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GEO-ENVIRONMENTAL CONSULTANTS

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REPORT ON GEOTECHNICAL INVESTIGATION CAMPEAU DRIVE & DIDSBURY ROAD KANATA, ONTARIO

REPORT NO.: 1475-05-G-LPL-A
REPORT DATE: OCTOBER 31, 2005

PREPARED FOR

LOBLAW PROPERTIES LIMITED
3563 LAKESHORE BLVD., WEST
TORONTO, ONTARIO
M8W 1P4

110 KONRAD CRESCENT, UNIT 16, MARKHAM, ONTARIO L3R 9X2
TEL.: 905-940-8509 FAX: 905-940-8192

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1.0 INTRODUCTION

Toronto Inspection Ltd. was retained by Loblaw Properties Limited to conduct an additional geotechnical investigation for a proposed retail store at Didsbury Road (formerly named as First Line Road) and Campeau Drive in Kanata, Ontario.

A previous investigation was conducted by ***Toronto Inspection Ltd.*** *(Report No. 03LPL782 dated April 2003)*, with eight boreholes extending to depths of 3.5m to 8.1m from the existing grade level. Copies of the borehole logs and the borehole location plan are attached in Appendix A of this report. The investigation revealed that the subsoil consisted of compact to very loose sand overlying a soft to very soft clayey silt and silty clay deposits. The lower limit of the soft clay deposit was not established in the previous borehole investigation.

The additional borehole investigation was to determine the depth of the soft clay strata and to collect relatively undisturbed soil samples from the soft clay for consolidation tests. In addition, in-situ shear vane tests were also conducted to estimate the shear strength of the clay deposit.

This report is provided on the basis of the above terms of reference and on an assumption that the design of structure will be in accordance with the applicable building codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, our office should be consulted to review the design and to confirm the recommendations and comments provided in the report.

This report superseded the previous investigation report (*Report No. 03LPL782 dated April 2003*).

2.0 SITE CONDITION

The site, approximately 16 acres in area, is located at the southwest quadrant of First Line Road and Campeau Road in North Kanata. At the time of investigation, the site was a farm land, with farm houses, barns and scattered trees on site. The existing ground surface of the site was grass covered. Some soil mounds were evident beside the swale along the east boundary. The existing site gradient drops by approximately 2m towards the west to northwest.

3.0 INVESTIGATION PROCEDURE

The field work for the investigation was carried out on September 9, 2005 and consisted of drilling two sampled boreholes (BH-101 and BH-102) at the locations shown on Drawing No. 1. The boreholes were advanced using a truck mounted drill rig, equipped with continuous flight hollow stem augers and sampling rods, supplied by a specialist drilling contractor.

Soil samples were retrieved from the boreholes at regular intervals using a split spoon sampler in conjunction with Standard Penetration Tests using a driving energy of 475 joules (350 ft-lbs), to depths of 6.6m and 8.1m from grade. Below the sampled depths, in-situ shear vane tests were performed to estimate the undrained shear strength of the cohesive subsoil and thin walled shelby tube samples of the soft clay were collected for a consolidation test in the laboratory. The soil samples were identified, logged and packed carefully in the field for later visual identification and testing.

In addition to Standard Penetration Tests, dynamic cone penetration tests were performed at the borehole locations, from the ground surface to depths of 38.1m and 26.6m from grade, to determine the consistency of the subsoils.

Groundwater observations were made in the boreholes during and upon the completion of drilling.

The ground elevations at the borehole locations were determined in the field using the "Top of Fire Hydrant" located at the northeast intersection of Campeau Drive and Didsbury Road, as a temporary bench mark (TBM).

The geodetic elevation of 97.12m for the TBM was obtained from the Site Grading Plan prepared by Stantec Consulting Ltd.

4.0 SUMMARISED SITE AND SUBSURFACE CONDITIONS

Reference is made to the appended Borehole Location Plan (Drawing No. 1), Logs of Boreholes (Drawing Nos. 2 to 5) for details of field work, including soil classification, inferred stratigraphy, and groundwater observations carried out during the drilling of the boreholes. The current boreholes revealed that the subsoils, below the surficial topsoil,

generally consisted of a sand, overlying a silty clay deposit. Brief descriptions of the subsoil encountered at the current borehole locations, were as follows:

4.1 Topsoil

A layer of topsoil was contacted at the ground surface of the boreholes. The thickness of topsoil, at the borehole locations, was 250mm.

4.2 Sand

Underlying the topsoil at the location of boreholes, a sand deposit was encountered. The deposit was weathered at the upper portion and contained rootlets to depths of 0.3m to 0.6m from grade. The sand was generally fine to medium grained, with thin layers of sandy silt, extending to depths of 4.0m and 6.7m from the existing ground level. Some sea shells were present in the sand deposit, at a depth of 2.4m from grade at BH-101 location, indicating the sand might be a marine deposit.

Based on the Standard Penetration N-values, in the range of 3 to 12 blows per 0.3m penetration, the deposit was compact to loose. The moisture content of the sand deposit varied from 5 to more than 20%, indicating a saturation zone below the depth of 2 to 3m from grade.

The bulk unit weight of the sand deposit was estimated to be 19 kN/m^3 and increased to 21 kN/m^3 in a saturated condition.

4.3 Silty Clay

A silty clay deposit was encountered below the sand at the borehole locations. The deposit was cohesive, of low to medium plasticity and consisted of imbedded sea shells and trace of dark stains/organic matters upto a depth of 7.5m to 9m from grade. The unit weight of the clay deposit was estimated to be 16 kN/m^3.

Atterberg Limits tests, conducted on a clay sample obtained from the location of BH101, at a depth of 10.9m, were as follows:

Plastic Limit: $w_p = 21\%$
Liquid Limit: $w_L = 33\ \%$
Plasticity Index = $w_L - w_p = 12\%$

The results, plotted on the Plasticity Chart (Figure 1), indicated that the deposit can be classified as inorganic clay of medium plasticity.

The in-situ moisture content of the deposit was more than 30%, indicating saturated conditions and above the liquid limit of the soil.

The Standard Penetration N-values obtained in the clay deposit was less than 2 blows per 0.3m penetration. Based on the in-situ shear vane tests, conducted in the clay deposit at depths of 7.9m to 11.0m, the estimated undrained shear strength (c_u) of the clay deposit, varied from 40 kPa to 88 kPa.

The lower limit of the soft clay deposit was not established within the sampled depths. However, dynamic cone penetration tests were performed to estimate the lower extent of the soft deposit. Based on the dynamic cone penetration results, it is our opinion that the soft deposit extended to depths of at least 16m to 18m from grade, where the blow counts increased gradually.

A consolidation test was carried out on a relatively undisturbed sample of the clay, obtained using a thin wall Shelby tube from BH101, at a depth of 11.0m from grade. The results, shown on Figure 2, indicated that the deposit, at the test location, has a pre-consolidated pressure (p_c') of about 130 kPa (2,600 psf), around 30 kPa over the existing effective overburden pressure.

4.4 Groundwater

Groundwater seepage was evident in the boreholes during the drilling operation. Upon the completion of drilling, free water was recorded at depths of 2.1m and 5.4m from grade, at BH-101 and BH-102 locations, respectively.

Based on the field observation and the moisture content profile of the subsoil samples, it is our opinion that groundwater is apparent in the sand deposit at the saturation level of approximately 2.1m to 3.0m from grade level.

The groundwater level may fluctuate according to the seasonal conditions.

5.0 RECOMMENDATIONS

We understand that the proposed retail will be a single storey framed structure without a basement, with paved parking lot and driveways at street level. The site development will include site grading by cut and fill operation. The finished floor level will be 96.6m, ie. a cut of about 1.6m at the southeast portion and a fill of about 0.8m at the northwest portion of the proposed building. Based on the subsoil conditions, as encountered at the borehole locations, our recommendations are as follows:

5.1 Site Grading

During the site preparation, the contractor must allow for removal of topsoil and any deleterious fill from the areas of development before the cut and fill operation. The soil description and depth of fill, shown on the Borehole Logs, are specific depths at the borehole locations only. In areas of the existing building and underground utilities, additional fill material may be encountered. Since the depth of organic fill can vary considerably at the site, the contractor bidding for the project must determine the depths and the profile of the fill material by test pits to accurately define the volume of organic fill to be removed from the site.

Compressible material, consisting of silty clay with relatively high organic content, will not be suitable for reuse in areas where future settlement cannot be tolerated. This material will have to be disposed off-site or reused in landscaped areas, subject to approval by the landscape architect.

