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REPORT ON

**FOUNDATION INVESTIGATION AND DESIGN
EMBANKMENTS CROSSING DEEP SWAMPS
FOUR LANING OF THE PARRY SOUND BYPASS**

**G.W.P. 209-97-00
MTO DISTRICT 52**

Submitted to:
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May 1999



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PART A – FIELD INVESTIGATION

**EMBANKMENTS CROSSING DEEP SWAMPS
FOUR LANING OF THE PARRY SOUND BYPASS**

**G.W.P. 209-97-00
MTO DISTRICT 52**

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1.0 INTRODUCTION

Golder Associates Ltd. has been retained by Cole, Sherman & Associates (Cole, Sherman) on behalf of the Ministry of Transportation, Ontario (MTO) to carry out a foundation investigation along the alignment of the proposed embankments over areas of deep swamps for the northbound and southbound lanes of the proposed Highway 69. The embankment design forms part of the Parry Sound Bypass project, which involves four laning of a section of Highway 69 from Badger Road northerly 10 km to Sequin River. The locations of the particular sections of the embankment along alignment of new Highway 69, where foundation input was required are summarized in Table 1, attached.

The purpose of this investigation is to determine the subsurface conditions within the sites of the proposed embankments crossing the swamps by drilling boreholes, and carrying out in-situ tests and laboratory tests on selected samples. Based on our interpretation of the data obtained, recommendations on the geotechnical aspects of design of the proposed works are provided. Comments are also provided on anticipated construction problems where they may affect design of the proposed structure.

The proposed horizontal and vertical alignment for Highway 69 were provided initially to us on the 1:5000 plan and profile for the route planning study drawings and subsequently during the design study phase on the design / contract drawings prepared by Cole, Sherman.

The terms of reference for the scope of work are outlined in our proposal letter P71-1494, dated November 26, 1997 and letters dated July 6, 1998 and April 16, 1999 outlining the scope of additional investigation to be carried out within the swamp areas. The work was carried out in accordance with our Quality Control Plan for Foundation Design Services, dated March 03, 1998.

2.0 SITE DESCRIPTION

The site is located in the vicinity and to the east of the existing Highway 69, south of Parry Sound, Ontario, and is within the MTO District 52, Huntsville. The existing Highway 69, from Badger Road northerly to the Sequin River, is presently a two lane undivided highway.

The topography within the study area is extremely variable. The ground surface along the proposed highway alignment undulates between areas of steep rock ridges and low lying swamp. Where the existing highway extends through the swamp areas, the road embankment is typically of relatively low height.

3.0 INVESTIGATION PROCEDURES

The field work for this investigation was carried out between May 13, 1998 and June 2, 1998, on December 19 and 20, 1998 and between February 24 and April 23, 1999. At this time, twenty-six (26) boreholes were drilled within the areas of the proposed swamp crossings. Where access was possible, the investigation was carried out using a bombardier mounted CME 55 drill rig supplied and operated by Marathon Drilling Inc. of Ottawa. Boreholes in the deep swamp areas were advanced using portable drilling equipment mounted on platforms or floating rafts.

Soil samples were obtained at regular intervals of depth using 50 mm outside diameter split-spoon samplers in accordance with Standard Penetration Test (SPT) procedures. In-situ vane testing was carried out in the boreholes to obtain the undrained shear strength of the peat and the underlying silty clay deposit. Groundwater conditions in the open holes were observed throughout the drilling operations.

The field work was supervised on a full-time basis by members of our technical staff who located the boreholes in the field, directed the drilling, sampling and in-situ testing operations, and logged the borings. The soil samples were identified in the field, placed in labeled containers and transported back to our laboratory in Mississauga for further examination. Index, classification and consolidation tests were carried out on selected samples.

The as-drilled borehole locations were determined by our field personnel based on the highway chainages as staked in the field and offset from the centerline of the median. The borehole locations are summarized in Table 1.

4.0 GENERAL SITE GEOLOGY AND STRATIGRAPHY

4.1 Site Geology

From published geologic information, the site is located in the physiographic region known as the Laurentian Highlands which forms the southernmost part of the Canadian Precambrian Shield (Geology of Ontario; OGS Special Volume 4). The Laurentian Highlands comprises a southeast-trending, slightly elevated region underlain by Precambrian bedrock, which was eroded to form an undulating surface with frequent rounded knobs and ridges. The terrain comprises large expanses of intrusive and metamorphic rocks such as gneisses and gneissic or massive granitic rocks. The rocks are geologically complex with considerable folding, intrusive activity, regional metamorphism and faulting. The local physiography is characterized by shallow overburden consisting mainly of outwash sand and gravel and irregular, variable bedrock surface with frequent rock outcrops and shallow bedrock. Since irregular bedrock surface is typical in the area, terrain with organic deposits is widespread.

4.2 Site Stratigraphy

The detailed subsurface soil and groundwater conditions encountered in the boreholes, together with the results of the laboratory tests carried out on selected soil samples, are given on the attached Record of Borehole sheets on Figure 1 and in Appendix B, following the text of this report. The stratigraphic boundaries shown on the Record of Borehole sheets are inferred from non-continuous sampling and, therefore, represent transitions between soil types rather than exact planes of geological change. Subsoil conditions will vary between and beyond the borehole locations. The borehole information was supplemented by the information obtained from the probeholes carried out as part of the geotechnical investigation. Relevant probehole information is included in Appendix A, which follows text of this report.

A detailed description of the subsurface conditions as encountered at the boreholes put down within each swamp crossing is provided in the following sections.

Station 18+100 to Station 18+300

Eleven (11) boreholes, numbered 98-1A to 98-1E and 99A to 99E were put down within this swamp area as shown on Drawing N111101E, attached. Three (3) boreholes were located along the existing highway embankment and eight (8) boreholes were put down at the selected locations within the swamp area.

In summary, the soils encountered in the boreholes put down within the swamp consist of organic deposits underlain by very soft to soft silty clay. The boreholes put down through the existing highway embankment encountered the organic and silty clay deposits below the sand and gravel fill / road structure at some borehole locations. At other locations, organic deposits were not evident.

In the boreholes put down within the swamp area and outside of the existing embankment, the base of the peat was encountered between 6.1 m and 7.2 m depth. The peat is fibrous to approximately 4 m depth then becomes amorphous. The peat is underlain by as much as 4.3 m of very soft to soft silty clay. The in-situ vane testing carried out within the silty clay indicates undrained shear strength varying typically between 5 kPa and 15 kPa. The consolidation testing was carried out on one sample of the silty clay collected from Borehole 98-1C. The results of the testing are attached in Appendix B, for reference. A compression index $C_c = 1.0$ was obtained for the silty clay sample.

Boreholes 99A to 99C were put down through the existing road embankment. The road embankment fill consists of sand and gravel with trace silt and variable amount of cobbles / rockfill. A layer of cobble / rockfill was encountered between 0.9 m and 2 m depth in Borehole 99C. The base of the road embankment fill was encountered at about 4.6 m, 8.4 m and 5.8 m depth in Boreholes 99A to 99C, respectively. In Borehole 99A, the embankment fill is underlain by about 2.7 m of peat extending to the bedrock surface inferred from resistance to auger penetration at about 7.3 m depth. In Borehole 99B, the fill is underlain by a native sand extending to about 10.1 m depth to bedrock surface and in Borehole 99C, about 1.8 m of peat and 1.1 m of silty clay underlie the fill. Occasional layers of sand were encountered in the peat deposit.

Standing water to about 0.3 m depth was noted in the boreholes drilled to the east of the existing embankment and the water level was encountered at ground surface in the boreholes located to the west of the existing embankment. In the boreholes put down through the road embankment the water level was encountered between 1.5 m and 2.4 m depth during drilling.

Station 18+600 to Station 18+690

2

Three (3) boreholes, numbered 98-2A to 98-2C were drilled within this swamp area as shown on Drawing N111102E, attached. In summary, the soils encountered in the boreholes put down within the swamp consist of peat underlain by a very soft to firm silty clay and clayey silt extending to as much as 7.3 m depth.

In the boreholes put down within the swamp area, the base of the peat was encountered between 2.7 m and 3.2 m depth. The peat is fibrous and becomes amorphous with depth. The peat is underlain by very soft to firm silty clay and clayey silt. The in-situ vane testing carried out within the silty clay and clayey silt indicates undrained shear strength varying typically between 10 kPa and 45 kPa. Interlayers of sand and silty sand were encountered within the cohesive deposit.

Refusal to further auger penetration was encountered in Boreholes 98-2A and 98-2B at about 5.9 m and 7.3 m depth, probably on bedrock. Borehole 98-2C was terminated at about 5.3 m depth.

Standing water to about 0.15 m depth was noted in Borehole 98-2A drilled to the east of the existing embankment and the water level was encountered at ground surface in Boreholes 98-2B and 98-2C.

Station 20+895 to Station 21+380

3

Five (5) boreholes numbered HF-1A to HF-1E, were drilled within this area as shown on Drawing N111104, where a high embankment is proposed. The soils encountered in the boreholes consist of topsoil overlying the surficial deposit of sand, silty sand and silt, which in turn is underlain by silty clay and sand. The topsoil varies from 80 mm to 300 mm in thickness.

The surficial granular deposit is typically very loose to loose and extends to the depths ranging from 1.4 m to 1.7 m. Underlying the surficial granular deposit is a soft to firm silty clay to clayey silt. No silty clay was encountered in Borehole HF-1A. In-situ vane testing carried out in the silty clay indicates undrained shear strength ranging between 15 kPa and 38 kPa. Consolidation testing carried out on one (1) sample of silty clay collected from Borehole HF-1B indicate a compression index C_c of about 1.0. The results of the consolidation testing are included into Appendix B, following text of this report. The silty clay layer in the boreholes varies in thickness from about 0.5 m to 4.3 m. The base of the silty clay layer was encountered between 1.8 m and 5.8 m depth at the borehole locations. The silty clay is underlain by a relatively thin layer of silty sand extending to the bedrock surface. The bedrock was inferred from refusal to further auger penetration at depths ranging from 1.7 m to 6.4 m.

Borehole HF-1A was dry on completion of drilling. Water level in the remainder of the boreholes ranged from 0.3 m to 1.8 m below ground surface during drilling operations.

Station 25+995 to Station 10+020

Two (2) boreholes, numbered SW98-5A and SW98-5B were drilled within this swamp area as shown on Drawing N111105E, attached. The soils encountered in the boreholes consist of about 1.1 m to 1.7 m of peat underlain by a very soft to soft silty clay and sand deposits. The silty clay is underlain by about 0.6 m of loose sand in Borehole SW98-5A. The boreholes were terminated at about 3.1 m and 1.5 m depths on bedrock surface, which was inferred by resistance to further auger penetration.

Water level in open boreholes was noted to be at ground surface during drilling operations.

Station 24+390 to Station 24+615

One (1) borehole, numbered SW98-3A was drilled within this area as shown on Drawing N111103E, attached. The soils encountered in the borehole consist of extensive granular deposits of sand and silty sand extending to the surface of the bedrock inferred from resistance to auger penetration at 17.1 m depth.

The probeholes put down as part of the geotechnical investigation within this area encountered up to 1.8 m of peat. The peat is underlain by very loose sand and silt which in turn is underlain by bedrock.

Station 11+795 to Station 11+850

Two (2) boreholes, numbered SW98-4A and SW98-4B were drilled within this swamp area as shown on Drawing N111106E, attached. The swamp is covered by about 0.6 m deep water. The soils encountered in the boreholes consist of about 0.1 m to 0.5 m of peat underlain by a very soft to firm clayey silt to silty clay and silty sand deposits. The clayey silt to silty clay extends to depths between 1.1 m and 3.7 m. In both boreholes, a layer of sand about 0.6 m in thickness underlies the silty clay. Bedrock was inferred from resistance to auger penetration at 1.7 m and 4.3 m depths.

Station 10+790 to Station 10+920 (McDougall Road)

Two (2) boreholes, numbered 101 and 102 were drilled within this swamp area as shown on Drawing N111107E, attached. The soils encountered in the boreholes consist of about 4.7 m to 5.8 m of peat underlain by sand to silty sand deposits.

The peat is fibrous and becomes amorphous with depth. The peat is underlain by a very loose to compact sand and silty sand deposit. The granular deposit extends to the depths of 8.2 m and 9.0 m investigated in the boreholes.

Water level in the open boreholes was encountered at about ground surface during drilling.

May 1999

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PART B – FOUNDATION DESIGN
EMBANKMENTS CROSSING DEEP SWAMPS
FOUR LANING OF THE PARRY SOUND BYPASS
G.W.P. 209-97-00
MTO DISTRICT 52

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5.0 ENGINEERING RECOMMENDATIONS

5.1 General

This section of the report provides our recommendations on the geotechnical aspects of design of the Highway 69 embankments based on our interpretation of the factual information obtained during the investigation. It should be noted that the interpretation and recommendations are intended for use only by the design engineer. Where comments are made on construction they are provided only in order to highlight those aspects which could affect the design of the project. Those requiring information on aspects of construction should make their own interpretation of the factual information provided as it may affect equipment selection, proposed construction method and scheduling.

The works described in this report are associated with the highway embankments crossing the swamp areas. The proposed horizontal and vertical alignment for Highway 69 embankments crossing the swamps were initially provided to us on the 1:5000 Route Planning Study drawings and subsequently during the design study on the design / contract drawings prepared by Cole, Sherman.

5.2 Embankment Construction Techniques

why but?

Generally, highway construction over swamp areas can be carried out with sub-excavation of the full depth of organic and soft clayey deposits in accordance with OPSD 203.010, where no more than 6 m of sub-excavation is required. The embankment loading imposed on the thick deposits of peat and silty clay would induce large settlement if these deposits were left in place. The swamp locations, sub-excavation depths and the proposed swamp treatment are listed in Table 2, attached.

Two main swamps requiring special consideration are located between Stations 18+100 and 18+300 and Stations 18+600 and 18+690. At these two locations, full depth excavation could impact on the adjacent existing highway embankment unless special precautions are undertaken.

The proposed construction staging for the highway construction within these swamp areas assumes that the Northbound Lanes will be built first with a temporary tie-in to the existing

Highway 69 at Station 18+700. The two lane crossover from the existing Highway 69 to the new Northbound Lanes is proposed between Station 17+800 to 18+200.

In summary, the following are the key aspects for the embankment design:

- 1) The sub-excavation must be carried out in strips with base width no greater than 3 m.
- 2) The base of the strip excavation must not encroach any further towards the existing embankment than a line drawn down at 1.25 H:1V from the shoulder / crest of the existing embankment to the base of the excavation.
- 3) The strip excavations should be made perpendicular to the existing embankment with backfilling of each strip being carried out prior to excavation of the next strip.
- 4) The strip excavation should be carried out such that the works always proceed away from the existing embankment.

Based on our review of projects elsewhere and discussions with contractors, we suggest the following procedures be considered for these two swamps.

The work should start on either side of each swamp crossing by constructing a leveled surface on the exposed bedrock or competent ground. Initially, a hydraulic backhoe could be used to start excavation. The backhoe operations could be supplemented by dragline operation. It is understood that dragline equipment has been used successfully to depths of 13 m for highway construction in this Region of Ontario in the recent past.

Sufficient trucks will be necessary to bring in fill and haul the excavated material on a continuous basis. The excavated peat may be stockpiled and used subsequently to flatten the side slopes of the rockfill embankments, if needed. Any mudwave developed during fill placement of one strip should be removed prior to the excavation of the next strip and end dumping.

5.2.1 Swamp between Station 18+100 and Station 18+300

Removal of the peat and silty clay deposits to its full depth under the Northbound and Southbound Lanes embankment is required. The subsurface conditions through the swamp will

be variable. The thickness of the peat as encountered is as much as 7 m along the majority of the swamp crossing. The peat is typically underlain by very soft to soft silty clay up to 4 m in thickness. Based on the borehole information, the overall depth of peat and clay to be excavated will be as much as 11.5 m and typically about 10 m.

Northbound Lanes

For the Northbound Lanes construction, the excavation can be carried out as follows:

- work can be carried out from both ends of the swamp, working towards the center;
- removal of the peat and silty clay deposits for the entire section of the roadway should be carried out in short sections perpendicular to the highway alignment with the base of the excavation / trench not wider than 3 m;
- the excavation should be carried out such that the base of the excavation is maintained outside a zone defined by a line drawn downward at 1.25 horizontal to 1 vertical (1.25H:1V) from the toe of the existing highway to the base of the excavation;
- excavation and backfilling operations should be carried out simultaneously in a manner that the excavation is not left open for more than 3 m in length at any given time.

It should be noted that full excavation of the silty clay in accordance with OPSP 203.010 will not be possible due to the proximity of the existing and proposed embankments and the conditions anticipated under the existing embankment. There will be a wedge within the median of the highway, about 4 m in width on each side of the median, where the silty clay and possibly the peat cannot be removed due to intersection of the 1.25H:1V excavation limit requirements. It is considered that leaving the wedge of soft materials in place between the embankments should not jeopardize the embankment stability. Consideration should be given to surcharging the median area after construction of the Northbound Lanes to consolidate, as much as possible, the wedge of material left in place.

It is anticipated that the initial settlements will be quite large during end dumping of the rockfill. In addition, in spite of careful excavation methods, some pockets of peat and silty clay may be entrapped at the base of the rockfill, inducing settlements. It is our recommendation that the rockfill embankment be preloaded and surcharged with 2.0 m of either rockfill or alternatively, Granular B which is heavier than rockfill. After completion of embankment construction, the

Granular B material could be re-used as granular base course elsewhere on the project at a later stage of the project. If rockfill is used as a surcharge material, once the surcharge is removed, the backfill could be used to flatten the rock embankment side slopes or used somewhere else on the project. Both materials are equally suitable for preloading purposes, and the final choice should be based on economical considerations. If the preloading and surcharging method is used, most of the differential settlements should occur during the construction period, prior to the paving operation.

Southbound Lanes

The three (3) boreholes put down along the edge of the existing highway embankment indicate that the peat and silty clay underlying the existing embankment was not fully removed at all locations. Furthermore, at the locations where these deposits were apparently fully removed to the firm bottom, the removal extends only under the traveled portion of the road embankment / pavement width. Since the grade of the proposed SBL embankment will be about 2.5 m to 3.5 m higher than the existing embankment grade, the additional loading imposed on the peat and silty clay deposits still in place could induce relatively large differential settlement. Therefore, it is recommended that the existing embankment fill, peat and silty clay deposit be fully removed and the new embankment fill be placed on the firm base (bedrock or sand).

The construction procedures as described for the construction of the Northbound Lanes may generally be used for construction of the Southbound Lanes with the following considerations:

- The excavation in strips should be carried out such that the base of the excavation is maintained outside a zone defined by a line drawn downward at 1H:1V from the toe of the new NBL embankment.
- Care will be required at the lower depths of the excavation close to the base of the excavation carried out for the NBL embankment construction to ensure that the toe of the rockfill backfill is not undermined.

5.2.1 Swamp between Stations 18+600 and Station 18+690

The existing highway embankment is about 5.5 m in height. Based on the borehole and probehole information, there is up to about 3.5 m of peat and as much as 4 m of soft clay within

the area of the proposed embankments. The subsurface conditions throughout the swamp will be variable and the overall depth of peat and silty clay will be as much as 7.5 m.

It is understood that the Northbound Lanes embankment will be built first with a temporary tie-in to the existing Highway 69 at Station 18+700. In general, the tie-in will be within the limits of this swamp and the construction of the NBL embankment will therefore be immediately adjacent to and encroaching on the existing embankment.

Removal of the peat and silty clay deposits to its full depth under the new highway embankments is required. It is not possible to sub-excavate fully under the shoulder of the existing highway embankment for construction of the NBL without installation of the temporary works to support the paved / traveled width of the existing embankment. There is a restriction on how close the strip excavation can encroach on the existing embankment shoulders and there will still be significant quantities of peat and silty clay that remains under the paved width.

Consideration should therefore be given to the use of lightweight fill above the general swamp area to build a temporary NBL embankment between about Stations 18+600 to 18+690. There will be differential settlement occurring during this temporary embankment use; both across the road and along the road in this area. The differential settlement will be a consequence of the gradual encroachment of the new NBL embankment over the side slope of the existing embankment; this will induce variable loading conditions and consequently variable settlements. The use of lightweight fill will reduce these differential settlements and will also improve the stability conditions during the sub-excavation process for the SBL embankment. Surcharging and / or preloading of the NBL embankment will likely not be of much benefit in this case where the intent is to go back and fully remove the organic / clay deposits.

Given the configuration of the existing and new highway embankments and the anticipated variable subsurface conditions, the recommended construction techniques are described below.

Northbound Lanes

The organic / clay deposits are present under the side slopes of the existing embankment. For the Northbound Lanes construction, the excavation can be carried out as follows:

- The excavation should be carried out in strips formed perpendicular to the existing embankment with the base of the excavation / trench not wider than 3 m.
- The excavation should be carried out such that the base of the strip excavation is maintained outside a zone defined by a line drawn downward at 1.25 horizontal to 1 vertical from the toe of the existing highway embankment to the base of the excavation.
- The sub-excavation should be backfilled with rockfill up to the general ground level within the swamp using the continuous backfilling as identified above for the Swamp between Stations 18+100 and 18+300. Lightweight fill should be used to raise embankment level to the design grade.

After construction and diversion of the traffic to the completed SBL, the rockfill and lightfill should be removed and full sub-excavation of the pre-existing embankment fill, organic and silty clay deposits should be carried out to construct the new NBL embankment according to OPSP 203.010. The sub-excavation should extend into the rockfill area as placed during the initial construction stage. The sub-excavation should be backfilled with rockfill up to the design level and surcharged, as described for the Swamp between Stations 18+100 and 18+300.

Southbound Lanes

Full removal of the peat and silty clay deposits for the entire section of the roadway will be required.

The excavation should be carried out in strips formed perpendicular to the existing embankment with the base of the excavation / trench not wider than 3 m. The construction procedures, as described for the construction of the Northbound Lanes between Stations 18+100 and 18+300, may generally be used for construction of the embankment for the Southbound Lanes. The excavation should be carried out such that the base of the excavation is maintained outside a zone defined by a line drawn at 1.25H: 1V from the toe of the proposed NBL embankment.

The work should be carried out such that the toe of the NBL embankment is not undermined. The completed rockfill embankment should be surcharged with 2 m of Granular B Type II for a minimum of 2 months.

GOLDER ASSOCIATES LTD.

