APPENDIX B

Geotechnical Slope Stability Assessment

West Side & East Side

DS Consulting (July 2019/2020)

Report on

Geotechnical Slope Stability Assessment
Serson Creek
Lakeview Village, 800 Hydro Road
Mississauga, Ontario

Prepared For:

Lakeview Community Partners Limited

Project No. 18-519-102
July 19, 2019

DS CONSULTANTS LTD.
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FIGURES

1. INTRODUCTION

DS Consultants Ltd. (DS) was retained by Lakeview Community Partners Limited to undertake a geotechnical slope stability assessment for the Serson Creek bank slopes for the proposed Lakeview Village development at 800 Hydro Road in Mississauga, Ontario.

The purpose of this study was to assess the stability of the existing west bank slope of Serson Creek and determine the location of the long-term stable top of slope (LTSTOS) line.

This report is provided on the basis of the terms of reference presented above and, on the assumption, that the design will be in accordance with applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the design. It may then be necessary to carry out additional 0borings and reporting before the recommendations can cater to the changed design.

The site investigation and recommendations follow generally accepted practice for geotechnical consultants in Ontario. The format and contents are guided by client specific needs and economics and do not conform to generalized standards for services. Laboratory testing for most part follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

This report has been prepared for Lakeview Community Partners Limited, its architect and designers. Use of this report by third party without DS consent is prohibited.

2. SUBSURFACE CONDITIONS

DS Consultants Ltd. carried out a preliminary geotechnical investigation, documented in the report No. 18-519-10, dated October 15, 2018. Nine (9) boreholes (BH18-01, BH18-03, BH18-04, BH18-36, BH18-38, BH18-41, BH18-42, BH18-43, and BH18-48) were drilled near the creek area. The borehole location plan and relevant borehole logs are attached in **Appendix A**. The subsurface information in these boreholes are used in this slope stability study.

Fill materials to variable depths were encountered in all boreholes, consisting of clayey silt, silty clay, sandy silt to sand. The fill was in a loose to compact state, with measured SPT 'N' values ranging from 4 to over 15 blows per 300 mm penetration. The native soils consisted of cohesive deposits of clayey silt to silty clay (till) and cohesionless deposits of silt, sandy silt to sand. Shale bedrock in the boreholes was at depths ranging from 3.1 m to more than 20 m.

Groundwater in the boreholes was within 6 m below the surface. In the slope area near the creek, the groundwater level will fluctuate with the water level in the creek.

3. SLOPE CONDITIONS AND PROFILES

A site visit was made by a senior geotechnical engineer from DS Consultants Ltd. on June 17, 2019. Selected photographs taken during our site visits are presented in **Appendix B**. The subject creek slopes are located between Lakeshore Blvd and about 100 m north of Lake Ontario.

For the convenience of discussion, Lakeshore Blvd. in the area is assumed in the east-west alignment. There is an existing bridge for the excess road from WWTP to the site. According to the slope conditions, the creek slopes are considered consisting of 2 reaches as follows:

- Reach S2 is located from the access road bridge to Lake Ontario, along the WWTP and the access road.
- Reach S3 is located from Lakeshore Blvd to the access road bridge.

Based on our site observations, the slope conditions are described as follows:

- The slope in Reach 3 area was generally 2 to 3 m in height, with steepness of 2H:1V to 3H:1V or flatter.
- The height of the west bank slope in Reach S2 area ranged from about 6 m near the bridge to about 3 m near the lake, decreasing toward south. The steepness of the slope was about 2H:1V to 3H:1V or flatter. At the south part, there was a ditch of 1 to 1.5 m in depth between the creek slope and the access road (see Photos B17 and B18 in **Appendix B**).
- The slope surface is generally well covered with mature trees and other vegetation.
- The width of the creek was generally 2 to 3 m. The water depth of creek was within 0.5 m during our site visit on June 17, 2019, while the creek bed in the area near the access road bridge was dry.
- No evidence of slope failure was observed during our site visit. Slope toe erosion at the creek water level were observed at various locations along the creek.

The existing slope profiles at 14 Sections (A-A to N-N, see Figure 1 for locations) were provided to us by Urbantech, as presented on Figures 2 to 15.

4. EROSION CONSIDERATIONS

In the Geomorphic Assessment Report by Beacon Environmental Limited, a long-term toe erosion allowance of 8 m is recommended for the Serson Creek bank slopes across the site (Reach S2 and S3). This recommended toe erosion allowance for the creek bank slopes is used in the slope stability assessment.

5. SOIL PARAMETERS

Based on the borehole information and our site observations, soil parameters used in the slope stability analyses are given on **Table 1**.

Table 1: Soil Parameters for Long-term Slope Stability Analyses

Soil Type	Unit Weight (kN/m^3)	Cohesion c' (kPa)	Friction Angle ϕ' (degree)
Fill	20	0	30
Silty clay/clayey silt	21	5	28
Compact sandy silt to sand	21	0	32
Dense sandy silt to sand	21	0	34

6. STABILITY ANALYSES OF EXISTING SLOPES

The existing slope profiles at Sections A-A to N-N (see Figure 1 for locations) are presented on Figures 2 to 15. Long-term stability analyses of the existing slopes at three typical Sections A-A, L-L and N-N have been carried out with the computer program SLIDE (Version 8) using the Simplified Bishop method, Simplified Janbu method and GLE/Morgenstern-Price method. The analysis results are presented in Figures 16 to 18 and are summarized on Table 2 below.

Table 2: Long-term Stability Analysis Results of Existing Slopes

Slope Location	Approximate Steepness	Calculated Factor of Safety (FS)	Long-Term Stability
Section A-A (See Figure 16)	2H:1V	1.23	FS<1.5, Not stable
Section L-L (See Figure 17)	2.5H:1V	1.56	FS>1.5, Stable
Section N-N (See Figure 18)	2.2H:1V	1.43	FS<1.5, Not Stable

The calculated factor of safety of the existing slope at Section L-L is 1.56, which is greater than the CVC's minimum acceptable value of 1.5. The existing slope at Section L-L is considered stable in terms of long-term stability based on CVC's requirements.

The calculated factors of safety of the existing slopes at Sections A-A and N-N range from 1.23 to 1.43, which are less than the CVC's minimum acceptable value of 1.5. The existing slopes at Sections A-A and N-N are considered not stable in terms of long-term stability based on CVC's requirements.

7. STABILITY ANALYSES OF LONG-TERM STABLE SLOPE

As discussed previously, the existing slope at Section L-L is about 2.5H:1V, and is considered stable in terms of long-term stability. The existing slopes at Sections A-A and N-N are relatively steeper, and are considered not stable in terms of long-term stability.

For long-term stability, a toe allowance of 8 m is also required for analysing the long-term stable slope.

In order to determine the long-term stable slope, analysis of a 2.5H:1V slope with a toe erosion allowance of 8 m at Section A-A have been carried out, and the results are presented on Figure 19. The calculated factor of safety of the 2.5H:1V slope at Section A-A is 1.62, which is greater than the minimum acceptable value of 1.5. Similarly, stability analyses of stable slopes at Sections L-L and N-N are carried out, and the results are presented on Figures 20 and 21. Table 3 presents a summary of the results of long-term stable slopes.

Table 3: Long-term Stability Analysis Results of Stable Slopes

Slope Location	Approximate Steepness	Toe Erosion Allowance (m)	Calculated Factor of Safety (FS)	Long-Term Stability
Section A-A (See Figure 19)	2.5H:1V	8.0	1.53	FS>1.5, Stable
Section L-L (See Figure 20)	2.5H:1V	8.0	1.57	FS>1.5, Stable
Section N-N (See Figure 21)	2.5H:1V	8.0	1.57	FS>1.5, Stable

The factor of safety values of the slopes as summarized on Table 3 are greater than the minimum required value of 1.5. Based on the analysis results, it can be concluded that a slope of 2.5H:1V with a toe erosion allowance of 8m is stable and acceptable in terms of long-term stability.

8. LONG-TERM STABLE TOP OF SLOPE (LTSTOS)

Based on the slope stability analysis results presented above, Points “S1”, “S12” and “S14” in Figures 19 to 21 represent the long-term stable top of slope (LTSTOS) at Sections A-A, L-L and N-N, respectively. Accordingly, Points “S1”, “S12” and “S14” are also shown in profile Figures (Figure 2, Figure 13 and Figure 15) at Sections A-A, L-L and N-N, respectively.

Similarly, the long-term stable top of slope (LTSTOS) at other sections (B-B to K-K, and N-N) can be obtained using a stable slope of 2.5H:1V and a toe erosion allowance of 8m, as shown in Figures 3 to 12, and Figure 14.

Based on the analysis results, the points representing the long-term stable top of slope (LTSTOS) at Sections A-A to N-N are as follows.

- Point “S1” on Figure 2 represents the long-term stable top of slope at Section A-A.
- Point “S2” on Figure 3 represents the long-term stable top of slope at Section B-B.
- Point “S3” on Figure 4 represents the long-term stable top of slope at Section C-C.
- Point “S4” on Figure 5 represents the long-term stable top of slope at Section D-D.
- Point “S5” on Figure 6 represents the long-term stable top of slope at Section E-E.
- Point “S6” on Figure 7 represents the long-term stable top of slope at Section F-F.
- Point “S7” on Figure 8 represents the long-term stable top of slope at Section G-G.
- Point “S8” on Figure 9 represents the long-term stable top of slope at Section H-H.
- Point “S8” on Figure 10 represents the long-term stable top of slope at Section I-I.
- Point “S10” on Figure 11 represents the long-term stable top of slope at Section J-J.
- Point “S11” on Figure 12 represents the long-term stable top of slope at Section K-K.
- Point “S12” on Figure 13 represents the long-term stable top of slope at Section L-L.
- Point “S13” on Figure 14 represents the long-term stable top of slope at Section M-M.
- Point “S14” on Figure 15 represents the long-term stable top of slope at Section N-N.

Based on the long-term stable top of slope (LTSTOS) at Sections A-A to N-N, and our field observations, the recommended long-term stable top of slope line (**Line S10-S11 ... S8-S9)** is shown on Figure 1.

The derived the long-term stable top of slope (LTSTOS) line is based on the grade at the time of site survey for the topographic map in Figure 1. Where the grade elevation in the area along the creek slope has changed since the site survey, the location of long-term stable top of slope (LTSTOS) line may need to be adjusted.

9. GENERAL COMMENTS AND LIMITATIONS OF REPORT

DS Consultants Ltd. (DS) 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, DS will assume no responsibility for interpretation of the recommendations in the report.

This report is intended solely for the Client named. The material in it reflects our best judgment in light of the information available to DS at the time of preparation. Unless otherwise agreed in writing by DS, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the test hole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the

test holes may differ from those encountered at the test hole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative elevation differences between the test hole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of test holes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. DS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.

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Figures

Long-Term Stable Top of Slope (LTSTOS) Line
(S10 - S11 .....S8 - S9)

Path:----

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE LOCATION PLAN**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
11 X 17	F.Z	S.Y	July 2019
Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. 1

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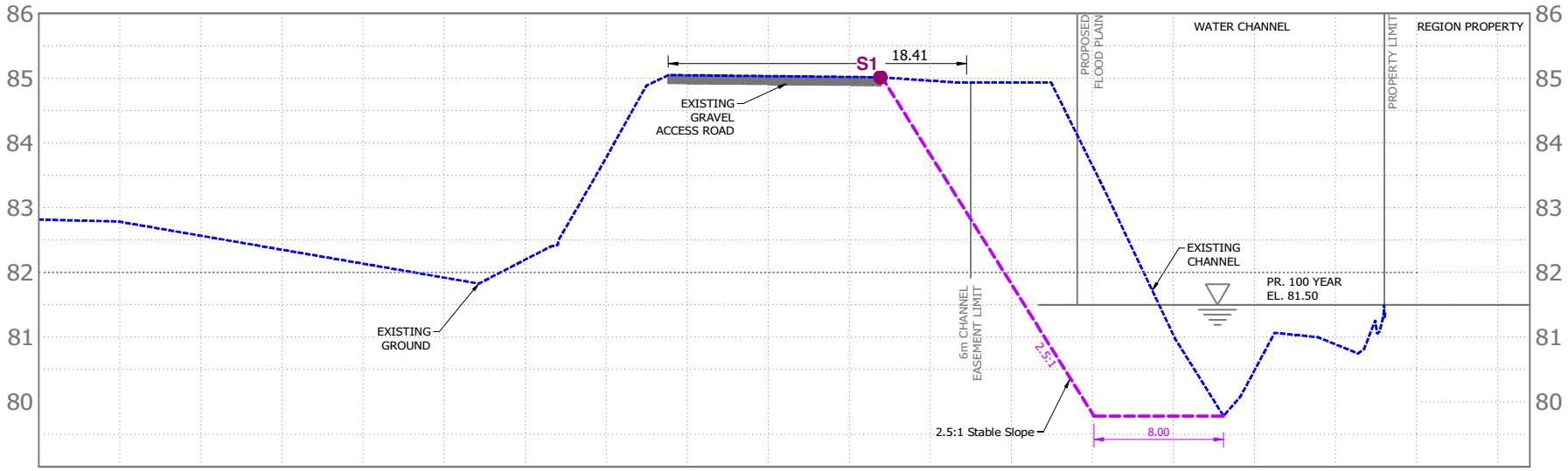

