FORM_C_V25 (Charge)

NEW WESTMINSTER LAND TITLE OFFICE

LAND TITLE ACT
FORM C (Section 233) CHARGE
GENERAL INSTRUMENT - PART 1 **Province of British Columbia**

May-12-2021 13:19:07.005

CA8999237 CA8999238

LOCK

Your electronic signature is a representation that you are a designate authorized to certify this document under section 168.4 of the *Land Title Act,* RSBC 1996 c.250, that you certify this document under section 168.41(4) of the act, and that an execution copy, or a true copy of that execution copy, is in your possession.

Randal Singh Dhaliwal ZVBI1K

Digitally signed by Randal Singh Dhaliwal ZVBI1K
Date: 2021.05.11 13:48:56 -07'00'

1. APPLICATION: (Name, address, phone number of applicant, applicant's solicitor or agent)

Import Profile

Fasken Martineau DuMoulin LLP
Barristers & Solicitors
1800 - 13401 - 108th Avenue
Surrey BC V3T 5T3
Document Fees: $150.44

LTO Client No. 11565
Matter No. 313479.00131
RC-Geotechnical Covenant
City of Maple Ridge File No.: 2017-306-RZ

Deduct LTSA Fees? Yes ☑

2. PARCEL IDENTIFIER AND LEGAL DESCRIPTION OF LAND:
[PID] [LEGAL DESCRIPTION]

SEE SCHEDULE

STC? YES ☐

Pick up STC?

Use 30 Parcel Schedule | Use 3 Parcel Schedule

3. NATURE OF INTEREST CHARGE NO. ADDITIONAL INFORMATION

Use Schedule

SEE SCHEDULE

4. TERMS: Part 2 of this instrument consists of (select one only)
(a) ☐ Filed Standard Charge Terms D.F. No. (b) ☑ Express Charge Terms Annexed as Part 2
A selection of (a) includes any additional or modified terms referred to in Item 7 or in a schedule annexed to this instrument.

5. TRANSFEROR(S):

Use Schedule

1127042 B.C. LTD., INC.NO. BC1127042
THE TORONTO-DOMINION BANK (AS TO PRIORITY)

6. TRANSFEREE(S): (including postal address(es) and postal code(s))

Use Schedule

CITY OF MAPLE RIDGE

11995 HANEY PLACE
MAPLE RIDGE BRITISH COLUMBIA
V2X 6A9 CANADA

Joint Tenants?

7. ADDITIONAL OR MODIFIED TERMS:

Use Schedule

N/A

8. EXECUTION(S): This instrument creates, assigns, modifies, enlarges, discharges or governs the priority of the interest(s) described in Item 3 and the Transferor(s) and every other signatory agree to be bound by this instrument, and acknowledge(s) receipt of a true copy of the filed standard charge terms, if any.

Officer Signature(s)

KAREEM JETHA
Barrister & Solicitor
Fasken Martineau DuMoulin LLP
1800 - 13401 108th Avenue
Surrey, BC V3T 5T3
604-631-6473

Execution Date		
Y	M	D
20	12	11

Transferor(s) Signature(s)

1127042 B.C. LTD. (INC. NO. BC1127042), by its authorized signatory:

Print name: Randal Dhaliwal

OFFICER CERTIFICATION:
Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.

More Signatures

Officer Signature(s)	Execution Date Y	M	D	Transferor / Borrower / Party Signature(s)
CASSANDRA ENNS Barrister & Solicitor FARRIS LLP 2500 - 700 West Georgia Street P.O. Box 10026, Pacific Centre Vancouver, BC V7Y 1B3	20	12	22	THE TORONTO-DOMINION BANK, by its authorized signatory(ies): Print name: Mike Lynch, Director TD Pacific Real Estate Group Print name:

OFFICER CERTIFICATION:
Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.

More Signatures

Officer Signature(s)	Execution Date Y	M	D	Transferor / Borrower / Party Signature(s)
CATHERINE A. SCHMIDT Commissioner for Taking Affidavits in British Columbia 11995 Haney Place Maple Ridge, B.C. V2X 6A9 Expires: January 31, 2022	21	01	21	CITY OF MAPLE RIDGE, by its authorized signatory (ies): Name: Michael Morden, Mayor Name: Stephanie Nichols, Corporate Officer

OFFICER CERTIFICATION:
Your signature constitutes a representation that you are a solicitor, notary public or other person authorized by the *Evidence Act*, R.S.B.C. 1996, c.124, to take affidavits for use in British Columbia and certifies the matters set out in Part 5 of the *Land Title Act* as they pertain to the execution of this instrument.

More Signatures

LAND TITLE ACT
FORM E

SCHEDULE PAGE 4 OF 28 PAGES

2. PARCEL IDENTIFIER AND LEGAL DESCRIPTION OF LAND

Related Plan Number: **EPP107648**

STC for each PID listed below? YES ☐

[PID] [LEGAL DESCRIPTION – must fit in a single text line]

NO PID NMBR LOT 1 DISTRICT LOT 399 GROUP 1 NEW WESTMINSTER DISTRICT PLAN EPP107648

Additional 30 Parcel Schedule | Additional 3 Parcel Schedule

LAND TITLE ACT
FORM E

SCHEDULE

NATURE OF INTEREST	CHARGE NO.	ADDITIONAL INFORMATION
Covenant		Section 219
Priority Agreement		Granting covenant filed herein priority over Mortgage No. CA6265768 (as extended by CA7031487, CA7417761, CA7428386 and CA7931661) and Assignment of Rents No. CA6265769 (as extended by CA7031488, CA7417762, CA7428387 and CA7931662)

NATURE OF INTEREST CHARGE NO. ADDITIONAL INFORMATION

NATURE OF INTEREST CHARGE NO. ADDITIONAL INFORMATION

NATURE OF INTEREST CHARGE NO. ADDITIONAL INFORMATION

NATURE OF INTEREST CHARGE NO. ADDITIONAL INFORMATION

More Pages

TERMS OF INSTRUMENT - PART 2

RESTRICTIVE COVENANT

2017-306-RZ
(Geotechnical Covenant)

(Section 219 *Land Title Act*)

THIS AGREEMENT made this 21 day of January, 2021.

BETWEEN:

1127042 B.C. LTD.
201 - 12837 76th Avenue
Surrey, BC V3W 2V3

(hereinafter called the "Covenantor")

OF THE FIRST PART

AND:

CITY OF MAPLE RIDGE
11995 Haney Place,
Maple Ridge, BC V2X 6A9

(hereinafter called the "Covenantee")

OF THE SECOND PART

WHEREAS:

A. The Covenantor is the registered owner of or has an equity of redemption in certain lands in the City of Maple Ridge and more particularly known and described as:

Parcel Identifier: No PID

Legal Description:
Lot 1 District Lot 399 Group 1 New Westminster District Plan EPP107648

(hereinafter called the “said lands”);

B. Section 219 of the *Land Title Act* provides; inter alia, that there may be registered as a charge against title to the land a covenant, whether of a negative or positive

nature, in favour of a City; and

C. The Covenantor and Covenantee are concerned with ensuring that the construction is performed in accordance with recommendations identified in the Geotechnical Report dated November 4, 2017 prepared by Able Geotechnical Ltd., a copy of which is attached hereto as Schedule “A”.