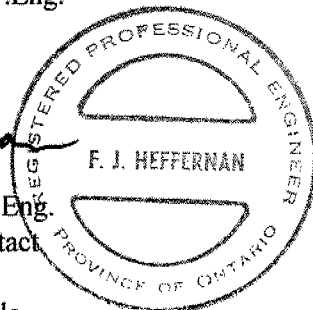
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AMP/ASP/FJH/amp/clg
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TABLE 1**SUMMARY OF SWAMP LIMITS AND BOREHOLE LOCATIONS**

<i>Swamp Limits</i>	<i>Borehole Number</i>	<i>Borehole Location</i>
18+100 - 18+300 <i>near exit embankment</i>	98-1A	18+250, 20 m Rt
	98-1B	18+200, 55 m Rt
	98-1C	18+200, 20 m Rt
	98-1D	10+200, 7 m Rt
	98-1E	18+200, 7 m Lt
	99A	18+220, 19 m Lt
	99B	18+170, 19 m Lt
	99C	18+140, 20 m Lt
	99D	18+130, 33 m Lt
	99E	18+130, 35 m Lt
	99F	18+140, 8 m Lt
18+600 - 18+690 <i>near exit embankment</i>	98-2A	18+650, 32 m Rt
	98-2B	18+638, 15 m Lt
	98-2C	18+638, 17 m Rt
20+895 - 21+380	HF-1A	21+115, 20 m Rt
	HF-1B	21+080, 20 m Lt
	HF-1C	21+050, 29 m Rt
	HF-1D	21+000, 18 m Rt
	HF-1E	21+050, 19 m Lt
24+390 - 24+615	SW98-3A	24+525, 25 m Rt
25+995 - 10+060	SW98-5A	26+025, 19 m Lt
	SW98-5B	10+060, 28 m Lt
11+795 - 11+850	SW98-4A	11+825, 19 m Rt
	SW98-4B	11+825, 19 m Lt
10+790 - 10+920	101	10+850, 2 m Lt
(McDougall Road)	102	10+875, 3 m Lt

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TABLE 2**SUMMARY OF SWAMP LIMITS AND TREATMENT OF THE FOUNDATION SOILS**

Swamp Number / Limits	Proposed Max Embankment Height * (m)	Anticipated Maximum Excavation Depth (m)	Underlying Strata	Recommended Treatment	Comments
Highway 69 Northbound Lanes					
18+100 - 18+300	5.0 - 5.5	11.5	Sand and bedrock	✓ Full sub-excavation of peat and silty clay	<ul style="list-style-type: none"> Construction staging proposed Excavation of organics and silty clay to be carried out in strips
18+600 - 18+690	7.0	7.5	Sand and bedrock	✓ Full sub-excavation of peat and silty clay	<ul style="list-style-type: none"> Construction staging proposed Excavation of organics and silty clay to be carried out in strips and the temporary embankment constructed Complete excavation and construction NBL after completion of SBL
20+895 - 21+640	6.0 - 26.5	6.0	Sand and bedrock	OPSD 203.010	-
24+390 - 24+615	6.0 - 20.0	1.8	Sand and bedrock	OPSD 203.010	• Silty clay deposit to be sub-excavated
25+995 - 10+060	4.0 - 7.0	2.5	Sand	OPSD 203.010	-
11+795 - 11+850	2 - 4	4	Silty sand and bedrock	OPSD 203.010	-
Highway 69 Southbound Lanes					
18+100 - 18+300	2.5 - 3.5	11.5	Bedrock	OPSD 203.010 Full sub-excavation of the existing embankment fill required due to presence of peat and soft silty clay underlying embankment	<ul style="list-style-type: none"> Construction staging proposed Existing embankment fill thickness varies from 4.5 m to 8.4 m About 3 m of peat and soft silty clay underlie the embankment fill in places
18+600 - 18+690	7.0	7.5	Silty sand and bedrock	OPSD 203.010	<ul style="list-style-type: none"> Construction staging proposed Excavation of organics and silty clay to be carried out in strips
20+895 - 21+640	6.0 - 26.5	6.0	Sand and bedrock	OPSD 203.010	• Silty clay deposit to be sub-excavated
24+390 - 24+615	6.0 - 20.0	1.8	Sand and bedrock	OPSD 203.010	-
25+995 - 10+060	4.0 - 7.0	2.5	Sand	OPSD 203.010	-
11+795 - 11+850	2 - 4	4	Silty sand and bedrock	OPSD 203.010	-

May 1999

981-1111 / 8000

TABLE 2

SUMMARY OF SWAMP LIMITS AND TREATMENT OF THE FOUNDATION SOILS

<i>Swamp Number / Limits</i>	<i>Proposed Max Embankment Height *</i> (m)	<i>Anticipated Maximum Excavation Depth</i> (m)	<i>Underlying Strata</i>	<i>Recommended Treatment</i>	<i>Comments</i>
Badger Road					
11+760 - 11+880	4	7.5	Silty sand and bedrock	OPSD 203.010	-
S-E/W RAMP (Badger Road) 19+670 - 19+720	7	5.0	Sand	OPSD 203.010	-
McDougall Road					
10+790 - 10+920	2 - 6	6.0	Sand and silty sand	OPSD 203.010	-

NOTE: * Height above the existing ground surface

WORD S\FINALDAT\1100\981-1111\1999\8111\ET2

LIST OF ABBREVIATIONS

The abbreviations commonly employed on Records of Boreholes, on figures and in the text of the report are as follows:

I SAMPLE TYPE

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO	Drive open
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample

II PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg. (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) drive open sampler for a distance of 300 mm (12 in.).

Dynamic Penetration Resistance; N_6 :

The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) to drive uncased a 50 mm (2 in.) diameter, 60° cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH:	Sampler advanced by hydraulic pressure
PM:	Sampler advanced by manual pressure
WH:	Sampler advanced by static weight of hammer
WR:	Sampler advanced by weight of sampler and rod

Piezo-Cone Penetration Test (CPT):

An electronic cone penetrometer with a 60° conical tip and a projected end area of 10 cm² pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (Q_t), porewater pressure (PWP) and friction along a sleeve are recorded electronically at 25 mm penetration intervals.

III SOIL DESCRIPTION

(a) Cohesionless Soils

Density Index (Relative Density)	N Blows/300 mm or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	over 50

(b) Cohesive Soils

Consistency	C_u, S_u kPa	psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very stiff	100 to 200	2,000 to 4,000
Hard	over 200	over 4,000

IV. SOIL TESTS

w	water content
w_p	plastic limit
w_l	liquid limit
C	consolidation (oedometer) test
CHEM	chemical analysis (refer to text)
CID	consolidated isotropically drained triaxial test ¹
CIU	consolidated isotropically undrained triaxial test with porewater pressure measurement ¹
D_R	relative density (specific gravity, G_s)
DS	direct shear test
M	sieve analysis for particle size
MH	combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	organic content test
SO ₄	concentration of water-soluble sulphates
UC	unconfined compression test
UU	unconsolidated undrained triaxial test
V	field vane test (LV-laboratory vane test)
γ	unit weight

Note:

1. Tests which are anisotropically consolidated prior to shear are shown as CAD, CAU.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I GENERAL

π	= 3.1416
$\ln x$,	natural logarithm of x
$\log_{10} x$ or $\log x$,	logarithm of x to base 10
g	acceleration due to gravity
t	time
F	factor of safety
V	volume
W	weight

II STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta \sigma$
ϵ	linear strain
ϵ_v	volumetric strain
η	coefficient of viscosity
ν	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial effective overburden stress
$\sigma_1, \sigma_2, \sigma_3$	principal stresses (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress = $(\sigma_1 + \sigma_2 + \sigma_3)/3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight*)
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) (formerly G_s)
e	void ratio
n	porosity
S	degree of saturation
*	Density symbol is ρ . Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density x acceleration due to gravity)

(a) Index Properties (con't.)

w	water content
w_l	liquid limit
w_p	plastic limit
I_p	plasticity Index = $(w_l - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_c	consistency index = $(w_l - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(c) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(d) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (overconsolidated range)
C_s	swelling index
C_α	coefficient of secondary consolidation
m_v	coefficient of volume change
c_v	coefficient of consolidation
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation pressure
OCR	Overconsolidation ratio = σ'_p / σ'_{vo}

(e) Shear Strength

τ_p, τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = $\tan \delta$
c'	effective cohesion
c_u, s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3) / 2$
p'	mean effective stress $(\sigma'_1 + \sigma'_3) / 2$
q	$(\sigma_1 - \sigma_3) / 2$ or $(\sigma'_1 - \sigma'_3) / 2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes: 1. $\tau = c' + \sigma' \tan \phi'$

2. Shear strength = (Compressive strength)/2

6020SW1A.BHS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: Sta. 18+250, 20m Rt

RECORD OF BOREHOLE 98-1A




BORING DATE: MAY 14, 1998

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
				DEPTH (m)				Cu, kPa	nat V - rem V -	+ ⊕	Q - ● U - ○	Wp	W	Wi			
0	TRIPOD HILT ROTARY DRILLING BW 76mm CASING	WATER SURFACE		0.00													
		Ground surface		0.15													
1		Peat Fibrous becoming amorphous below approx. 4m depth Very loose Dark brown to black															
				1	50 DO	PM											
2																	
				2	50 DO	PM											
3																	
4																	
				3	50 DO	PM											
5																	
6																	
7			Silty Clay, trace sand, trace organics Very soft Grey		6.40	50 DO	PM										
				6.71													
8		Sand, trace silt Very loose Grey			50 DO	WH											
9		End of borehole Refusal to further auger penetration Probably on Bedrock		8.41													
10		Hammer weight of 32 kg used to obtain samples.															

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

DATA INPUT: PS MAY 25/98

SOIL#6

6020SW18 BHS

W.P. 209-97-00

RECORD OF BOREHOLE 98-1B

SHEET 1 OF 1

DIST. 52, HWY 69



BORING DATE: MAY 14, 1998

DATUM:

LOCATION: Sta. 18+200, 55m Rt

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa	nat V - rem V -	+ ⊕	Q - ● U - ○	Wp	W			Wl	
								10	20	30	40	20	40	60	80		
0		WATER LEVEL															
		WATER		0.00													
				0.15													
1	ROTARY WASH BORING BW 76mm CASING	Peat Fibrous becoming amorphous below approx. 4m depth Dark brown to black															
				1	50 DO	PM											
2					2	50 DO	PM									○ > 905	
3																	
4																	
5																	
6																	
7		Clayey Silt, trace sand, trace organics Soft Grey		6.20											○ > 144.4		
															○ > 103.4		
8		End of borehole Refusal to further auger penetration Probably on Bedrock		7.32													
9																	
10																	

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

DATA INPUT: ps may 25/98

SOILM6

6020SW1C.BHS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: Sta. 18+200, 20m Rt

RECORD OF BOREHOLE 98-1C

BORING DATE: MAY 20, 1998

SHEET 1 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa	WATER CONTENT, PERCENT Wp W Wl				
0		WATER SURFACE									
		WATER	0.00 0.13								
1											
2				1	50 DO PM						> 475
3											
4		Peat Fibrous becoming amorphous below approx. 4m depth Very loose Dark brown to black									
5				2	50 DO PM						> 639
6											
7				3	50 DO PM						> 875.5
8			8.84								
9				4	50 DO WH						> 110.1
10		Silty Clay, trace sand, trace organics Very soft Grey									
		Note: Rod and split spoon sunk to 9m depth		5	50 TO PM						C MH
											Unit weight = 15.5 kN/m3
		CONTINUED ON NEXT PAGE									

DATA INPUT: ps may 25/98
 SOIL M6

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

60205W1C BHS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: Sta. 18+200, 20m Rt

RECORD OF BOREHOLE 98-1C

BORING DATE: MAY 20, 1998

SHEET 2 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, k, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT	
								Cu, kPa	nat V - + Q - ● rem V - ⊕ U - ○			Wp	W
10	ROTARY WASH BORING BW 76mm CASING	CONTINUED FROM PREVIOUS PAGE			56	TO	PM						
		Silty Clay, trace sand, trace organics Very soft Grey		10.36									
11		Silty Sand, trace gravel Compact Dense Grey		10.97	50	Q	>14						
		End of Borehole Refusal to further auger penetration Probably on Bedrock											
12													
13													
14													
15													
16													
17													
18													
19													
20													

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

DATA INPUT: ps may 25/98

SOIL/66

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: 10+200, 7m LL

RECORD OF BOREHOLE 98-1D

BORING DATE: FEB.24/99

SHEET 1 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa	nat V - rem V -	+ ⊕	Q - U -	⊙ ○	Wp			W	Wt
0		GROUND SURFACE		0.00													
1		Peat, fibrous, becoming amorphous below about 5m depth Very loose Black															
2																	
3																	
4																	
5	MANUAL DRILLING 63.5mm I.D. PLASTIC CASING																
6																	
7																	
8																	
9		Silty Clay Very soft Grey															
10																	
CONTINUED ON NEXT PAGE																	

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DJM

CHECKED: ASP

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: 10+200, 7m Lt.

RECORD OF BOREHOLE 98-1D

BORING DATE: FEB.24/99

SHEET 2 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, k, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT	
								Cu, kPa	nat V - + rem V - @ U - O			Wp	W
10	MANUAL DRILLING 83.5mm I.D. PLASTIC CASING	CONTINUED FROM PREVIOUS PAGE											
		Sand Very loose Grey		10.38									
		Silty Clay Firm Grey		10.60	7	50 DO							
11		Silty Sand Loose Grey		11.28	8	50 DO							
		END OF BOREHOLE											
12													
13													
14													
15													
16													
17													
18													
19													
20													

Note:
Water level in
open borehole at
ground surface
during drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DJM

CHECKED: ASP

W.P. 209-87-00
DIST. 52, HWY 69
LOCATION: Sta. 10+200, 7m Rt.

RECORD OF BOREHOLE 98-1E

BORING DATE: FEB.24/99

SHEET 1 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, k, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa	nat V - rem V -			+ ⊕	Q - ● U - ○	WATER CONTENT, PERCENT Wp — W — Wl																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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		Water		0.30																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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1	MANUAL DRILLING 63.5mm I.D. PLASTIC CASING	Peat, fibrous becoming amorphous below approx. 4m depth Very loose Dark brown to black			1	50 DO	PM																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

W.P. 209-97-00

RECORD OF BOREHOLE 98-1E

SHEET 2 OF 2

DIST. 52, HWY 69

BORING DATE: FEB.24/99

DATUM:

LOCATION: Sta. 10+200, 7m Ft.

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa	nat V - rem V -	+ ⊕	Q - ● U - ○	Wp	W			Wi	
10	MANUAL DRILLING 83.5mm I.D. PLASTIC CASING	CONTINUED FROM PREVIOUS PAGE															
		-becoming firm below 10m depth						⊕	+								
		Layer of sand between 10.36m and 10.60m depth.			7	50 DO	WH										
11		Silty Clay, trace sand															
		Very soft															
		Grey															
		Silty Sand			8	50 DO	8										
		Loose		11.28													
		Grey															
12		END OF BOREHOLE REFUSAL TO FURTHER AUGER PENETRATION PROBABLY ON BEDROCK		11.52													
		Hammer weight of 32 kg used to obtain samples and blows/0.3m refer to this hammer weight.															
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

Note:
Water level in
open borehole at
ground surface
during drilling.

DEPTH SCALE

1 to 50

LOGGED: SB

CHECKED: AP

Golder Associates

6023SW2A.BHS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: Sta. 18+650, 32m Rt

RECORD OF BOREHOLE 98-2A

BORING DATE: MAY 22, 1998

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa	nat V - + Q - ● rem V - ⊕ U - ○					WATER CONTENT, PERCENT Wp ——— W ——— Wi		
0		WATER SURFACE													
		Ground surface	0.00												
			0.15												
1		Peat Fibrous to amorphous Very loose to loose Dark brown		1	50 DO	PM									
2															
3		Silty Clay, trace sand, trace organics Soft Grey	2.74	2	50 DO	PM									
		Sand Loose Grey	3.28												
4			3.81												
5		Silty Clay Soft to firm Brown		3	50 DO	PM									
6		Silty Sand Compact Grey	5.79	4	50 DO	10/ 13									
		End of Borehole Refusal to further auger penetration Probably on Bedrock	5.94												
7															
8															
9															
10															

Note:
Water level 0.15m
above ground
surface.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

DATA INPUT: ps may 25/99

SOIL M6

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: 18+638, 15m Lt.

RECORD OF BOREHOLE 98-2B

BORING DATE: FEB.25/99

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								nat V - +		Q - ●		rem V - ⊕				U - ○	
								20	40	60	80	20	40	60	80		
0	MANUAL DRILLING 83.5mm I.D. PLASTIC CASING	GROUND SURFACE		0.00													
1		Peat Fibrous Loose Black						⊕	+								
2					1	50	4	⊕	+								
3								⊕	+								
4		Clayey Silt, trace organics, occ. sandy silt and organic silt layers Firm Grey		3.17	2	50	6	⊕	+								
5		Silty Clay Firm Grey		3.98	3	50		⊕	+								
6		Silty Sand Very loose Grey		4.82	4	50	1										
7		Silty Clay, occ. silty sand layers Very soft to firm Grey/brown		5.03	5	50	1	⊕	+								
8		END OF BOREHOLE REFUSAL TO FURTHER AUGER PENETRATION PROBABLY ON BEDROCK		7.25													
9																	
10																	

Note:
Water level at
ground surface
during drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DJM

CHECKED: ASP

DATA INPUT: PS MAY 25/99

SOIL46

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: 18+638, 17m Rt.

RECORD OF BOREHOLE 98-2C

BORING DATE: FEB.26/99

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION					
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT								
								Cu, kPa	nat V - rem V -	+	Q - ● U - ○	Wp	W			W	W			
0	MANUAL DRILLING 63.5mm I.D. PLASTIC CASING	GROUND SURFACE		0.00																
1		Peat Fibrous Loose Black			1	50 DO	MH	⊕	+											
								⊕	+											
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				
		Clayey Silt with organics Soft Grey		3.32	2	50 DO	PM	⊕	+											
		Silty Clay, some silt, occ. silt /sand layers Very soft Grey			3	50 DO														
					4	50 DO	PM													
					5	50 DO	PM													
		END OF BOREHOLE		5.33																
		Hammer weight 32 kg used to obtain samples.																		

Note:
Water level at
ground surface
during drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DJM

CHECKED: ASP

60203SW98A.BHS

W.P. 209-97-00

RECORD OF BOREHOLE SW98-3A

SHEET 1 OF 2

DIST. 52, HWY 69

BORING DATE: MAY 14, 1998

DATUM:

LOCATION: Sta. 24+525, 25m Rt

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa		rem V - U - O		Wp				W	
0		GROUND SURFACE		0.00													
1		Silty Sand, trace gravel, trace roots Very loose Grey			1	50 DO	3										
2					2	50 DO	2										
3		Sand, trace silt, trace gravel Loose to compact Brown		1.52	3	50 DO	6										
4					4	50 DO	9										
5					5	50 DO	5										
6					6	50 DO	23										
7																	
8					7	50 DO	14										
9					8	50 DO	17										
10		CONTINUED ON NEXT PAGE															

DATA INPUT: ps MAY 25/99

SOILM6

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

6020SW3A BHS
DATA INPUT: ps MAY 25/98
SOIL#6

W.P. 209-87-00
DIST. 52, HWY 69
LOCATION: Sta. 24+525, 25m Pt

RECORD OF BOREHOLE SW98-3A

BORING DATE: MAY 14, 1998

SHEET 2 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER TYPE BLOWS/0.3m	SHEAR STRENGTH		WATER CONTENT, PERCENT			
						Cu, kPa	nat V - + Q - ● rem V - @ U - ○	Wp	W		
10	CME 55 BOMBARDIER HOLLOW STEM AUGER	CONTINUED FROM PREVIOUS PAGE									
		Sand, trace silt, trace gravel Loose to compact Brown									
11			10.36	9	50 DO	26					
		Silty Sand, trace gravel Compact Grey									
12			11.88	10	50 DO	24					
13		Sand, some gravel, occ. cobbles Compact to very dense Brown to grey									
14											
15											
16											
17											
18											
19											
20											
		End of Borehole Refusal to further auger penetration probably on Bedrock		17.07							

Note:
Water level at
1.5m depth on
completion of
drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

60203W4A.BHS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: Sta. 11+825, 19m Rt

RECORD OF BOREHOLE SW98-4A

BORING DATE: MAY 20, 1998

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH Cu, kPa	nat V - + Q - ● rem V - ⊕ U - ○	WATER CONTENT, PERCENT Wp ——— W ——— Wi			
0	TRIPOD HILTI ROTARY DRILLING BW CASING	WATER SURFACE									
		Water	0.00								
		Peat Fibrous Loose	0.27								
1		Clayey Silt, trace sand Firm Gray	0.79	1	SO DO						
		Silty Sand Compact Gray to reddish brown	1.10		20						
2		End of Borehole Refusal to further auger penetration probably on Bedrock	1.70								
3		Hammer weight 32 kg used to obtain soil samples and blows/ 0.3m refer to this hammer weight.									
4											
5											
6											
7											
8											
9											
10											

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

DATA INPUT: ps MAY 25/98
 SOLM6

W.P. 209-87-00
DIST. 52, HWY 69
LOCATION: Sta. 11+825, 19m Lt

RECORD OF BOREHOLE SW98-4B

BORING DATE: MAY 20, 1998

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
				DEPTH (m)				Cu, kPa	nat V - rem V -	+	Q - ● U - ○	Wp	W			Wt	
0	TRIPOD HILL TITRATORY DRILLING BW CASING	WATER SURFACE		0.00													
		Water															
		Peat Fibrous		0.61 0.70	1	50 DO	4										
1		Clayey Silt to Silty clay, trace sand Soft to stiff Grey															
2																	
3																	
4																	
		Silty Sand Dense Grey		3.66	3	50 DO	36										
5		End of Borehole Refusal to further auger penetration probably on Bedrock Hammer weight 32 kg used to obtain samples and blows/0.3m refer to this hammer weight.		4.27													
6																	
7																	
8																	
9																	
10																	

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

6020SW5A BHS

W.P. 209-87-00
 DIST. 52, HWY 69
 LOCATION: Sta. 26+025, 19m Lt

RECORD OF BOREHOLE SW98-5A

BORING DATE: MAY 29, 1998

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa		nat V - + rem V - @		Q - ● U - ○		Wp ----- W ----- Wt			
								20	40	60	80						
0	TRIPOD HILT ROTARY DRILLING BW CASING	GROUND SURFACE		0.00													
1		Peat Fibrous Loose Dark brown to black			1	SO DO	7								○ > 845		
2		Silty Sand Grey		1.71 1.83													
		Silty Clay, trace sand Very soft Grey			2	SO DO	WH										
		Sand, some gravel Loose Grey		2.44		3	SO DO	WH									
3		End of Borehole Refusal to further auger penetration probably on Bedrock		3.05											Note: Water level in open hole at ground surface during drilling.		
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Note:
Water level in
open hole at
ground surface
during drilling.

