------	--	--	--


Cont 'd

RECORD OF BOREHOLE No 612-25S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+725, o/s 34m Lt. Second Twp. ORIGINATED BY FP
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NW Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 14, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa										WATER CONTENT (%)		
								○ UNCONFINED	● QUICK TRIAXIAL	✕ LAB VANE	✚ FIELD VANE									
207.3							20	40	60	80	100	20	40	60						
	Varved Red/ grey		11	SS	1															
			12	SS	1															
			13	TW	PH															

RECORD OF PENETRATION TEST No 612-26S

1 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+737.5, o/s 36m Lt. Secord Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 26, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L	WATER CONTENT (%)			
222.3 0.0	Ground Surface													
							222							
							221							
							220							
							219							
							218							
							217							
							216							
							215							
							214							
							213							
							212							
							211							
							210							
							209							
							208							

Cont'd

RECORD OF PENETRATION TEST No 612-26S

2 of 2 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+737.5, o/s 36m Lt. Secord Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 26, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV. DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
207.3																	
207																	
206																	
205																	
204.1																	
18.2	End of dynamic cone penetration test Refusal on probable bedrock																

METRIC

ON_MOT VER3 SWAMP 612- APRIL 07, 2003.GPJ ON_MOT.GDT 11/16/04 3:35:52 PM

RECORD OF BOREHOLE No 612-27S

2 of 2

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+750, o/s 19m Lt. Secord Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE C.F.H.S.A. & NQ Wash Boring COMPILED BY PC
 DATUM Geodetic DATE April 03, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w_p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w_L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL						
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa													WATER CONTENT (%)		
								○ UNCONFINED		+ FIELD VANE											● QUICK TRIAXIAL		× LAB VANE
207.4							20	40	60	80	100	20	40	60									
206.1 16.3	Clay, Varved Soft Grey Wet to firm Trace fine sand Stiff		11	SS	2																		
			12	SS	4																		
			13	SS	3																		
			14	SS	8																		
198.3 24.1	End of borehole Refusal on probable bedrock * 2003 04 03 ▽ Water level observed during drilling																						

RECORD OF PENETRATION TEST No 612-31S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+012.5, o/s 35m Lt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 26, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT		PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20 40 60 80 100	20 40 60 80 100	W _p W W _L				
222.3 0.0	Ground Surface													
							222							
							221							
							220							
219.4 2.9	End of dynamic cone penetration test Refusal on probable bedrock													

RECORD OF PENETRATION TEST No 612-33S

1 of 1 **METRIC**

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+037.5, o/s 4m Lt. Dill Twp. ORIGINATED BY RE
 DIST 54 HWY 69 BOREHOLE TYPE Dynamic Cone Penetration Test COMPILED BY PC
 DATUM Geodetic DATE March 25, 2003 CHECKED BY GD

SOIL PROFILE		SAMPLES				GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT NATURAL MOISTURE CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			20	40	60	80	100	W _p	W	W _L		
223.3 0.0	Ground Surface																
							223										
							222										
							221										
							220										
							219										
							218										
							217										
							216										
215.1 8.2	End of dynamic cone penetration test Refusal on probable bedrock																

RECORD OF BOREHOLE No 612-34S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+050, o/s 19m Lt. Dill Twp. ORIGINATED BY CB
 DIST 54 HWY 69 BOREHOLE TYPE Excavator COMPILED BY PC
 DATUM Geodetic DATE March 26, 2003 CHECKED BY GD

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC NATURAL LIQUID LIMIT MOISTURE LIMIT CONTENT CONTENT			UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa ○ UNCONFINED + FIELD VANE ● QUICK TRIAXIAL × LAB VANE					W _p	W	W _L		
224.0	Ground Surface																
0.0	Peat, fine fibrous																
0.2	Dark brown																
223.4	Clay, trace sand trace silt																
0.6	Brown Moist																
	End of Test Pit																
	Refusal on probable bedrock																
	* 2003 03 26																
	▼ Water level measured after drilling																