Due to the current difference on the ground elevation, the proposed re-development of the site will require a cut and fill operation. Within the fill areas such as the parking lot, the ground will be subject to surcharge loads resulting in differential settlement. Assuming a unit weight of 20 kN/m^3 for the uplift material, the anticipated long term settlement (not including the immediate settlement anticipated in the sand layer) is estimated as follows:

GRADE RAISE	IMPOSED FILL LOAD	ESTIMATED SETTLEMENT
0.5m	10 kPa	5 mm
1.0m	20 kPa	10 mm
1.5m	30 kPa	15 mm

5.2 Foundations

The silty clay subsoil, below the sand crust at the site, is slightly over-consolidated with an estimated overstress of 30 kPa from the existing overburden pressure. The building can be supported on conventional footings only if the proposed grade raise is kept to a minimum.

Based on the shear resistance of the subsoil, the allowable bearing pressures for conventional footings founded on the sand deposit at this site will have to be limited to 72 kPa (1,500 p.s.f.).

The settlement analysis indicate that with a maximum grade raise of 0.8m, the anticipated live and dead load of 7 kPa on the slab-on-grade and footings designed for a bearing pressure of 72 kPa, founded at a depth of 1.8m from grade, will result in an estimated settlement of 40mm, a differential settlement of approximately 35mm across the building.

If the allowable settlement is to be limited to 25mm, a light weight fill (Expanded Polystyrene Geofoam or equivalent) may be used for uplifting part of the building site at the northwest portion of the proposed building, to reduce the surcharge load onto the soft deposit. The Geofoam has a unit weight of about 0.1 kN/m^3. **For 0.2m grade raise with Geofoam, and 0.6m with conventional fill, the anticipated settlement, under the similar slab-on-grade and foundation loading conditions, will be about 20mm, compared to 40mm with regular fill material.** The Geofoam can be applied in any part of the building area where the grade raise is more than 0.6m from the existing grade.

The Geofoam should be placed and installed as per manufacturer's specifications. In addition, the Geofoam should be so installed to resist any uplift pressure from the possible hydrostatic pressure in the ground. It is necessary to place the Geofoam at the lowest level, with the conventional fill on top for uplift resistance. Subdrains should also be installed at a level below the Geofoam to drain any groundwater build up. Alternatively, an anchoring system may be installed to hold the Geofoam in place.

All the perimeter footings, grade beams and exterior footings which will be exposed to seasonal freezing condition should be placed covered with at least 1.8m of soil or

equivalent thermal insulation for frost protection. Interior column footings within heated buildings can be placed at a depth of 1 m from the existing ground level.

It should be noted that the above recommendations for the foundations have been analysed by ***Toronto Inspection Ltd.*** from the information obtained from the present and previous boreholes. Field inspection should be provided by ***Toronto Inspection Ltd.*** to verify that the soils at the site are as interpreted from the borehole information provided. If the soil conditions are found to vary from those shown on the borehole logs, the design and construction recommendations might have to be modified in the field.

5.3 Slab-on-grade Construction

The floor slab of the proposed building, founded on conventional footings, can be designed and constructed as a conventional slab-on-grade method. Prior to site grading, the building subgrade should be proof-rolled using a heavy roller in the presence of the soils engineer. Any new fill below the subgrade level should be free of organics, and should be compacted in shallow lifts not exceeding 300 mm to 95% Standard Proctor maximum dry density.

A bedding consisting of at least 150 mm of Granular A (OPSS Form 1010) or 20mm crusher run limestone, is recommended as a moisture barrier under a light to medium loaded floor slab. The bedding should be compacted to at least 100% Standard Proctor Maximum Dry Density (SPMDD).

5.4 Earthquake Consideration

The Ontario Building Code requires that all buildings be designed to resist a minimum earthquake force V, as given in the following expression:

$$V = v.S.I.F.W$$

From a geotechnical point of view, the factors of importance, v and F, at this site can be taken as 0.10 and 1.3, respectively. These values should be reviewed by the Structural Engineer.

5.5 Excavation and Backfill

All excavations should comply with the Ontario Occupational Health and Safety Act. Excavation should be sloped back to a safe angle of less than 45°. For excavation into the clay deposit or below the saturated level, the slope of excavation should be flattened to a safe condition.

A continuous ground water table apparently exists at the site within the sand deposit. The sand deposit will have to be dewatered before any excavation can be carried out into and below the water level within this deposit. It is our opinion that filtered sumps might be adequate for shallow excavations to within 2m to 3m from grade. Provision should be made in the construction budget to install a system of vacuum well points to lower the water table for excavations deeper than a depth of 3m below the existing ground level.

Bedding for the underground services, including catch basins and manholes, within the sand deposit, should consist of OPSS Granular A, 20mm crusher run limestone, or equivalent. If the subsoil at bottom of trenches consists of saturated sand or wet clay, the bedding in the service trenches should consist of 20mm clear limestone and a geotextile filter fabric should be used to separate the clear stone bedding from the base and the sides of the excavation. The geotextile filter fabric must surround the clear stone bedding completely.

Permanent lowering of water table in the sand and the lower silty clay deposit could result in long term settlement due to additional load of the soft clay deposit. If the sewer inverts extend below the existing water table or into the lower silty clay deposit, this office should be consulted to provide recommendations to prevent the lowering of the water table in the long run.

The sand material removed from the site may be reused for backfilling. However, the in-situ moisture content of the clay material was much higher than their optimum moisture content and this material is not suitable for backfilling the trenches in their current high moisture content state. Provided that the material can be dried out to or below the optimum moisture content, the use of the on-site excavated clay material should be limited to backfill locations where future settlement will be of little consequence.

Topsoil and other compressible fill removed from the site may be reused in landscape areas, subject to the approval of the landscape architect.

Backfill around catch basins, manholes, and narrow trenches should consist of imported granular material. The backfill should be compacted using a smaller vibratory equipment. Catch basins should be perforated just above the drain level and the holes should be screened with a filter fabric. This will help in draining the pavement structure as well as alleviate the problem of differential movement of catch basins or manholes due to frost action.

5.6 Pavement Construction

We understand that the proposed parking lot will be raised slightly from the existing grade level. The settlement associated with the grade raise has been discussed in Section 5.1 of this report.

Provided that the uplift fill material over the subgrade consists of free draining soils, the Standard Loblaw's pavement design should be followed for the light and heavy duty parking and access roads.

If a frost susceptible material (fine sand, silt or clay) is used to uplift the subgrade, an additional thickness of subbase of upto 450mm should be utilized for the light duty pavement and 600mm for the heavy duty driveway.

The subgrade preparation of the entire pavement area should include removal of the existing vegetation and compressible fill, followed by proof rolling using a heavy roller. Any soft spots revealed by the proof rolling should be subexcavated and replaced with an approved dry material and compacted to at least 98% of its SPMDD.

Provision should be made for the water to drain out and not collect in the granular base courses for the pavement to function properly. If the subgrade consisted of a frost susceptible material, continuous perforated, OPSS 405, longitudinal drains, minimum diameter of 100mm, should be used as subdrains. The subdrains should be at least 1.1m below the pavement level and installed on a positive gradient to allow for a free flow of water. The backfill above the drains should comprise of free draining Granular B or its equivalent and should be continuous with the granular subbase of the pavement.

6.0 GENERAL STATEMENT OF LIMITATION

The comments and recommendations presented in this report are based on the subsoil and ground water conditions encountered at the borehole locations, indicated in the borehole location plan, and are intended for the guidance of the design engineer. Although we consider this report to be representative of the subsurface conditions at the subject property, the soil and the ground water conditions between and beyond the borehole locations may differ from those encountered at the time of our investigation and may become apparent during construction. Any contractor bidding on, or undertaking the works, should decide on their own investigation and interpretations of the groundwater and the soil conditions between the borehole locations.

Any use and / or the interpretation of the data presented in this report, and any decisions made on it by the third party are responsibility of the third parties. The responsibility of ***Toronto Inspection Ltd.*** is limited to the accurate interpretation of the soil and ground water conditions prevailing in the locations investigated and accepts no responsibility for the loss of time and damages, if any, suffered by the third party as a result of decisions or actions based on this report.