> 645

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

DATA INPUT: ps MAY 25/99

SOIL M6

6020SW5B.BHS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: Sta. 10+060, 28m Lt

RECORD OF BOREHOLE SW98-5B

BORING DATE: MAY 29, 1998

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, k, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT	
								Cu, kPa	nat V - + Q - ● rem V - ⊕ U - ○			Wp	W
0	TRIPOD HILT ROTARY DRILLING BW CASING	GROUND SURFACE		0.00									
		Peat Fibrous Black											
1		Silty Clay, trace sand, occ. sand seam Soft Grey		1.07	1	50 DO	WH						
2		End of Borehole Refusal to further auger penetration Probably Bedrock		1.48									
3													
4													
5													
6													
7													
8													
9													
10													

Note:
Water level in
open hole at
ground surface
during drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

DATA INPUT: ps mar 9/99

SOL 16

6020HF1A.BKS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: Sta. 21+115, 20m Rt

RECORD OF BOREHOLE HF-1A

BORING DATE: MAY 20, 1998

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, K, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT	
								Cu, kPa	nat V - + Q - ● rem V - ⊗ U - ○			Wp	W
0	CME 55 BOMBARDIER 100mm OD HOLLOW STEM AUGER	GROUND SURFACE		0.00									
		Topsoil		0.13	1	50 00	4						
		Silty Sand, trace gravel Loose Dark brown											
2		End of Borehole Refusal to further auger penetration Probably on Bedrock		1.70	2	50 00	9						
3													
4													
5													
6													
7													
8													
9													
10													

Note:
Borehole dry on
completion of
drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

DATA INPUT: PS MAY 25/99

SOLM6

6020HF1B.BHS
DATA INPUT: PS MAY 25/99
SOL166

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: Sta. 21+080, 20m Lt

RECORD OF BOREHOLE HF-1B

BORING DATE: MAY 20, 1998

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, K, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa	nat V - rem V -	+	Q - ● U - ○	Wp	W			Wt	
0	CME 55 BOMBARDIER 108mm OD HOLLOW STEM AUGER	GROUND SURFACE		0.00													
		Topsoil		0.15	1	50 DO											
1		Sand Very loose Brown															
2		Silty Clay, trace sand Soft to firm Brown and Grey		1.52	2	50 DO											
3		-120mm of brown sand at 1.82m depth			3	50 DO	PH										
4																	
5		Silty Sand Loose Grey		4.57	4	50 DO											
6		End of Borehole Refusal to further auger penetration probably on Bedrock		5.28													
7																	
8																	
9																	
10																	

Unit Weight = 15.3 kN/m3

Note:
Water level in
open borehole at
about 1.8m depth
during drilling.

C
MH
Unit Weight = 15.3 kN/m3

Note:
Water level in
open borehole at
about 1.8m depth
during drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DRS

CHECKED: AP

W.P. 208-97-00
DIST. 52, HWY 69
LOCATION: 21+050, 29m Rt.

RECORD OF BOREHOLE HF-1C

BORING DATE: FEB.27/99

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, k, cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH Cu, kPa	nat V - + Q - ● ram V - ⊕ U - ○	WATER CONTENT, PERCENT Wp ----- W ----- Wl			
0	MANUAL DRILLING 63.5mm I.D. PLASTIC CASING	GROUND SURFACE									
		Topsoil	0.00								
		Silty Sand, trace topsoil	0.08								
		Grey	0.23								
1		Sand with occ. clayey silt interlayers Compact Brown/grey		1	50 DO	8					
	Clayey Silt Very soft Brown/grey	1.37									
2			2	50 DO	8						
	Sandy Silt, trace clay Compact Grey	1.77									
			3	50 DO	32						
3		END OF BOREHOLE Refusal to further auger penetration probably on Bedrock	2.40								
4		Hammer weight of 32 kg used to obtain samples and blows/0.3m refer to this hammer weight.									
5											
6											
7											
8											
9											
10											

Note:
Water level in
open borehole at
about 1.8m depth
during drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DJM

CHECKED: AP

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: 21+000, 18m Rt.

RECORD OF BOREHOLE HF-1D

BORING DATE: FEB.27/99

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa	nat V - rem V -	+	Q - ● U - ○	Wp	W			W	W
								20	40	60	80	20	40	60	80		
0	MANUAL DRILLING 63.5mm I.D. PLASTIC CASING	GROUND SURFACE															
		Topsoil		0.00													
		Silty Sand, trace clay Brown/grey, mottled		0.30													
1		Silt, trace clay, occ. sand layers Loose Grey		0.78	1	50 DO	5										
				1.52	2	50 DO	PM										
2					3	50 DO	PM										
		Silty Clay, occ. silty sand layers Soft Grey			4	50 DO	WH										
3																	
4					5	50 DO	PM										
5																	
6		Silty Sand Compact Grey		5.79	7	50 DO	10										
		END OF BOREHOLE		6.40													
7		Hammer weight of 32 kg used to obtain samples and blows/0.3m refer to this hammer weight.															
8																	
9																	
10																	

Note:
Water level in
open borehole at
0.3m depth on
completion of
drilling.

Note:
Water level in
open borehole at
0.3m depth on
completion of
drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DJM

CHECKED: AP

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: 21+050, 19m LL

RECORD OF BOREHOLE HF-1E

BORING DATE: FEB.28/99

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa		nat V - + rem V - @ U - O		Wp ----- Wl					
								20	40	60	80	20	40	60	80		
0	MANUAL DRILLING 63.5mm I.D. PLASTIC CASING	GROUND SURFACE															
		Topsoil		0.00													
				0.18													
		Silty Sand, occ. clayey silt seams Loose Brown/grey			1	SO DO	19										
1				1.22													
		Clayey Silt Brown		1.37													
		Silty Sand Very loose Grey		1.68	2	SO DO	5										
2					3	SO DO	2										
		Silty Clay, occ. silty sand layers Soft to firm Brown to grey			4	SO DO	2										
3																	
4																	
		Silty Sand, trace gravel Very loose to compact Grey		4.57	5 DO	12											
5					6 DO	40											
		END OF BOREHOLE Refusal to further auger penetration probably on Bedrock		5.15													
6																	
		Hammer weight of 32 kg used to obtain samples and blows/0.3m refer to this hammer weight.															
7																	
8																	
9																	
10																	

Note:
Water level in
open borehole at
0.6m depth on
completion of
drilling.

Note:
Water level in
open borehole at
0.6m depth on
completion of
drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DJM

CHECKED: AP

N800098A BHS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: Sta. 18+220, 14m Lt

RECORD OF BOREHOLE 99A

BORING DATE: APRIL 22/99

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, K, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa		c _u , kPa		W _p				W	
0		GROUND SURFACE		0.00													
1	CME 55 BOMBARDIER HOLLOW STEM AUGERS	Sand and gravel, trace silt, trace cobble Compact, becoming very loose to loose below 2.3m depth Black and brown (FILL)		1	50	11											
2				50	15												
3				50	23												
4				50	8												
5				50	5												
6				50	2												
5		Peat, fibrous occ. layer of grey silty sand and gravel between 4.7m and 5.2m depth Very loose to loose Dark brown		7	50	6											
6	50			4													
7	50			3													
7.30		END OF BOREHOLE REFUSAL TO FURTHER AUGER PENETRATION PROBABLY ON BEDROCK															

>112.6
 >290.5
 >159.2

Note:
 water level in
 open borehole at
 2.3m depth on
 completion of
 drilling.

DATA INPUT: PS MAY 25/99

SOLM6

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

N800099B BHS
DATA INPUT: PS MAY 25/99
SOILM6

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: Sta. 18+170, 14m Lt.

RECORD OF BOREHOLE 99B




BORING DATE: APRIL 22/99

SHEET 1 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m										
				DEPTH (m)				SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa	nat V - rem V -	+	Q - ● U - ○						
								20	40	60	80	20	40	60	80		
0		GROUND SURFACE		0.00													
		Sand and gravel, trace silt, some cobbles Loose to very dense Brown (FILL)			1	50 DO	8										
1					2	50 DO	54										
						3	50 DO	45									
2						4	50 DO	40									
						5	50 DO	13									
3																	
4				3.81													
		Sand and gravel, occ. cobbles/ rockfill Loose to compact Brown (FILL)			6	50 DO	2										
5					7	50 DO	2										
						8	50 DO	8									
6						9	50 DO	10									
						10	50 DO	11									
7																	
8																	
		Sand, some gravel, some silt Loose to compact Grey			11	50 DO	7										
9					12	50 DO	5										
						13	50 DO	23									
10		CONTINUED ON NEXT PAGE															

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

N800098B BHS
SOILM6
DATA INPUT: PS MAY 25/99

W.P. 208-97-00
DIST. 52, HWY 69
LOCATION: Sta. 18+170, 14m Lt

RECORD OF BOREHOLE 99B

BORING DATE: APRIL 22/99

SHEET 2 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, K, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa	nat V - rem V -	+	Q - ● U - ○	Wp	W			Wi	
10		CONTINUED FROM PREVIOUS PAGE													Note: Water level in open borehole at 1.5m depth on completion of drilling.		
		END OF BOREHOLE REFUSAL TO FURTHER AUGER PENETRATION PROBABLY ON BEDROCK															
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

W.P. 209-87-00
DIST. 52, HWY 69
LOCATION: Sta. 18+140, 20m Lt.

RECORD OF BOREHOLE 99C




BORING DATE: APRIL 23/99

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m			HYDRAULIC CONDUCTIVITY, k, cm/s			ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH			WATER CONTENT, PERCENT				
				DEPTH (m)				Cu, kPa	nat V - rem V -	+ ⊗	Q - ● U - ○	Wp	W		
0		GROUND SURFACE		0.00											
1	CME 55 BOMBARDIER HOLLOW STEM AUGERS	Sand and gravel, trace silt, trace cobbles Layer of cobbles/rockfill between 0.9m and 2.0m depth Very loose to loose Brown (FILL)													
2				1	50 DO	58									
3															
4				2	50 DO	6									
5				3	50 DO	3									
6				5.79											
7		Peat Fibrous Loose Dark brown			4	50 DO	3								
8		Silty Clay, trace sand Very soft Grey		7.62		50 DO	WH								
9		END OF BOREHOLE REFUSAL TO FURTHER AUGER PENETRATION PROBABLY ON BEDROCK		8.70											
10															

Note: Water level in open borehole at 2.4m depth on completion of drilling.

Note:
Water level in
open borehole at
2.4m depth on
completion of
drilling.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: Sta. 18+130, 33m Lt.

RECORD OF BOREHOLE 99D

BORING DATE: APRIL 21&22/99

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, K, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	SHEAR STRENGTH				WATER CONTENT, PERCENT						
							Cu, kPa		nat V - + Q - ● rem V - ⊕ U - ○		Wp -----W-----Wt						
							20	40	60	80		20	40	60	80		
0	CME 55 BOMBARDIER HOLLOW STEM AUGERS	WATER SURFACE															
		Water		0.00													
		Peat, fibrous becoming amorphous below approximately 4m depth Very loose Dark brown to black		0.15	1	50 DO	PM										
1					2	50 DO	2									>775	
					3	50 DO	1									>1940	
2																	
3																	
4																	
5																	
6																	
7		Silty Clay, trace sand Very soft Grey		6.10	6	50 DO	WR										
8																	
9		Sand and Gravel, trace silt and clay Dense Grey		8.30	8	50 DO	31										
10		END OF BOREHOLE		8.75													

Note:
Water level 0.15m
above the peat
surface.

Note:
Water level 0.15m
above the peat
surface.

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: Sta. 18+130, 35m Lt.

RECORD OF BOREHOLE 99E

BORING DATE: APRIL 20/99

SHEET 1 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m		HYDRAULIC CONDUCTIVITY, k _v cm/s		ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT ELEV. DEPTH (m)	NUMBER TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa	WATER CONTENT, PERCENT Wp W Wl				
0	CME 55 BOMBARDIER HOLLOW STEM AUGERS	GROUND SURFACE	0.00	1	50 DO	22					
1		Sand and gravel, trace silt, trace clay, trace organics Compact Brown		2	50 DO	11					
2		peat, fibrous becoming amorphous below approximately 4m depth, trace sand, trace clay Very loose to loose Dark brown to black	1.52	3	50 DO	5					>1194.7
3			4	50 DO	2					>785.2	
4			5	50 DO	1					>877.4	
5			6	50 DO	PM					>743.5	
6			7	50 DO	PM					>689.0	
7		Silty Clay, trace sand, occ. sand layer Very soft to soft Grey	6.10	8	50 DO	PM					
8			9	50 DO	PM						
9			10	50 DO	WH						
10		CONTINUED ON NEXT PAGE									

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: Sta. 18+130, 35m Lt.

RECORD OF BOREHOLE 99E

BORING DATE: APRIL 20/99

SHEET 2 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
				DEPTH (m)				Cu, kPa	nat V - rem V -	+ ⊕	Q - ● U - ○	Wp	W	Wi			
10	CME 55 BOMBARDIER HOLLOW STEM AUGERS	CONTINUED FROM PREVIOUS PAGE															
		Silty Clay, trace sand, occ. sand layer Very soft to soft Grey						⊕	+								
		Silty Sand, trace clay, trace gravel Dense Grey		10.67	11	50 DO	38		⊕	+							
11		END OF BOREHOLE		11.13													
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: Sta. 18+140, 8m Lt.

RECORD OF BOREHOLE 99F

BORING DATE: APRIL 23/99

SHEET 1 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa	nat V - + rem V - @ U - O	WATER CONTENT, PERCENT Wp ----- Wl						
				DEPTH (m)												
0	CME 55 BOMBARDIER HOLLOW STEM AUGERS	GROUND SURFACE														
		Water		0.00												
		Peat, fibrous becoming amorphous below 4m depth, trace sand Very loose Dark brown to black		0.30	1	50 DO	2								>665.5	
1					2	50 DO	3								>596.5	
2								@	+							
								@	+							
3				3	50 DO	PM										
								@	+							
4								@	+							
				4	50 DO	WR									>795.5	
5								@								
								@								
6					5	50 DO	PM								>251.3	
							@									
7							@	+								
		Silty Clay, trace sand, trace organics Very soft Grey	7.16	6	50 DO	WH										
8						@										
						@										
9				7	50 DO	WR										
		Silty Sand, trace clay, trace gravel Dense Grey	9.29	8	50 DO	31	@	+								
10																
CONTINUED ON NEXT PAGE																

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

W.P. 209-87-00
DIST. 52, HWY 69
LOCATION: Sta. 18+140, 8m Lt.

RECORD OF BOREHOLE 99F

BORING DATE: APRIL 23/99

SHEET 2 OF 2

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	SOIL PROFILE DESCRIPTION	STRATA ELEV. DEPTH (m)	SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
			NUMBER	TYPE				
			BLOWS/0.3m					
10	CONTINUED FROM PREVIOUS PAGE							
10.05	END OF BOREHOLE REFUSAL TO FURTHER AUGER PENETRATION PROBABLY ON BEDROCK							
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: SB

CHECKED: AP

N8000101 BHS

W.P. 209-97-00
 DIST. 52, HWY 69
 LOCATION: 10+850, 2.0m Lt

RECORD OF BOREHOLE 101




BORING DATE: DEC.19&20/98

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa	nat V - ram V -	+	Q - ● U - ○	Wp	W			Wi	
								20	40	60	80	20	40	60	80		
0	PORTABLE DRILLING EQUIPMENT 63.5mm I.D. PLASTIC CASING	GROUND SURFACE		0.00													
1		Peat Fibrous becoming amorphous below 3.7m depth Very loose Dark brown to black						⊕	+								
2				1	50 00	WH										○ > 888.7	
3								⊕	+								
4				2	50 00	1		⊕	+								○ > 947.8
5								⊕	+								
6		Sand, trace silt and gravel Loose Grey			5.79	4	50 00	3									
7				5	50 00	4											
8		Sandy Silt, trace clay Loose Grey			7.01	6	50 00	9									
9																	
10		END OF BOREHOLE REFUSAL TO FURTHER AUGER PENETRATION PROBABLY ON BEDROCK		8.17													
		Hammer weight of 32 kg used to obtain samples and blows/0.3m refer to this hammer weight.															

Note:
Water level in
open borehole at
0.1m depth below
ground surface
during drilling.

Note:
 Water level in
 open borehole at
 0.1m depth below
 ground surface
 during drilling.

DATA INPUT: PS MAY 25/99

SOILM6

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: DJM

CHECKED: AP

NE000102 BHS

DATA INPUT: PS MAY 25/99
SOILM6

W.P. 209-97-00
DIST. 52, HWY 69
LOCATION: 10+875, 3.0m LT.

RECORD OF BOREHOLE 102

BORING DATE: DEC.20/98

SHEET 1 OF 1

DATUM:

PROJECT: 981-1111



DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, K, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT, PERCENT					
								Cu, kPa		c _u , kPa		W _p				W	
0		GROUND SURFACE		0.00													
1		Peat Fibrous, becoming amorphous below approximately 2.4m depth Loose to very loose Dark brown to black															
2																	
3																	
4																	
5		Sand, trace gravel Loose to compact Grey		4.72													
6																	
7																	
8																	
9		END OF BOREHOLE		9.00													
10		Hammer weight of 32 kg used to obtain samples and blows/0.3m refer to this hammer weight.															

Note:
Water level in
open borehole at
0.1m depth below
ground surface.

DEPTH SCALE

1 to 50

Golder Associates

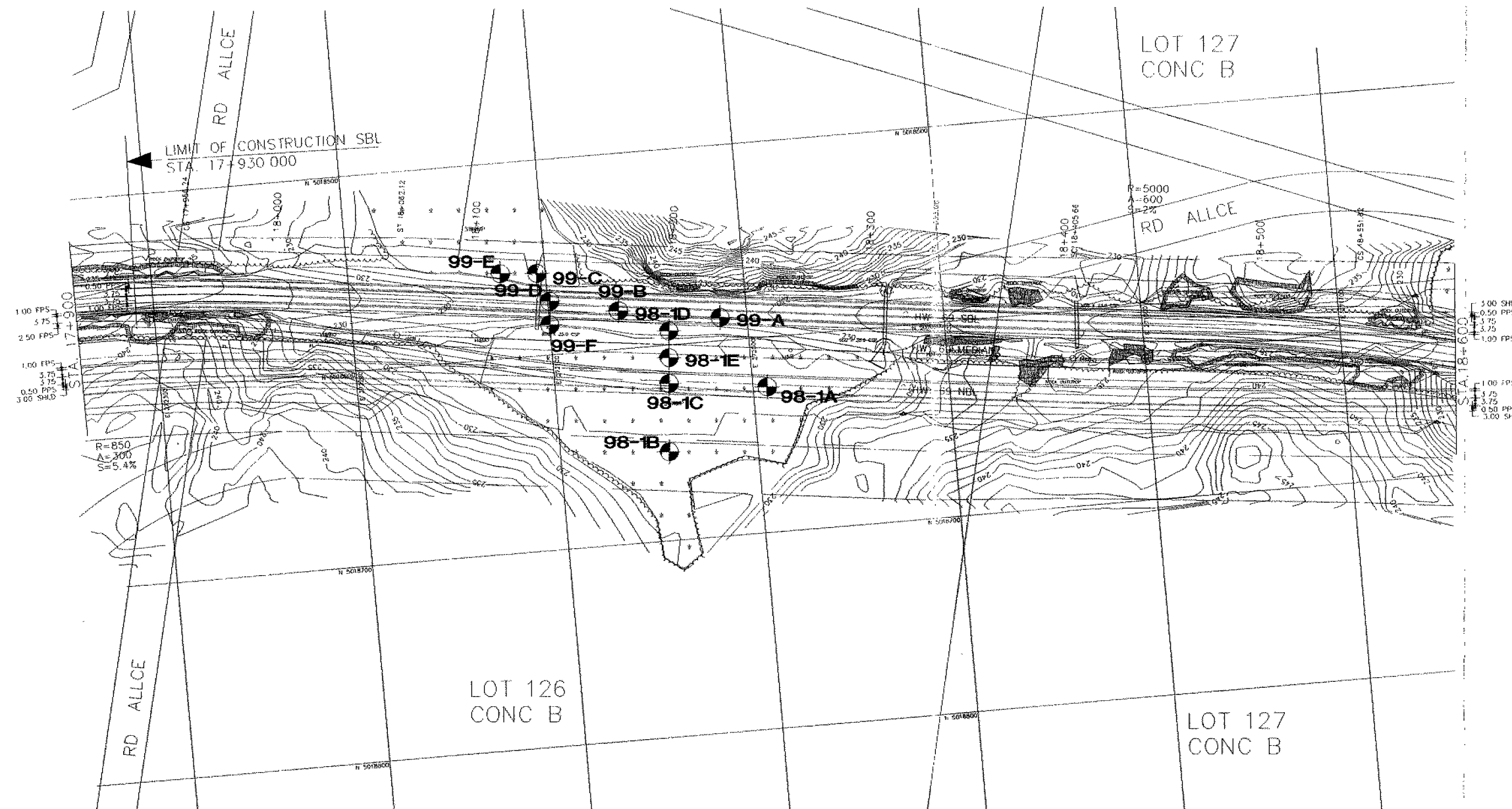
LOGGED: DJM

CHECKED: AP



1

6.1m - 7.2m peak
underlain by 4.3m sh/ clay

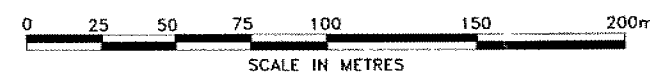


LEGEND			
	Bore Hole		
N	Blows/0.3m (Std. Pen. Test, 475 j/blow)		
Cone	Blows/0.3m (60° Cone, 475 j/blow)		
	WL at time of investigation		
No.	ELEVATION	COORDINATES	
		STATION	OFFSET
98-1A	N/A	18+250	20m Rt.
98-1B	N/A	18+200	55m Rt.
98-1C	N/A	18+200	20m Rt.
98-1D	N/A	10+200	7m Lt.
98-1E	N/A	18+200	7m Rt.
99-A	N/A	18+220	14m Lt.
98-B	N/A	18+170	14m Lt.
98-C	N/A	18+140	20m Lt.
98-D	N/A	18+130	33m Lt.
98-E	N/A	18+110	35m Lt.
98-F	N/A	18+140	8m Lt.