RECORD OF BOREHOLE No 612-35S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+075, o/s 19m Lt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
226.1	Ground Surface																							
0.0	Topsoil																							
0.1	End of borehole																							
	Refusal on probable bedrock																							
	* Borehole dry on completion of drilling																							

RECORD OF BOREHOLE No 612-36S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+087.5, o/s 34m Lt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE				SAMPLES			GROUND WATER CONDITIONS	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT						PLASTIC LIMIT NATURAL MOISTURE CONTENT LIQUID LIMIT			UNIT WEIGHT γ	REMARKS & GRAIN SIZE DISTRIBUTION (%)			
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES	SHEAR STRENGTH kPa						W _p	W	W _L	WATER CONTENT (%)	GR	SA		SI	CL		
228.0	Ground Surface					*																
0.0	Topsoil																					
0.1	End of borehole																					
	Refusal on probable bedrock																					
	* Borehole dry on completion of drilling																					

RECORD OF BOREHOLE No 612-37S

1 of 1

METRIC

G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+087.5, o/s 5m Lt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									
227.4	Ground Surface							20	40	60	80	100					
0.0	Topsoil	•															
0.1	Sand, trace silt trace gravel	••					227										
226.9																	
0.5	Brown Moist End of borehole Refusal on probable bedrock * Borehole dry on completion of drilling																

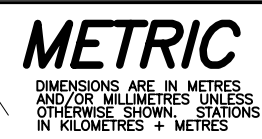
RECORD OF BOREHOLE No 612-38S

1 of 1

METRIC

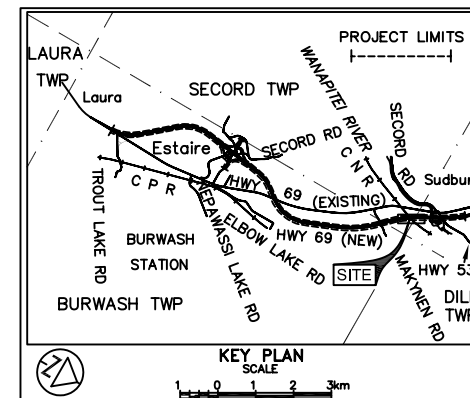
G.W.P. 312-99-00 LOCATION Hwy 69 Sta. 10+100, o/s 19m Lt. Dill Twp. ORIGINATED BY CB/RE
 DIST 54 HWY 69 BOREHOLE TYPE Manual Hand Sampling COMPILED BY PC
 DATUM Geodetic DATE May 02, 2003 CHECKED BY _____

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS *	ELEVATION SCALE	DYNAMIC CONE PENETRATION RESISTANCE PLOT					PLASTIC LIMIT w _p	NATURAL MOISTURE CONTENT w	LIQUID LIMIT w _L	UNIT WEIGHT γ kN/m ³	REMARKS & GRAIN SIZE DISTRIBUTION (%)							
ELEV DEPTH	DESCRIPTION	STRAT PLOT	NUMBER	TYPE	"N" VALUES			SHEAR STRENGTH kPa									WATER CONTENT (%)				GR	SA	SI	CL
								○ UNCONFINED	● QUICK TRIAXIAL	+	×	FIELD VANE					LAB VANE							
227.8	Ground Surface							20	40	60	80	100												
0.0	Topsoil	•																						
0.1	Sand, trace silt trace gravel	•••																						
227.2	Brown Moist	•																						
0.6	End of borehole																							
	Refusal on probable bedrock/boulder																							
	* Borehole dry on completion of drilling																							



HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 612, STA. 10+368.8 SECOND TWP TO 10+108 DILL TWP
BOREHOLE LOCATION & SOIL STRATA

PML Peto MacCallum Ltd
CONSULTING ENGINEERS



BH No	ELEVATION	STA SECOND TWP	o/s CL ME
612-1M	232.5	10+387.5	CL
612-2M	225.0	10+412.5	CL
612-3M	220.3	10+437.5	CL
612-4M	220.3	10+462.5	CL
612-5M	220.3	10+475	CL
612-6M	220.4	10+487.5	CL
612-7M	225.0	10+575	CL
612-8M	225.6	10+625	CL
612-9M	227.1	10+675	CL

- 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.