SECTION A-A
ALTERNATIVE
STA.0+087

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION A-A**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
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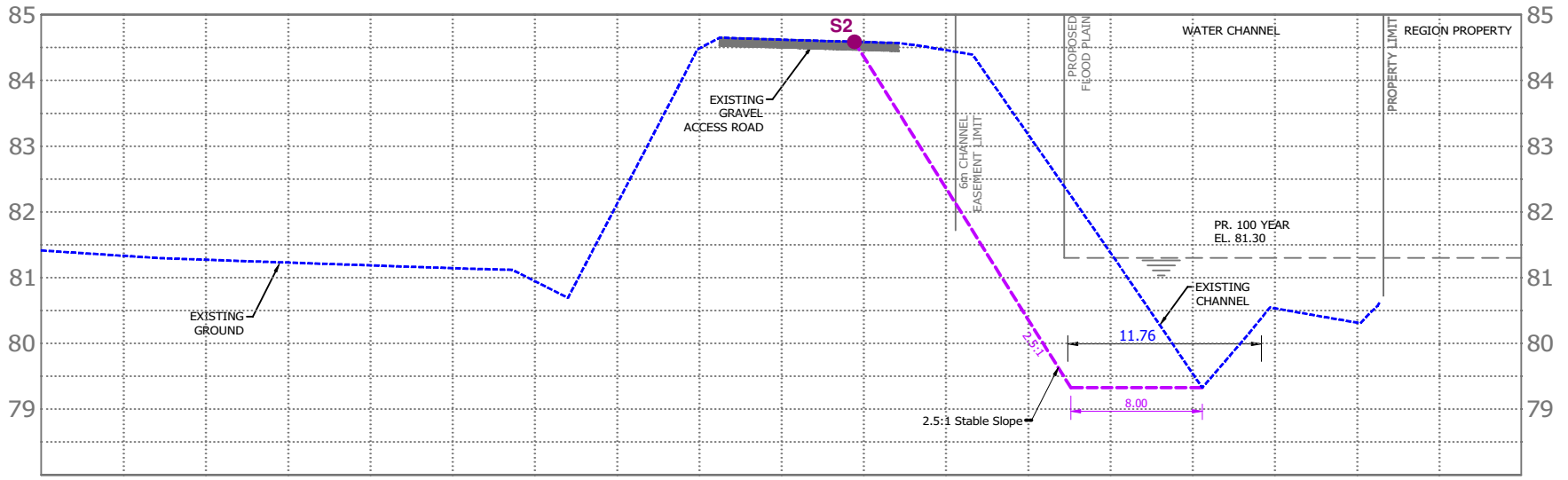

SECTION B-B
ALTERNATIVE
STA.0+147

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION B-B**

Client:	Size:	Approved By:	Drawn By:	Date:
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	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. 3

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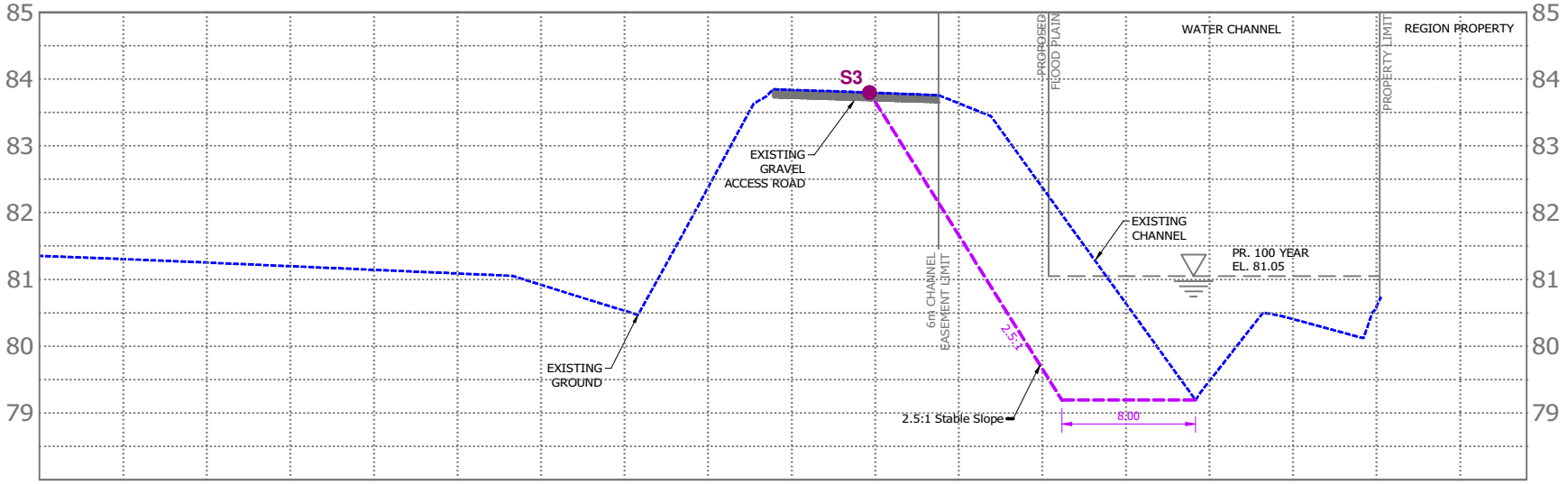

SECTION C-C
ALTERNATIVE
STA.0+207

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Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION C-C**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2019
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. 4

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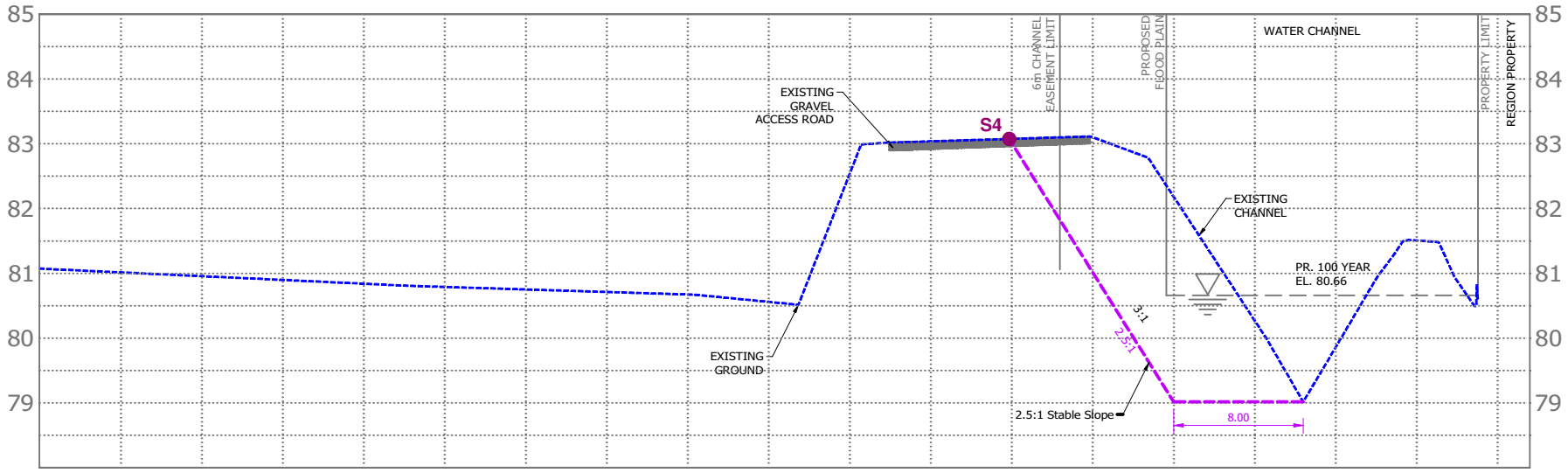

SECTION D-D
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Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION D-D**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

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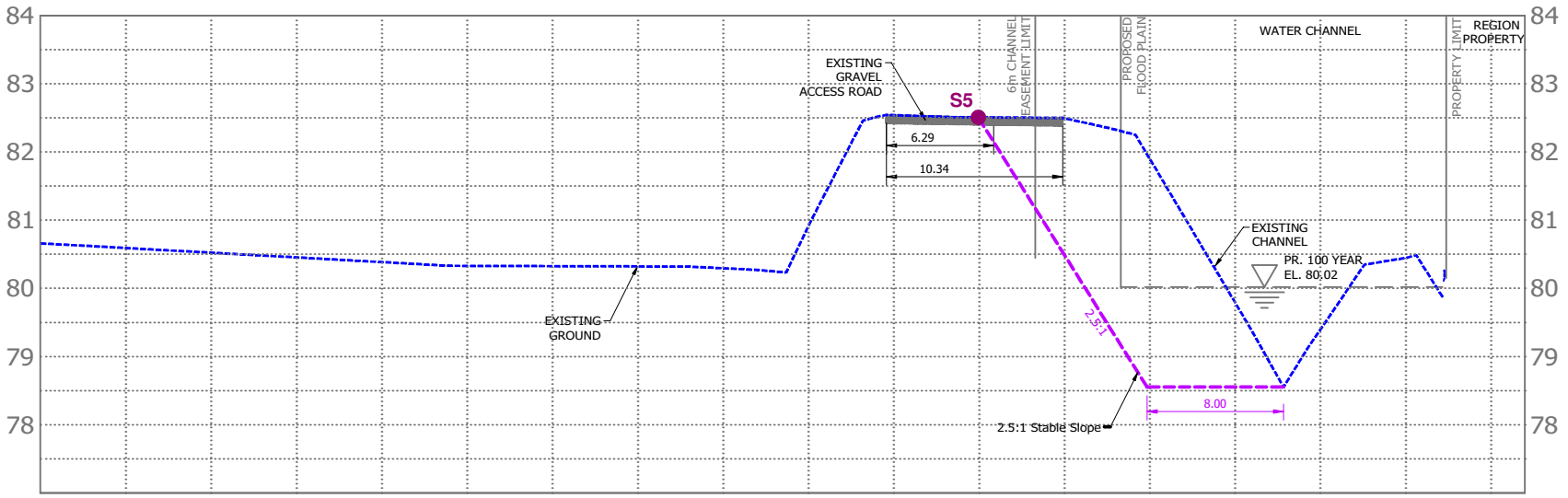

SECTION E-E
ALTERNATIVE
STA.0+328

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION E-E**

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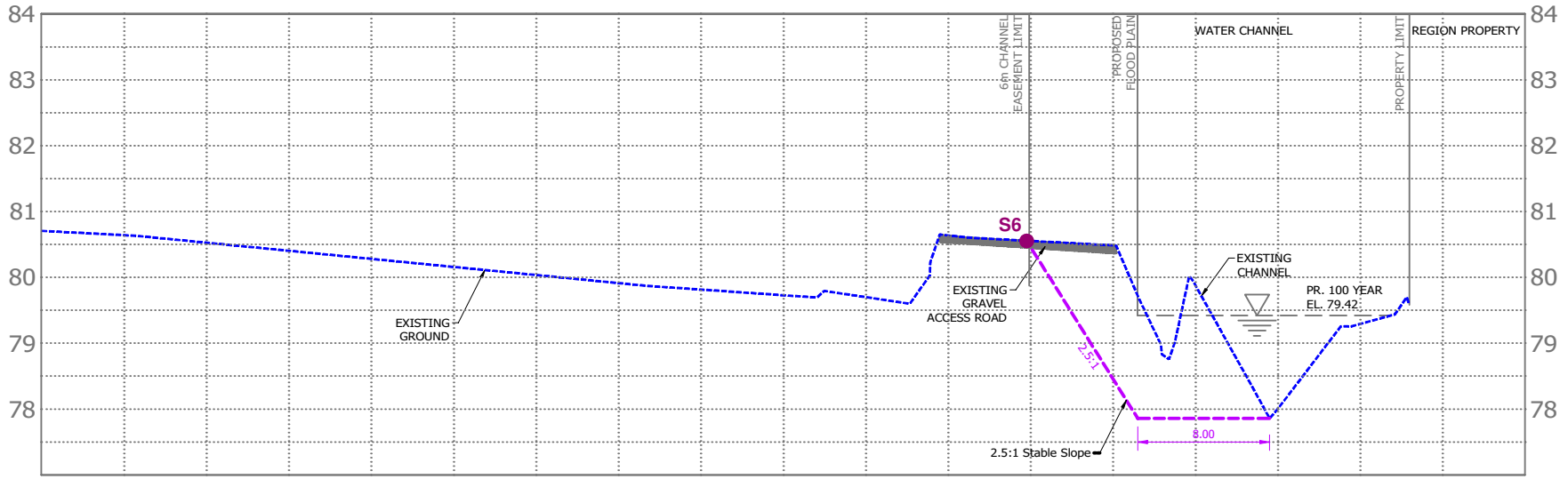

SECTION F-F
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STA.0+389

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Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION F-F**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