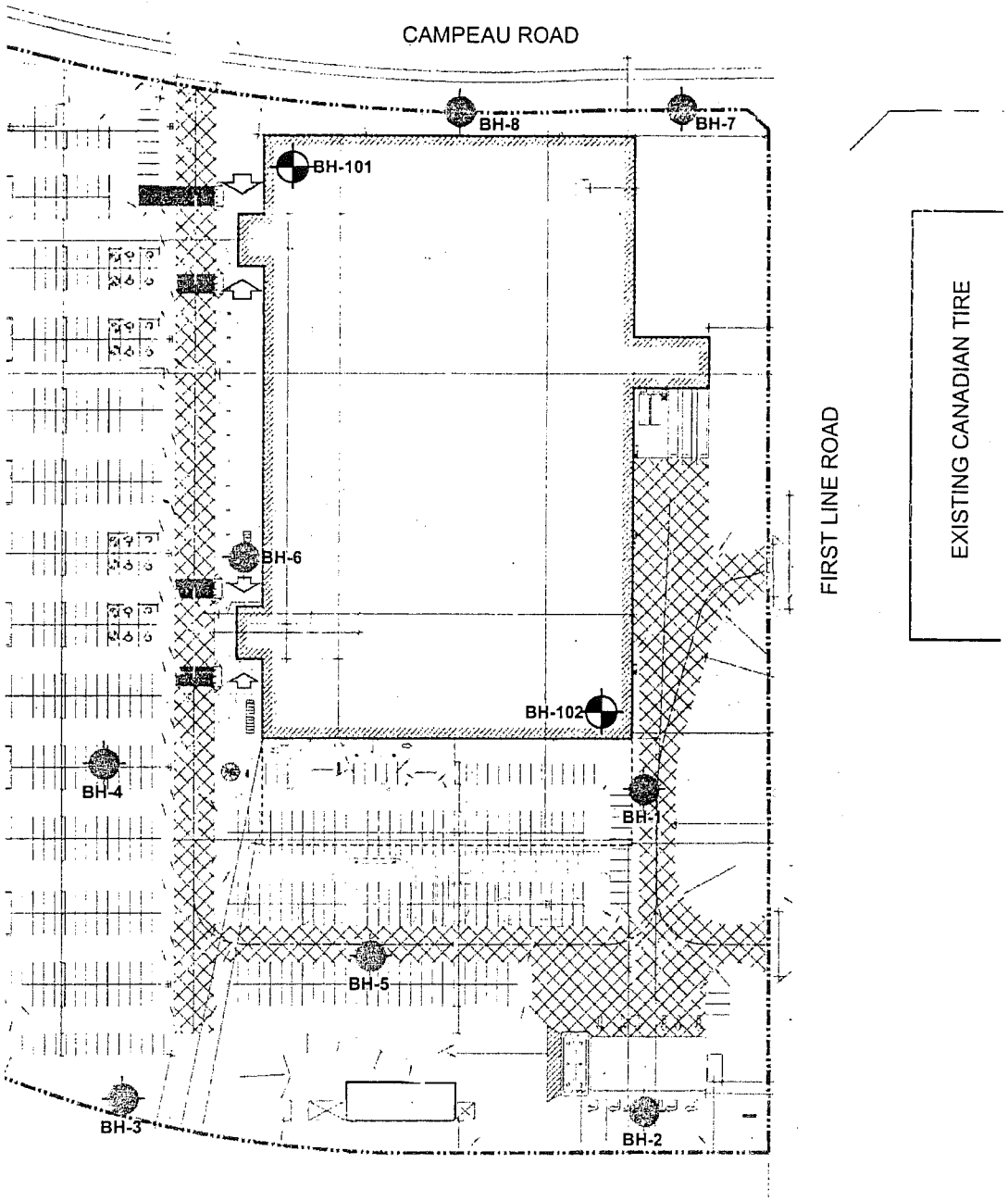
Any legal actions arising directly or indirectly from this work and/or ***Toronto Inspection Ltd.'s*** performance of the services shall be filed no longer than two years from the date of ***Toronto Inspection Ltd.'s*** substantial completion of the services. ***Toronto Inspection Ltd.*** shall not be responsible to the client for lost revenues, lost of profits, cost of content, claims of customers, or other special indirect, consequential or punitive damages.

To the fullest extent permitted by law, the client's maximum aggregate recovery against ***Toronto Inspection Ltd.***, its directors, employees, sub-contractors and representatives, for any and all claims by clients for all causes including, but not limited to, claims of breach of contract, breach of warranty and /or negligence, shall be the amount of the fee paid to ***Toronto Inspection Ltd.*** for its professional services rendered with respect to the particular site which is the subject of the claim by the client.

Yours very truly,
TORONTO INSPECTION LTD.

Bennett C. Sun, P. Eng.
Senior Geotechnical Engineer

Upkar S. Sappal, P.Eng.
Principal Engineer



LEGEND:

Borehole Location

Previous Borehole Location

NOT TO SCALE

Toronto Inspection GEO-ENVIRONMENTAL

TITLE: Borehole Location Plan

LOCATION: Campeau Dri

Project No. 1475-05-G-LPL-A

Log of Borehole 101

Dwg No. 2

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line & Campeau Road, North Kanata, Toronto, Ontario

Date Drilled: 09/09/05

Drill Type: Truck Mounted Drill Rig

Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
		Ground Surface	96.26	0
		TOPSOIL - 250mm topsoil.	96.01	
		SAND - compact to loose, - brown, - some rootlets to 0.6m, - fine to medium grained, - silty at 0.9m, - some sea shell below 2.4m, - moist, wet below 2.1m.	94.13	2
			92.30	4
		SILTY CLAY - soft to very soft, - grey, - trace of sea shells to 7.5m, - low to medium plasticity, - wet.		5
			84.98	11
		END OF BOREHOLE NOTE: Upon completion of drilling: - water level at 2.1m depth.		

N Value: 20 40 60 80
Shear Strength: 100 200 kPa
Headspace Reading (ppm): 100 200 300
Natural Moisture Content % Atterberg Limits (% Dry Weight): 10 20 30
Natural Unit Weight kN/m3

LGBE3 FIRSTLINE&CAMPEAURD.GPJ 11/01/05

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1475-05-G-LPL-A

Log of Borehole 101A

Dwg No. 3

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line & Campeau Road, North Kanata, Toronto, Ontario

Date Drilled: 09/09/05

Drill Type: Truck Mounted Drill Rig

Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value / Shear Strength kPa	Headspace Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m3
		Ground Surface	96.26	0	20 40 60 80 / 100 200	100 200 300 / 10 20 30	
		DYNAMIC CONE TEST		1–37			
			58.16	38			

LGBE3 FIRSTLINE&CAMPEAURD.GPJ 10/14/05

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1475-05-G-LPL-A

Log of Borehole 102

Dwg No. 4

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line & Campeau Road, North Kanata, Toronto, Ontario

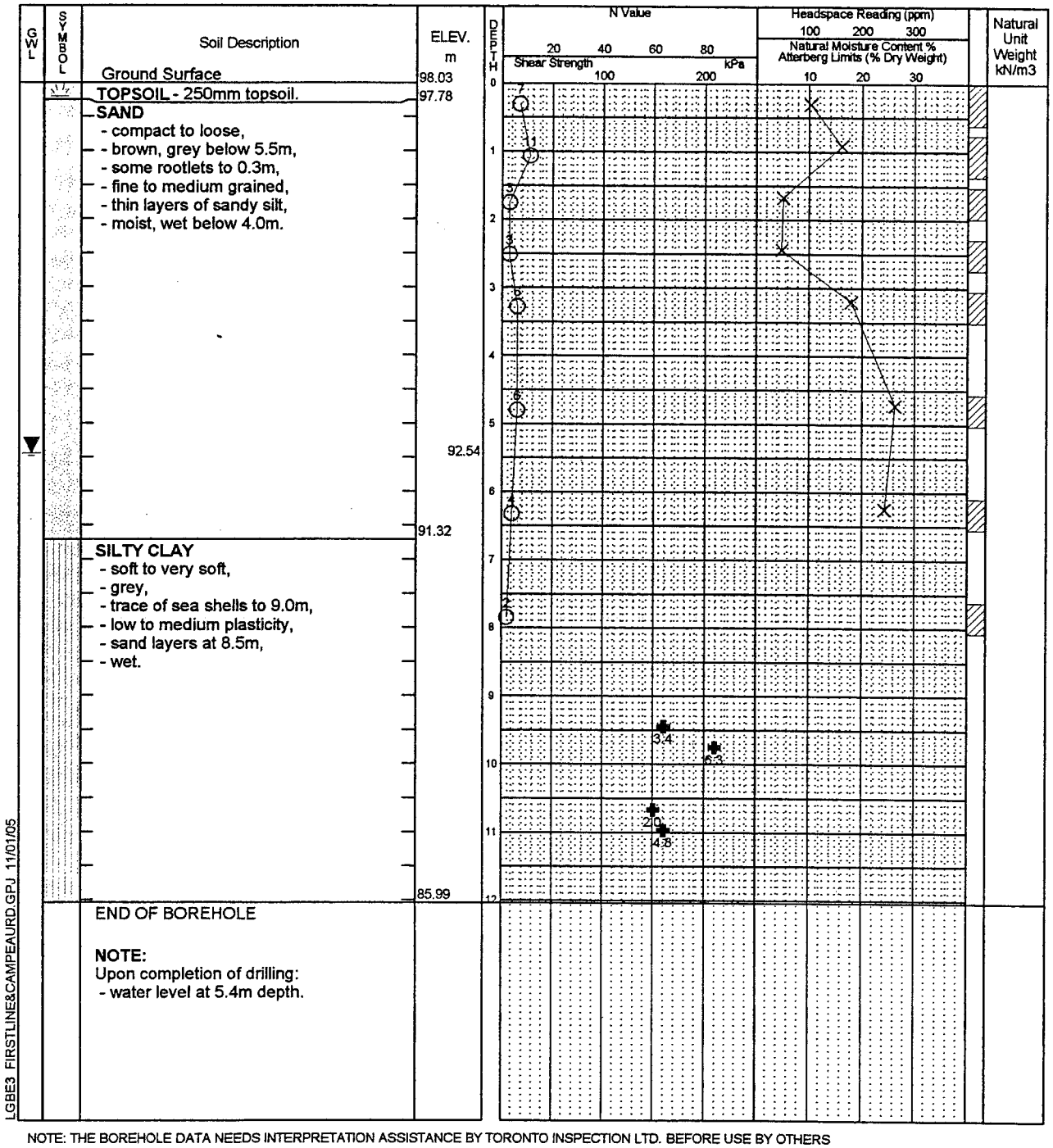
Date Drilled: 09/09/05

Drill Type: Truck Mounted Drill Rig

Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression % Strain at Failure
Penetrometer