NOW THEREFORE, in consideration of the premises and of the mutual covenants and agreements of the parties herein contained and of the sum of One Dollar ($1.00) paid by the Covenantee to the Covenantor (the receipt and sufficiency whereof is hereby acknowledged by the Covenantor), the Covenantor hereby grants, covenants and agrees unto the Covenantee, pursuant to the Section 219 of the *Land Title Act*, that, except as herein specifically provided, no dwelling or structure be constructed or placed upon the said lands, nor any construction shall occur upon the said lands except in compliance with this covenant (it being the intention of the parties hereto that the covenant herein contained shall be annexed to the said lands) as follows:

1. The Covenantor shall retain, at its expense, the services of Able Geotechnical Ltd. (hereinafter called the "Engineer”), being a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia, to review and approve or reject drawings for any proposed dwellings proposed to be built or works to be constructed on the said lands. If the Engineer approves such drawings, he shall note his approval on such drawings and the Covenantor shall submit only such approved drawings to the Covenantee for the purpose of applying for a building permit for each individual building within the said lands.

2. It is understood and agreed by and between the parties hereto that:

    a) This Agreement does not affect the Covenantor's responsibility to comply with all Municipal bylaws and requirements otherwise provided;

    b) The Covenantee has made no representations, covenants, warranties, guarantees or promises (verbal or otherwise) to the Covenantor other than those contained herein;

    c) The covenants and agreements contained herein shall run with the said lands and shall be binding upon the Covenantor and all persons claiming through, under, or in trust for him and the Covenantor will in every conveyance, lease or other assurance of the said lands or any part thereof give to the Grantee, Lessee or Purchaser thereof express notice of the said covenants and agreements and for that purpose this Agreement shall be registered in the Land Title Office at the City of New Westminster, in the Province of British Columbia, against the title of the said lands;

    d) The Covenantor will, at the expense of the Covenantor, do or cause to be done all acts reasonably necessary to grant priority to this Covenant over

all charges and encumbrances which have been registered against the title to the lands in the New Westminster Land Title Office save and except those specifically exempted in writing by the Covenantee or those in favour of the Covenantee;

e) The Covenantor hereby releases, indemnifies and saves the Covenantee harmless from and against any and all actions, causes of action, losses, damages, costs, claims, debts and demands whatsoever by any person, arising out of or in any way due to the granting or existence or enforcement of this Covenant;

f) In the event of the inability or refusal of the Engineer to perform the duties and responsibilities herein contained, another engineer, being a member in good standing of the Association of Professional Engineers and Geoscientists of British Columbia, acceptable to the Covenantee shall be retained by the Covenantor under the terms and conditions prescribed herein;

g) Notwithstanding anything contained herein, the Covenantor shall not be liable under any of the covenants and agreements contained herein where such liability or obligation arises by reason of an act or omission occurring after the Covenantor ceases to have any further interest in the Lot;

h) This Agreement shall enure to the benefit of and be binding upon the parties hereto, their respective heirs, executors, administrators, successors and assigns; and

i) Wherever the singular or masculine is used herein, the same shall be construed as meaning the plural, feminine or body corporate or politic where the context or the parties so require.

CONSENT AND PRIORITY AGREEMENT

THE TORONTO-DOMINION BANK, in consideration of the payment of ONE ($1.00) DOLLAR and other good and valuable consideration (the receipt and sufficiency of which is hereby acknowledged), hereby agrees and consents to the registration of the covenant herein granted under Section 219 of the *Land Title Act,* running with the *said lands* and against the *said lands* in priority to encumbrances, liens and interests registered in favour of The Toronto-Dominion Bank under instrument numbers CA6265768 (as extended by CA7031487, CA7417761, CA7428386 and CA7931661) and CA6265769 (as extended by CA7031488, CA7417762, CA7428387 and CA7931662) in the same manner and to the same effect as if such charges had been dated, granted and registered prior to the said encumbrances, liens and interests.

SCHEDULE “A”
Geotechnical Site Assessment

November 4th, 2017
File: 554-1

Platinum Enterprises Ltd.
#201 – 12837 76 Avenue
Surrey, BC V3W 2V3

Attention: Avtar Johal

Re: Preliminary Geotechnical Site Assessment
Proposed Condominium Development
22229 Brown Avenue, Maple Ridge

1 INTRODUCTION

This report presents the results of a geotechnical site assessment conducted by Able Geotechnical Ltd. (Able) for the proposed condominium development at the above referenced project site. The purpose of the assessment was to evaluate the site soil conditions in order to provide geotechnical recommendations in relation to the following.

- Subgrade preparation for proposed roads and building foundations.
- Allowable soil bearing pressures for building foundations.
- Lateral loading for the parkade walls.
- Bearing pressure for the footings and engineering review requirements.

Attachments to this report include lateral loading sketch, an augerhole Location Plan and soil logs.

2 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

The site is bounded by Brown Avenue to the south, and existing residential developments to the other three sides. The site is 'L' shaped and one side measures approximately 160 m. The site was vacant at the time of site investigation. The site was vegetated with tall grass, bushes and isolated mature trees. The northern half of the site drops by approximately 1 m and the overall site drops from south to north by approximately 2 m.

Preliminary site plan from the Architect indicates that the development includes three condominium buildings, as shown on the attached Location Plan. The buildings will be serviced by a new section of on-site road. The road will be connected to Brown Avenue and 222 Street. The underground parkade will cover almost the entire site. The parkade outer footing wall will be approximately 1.5 m setback from all the property lines, except that it is at 4.5 m setback along the ROW at the northwest. The excavation depth for buildings would be between 2.5 m to 3 m below the existing grades.

HAZARD ASSESSMENT

3 DISCUSSION

The Community Charter and Local Government Act[1] adopted by the City of Maple Ridge were developed to ensure that development occurs only on locations which are safe for the use intended. These include:

1. A topographic and geomorphological description of the site and a statement as to which type of natural hazards may affect it.
2. A review of previous geotechnical studies affecting the site and/or engineering work in the vicinity.
3. An assessment of the nature, extent, frequency and potential effect of the hazard including a description of the scientific methodology used to define these parameters.
4. Proposed mitigative works to prevent/minimize hazardous occurrences.
5. An assessment of the effect of the mitigative works in terms of their ability to reduce the potential impact of the hazards.
6. Any other recommendations deemed appropriate.