HWY No 69				DIST 54	
SUBM'D	PC	CHECKED CN	DATE OCT 29, 2004		SITE
DRAWN	MM	CHECKED GD	APPROVED DWK	DWG 612-	

REFER TO DRAWINGS 612-2 TO 612-5 FOR SECTIONS A-A,
B-B AND C-C

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg;
1_bpl06.dwg; 1_bpl07.dwg; October, 2002



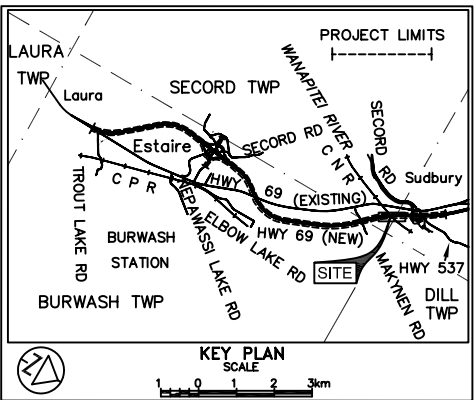
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 612, STA. 10+368.8 SECOND TWP TO 10+108 DILL TWP
SOIL STRATA

SHEET



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-May 2003
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

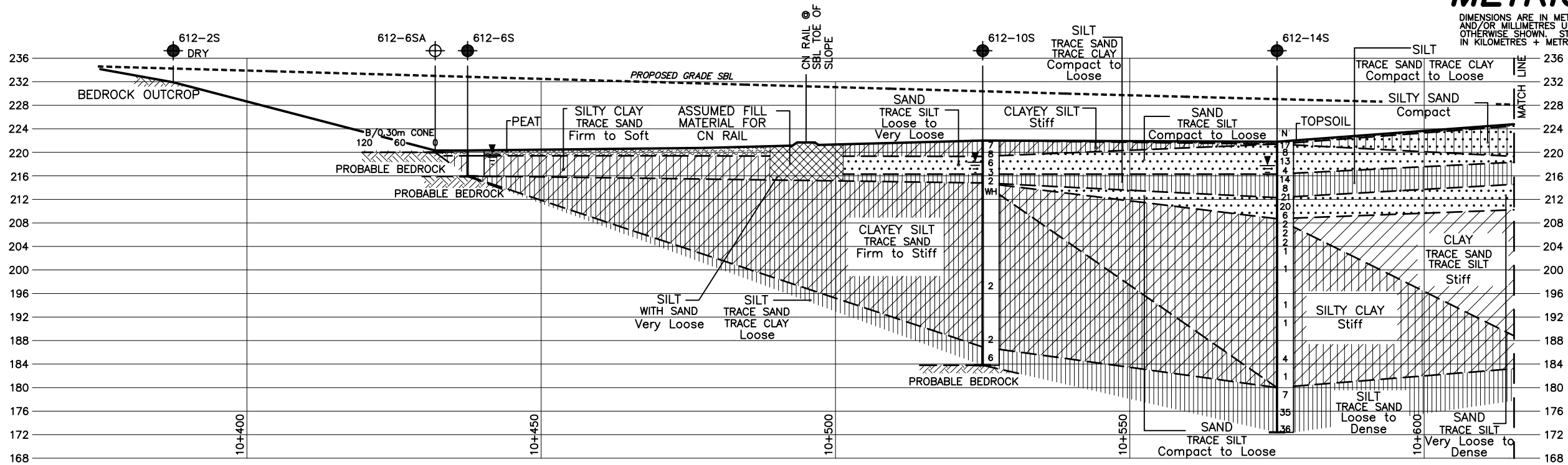
BH No	ELEVATION	STA SECOND TWP	o/s CL MED
Refer to drawing 612-1 for co-ordinates			