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NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1475-05-G-LPL-A

Log of Borehole 102A

Dwg No. 5

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line & Campeau Road, North Kanata, Toronto, Ontario

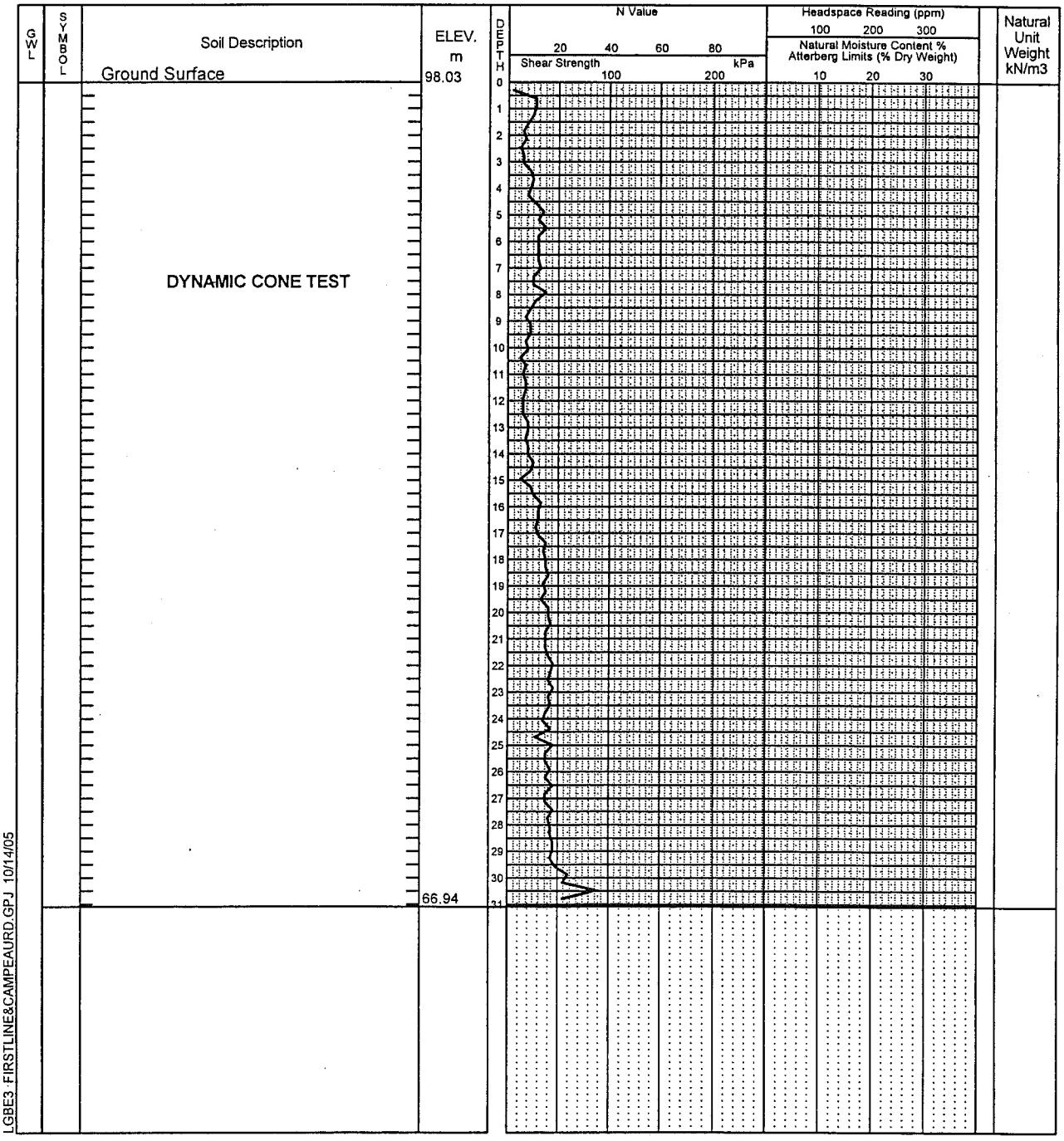
Date Drilled: 09/09/05

Drill Type: Truck Mounted Drill Rig

Datum: Geodetic

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression % Strain at Failure
Penetrometer



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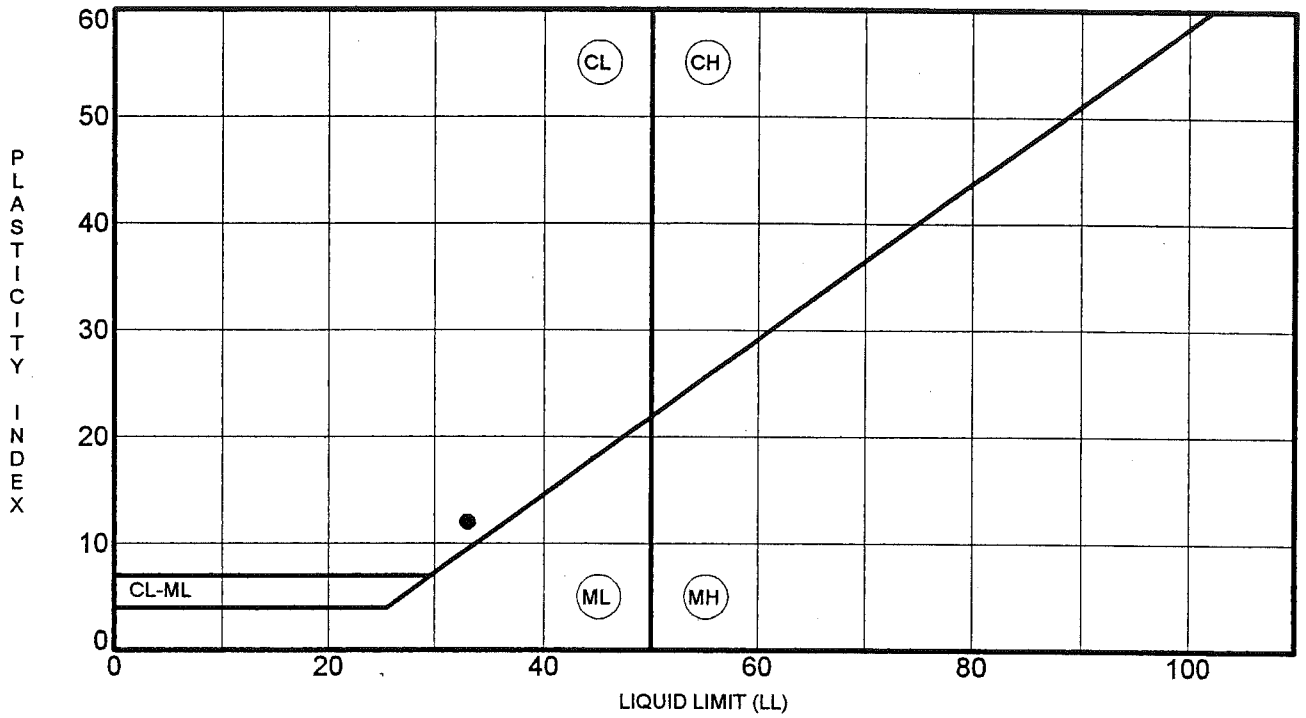
NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)



	Specimen Identification		LL	PL	PI	Fines	Classification
●	**BH 101**	**35.0**	**33**	**21**	**12**		**SILTY CLAY**