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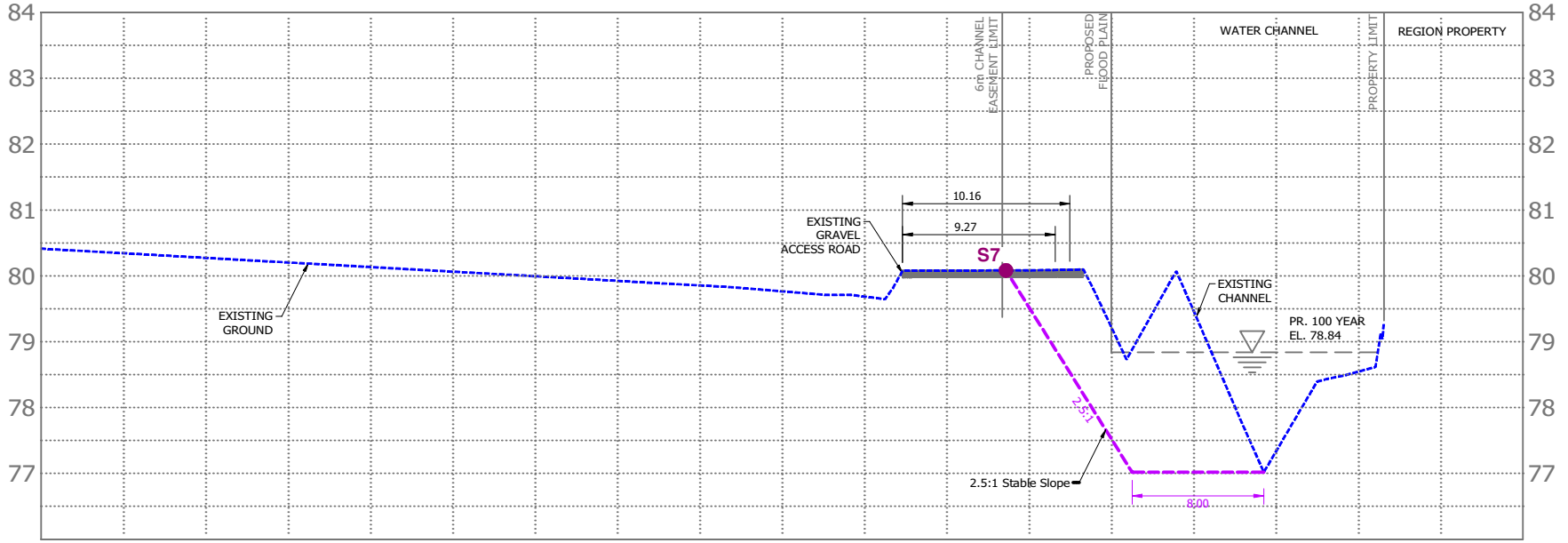

SECTION G-G
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Horizontal Scale

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Title: **SLOPE PROFILE AT SECTION G-G**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

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Rev.	**Scale:**	**Project No:**	**Figure No.**
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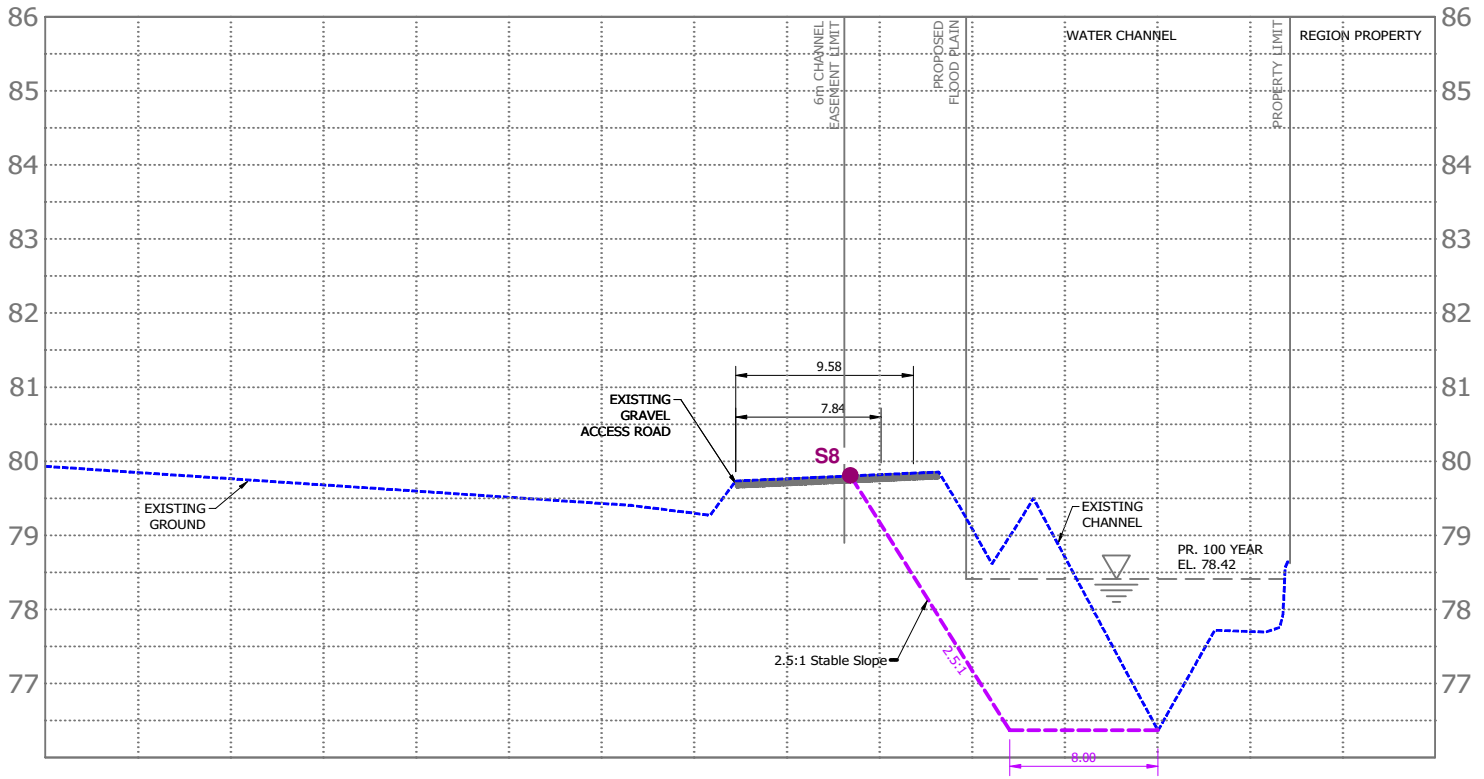

SECTION H-H
ALTERNATIVE
STA.0+510

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Horizontal Scale

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Title: **SLOPE PROFILE AT SECTION H-H**

Client:	Size:	Approved By:	Drawn By:	Date:
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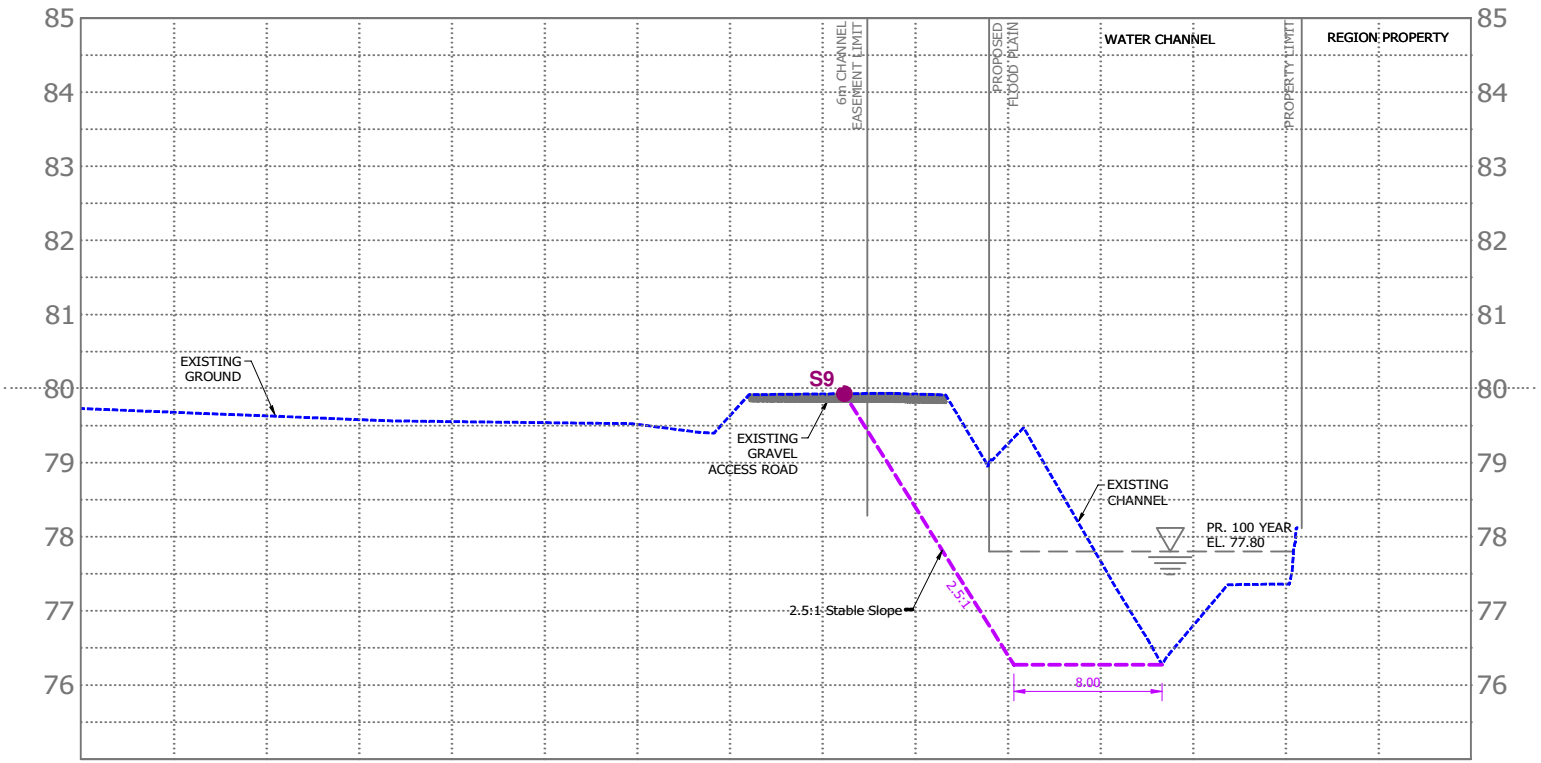

SECTION I-I
ALTERNATIVE
STA.0+087

0 5 10m

Horizontal Scale

DS CONSULTANTS LTD. 6221 Highway 7, UNIT 16 Vaughan, Ontario L4H 0K8 Telephone: (905) 264-9393 www.dsconsultants.ca	Project: SERSON CREEK SLOPE STABILITY ASSESSMENT			
	Title: **SLOPE PROFILE AT SECTION I-I**			
Client: LAKEVIEW COMMUNITY PARTNERS LIMITED	Size: 8.5 x 11	Approved By: F.Z	Drawn By: S.Y	Date: July 2019
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. **10**

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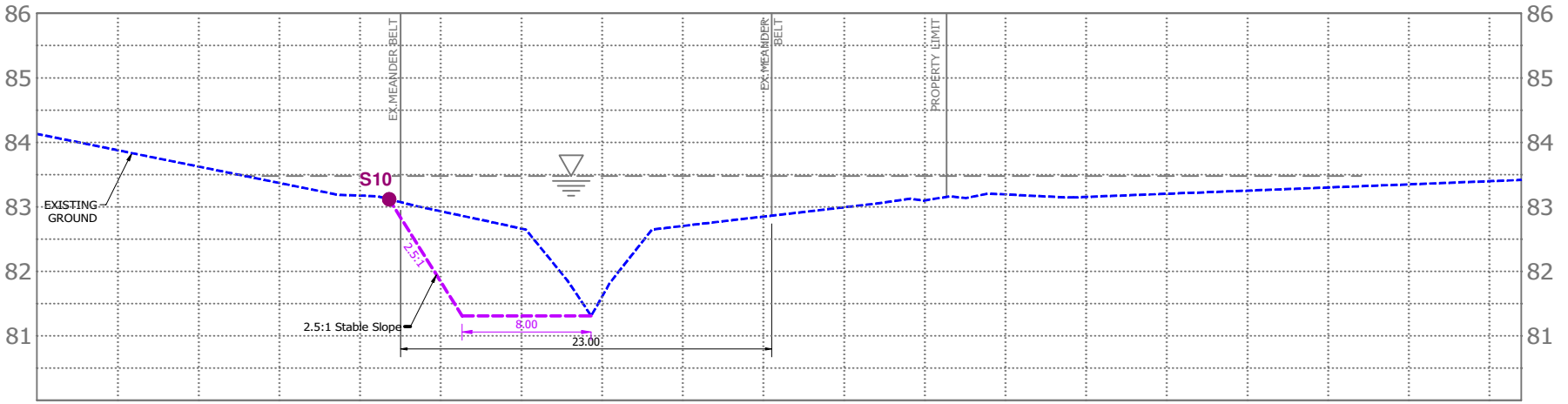

SECTION
J-J (1)