Of the hazards that need to be addressed, their definitions are as follows:

1. Rock Fall –Rock-fall is characterized by the detachment of individual rock fragments from a steep slope and their gravitational down-slope transport.
2. Landslide, small-scale localised – the down-slope movement of soil, rock, and other weathered materials that could be sudden and rapid or gradual and incremental.
3. Inundation by Flood Waters – an unusually large volume of water flowing in the channel, a portion of which may flow overbank. Floods are associated with other hazards such as channel erosion and avulsion,
4. Mountain Stream Channel Erosion – refers to a lateral migration of a stream channel, generally occurring during a large flow event. Channel erosion can result in loss or damage to foundations or supports of structures adjacent to the channel.
5. Mountain Stream Channel Avulsion – abandonment of a channel course to occupy a different position on the alluvial fan. Avulsion of a small stream channel may only result in minor erosion.
6. Debris Flood – a large flood event associated with an unusually high amount of sediment movement consisting of coarse bed-load material and organic material such as trees and logs. Due to the high concentration of sediment, debris flows are capable of transporting much larger sizes and volumes of rock than a clear water event.
7. Debris Flow and Debris Torrents – a rapid, channelized, fluid transport of water saturated debris. A debris flow path can be divided into an initiation zone, a transport and erosion zone, and a deposition zone. Transport often initiates within steep gullies and is conveyed downslope at high velocity which can damage forests and human developments.

[1] Section 56 of the Community Charter, SBC Chapter 26, and Sections 879 and 920 of the Local Government Act, RSBC 1996, Chapter 323

The work scope included a desk study of the previous geohazard reports. Able also reviewed the paper 'Hazard Acceptability Thresholds for Development Approvals by Local Governments' prepared by Cave (1993)[2]. Able has reviewed the topography and water courses of the surrounding areas for any evidence of past or potential hazard events. The geotechnical hazards are discussed below.

3.1 Rockfall Hazard

Observation indicates that the site and its surroundings consist of surficial soils and any source of rock detachment is not present. It is considered that the annual probability of hazard occurrence from fragmental rock-fall to be less than 1:10,000. Upon the criteria of Cave (1993), this would allow for the proposed development without conditions relating to this hazard.

3.2 Landslide

The topography of the site and adjoining areas is flat. This hazard is not applicable. The annual probability of hazard occurrence from landslide is less than 1:10,000.. Upon the criteria of Cave (1993), this would allow for the proposed development without conditions relating to this hazard.

3.3 Flooding

The site is well above the flood levels indicated by the District of Maple Ridge Floodplain maps for the North Aloutte, South Alouette River, and Fraser River. This hazard is not applicable to the site, therefore a flood plain covenant is not required. Upon the criteria of Cave (1993), this would allow the proposed development without conditions relating to this hazard.

3.4 Mountain Stream Erosion or Avulsion

Mountain streams are not located on or in the vicinity of this site. Therefore, mountain stream erosion or avulsion is less than 1:500 year. Based on the criteria of Cave (1993), this would allow for the proposed development without conditions relating to this hazard.

3.5 Debris Flow and Debris Flood

Debris flows and related sediment flows are fast moving flow-type landslides composed of a slurry of rock, mud, organic matter, and water that move down drainage-basin channels onto alluvial fans. Debris flows generally initiate on steep slopes or in channels by the addition of water from intense rainfall or rapid snowmelt. Flows typically incorporate additional sediment and vegetation as they travel down channel.

There are no creeks subject to debris flows and debris floods in the vicinity of the site. Also in our review of the site, no evidence of past debris hazard was noticed. This hazard is not applicable.

Debris flow and debris flood hazards are most commonly associated with gully systems with unstable sidewalls and moderate to steep channel gradients. The site reconnaissance indicates complete absence of a clearly defined channel or an alluvial fan in the proximity of the site. Based on this, it is considered that the annual probability of hazard occurrence from debris flows

[2] Cave P.W. 1993. Hazard Acceptability Thresholds for Development Approvals by Local Government, British Columbia Hazard Workshop

to be less than 1:10,000. Upon the criteria of Cave (1993), this would allow for the proposed development without conditions relating to this hazard.

Similarly, it is considered that the annual probability of hazard occurrence from debris floods to be less than 1:10,000 and therefore considered non-applicable. Based on the criteria of Cave (1993), this would allow for the proposed construction without conditions relating to this hazard.

3.1 Global Catastrophic Landslide

The surrounding topography and the adjacent projects were reviewed. No evidence of large scale landslide happened in the recent past was ovserved. Therefore the annual probability of hazard from a global catastrophic landslide is low (<1:10,000)

3.2 Snow Avalanche

This hazard is not applicable since the site is not in an avalanche area.

3.3 Seismic Hazard

Seismic ground motions can cause saturated, loose to compact granular soils to temporarily lose most of their shear strength and behave like a liquid. This is referred to as liquefaction and can result in sudden differential settlement and lateral spreading. Based on the site investigation, the site is not underlain by liquefiable soils.

The site is located such that no snow avalanches, rock-fall, mountain stream erosion, debris flow, catastrophic landslip, and flooding would affect it and therefore these geotechnical hazards are not applicable for this proposed development. **After considering each hazard, it is concluded that the proposed development is safe for the use intended.**

GEOTECHNICAL ASSESSMENT

4 SUBSURFACE INVESTIGATION (AUGERHOLES AND CPT)

The subsurface exploration consisted of three augerholes (AH1 to AH3) drilled to depths up to 12 m below the existing site grade. A track-mounted drill was utilized to conduct the augerhole program. An engineer from Able supervised the field work, located the augerholes, classified the soils encountered in the augerholes and sent representative soil samples to the laboratory for moisture content determination. Site conditions and features of geological significance were also recorded. In order to determine the strength of sub-soils, three Cone Penetration Tests (CPT1 to CPT3) were also conducted near each auger hole. CPT provides continuous profile of undrained shear strength of soil.

The approximate locations of the augerholes and CPTs are shown on the attached site plan. The soil logs showing soil type and moisture contents are also included. The depths indicated on the logs are related to the ground surface at the time of the subsurface exploration. The augerholes were backfilled with excavated soil upon completion of the investigation and compacted with the bucket.

5 SOIL AND GROUNDWATER CONDITIONS

Geological map (GeoMap Vancouver – Robert J.W. Turner and John J. Clauge) indicates that the site is located within a formation of silt and clay soils belonging to Ice Age sediments. The subsurface conditions encountered were generally consistent with the published geological information. The soil conditions were generally very consistent in all the augerholes. In general

the site is mantled by very stiff crust of clay, approximately 2.0 m thick. The clay crust becomes stiff below 2.0 m and firm below 2.5 m. Clay continues to drop in stiffness and becomes very soft below 4 m and remains very soft to the end of exploration to 12 m depth below the existing depth. The shear strength is determined in terms of undrained shear strength (Su) and is indicated on the attached soil logs. In general the Su of crust is in the order of 200 kPa at 1 m depth, and it linearly drops to 25 kPa at 5 m depth and remains at 25 kPa below. Based on our previous work experience in this area, the clay is likely to remain very soft to several meters below the end of exploration.

Groundwater: No groundwater seepage was encountered in any of the augerholes. Based on the augerhole information, it is expected that groundwater seepage should not be encountered during subgrade preparation.

