DAVROC
TESTING LABORATORIES INC.

CONSULTING ENGINEERS •
Materials Testing and Inspection

Report
Geotechnical Investigation

Proposed 2 Storey Industrial Building and Asphalt Plant
12415 Coleraine Drive
Bolton, Ontario

Prepared for
Mr. Sam DiGregorio

Dig-Con International Limited
4 Holland Drive
Bolton, Ontario
L7E 1G1

Prepared By:
Davroc Testing Laboratories Inc.,
April 7, 2017

File No. L16-0736MT

2051 Williams Parkway
Unit 20 And Unit 21
❖
Brampton, Ontario
Canada, L6S 5T4
❖
Tel: (905) 792-7792
Fax: (905) 792-7829
www.davroc.com

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1. INTRODUCTION

This report presents the results of the geotechnical investigation carried out by Davroc Testing Laboratories Inc., for the proposed asphalt plant at 12415 Coleraine Drive in Bolton, Ontario. This investigation was authorized by Mr. Sam DiGregorio of Dig-Con International Limited and Melinda Holland of The Biglieri group.

It is understood that the proposed asphalt plant will consist of the asphalt plant machinery, an office building and both granular and asphaltic concrete pavements.

The purpose of this investigation was to determine the subsurface conditions at twelve (12) borehole locations and from the findings in the boreholes provide geotechnical recommendations for the design and construction of the asphalt plant.

The number, locations and depths of the boreholes were mutually agreed upon by Davroc Testing Laboratories Inc. and the client.

The comments and recommendations given in this report are based on the assumption that the above-described design concept will proceed into construction. If changes are made either in the design phase or during construction, this office must be retained to review these modifications. The result of this review may be a modification of our recommendations or the requirement of additional field or laboratory work to check whether the changes are acceptable from a geotechnical viewpoint.

2. PROCEDURE

The fieldwork was carried out on March 13, 2017. At that time twelve (12) boreholes were advanced to depths ranging from about 2.1 to 6.7 m by a drilling subcontractor using solid stem continuous flight auger equipment. Samples were retrieved at regular intervals with a split barrel sampler in accordance with the Standard Penetration Test procedures. The samples were logged in the field and then returned to the laboratory for testing and detailed examination. The drilling operations were carried out under the supervision of a member of our field staff.

Groundwater observations were made in the open boreholes during and upon completion of the drilling operations and the results are recorded on the borehole logs.

The locations of the boreholes were laid out in the field by Davroc personnel. Ground surface elevations were not surveyed.

As well as visual examination in the laboratory, all samples were tested for moisture content. The undrained shear strength of selected samples was determined with a penetrometer. The samples will be stored for a period of three months and then discarded, unless we are instructed differently.

3. Subsurface Conditions

The borehole locations are shown on Drawing 1 and detailed subsurface conditions are presented on the borehole logs, Drawings 2 to 13. It should be noted that the soil boundaries indicated on the borehole logs are inferred from non-continuous sampling and observations during drilling. These boundaries are intended to reflect approximate transition zones for the purpose of geotechnical design and should not be interpreted as exact planes of geological change. The "Notes on Sample Description" preceding the borehole logs form an integral part of and should be read in conjunction with this report.

A brief description of the subsurface conditions follows.

3.1 Topsoil

A cover of topsoil ranging from approximately 250 mm to 300 mm was estimated at the borehole locations.

Topsoil observations were carried out at the borehole locations only and were found to be variable. It should be noted that the topsoil layer was frozen at the time of the field work and as such it was difficult to assess the thickness with a great degree of accuracy in the boreholes. Consequently, topsoil quantities should not be established from the information provided at the borehole locations only. If required, a more detailed evaluation (involving shallow test pits are recommended to accurately quantify the amount of topsoil to be removed for construction purposes.

3.2 Clayey Silt Till

Clayey silt till was found below the topsoil and extends to a depth of at least 6.7 m. The clayey silt till is brown to about 4.5 m and then turns grey. It is generally very stiff to hard below an approximate 0.7 m thick surface weathered layer.

The clayey silt till samples were noted to be moist and the moisture content of the samples range from about 13 to 22 percent.

3.3 Groundwater

Groundwater levels were monitored in the open boreholes at the completion of the drilling operations. All boreholes were dry and open to almost their complete depth at the completion of drilling. Long term water levels were not monitored.

4. ENGINEERING DISCUSSION AND RECOMMENDATIONS

4.1 Foundations

The proposed asphalt plant and office building can be supported by spread footings founded on the very stiff to hard clayey silt till encountered below a depth of about 0.8 m. A bearing value of 300 kPa SLS and 450 kPa ULS (factored) can be used below a depth of 0.8 m.

Footings designed to the bearing value given above are expected to settle less than 25 mm total and 19 mm differential.

All footings exposed to seasonal freezing conditions must have at least 1.2 metres of soil cover or equivalent insulation for protection against frost effects.

It should be noted that the recommended bearing capacities have been calculated by Davroc Testing Laboratories Inc. from the borehole information for the design stage only. The investigation and comments are necessarily on-going as new information of the underground conditions becomes available. For example, more specific information is available with respect to conditions between boreholes when foundation construction is underway. The interpretation between boreholes and the recommendations of this report must therefore be checked through field inspections provided by Davroc Testing Laboratories Inc. to validate the information for use during the construction stage.

The site classification for seismic response for this site is Site Class 'D' according to Table 4.1.8.4.A of the Ontario Building Code.

4.2 Floor Slabs and Permanent Drainage

Conventional slab on grade construction can be used on the natural soils encountered at this site. Prior to constructing the floor slab, all topsoil must be stripped and the subgrade should be thoroughly proof rolled until the surface is compacted to at least 98 percent standard Proctor maximum dry density. Any soft wet subgrade material encountered during proof rolling must be excavated to a solid base and be replaced with well compacted inorganic fill.

A moisture barrier consisting of at least 200 mm of clear crushed stone should be installed under the floor slab.

All underfloor fill should be compacted to at least 98 percent standard Proctor maximum dry density. Where heavy loads are anticipated the underfloor fill should be compacted to at least 100 percent standard Proctor maximum dry density.

Where the floor slab is at least 300 mm above the exterior grade perimeter drainage is not considered necessary. Where the floor slab is lower, the perimeter drainage system shown on Drawing 14 is suggested.

The perimeter drainage system shown on Drawing 6 is recommended against the basement walls.

4.3 Excavations

Excavation of the soil at this site can be carried out with heavy hydraulic backhoes. Problems with groundwater are not anticipated for the installation of foundations. It is expected that any seepage, which occurs during wet periods, can be removed by pumping from sumps.

It should be noted that the till is a non-sorted sediment and therefore may contain boulders. Provisions must be made in the excavation contract for the removal of possible boulders.

All temporary excavations must be carried out in accordance with the most recent Occupational Health and Safety Act (OHSA). In accordance with OHSA the soils at this site are considered to be Type 2.

4.4 Backfill

The clayey silt till, free of any topsoil, is considered to be suitable for use as construction backfill where it can be compacted with sheep's foot type compactors. Loose lifts of soil, which are to be compacted, should not exceed 200 mm.

Some moisture content adjustment of the clayey silt till may be required depending upon the time of year the soil is being compacted.

It should be noted that the excavated soils are subject to moisture content increase during wet weather which would make these materials too wet for adequate compaction. Stockpiles should therefore be compacted at the surface or be covered with tarpaulins to help minimize moisture uptake.

Imported granular fill, which can be compacted with hand held equipment, should be used in confined areas.

The excavated soils are not considered to be free draining. Where free draining backfill is required, imported granular fill such as OPSS Granular B should be used.