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION J-J**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2019
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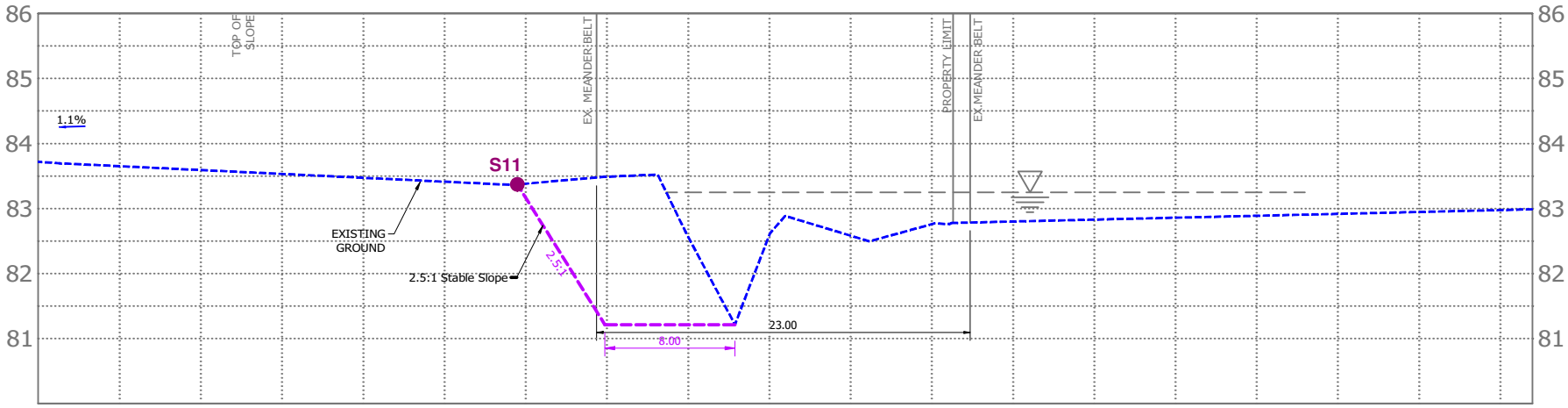

SECTION
K-K (1)

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION K-K**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2019
Rev.	Scale:	Project No:	Figure No.
	As Shown	18-519-102	**12**

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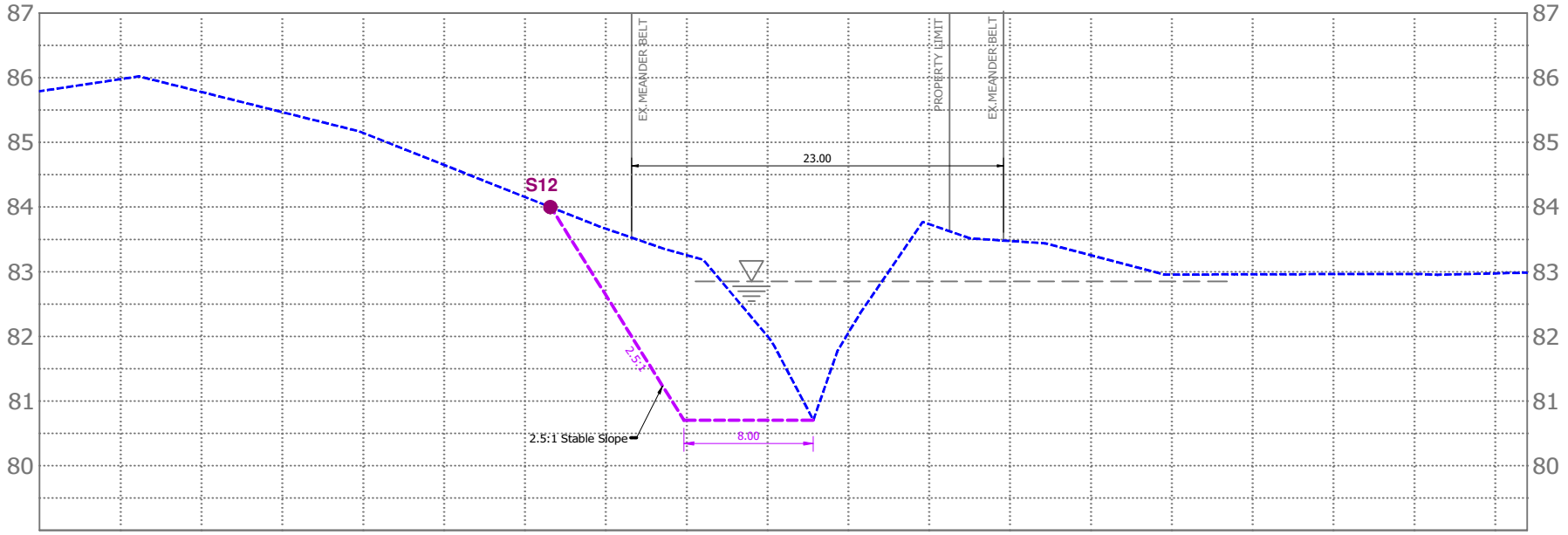


SECTION
L-L (1)

0 5 10m

Horizontal Scale

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

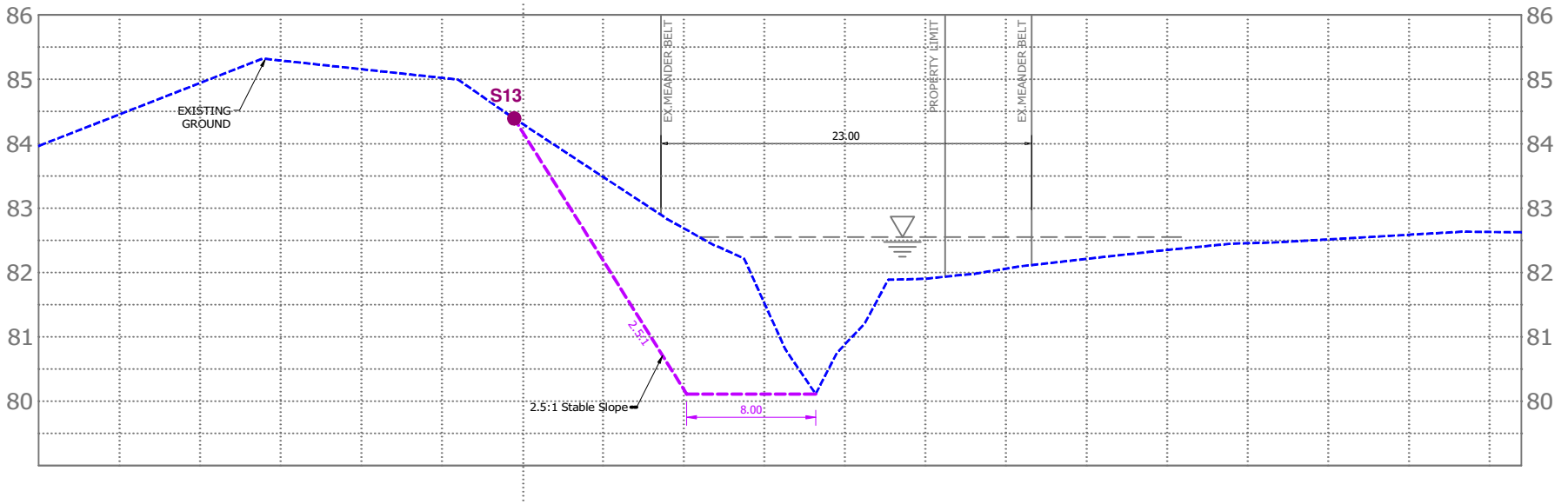
Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION L-L**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2019
Rev.	Scale:	Project No:	Figure No.
	As Shown	18-519-102	**13**

Path:j:\2018 projects\18-519-102 slope stability at serson creek_lakeview community partners limited\drawings\17-549-existing serson creek sections - sept 03.dwg



SECTION
M-M (1)

0 5 10m

Horizontal Scale

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

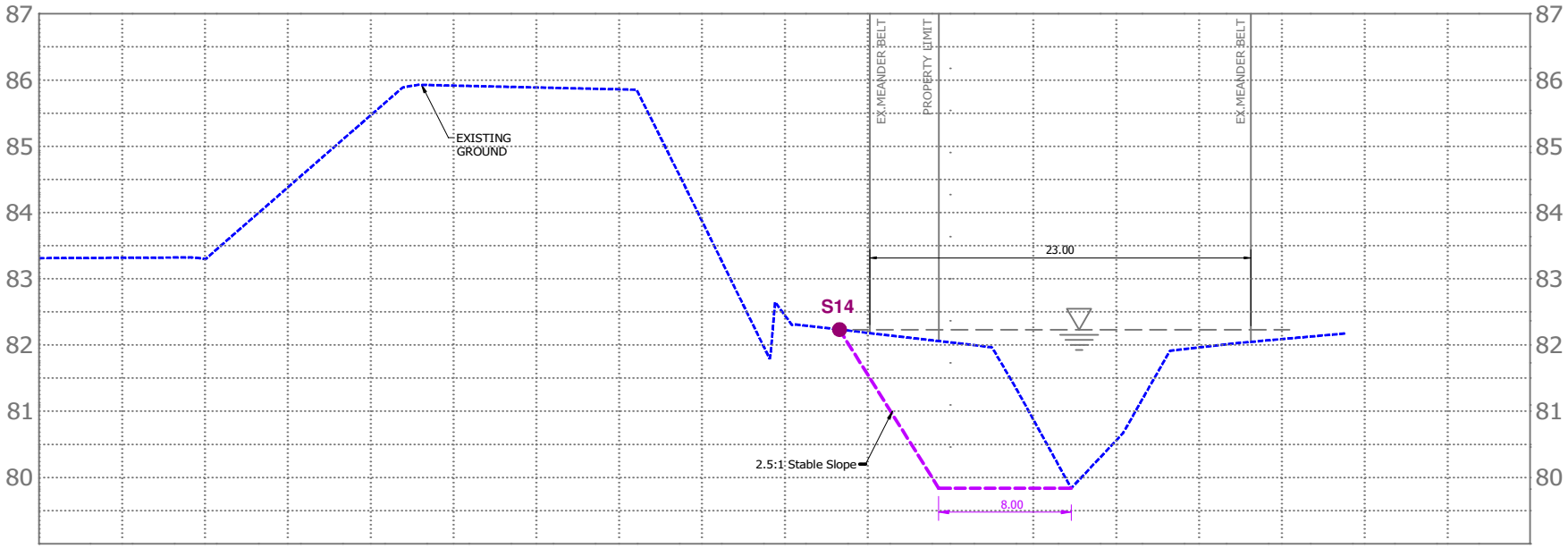
Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION M-M**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2019
Rev.	Scale:	Project No:	Figure No.
	As Shown	18-519-102	**14**

Path:j:\2018 projects\18-519-102 slope stability at serson creek_lakeview community partners limited\drawings\17-549-existing serson creek sections - sept 03.dwg