NOTE

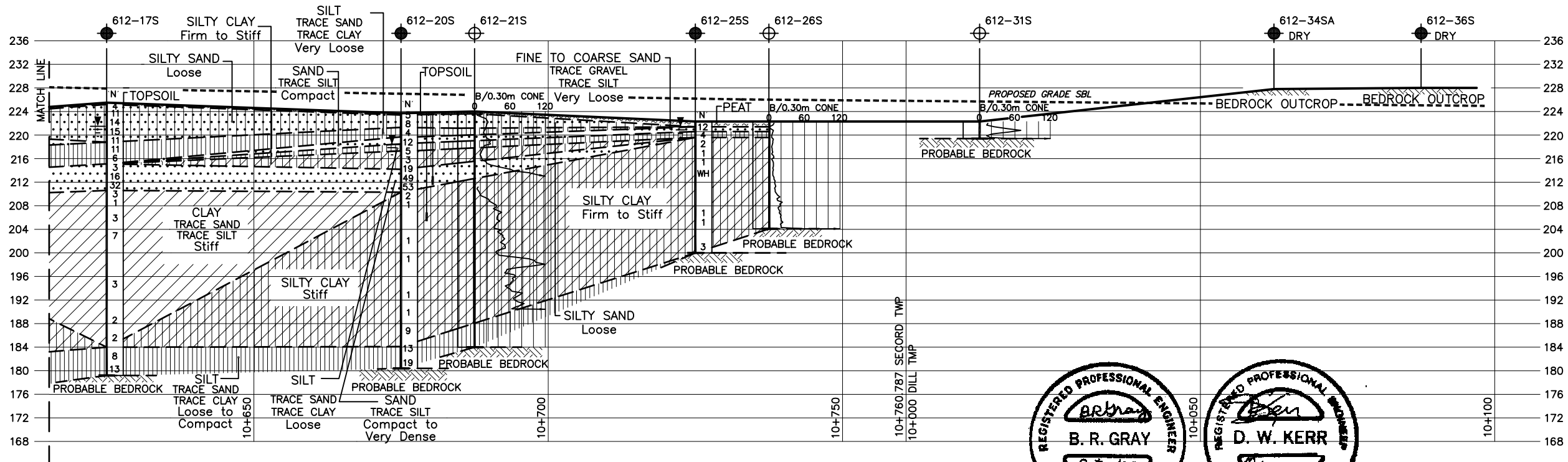
The boundaries between soil strata have been established only at Borehole locations. Between Boreholes the boundaries are assumed from geological evidence.

DATE	BY	DESCRIPTION

Geocres No.		DIST	
HWY No	69		54
SUBM'D	PC	CHECKED CN	DATE OCT 29, 2004 SITE
DRAWN	MM	CHECKED GD	APPROVED DWK DWG 612-2



A-A



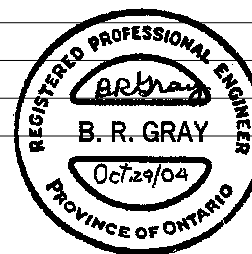
A-A (Continued)

SECTION
SCALE



NOTE:

REFER TO DRAWING 612-1 FOR PLAN; DRAWINGS 612-3 TO 612-5 FOR SECTIONS B-B AND C-C



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002

METRIC

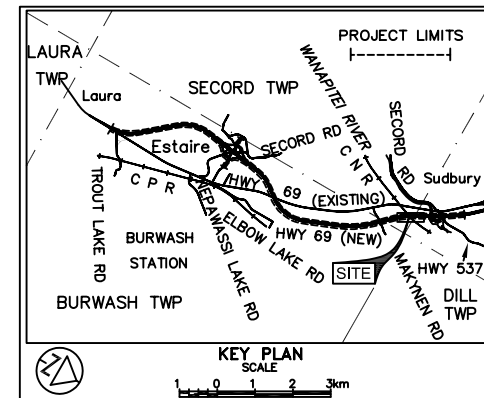
DIMENSIONS ARE IN METRES
AND/OR MILLIMETRES UNLESS
OTHERWISE SHOWN. STATIONS
IN KILOMETRES + METRES

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 612, STA. 10+368.8 SECOND TWP TO 10+108 DILL TWP
SOIL STRATA