4.5 Pavements

The recommended pavement structures provided in Table 1 is based upon an estimate of the subgrade soil properties determined from visual examination and textural classification of the soil samples. Consequently, the recommended pavement structures should be considered for preliminary design

purposes only. A functional design life of ten to fifteen years has been used to establish the pavement recommendations. This represents the number of years to the first rehabilitation, assuming regular maintenance is carried out. If required, a more refined pavement structure design can be performed based on specific traffic data and design life requirements and will involve specific laboratory tests to determine frost susceptibility and strength characteristics of the subgrade soils, as well as specific data input from the client.

Table 1: Recommended Pavement Structure Thickness

Pavement Layer	Compaction Requirements	Light y Duty and Parking	Heavy Duty
Asphaltic Concrete	92 to 96.5% MRD 92 to 96.5% MRD	40 mm OPSS HL 3 40 mm OPSS HL 8	50 mm OPSS HL 3 (High Stability) 100 mm OPSS HL 8 (High Stability)
OPSS Granular A Base (Crushed Limestone)	100% SPMDD*	150 mm	150 mm
OPSS Granular B Sub-base (50 mm Crusher Run Limestone)	100% SPMDD	150 mm	300 mm

* Denotes Standard Proctor Maximum Dry Density, ASTM-D698
The subgrade must be compacted to 98% SPMDD for at least the upper 300 mm.

If it is proposed not to pave the plant area, then the heavy duty pavement should consist of 300 mm of OPSS Granular A (crushed limestone) and 450 mm of OPSS Granular B) (crushed limestone).

The long term performance of the pavement structure is highly dependent upon the subgrade support conditions. Stringent construction control procedures should be maintained to ensure uniform subgrade moisture and density conditions are achieved. In addition, the need for adequate drainage cannot be over-emphasized. The finished pavement surface and underlying subgrade should be free of depressions and should be sloped (preferably at a minimum grade of two percent) to provide effective surface drainage toward catch basins. Surface water should not be allowed to pond adjacent to the outside edges of pavement areas. Sub-drains should be installed to intercept excess subsurface moisture and prevent subgrade softening. This is particularly important in heavy-duty pavement areas.

Additional comments on the construction of parking areas and access roadways are as follows:

1. As part of the subgrade preparation, proposed parking areas and access roadways should be stripped of topsoil and other obvious objectionable material. Fill required to raise the grades to design elevations should conform to backfill requirements outlined in previous sections of this report. The subgrade should be properly shaped, crowned then proof-rolled in the full time presence of a representative of this office. Soft or spongy subgrade areas should be sub-excavated and properly replaced with suitable approved backfill compacted to 98% SPMDD.
2. The locations and extent of sub-drainage required within the paved areas should be reviewed by this office in conjunction with the proposed lot grading. Assuming that satisfactory cross falls in the order of two percent have been provided, sub-drains extending from and between catch basins may be satisfactory. In the event that shallower cross falls are considered, a more extensive system of sub-drainage may be necessary and should be reviewed by Davroc Testing Laboratories Inc.

3. The most severe loading conditions on light-duty pavement areas and the subgrade may occur during construction. Consequently, special provisions such as restricted access lanes, half-loads during paving, etc., may be required, especially if construction is carried out during unfavorable weather.

4. It is recommended that Davroc Testing Laboratories Inc. be retained to review the final pavement structure designs and drainage plans prior to construction to ensure that they are consistent with the recommendations of this report.

5. GENERAL COMMENTS

Davroc Testing Laboratories Inc. should be retained for a general review of the final design and specifications to verify that this report has been properly interpreted and implemented. If not accorded the privilege of making this review, Davroc Testing Laboratories Inc. will assume no responsibility for interpretation of the recommendations in the report.

This report has been prepared for and is intended for the exclusive use of the client and their architects and engineers. Any use which a third party makes of this report, or any part thereof, of any reliance on or decision to be made based on it, are the responsibility of such third parties. Davroc Testing Laboratories Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decision made or actions based on this report. The contents of this report should not be relied upon by any other party without the express written consent of Davroc Testing Laboratories Inc. The findings are relevant for the dates of our Site visits and should not be relied upon to represent conditions at later dates.

The information in this report in no way reflects on the environmental aspects of the soil and has not been addressed in this report, since this aspect is beyond the scope and terms of reference. Should specific information be required, additional testing may be required.

The comments given in this report are primarily intended only for the guidance of design engineers. The number of boreholes required to determine the localized underground conditions between boreholes affecting construction costs, techniques, sequencing, equipment, scheduling, etc. could be greater than has been carried out for design purposes. Contractors bidding on or undertaking the works should make their own interpretations of the factual borehole results and draw their own conclusions as to how the subsurface conditions may affect them.

More specific information with respect to the conditions between samples, or the lateral and vertical extent of materials may become apparent during excavation operations. The interpretation of the borehole information must, therefore, be validated during excavation operations. Consequently, during the future development of the property, conditions not observed during this investigation may become apparent; should this occur, Davroc Testing Laboratories Inc. should be contacted to assess the situation and additional testing and reporting may be required. Davroc Testing Laboratories Inc. has qualified personnel to provide assistance in regards to future geotechnical issues related to this property.

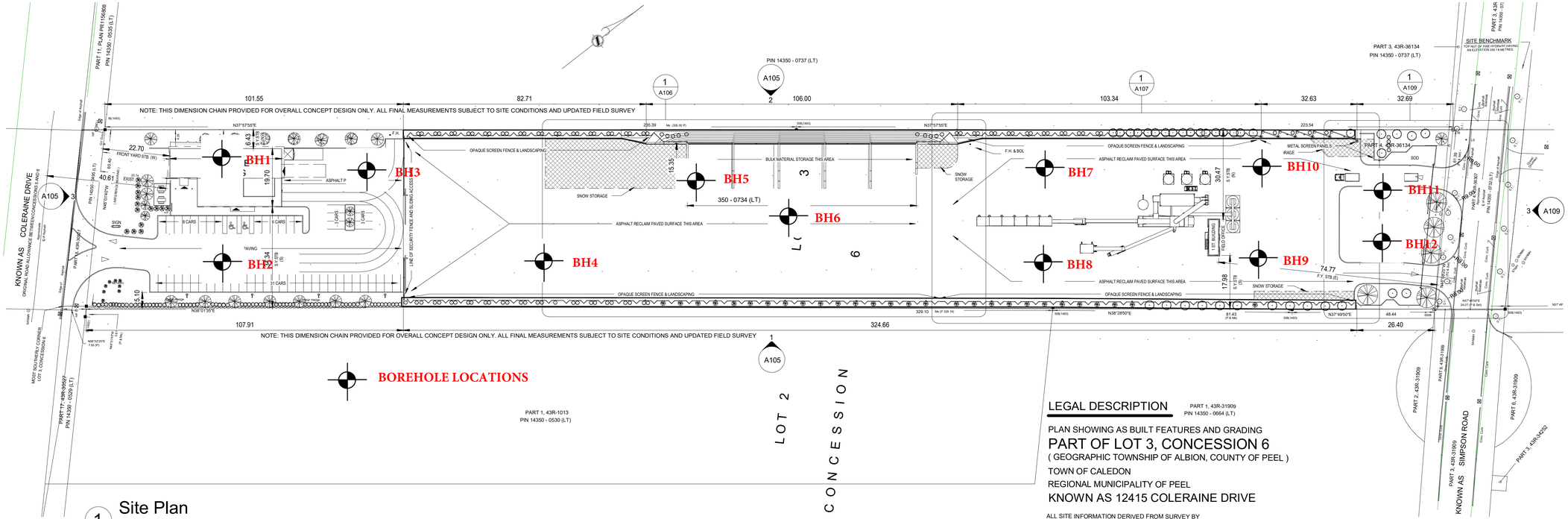
We trust that this report is satisfactory for your purposes. Should you have any questions or comments, please do not hesitate to contact this office.