SECTION
N-N

0 5 10m

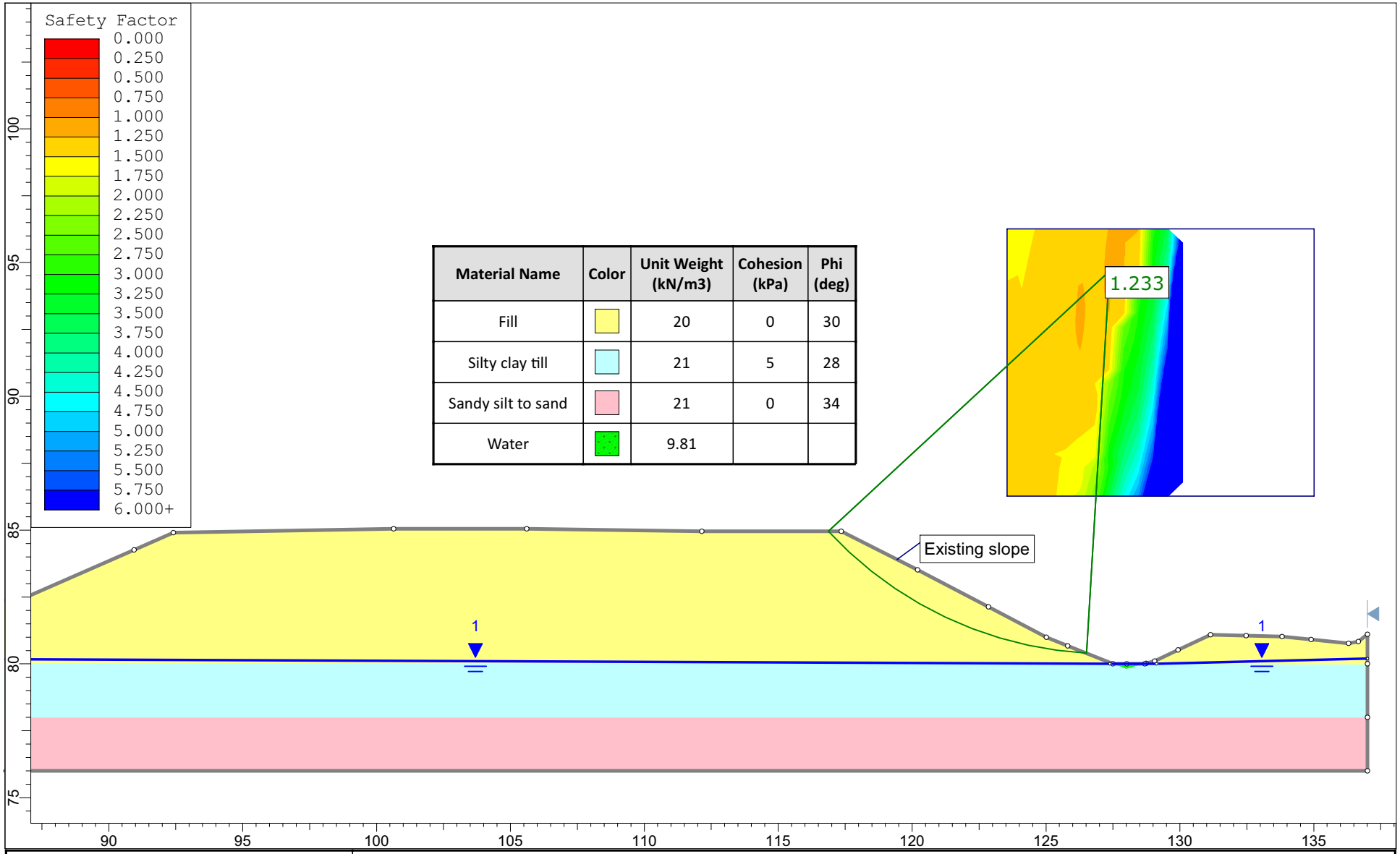
Horizontal Scale

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

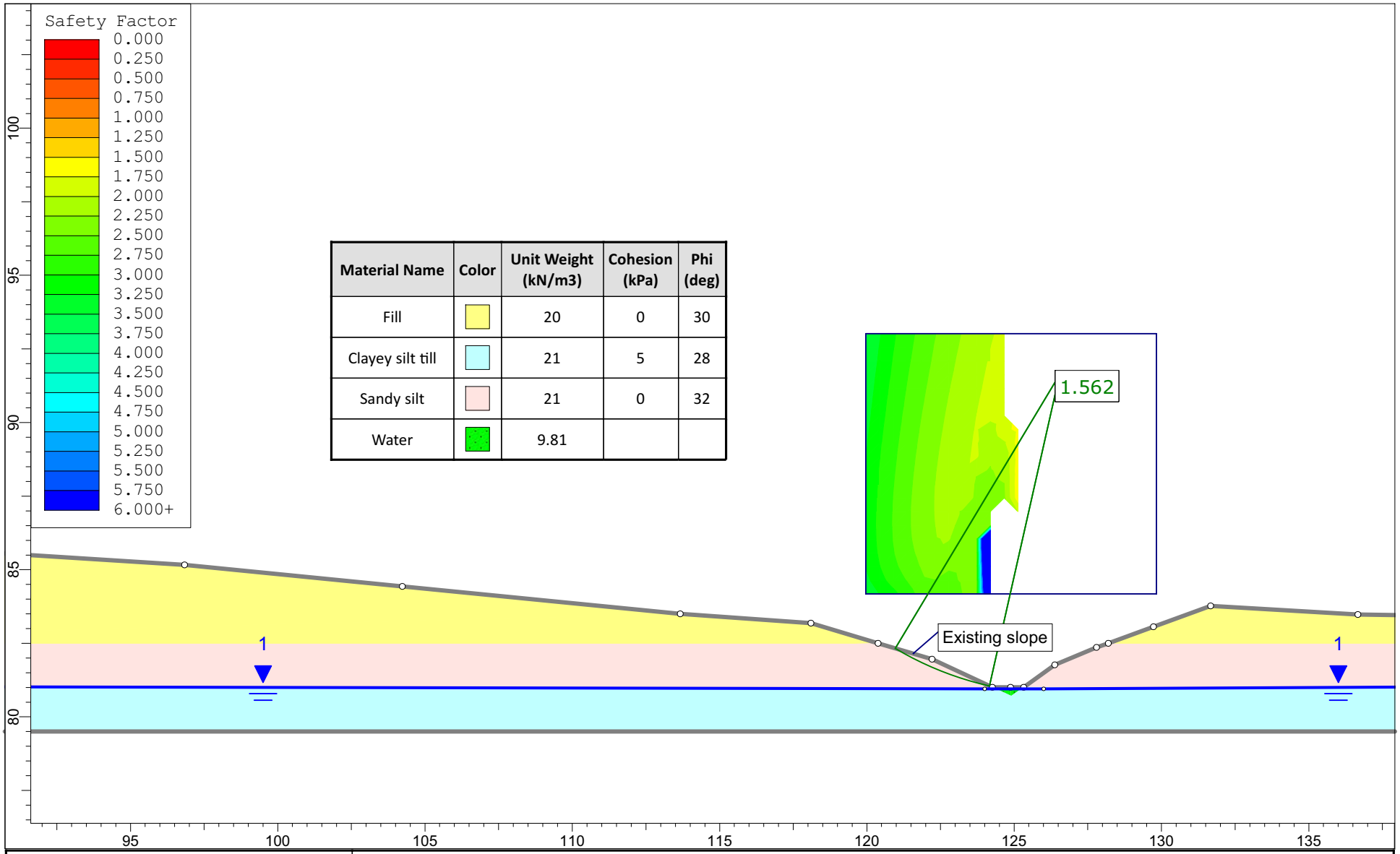
Title: **SLOPE PROFILE AT SECTION N-N**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2019
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. 15



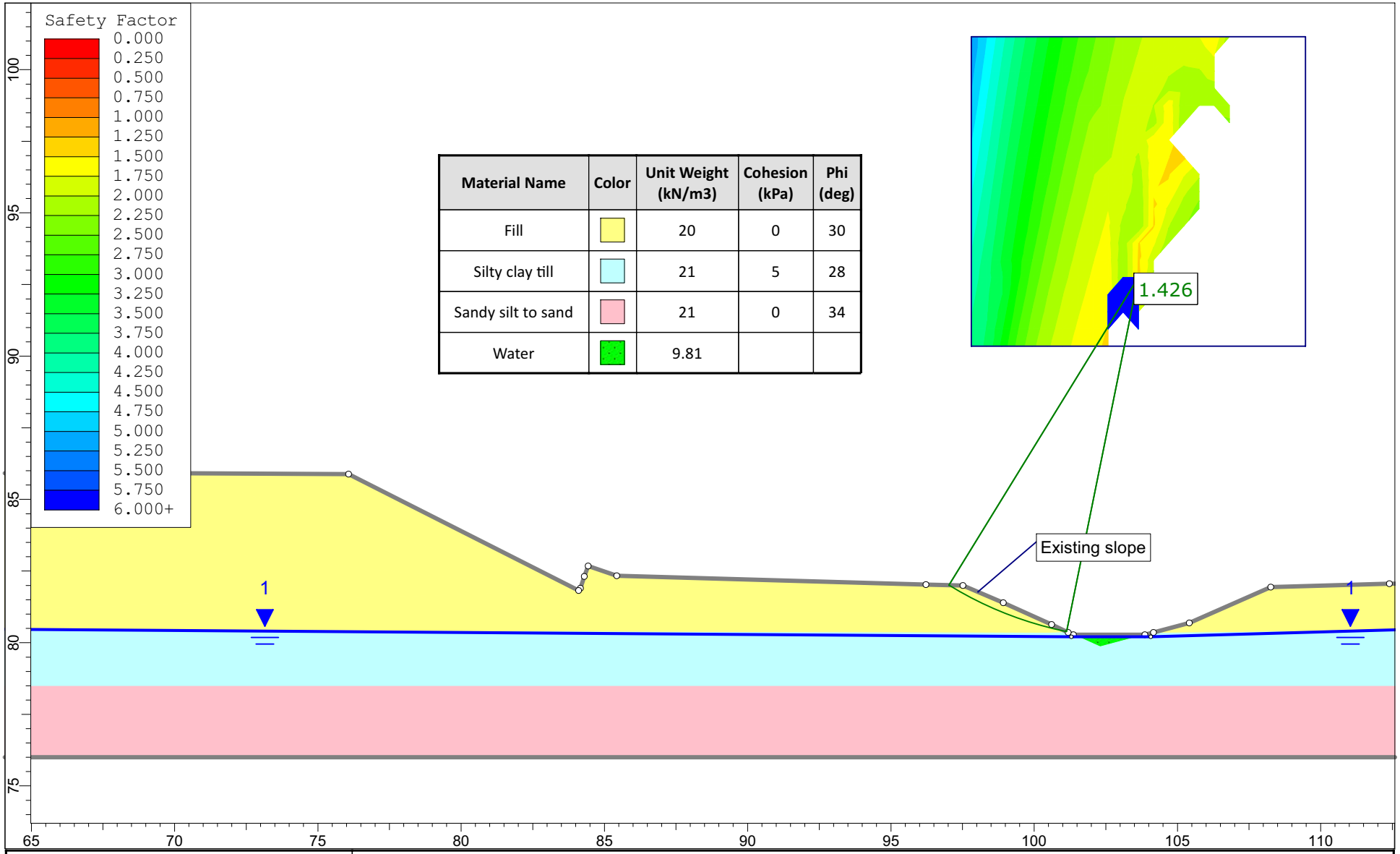
rocscience	Project	Slope Stability of Serson Creek Bank Slopes		
	Analysis Description	Existing West Bank Slope at Section A-A		
	Drawn By	DS	Scale 1:200	Company DS Consultants Ltd.
	Date	July 2019		File Name Figure 16 - Existing West Bank at Section A-A.slmd

SLIDEINTERPRET 8.024



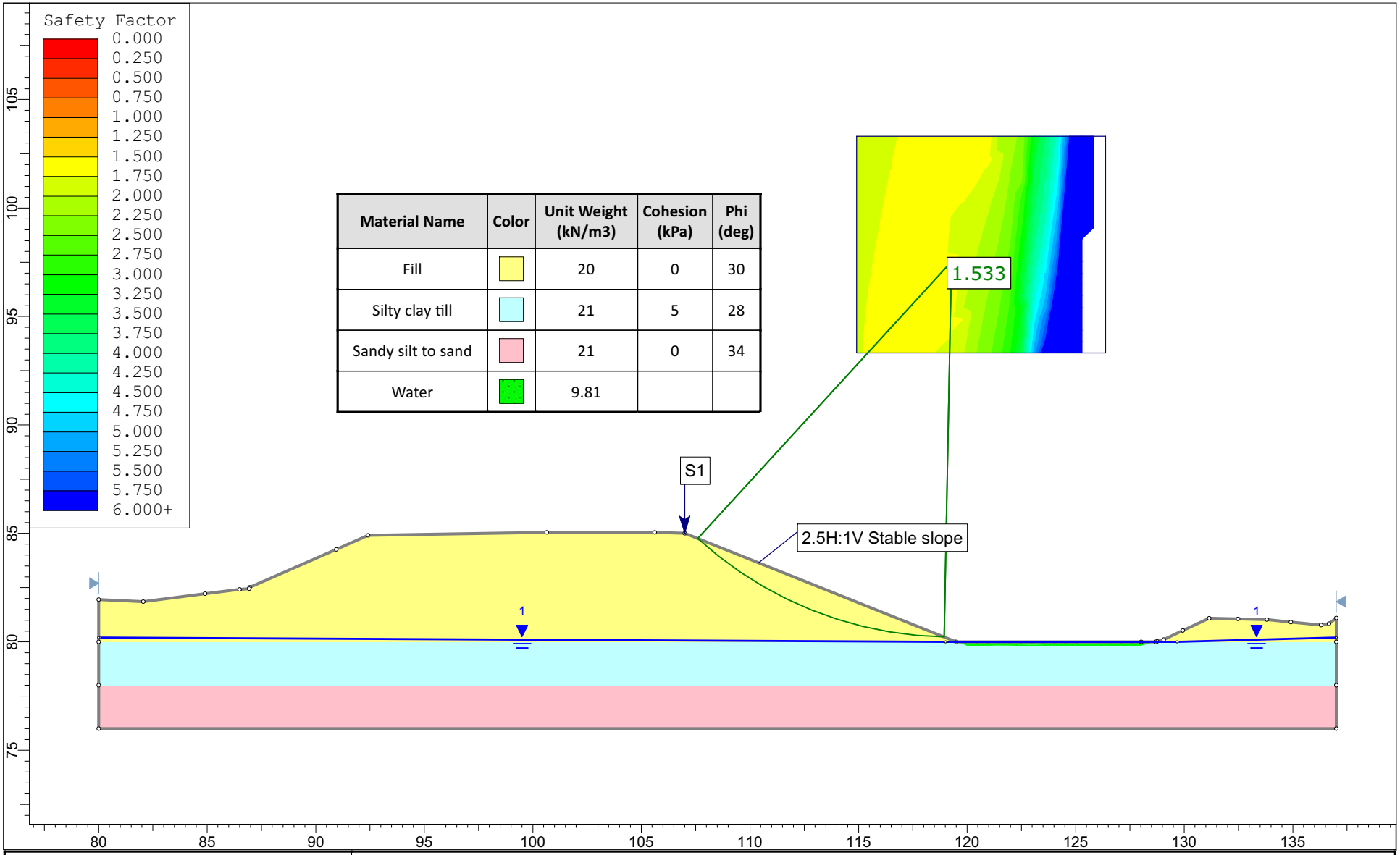
rocscience	Project	Slope Stability of Serson Creek Bank Slopes		
	Analysis Description	Existing West Bank Slope at Section L-L		
	Drawn By	DS	Scale 1:182	Company DS Consultants Ltd.
	Date	July 2019		File Name Figure 17 - Existing West Bank at Section L-L.slmd

SLIDEINTERPRET 8.024



rocscience	Project	Slope Stability of Serson Creek Bank Slopes		
	Analysis Description	Existing South Bank Slope at Section N-N		
	Drawn By	DS	Scale 1:187	Company DS Consultants Ltd.
	Date	July 2019		File Name Figure 18 - Existing South Bank at Section N-N.slmd