SHEET

PML Peto MacCallum Ltd.
CONSULTING ENGINEERS



LEGEND

- Borehole
- Dynamic Cone Penetration Test (Cone)
- Borehole & Cone
- N Blows/0.3m (Std. Pen Test, 475 J / blow)
- CONE Blows/0.3m (60° Cone, 475 J / blow)
- W L at time of investigation Mar-May 2003
- Head
- ARTESIAN WATER Encountered
- PIEZOMETER

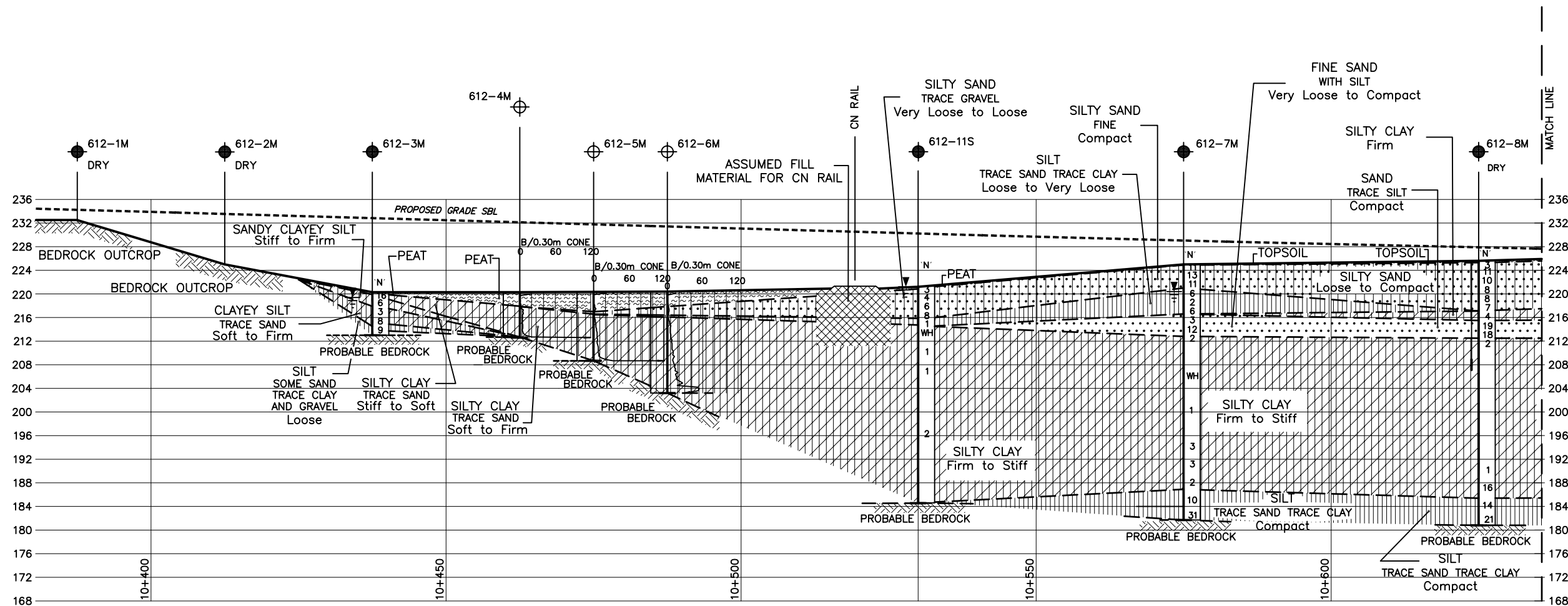
BH No	ELEVATION	STA SECOND TWP	o/s CL MED
Refer to drawing 612-1 for co-ordinates			

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.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	GD
APPROVED	DWK	DWG	612-3