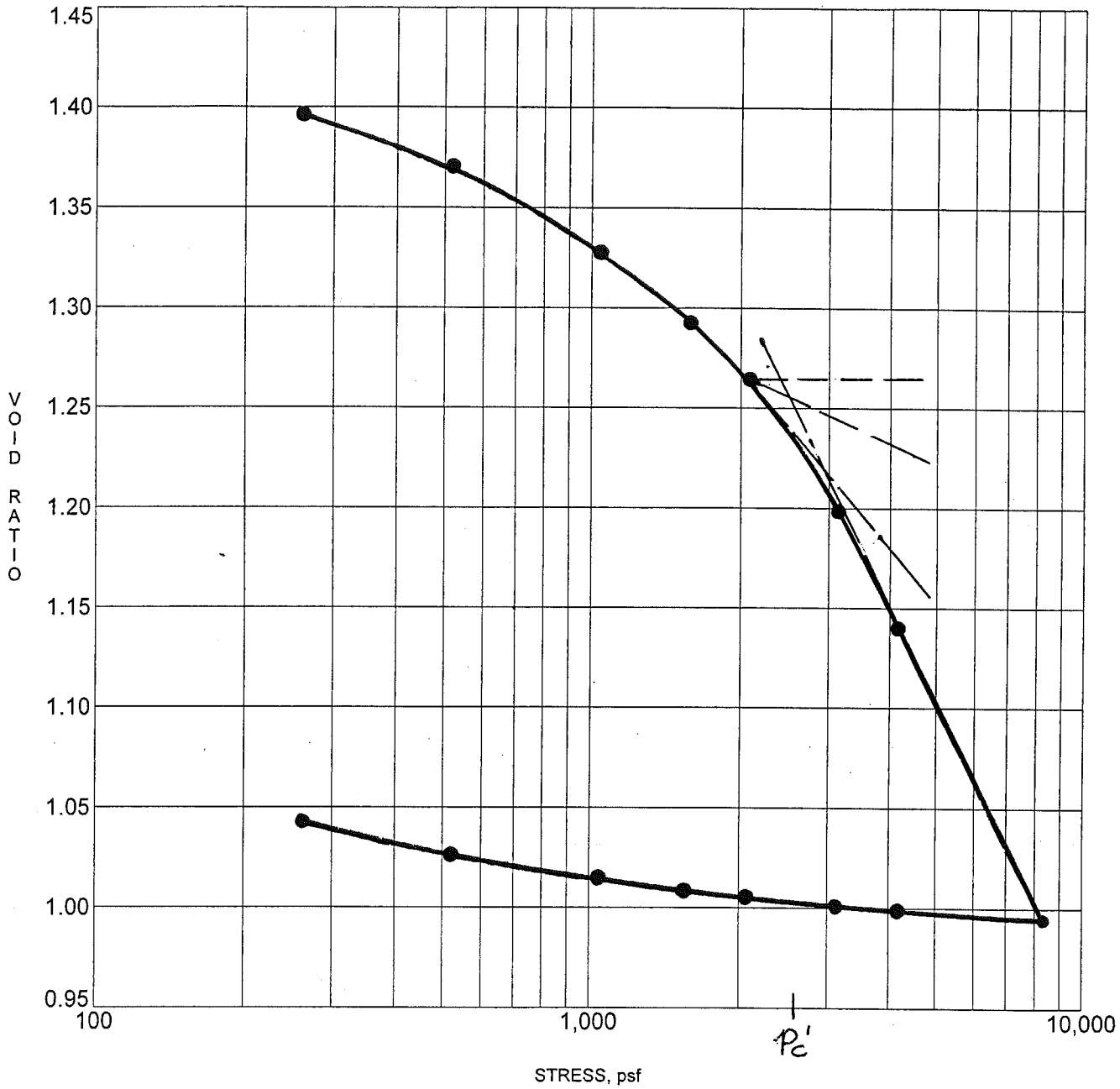
PROJECT **Proposed Retail - Campeau Dr, and Didsbury Rd, Kanta, Ontario**

JOB NO. **1475-05-G-LPL-A**

FIGURE NO. **1**

ATTERBERG LIMITS' RESULTS

Toronto Inspection Ltd.



	Specimen Identification		Classification	WD	MC%
●	BH 101	36.0	SILTY CLAY	1588.89	46

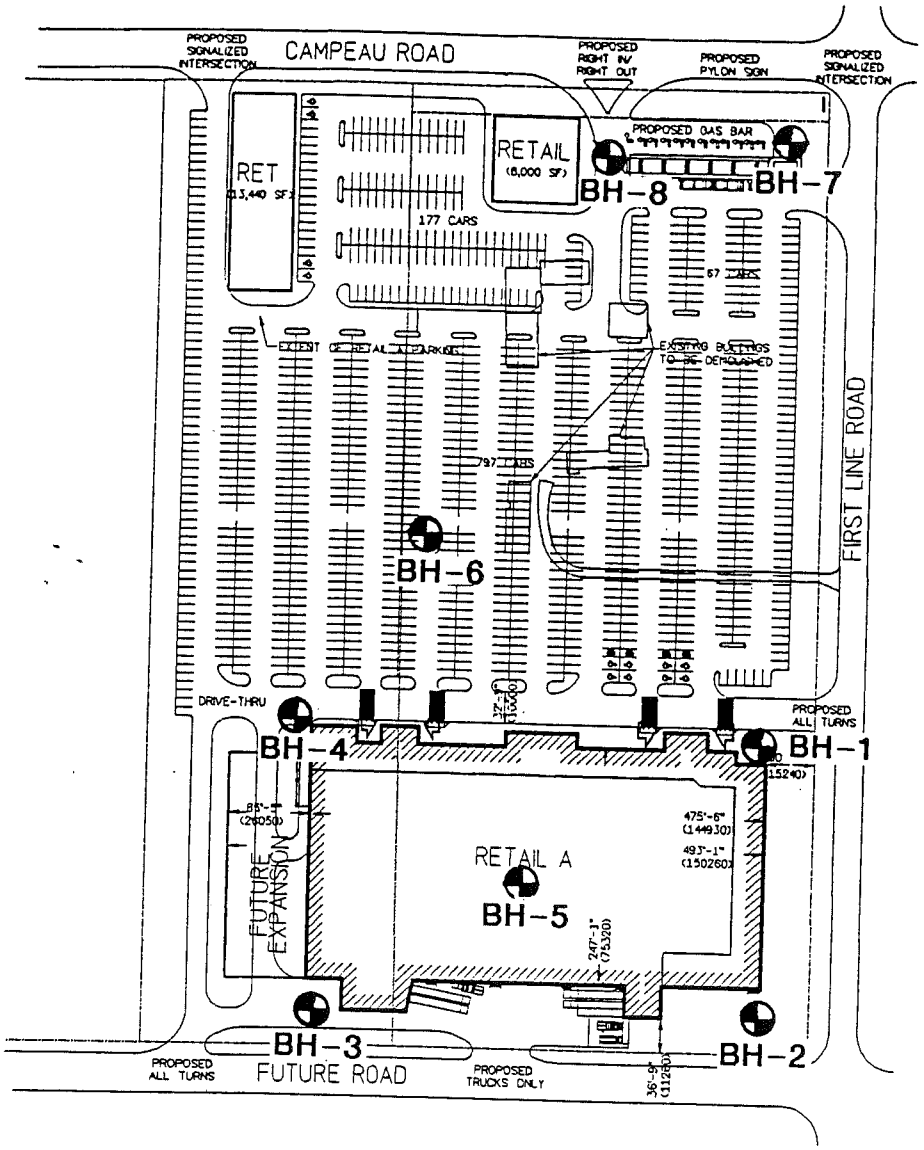
PROJECT Proposed Retail - Campeau Dr, and Didsbury Rd, Kanta, Ontario

JOB NO. 1475-05-G-LPL-A

FIGURE NO. 2

CONSOLIDATION TEST

Appendix A
Previous Logs and
Location Plan of Boreholes



LEGEND

Borehole Location

NOT TO SCALE

TORONTO INSPECTION LTD.	REPORT NO.: 03 LPL 782
TITLE: **BOREHOLE LOCATION PLAN**	DRAWING NO.: 1
LOCATION: Proposed Retail Store & Gas Station - First Line Road & Campeau Road, North Kanata	

Project No. 03 LPL 782

Log of Borehole 1

Dwg No. 2

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line Road & Campeau Road, North Kanata