SLIDEINTERPRET 8.024

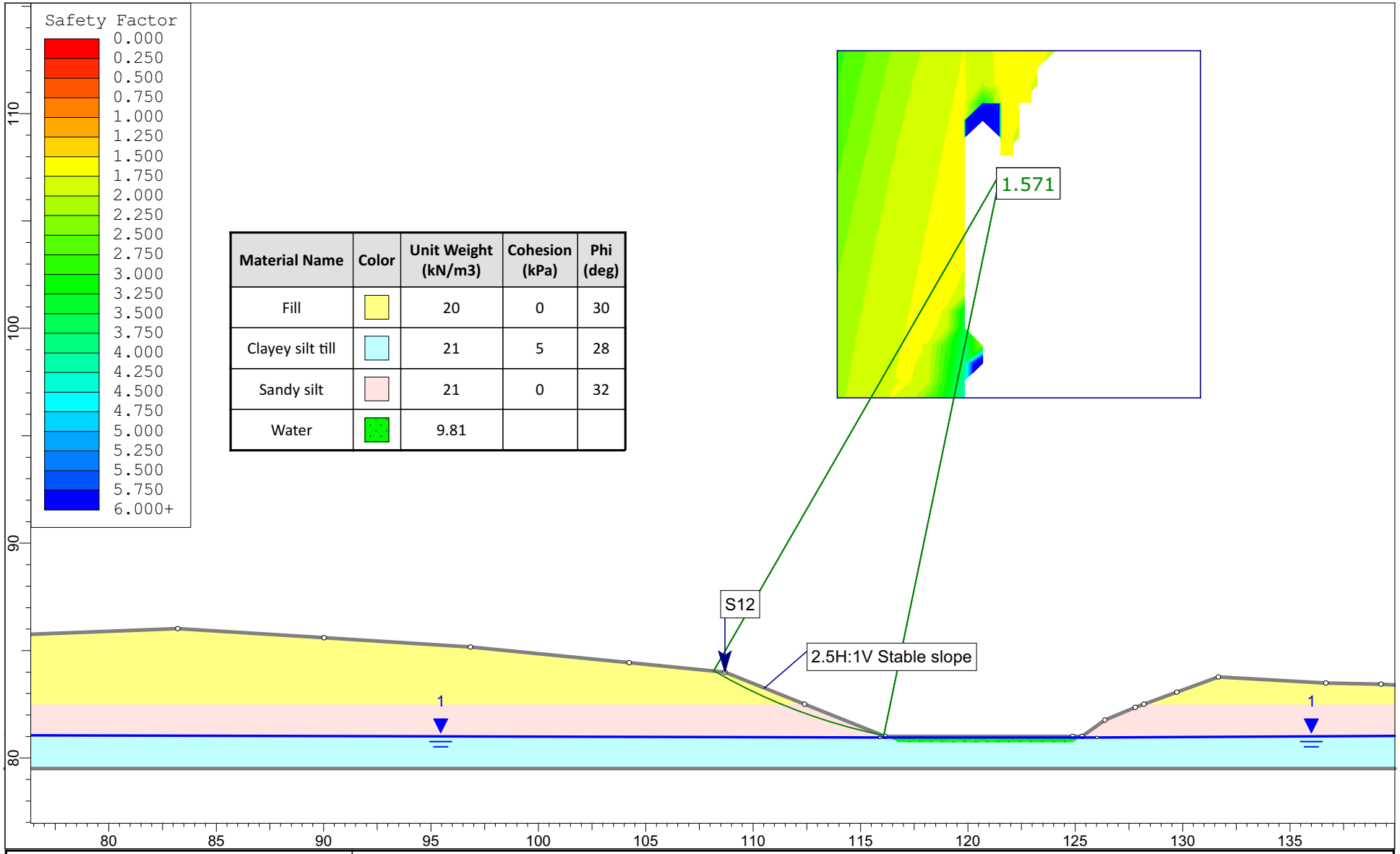


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Silty clay till		21	5	28
Sandy silt to sand		21	0	34
Water		9.81		

rocscience

SLIDEINTERPRET 8.024

Project	Slope Stability of Serson Creek Bank Slopes			
Analysis Description	Long-term Stable West Bank Slope at Section A-A with 8 m Toe Erosion Allowance			
Drawn By	DS	*Scale*	1:247	*Company* DS Consultants Ltd.
Date	July 2019			*File Name* Figure 19 - Stable West Bank at Section A-A.slmd

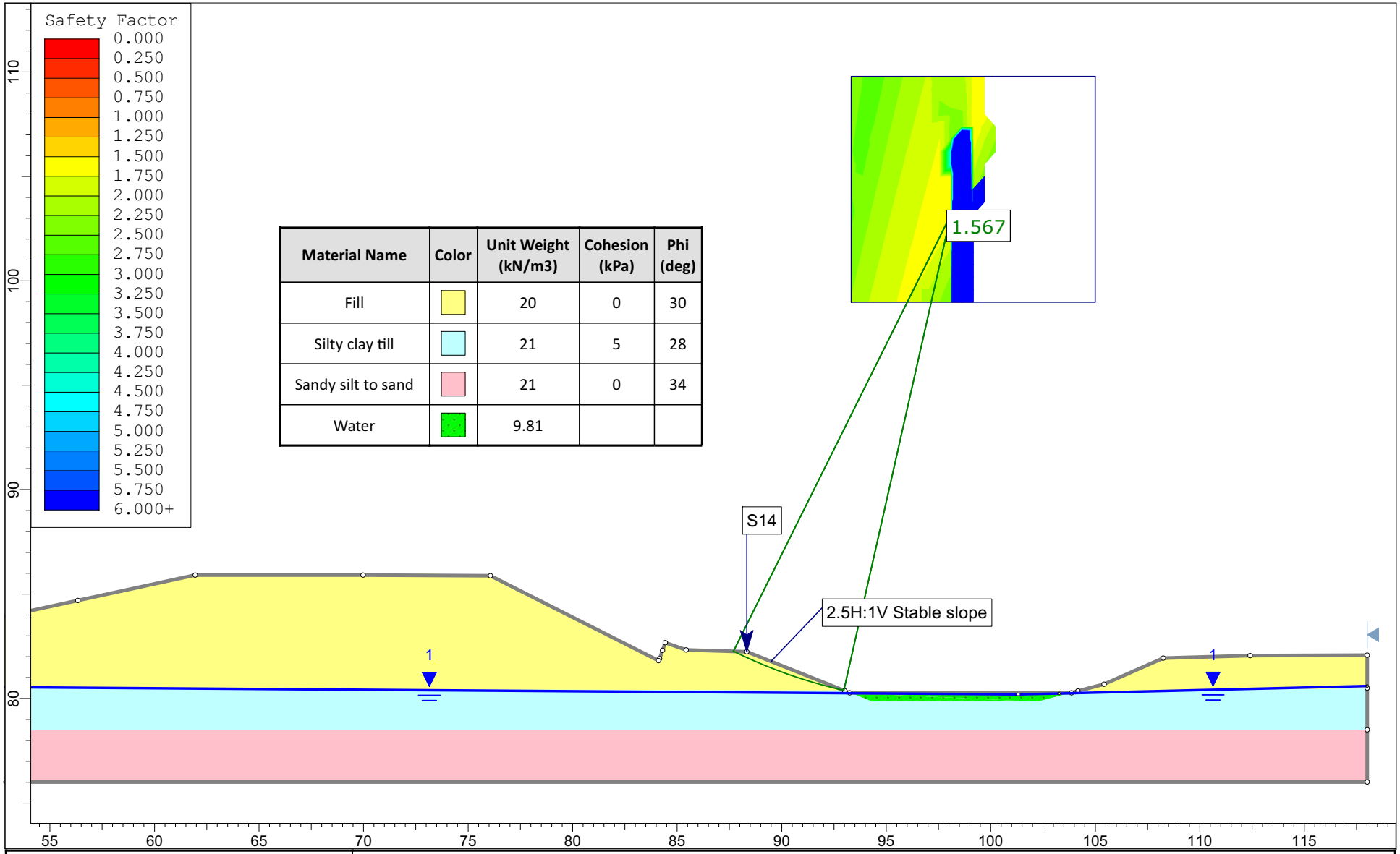


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Clayey silt till		21	5	28
Sandy silt		21	0	32
Water		9.81		

rocscience

SLIDEINTERPRET 8.024

Project	Slope Stability of Serson Creek Bank Slopes		
Analysis Description	Long-term Stable West Bank Slope at Section L-L with 8 m Toe Erosion Allowance		
Drawn By	DS	*Scale* 1:250	*Company* DS Consultants Ltd.
Date	July 2019	*File Name*	Figure 20 - Stable West Bank at Section L-L.slmd



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Silty clay till		21	5	28
Sandy silt to sand		21	0	34
Water		9.81		

rocscience

SLIDEINTERPRET 8.024

Project	Slope Stability of Serson Creek Bank Slopes		
Analysis Description	Long-term Stable South Bank Slope at Section N-N with 8 m Toe Erosion Allowance		
Drawn By	DS	*Scale* 1:257	*Company* DS Consultants Ltd.
Date	June 2019	*File Name*	Figure 21 - Stable South Bank at Section N-N.slmd

Appendix A

Location Plan and Logs of Boreholes by DS Consultants Ltd.

J:\-GIS\18-519-10 800 Hydro Road, Mississuaga\1-QGIS\Geotechnical\Figure 1- BH Location Plan.qgs

Image Source: Imagery @2018 Google

Legend:

Boreholes

- Monitoring Well
- Borehole

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

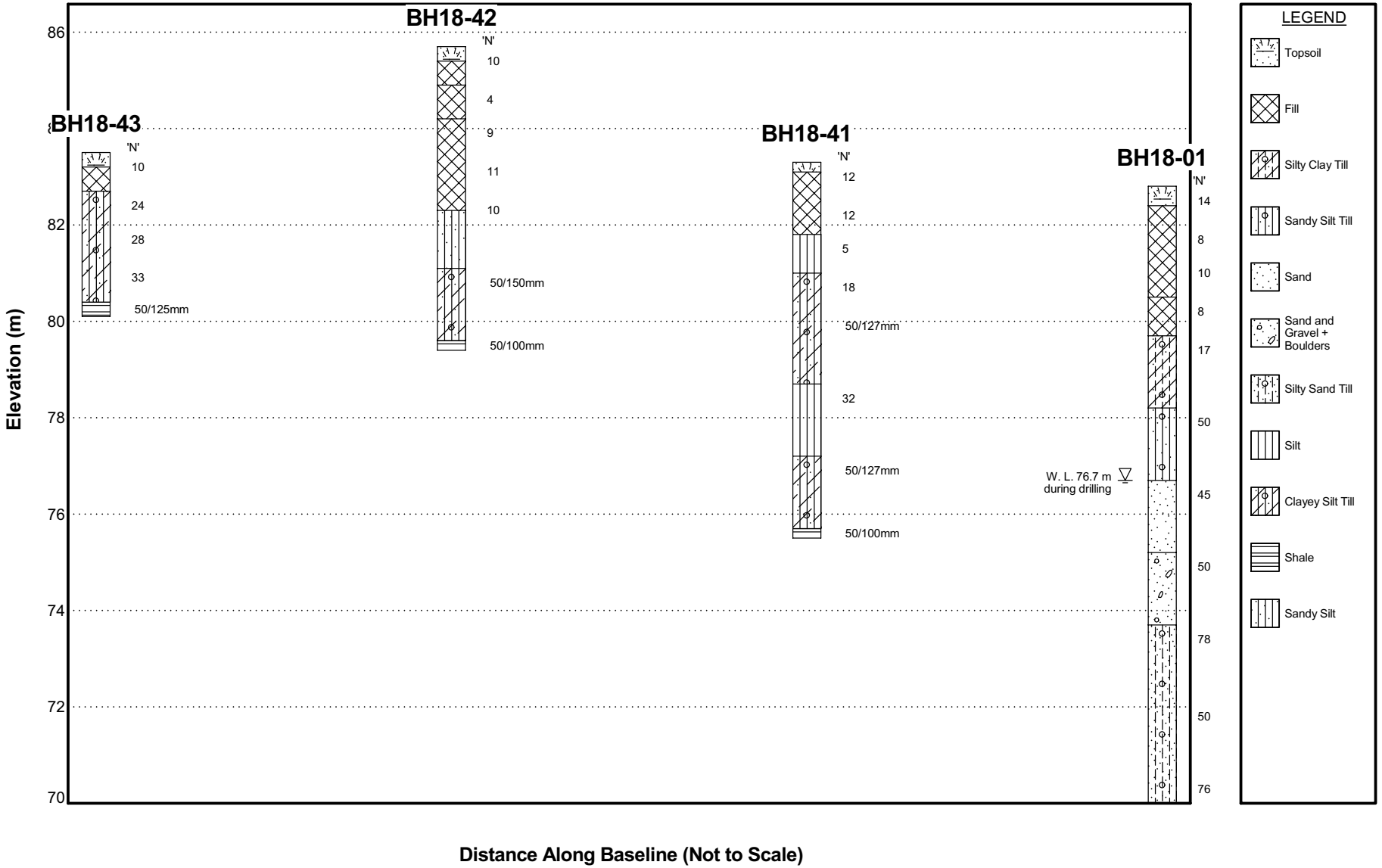
Client:
INFRASTRUCTURE ONTARIO
800 Hydro Road
Mississauga, ON