Yours truly,
Davroc Testing Laboratories Inc.

Holger Lohse, P.Eng.
Consulting Engineer

Sal Fasullo, C.E.T.
Vice-President

Drawings



1 Site Plan
1 : 700

LEGAL DESCRIPTION

PART 1, 43R-31909
PIN 14350 - 0664 (LT)

PLAN SHOWING AS BUILT FEATURES AND GRADING

PART OF LOT 3, CONCESSION 6

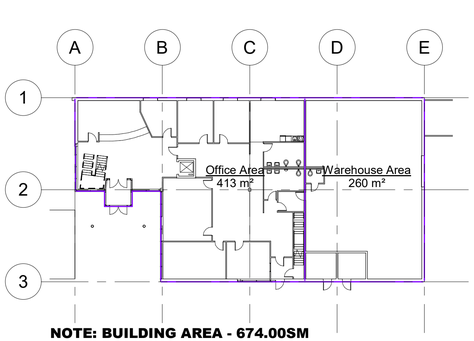
(GEOGRAPHIC TOWNSHIP OF ALBION, COUNTY OF PEEL)

TOWN OF CALEDON

REGIONAL MUNICIPALITY OF PEEL

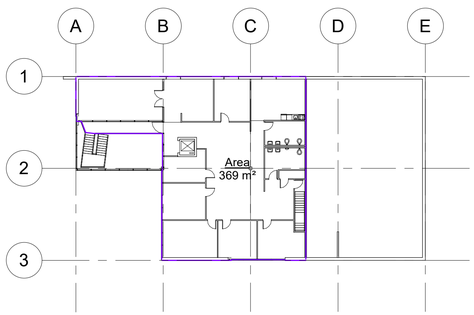
KNOWN AS 12415 COLERAINE DRIVE

ALL SITE INFORMATION DERIVED FROM SURVEY BY YOUNG & YOUNG SURVEYING INC.



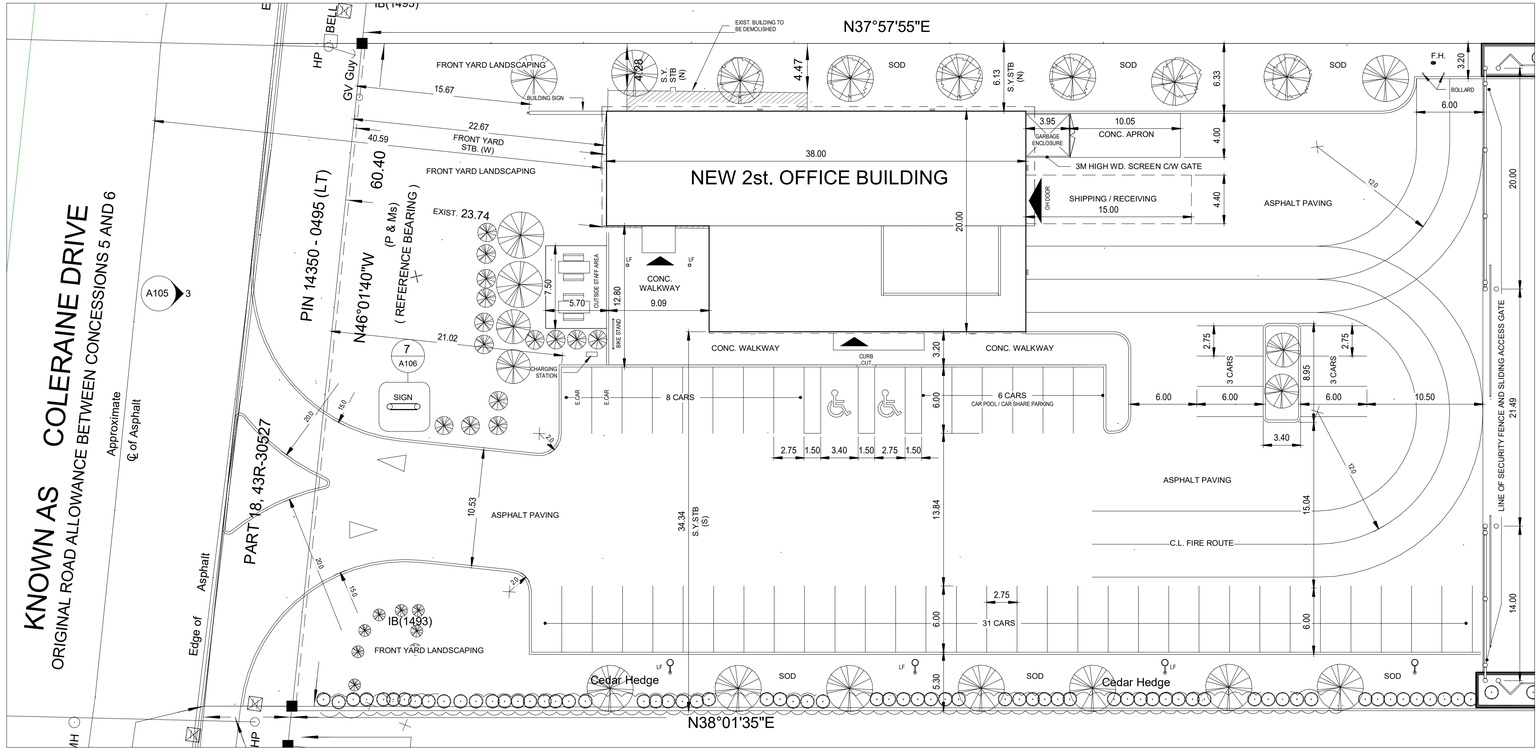
NOTE: BUILDING AREA - 674.00SM

2 Level 1 Building Areas
1 : 300



NOTE: COMBINED GFA THIS BUILDING - 1,042.00SM

3 Level 2 Building Areas
OFFICE AREA 369.00SM
1 : 300



4 Partial Site Plan Front Area
1 : 250

REVISIONS, RECORDS

No.	Date	Subject
01	15/01/2018	ISSUED FOR PRELIMINARY REVIEW
03	10/04/2018	ISSUED FOR COORDINATION
04	27/04/2018	ISSUED FOR SITE PLAN APPLICATION

WRITTEN DIMENSIONS GOVERN OVER SCALED DIMENSIONS
CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND SITE CONDITIONS AND REPORT DISCREPANCIES TO THE ARCHITECT
THIS DRAWING NOT FOR CONSTRUCTION UNLESS COPY SIGNED AND DATED BY THE ARCHITECT ON LINE BELOW

J. GORKA ARCHITECT
261 Willowdale Avenue
Toronto, Ontario M2N 4Z8
tel: (416) 226 9709

ONTARIO ASSOCIATION OF ARCHITECTS
JACEK A. GORKA
LICENCE 3941
27/04/2018

COMMISSION TITLE
ASPHALT MIXING PLANT FACILITIES at # 12415 COLERAINE DRIVE, BOLTON

DRAWING TITLE
OVERALL SITE PLAN and FRONT OFFICE COMPONENT

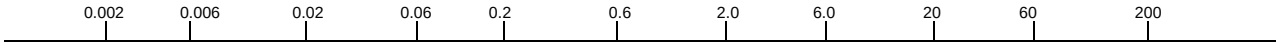
DRAWING COMMENCED	
DRAWING SCALE	As indicated
DRAWN BY:	J.G.
CHECKED BY:	J.G.
COMMISSION No:	2018-03
DRAWING No:	A102