6 DISCUSSION AND RECOMMENDATIONS

6.1 General

Based on the subsurface investigation, the site is mantled with a thin crust of very stiff clay. The clay crust starts softening below 1.5 m depth and turns very soft below 5 m depth. The clay crust has gained strength due to desiccation over many decades and the strength gain is equivalent to over consolidation. The soft clay is compressible under loading in excess of pre-consolidation pressure. Therefore, the column loading should be minimised and the building should be located as high as possible in the stiff clay. Based on the site investigation, the site has suitable soil conditions for the building supported over conventional footings or raft footing. The raft foundation, typically consist of a monolithic reinforced concrete slab under the entire parkade. Excavation for the underground parking is expected to be approximately 2.5 m deep and will expose firm to soft soils. The native soils are highly sensitive to construction activity and moisture, therefore caution should be taken to protect the subgrade. The following sections of the report provide our recommendations in further detail.

6.2 Subgrade Preparation

Stripping of the final subgrade should be carried out with clean-up bucket of excavator to minimize disturbance to the subgrade. The excavator should progressively retreat from stripped areas to avoid disturbance to the exposed subgrade. Prepared subgrades must be sloped to drain water away from the stripped areas, from where it should be pumped out. Stripped subgrade should be capped with 75 mm minus crushed gravel, minimum 200 mm thick, immediately after the stripping. It should be gently compacted immediately after placement. For stability purposes, woven geotextile may be required over the striped subgrade.

The native clays are very sensitive to moisture accumulation and construction activity. Consequently, measures must be adopted to avoid subgrade disturbance. Conduct the site preparation during extended dry weather. No construction activity directly over the native soils. No material should be stockpiled inside the excavation and within 3 m of the bank.

6.3 Temporary Excavation

The parkade outer footing wall will be approximately 1.5 m setback from all the property lines, except that it is at 4.5 m setback along the ROW at the northwest. Temporary excavation cut in the native clay is expected to be approximately 3 m deep. Excavation up to 2 m depth is expected to remain stable at vertical cut, however, below 2 m depth the excavation should be sloped not steeper than 1H:1V. These excavation comments are preliminary. During excavation, the Geotechnical Engineer should be given the opportunity to complete few test excavations at few locations, so that site specific safe cut slopes can be recommended. Areas of weak clays may require flatter slope cut and the slope may slightly encroachment into adjacent property or alternatively shoring may be required. Typically, the shoring consists of anchored shotcrete and the anchors encroach below the neighbouring property. Alternatively shoring can also consist of steel soldier piles and shotcrete lagging, if the encroachment is not permitted. Once the development concept proceeds, the shoring and excavation plans can be provided, if requested under a separate scope of work.

Material stockpile near the excavation should be away from the excavation by at least 3 m. All temporary slopes and 2 m beyond should be covered with polyethylene sheet, if the work is carried during rainy season. The polyethylene should be secured at top by wrapping around 1x2 or 2x4 lumber or soil bags.

6.4 Foundations

The proposed building may be supported on spread and strip footings or on a raft slab. The raft or conventional footings must be placed on the native undisturbed firm soils. The following footings parameters are recommended for the design:

Serviceability bearing pressure (SLS)	Ultimate bearing resistance (ULS)	Total and Differential settlement (mm)
80 kPa	120 kPa	50 mm and 35 mm
70 kPa	120 kPa	40 mm and 30 mm

Alternatively, the building may be supported over reinforced raft slab. The Modulus of subgrade reaction (Ks) for the raft slab should be taken as 2500 kN/m^3.

The above the gross values (including the footing weight). The footings should be placed over minimum 300 mm thick layer of 75 mm minus clear crushed gravel. The gravel layer must extend at least 300 mm beyond the footing edge. Parkade walls should be designed to resist the lateral pressure as indicated in the attached Lateral Loading Sketch. The settlement was calculated based on the Compression Index (Cc, based on PIasticity Index), Su, and over consolidation ratio.

All footing subgrades must be reviewed and approved by the geotechnical engineer to confirm the bearing pressure, before covering with gravel/structural fill. The footings should be designed in accordance with the requirements of the 2012 British Columbia Building Code. Footings should have a minimum embedment of 0.45 m for frost protection and confinement. Footing

subgrades should be stripped of water softened or loose soil prior to placing concrete. Similarly, the utility excavation bottom should be beyond a 1.5H:1V line projected down from the outer edge of footing to avoid its undermining.

6.5 Seismic Considerations

Based on the soil conditions, the Site Class is F, since the proposed building will be five stories, its fundamental period (T) will be in the order of 0.5 s, Site Class E parameters may be used.

Seismic ground motions can cause saturated, loose to compact sand and silts at shallow depth to temporarily lose their shear strength and behave like a liquid. This is referred to as liquefaction. A similar phenomenon called cyclic softening may occurs in clays, due to cyclic loading. Liquefaction/ cyclic softening can result in a) punching of the building through the upper crust and/or b) horizontal displacement of the building due to lateral spreading and/or c) settlement of the site and building due to consolidation of the liquefied stratum. Deeper deposits have more confinement and consequently are less prone to liquefaction or cyclic shear failure. Soils expected to liquefy under the design seismic event include clean sands and non-plastic silts. Susceptibility of cohesive soils to cyclic shear failure is governed by the following criteria (Bray et al. (2004):

w/w_L	PI	SUSCEPTIBILITY
>0.8	<12	Susceptible
>0.8	12<PI<20	Moderately Susceptible
<0.8	PI>20	No liquefaction or cyclic shear, but may undergo deformations if cyclic stress exceeds undrained shear strength

W: water content, w_L: Liquid limit, PI: Plasticity Index

The samples collected indicate w/w_L = ~1.0 and PI > 20%. Based on the above criteria, the soils are non-susceptible to liquefaction, therefore no liquefaction analysis is required. However, the very soft clays may undergo some deformations if cyclic shear stress exceeds the undrained shear strength during a design seismic event.

6.6 Slab-on-Grade

For conventional footings, the fill under the concrete floor slabs-on-grade should consist of compacted 20 mm clear crushed gravel. A moisture barrier consisting of 0.15 mm polyethylene sheeting should be installed under the slab to minimize potential for slab dampness. All tears in the polyethylene sheeting should be repaired with red polyethylene tape. The compaction of the slab-on-grade fill must be approved by the geotechnical engineer prior to installation of polyethylene sheet.

6.7 Foundation Drainage System

The foundation drainage system should consist of 100 mm diameter perforated solid wall PVC drain pipe placed around perimeter footing, and at any steps in the foundation wall. The invert of the pipe should be at the base level of the footings, and a minimum of 200 mm below the underside of floor slab. The pipe should be placed with its perforations pointing downwards. The drainage pipe should be surrounded on top and sides by 150 mm thick 19 mm clear crushed gravel. A layer of non-woven geotextile (Nilex 4545 or equivalent) should then be

blanketed over the top and sides of the clear crushed gravel to act as a filter against piping of fines from the backfill. The perimeter drainage pipe should be provided with permanent clean-outs, and should be sloped to direct water by gravity into a storm sewer.

6.8 Pavement Section

The majority of the proposed road work will be on-site, supported over the underground parkade and a small section of the proposed road work will be off-site (Lane) which will connect to 222 Street at the northwest.

On-site Road
The on-site road will be supported over underground parking and therefore no special subgrade preparation is required. The following minimum pavement section is recommended for the on-site road.