Project: GEOTECHNICAL INVESTIGATION

Title: **BOREHOLE LOCATION PLAN**

Approved By:	Drawn By:	Date:
N.W	S.Y	September 2018

Scale:	Project No.:	Figure No.:
As Shown	18-519-10	1



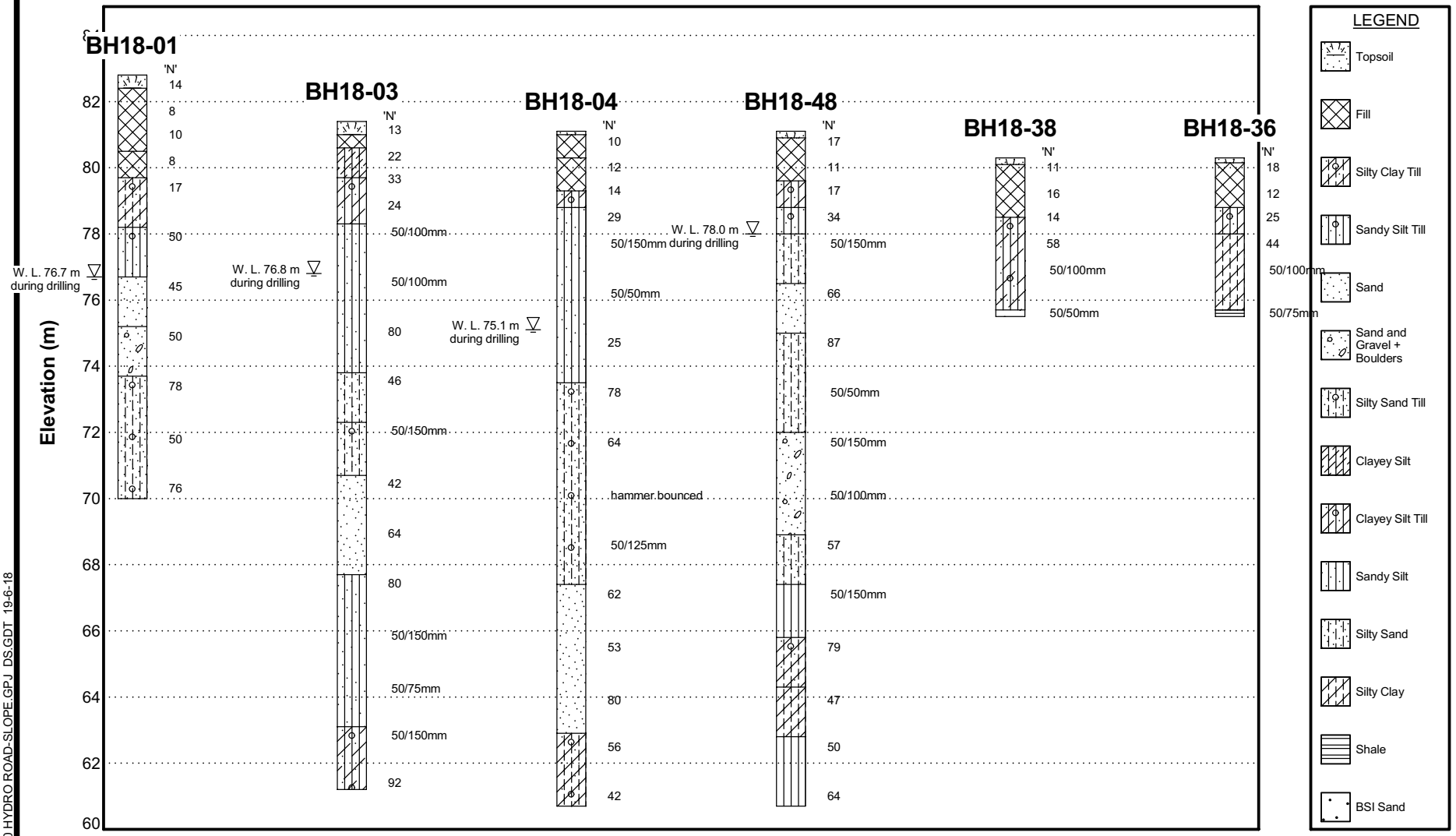
Distance Along Baseline (Not to Scale)

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	A1
JOB NO.	18-519-10
DATE	June 2019

DS FENCE (M) 18-519-10 800 HYDRO ROAD-SLOPE.GPJ DS.GDT 19-6-18



Distance Along Baseline (Not to Scale)

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

Generalized Sub-surface Profile

DRAWING NO.	A2
JOB NO.	18-519-10
DATE	June 2019

DS FENCE (M) 18-519-10 800 HYDRO ROAD-SLOPE.GPJ DS.GDT 19-6-18

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-01

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-18-2018

REF. NO.: 18-519-10
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.8												
0.0 / 82.4	**TOPSOIL:**350mm		1	SS	14							
0.4	**FILL:** clayey silt, some organics, trace gravel, grey, moist, stiff		2	SS	8		82					
1			3	SS	10		81					
2 / 80.5												
2.3 / 79.7	**FILL:** sandy silt, some organics, grey, moist, loose		4	SS	8		80					
3												
3.1 / 78.2	**SILTY CLAY TILL:** some sand, trace gravel, brown, moist, very stiff		5	SS	17		79			225		1 15 47 37
4												
4.6 / 76.7	**SANDY SILT TILL:** trace to some clay, trace gravel, grey, moist, very dense		6	SS	50	▽	78					
5												
6.1 / 75.2	**SAND:** trace silt, brown, wet, dense		7	SS	45		77					
6							W. L. 76.7 m during drilling					
7.6 / 73.7	**SAND AND GRAVEL:** trace silt, brown, wet, very dense		8	SS	50		76					
8							75					
9.1	**SILTY SAND TILL:** some gravel to gravelly, occassional cobble/boulders, trace clay, grey, moist to wet, very dense		9	SS	78		74					
9												
10							73					

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-01

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 200 mm
Date: Jul-18-2018

REF. NO.: 18-519-10
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY SAND TILL: some gravel to gravelly, occassional cobble/boulders, trace clay, grey, moist to wet, very dense(Continued)											
11			10	SS	50		72		○			
12	wet below 12.2 m		11	SS	76		71		○			
70.0							70					
12.8	**END OF BOREHOLE** Notes: 1) Water level at 6.1 mbgl during drilling											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
81.4												
0.0 / 81.0	**TOPSOIL:** 350mm		1	SS	13		81					
0.4 / 80.6	**POSSIBLE FILL:** clayey silt, brown, moist, stiff											
0.8 / 79.7	**CLAYEY SILT:**some sand, occassional sand seams, brown, moist, very stiff to hard		2	SS	22		80			>225		
			3	SS	33					>225		
1.7 / 78.3	**CLAYEY SILT TILL :** some sand, trace gravel, occassional sand seams, brown, moist, very stiff		4	SS	24		79					
3.1	**SANDY SILT TO SILTY SAND** trace clay, trace gravel, brown, moist to wet , very dense		5	SS	50/ 100mm		78					
	grey, wet below 4.6 m		6	SS	50/ 100mm	▽	77 W. L. 76.8 m during drilling					
			7	SS	80		76					
7.6 / 73.8	**SILTY SAND TO SAND:** trace clay, grey, wet, dense		8	SS	46		75					
9.1 / 72.3	**SILTY SAND TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense		9	SS	50/ 150mm		74					
							73					
							72					

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/0.3 m "N"	ELEVATION
70.7	**SILTY SAND TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense(Continued)				
10.7	**SAND:** trace silt, grey, wet, dense to very dense	10	SS	42	
		11	SS	64	
67.7					
13.7	**SANDY SILT TO SILTY SAND:** trace to some clay, some gravel, grey, wet, very dense	12	SS	80	
		13	SS	50/150mm	
		14	SS	50/75mm	
63.1					
18.3	**CLAYEY SILT TILL:** sandy, trace gravel, occasssional cobble/boulders, grey, moist, hard	15	SS	50/150mm	

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT W_P | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
0	95	(5)	

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: + 3, × 3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-03

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-25-2018

REF. NO.: 18-519-10
ENCL NO.: 4

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"			20 40 60 80 100	10 20 30			GR SA SI CL
61.2			16	SS	92					>225		
20.2	**END OF BOREHOLE** Notes: 1) Water level at 4.6 mbgl during drilling											

DYNAMIC CONE PENETRATION RESISTANCE PLOT
SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L
WATER CONTENT (%)

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

DS CONSULTANTS LTD.
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LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-22-2018

REF. NO.: 18-519-10
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS / 0.3 m "N"	ELEVATION
81.1					81
81.0 / 0.1	**TOPSOIL:** 150mm				
	FILL: silty sand and gravel, brown, moist, compact	1	SS	10	
80.3					
0.8	**FILL:** silt to clayey silt, trace organics, trace gravel, grey, moist, compact	2	SS	12	80
79.3		3	SS	14	
1.8	**CLAYEY SILT TILL:** sandy, trace gravel, trace cobble, brown, moist, very stiff				79
78.8					
2.3	**SANDY SILT TO SILTY SAND:** trace clay, trace to some gravel, brown, moist to wet, very dense to compact	4	SS	29	
		5	SS	50/ 150mm	78
		6	SS	50/ 50mm	77
	grey and wet below 6.1 m				76
		7	SS	25	
					74
73.5					
7.6	**SILTY SAND TILL:** trace clay, some gravel, occassional cobble/boulders, grey, wet, very dense	8	SS	78	
					73
		9	SS	64	
					72

W. L. 75.1 m during drilling

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-22-2018

REF. NO.: 18-519-10
ENCL NO.: 5

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT 20 40 60 80 100 / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE 20 40 60 80 100	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	SILTY SAND TILL: trace clay, some gravel, occassional cobble/boulders, grey, wet, very dense(Continued)						71				
11			10	SS	hammer bounced		70				
12							69				
			11	SS	50/ 125mm				○		
13							68				
67.4											
13.7	**SAND:** trace silt, grey, wet, very dense		12	SS	62		67		○		
15							66				
	interbed of silt at 15.5 m		13	SS	53				○		
16							65				
17			14	SS	80		64		○		
18											
62.9							63				
18.2	**SILTY CLAY TILL:** some sand, trace gravel, grey, moist, hard		15	SS	56				○	>225	
19							62				
20											

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-04

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-22-2018

REF. NO.: 18-519-10
ENCL NO.: 5

SOIL PROFILE (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L / WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
60.7	**SILTY CLAY TILL:** some sand, trace gravel, grey, moist, hard(Continued)		16	SS	42		61			>225	
20.4	**END OF BOREHOLE** Notes: 1) Water level at 6.0 mbgl during drilling										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^{3}$, $\times^{3}$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-36

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 33

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOWS/0.3 m "N"	ELEVATION
80.3 / 0.0	**TOPSOIL :**150 mm				
80.2 / 0.2	**FILL:** clayey silt, trace asphalt/concrete fragments, trace organics, grey to dark grey, moist, compact	1	SS	18	80
		2	SS	12	79
78.8 / 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff	3	SS	25	
78.0 / 2.3	**SILTY CLAY:**some sand, brown, moist, hard	4	SS	44	78
		5	SS	50/100mm	77
75.7 / 4.6	**SHALE:** Georgian Bay Formation, weathered, grey	6	SS	50/75mm	76
75.5 / 4.8	**END OF BOREHOLE:**				

Notes:
1) Borehole dry and open upon completion.

GROUND WATER CONDITIONS

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE

PLASTIC LIMIT W_P | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
0	11	57	32

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-38

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-27-2018

REF. NO.: 18-519-10
ENCL NO.: 35

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
80.3 / 0.0	**TOPSOIL:** 230mm						
80.1 / 0.2	**FILL:** clayey silt, trace gravel, trace cobbles, asphalt fragments, dark brown to dark grey, very moist, compact		1	SS	11		80
			2	SS	16		79
78.5 / 1.8	**CLAYEY SILT TILL:** sandy, trace gravel, occasional cobble/boulder, brown, moist, stiff to hard		3	SS	14		
			4	SS	58		78
			5	SS	50/ 100mm		77
75.7 / 4.6	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 50mm		76
75.5 / 4.8	**END OF BOREHOLE**						

Notes:
1) Borehole dry and open upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-41

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Auger
Diameter: 150 mm
Date: Jul-26-2018

REF. NO.: 18-519-10
ENCL NO.: 38

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION
83.3 / 0.0	**TOPSOIL:** 152mm						
83.1 / 0.2	**FILL:** clayey silt, trace rootlet, trace asphalt, brown, moist, stiff		1	SS	12		83
			2	SS	12		82
81.8 / 1.5	**SILT :** some sand, trace clay, brown, wet, loose		3	SS	5		
81.0 / 2.3	**CLAYEY SILT TILL :** some sand, trace gravel, trace cobble, brown to grey, moist, very stiff to hard		4	SS	18		81
			5	SS	50/ 127mm		80
78.7 / 4.6	**SILT :** some sand, trace clay, grey, very moist to wet, dense		6	SS	32		79
77.2 / 6.1	**CLAYEY SILT TILL :** some sand, trace gravel, trace cobble, grey, moist, hard		7	SS	50/ 127mm		78
75.7 / 7.6	**SHALE:** Georgian Bay Formation, weathered, grey		8	SS	50/ 100mm		77
75.5 / 7.8	**END OF BOREHOLE** Notes: 1) Borehole open and dry upon completion						76

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100
SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-42

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 39

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
85.7												
0.0 / 85.4	**TOPSOIL:** 350 mm											
0.3 / 84.9	**FILL:** silty sand, trace topsoil/rootlets, some gravel, brown, moist, compact		1	SS	10		85					
0.8 / 84.2	**FILL:** sandy silt, trace clay, brown, wet, loose		2	SS	4							
1.5 / 82.3	**FILL:** clayey silt, trace organics, grey, moist, stiff		3	SS	9		84					
			4	SS	11		83					
3.4 / 81.1	**SANDY SILT:** trace clay, brown, moist, compact		5	SS	10		82					
4.6 / 79.6	**CLAYEY SILT TILL:** trace gravel, brown, moist, hard		6	SS	50/ 150mm		81			>225		
6.1 / 79.4	**SHALE:** Georgian Bay Formation, weathered, grey		7	SS	50/ 100mm		80					
6.3	**END OF BOREHOLE** Notes: 1) Borehole dry and open upon completion.											