Notes On Sample Descriptions Drawing 1A

1. All sample descriptions included in this report follow the Canadian Foundations Engineering Manual soil classification system. This system follows the standard proposed by the International Society for Soil Mechanics and Foundation Engineering. Laboratory grain size analyses provided by Davroc Laboratories Inc. also follow the same system. Different classification systems may be used by others; one such system is the Unified Soil Classification. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		



EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

UNIFIED SOIL CLASSIFICATION

2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc.; none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

Log of Borehole 1

Project No. L16-0736BH

Drawing No. 2

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

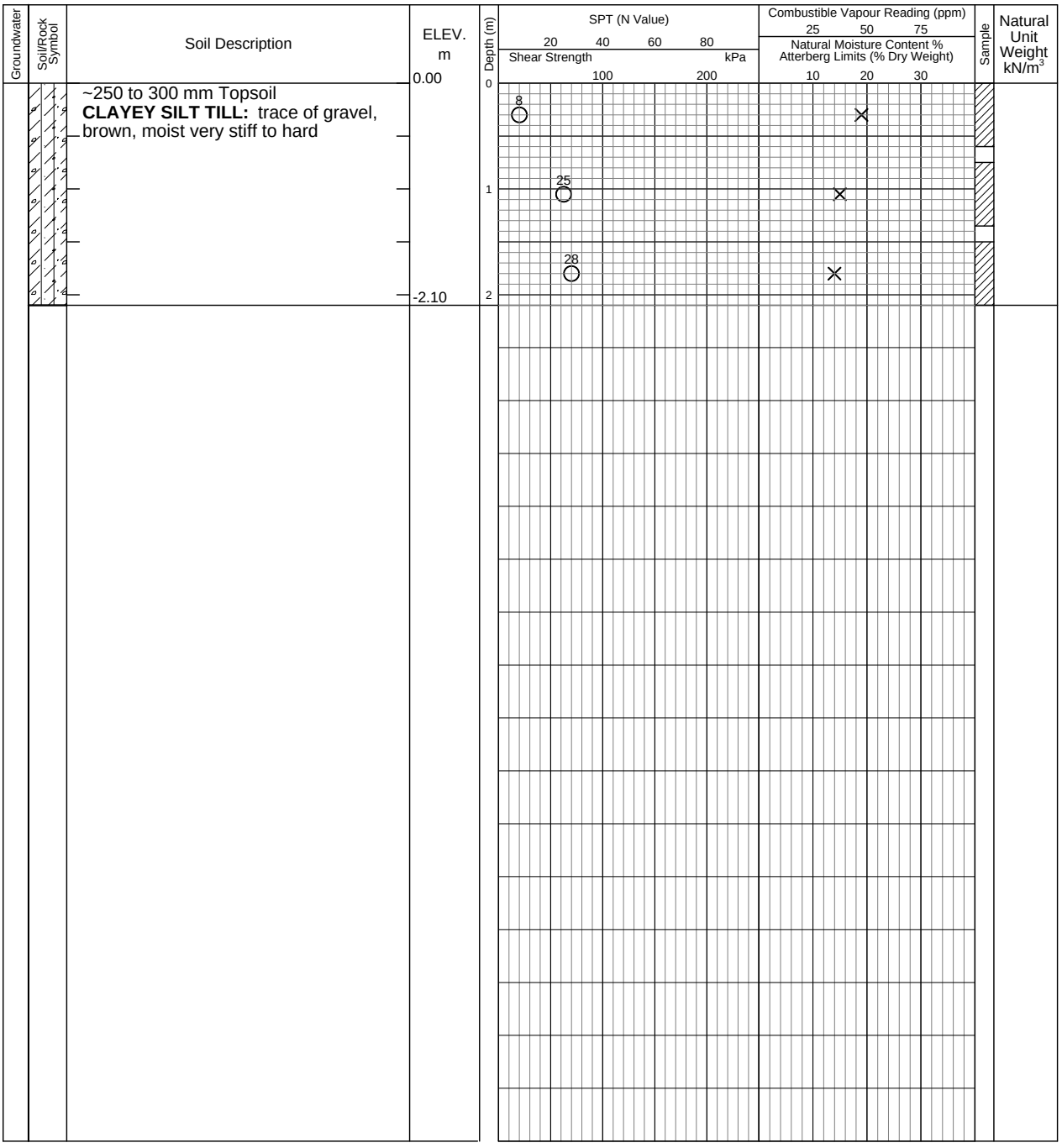
Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at % Strain at Failure

Penetrometer



DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 2

Project No. L16-0736BH

Drawing No. 6

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at % Strain at Failure

Penetrometer

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		~250 to 300 mm Topsoil **CLAYEY SILT TILL:** trace of gravel, brown, moist very stiff to hard	0.00	0	9			
				1	31			
				2	37			
			-2.10					

SPT (N Value): 20 40 60 80

Shear Strength kPa: 100 200

Combustible Vapour Reading (ppm): 25 50 75

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

DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 3

Project No. L16-0736BH

Drawing No. 4

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at % Strain at Failure

Penetrometer

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		~250 to 300 mm Topsoil **CLAYEY SILT TILL:** trace of gravel, brown, moist very stiff to hard	0.00	0	10			
				1	40			
					36			
			-2.10	2				

SPT (N Value): 20 40 60 80

Shear Strength kPa: 100 200

Combustible Vapour Reading (ppm): 25 50 75

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

DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 4

Project No. L16-0736BH

Drawing No. 5

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

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

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) / Shear Strength kPa	Combustible Vapour Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Sample	Natural Unit Weight kN/m³
		~250 to 300 mm Topsoil **CLAYEY SILT TILL:** trace of gravel, brown, moist very stiff to hard	0.00	0	10			
				1	35			
				2	41			
			-2.10					

SPT (N Value): 20 40 60 80
Shear Strength kPa: 100 200
Combustible Vapour Reading (ppm): 25 50 75
Natural Moisture Content % / Atterberg Limits (% Dry Weight): 10 20 30

DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 5

Project No. L16-0736BH

Drawing No. 6

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

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

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer

Groundwater	Soil/Rock Symbol	Soil Description	ELEV. m	Depth (m)	SPT (N Value) 20 40 60 80 / Shear Strength kPa 100 200	Combustible Vapour Reading (ppm) 25 50 75 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Sample	Natural Unit Weight kN/m³
		~250 to 300 mm Topsoil **CLAYEY SILT TILL:** trace of gravel, brown, moist very stiff to hard	0.00	0	8			
				1	20			
				2	31			
			-2.10					

DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 6

Project No. L16-0736BH

Drawing No. 7

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

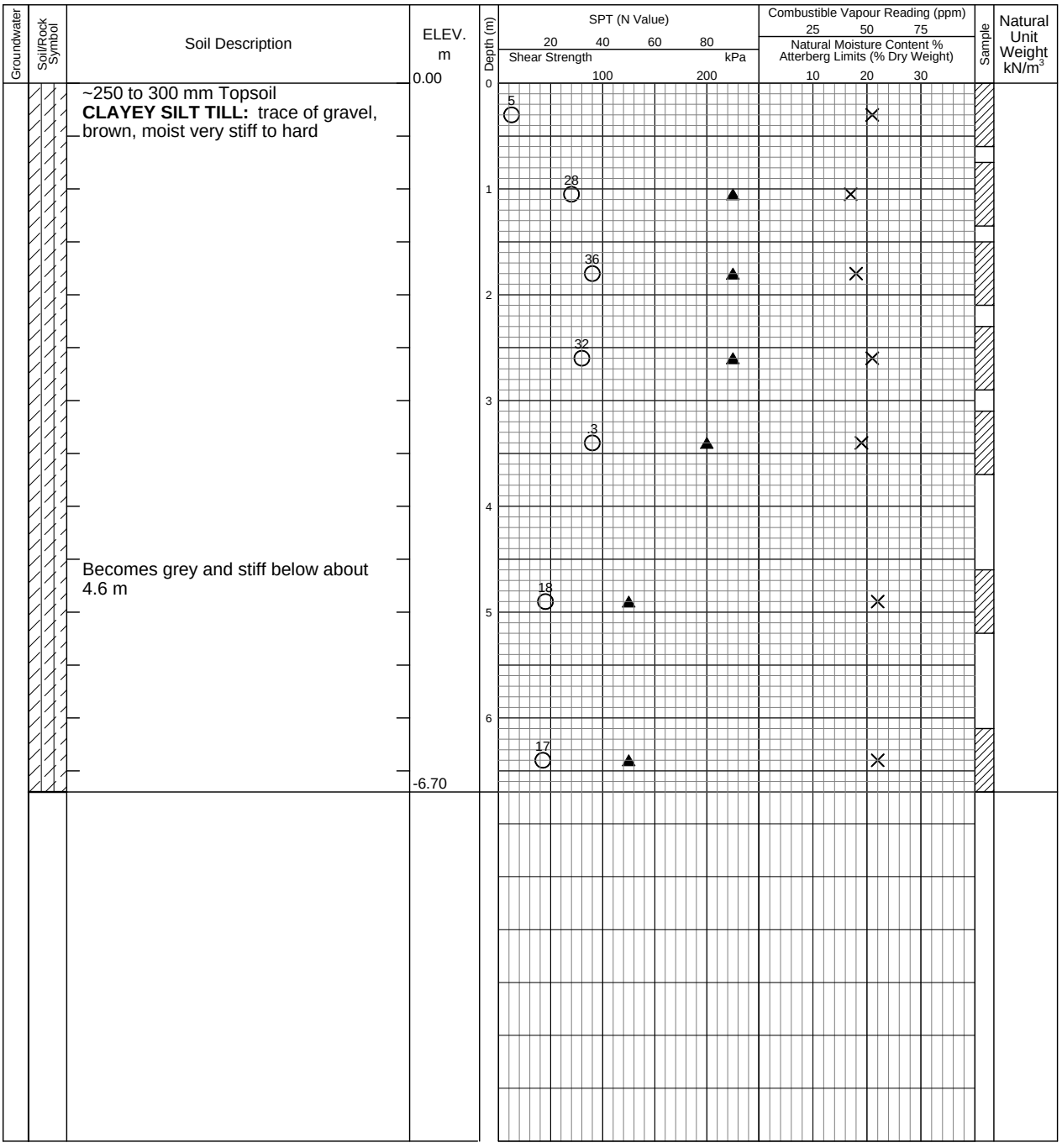
Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at % Strain at Failure

Penetrometer



DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	6.1

Log of Borehole 7

Project No. L16-0736BH

Drawing No. 8

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

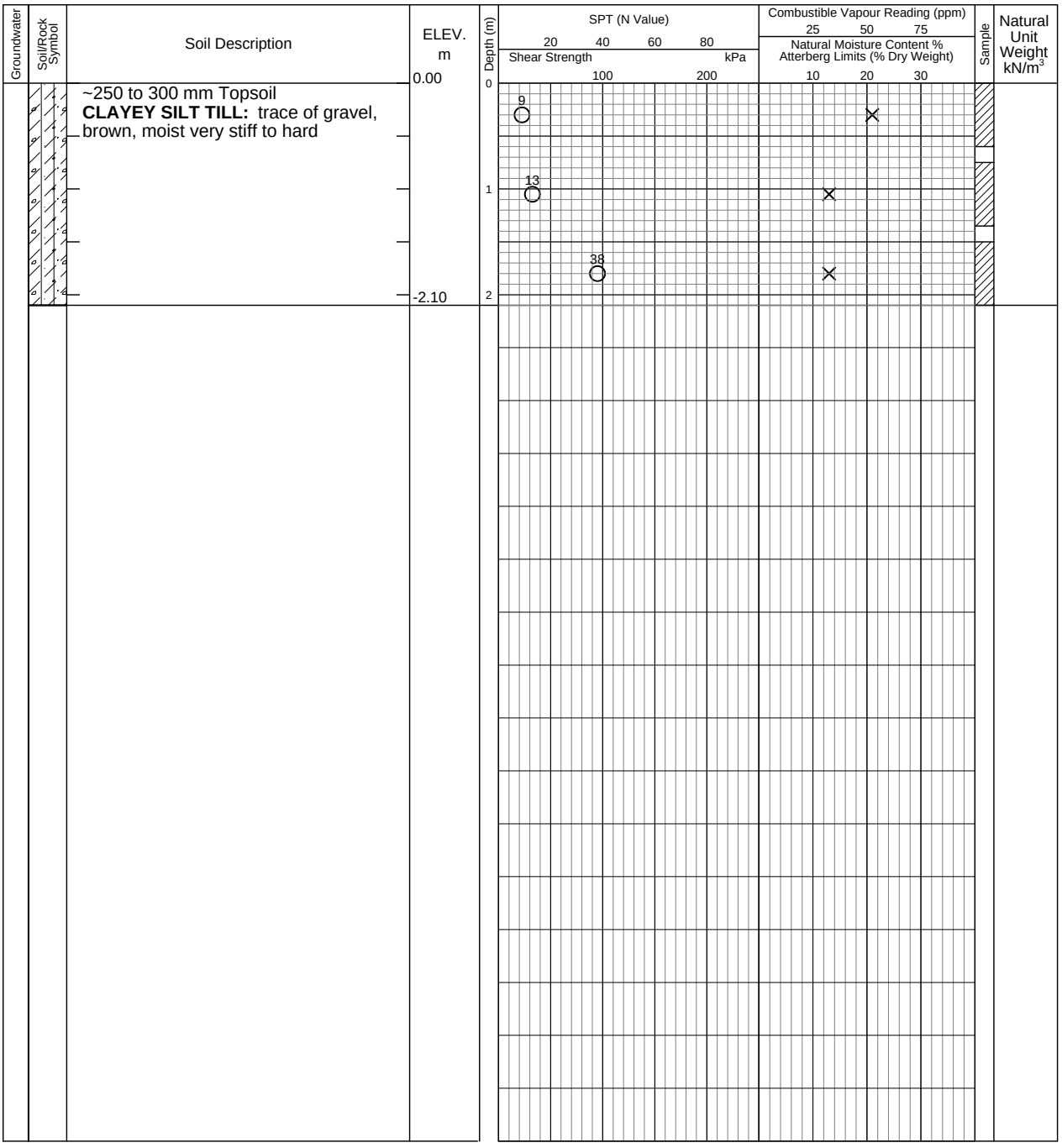
Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