- 75* mm of Asphalt Concrete
- 100 mm of 19 mm minus Crushed Granular Base to MMCD
- 150 mm of 75 mm minus Select Granular Sub base to MMCD
- Subgrade fill over parkade slab

Off-site Lane
The subgrade preparation for the on-site road works may be done as mentioned in Section 6.2 above. The surficial organics should be completely stripped to expose the underlying native very stiff clay. The undisturbed native very stiff clay should be protected from moisture and construction equipment. The native clay is competent for the new section of roads.

- 80 mm of Asphalt Concrete
- 100 mm of 19 mm minus Crushed Granular Base to MMCD
- 300 mm of 75 mm minus Select Granular Sub base to MMCD
- Approved subgrade fill as required
- Approved subgrade

The base and sub-base should meet the requirements provided in the Master Municipal Construction Document (MMCD) specifications, Sections 31 05 17 item 2.10 and item 2.8 respectively. The granular base and sub-base materials should be compacted to a minimum of 95% Modified Proctor maximum dry density (ASTM D-1557). Silt subgrades should be excavated neat and should not be compacted unless otherwise directed by the geotechnical engineer. Any disturbed or water softened subgrade soils should be cleaned out just prior to placing structural fill or the subbase layer.

6.9 Structural fill

Structural fill is defined as fill placed beneath any load bearing area. Imported structural fill should consist of well-graded, 75 mm minus pit run sand and gravel or other granular material approved by the Geotechnical Engineer. It should be non-organic and clean (less than 8% fines passing 0.075 mm sieve by weight). Structural fill should be placed in maximum 0.3 m lifts. In building envelope, it should be compacted to at least 95% of Modified Proctor maximum dry density or to the satisfaction of geotechnical engineer. Field density testing should be conducted to confirm that the compaction is adequate.

6.10 Utility Excavations and Backfill

Temporary cut slopes deeper than 1.2 m for utility trenches may be cut with side slopes of 3H:4V in accordance with WorksafeBC regulations, unless specific on site recommendations are provided by the geotechnical engineer. Alternately, the excavation sides can be shored and braced. Temporary surcharge loads such as equipment and material stockpiles should not be allowed within 2 m of unsupported excavation face.

Over approved or stiff/dense subgrade, the minimum bedding thickness beneath the pipe should be equal to ¼ the pipe diameter, but not less than 100 mm. Bedding and surround material should meet MMCD Section 31 05 17 item 2.7, type I (25 mm clear crushed gravel with less than 5% fines). This material should also be placed in areas (around manholes) where compaction is likely to disturb the pipe/manhole. It should be compacted if thicker than 0.3m.

Trench backfill should meet MMCD Section 31 05 17 Item 2.3 (75 mm minus Pit Run Gravel with less than 8% fines) or approved equivalent. Trench backfill should be compacted to a minimum of 95% MPMDD. Compaction equipment should not directly contact the pipe and should cross over the pipe only after a 300 mm of bedding has been placed over it.

6.11 Geotechnical Reviews

Recommendations presented herein are based on interpretation of the information collected during the site investigation. During construction, the Geotechnical Engineer must complete field reviews to assess the actual soil conditions to confirm the assumptions used from site investigation. Where conditions differ significantly from those assumed, the above recommendations may need revision. The field reviews are not carried out for the benefit of Contractors, therefore do not affect the Contractor's obligation to perform under his/her contract. It will be the Contractor's responsibility to advise Able (minimum 24 in advance) that a field review is required. It is also critical that Contractor should view this report in advance of work. The following construction reviews should be completed by Able.

1. Review of excavation deeper than 1.2 m for safe manned entry (if required).
2. Review of stripped subgrade for proposed buildings, driveways and parking during site stripping, before placing structural fill above it.
3. Compaction review of structural fill under the footings.
4. Compaction review of sub-slab fill before placing the poly sheeting, trench backfill, pavement structure subgrade fills.

Able cannot assume responsibility or liability for the adequacy of its recommendations when they are used in the field without Able being retained to review and approve the recommendations during construction.

7 CLOSURE AND LIMITATIONS

The subsurface conditions may vary between augerholes. The interpretation of subsurface conditions provided is an opinion and not a certification. Stratigraphic variations in ground conditions are expected due to its historic nature. As such, all explorations involve an inherent uncertainty that some conditions will not be detected, as expected. Environmental considerations are outside the scope of this geotechnical report. Samples obtained from site will be retained in our laboratory for 60 days. Should no instructions be received to the contrary, these samples will then be discarded. This report has been made in accordance with the generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made. This report has been prepared for the exclusive use of Platinum Enterprises Ltd., Client's design and construction team, City of Maple Ridge for specific application to the development mentioned in the report. Able and its employees accept no responsibility to another party for loss or liability incurred as a result of use of this report. Any use of this report for purposes other than the intended, should be approved in writing by Able. Contractors should make their own assessment of subsurface conditions and rely upon their own explorations for costing purposes. The recommendations in this report are provided on the assumption that the contractor will be suitably qualified and experienced. This report should not be included in the specifications without suitable qualifications approved by the Geotechnical Engineer. The report should be read with the attached Report Limitations and Conditions.

We appreciate the opportunity to be of service to you. If you have any questions regarding the contents of this report, or if we can be of further assistance to you on this project, please call the undersigned.