NOTES

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

PLAN



NO.	DATE	BY	REVISION
Geocres No.			
HWY 69	PROJECT NO.: 981-1111	DIST.	
SUBM'D. AMP	CHKD: ASP	DATE: 1999 05 25	SITE
DRAWN: JFC	CHKD. AMP	APPD.	DWG. N111101E



HWY 69
Sta. 18+600 to Sta. 19+300
BORE HOLE LOCATIONS

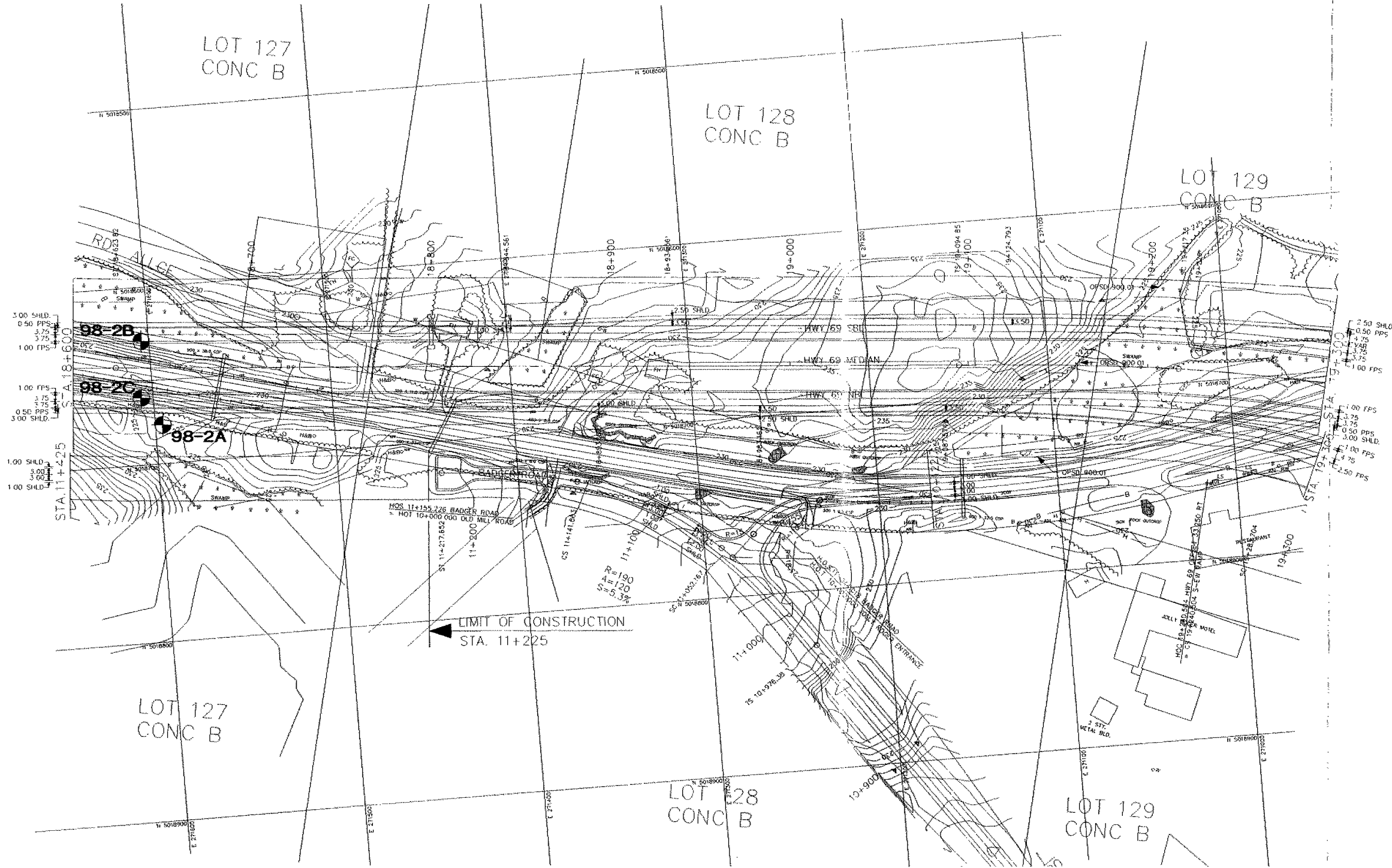
SHEET



Golder Associates Ltd.
MISSISSAUGA, ONTARIO, CANADA

2

2.7m - 3.2m deep
underlain by soft silty clay



LEGEND

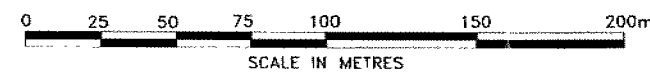
- Bore Hole
- Blows/0.3m (Std. Pen. Test. 475 j/blow)
- Blows/0.3m (60° Cone, 475 j/blow)
- WL at time of investigation

No.	ELEVATION	COORDINATES	
		STATION	OFFSET
98-2A	N/A	18+650	32m Rt
98-2B	N/A	18+638	15m Lt.
98-2C	N/A	18+638	17m Rt.

NOTES

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

PLAN

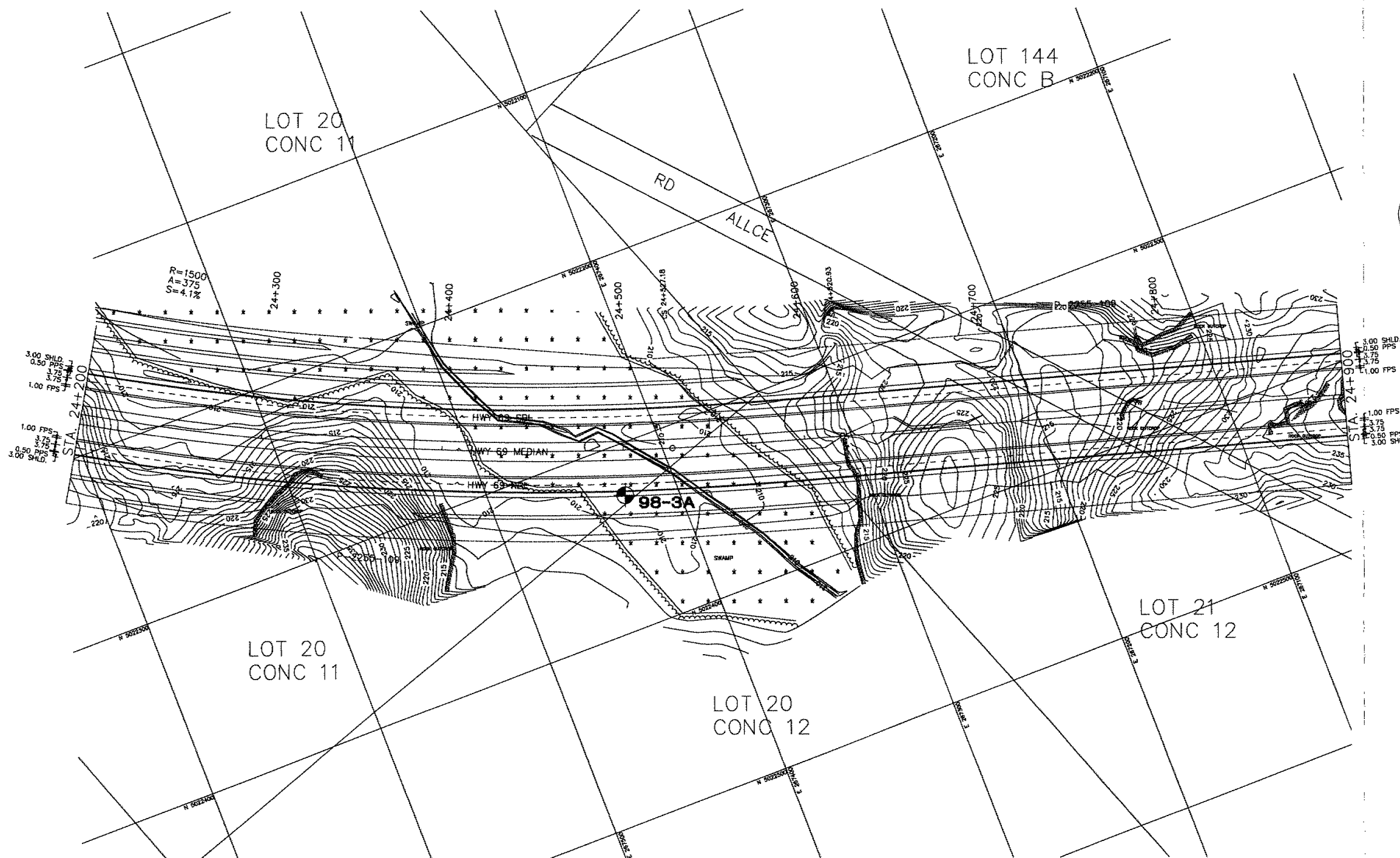


NO.	DATE	BY	REVISION

Geocres No.

HWY 69	PROJECT NO.: 981-1111	DIST.
SUBM'D. AMP	CHKD: ASP	DATE: 1999 05 25
DRAWN: JFC	CHKD. AMP	APPD.

DWG. N111102E



1.8m Peat
4

LEGEND

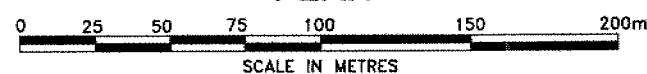
- Bore Hole
- N Blows/0.3m (Std. Pen. Test, 475 j/blow)
- Cone Blows/0.3m (60° Cone, 475 j/blow)
- WL at time of investigation

No.	ELEVATION	COORDINATES	
		STATION	OFFSET
98-3A	N/A	24+525	25m Rt

NOTES

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

PLAN



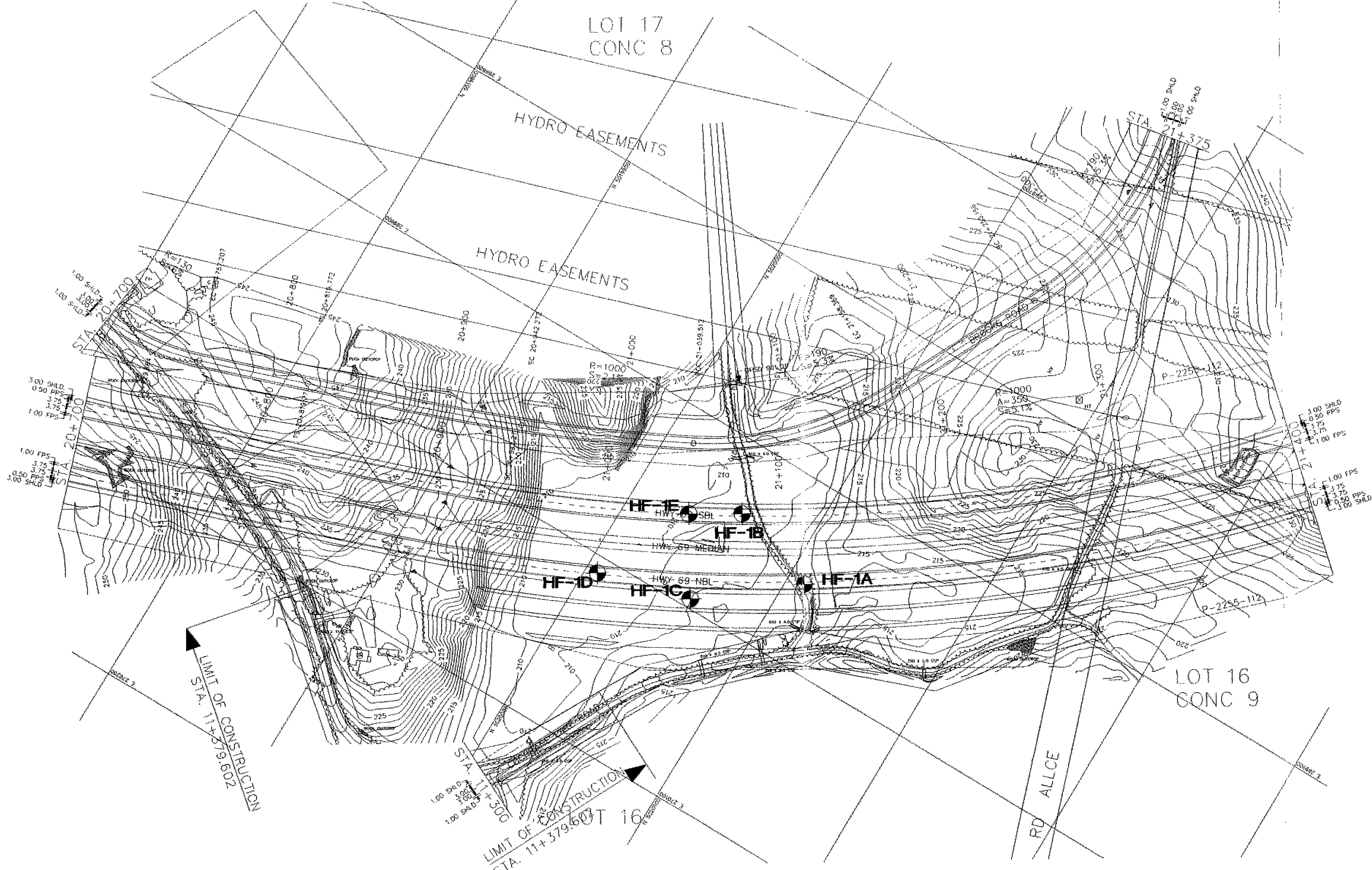
NO.	DATE	BY	REVISION

Geocres No.

HWY 69	PROJECT NO.: 981-1111	DIST.
SUBM'D. AMP	CHKD: ASP	DATE: 1999 05 25
DRAWN: JFC	CHKD. AMP	APPD.
		DWG. N111104E



3
no peat.
soft, silty clay
1.8m to 5.8m.



LEGEND

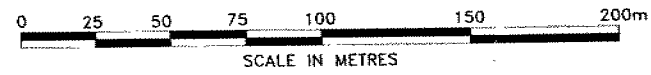
- Bore Hole
- Blows/0.3m (Std. Pen. Test. 475 j/blow)
- Cone Blows/0.3m (60° Cone. 475 j/blow)
- WL at time of investigation

No.	ELEVATION	COORDINATES	
		STATION	OFFSET
HF-1A	N/A	21+115	20m Rt
HF-1B	N/A	21+080	20m Lt.
HF-1C	N/A	21+050	29m Rt.
HF-1D	N/A	21+000	18m Lt.
HF-1E	N/A	21+050	19m Lt.

NOTES

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

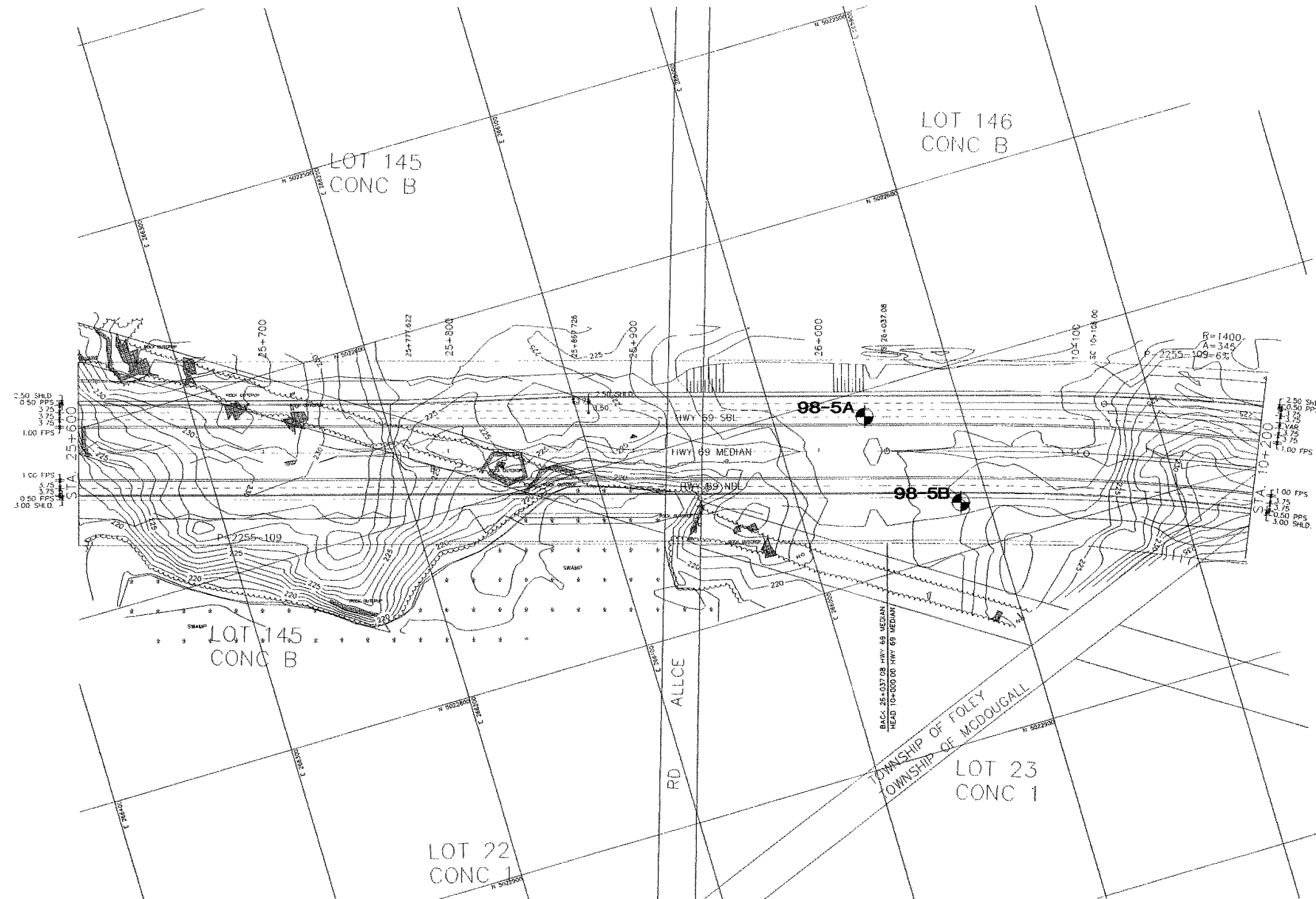
PLAN



NO.	DATE	BY	REVISION

Geocres No.

HWY 69	PROJECT NO.: 981-1111	DIST.
SUBM'D. AMP	CHKD: ASP	DATE: 1999 05 25
DRAWN: JFC	CHKD: AMP	APPD.
		SITE
		DWG. N111104E



111m to 1.7m
pea'l.

(5)

LEGEND

- Bore Hole
- N Blows/0.3m (Std. Pen. Test, 475 j/blow)
- Cone Blows/0.3m (60° Cone, 475 j/blow)
- WL at time of investigation

No.	ELEVATION	COORDINATES	
		STATION	OFFSET
98-5A	N/A	11+825	19m Rt
98-5B	N/A	10+060	28m Lt.

NOTES

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

NO.	DATE	BY	REVISION
Geocres No.			
HWY 69	PROJECT NO.: 981-1111	DIST.	
SUBM'D. AMP	CHKD: ASP	DATE: 1999 05 25	SITE
DRAWN: JFC	CHKD. AMP	APPD.	DWG. N111105E

PLAN





6

0.1m to 0.5m peat
underlying 1.1 to 3.7m
soft malpais/
silt/clay

LEGEND

- Bore Hole
- N Blows/0.3m (Std. Pen. Test, 475 j/blow)
- Cone Blows/0.3m (60° Cone, 475 j/blow)
- WL at time of investigation

No.	ELEVATION	COORDINATES	
		STATION	OFFSET
98-4A	N/A	11+825	19m Rt
98-4B	N/A	11+825	19m Lt

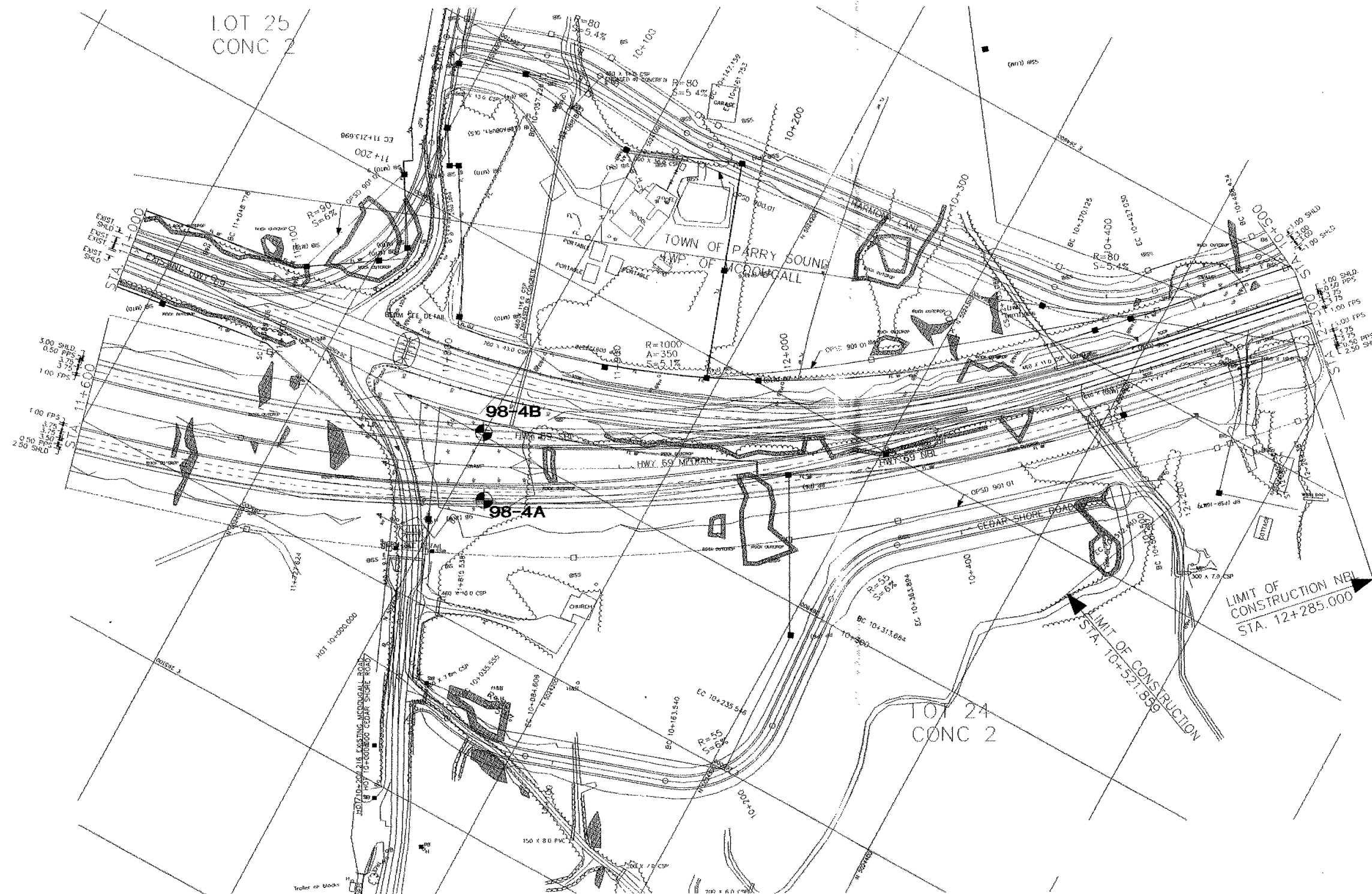
NOTES

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

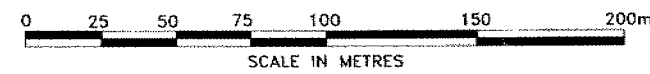
NO.	DATE	BY	REVISION

Geocres No.