B-B

SECTION
SCALE

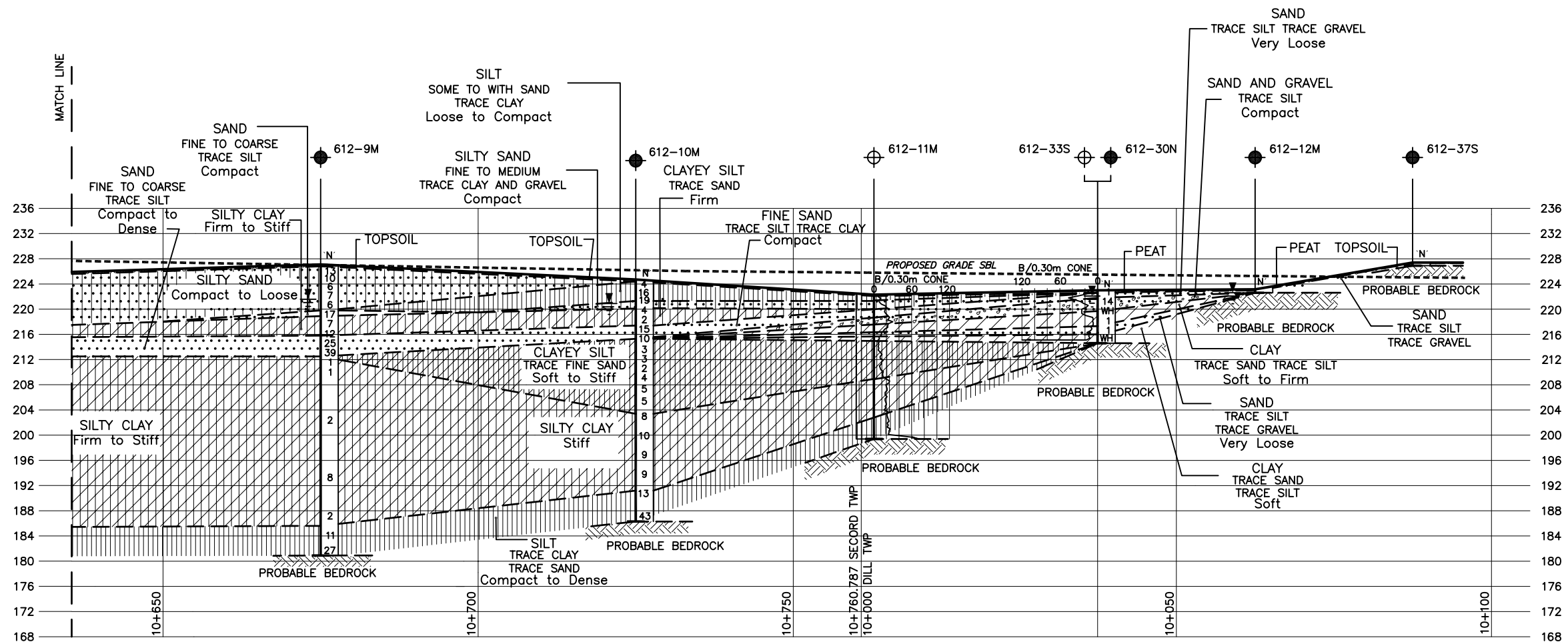
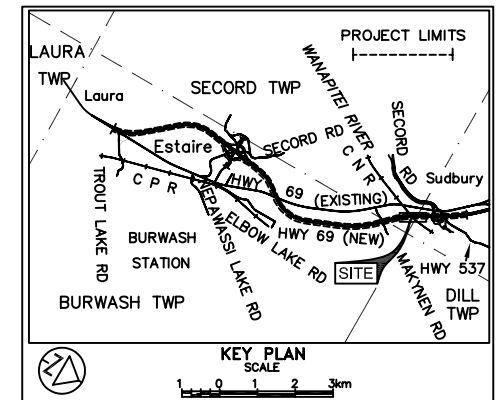


NOTE:

REFER TO DRAWING 612-1 FOR PLAN; DRAWING 612-2 FOR SECTION A-A, DRAWING 612-4 FOR SECTION B-B (CONTINUED) AND DRAWING 612-5 FOR SECTION C-C.