Yours truly,

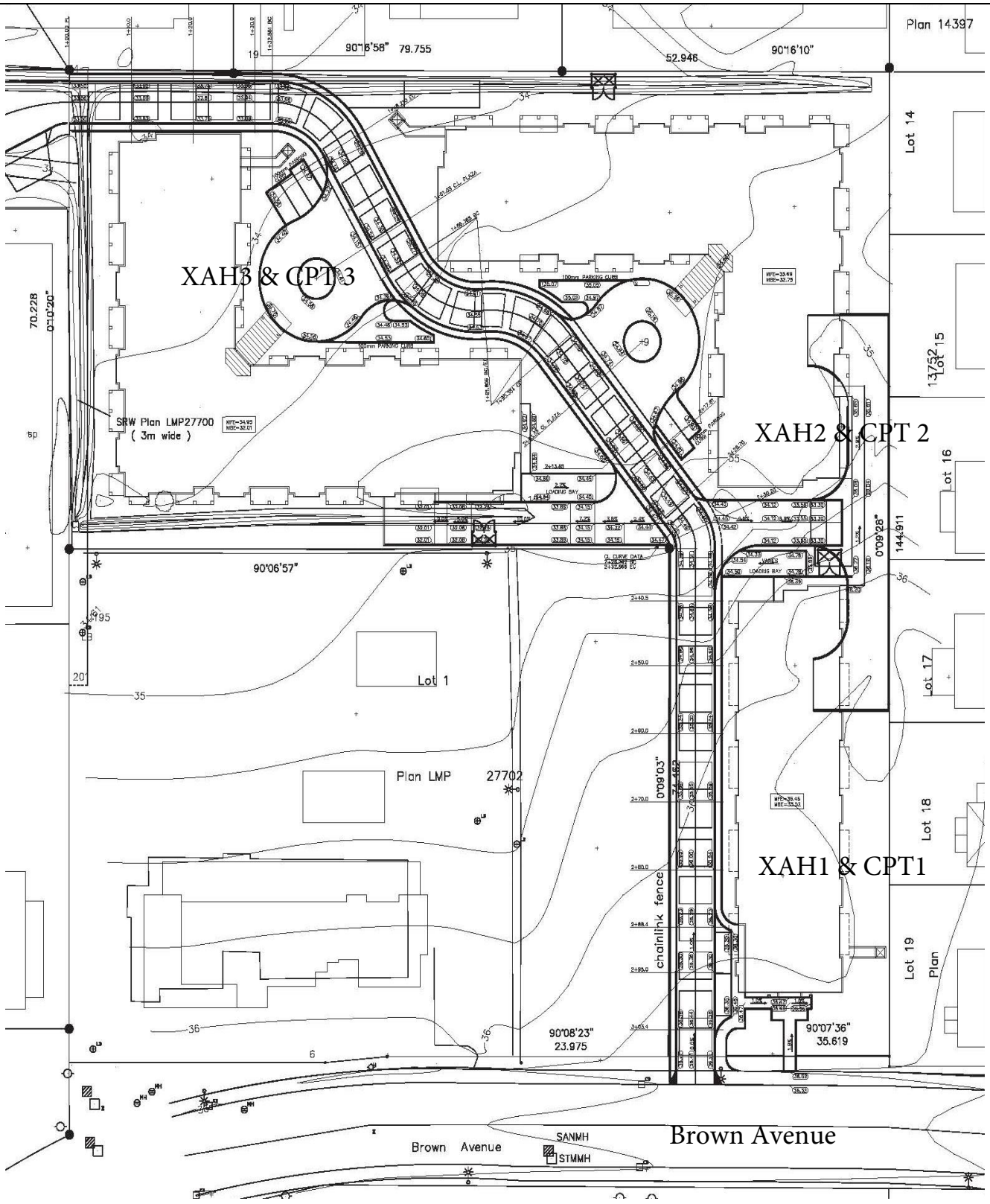
Able Geotechnical Ltd.

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
T. S. BAJWA
30368

December 15, 2017

Tegbir S. Bajwa, P. Eng.
Geotechnical Engineer

Enclosures: Augerhole Location Plan, Soil Logs, Lateral Loading Sketch, CPT Test Results



ABLE GEOTECHNICAL LTD.	AUGERHOLE LOCATION PLAN Project: Proposed Condominium Development	Our File: 554-1

SOIL LOGS

Project: Condominium Building
Site: 22229 Brown Avenue, Maple Ridge
Machine Type: Tracked Drill
Date Logged: June 30, 2017

AH 1

DEPTH (m)	SOIL CONDITIONS	D (m)	W (%)	Su (kPa)
0.0 – 0.1m	**Root mat and topsoil**			
0.1 – 4.5 m	**CLAY** Very Stiff, grey brown, moist medium plastic Becomes stiff below 2 m	0.6 0.9 1.2 1.5 1.8 2.1 2.4 2.7 3.0 3.3 3.6 3.9 4.2	27 30 	 200 150 120 60 50
4.5 – 6.0 m	**CLAY** Firm, light grey, wet medium plastic Becomes very soft below 4.5 m at 12m: LL =54 % PL = 29 % PI =25 %	4.5 4.8 5.1 5.4 5.7 6.0 6.3 6.6 6.9 7.2 7.5 7.8 8.1 8.4 8.7 9.0 - - 12	43 55 58 54	25 25 25 25
12m	Bottom of augerhole No groundwater seepage encountered			

D: Depth w: Moisture Su: Shear Strength LL: Liquid Limit PL: Plastic Limit PI: Plasticity Index

SOIL LOGS

Project: Condominium Building
Site: 22229 Brown Avenue, Maple Ridge
Machine Type: Tracked Drill
Date Logged: June 30, 2017

AH 2

DEPTH (m)	SOIL CONDITIONS	D (m)	W (%)	Su (kPa)
0.0 – 0.1m	**Root mat and topsoil**			
0.1 – 4.5 m	**CLAY** Very Stiff, grey brown, moist medium plastic Becomes stiff below 2 m Becomes very soft below 3.5 m	0.6 0.9 1.2 1.5 1.8 2.1 2.4 2.7 3.0 3.3 3.6 3.9 4.2	28 35	200 150 120 60 50
4.5 – 6.0 m	**CLAY** Firm, light grey, wet medium plastic at 4.5m: LL =47 % PL = 27 % PI = 20% at 6m: LL =63% PL = 29 % PI =34 %	4.5 4.8 5.1 5.4 5.7 6.0 6.3 6.6 6.9 7.2 7.5 7.8 8.1 8.4 8.7 9.0 - - 12	50 60 56	25 25 25
12m	Bottom of augerhole No groundwater seepage encountered			

D: Depth w: Moisture Su: Shear Strength LL: Liquid Limit PL: Plastic Limit PI: Plasticity Index

SOIL LOGS

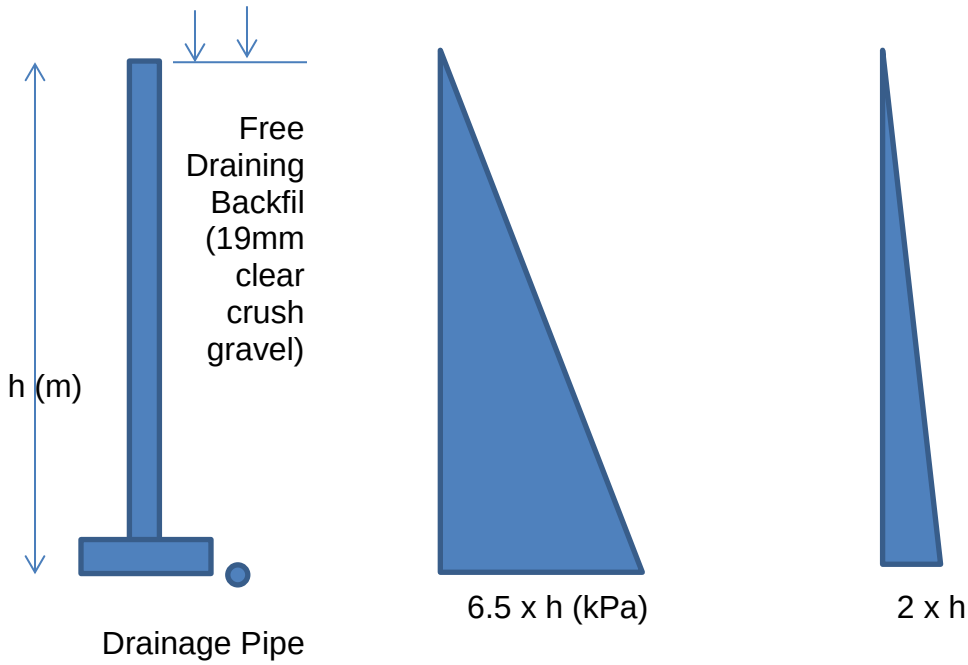
Project: Condominium Building
Site: 22229 Brown Avenue, Maple Ridge
Machine Type: Tracked Drill
Date Logged: June 30, 2017