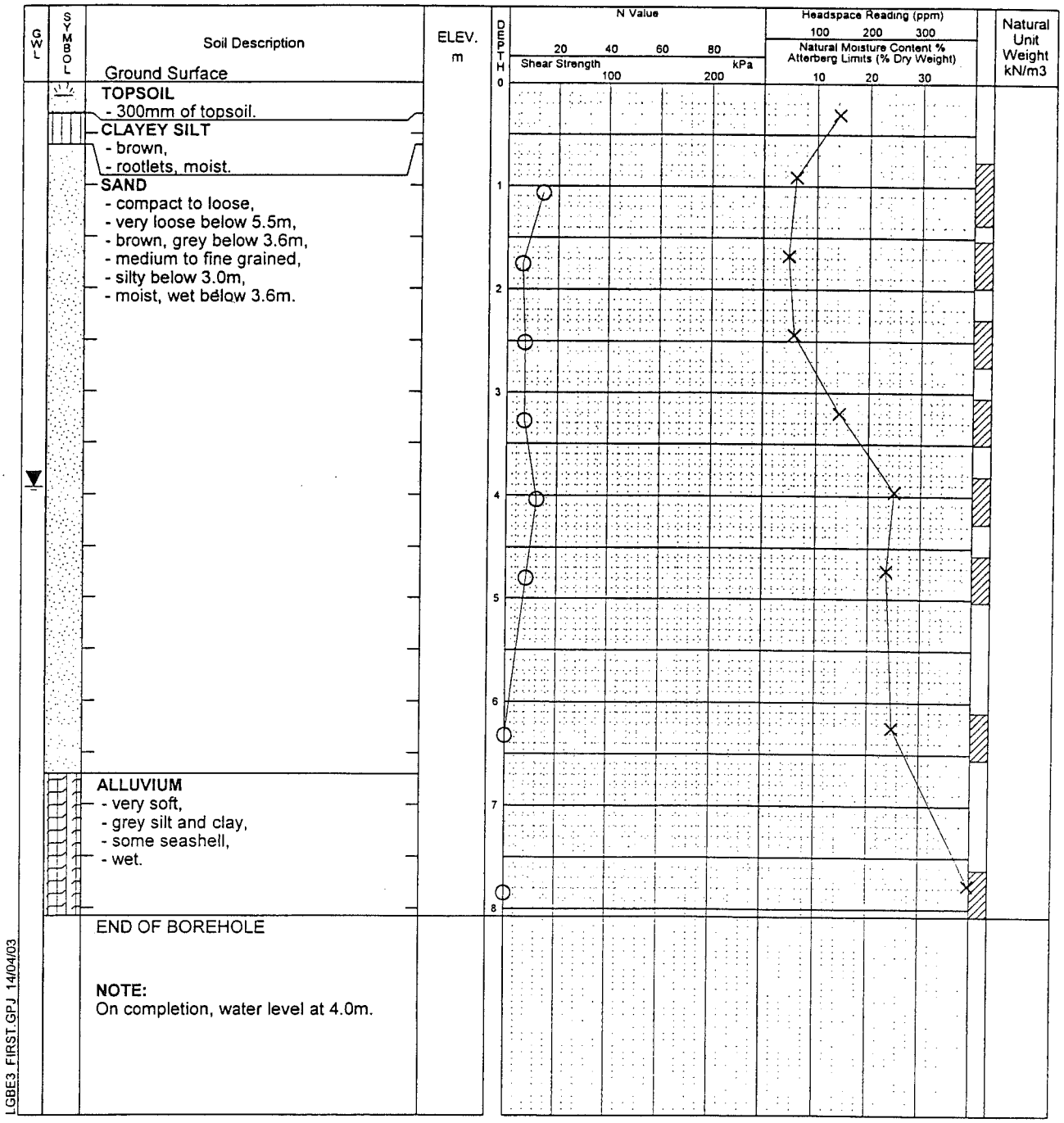
Date Drilled: 24/02/03

Drill Type: Truck mounted

Datum: Ground Surface

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression % Strain at Failure
Penetrometer



LGBE3 FIRST.GPJ 14/04/03

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 03 LPL 782

Log of Borehole 2

Dwg No. 3

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line Road & Campeau Road, North Kanata

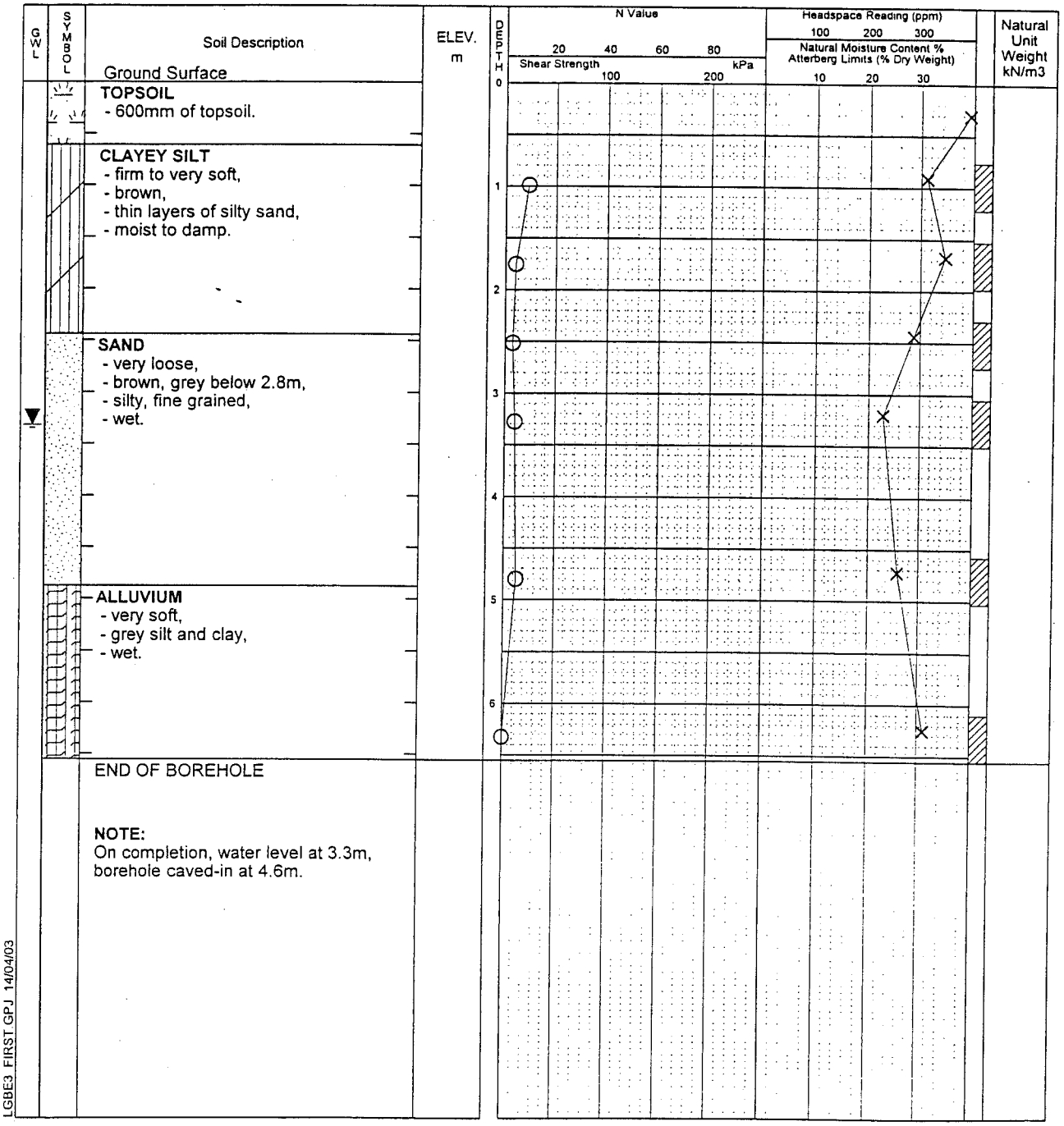
Date Drilled: 24/02/03

Drill Type: Truck mounted

Datum: Ground Surface

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer



LGBE3 FIRST GPJ 14/04/03

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 03 LPL 782

Log of Borehole 3

Dwg No. 4

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line Road & Campeau Road, North Kanata

Date Drilled: 24/02/03

Drill Type: Truck mounted

Datum: Ground Surface

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m
		Ground Surface	
		TOPSOIL - 600mm of topsoil.	
		CLAYEY SILT - firm to very soft, - brown, grey below 2.1m, - moist to wet.	
▼		**SAND** - very loose, - grey, - silty, - fine grained, wet.	
		ALLUVIUM - very soft, - grey silt and clay, - trace of seashell, - wet.	
		END OF BOREHOLE **NOTE:** On completion, water level at 3.0m, borehole caved-in at 4.3m.	