HWY 69	PROJECT NO.: 981-1111	DIST.
SUBM'D. AMP	CHKD. ASP	DATE: 1999 05 25
DRAWN: JFC	CHKD. AMP	APPD.
		DWG. N111106E



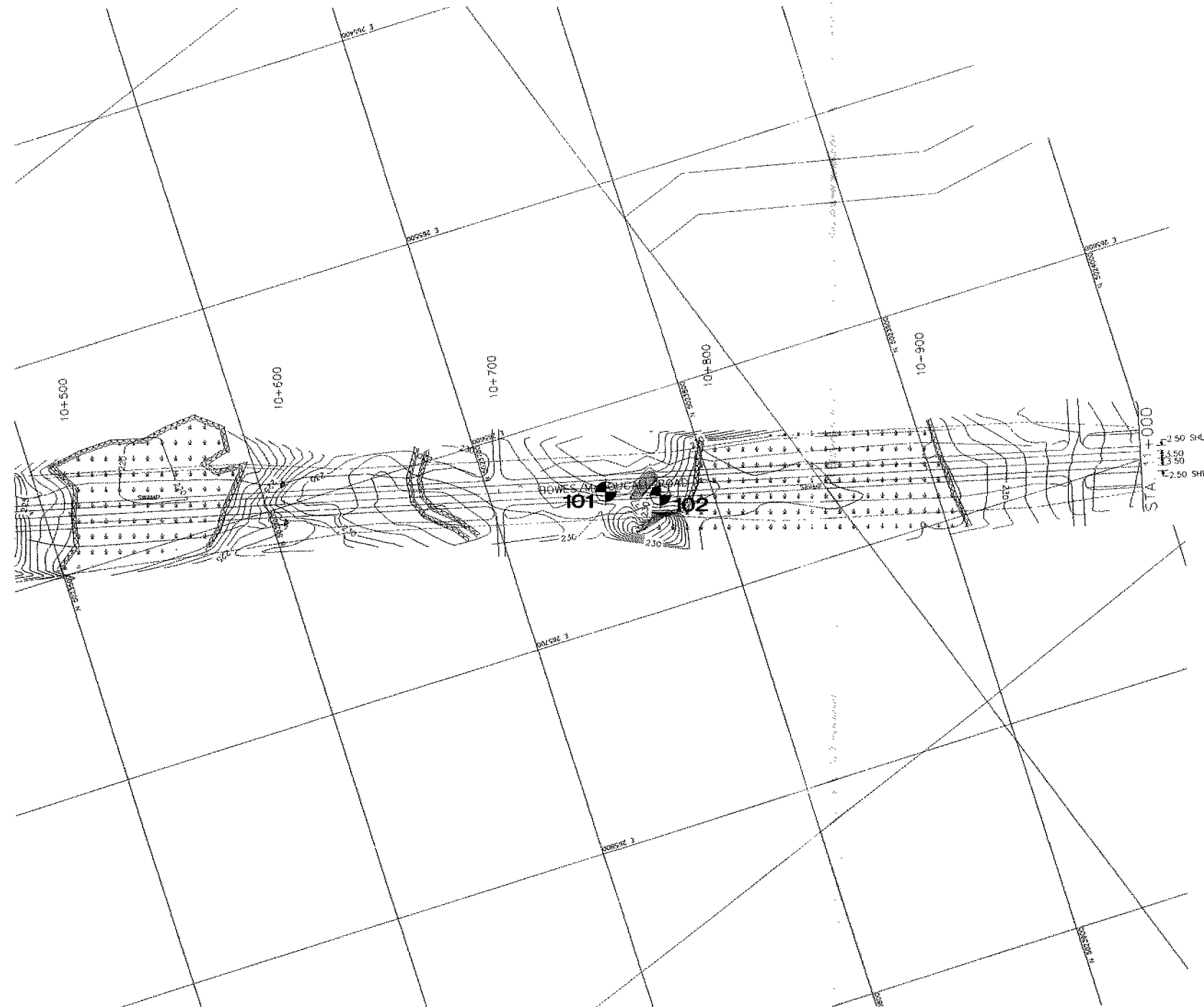
PLAN



SCALE IN METRES

7

47m to 5.8m Peal.



LEGEND

- Bore Hole
- N Blows/0.3m (Std. Pen. Test. 475 j/blow)
- Cone Blows/0.3m (60° Cone, 475 j/blow)
- WL at time of investigation

No.	ELEVATION	COORDINATES	
		STATION	OFFSET
98-3A	N/A	24+525	25m Rt

NOTES

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

NO.	DATE	BY	REVISION

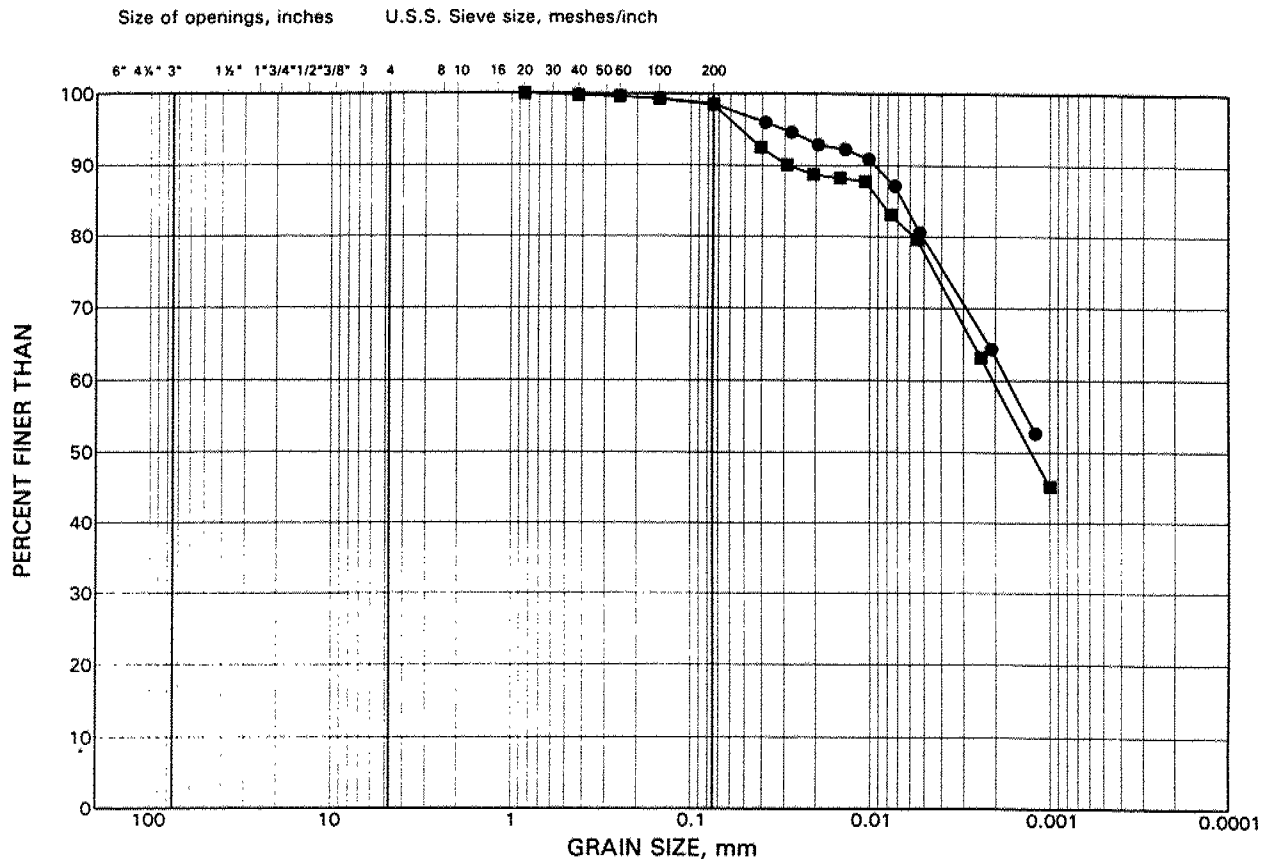
Geocres No.

HWY 69	PROJECT NO.:	981-1111	DIST.
SUBM'D. AMP	CHKD: ASP	DATE: 1999 05 25	SITE
DRAWN: JFC	CHKD. AMP	APPD.	DWG. N111107E

GRAIN SIZE DISTRIBUTION

Silty Clay

FIGURE 1



COBBLE	COARSE	FINE	COARSE	MEDIUM	FINE	SILT AND CLAY SIZES
SIZE	GRAVEL SIZE		SAND SIZE			FINE GRAINED

LEGEND

SYMBOL	BOREHOLE	SAMPLE	DEPTH(m)
•	98-1C	5	-
■	HF-1B	3	-

APPENDIX A

RELEVANT GEOTECHNICAL INFORMATION

**PAVEMENT DESIGN REPORT
HIGHWAY 69, W.P. 209-97-00
FOUR LANING OF THE PARRY SOUND BY-ASS
TOWN OF PARRY SOUND
DISTRICT 52, HUNTSVILLE**

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

18+050 19.00 Rt C/L D+2.70 HA

0 - 150 Si Tps
150 - 900 Si W F Sa, Moist
- 900 NFP BR

18+050 27.00 Rt C/L D+4.00 HA

0 - 150 Si Tps
150 - 800 Si W F Sa, Moist
- 800 NFP BR

18+050 11.00 Rt C/L D+300 HA

0 - 150 Si Tps
150 - 600 Si Tr F Sa, Wet
600 - 700 F Sa, Wet
- 700 NFP BR

18+060 27.00 Rt C/L D+3.30 HA

0 - 150 Si Tps
150 - 600 Si W F Sa
600 - 1.50 F-Med Sa W Gr

18+060 19.00 Rt C/L D+2.10 HA

0 - 150 Si Tps
150 - 1.20 Si W F Sa, Wet
- 1.20 NFP BR

18+060 11.00 Rt C/L D+400 HA

0 - 150 Si Tps
150 - 1.50 F Sa, Wet

18+100 19.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 2.00 Si Tr Sa & Cl, Wet
- 2.00 NFP Sloughing

18+100 27.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.20 Si W Cl, Wet
- 1.20 NFP BR

18+100 11.00 Rt C/L D-0 HA

0 - 150 Wat
150 - 2.00 Si Tr Sa, Wet
- 2.00 NFP Sloughing

18+125 11.00 Rt C/L D-0 HA

0 - 200 Wat
200 - 3.20 Muckamor
- 3.20 NFP BR

18+125 19.00 Rt C/L D-0 HA

0 - 100 Wat
100 - 2.70 Muckamor
- 2.70 NFP BR

18+125 27.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 300 Si W F Sa, Fr Wat @ 200
- 300 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111

July, 1998

18+250 30.00 Rt C/L D-0 PA

0 - 150 Wat
150 - 6.70 Muckamor
6.70 - 8.40 Sa Tr Si
- 8.40 NFP BR

18+250 31.00 Rt C/L D-0 HA

0 - 250 Wat
250 - 7.60 Muckamor

18+275 27.00 Rt C/L D+800 HA

0 - 150 Si Tps
- 150 NFP BR

18+275 19.00 Rt C/L D-0 HA

0 - 300 Wat
300 - 1.00 Muckamor
- 1.00 NFP BR

18+275 11.00 Rt C/L D-0 HA

0 - 100 Wat
100 - 4.00 Muckamor

18+300 19.00 Rt C/L D-500 HA

0 - 2.50 Muckamor
2.50 - 2.70 Si, Wet, Firm
- 2.70 NFP

18+300 11.00 Rt C/L D-500 HA

0 - 100 Wat
100 - 3.00 Muckamor
- 3.00 NFP Blds

18+300 27.00 Rt C/L D-0 HA

0 - 150 Si Tps
- 150 NFP BR

18+310 27.00 Rt C/L D+1.10 HA

0 - 150 Si Tps
150 - 400 Si Tr Sa
- 400 NFP Blds

18+310 11.00 Rt C/L D-300 HA

0 - 150 Si Tps
150 - 1.80 F-Med Sa Tr Si, Fr Wat @ 300

18+310 19.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 400 F-Med Sa Tr Si
- 400 NFP Blds

18+320 11.00 Rt C/L D-300 HA

0 - 150 Si Tps
150 - 1.00 Si Tr F Sa, Wet
- 1.00 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

18+470 11.00 Rt C/L D+700 HA

0 - 50 Moss
- 50 NFP BR

18+490 19.00 Rt C/L D+1.50 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa
- 400 NFP Blds

18+490 27.00 Rt C/L D+1.80 HA

0 - 100 Si Tps
- 100 NFP BR

18+490 11.00 Rt C/L D+600 HA

0 - 50 Moss
- 50 NFP BR

18+510 27.00 Rt C/L D+3.60 HA

- 0 BR

18+510 19.00 Rt C/L D+3.30 HA

0 - 100 Si Tps
100 - 300 Si W F Sa, Moist
- 300 NFP BR

18+510 11.00 Rt C/L D+2.00 HA

- 0 BR

18+530 27.00 Rt C/L D+3.50 HA

- 0 BR

18+530 19.00 Rt C/L D+2.50 HA

0 - 100 Si Tps W Blds
100 - 250 Si W F Sa
250 - 800 F-Med Sa Tr Si, Wet
800 - 900 F-Med Sa W Gr
- 900 NFP Blds

18+530 11.00 Rt C/L D+1.20 HA

0 - 150 Si Tps
150 - 400 Si W F Sa, Moist
- 400 NFP BR

18+550 11.00 Rt C/L D+1.50 HA

- 0 BR

18+550 27.00 Rt C/L D+200 HA

0 - 100 Si Tps W Blds
100 - 300 Si W F Sa, Moist
- 300 NFP BR

18+550 19.00 Rt C/L D+1.90 HA

0 - 100 Si Tps
- 100 NFP BR

18+570 27.00 Rt C/L D+240 HA

0 - 80 Si Tps
- 80 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

18+570 19.00 Rt C/L D+2.40 HA

0 - 150 Si Tps
- 150 NFP BR

18+570 11.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 600 Si Tr F Sa
- 600 NFP BR

18+580 11.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 250 F Sa W Si
- 250 NFP BR

18+580 19.00 Rt C/L D-300 HA

0 - 150 Si Tps
150 - 400 Si W F Sa
- 400 NFP BR

18+580 27.00 Rt C/L D-500 HA

0 - 150 Si Tps
150 - 900 Si W F Sa
- 900 NFP BR

18+590 27.00 Rt C/L D-2.70 HA

0 - 150 Si Tps
150 - 800 Si W F Sa
- 800 NFP Blds

18+590 19.00 Rt C/L D+3.00 HA

0 - 150 Si Tps
150 - 800 Si Tr F Sa, Moist
- 800 NFP Blds

18+590 11.00 Rt C/L D-2.00 HA

- 0 RF

18+600 27.00 Rt C/L D-5.00 HA

0 - 150 Si Tps
150 - 800 Si W Cl
800 - 1.00 Si W Cl Tr Co Sa
1.00 - 1.10 Si Tr Cl
- 1.10 NFP Blds

18+600 11.00 Rt C/L D-3.00 HA

- 0 RF

18+600 19.00 Rt C/L D-5.20 HA

0 - 100 Si Tps
100 - 800 Si Tr F Sa, Fr Wat @ 200
800 - 1.60 Si W Cl, Moist, Firm
1.60 - 1.70 F-Med Sa Tr Gr, Wet
- 1.70 NFP Blds

18+625 27.00 Rt C/L D-6.00 HA

0 - 50 Wat
50 - 800 Muckamor
800 - 1.00 F-Med Sa Tr Gr, Firm
- 1.00 NFP

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

18+625 11.00 Rt C/L D-400 HA

0 - 250 F-Med Sa Tr Gr Tps
- 250 NFP RF

18+625 19.00 Rt C/L D-4.50 HA

- 0 RF

18+650 19.00 Rt C/L D-2.00 HA

0 - 300 F-Med Sa Tr Gr Tps
- 300 NFP RF

18+650 27.00 Rt C/L D-5.00 HA

- 0 RF

18+650 11.00 Rt C/L D-0 PA

0 - 240 Asph
240 - 390 Cr Gr
390 - 1.30 F-Med Sa Tr Gr
- 1.30 NFP RF

18+670 16.00 Rt C/L D+1.00 PA

0 - 140 Asph
140 - 290 Cr Gr
290 - 2.10 F-Med Sa Tr Gr Tr RF
- 2.10 NFP RF
*50% extra material
required to backfill hole.

18+670 27.00 Rt C/L D-600 HA

0 - 350 F Sa Tr Gr Tps
- 350 NFP RF

18+670 11.00 Rt C/L D-0 PA

0 - 330 Asph
330 - 480 Cr Gr
480 - 900 F-Med Sa Tr Gr
- 900 NFP Sh Rk

18+690 11.00 Rt C/L D+4.00 PA

0 - 350 Asph
350 - 550 Cr Gr
550 - 1.10 F-Med Sa W Gr
- 1.10 NFP RF

18+690 27.00 Rt C/L D+1.20 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa
- 500 NFP RF

18+690 19.00 Rt C/L D+1.60 PA

0 - 300 Asph
300 - 450 Cr Gr
450 - 700 F-Med Sa Tr Gr
- 700 NFP RF

18+710 19.00 Rt C/L D+2.50 PA

0 - 360 Asph
360 - 510 Cr Gr
510 - 1.10 F-Med Sa Tr Gr
- 1.10 NFP RF

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

18+710 27.00 Rt C/L D+2.50 HA

0 - 150 Si Tps
150 - 300 Cr Gr
300 - 1.90 F-Med Sa Tr Gr Tr Sh Rk
- 1.90 NFP Sh Rk
*75% extra material required
to backfill hole.

18+750 19.00 Rt C/L D+1.20 PA

0 - 200 Asph
200 - 330 Cr Gr
330 - 1.60 F-Med Sa W Gr OCC RF
- 1.60 NFP RF
*20% extra material required
to backfill hole.

18+710 11.00 Rt C/L D+2.50 PA

0 - 210 Asph
210 - 410 Cr Gr
410 - 3.40 F-Med Sa W Gr W RF
3.40 - 5.00 Si W F Sa Tr Gr, Moist
- 5.00 NFP
*50% extra material required
to backfill hole.

18+750 27.00 Rt C/L D+2.00 PA

0 - 340 Asph
340 - 480 Cr Gr
480 - 1.90 F-Med Sa Tr Gr
- 1.90 NFP BR
*50 % extra material required
to backfill hole.

18+730 27.00 Rt C/L D+2.00 PA

0 - 270 Asph
270 - 420 Cr Gr
420 - 800 F-Med Sa Tr Gr
- 800 NFP Sh Rk

18+750 11.00 Rt C/L D+300 HA

0 - 150 Si Tps
150 - 800 F Sa Tr Si, Wet
- 800 NFP BR

18+730 19.00 Rt C/L D+2.00 PA

0 - 380 Asph
380 - 570 Cr Gr
570 - 800 F-Med Sa W Gr
- 800 NFP Sh Rk

18+780 0.30 Rt C/L D-0 HA

0 - 500 Wat
500 - 800 Muckamor
800 - 1.00 Si Tr Sa, Wet
- 1.00 NFP Blids

18+800 27.00 Rt C/L D+900 PA

0 - 200 Asph
200 - 400 Cr Gr
400 - 800 F-Med Sa W Gr
- 800 NFP RF

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

20+800 19.00 Rt C/L D-1.00 HA

0 - 100 Cr Gr
100 - 400 F-Med Sa W Gr
- 400 NFP Blds

20+850 19.00 Rt C/L D-2.30 HA

0 - 150 Si Tps
150 - 300 Si Tr F Sa, Moist
- 300 NFP BR

20+800 11.00 Rt C/L D-300 HA

0 - 150 Cr Gr
150 - 300 F-Med Sa Tr Gr
- 300 NFP Blds

20+850 27.00 Rt C/L D-4.50 HA

0 - 150 Si Tps
- 150 NFP BR

20+810 11.00 Rt C/L D-900 HA

0 - 1.50 F-Med Sa W Gr

20+900 11.00 Rt C/L D-0 HA

0 - 80 Moss
- 80 NFP BR

20+810 19.00 Rt C/L D-1.00 HA

0 - 150 Cr Gr
150 - 350 F-Med Sa W Gr
- 350 NFP Blds

20+900 19.00 Rt C/L D-500 HA

0 - 150 Si Tps
150 - 300 Si Tr F Sa, Moist
- 300 NFP Blds

20+810 27.00 Rt C/L D-1.40 HA

0 - 100 Cr Gr
100 - 400 F-Med Sa W Gr
- 400 NFP Blds

20+900 27.00 Rt C/L D-900 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa, Moist
- 400 NFP Blds

20+850 11.00 Rt C/L D-1.00 HA

0 - 150 Si Tps
150 - 200 Si Tr F Sa, Moist
- 200 NFP BR

20+950 19.00 Rt C/L D-1.50 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa, Wet
- 400 NFP Blds

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

20+950 27.00 Rt C/L D-2.10 HA

0 - 200 Si Tps
- 200 NFP Blds

20+950 11.00 Rt C/L D-1.00 HA

0 - 150 Si Tps
150 - 350 Si Tr F Sa
- 350 NFP Blds

20+950 43.00 Rt C/L D-2.80 HA

0 - 150 Si Tps
150 - 350 Si Tr F Sa, Wet
- 350 NFP Blds

21+000 0.30 Rt C/L D-0 HA

0 - 150 Si Tps, Fr Wat @ 100
150 - 1.20 Si W F Sa
1.20 - 1.60 Si Tr F Sa & Cl
- 1.60 NFP Sloughing

21+000 19.00 Rt C/L D-0 HA

0 - 150 Si Tps, Fr Wat @ 100
150 - 1.30 Si W F Sa Tr Cl
- 1.30 NFP Sloughing

21+000 27.00 Rt C/L D-0 HA

0 - 150 Si Tps, Fr Wat @ 100
150 - 1.30 Si W F Sa Tr Cl
- 1.30 NFP Sloughing

21+000 61.00 Rt C/L D+300 HA

0 - 80 Si Tps
80 - 400 Si Tr Cl, Fr Wat @ 400
400 - 2.50 Cl Tr Si
- 2.50 NFP Sloughing

21+050 0.30 Rt C/L D-0 HA

0 - 150 Si Tps
- 150 NFP BR

21+050 19.00 Rt C/L D-300 HA

0 - 50 Si Tps
50 - 400 Si W F Sa Tr Cl, Fr Wat @ 100
400 - 600 Cl Tr Si, Firm
- 600 NFP Sloughing