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

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer



DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 8

Project No. L16-0736BH

Drawing No. 9

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

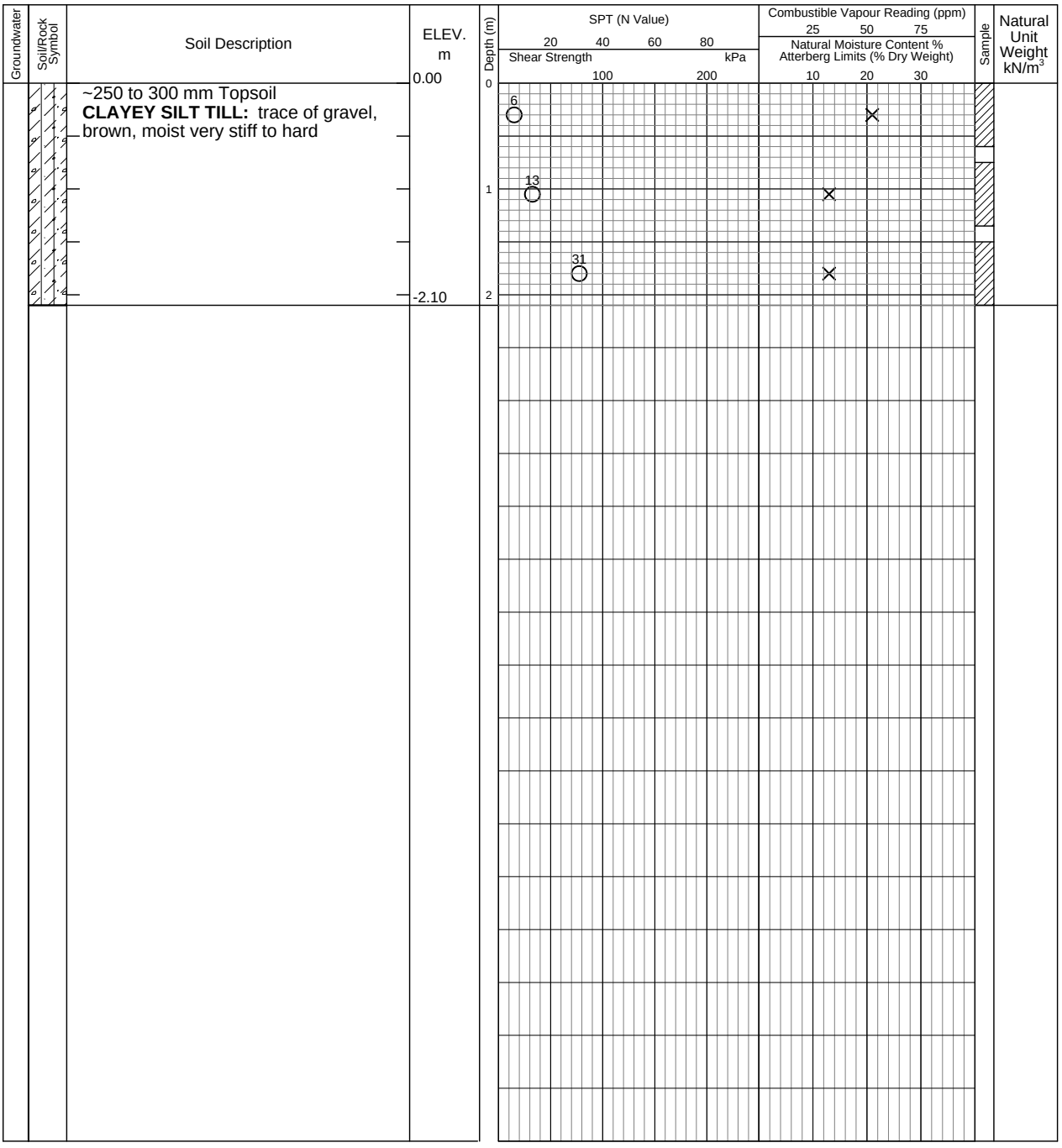
Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at % Strain at Failure

Penetrometer



DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 9

Project No. L16-0736BH

Drawing No. 10

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

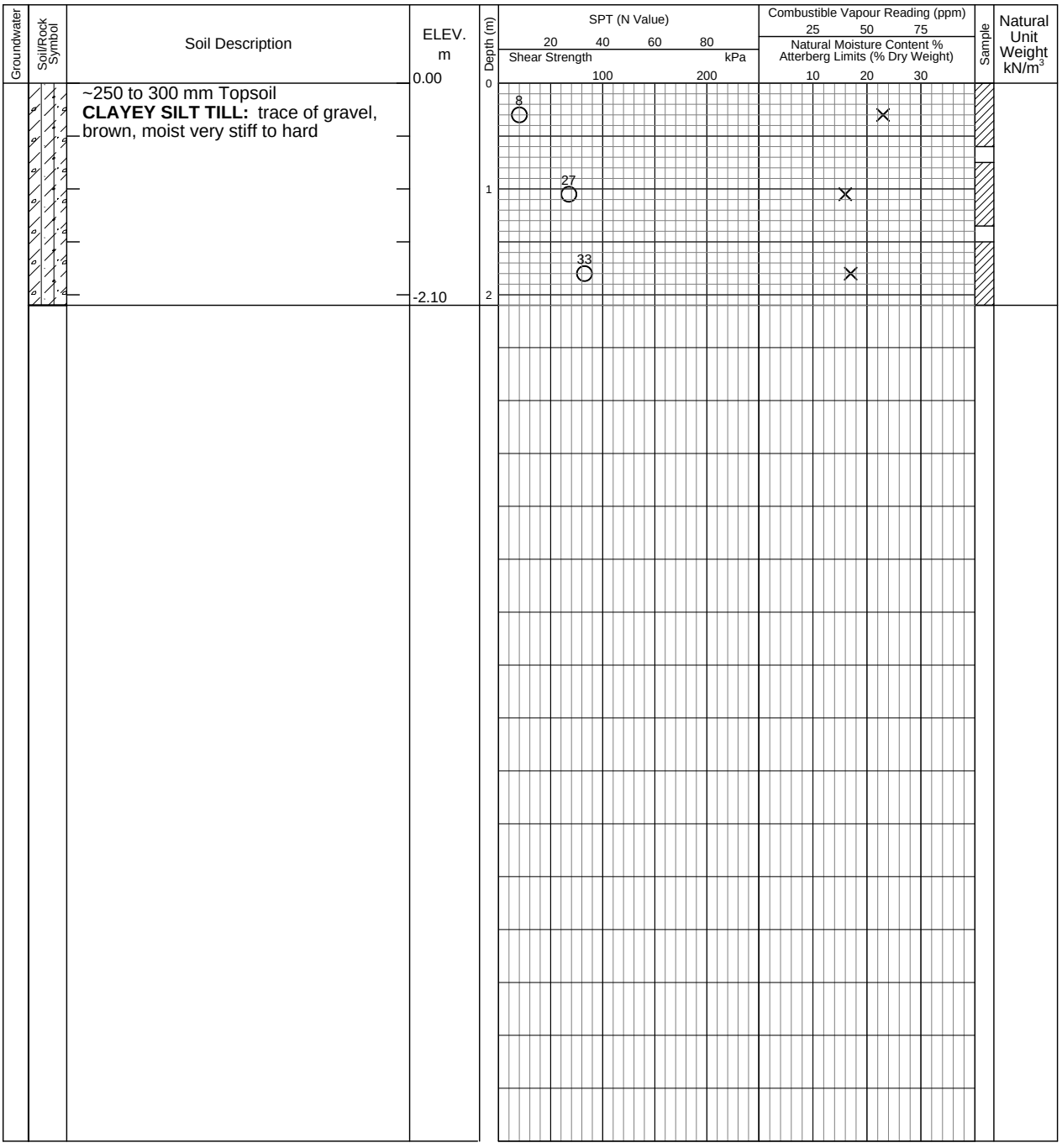
Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at % Strain at Failure