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002



LEGEND			
	Borehole		
	Dynamic Cone Penetration Test (Cone)		
	Borehole & Cone		
N	Blows/0.3m (Std. Pen Test, 475 J / blow)		
CONE	Blows/0.3m (60° Cone, 475 J / blow)		
	W L at time of investigation Mar-May 2003		
	Head		
	ARTESIAN WATER Encountered		
	PIEZOMETER		

BH No	ELEVATION	STA SECOND TWP	o/s CL MED
Refer to drawing 612-1 for co-ordinates			

— 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.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DATE	OCT 29, 2004	SITE	
DRAWN	MM	CHECKED	GD
APPROVED	DWK	DWG	612-4

REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002



B-B (Continued)

SECTION
SCALE



NOTE:

REFER TO DRAWING 612-1 FOR PLAN; DRAWING 612-2 FOR SECTION A-A; DRAWING 612-3 FOR PART OF SECTION B-B AND DRAWING 612-5 FOR SECTION C-C

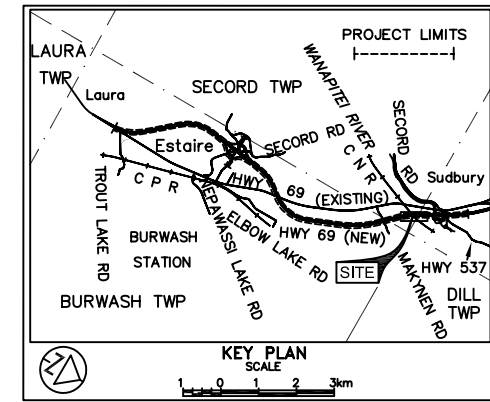
METRIC

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

CONT No
GWP No 312-99-00

HIGHWAY 69
HIGHWAY 69 FOUR-LANING FOR 12 km
From 4 km South of Estaire to 1 km North of Hwy 537
SWAMP 612, STA. 10+368.8 SECOND TWP TO 10+108 DILL TWP
SOIL STRATA