DEPTH: 0, 1, 2, 3, 4, 5, 6

N Value: 20, 40, 60, 80

Shear Strength: 100, 200 kPa

Headspace Reading (ppm): 100, 200, 300

Natural Moisture Content % Atterberg Limits (% Dry Weight): 10, 20, 30

Natural Unit Weight kN/m3

LGBE3 FIRST.GPJ 14/04/03

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 03 LPL 782

Log of Borehole 4

Dwg No. 5

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line Road & Campeau Road, North Kanata

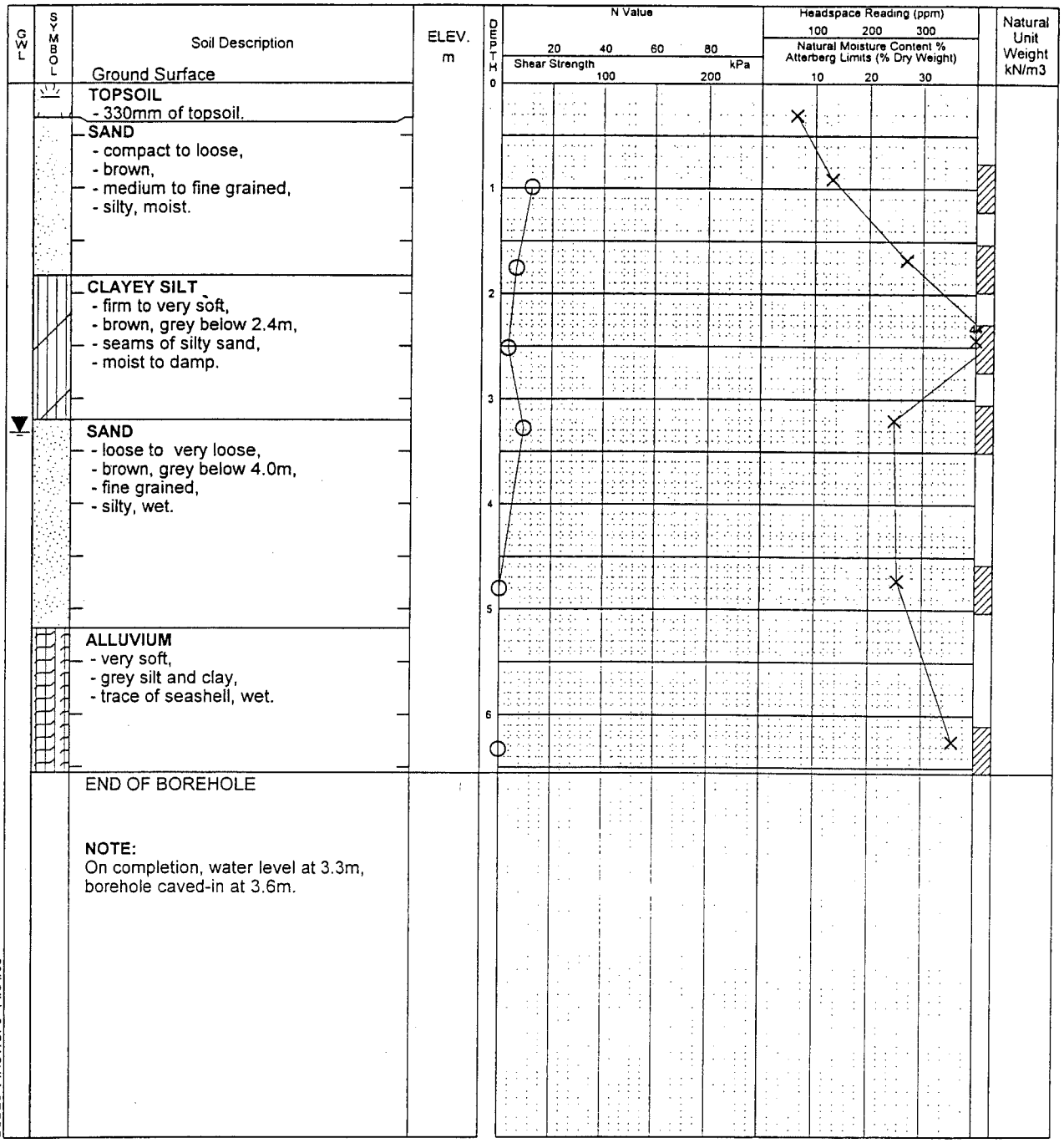
Date Drilled: 24/02/03

Drill Type: Truck mounted

Datum: Ground Surface

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression % Strain at Failure
Penetrometer



LGBE3 FIRST.GPJ 14/04/03

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 03 LPL 782

Log of Borehole 5

Dwg No. 6

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line Road & Campeau Road, North Kanata

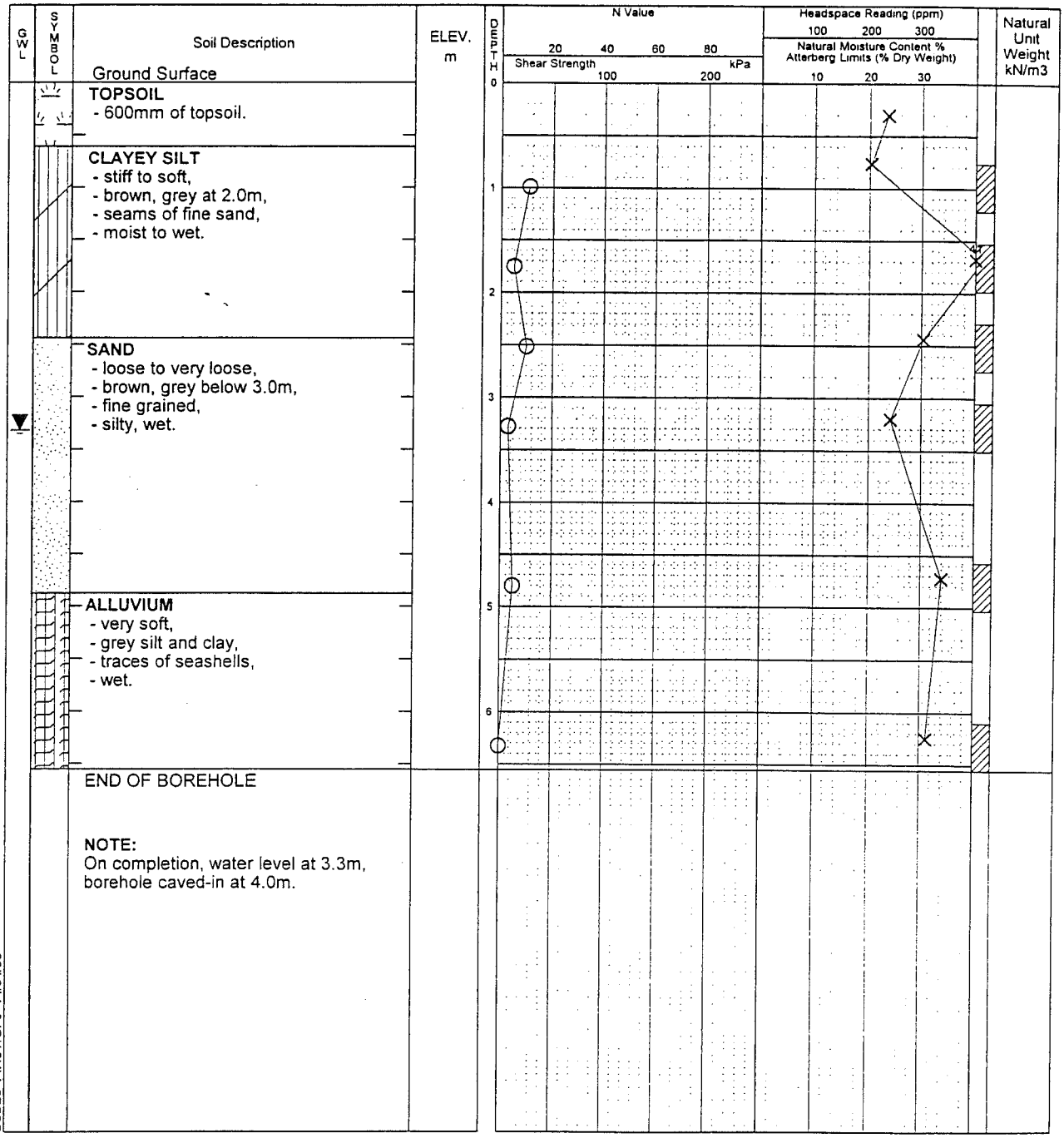
Date Drilled: 24/02/03

Drill Type: Truck mounted

Datum: Ground Surface

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test S

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer



LGBE3 FIRST.GPJ 14/04/03

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Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 03 LPL 782

Log of Borehole 6

Dwg No. 7

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line Road & Campeau Road, North Kanata

Date Drilled: 24/02/03

Drill Type: Truck mounted

Datum: Ground Surface

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression % Strain at Failure
Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
		Ground Surface		0
		TOPSOIL - 450mm of topsoil.		
		SAND - compact to loose, - brown, - fine to medium grained, - thin layers of sandy silt, - moist.		1 2 3
		END OF BOREHOLE **NOTE:** On completion, no free water in borehole, borehole caved-in at 3.0m.		