21+050 27.00 Rt C/L D-300 HA

0 - 100 Si Tps
100 - 1.00 Si W F Sa Tr Cl, Wet,
Fr Wat @ 200
1.00 - 1.10 Cl Tr Si, Firm
- 1.10 NFP Sloughing

21+050 61.00 Rt C/L D-400 HA

0 - 150 Si Tps
150 - 200 Si W Cl, Fr Wat @ 200
200 - 2.80 Cl Tr Si, Firm
2.80 - 2.90 Si W F Sa, Wet
- 2.90 NFP Sloughing

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111

July, 1998

21+100 19.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.70 Si Tr F Sa, Fr Wat @ 200
1.70 - 1.90 F-Med Sa Tr Si
1.90 - 2.40 F Sa W Si
- 2.40 NFP Sloughing

21+100 61.00 Rt C/L D-0 HA

0 - 500 F-Med Sa Tr Gr
- 500 NFP Blds

21+100 27.00 Rt C/L D-0 HA

0 - 150 Si Tps, Fr Wat @ 100
150 - 1.20 Si Tr F Sa, Wet
1.20 - 1.70 F Sa Tr Si
1.70 - 2.00 Si Tr Cl
- 2.00 NFP Sloughing

21+150 59.00 Rt C/L D+1.20 HA

0 - 50 Moss
- 50 NFP BR

21+150 0.30 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa
- 500 NFP BR

21+150 27.00 Rt C/L D-1.00 HA

0 - 100 Si Tps
100 - 800 Si Tr Cl, Wet
800 - 1.30 Si W Cl
- 1.30 NFP Sloughing

21+150 19.00 Rt C/L D-900 HA

0 - 150 Si Tps
150 - 1.50 Cl, Moist, Firm
1.50 - 1.60 Cl W Si, Moist, Fr Wat @ 1.60
- 1.60 NFP BR

21+200 0.30 Rt C/L D-0 HA

0 - 50 Moss
- 50 NFP BR

21+200 19.00 Rt C/L D-1.30 HA

0 - 150 Si Tps
150 - 1.20 Si Tr F Sa, Wet
1.20 - 1.50 Si, Wet, Fr Wat @ 1.50
- 1.50 NFP Sloughing

21+200 27.00 Rt C/L D-1.40 HA

0 - 100 Si Tps, Fr Wat @ 50
100 - 1.40 Si Tr F Sa, Wet
- 1.40 NFP Sloughing

21+200 59.00 Rt C/L D-1.10 HA

0 - 500 F-Med Sa Tr Gr
- 500 NFP Blds

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

21+250 27.00 Rt C/L D-1.20 HA

0 - 150 Si Tps, Fr Wat @ 50
150 - 1.30 Si Tr F Sa, Wet
- 1.30 NFP Sloughing

21+250 55.00 Rt C/L D-800 HA

0 - 100 Si Tps
100 - 1.10 Si W F Sa
- 1.10 NFP Blds

21+250 19.00 Rt C/L D-700 HA

0 - 150 Si Tps
150 - 1.30 Si Tr F Sa, Wet
- 1.30 NFP Sloughing

21+250 0.30 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.50 Cl W Si, Wet
1.50 - 1.60 Si Tr Cl, Wet, Fr Wat @ 1.60
- 1.60 NFP BR

21+300 19.00 Rt C/L D-600 HA

0 - 150 Si Tps
150 - 1.00 Si Tr F Sa, Wet
- 1.00 NFP BR

21+300 27.00 Rt C/L D-800 HA

0 - 150 Si Tps
150 - 700 Si W F Sa
- 700 NFP BR

21+300 11.00 Rt C/L D-300 HA

0 - 100 Si Tps
100 - 1.30 Si Tr F Sa, Wet, Fr Wat @ 500
- 1.30 NFP BR

21+350 27.00 Rt C/L D-700 HA

0 - 150 Si Tps
150 - 700 Si Tr F Sa
- 700 NFP BR

21+350 11.00 Rt C/L D-200 HA

0 - 150 Si Tps
- 150 NFP BR

21+350 19.00 Rt C/L D-500 HA

0 - 150 Si Tps
150 - 800 Si Tr Cl, Moist
- 800 NFP BR

21+400 27.00 Rt C/L D+600 HA

0 - 100 Si Tps
- 100 NFP BR

21+400 19.00 Rt C/L D+300 HA

0 - 150 Si Tps
- 150 NFP Blds

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

24+200 19.00 Rt C/L D-200 HA

0 - 200 Si Tps
- 200 NFP BR

24+250 27.00 Rt C/L D+600 HA

0 - 100 Si Tps
100 - 400 Si W F Sa
- 400 NFP BR

24+250 11.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 1.30 F-Med Sa Tr Gr, Wet
- 1.30 NFP Blds

24+250 19.00 Rt C/L D+300 HA

0 - 150 Si Tps
150 - 1.00 F-Med Sa, Wet
- 1.00 NFP Blds

24+300 19.00 Rt C/L D+1.20 HA

0 - 150 Si Tps
150 - 700 F Sa W Si, Moist
- 700 NFP BR

24+300 27.00 Rt C/L D+1.60 HA

0 - 150 Si Tps
150 - 600 F Sa W Si, Moist
- 600 NFP BR

24+300 11.00 Rt C/L D+700 HA

0 - 150 Si Tps
150 - 650 F Sa Tr Si, Moist
- 650 NFP Blds

24+350 11.00 Rt C/L D+2.00 HA

0 - 150 Si Tps
- 150 NFP BR

24+350 19.00 Rt C/L D+4.00 HA

0 - 150 Si Tps
- 150 NFP BR

24+350 27.00 Rt C/L D+6.00 HA

0 - 100 Si Tps
- 100 NFP BR

24+400 0.30 Rt C/L D-0 HA

0 - 50 Moss
50 - 2.00 Muckamor, Fr Wat @ 100
2.00 - 2.10 Si Tr F Sa, Wet, Firm
- 2.10 NFP

24+400 11.00 Rt C/L D-0 HA

0 - 50 Moss
50 - 1.40 Muckamor, Fr Wat @ 100
1.40 - 1.50 Si W F Sa, Wet, Firm
- 1.50 NFP

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111

July, 1998

24+400 19.00 Rt C/L D+300 HA

0 - 150 Si Tps
- 150 NFP BR

24+400 27.00 Rt C/L D+2.10 HA

0 - 150 Si Tps
- 150 NFP BR

24+425 0.30 Rt C/L D-0 HA

0 - 50 Moss
50 - 1.20 Muckamor, Fr Wat @ 100
1.20 - 1.30 Si W F Sa, Wet, Firm
- 1.30 NFP

24+425 19.00 Rt C/L D-0 HA

0 - 150 Si Tps W Org, Fr Wat @ 150
150 - 1.60 Muckamor
1.60 - 1.70 Si Tr F Sa, Wet, Firm
- 1.70 NFP

24+425 27.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 1.80 F Sa W Si, Fr Wat @ 200
- 1.80 NFP Sloughing

24+450 27.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 1.10 Si Tr F Sa, Fr Wat @ 300
- 1.10 NFP Sloughing

24+450 11.00 Rt C/L D-0 HA

0 - 1.00 Muckamor, Fr Wat @ 100
1.00 - 1.10 Si Tr F Sa, Wet, Firm
- 1.10 NFP

24+450 19.00 Rt C/L D-0 HA

0 - 150 Si Tps W Org, Fr Wat @ 150
150 - 300 Si Tr F Sa
300 - 1.00 F Sa Tr Si, Wet
- 1.00 NFP Sloughing

24+475 11.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.30 Muckamor, Fr Wat @ 200
1.30 - 1.40 Si Tr F Sa, Wet, Firm
- 1.40 NFP

24+475 19.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.20 Muckamor, Fr Wat @ 200
1.20 - 1.30 Si Tr F Sa, Wet, Firm
- 1.30 NFP

24+475 27.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 1.50 Si W F Sa, Fr Wat @ 400
- 1.50 NFP Sloughing

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

24+500 19.00 Rt C/L D-0 HA

0 - 100 Si Tps, Fr Wat @ 25
100 - 1.20 Muckamor
1.20 - 1.30 Si Tr F Sa, Wet, Firm
- 1.30 NFP

24+500 27.00 Rt C/L D-0 HA

0 - 150 Si Tps W Org, Fr Wat @ 100
150 - 1.10 Si Tr F Sa
- 1.10 NFP Sloughing

24+500 11.00 Rt C/L D-0 HA

0 - 150 Si Tps, Fr Wat @ 100
150 - 1.20 Muckamor
1.20 - 1.30 Si Tr F Sa, Wet, Firm
- 1.30 NFP

24+500 0.30 Rt C/L D-0 HA

0 - 150 Si Tps, Fr Wat @ 100
150 - 2.10 Muckamor
2.10 - 2.20 Si Tr F Sa, Wet, Firm
- 2.20 NFP

24+525 0.30 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 700 Muckamor, Fr Wat @ 200
700 - 710 Si Tr F Sa, Firm
- 710 NFP

24+525 38.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.00 Muckamor
1.00 - 1.10 Si Tr F Sa, Firm
- 1.10 NFP

24+525 19.00 Rt C/L D-0 HA

0 - 300 Wat
300 - 1.00 Muckamor
1.00 - 1.10 Si Tr F Sa, Firm
- 1.10 NFP

24+550 19.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.10 Muckamor, Fr Wat @ 300
1.10 - 1.20 Si Tr F Sa, Firm
- 1.20 NFP

24+550 40.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.10 Si W F Sa, Fr Wat @ 300
1.10 - 2.00 F Sa W Si
- 2.00 NFP Sloughing

24+600 27.00 Rt C/L D-400 HA

0 - 150 Si Tps
150 - 1.10 Si W F Sa, Fr Wat @ 700
1.10 - 2.10 F Sa W Si, Wet
- 2.10 NFP Sloughing

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111

July, 1998

24+600 19.00 Rt C/L D-200 HA

0 - 150 Si Tps
150 - 1.30 Si W F Sa, Fr Wat @ 800
1.30 - 2.30 F Sa W Si, Wet
- 2.30 NFP Sloughing

24+600 11.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.40 Si W F Sa, Fr Wat @ 1.00
1.40 - 2.50 F Sa W Si, Wet
- 2.50 NFP Sloughing

24+650 11.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 300 Si Tr F Sa
- 300 NFP BR

24+650 19.00 Rt C/L D+500 HA

0 - 150 Si Tps
150 - 700 Si Tr F Sa
- 700 NFP BR

24+650 27.00 Rt C/L D+500 HA

0 - 50 Moss
- 50 NFP BR

24+700 11.00 Rt C/L D+500 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa
- 400 NFP BR

24+700 19.00 Rt C/L D+700 HA

0 - 50 Si Tps
- 50 NFP BR

24+700 27.00 Rt C/L D+900 HA

0 - 50 Si Tps
- 50 NFP BR

24+750 27.00 Rt C/L D+400 HA

0 - 150 Si Tps
150 - 800 F Sa W Si
- 800 NFP Blds

24+750 11.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.40 F Sa W Si, Wet
- 1.40 NFP Blds

24+750 19.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 800 F Sa W Si
- 800 NFP Blds

24+800 27.00 Rt C/L D+1.00 HA

0 - 150 Si Tps
- 150 NFP Blds

24+800 11.00 Rt C/L D+300 HA

0 - 200 Si Tps
- 200 NFP Blds

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

25+520 19.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 700 Si Tr F Sa, Wet
- 700 NFP BR

25+520 27.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 300 Si Tr F Sa, Moist
- 300 NFP BR

25+520 11.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 500 Si W F Sa, Wet
- 500 NFP BR

25+530 27.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 900 Si Tr F Sa, Wet, Fr Wat @ 800
- 900 NFP Blds

25+530 19.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 400 Si Tr F Sa, Wet
- 400 NFP BR

25+530 11.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 1.50 F Sa Tr Si, Wet, Fr Wat @ 600

25+540 27.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 500 Si W F Sa, Wet
- 500 NFP Blds

25+540 19.00 Rt C/L D-100 HA

0 - 100 Si Tps
100 - 1.50 Si W F Sa, Wet, Fr Wat @ 500

25+540 11.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 1.30 Si W F Sa Tr Gr, Wet,
Fr Wat @ 500
- 1.30 NFP Blds

25+550 11.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 1.50 Si W F Sa, Wet, Fr Wat @ 500

25+550 19.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 1.10 Si W F Sa, Wet, Fr Wat @ 300
- 1.10 NFP Blds

25+550 27.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 800 Si W F Sa, Wet
- 800 NFP Blds

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

25+600 11.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 400 Si Tr F Sa
- 400 NFP Blds

25+600 19.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 1.50 F-Med Sa Tr Gr & Si, Wet,
Fr Wat @ 800
- 1.50 NFP Blds

25+600 27.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 900 F-Med Sa Tr Si, Wet
900 - 1.30 F Sa W Si, Wet, Fr Wat @ 1.00
1.30 - 1.50 F Sa Tr Gr, Wet
- 1.50 NFP Sloughing

25+610 19.00 Rt C/L D-2.10 HA

0 - 100 Si Tps
100 - 1.50 F-Med Sa Tr Gr & Si, Moist

25+610 27.00 Rt C/L D-2.40 HA

0 - 100 Si Tps
100 - 600 F-Med Sa Tr Si, Wet
- 600 NFP Blds

25+610 11.00 Rt C/L D-1.80 HA

0 - 100 Si Tps
100 - 400 Si Tr F Sa
- 400 NFP BR

25+620 27.00 Rt C/L D-2.40 HA

0 - 150 Si Tps
150 - 700 F-Med Sa Tr Si, Wet
- 700 NFP Blds

25+620 19.00 Rt C/L D-2.10 HA

0 - 100 Si Tps
100 - 1.50 F Sa Tr Si, Wet

25+620 11.00 Rt C/L D-1.80 HA

0 - 200 Si Tps
- 200 NFP BR

25+630 19.00 Rt C/L D-2.10 HA

0 - 100 Si Tps
100 - 500 Si Tr F Sa, Moist
- 500 NFP Blds

25+630 27.00 Rt C/L D-2.10 HA

0 - 100 Si Tps
100 - 600 Si Tr F Sa, Wet
- 600 NFP BR

25+630 11.00 Rt C/L D-2.00 HA

0 - 100 Si Tps
100 - 400 Si Tr F Sa
- 400 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

25+640 27.00 Rt C/L D-500 HA

0 - 50 Moss
- 50 NFP BR

25+640 19.00 Rt C/L D-300 HA

0 - 500 Si Tps
- 500 NFP BR

25+640 11.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 300 Si Tr F Sa, Wet
- 300 NFP Blds

25+660 19.00 Rt C/L D-0 HA

0 - 100 Si Tps
100 - 300 Si Tr F Sa, Moist
- 300 NFP BR

25+660 27.00 Rt C/L D-200 HA

0 - 100 Si Tps
- 100 NFP BR

25+660 11.00 Rt C/L D-0 HA

0 - 50 Si Tps
- 50 NFP BR

25+680 11.00 Rt C/L D-300 HA

0 - 150 Si Tps
150 - 300 Si Tr F Sa, Wet
- 300 NFP BR

25+680 19.00 Rt C/L D-0 HA

0 - 50 Si Tps
- 50 NFP BR

25+680 27.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa, Wet
- 400 NFP BR

25+700 11.00 Rt C/L D-200 HA

0 - 50 Moss
- 50 NFP BR

25+700 19.00 Rt C/L D-200 HA

0 - 150 Si Tps
- 150 NFP BR

25+700 27.00 Rt C/L D-0 HA

0 - 100 Si Tps
- 100 NFP BR

25+720 11.00 Rt C/L D-300 HA

0 - 50 Si Tps
- 50 NFP BR

25+720 19.00 Rt C/L D-300 HA

0 - 50 Si Tps
- 50 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

25+720 27.00 Rt C/L D-300 HA

0 - 300 Si Tps, Wet
- 300 NFP BR

25+740 19.00 Rt C/L D+200 HA

0 - 100 Si Tps
- 100 NFP BR

25+740 27.00 Rt C/L D-300 HA

0 - 50 Si Tps
- 50 NFP BR

25+740 11.00 Rt C/L D+100 HA

0 - 150 Si Tps
- 150 NFP BR

25+760 11.00 Rt C/L D-0 HA

0 - 150 Si Tps
- 150 NFP BR

25+760 19.00 Rt C/L D+100 HA

0 - 150 Si Tps
- 150 NFP Blds

25+760 27.00 Rt C/L D+200 HA

0 - 50 Si Tps
- 50 NFP BR

25+780 11.00 Rt C/L D+300 PA

0 - 150 Si Tps
150 - 1.35 F-Med Sa W Si Tr Blds & Cob
& Gr
1.35 - 1.90 F Sa W Si, Wet @ 1.90
1.90 - 2.60 F-Med Sa W Si Tr Blds & Cob
& Gr
- 2.60 NFP BR

25+780 19.00 Rt C/L D+600 PA

0 - 150 Si Tps
150 - 1.80 Si W F Sa Tr Blds & Cob & Gr
1.80 - 2.13 F-Med Sa Tr Blds & Cob & Gr
& Si
- 2.13 NFP BR

25+780 27.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 600 Si Tr F Sa, Moist
- 600 NFP Blds

25+800 19.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 800 Si Tr F Sa & Cl, Moist
- 800 NFP Blds

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

25+800 11.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 1.30 Si Tr Gr & F Sa, Wet,
Fr Wat @ 800*
1.30 - 1.40 Si W F Sa, Wet
1.40 - 1.80 F Sa Tr Si, Wet
- 1.80 NFP Blds

* Sample Depth = 500 - 800

w = 18 %

25+800 27.00 Rt C/L D-0 HA

0 - 200 Si Tps
200 - 800 Si Tr F Sa, Wet
- 800 NFP Blds

25+820 11.00 Rt C/L D-200 HA

0 - 50 Moss
- 50 NFP BR

25+820 19.00 Rt C/L D-600 HA

0 - 50 Moss
- 50 NFP BR

25+820 27.00 Rt C/L D-800 HA

0 - 50 Moss
- 50 NFP BR

25+840 11.00 Rt C/L D-100 HA

0 - 50 Moss
- 50 NFP BR

25+840 27.00 Rt C/L D-5.00 HA

0 - 150 Si Tps
- 150 NFP Blds

25+840 19.00 Rt C/L D-1.80 HA

- 0 BR

25+850 19.00 Rt C/L D-5.00 HA

0 - 50 Moss
50 - 150 Si Tps
- 150 NFP Blds

25+850 11.00 Rt C/L D-3.70 HA

- 0 BR

25+850 27.00 Rt C/L D-5.00 HA

0 - 3.00 Muckamor
- 3.00 NFP BR

25+860 27.00 Rt C/L D-5.00 HA

0 - 3.00 Muckamor
- 3.00 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

25+860 19.00 Rt C/L D-5.00 HA

0 - 100 Wat
100 - 1.70 Muckamor
- 1.70 NFP BR

25+860 11.00 Rt C/L D-1.30 HA

0 - 50 Moss
- 50 NFP Blds

25+870 11.00 Rt C/L D-2.00 HA

- 0 BR

25+870 19.00 Rt C/L D-4.80 HA

0 - 1.10 Muckamor
- 1.10 NFP BR

25+870 27.00 Rt C/L D-5.00 HA

0 - 1.10 Muckamor
- 1.10 NFP BR

25+875 11.00 Rt C/L D-3.00 HA

- 0 BR

25+875 19.00 Rt C/L D-4.80 HA

0 - 50 Wat
50 - 1.10 Muckamor*
- 1.10 NFP BR

* Sample Depth = 500 - 800

w = 1155 %

25+875 27.00 Rt C/L D-5.00 HA

0 - 80 Wat
80 - 1.20 Muckamor
- 1.20 NFP BR

25+900 11.00 Rt C/L D-1.00 HA

- 0 BR

25+900 27.00 Rt C/L D-3.00 HA

0 - 150 Wat
150 - 2.00 Muckamor
- 2.00 NFP BR

25+900 19.00 Rt C/L D-3.00 HA

0 - 200 Moss
- 200 NFP BR

25+925 11.00 Rt C/L D-4.00 HA

0 - 50 Moss
- 50 NFP BR

25+925 27.00 Rt C/L D-3.00 HA

0 - 900 Muckamor
- 900 NFP BR

25+925 19.00 Rt C/L D-2.40 HA

0 - 50 Moss
- 50 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

25+940 27.00 Rt C/L D-2.00 HA

- 0 BR

25+940 11.00 Rt C/L D-1.20 HA

0 - 100 Si Tps
- 100 NFP BR

25+940 19.00 Rt C/L D-2.10 HA

0 - 100 Si Tps
100 - 600 Si W F Sa
- 600 NFP BR

25+950 19.00 Rt C/L D-1.60 HA

0 - 150 Si Tps
150 - 600 Si W F Sa
- 600 NFP Blds

25+950 11.00 Rt C/L D-1.00 HA

0 - 100 Si Tps
- 100 NFP BR

25+950 27.00 Rt C/L D-300 HA

0 - 150 Si Tps
- 150 NFP BR

25+960 27.00 Rt C/L D+400 HA

- 0 BR

25+960 11.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 600 Si W F Sa
- 600 NFP BR

25+960 19.00 Rt C/L D+1.00 HA

0 - 100 Si Tps
100 - 800 Si W F Sa
- 800 NFP Blds

25+980 27.00 Rt C/L D+700 HA

0 - 300 Si Tps W Org
- 300 NFP Blds

25+980 19.00 Rt C/L D+400 HA

0 - 300 Si Tps W Org
300 - 1.00 Si Tr F Sa & Org
- 1.00 NFP Blds

25+980 11.00 Rt C/L D+200 HA

0 - 300 Si Tps W Org
300 - 1.00 Si Tr F Sa & Org
- 1.00 NFP Blds

26+000 19.00 Rt C/L D+400 HA

0 - 150 Si Tps
- 150 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

26+000 27.00 Rt C/L D+400 HA

0 - 150 Si Tps
150 - 250 Si Tr F Sa
- 250 NFP BR

26+000 11.00 Rt C/L D-0 HA

0 - 400 Wat
400 - 1.40 Muckamor
1.40 - 1.50 F Sa W Si, Wet
- 1.50 NFP BR

26+025 11.00 Rt C/L D-0 HA

0 - 100 Wat
100 - 1.00 Muckamor
1.00 - 1.20 F Sa Tr Si, Wet
- 1.20 NFP BR

26+025 19.00 Rt C/L D-0 HA

0 - 50 Wat
50 - 1.00 Muckamor
1.00 - 1.20 F-Med Sa Tr Si, Wet
- 1.20 NFP BR

26+025 27.00 Rt C/L D+200 HA

0 - 150 Si Tps
- 150 NFP BR

10+010 27.00 Rt C/L D+400 HA

0 - 150 Si Tps
150 - 450 Si Tr F Sa
- 450 NFP BR

10+010 19.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 600 Si W F Sa
- 600 NFP Blds