SHEET



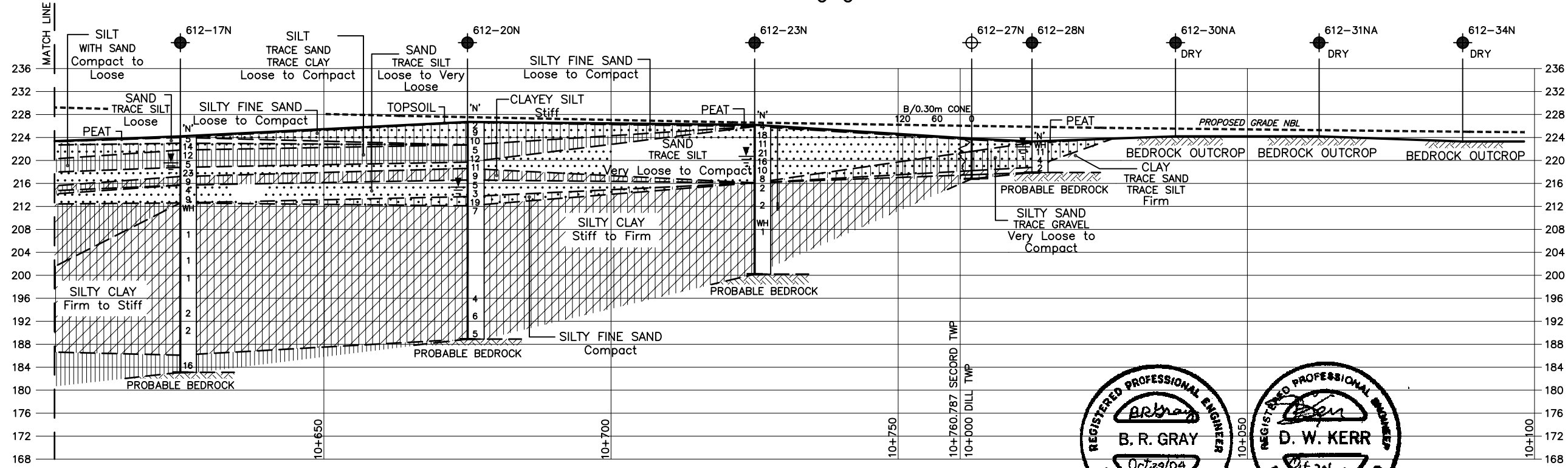
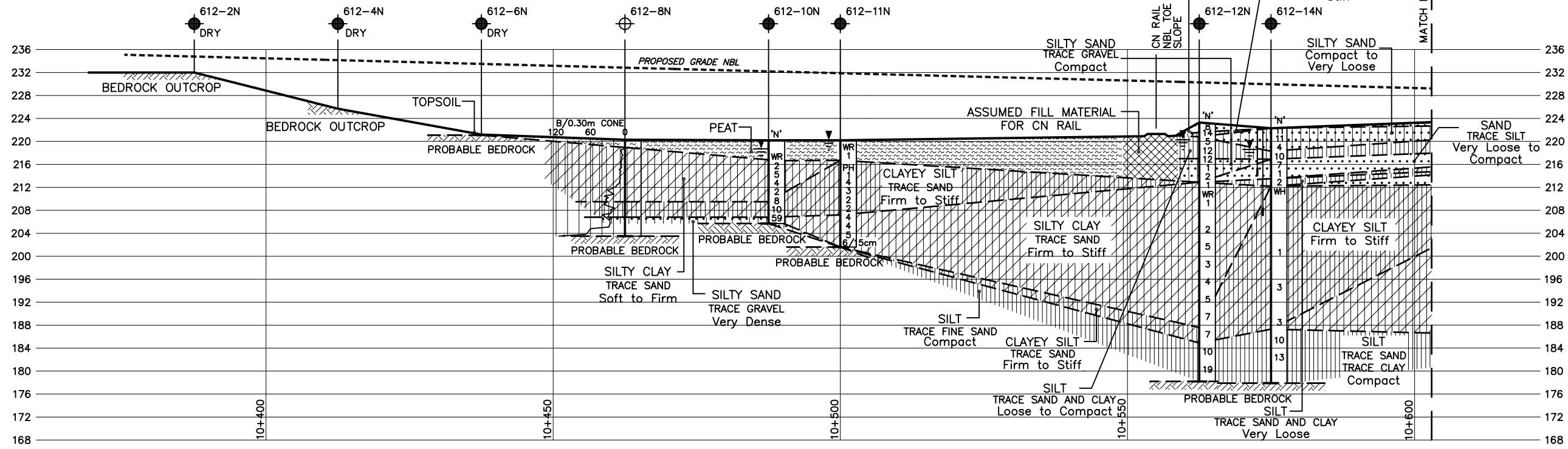
- LEGEND
- Borehole
 - Dynamic Cone Penetration Test (Cone)
 - Borehole & Cone
 - N Blows/0.3m (Std. Pen Test, 475 J / blow)
 - CONE Blows/0.3m (60° Cone, 475 J / blow)
 - W L at time of investigation Mar-May 2003
 - Head
 - ARTESIAN WATER Encountered
 - PIEZOMETER

BH No	ELEVATION	STA SECOND TWP	o/s CL MED
Refer to drawing 612-1 for co-ordinates			

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

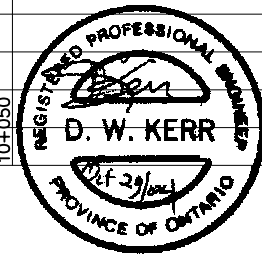
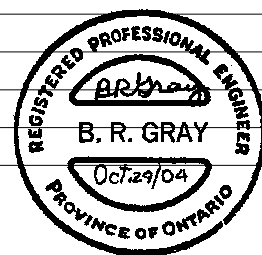
REVISIONS	DATE	BY	DESCRIPTION

Geocres No.			
HWY No	69	DIST	54
SUBM'D	PC	CHECKED	CN
DRAWN	MM	CHECKED	GD
DATE	OCT 29, 2004	DATE	OCT 29, 2004
APPROVED	DWK	APPROVED	DWK
DWG	612-5	DWG	612-5



NOTE:
REFER TO DRAWING 612-1 FOR PLAN; DRAWINGS 612-2 TO 612-4 FOR SECTIONS A-A AND B-B

C-C (Continued)
SECTION
SCALE
8 4 0 8 16m



REF No E-Main69-5.dwg; 5Propty.dwg; 1_bpl05.dwg; 1_bpl06.dwg; 1_bpl07.dwg; October, 2002