Penetrometer



DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 10

Project No. L16-0736BH

Drawing No. 11

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

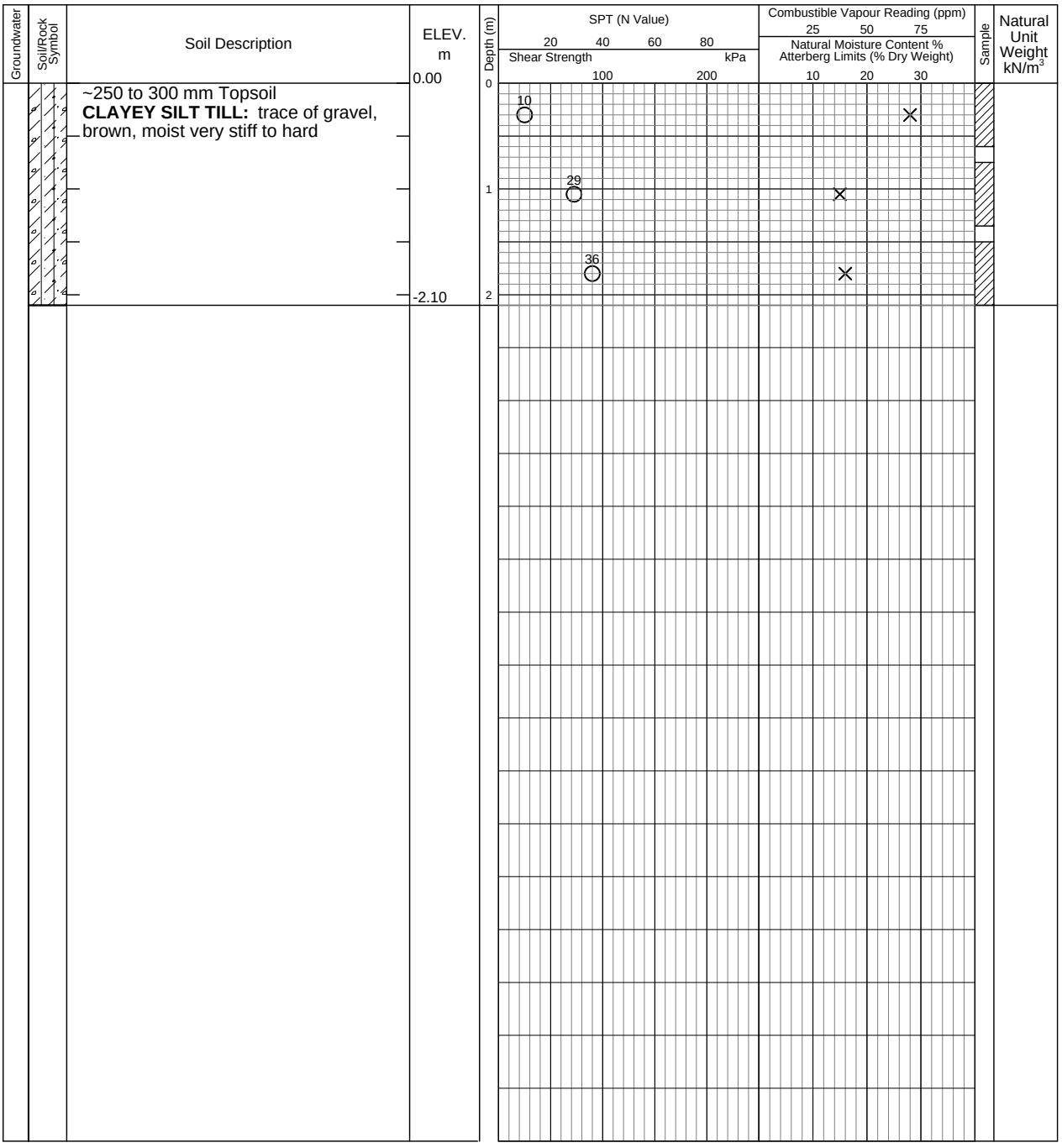
Combustible Vapour Reading

Natural Moisture

Plastic and Liquid Limit

Undrained Triaxial at % Strain at Failure

Penetrometer



DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	2.1

Log of Borehole 11

Project No. L16-0736BH

Drawing No. 12

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

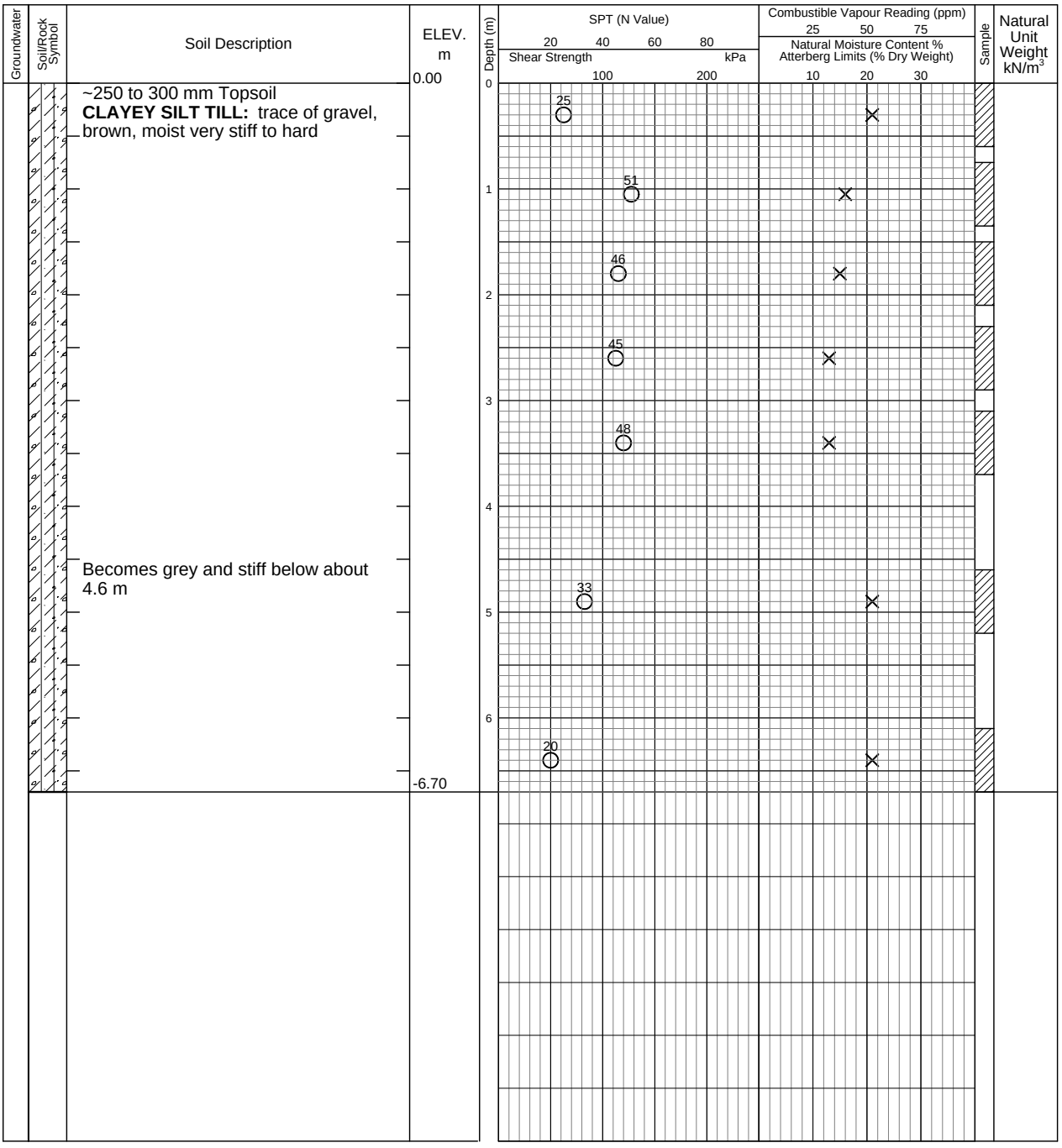
Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