10+010 11.00 Rt C/L D-0 HA

0 - 200 Si Tps
200 - 500 Si Tr F Sa
- 500 NFP Blds

10+020 27.00 Rt C/L D+300 HA

0 - 150 Si Tps
150 - 300 Si W F Sa
- 300 NFP BR

10+020 11.00 Rt C/L D+200 HA

0 - 200 Si Tps
- 200 NFP BR

10+020 19.00 Rt C/L D+300 HA

0 - 150 Si Tps
150 - 250 Si Tr F Sa
- 250 NFP BR

10+040 19.00 Rt C/L D+300 HA

0 - 150 Si Tps
- 150 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

10+040 11.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa
- 400 NFP Blds

10+040 27.00 Rt C/L D-0 HA

0 - 250 Si Tps
- 250 NFP BR

10+060 27.00 Rt C/L D+300 HA

0 - 150 Si Tps
150 - 600 Si Tr F Sa
- 600 NFP BR

10+060 19.00 Rt C/L D+300 HA

0 - 50 Moss
- 50 NFP BR

10+060 11.00 Rt C/L D+200 HA

0 - 100 Si Tps
- 100 NFP BR

10+080 27.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa
- 500 NFP BR

10+080 19.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa
- 400 NFP BR

10+080 11.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 400 Si W F Sa, Wet
- 400 NFP Blds

10+100 19.00 Rt C/L D+300 HA

0 - 150 Si Tps
150 - 1.10 Si Tr F Sa & Cl
- 1.10 NFP BR

10+100 11.00 Rt C/L D+100 HA

0 - 150 Si Tps
150 - 1.40 Cl W F Sa Tr Si, Fr Wat @ 1.40
1.40 - 1.50 F Sa Tr Gr & Cl
- 1.50 NFP BR

10+100 27.00 Rt C/L D+400 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa
- 400 NFP BR

10+120 11.00 Rt C/L D+200 HA

0 - 150 Si Tps
150 - 250 Si W F Sa
- 250 NFP BR

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

11+760 11.00 Rt C/L D+200 HA

0 - 100 Si Tps
- 100 NFP BR

11+770 11.00 Rt C/L D-0 HA

0 - 150 Si Tps
- 150 NFP BR

11+770 19.00 Rt C/L D+300 HA

0 - 50 Si Tps
- 50 NFP BR

11+770 27.00 Rt C/L D-0 HA

0 - 100 Si Tps
- 100 NFP BR

11+780 11.00 Rt C/L D-100 PA

0 - 80 Asph
80 - 700 F-Med Sa Tr Gr & Si
- 700 NFP RF

11+780 19.00 Rt C/L D-200 HA

0 - 70 Asph
70 - 1.50 F-Med Sa Tr Gr & Si
- 1.50 NFP RF

11+780 27.00 Rt C/L D-300 PA

0 - 60 Asph
60 - 1.40 F-Med Sa Tr Gr & Si
- 1.40 NFP RF

11+790 11.00 Rt C/L D-0 HA

- 0 RF

11+790 27.00 Rt C/L D+2.00 HA

0 - 100 Si Tps
100 - 1.10 F-Med Sa W Gr
- 1.10 NFP RF

11+790 19.00 Rt C/L D+1.30 HA

0 - 400 F-Med Sa W Gr
- 400 NFP RF

11+800 29.00 Rt C/L D-0 HA

0 - 250 Wat
250 - 800 Muckamor
800 - 900 F Sa Tr Si, Firm
- 900 NFP

11+800 19.00 Rt C/L D-0 HA

0 - 300 Wat
300 - 1.00 Muckamor
1.00 - 1.30 F Sa Tr Si, Firm
- 1.30 NFP

11+800 9.00 Rt C/L D-0 HA

0 - 300 Wat
300 - 900 Muckamor
- 900 NFP

Northbound Lanes

Station 17+320 to 26+025 (Seguin Twp.) and 10+000 to 12+280 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

11+825 11.00 Rt C/L D-0 HA

0 - 250 Wat
250 - 800 Muckamor
800 - 900 F Sa W Si, Firm

11+850 5.00 Rt C/L D-0 HA

0 - 600 Wat
600 - 900 Muckamor
- 900 NFP Blds

11+825 31.00 Rt C/L D-0 HA

0 - 200 Wat
200 - 700 Muckamor
700 - 900 F Sa Tr Si & Cl, Firm
- 900 NFP

11+890 11.00 Rt C/L D-200 HA

0 - 150 Si Tps
150 - 300 Si Tr F Sa
- 300 NFP BR

11+825 19.00 Rt C/L D-0 PA

0 - 225 Wat
225 - 1.05 Cl W Si Tr Sa, Stiff
1.05 - 2.00 F Sa W Si, Firm
- 2.00 NFP Blds

11+890 19.00 Rt C/L D-200 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa
- 400 NFP BR

11+850 33.00 Rt C/L D+400 HA

0 - 150 Si Tps
150 - 700 F-Med Sa Tr Si
- 700 NFP Blds

11+890 27.00 Rt C/L D-0 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa
- 500 NFP Blds

11+850 19.00 Rt C/L D-0 HA

0 - 150 Wat
150 - 800 Muckamor
- 800 NFP

11+900 27.00 Rt C/L D-200 HA

0 - 150 Si Tps
- 150 NFP BR

11+900 11.00 Rt C/L D-600 HA

0 - 100 Si Tps
100 - 400 Si Tr F Sa
- 400 NFP BR

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111

July, 1998

17+900 20.00 Lt C/L D-3.50 PA

0 - 430 Asph
430 - 620 Cr Gr
620 - 1.10 F-Med Sa Tr Gr
- 1.10 NFP BR

18+000 20.00 Lt C/L D-500 PA

0 - 370 Asph
370 - 570 Cr Gr
570 - 850 F-Med Sa Tr Gr
- 850 NFP Sh Rk

17+900 14.00 Lt C/L D-350 PA

0 - 380 Asph
380 - 560 Cr Gr
560 - 900 F-Med Sa Tr Gr
- 900 NFP Sh Rk/BR

18+050 20.00 Lt C/L D-1.25 PA

0 - 410 Asph
410 - 600 Cr Gr
600 - 900 F-Med Sa Tr Gr
- 900 NFP RF

17+950 20.00 Lt C/L D-5.50 PA

0 - 400 Asph
400 - 610 Cr Gr
610 - 1.20 F-Med Sa Tr Gr
- 1.20 NFP BR

18+050 14.00 Lt C/L D+1.00 PA

0 - 360 Asph
360 - 540 Cr Gr
540 - 1.00 F-Med Sa Tr Gr
1.00 - 1.40 F-Med Sa W Si
- 1.40 NFP Sh Rk

17+950 14.00 Lt C/L D-550 PA

0 - 350 Asph
350 - 540 Cr Gr
540 - 1.10 F-Med Sa Tr Gr
- 1.10 NFP Sh Rk

18+100 14.00 Lt C/L D+1.00 PA

0 - 430 Asph
430 - 580 Cr Gr
580 - 1.30 F-Med Sa Tr Gr
- 1.30 NFP Sh Rk

18+000 14.00 Lt C/L D-300 PA

0 - 330 Asph
330 - 520 Cr Gr
520 - 1.10 F-Med Sa Tr Gr
- 1.10 NFP Sh Rk

18+100 20.00 Lt C/L D-1.00 PA

0 - 500 Asph
500 - 700 Cr Gr
700 - 1.00 F-Med Sa Tr Gr
- 1.00 NFP RF

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111

July, 1998

18+150 14.00 Lt C/L D+1.30 PA

0 - 460 Asph
460 - 610 Cr Gr
610 - 900 F-Med Sa Tr Gr
- 900 NFP BR

18+250 20.00 Lt C/L D+1.20 PA

0 - 300 Asph
300 - 490 Cr Gr
490 - 900 F-Med Sa Tr Gr
- 900 NFP BR

18+150 20.00 Lt C/L D-1.30 PA

0 - 630 Asph
630 - 820 Cr Gr
820 - 1.30 F-Med Sa Tr Gr
- 1.30 NFP RF

18+300 14.00 Lt C/L D+500 PA

0 - 400 Asph
400 - 550 Cr Gr
550 - 750 F-Med Sa Tr Gr
- 750 NFP Sh Rk

18+200 14.00 Lt C/L D+1.10 PA

0 - 460 Asph
460 - 610 Cr Gr
610 - 1.00 F-Med Sa Tr Gr
- 1.00 NFP Sh Rk

18+300 20.00 Lt C/L D+900 PA

0 - 390 Asph
390 - 590 Cr Gr
590 - 1.00 F-Med Sa Tr Gr
- 1.00 NFP BR

18+200 20.00 Lt C/L D+800 PA

0 - 310 Asph
310 - 510 Cr Gr
510 - 900 F-Med Sa Tr Gr
- 900 NFP BR

18+350 14.00 Lt C/L D-1.80 PA

0 - 370 Asph
370 - 520 Cr Gr
520 - 800 F-Med Sa Tr Gr
- 800 NFP BR

18+250 14.00 Lt C/L D+1.50 PA

0 - 440 Asph
440 - 580 Cr Gr
580 - 1.00 F-Med Sa Tr Gr
- 1.00 NFP BR

18+350 20.00 Lt C/L D-1.10 PA

0 - 310 Asph
310 - 500 Cr Gr
500 - 550 F-Med Sa Tr Gr
- 550 NFP BR

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

18+550 19.00 Lt C/L D-2.30 HA

0 - 100 Si Tps
100 - 300 F Sa Tr Si
- 300 NFP BR

18+570 27.00 Lt C/L D+600 HA

0 - 100 Si Tps
100 - 400 Si W F Sa
- 400 NFP BR

18+570 19.00 Lt C/L D+1.30 HA

- 0 BR

18+570 11.00 Lt C/L D+500 PA

0 - 330 Asph
330 - 530 Cr Gr
530 - 1.10 F-Med Sa Tr Gr
- 1.10 NFP BR

18+570 5.50 Lt C/L D+500 PA

0 - 410 Asph
410 - 560 Cr Gr
560 - 1.00 F-Med Sa Tr Gr
- 1.00 NFP BR

18+580 27.00 Lt C/L D-0 HA

- 0 BR

18+580 19.00 Lt C/L D+1.00 HA

- 0 BR

18+590 27.00 Lt C/L D-4.50 HA

0 - 200 Wat
200 - 500 Muckamor
500 - 600 Si Tr F Sa, Firm
- 600 NFP

18+590 2.00 Lt C/L D-0 PA

0 - 330 Asph
330 - 480 Cr Gr
480 - 600 F-Med Sa Tr Gr
- 600 NFP BR

18+590 19.00 Lt C/L D-2.50 HA

- 0 RF

18+600 19.00 Lt C/L D-2.70 HA

- 0 RF

18+600 27.00 Lt C/L D-4.50 HA

0 - 300 Wat
300 - 1.50 Muckamor
1.50 - 1.60 F Sa Tr Si, Firm
- 1.60 NFP

18+600 11.00 Lt C/L D-400 HA

0 - 100 Si Tps
100 - 400 F-Med Sa Tr Gr
- 400 NFP RF

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

18+625 33.00 Lt C/L D-4.50 HA

0 - 50 Wat
50 - 4.50 Muckamor
4.50 - 6.00 Si W Cl, Wet, Soft
- 6.00 NFP

18+625 19.00 Lt C/L D-4.50 HA

0 - 500 Muckamor
- 500 NFP RF

18+625 11.00 Lt C/L D-2.00 HA

0 - 100 Si Tps
- 100 NFP RF

18+650 30.00 Lt C/L D-4.00 HA

0 - 300 Wat
300 - 3.70 Muckamor
- 3.70 NFP Blds

18+650 32.00 Lt C/L D-4.00 PA

0 - 150 Wat
150 - 2.74 Muckamor
2.74 - 3.28 Cl W Si Tr Sa Tr Org, Soft, Wet
3.28 - 3.81 Sa, Loose, Wet
3.81 - 5.79 Cl W Si, Firm
5.79 - 5.84 Sa W Si, Compact
- 5.84 NFP BR

18+650 19.00 Lt C/L D-4.00 HA

0 - 5.70 Muckamor
5.70 - 6.20 Si W Cl, Wet, Soft

18+650 11.00 Lt C/L D-3.00 HA

0 - 80 Si Tps
- 80 NFP RF

18+675 11.00 Lt C/L D-3.50 HA

0 - 1.40 Muckamor
1.40 - 2.00 Si W F Sa Tr Cl & Org
2.00 - 2.80 F Sa W Si, Firm
- 2.80 NFP

18+675 27.00 Lt C/L D-300 HA

0 - 100 Si Tps
100 - 500 Si W F Sa
- 500 NFP Blds

18+675 19.00 Lt C/L D-3.50 HA

0 - 900 Muckamor, Fr Wat @ 0
900 - 1.10 Si Tr Sa & Cl
1.10 - 1.30 Si W Cl Tr F Sa
- 1.30 NFP Blds

18+700 11.00 Lt C/L D-400 HA

0 - 100 Si Tps, Fr Wat @ 100
100 - 1.30 Si W F Sa
1.30 - 1.80 Cl W Si, Moist, Stiff
- 1.80 NFP Sloughing

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

18+700 27.00 Lt C/L D+2.00 HA

0 - 100 Si Tps
100 - 1.00 Si Tr F Sa, Wet, Fr Wat @ 300
- 1.00 NFP BR

18+700 19.00 Lt C/L D+1.50 HA

0 - 100 Wd Chips
100 - 1.70 Si Tr F Sa & Cl, Wet
1.70 - 1.90 Si W Gr & F Sa, Wet
- 1.90 NFP BR

18+720 19.00 Lt C/L D+500 HA

0 - 50 Si Tps
50 - 300 F-Med Sa, Wet
300 - 600 Si W F Sa, Wet, Fr Wat @ 400
600 - 900 Si W F Sa Tr Gr, Wet
- 900 NFP BR

18+720 27.00 Lt C/L D+1.50 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa
- 500 NFP BR

18+720 11.00 Lt C/L D+400 HA

0 - 150 Si Tps
150 - 400 F-Med Sa Tr Si
- 400 NFP BR

18+740 11.00 Lt C/L D+1.50 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa
400 - 1.20 Si Tr F Sa & Cl
- 1.20 NFP Blds

18+740 27.00 Lt C/L D+1.80 HA

0 - 50 Cr Gr
50 - 300 F Sa W Si Tr Gr
300 - 600 F Sa Tr Gr & Si
- 600 NFP BR

18+740 19.00 Lt C/L D+1.70 HA

0 - 100 Si Tps
100 - 500 Si Tr F Sa
500 - 650 Si
- 650 NFP BR

18+750 27.00 Lt C/L D+1.50 HA

0 - 100 Si Tps
100 - 900 Si Tr F Sa
- 900 NFP Blds

18+750 19.00 Lt C/L D+1.40 HA

0 - 150 Cr Gr
150 - 800 F-Med Sa Tr Si
800 - 850 F-Med Sa Tr Gr & Si
- 850 NFP BR

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

20+840 27.00 Lt C/L D+600 HA

0 - 100 Si Tps
100 - 400 Si Tr F Sa, Moist
- 400 NFP BR

20+840 19.00 Lt C/L D+400 HA

0 - 100 Si Tps
100 - 300 Si Tr F Sa, Moist
- 300 NFP BR

20+840 11.00 Lt C/L D+300 HA

0 - 100 Si Tps
- 100 NFP BR

20+860 19.00 Lt C/L D+2.40 HA

0 - 150 Si Tps
150 - 600 Si Tr F Sa, Moist
- 600 NFP BR

20+860 27.00 Lt C/L D+2.70 HA

0 - 150 Si Tps
150 - 300 Si Tr F Sa, Moist
- 300 NFP BR

20+860 11.00 Lt C/L D+2.00 HA

0 - 150 Si Tps
150 - 600 Si Tr F Sa, Moist
- 600 NFP BR

20+870 27.00 Lt C/L D+1.30 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa, Moist
- 500 NFP BR

20+870 11.00 Lt C/L D+400 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa, Moist
- 500 NFP Blds

20+870 19.00 Lt C/L D+800 HA

0 - 100 Si Tps
100 - 300 Si Tr F Sa, Moist
- 300 NFP BR

20+880 27.00 Lt C/L D+1.50 HA

0 - 150 Si Tps
150 - 600 Si Tr F Sa, Moist
- 600 NFP BR

20+880 11.00 Lt C/L D+700 HA

0 - 150 Si Tps
150 - 800 Si Tr F Sa, Wet
800 - 900 Si Tr Gr & F Sa, Wet
- 900 NFP BR

20+880 19.00 Lt C/L D+900 HA

0 - 150 Si Tps
150 - 800 Si Tr F Sa, Wet
- 800 NFP BR

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

20+890 11.00 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa, Moist
- 500 NFP Blds

20+890 19.00 Lt C/L D-300 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa, Moist
- 400 NFP BR

20+890 27.00 Lt C/L D-0 HA

0 - 150 Si Tps
- 150 NFP BR

20+900 19.00 Lt C/L D-600 HA

0 - 150 Si Tps
150 - 900 Si Tr F Sa, Moist
- 900 NFP BR

20+900 27.00 Lt C/L D-500 HA

0 - 150 Si Tps
150 - 800 Si Tr F Sa, Moist
- 800 NFP BR

20+900 11.00 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 900 Si Tr F Sa, Moist
- 900 NFP BR

20+950 19.00 Lt C/L D+2.10 HA

0 - 150 Si Tps
- 150 NFP BR

20+950 27.00 Lt C/L D+2.00 HA

0 - 150 Si Tps
150 - 400 Si Tr F Sa, Moist
- 400 NFP BR

20+950 11.00 Lt C/L D+400 HA

0 - 200 Si Tps
- 200 NFP BR

21+000 19.00 Lt C/L D-0 HA

0 - 150 Si Tps, Fr Wat @ 100
150 - 1.30 Si W F Sa Tr Cl
- 1.30 NFP Sloughing

21+000 27.00 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 1.30 Si W F Sa Tr Cl
- 1.30 NFP Sloughing

21+000 61.00 Lt C/L D+11.50 HA

0 - 80 Si Tps
- 80 NFP BR

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111

July, 1998

21+050 19.00 Lt C/L D-500 HA

0 - 150 Si Tps
150 - 1.30 Si Tr F Sa, Wet, Fr Wat @ 300
1.30 - 1.90 Cl Tr Si, Firm
- 1.90 NFP BR

21+050 27.00 Lt C/L D-500 HA

0 - 150 Si Tps
150 - 1.70 F Sa W Si, Wet, Fr Wat @ 300
- 1.70 NFP BR

21+050 61.00 Lt C/L D-0 HA

0 - 150 Si Tps
- 150 NFP BR

21+100 0.30 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 1.80 F Sa W Si, Fr Wat @ 300
- 1.80 NFP Sloughing

21+100 61.00 Lt C/L D+100 HA

0 - 150 Si Tps
150 - 1.60 F Sa Tr Si, Wet, Fr Wat @ 200
- 1.60 NFP Sloughing

21+100 19.00 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 1.40 F Sa Tr Si, Wet, Fr Wat @ 300
- 1.40 NFP Sloughing

21+100 27.00 Lt C/L D-100 HA

0 - 150 Si Tps
150 - 1.40 F Sa Tr Si, Wet, Fr Wat @ 300
- 1.40 NFP Sloughing

21+150 19.00 Lt C/L D-200 HA

0 - 150 Si Tps
150 - 1.40 Si Tr F Sa, Moist
- 1.40 NFP BR

21+150 27.00 Lt C/L D+100 HA

0 - 100 Si Tps
100 - 1.10 Si Tr F Sa, Moist
- 1.10 NFP BR

21+150 46.00 Lt C/L D+400 HA

0 - 150 Si Tps
150 - 1.20 Si Tr F Sa, Moist
- 1.20 NFP BR

21+200 27.00 Lt C/L D+3.00 HA

0 - 400 Si Tps
- 400 NFP BR

21+200 11.00 Lt C/L D+1.80 HA

0 - 150 Si Tps
- 150 NFP BR

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

21+200 19.00 Lt C/L D+2.30 HA

0 - 150 Si Tps
- 150 NFP BR

21+250 11.00 Lt C/L D+2.00 HA

0 - 50 Moss
- 50 NFP BR

21+250 19.00 Lt C/L D+2.80 HA

0 - 150 Si Tps
- 150 NFP BR

21+250 27.00 Lt C/L D+3.00 HA

0 - 150 Si Tps
- 150 NFP BR

21+300 11.00 Lt C/L D+100 HA

0 - 100 Si Tps
100 - 500 Si Tr Sa
- 500 NFP Blds

21+300 19.00 Lt C/L D+300 HA

0 - 500 F-Med Sa W Gr
- 500 NFP Blds

21+300 27.00 Lt C/L D+600 HA

0 - 400 F-Med Sa W Gr
- 400 NFP BR

21+350 11.00 Lt C/L D+400 HA

0 - 50 Moss
- 50 NFP BR

21+350 19.00 Lt C/L D+500 HA

0 - 150 Si Tps
150 - 500 Si Tr Sa
- 500 NFP BR

21+350 27.00 Lt C/L D+400 HA

0 - 150 Si Tps
150 - 500 Si Tr Sa
- 500 NFP BR

21+400 27.00 Lt C/L D+200 HA

0 - 150 Si Tps
150 - 1.10 Si Tr F Sa
- 1.10 NFP BR

21+400 11.00 Lt C/L D+100 HA

0 - 150 Si Tps
150 - 700 Si W F Sa
- 700 NFP BR

21+400 19.00 Lt C/L D+200 HA

0 - 150 Si Tps
- 150 NFP BR

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

24+250 11.00 Lt C/L D-400 HA

0 - 150 Si Tps
150 - 1.30 F-Med Sa Tr Si, Wet,
Fr Wat @ 300
1.30 - 2.00 F-Med Sa Tr Gr & Si, Wet
- 2.00 NFP Sloughing

24+250 19.00 Lt C/L D-500 HA

0 - 150 Si Tps
150 - 1.50 F-Med Sa Tr Si, Wet,
Fr Wat @ 300
1.50 - 2.00 F-Med Sa Tr Gr & Si, Wet
- 2.00 NFP Sloughing

24+250 27.00 Lt C/L D-500 HA

0 - 150 Si Tps
150 - 1.30 F-Med Sa Tr Si, Fr Wat @ 300
1.30 - 2.00 F-Med Sa Tr Gr & Si, Wet
- 2.00 NFP Sloughing