N Value: 20 40 60 80
Shear Strength kPa: 100 200
Headspace Reading (ppm): 100 200 300
Natural Moisture Content % Atterberg Limits (% Dry Weight): 10 20 30
Natural Unit Weight kN/m3

LGBE3 FIRST.GPJ 14/04/03

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Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 03 LPL 782

Log of Borehole 7

Dwg No. 8

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line Road & Campeau Road, North Kanata

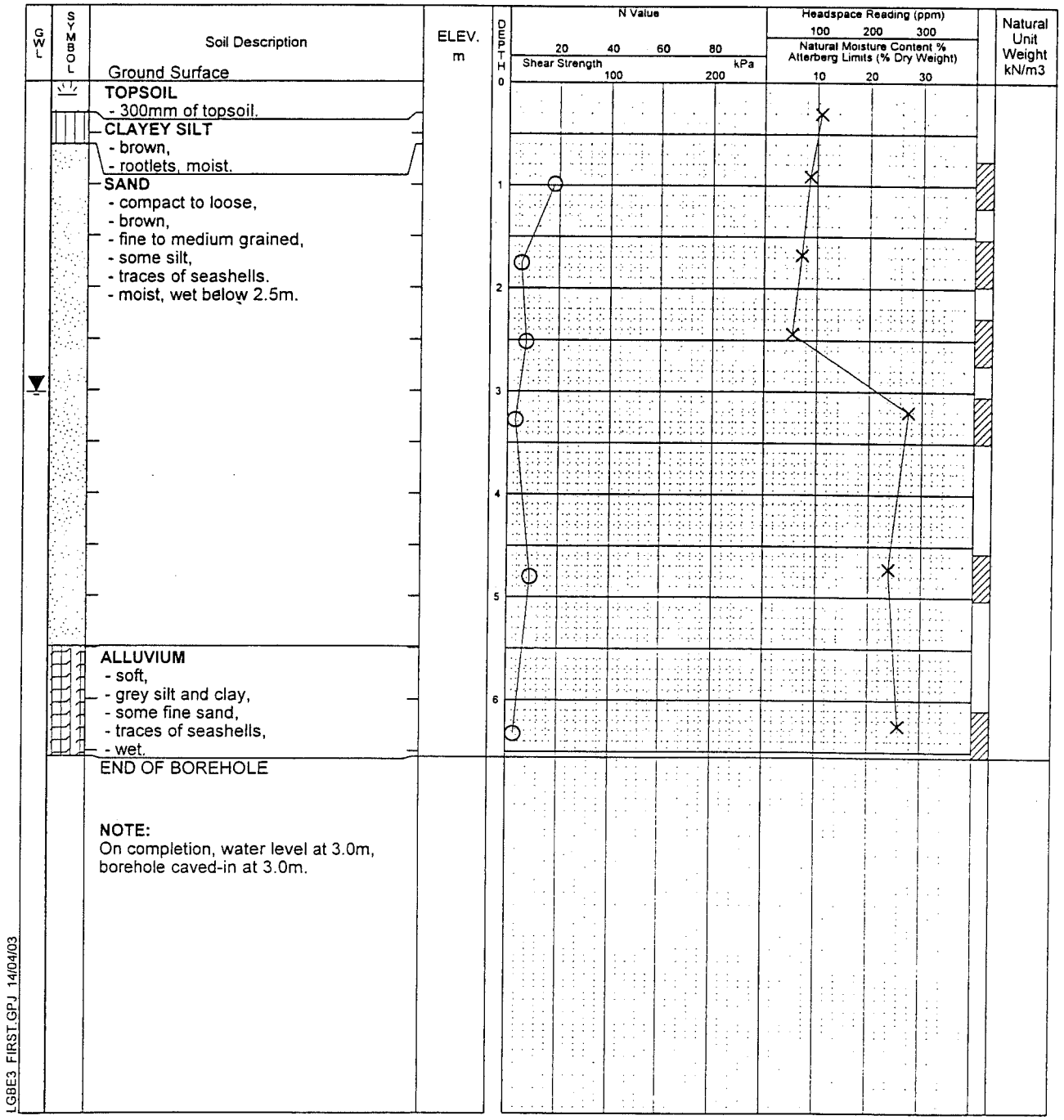
Date Drilled: 24/02/03

Drill Type: Truck mounted

Datum: Ground Surface

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer



LGBE3 FIRST.GPJ 14/04/03

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Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 03 LPL 782

Log of Borehole 8

Dwg No. 9

Project: Proposed Development

Sheet No. 1 of 1

Location: First Line Road & Campeau Road, North Kanata

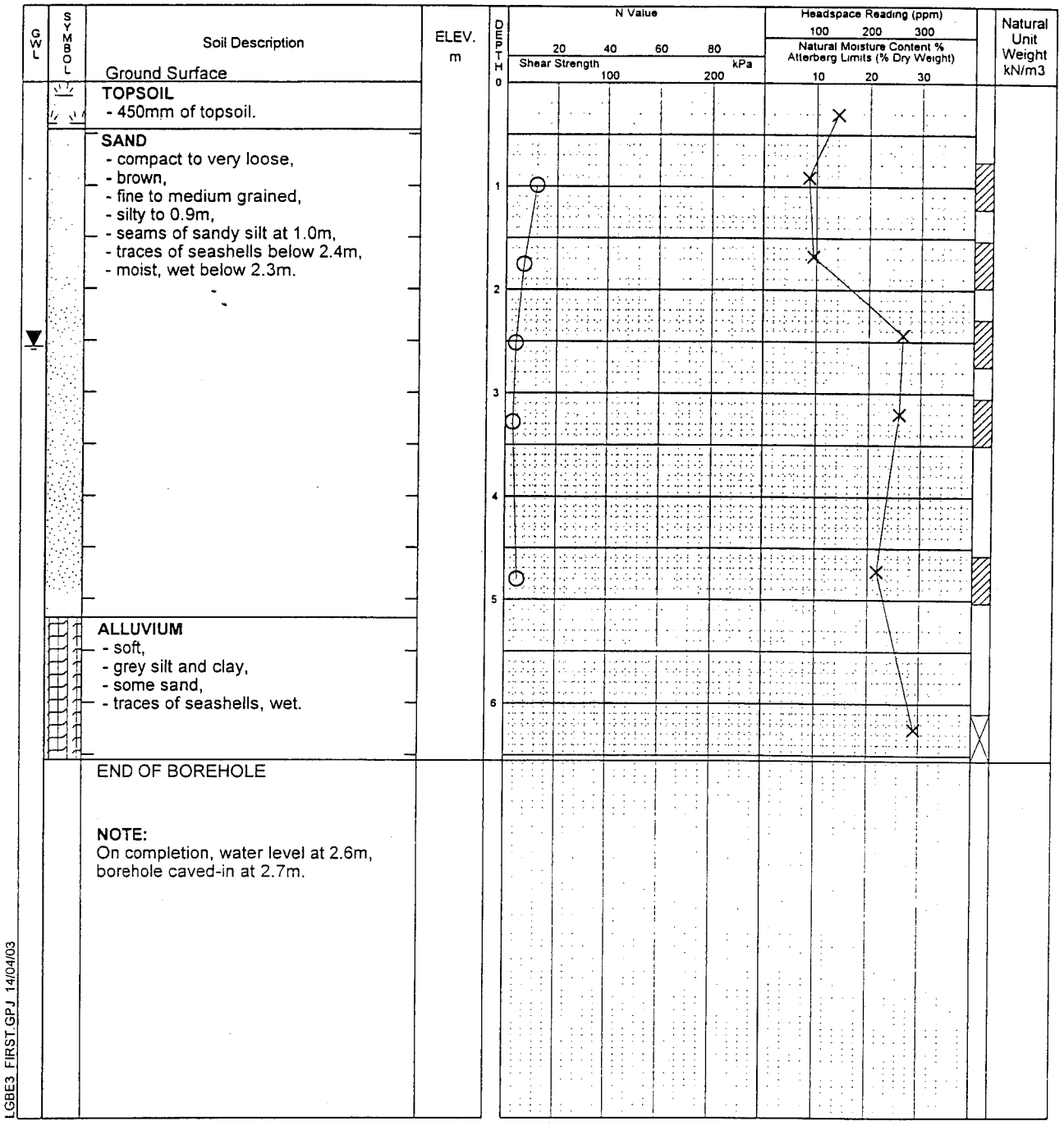
Date Drilled: 24/02/03

Drill Type: Truck mounted

Datum: Ground Surface

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression % Strain at Failure
Penetrometer



LGBE3 FIRST.GPJ 14/04/03

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Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)