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

Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer



DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	6.1

Log of Borehole 12

Project No. L16-0736BH

Drawing No. 13

Project: Proposed Asphalt Plant

Sheet No. 1 of 1

Location: 12415 Coleraine Drive, Bolton, Ontario

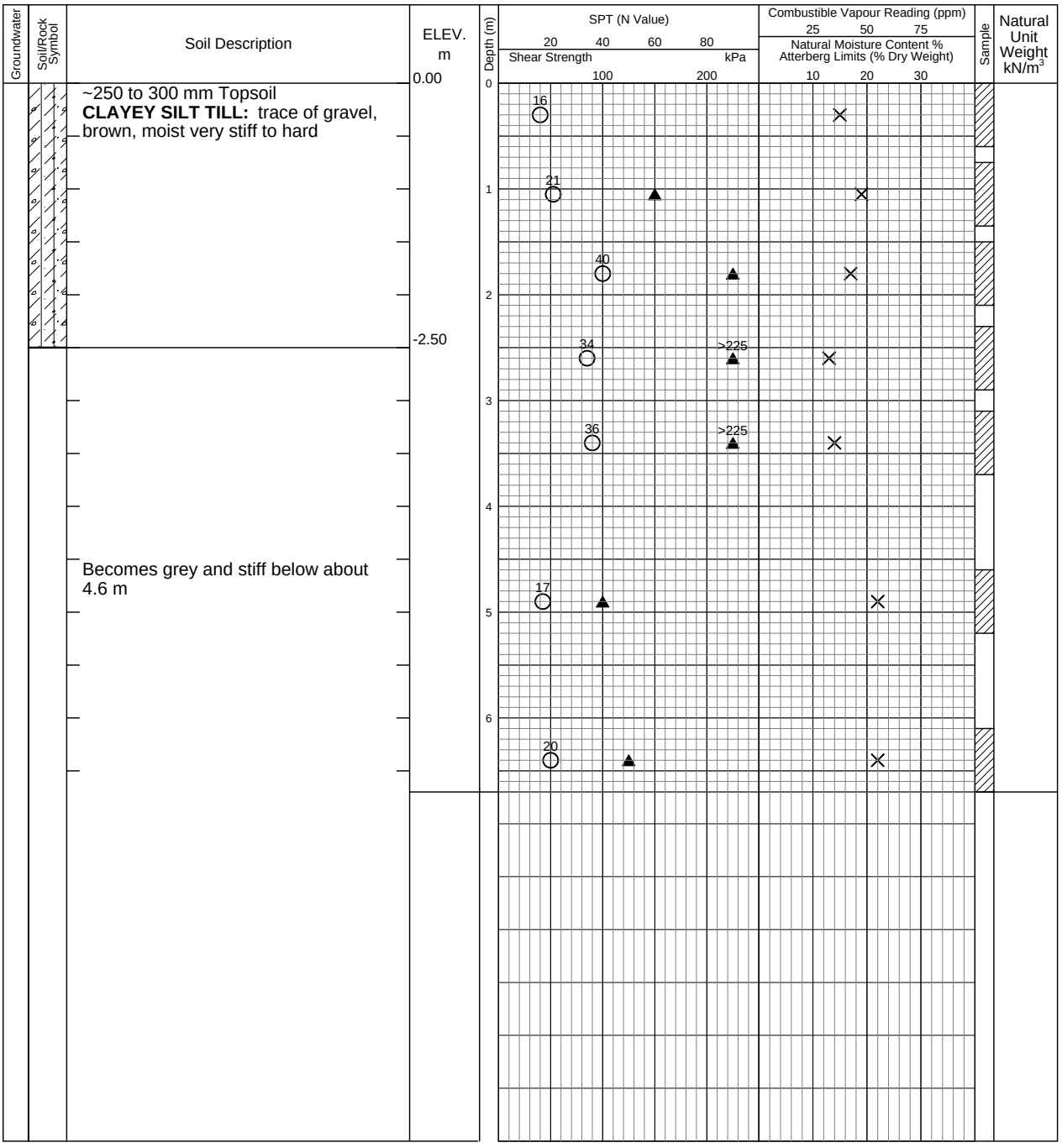
Date Drilled: March 13, 2017

Drill Type: Solid Stem Augers

Datum: Ground Surface = 0.0 m

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

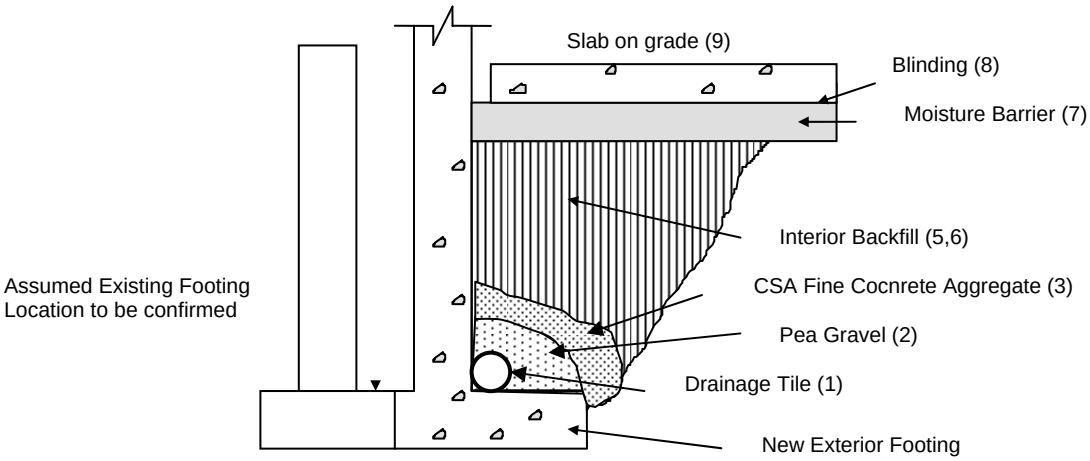
Combustible Vapour Reading
Natural Moisture
Plastic and Liquid Limit
Undrained Triaxial at % Strain at Failure
Penetrometer



DAVRTEST COLORAENE GINT LOGS.GPJ NEW.GDT 4/4/17

Davroc Testing Laboratories Inc.

Time	Water Level (m)	Depth to Cave (m)
on completion	dry	6.1



Notes

1. Drainage tile to consist of 100 mm (4") diameter weeping tile or equivalent perforated pipe leading to a positive sump or outlet. Invert to be a minimum of 150 mm (6") below underside of floor slab.
2. Pea gravel - 150 mm (6") top and side of drain. If drain is not on footing, place 100 mm (4 inches) of pea gravel below drain. 20 mm (3/4") clear stone is an alternative provided it is surrounded by an approved porous plastic membrane (Terrafix 270R or equivalent).
3. C.S.A. fine concrete aggregate to act as filter material. Minimum 300 mm (12") top and side of tile drain. This may be replaced by an approved porous plastic membrane as indicated in (2).
4. Impermeable backfill seal - compacted clay, clayey silt or equivalent. If original soil is free-draining, seal may be omitted.
5. The interior fill may be any clean non-organic soil which can be compacted to the specified density in this confined space.
6. Do not use heavy compaction equipment within 450 mm (18") of the wall. Do not fill or compact within 1.8 m (6') of the wall unless fill is placed on both sides simultaneously.
7. Moisture barrier to be at least 200 mm (8") of compacted clear 20 mm (3/4") stone or equivalent free draining material.
8. If the 20 mm (3/4") stone requires surface blinding, use 6 mm (1/4") stone chips.
9. Slab on grade should not be structurally connected to the wall or footing.
10. Exterior grade to slope away from building.

DRAINAGE AND BACKFILL RECOMMENDATIONS FOR SLAB ON GRADE CONSTRUCTION

(not to scale)

Note:
This system is not normally required if the floor slab is at least 300 m (1') above the exterior grade.