24+300 19.00 Lt C/L D-2.00 HA

0 - 150 Si Tps
150 - 1.20 Si W F Sa, Wet, Fr Wat @ 350
1.20 - 1.40 F Sa W Si, Wet
- 1.40 NFP Sloughing

24+300 11.00 Lt C/L D-1.80 HA

0 - 150 Si Tps
150 - 7(X) F Sa, Wet
- 7(X) NFP Blds

24+300 27.00 Lt C/L D-2.00 HA

0 - 50 Moss
50 - 2.00 Muckamor, Fr Wat @ 100
2.00 - 2.10 Si Tr F Sa, Wet
- 2.10 NFP

24+300 50.00 Lt C/L D-2.00 HA

0 - 50 Moss
50 - 3.80 Muckamor, Fr Wat @ 100
3.80 - 3.90 Si Tr F Sa, Wet, Firm
- 3.90 NFP

24+350 11.00 Lt C/L D-800 HA

0 - 150 Si Tps
150 - 300 Si W F Sa
- 300 NFP Blds

24+350 19.00 Lt C/L D-1.70 HA

0 - 150 Si Tps
150 - 400 Si W F Sa
- 400 NFP Blds

24+350 27.00 Lt C/L D-2.20 HA

0 - 150 Si Tps
150 - 500 Si W F Sa, Wet
- 500 NFP Blds

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

24+400 19.00 Lt C/L D-0 HA

0 - 50 Moss
50 - 2.20 Muckamor, Wet
2.20 - 2.30 Si Tr F Sa, Wet, Firm
- 2.30 NFP

24+400 49.00 Lt C/L D-0 HA

0 - 50 Moss
50 - 3.60 Muckamor, Fr Wat @ 100
3.60 - 3.70 Si W F Sa, Wet, Firm
- 3.70 NFP

24+425 19.00 Lt C/L D-0 HA

0 - 450 Wat, Fr Wat @ 50
450 - 1.80 Muckamor
1.80 - 1.90 Si W F Sa, Wet, Firm
- 1.90 NFP

24+425 49.00 Lt C/L D-0 HA

0 - 100 Wat
100 - 2.10 Muckamor
2.10 - 2.20 Si W F Sa, Wet, Firm
- 2.20 NFP

24+450 49.00 Lt C/L D-0 HA

0 - 300 Si Tps W Org, Fr Wat @ 200
300 - 2.60 Muckamor
2.60 - 2.70 Si Tr F Sa, Wet, Firm
- 2.70 NFP

24+450 0.30 Lt C/L D-0 HA

0 - 50 Moss
50 - 1.80 Muckamor, Fr Wat @ 100
1.80 - 1.90 Si Tr F Sa, Wet, Firm
- 1.90 NFP

24+450 19.00 Lt C/L D-0 HA

0 - 300 Wat
300 - 2.10 Muckamor
2.10 - 2.20 Si Tr F Sa, Wet, Firm
- 2.20 NFP

24+475 19.00 Lt C/L D-0 HA

0 - 150 Si Tps W Org
150 - 1.50 Muckamor, Fr Wat @ 200
1.50 - 1.60 Si Tr F Sa, Wet, Firm
- 1.60 NFP

24+475 49.00 Lt C/L D-0 HA

0 - 300 Si Tps W Org, Fr Wat @ 300
300 - 2.00 Muckamor
2.00 - 2.10 Si Tr F Sa, Wet, Firm
- 2.10 NFP

24+500 19.00 Lt C/L D-0 HA

0 - 250 Si Tps W Org, Fr Wat @ 200
250 - 2.20 Muckamor
2.20 - 2.30 Si Tr F Sa, Wet, Firm
- 2.30 NFP

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

24+500 47.00 Lt C/L D-0 HA

0 - 150 Si Tps, Fr Wat @ 150
150 - 2.00 Muckamor
2.00 - 2.10 F-Med Sa, Firm
- 2.10 NFP

24+550 27.00 Lt C/L D+400 HA

0 - 100 Si Tps
100 - 1.30 F Sa W Si
1.30 - 1.40 Si W F Sa, Wet
1.40 - 2.50 Si Tr F Sa, Wet
- 2.50 NFP BR

24+525 19.00 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 1.30 Muckamor, Fr Wat @ 200
1.30 - 1.40 F Sa Tr Si, Firm
- 1.40 NFP

24+550 0.30 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 1.20 Muckamor, Fr Wat @ 200
1.20 - 1.35 Si Tr F Sa, Firm
- 1.35 NFP

24+525 38.00 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 1.00 Muckamor, Fr Wat @ 200
1.00 - 1.40 F Sa W Si, Firm
- 1.40 NFP

24+600 27.00 Lt C/L D-100 HA

0 - 150 Si Tps
150 - 300 Si Tr F Sa & Org, Wet
- 300 NFP BR

24+550 11.00 Lt C/L D-0 HA

0 - 1.00 Muckamor, Fr Wat @ 250
1.00 - 1.10 Si Tr F Sa, Firm
- 1.10 NFP

24+600 11.00 Lt C/L D+100 HA

0 - 150 Si Tps
150 - 2.50 F Sa W Si, Fr Wat @ 1.80
- 2.50 NFP Sloughing

24+550 19.00 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 600 Muckamor, Fr Wat @ 250
600 - 1.30 F Sa W Si, Firm
- 1.30 NFP

24+600 19.00 Lt C/L D+100 HA

0 - 150 Si Tps
150 - 2.30 F Sa W Si, Fr Wat @ 1.70
- 2.30 NFP Sloughing

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

25+950 27.00 Lt C/L D-300 HA

0 - 150 Si Tps
150 - 300 Si Tr F Sa
- 300 NFP Blds

25+960 19.00 Lt C/L D-500 HA

0 - 150 Si Tps
- 150 NFP Blds

25+960 11.00 Lt C/L D-1.00 HA

0 - 100 Si Tps
- 100 NFP Blds

25+960 27.00 Lt C/L D-500 HA

0 - 150 Si Tps
150 - 1.00 Si W F Sa, Wet
- 1.00 NFP Blds

25+970 19.00 Lt C/L D-200 HA

0 - 150 Si Tps
150 - 700 Si W F Sa
- 700 NFP Blds

25+970 27.00 Lt C/L D-500 HA

0 - 150 Si Tps
150 - 500 Si Tr F Sa, Wet
- 500 NFP Blds

25+970 11.00 Lt C/L D-100 HA

0 - 200 Si Tps
200 - 700 Si W F Sa
- 700 NFP Blds

25+980 11.00 Lt C/L D-300 HA

0 - 200 Si Tps
200 - 350 Si Tr F Sa, Moist
- 350 NFP Blds

25+980 19.00 Lt C/L D-400 HA

0 - 100 Wat
100 - 800 Muckamor
- 800 NFP BR

25+980 27.00 Lt C/L D-500 HA

0 - 100 Wat
100 - 1.10 Muckamor
- 1.10 NFP BR

26+000 19.00 Lt C/L D-0 HA

0 - 1.00 Muckamor, Fr Wat @ 50
1.00 - 1.10 F-Med Sa Tr Si, Wet, Firm
- 1.10 NFP

26+000 27.00 Lt C/L D-0 HA

0 - 100 Wat
100 - 800 Muckamor
800 - 850 F-Med Sa Tr Si, Wet, Firm
- 850 NFP

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

26+000 11.00 Lt C/L D-0 HA

0 - 1.30 Muckamor, Fr Wat @ 50
1.30 - 1.40 Si W F Sa, Wet, Firm
- 1.40 NFP

26+025 19.00 Lt C/L D-0 HA

0 - 50 Wat
50 - 1.40 Muckamor
- 1.40 NFP

26+025 27.00 Lt C/L D-0 HA

0 - 100 Wat
100 - 1.10 Muckamor
1.10 - 1.20 F-Med Sa, Wet, Firm
- 1.20 NFP

26+025 11.00 Lt C/L D-0 HA

0 - 50 Wat
50 - 1.00 Muckamor
1.00 - 1.10 F-Med Sa Tr Si, Wet, Firm
- 1.10 NFP

26+030 11.00 Lt C/L D-0 HA

0 - 1.20 Muckamor
1.20 - 1.30 F-Med Sa W Si, Wet, Firm
- 1.30 NFP BR

26+030 19.00 Lt C/L D-0 HA

0 - 100 Wat
100 - 1.60 Muckamor
1.60 - 1.75 F Sa W Si Tr Cl, Wet
1.75 - 1.85 Cl W F Sa Tr Si, Wet
1.85 - 1.95 F-Med Sa W Si, Wet
- 1.95 NFP BR

26+030 27.00 Lt C/L D-0 HA

0 - 1.10 Muckamor
1.10 - 1.30 F Sa W Cl Tr Si, Wet, Firm
- 1.30 NFP

10+010 27.00 Lt C/L D-0 HA

0 - 100 Wat
100 - 1.30 Muckamor
1.30 - 1.40 F-Med Sa Tr Si, Wet, Firm
- 1.40 NFP

10+010 19.00 Lt C/L D-0 HA

0 - 200 Wat
200 - 1.80 F Sa W Si Tr Cl, Wet, Firm
- 1.80 NFP Sloughing

10+010 11.00 Lt C/L D-0 HA

0 - 100 Wat
100 - 1.30 Muckamor
1.30 - 1.50 F Sa W Si, Wet, Firm
- 1.50 NFP

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

10+035 27.00 Lt C/L D-0 HA

0 - 150 Wat
150 - 1.10 Muckamor
1.10 - 1.20 Si Tr F Sa, Firm
- 1.20 NFP

10+060 19.00 Lt C/L D-200 HA

0 - 100 Wat
100 - 500 Muckamor
500 - 600 Si Tr F Sa & Cl, Firm
- 600 NFP

10+035 19.00 Lt C/L D-0 HA

0 - 100 Wat
100 - 700 Muckamor
700 - 750 Si Tr F Sa
- 750 NFP BR

10+060 27.00 Lt C/L D-200 HA

0 - 150 Wat
150 - 600 Muckamor
600 - 700 Si W F Sa, Firm
- 700 NFP

10+035 11.00 Lt C/L D-0 HA

0 - 150 Si Tps
150 - 500 Si W F Sa, Wet
- 500 NFP Blds

10+085 27.00 Lt C/L D-100 HA

0 - 100 Wat
100 - 1.40 Muckamor
1.40 - 1.50 Si W F Sa Tr Cl, Firm
- 1.50 NFP

10+060 28.00 Lt C/L D-200 HA

0 - 1.10 Muckamor
1.10 - 1.37 Cl W Si, Wet, Soft
1.37 - 1.46 F-Med Sa W Gr, Wet
- 1.46 NFP BR

10+085 19.00 Lt C/L D-100 HA

0 - 50 Moss, Fr Wat @ 50
50 - 1.50 Muckamor
1.50 - 1.60 Si W F Sa, Firm
- 1.60 NFP

10+060 11.00 Lt C/L D-100 HA

0 - 150 Si Tps
150 - 400 Si W F Sa, Wet
- 400 NFP BR

10+085 11.00 Lt C/L D-200 HA

0 - 150 Si Tps
150 - 500 Cl Tr F Sa & Si
500 - 700 Si W F Sa Tr Cl
- 700 NFP Blds

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

11+760 19.00 Lt C/L D-300 HA

0 - 100 Si Tps
100 - 600 Si Tr F Sa
- 600 NFP BR

11+780 19.00 Lt C/L D+250 PA

0 - 600 F-Med Sa Tr Gr Tr Si*
- 600 NFP RF

* Sample Depth = 200 - 400

11+770 27.00 Lt C/L D+900 PA

0 - 150 Asph
150 - 500 F-Med Sa Tr Gr & Si
- 500 NFP RF

Passing 26.5 mm = 100 %
4.75 mm = 74 %
2.00 mm = 63 %
425 um = 44 %
75 um = 6 %
w = 1 %
Acceptable Granular B, Type I

11+770 11.00 Lt C/L D+500 HA

- 0 RF

11+770 19.00 Lt C/L D-0 HA

0 - 300 F Sa W Gr
- 300 NFP RF

11+780 27.00 Lt C/L D-0 HA

- 0 RF

11+780 11.00 Lt C/L D+100 PA

0 - 130 Asph
130 - 600 F-Med Sa Tr Gr & Si
- 600 NFP RF

11+790 27.00 Lt C/L D-1.80 HA

0 - 200 Wat
200 - 750 Muckamor
- 750 NFP RF

11+790 11.00 Lt C/L D-1.80 HA

0 - 200 Wat
200 - 1.00 Muckamor
- 1.00 NFP RF

11+790 19.00 Lt C/L D-1.80 HA

0 - 200 Wat
200 - 900 Muckamor
- 900 NFP RF

Southbound Lanes

Station 17+320 to 26+030 (Seguin Twp.) and 10+000 to 12+300 (McDougall Twp.),
Referenced to C/L of Median

981-1111
July, 1998

11+800 11.00 Lt C/L D-0 HA

0 - 700 Wat
700 - 800 Muckamor
800 - 1.05 Cl W Si, Firm

11+800 19.00 Lt C/L D-0 HA

0 - 300 Wat
300 - 460 Muckamor
460 - 750 Cl W Si
750 - 1.05 F Sa W Si, Firm

11+800 25.00 Lt C/L D-0 HA

0 - 700 Wat
700 - 900 Muckamor
900 - 1.20 Cl W Si, Firm

11+825 27.00 Lt C/L D-0 HA

0 - 900 Wat
900 - 1.80 Muckamor
- 1.80 NFP

11+825 11.00 Lt C/L D-0 HA

0 - 800 Wat
800 - 950 Muckamor
950 - 1.15 Cl W Si
1.15 - 1.20 F Sa W Si, Firm

11+825 25.00 Lt C/L D-0 HA

0 - 880 Wat
880 - 1.10 Muckamor
1.10 - 1.50 Cl W Si, Firm

11+825 19.00 Lt C/L D-0 PA

0 - 600 Wat
600 - 700 Muckamor
700 - 3.66 Cl W Si Tr Sa, Wet, Stiff
3.66 - 4.27 F Sa W Si, Wet, Comp
- 4.27 NFP Blds

11+850 19.00 Lt C/L D-0 HA

0 - 100 Wat
100 - 500 Muckamor
500 - 600 F Sa Tr Si & Cl, Firm
- 600 NFP

11+850 32.00 Lt C/L D+1.50 HA

- 0 RF

11+850 6.00 Lt C/L D-0 HA

0 - 300 Wat
300 - 650 Muckamor
650 - 800 F Sa Tr Si & Cl, Firm
- 800 NFP

11+880 54.00 Lt C/L D-0 HA

0 - 300 F-Med Sa Tr Gr & Si
- 300 NFP BR

APPENDIX B

CONSOLIDATION TEST RESULTS

CONSOLIDATION SUMMARY

FIGURE B-1

PROJECT	981-1111	SPECIFIC GRAVITY	2.63 measured	DATE STARTED	98-07-23
BOREHOLE	98-1C	AREA(mm ²)	1932.21	DATE COMPLETED	98-07-23
SAMPLE	5	SOLIDS HT.2HS	4.195		
DEPTH, m	9.1-10.1	DRY WEIGHT, g	21.32		

Load kPa	Corr. Height mm	Void Ratio	Average Height mm	t90 sec	t50 sec	cv, t90 cm ² /s	k cm/S	mv m ² /kN
0.00	12.600	2.003	12.600					
15.80	12.224	1.914	12.412	120		2.72E-03	5.04E-07	1.89E-03
20.00	12.120	1.889	12.172	110		2.86E-03	5.50E-07	1.97E-03
40.00	11.462	1.732	11.791	51		5.78E-03	1.48E-06	2.61E-03
80.00	10.119	1.412	10.791	410		6.02E-04	1.57E-07	2.66E-03
159.80	8.960	1.136	9.540	160		1.21E-03	1.36E-07	1.15E-03
320.10	8.069	0.923	8.515	45		3.42E-03	1.48E-07	4.41E-04
640.20	7.370	0.757	7.720	66		1.91E-03	3.25E-08	1.73E-04
1280.30	6.789	0.618	7.080	25		4.25E-03	3.00E-08	7.20E-05
2603.20	6.265	0.493	6.527	40		2.26E-03	6.96E-09	3.14E-05
640.20	6.416	0.529	6.341					6.11E-06
80.00	6.759	0.611	6.588					4.86E-05
15.80	7.036	0.677	6.898					3.42E-04

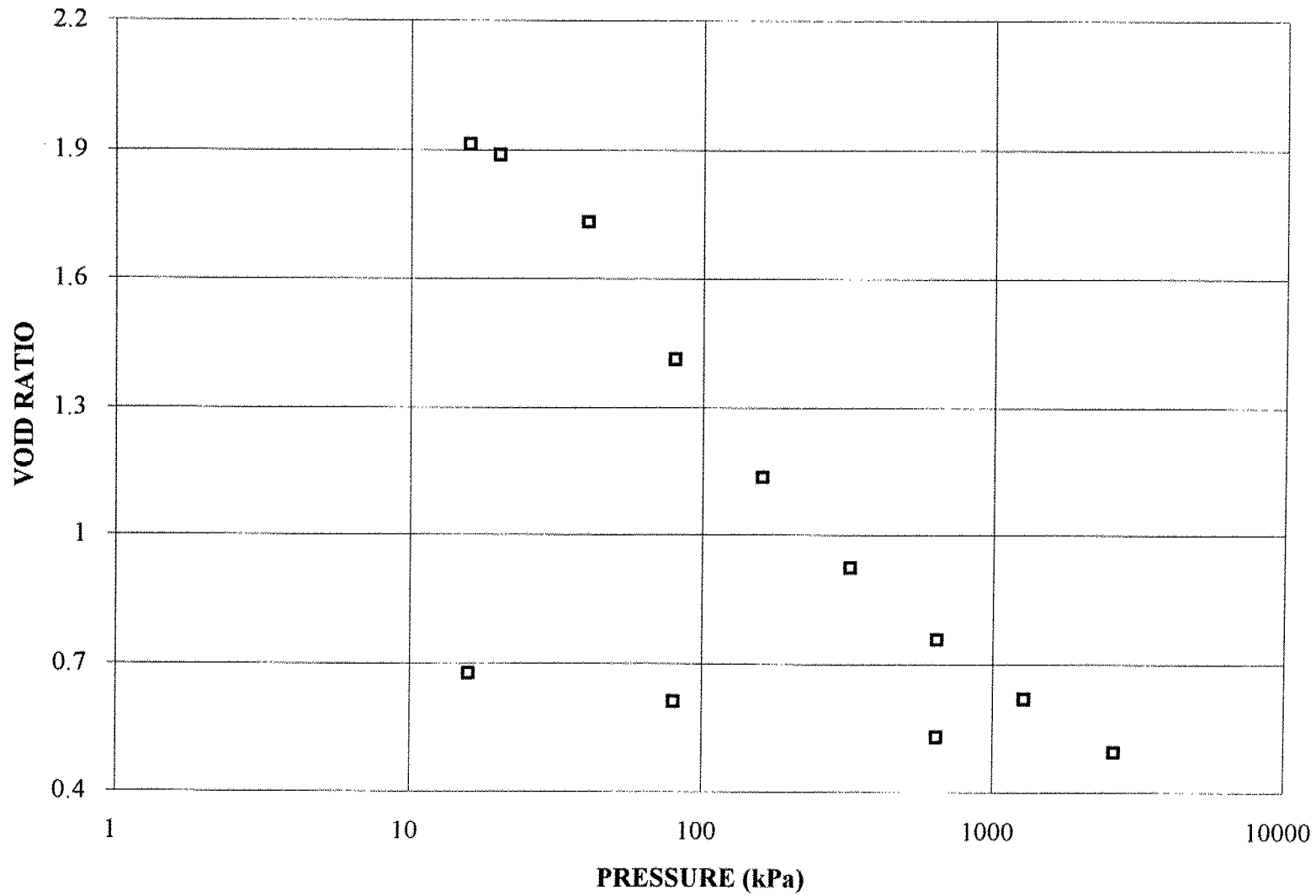
Notes:

k calculated using Cv based on t90 values.

Water Content %, initial	80.6	Liquid Limit, %	56.0
Water Content %, final	35.6	Plastic Limit, %	22.3
		Plastic Index, %	33.7
Original Volume, cc	24.35	Liquidity Index	1.730
Volume of Solids, cc	8.11		
Volume of Voids, cc	16.24	Unit Weight, kN/m ³	15.51
Degree of Saturation, %	105.8	Dry Unit Weight, kN/m ³	8.59

CONSOLIDATION TEST
VOID RATIO VS. LOG. PRESSURE

FIGURE B-2



CONSOLIDATION SUMMARY

FIGURE B-3

PROJECT	981-1111	SPECIFIC GRAVITY			2.64	measured	DATE STARTED	98-07-23
BOREHOLE	HF-1B	AREA(mm ²)			3151.98		DATE COMPLETED	98-07-23
SAMPLE	3	SOLIDS HT.2HS			6.599			
DEPTH, m	3.0-3.7	DRY WEIGHT, g			54.91			
	Corr.	Void	Average			cv.	k	mv
Load	Height	Ratio	Height	t90	t50	t90		
kPa	mm		mm	sec	sec	cm2/s	cm/S	m2/kN
0.00	19.090	1.893	19.090					
9.70	18.915	1.866	19.003	49		1.56E-02	1.45E-06	9.45E-04
19.40	18.730	1.838	18.823	55		1.37E-02	1.34E-06	9.99E-04
38.81	18.468	1.799	18.599	36		2.04E-02	1.41E-06	7.07E-04
77.62	18.048	1.735	18.258	21		3.37E-02	1.87E-06	5.67E-04
155.23	15.742	1.386	16.895	60		1.01E-02	1.54E-06	1.56E-03
310.46	13.448	1.038	14.595	764		5.91E-04	4.48E-08	7.74E-04
620.93	11.959	0.812	12.704	211		1.62E-03	3.99E-08	2.51E-04
1241.86	10.812	0.638	11.386	160		1.72E-03	1.63E-08	9.68E-05
2483.71	10.136	0.536	10.474	13		1.79E-02	5.00E-08	2.85E-05
1241.86	10.234	0.551	10.185					4.13E-06
310.46	10.556	0.600	10.395					1.81E-05
9.70	11.160	0.691	10.858					1.05E-04

Notes:

k calculated using Cv based on t90 values.

Water Content %, initial	70.60	Liquid Limit, %	55.3
Water Content %, final	33.45	Plastic Limit, %	21.3
		Plastic Index, %	34.0
Original Volume, cc	60.17	Liquidity Index	1.450
Volume of Solids, cc	20.80		
Volume of Voids, cc	39.37	Unit Weight, kN/m ³	15.26
Degree of Saturation, %	98.5	Dry Unit Weight, kN/m ³	8.95

CONSOLIDATION TEST
VOID RATIO VS. LOG PRESSURE

FIGURE B-4