AH 3

DEPTH (m)	SOIL CONDITIONS	D (m)	W (%)	Su (kPa)
0.0 – 0.1m	**Root mat and topsoil**			
0.1 – 4.5 m	**CLAY** Very Stiff, grey brown, moist medium plastic Becomes stiff below 2 m Becomes very soft below 3.5 m	0.6 0.9 1.2 1.5 1.8 2.1 2.4 2.7 3.0 3.3 3.6 3.9 4.2	 32 	 200 200 200 70 50
4.5 – 7.5 m	**CLAY** Firm, light grey, wet medium plastic	4.5 4.8 5.1 5.4 5.7 6.0 6.3 6.6 6.9 7.2 7.5	48 51 55	25 25 25
7.5m	Bottom of augerhole No groundwater seepage encountered			

D: Depth w: Moisture Su: Shear Strength LL: Liquid Limit PL: Plastic Limit PI: Plasticity Index

LATERAL LOADING ON PARKADE WALLS



Footing 1) Static component 2) Incremental Seismic component

For Static Condition: 1
For Seismic Condition: 1+2
For the cantilever wall, the static component = 6.6 x h (kPa)

Based on:

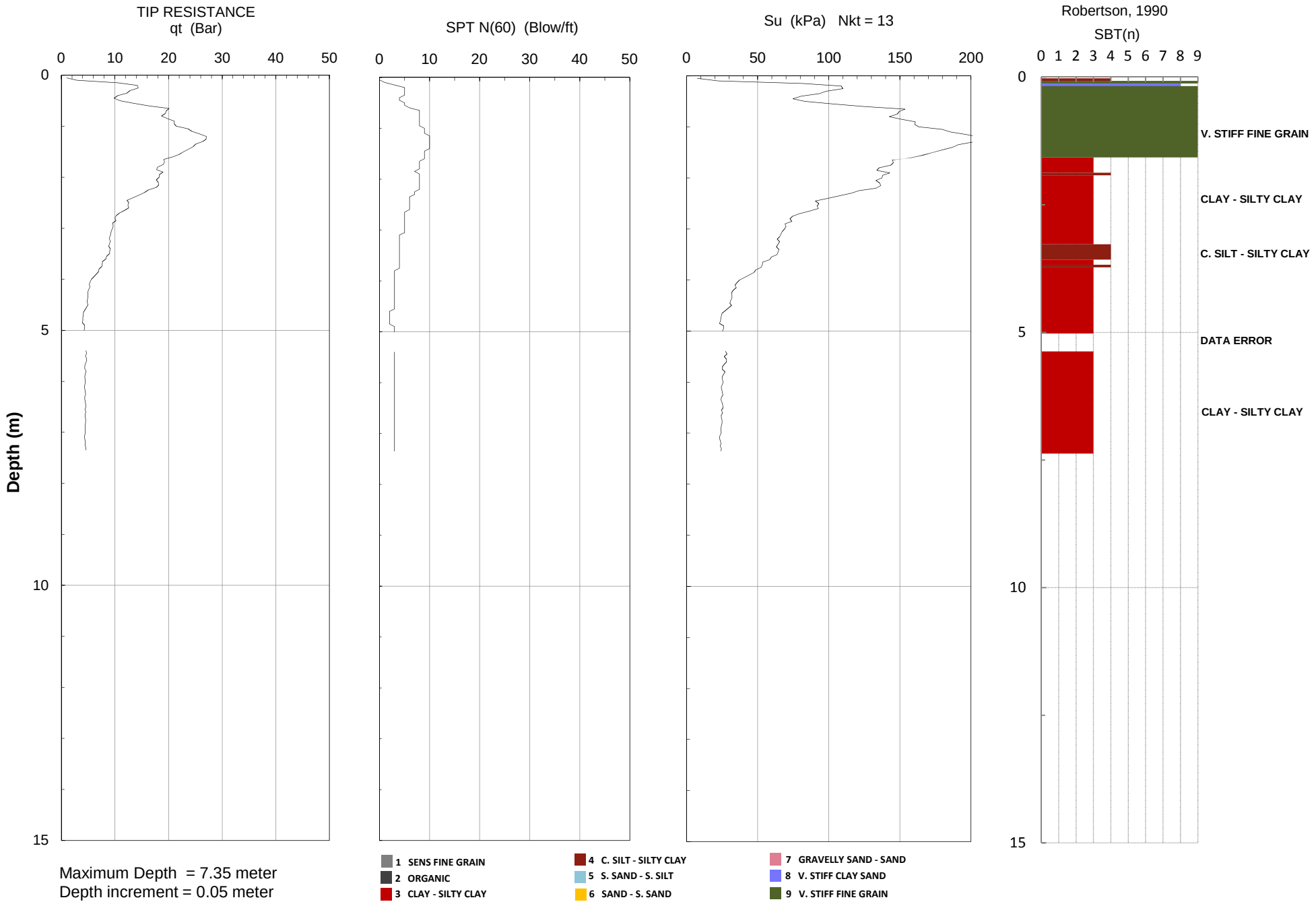
- Mononobe-Okabe equation and
- Atik and Sitar (Atik, L. and Sitar, N.,(2010) “seismic earth Pressure on Cantiliver retaining structures” ASCE Journal of Geoenvironmental and Geotechnical Engineering, October 2010)

ABLE GEOTECHNICAL

Operator: Schwartz Soil Technical
Sounding: CPT17 - 01
Cone ID: DPG1179

Date: October 20, 2017
Site: 22229 Brown Avenue
Maple Ridge B.C.

Schwartz SOIL TECH



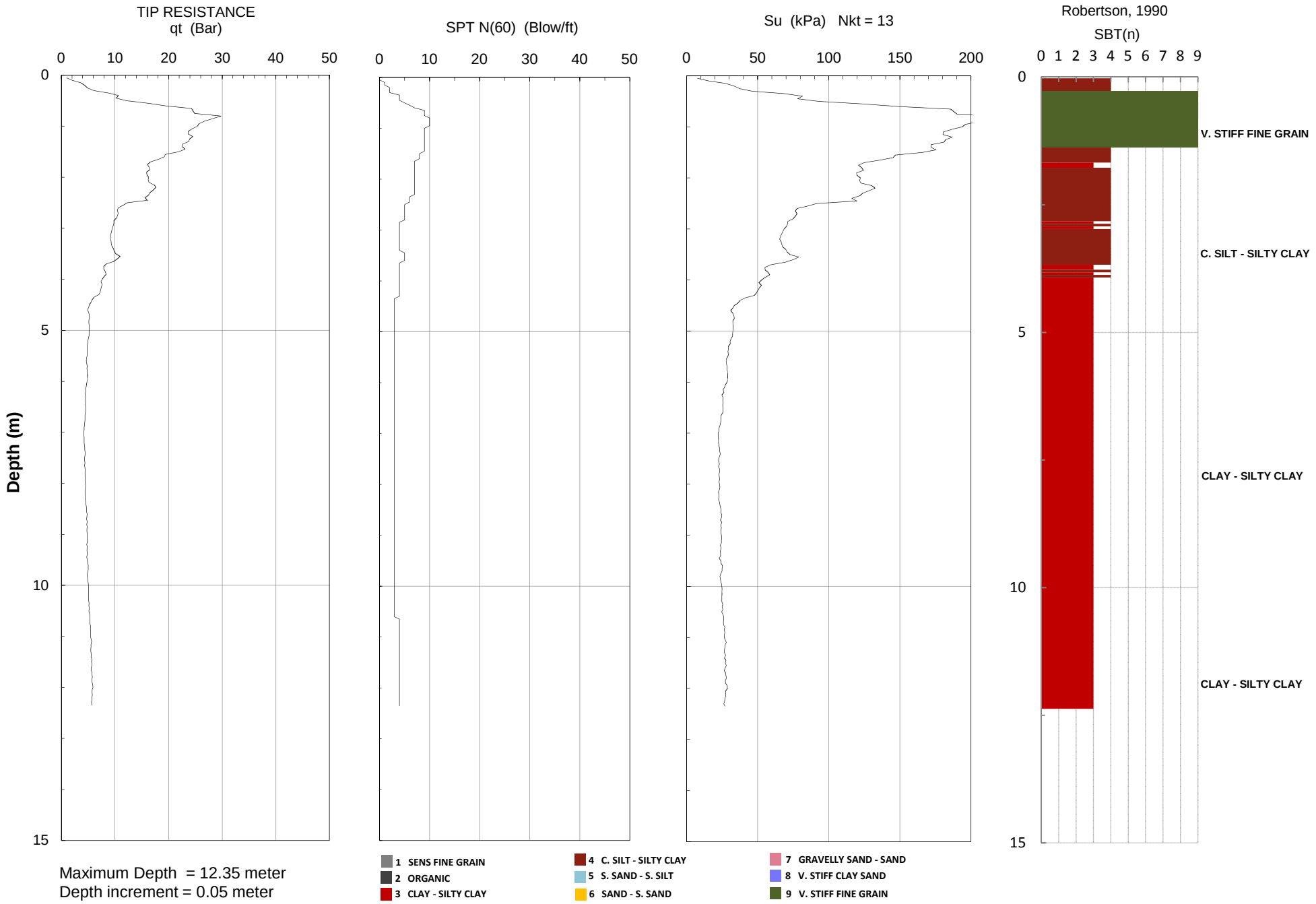
Maximum Depth = 7.35 meter
Depth increment = 0.05 meter

ABLE GEOTECHNICAL

Operator: Schwartz Soil Technical
Sounding: CPT17 - 02
Cone ID: DPG1179

Date: October 20, 2017
Site: 22229 Brown Avenue
Maple Ridge B.C.

Schwartz SOIL TECH



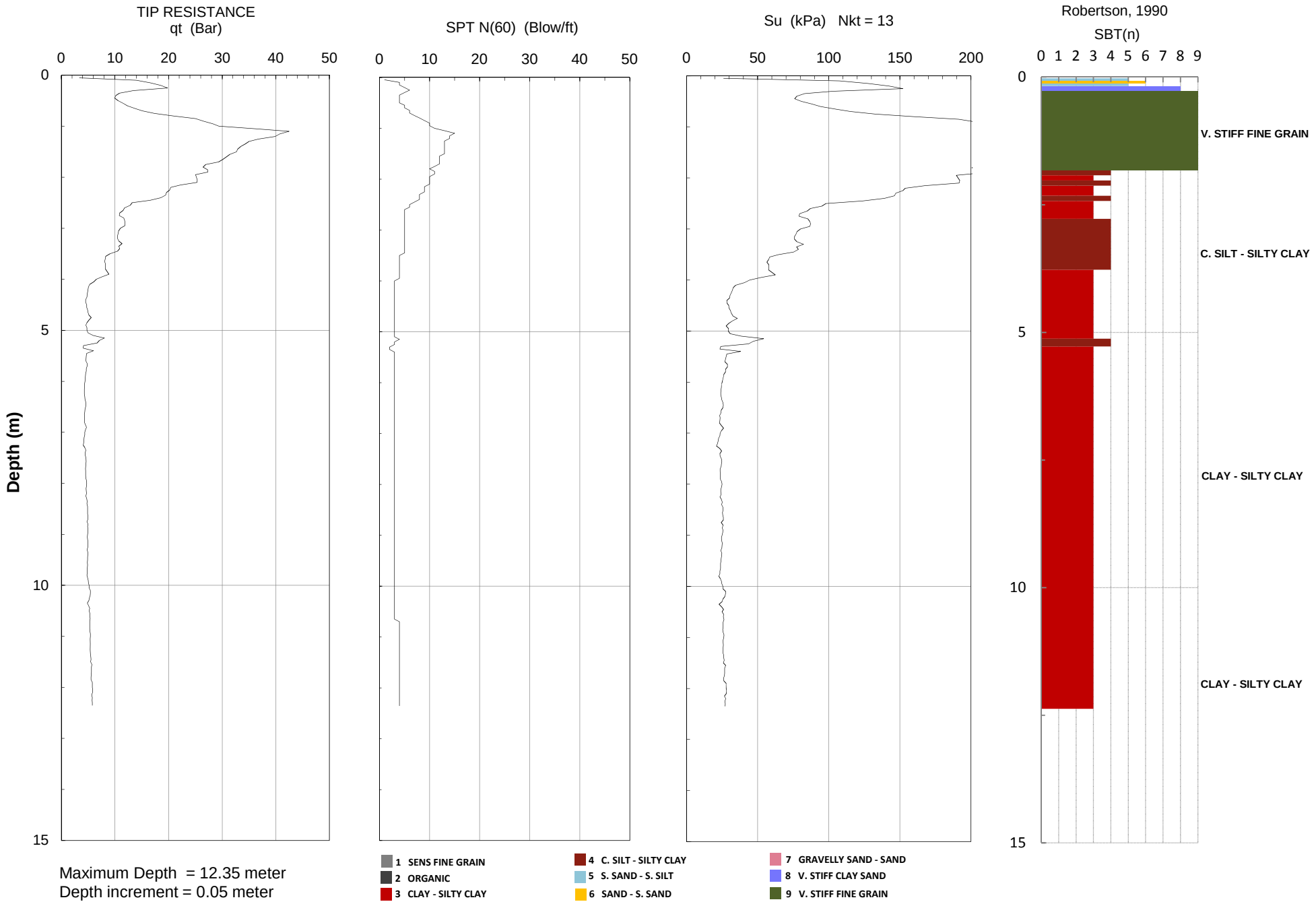
Maximum Depth = 12.35 meter
Depth increment = 0.05 meter

ABLE GEOTECHNICAL

Operator: Schwartz Soil Technical
Sounding: CPT17 - 03
Cone ID: DPG1179

Date: October 20, 2017
Site: 22229 Brown Avenue
Maple Ridge B.C.

Schwartz SOIL TECH



Maximum Depth = 12.35 meter
Depth increment = 0.05 meter

END OF DOCUMENT