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

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LOG OF BOREHOLE BH18-43

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jun-29-2018

REF. NO.: 18-519-10
ENCL NO.: 40

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa) 20 40 60 80 100	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L WATER CONTENT (%) 10 20 30	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.5												
0.0 / 83.2	**TOPSOIL:** 350mm											
0.3 / 82.7	**FILL:** clayey silt, brown, moist, stiff		1	SS	10		83					
0.8	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff to hard		2	SS	24							
			3	SS	28		82			>225		
	grey below 2.3 m		4	SS	33		81					
80.4												
3.1 / 80.1	**SHALE:** Georgian Bay Formation, weathered, grey		5	SS	50/ 125mm							
3.4	**END OF BOREHOLE**											

Notes:
1) Borehole open and dry upon completion

SHEAR STRENGTH (kPa): ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

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LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
81.1 / 0.0	**TOPSOIL:** 200mm						81
80.9 / 0.2	**FILL :** clayey silt mixed with asphalt, trace organics, some sand, dark grey, moist, compact		1	SS	17		
1			2	SS	11		80
79.6 / 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, greyish brown, moist, very stiff		3	SS	17		79
2							
78.8 / 2.3	**SANDY SILT TILL :** trace to some clay, trace gravel, brown, moist, dense		4	SS	34		
3							
78.0 / 3.1	**SILTY SAND :** trace clay, brown, wet, very dense		5	SS	50/ 150mm	▽ W. L. 78.0 m during drilling	78
4							77
76.5 / 4.6	**SAND:** trace silt, trace gravel, grey, wet, very dense		6	SS	66		76
5							
75.0 / 6.1	**SILTY SAND:** trace clay, grey, wet, very dense		7	SS	87		75
7							74
8			8	SS	50/ 50mm		73
72.0 / 9.1	**SAND AND GRAVEL:** trace silt, grey, wet, very dense		9	SS	50/ 150mm		72
10							

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT W_P | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W_L
WATER CONTENT (%) (10 20 30)

POCKET PEN. (C_u) (kPa)
NATURAL UNIT WT (kN/m³)
METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
11	**SAND AND GRAVEL:** trace silt, grey, wet, very dense(Continued)		10	SS	50/ 100mm		70
12 68.9							
12.2	**SILTY SAND:** trace clay, grey, wet, very dense		11	SS	57		69
13 67.4							68
13.7	**SILT :** trace clay, grey, wet, very dense		12	SS	50/ 150mm		67
14 15 65.8							66
15.3	**SILTY CLAY TILL :** some sand to sandy, trace gravel, grey, moist hard		13	SS	79		65
16 64.3							
16.8	**SILTY CLAY:** trace sand, grey, moist, hard		14	SS	47		64
17 18 62.8							63
18.3	**SILT TO CLAYEY SILT:** trace sand, grey, very moist, very dense		15	SS	50		62
19 20							

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100

SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P | NATURAL MOISTURE CONTENT W | LIQUID LIMIT W_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
>225		
>225		
>225		

Continued Next Page

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

LOG OF BOREHOLE BH18-48

PROJECT: Preliminary Geotechnical Investigation- Proposed Development
CLIENT: Lakeview Community Partners Ltd.
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1

DRILLING DATA
Method: Hollow Stem Auger
Diameter: 150mm
Date: Jul-05-2018

REF. NO.: 18-519-10
ENCL NO.: 45

SOIL PROFILE			SAMPLES			GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT / SHEAR STRENGTH (kPa)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT / WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%)
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS/0.3 m "N"							GR SA SI CL
60.7	**SILT TO CLAYEY SILT:** trace sand, grey, very moist, very dense(Continued)		16	SS	64		61			>225		
20.4	**END OF BOREHOLE:** Notes: 1) Water level at 3.1 mbgl during drilling											

DS SOIL LOG 18-519-10 800 HYDRO ROAD.GPJ DS.GDT 18-10-12

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +³, ×³: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

Appendix B

Site Photographs
(taken on June 17, 2019)

Photo B1: Creek and Concrete Culvert at Lakeshore Blvd (looking north - upstream)

Photo B2: Creek conditions at south of Lakeshore Blvd (looking south - downstream)

Photo B3: Creek conditions at north of Section L-L (looking north - upstream)

Photo B4: Creek conditions at north of Section L-L (looking south - downstream)

Photo B5: Top of slope conditions to north of Section M-M (looking north toward Lakeshore Blvd)

Photo B6: Creek conditions at the turning point to south of Section M-M (looking northeast)

Photo B7: Creek conditions at west of Section N-N (looking east)

Photo B8: Top of slope conditions in area of and to west of Section N-N (looking east from Borehole BH18-41 area – See Appendix A)

Photo B9: Creek conditions at west of Section N-N (looking northwest)

Photo B10: Top of slope conditions to west of Section N-N (looking west)

Photo B11: Slope conditions to east of Section N-N near road bridge (looking west)

Photo B12: Creek conditions at north of Bridge (looking south - downstream)

Photo B13: Road Bridge area (looking east)

Photo B14: Top of slope conditions and road to west of creek in Reach S2 area (looking south)

Photo B15: Creek conditions to south of bridge (looking north - upstream)

Photo B16: Creek and slope conditions to south of bridge (looking south from bridge – looking downstream)

Photo B17: Ditch between Creek and Road at south part of Reach S2 area (looing south - downstream)

Photo B18: Ditch between Creek and Road at south part of Reach S2 area (looing north - upstream)

Photo B19: Creek Conditions to South of Steel Wire Fence at south end of Each S2 (looking north - upstream)

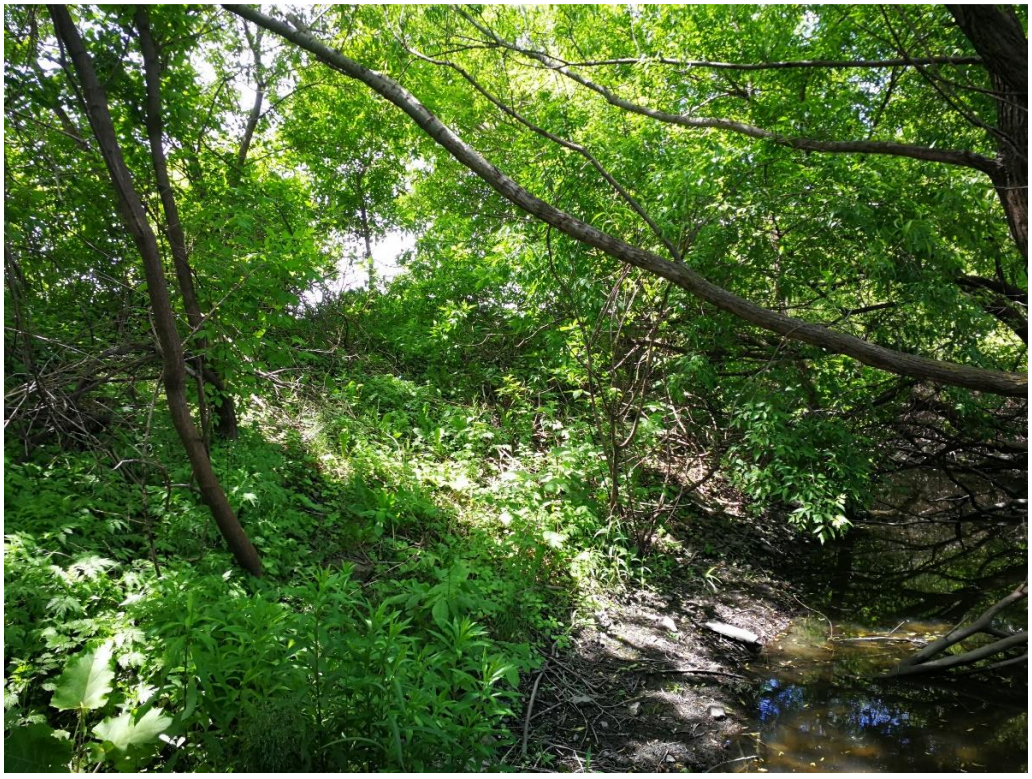

Photo B20: Slope Conditions at South of Steel Wire Fence to south end of Reach S2 area (looking northwest)

Report on

Supplementary
Geotechnical Slope Stability Assessment
East Side Slope of Serson Creek
Lakeview Village, 800 Hydro Road
Mississauga, Ontario

Prepared For:

Lakeview Community Partners Limited

Project No. 18-519-102 (East Slope)
July 24, 2020

DS CONSULTANTS LTD.
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Table of Contents

FIGURES

1. INTRODUCTION

DS Consultants Ltd. (DS) was retained by Lakeview Community Partners Limited to undertake a geotechnical slope stability assessment for the Serson Creek bank slopes for the proposed Lakeview Village development at 800 Hydro Road in Mississauga, Ontario.

In July 2019, DS Consultants Ltd. completed a geotechnical slope stability assessment for the west side slope of Serson Creek at the site, and the findings are documented in DS's previous report (No. 18-519-102) dated July 19, 2019.

This supplementary geotechnical slope stability assessment report is for the stability assessment of the east side slope of Serson Creek at site. The purpose of this study was to assess the stability of the existing east bank slope of Serson Creek and determine the location of the long-term stable top of slope (LTSTOS) line.

This report is provided on the basis of the terms of reference presented above and, on the assumption, that the design will be in accordance with applicable codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, or if any questions arise concerning the geotechnical aspects of the codes and standards, this office should be contacted to review the design. It may then be necessary to carry out additional 0borings and reporting before the recommendations can cater to the changed design.

The site investigation and recommendations follow generally accepted practice for geotechnical consultants in Ontario. The format and contents are guided by client specific needs and economics and do not conform to generalized standards for services. Laboratory testing for most part follows ASTM or CSA Standards or modifications of these standards that have become standard practice.

This report has been prepared for Lakeview Community Partners Limited, its architect and designers. Use of this report by third party without DS consent is prohibited.

2. FIELD AND LABORATORY WORK

At the north part of the slope site where there in no existing boreholes near the east slope bank of the creek, three boreholes (BH20-1 to BH20-3) were drilled by DS Consultants Ltd. to refusal at depths ranging from 1.9 to 2.6m. The boreholes were drilled with portable equipment by a drilling sub-contractor under the direction and supervision of DS Consultants Ltd. personnel. Continuous samples were retrieved with a 50 mm O.D. split-barrel sampler driven with a hammer weighing 312 N and dropping 760 mm. The blow counts were converted to standard SPT 'N' values. The samples were logged in the field and returned to the DS Consultants Ltd. laboratory for detailed examination by the project engineer and for laboratory testing.

As well as visual examination in the laboratory, all of the soil samples were tested for moisture content. Two selected samples were tested for grain size distribution and Atterberg Limits, and the results are shown in the borehole logs and on **Drawing 5** in **Appendix I**.

Water level observations were made during drilling and in the open boreholes at the completion of the drilling operations. A piezometer was installed in each borehole for stabilized groundwater level measurement.

The ground surface elevations at the borehole locations were surveyed by DS, using a differential GPS unit.

3. SUBSURFACE CONDITIONS

North Part of Site:

Three boreholes (BH20-1 to BH20-3) were drilled by DS Consultants Ltd. at the north part of the site. The borehole location plan, borehole logs, and grain size analysis results are presented on **Drawings 1 to 5** in **Appendix I**. The subsurface conditions in the boreholes are summarized in the following paragraphs.

In BH20-1 to BH20-3, a topsoil layer of 150 to 200 mm in thickness was found below surface. Below the topsoil, fill material was found, extending to depths ranging from 0.8 to 1.5 m. The fill consisted of stiff to very stiff clayey silt, with inclusions of topsoil and organics.

The native soil below the fill consisted of very stiff to hard silty clay till, extending to the explored depth of the boreholes. The till contains some sand and trace to some gravel.

Grain size analyses of 2 silty clay till samples (BH20-1/SS2 and BH20-3/SS3) were conducted and the results are presented in **Drawing 5** in **Appendix I** and on the borehole logs, with the following fractions:

Clay: 28 to 37%

Silt: 46 to 49%

Sand: 11 to 15%

Gravel: 3 to 11%

The boreholes were found dry during the drilling operations. No groundwater was detected in the piezometers in the boreholes. In the slope area near the creek, the groundwater level will fluctuate with the water level in the creek.

South Part of Site:

WSP Canada Inc. carried out a geotechnical investigation for the WWPT watermain extension, documented in the report No. 171-16737-00, dated April 27, 2018. The report by WSP was provided to us by the client. In WSP's geotechnical investigation, six (6) boreholes (BH16-1 to BH16-3, BH17-1, BH17-2 and BH17-4) were drilled near the east bank slope of Serson Creek. The borehole location plan and

relevant borehole logs are attached in **Appendix II**. The subsurface information in these boreholes are used in this slope stability study.

In the boreholes, fill materials were found extending to depths of 1.2 to 3.4 m. The fill consisted of clayey silt, silty clay, sandy silt to sand. The fill was in a loose to dense state, with measured SPT 'N' values ranging from 6 to over 30 blows per 300 mm penetration. The native soils consisted of very stiff to hard cohesive deposits of clayey silt to silty clay (till) and dense to very dense cohesionless deposits of silt, sand, sandy silt to silty sand.

Groundwater in the boreholes was within 6 m below the surface. In the slope area near the creek, the groundwater level will fluctuate with the water level in the creek.

4. SLOPE CONDITIONS AND PROFILES

A site visit was made by a senior geotechnical engineer from DS Consultants Ltd. on July 20, 2020 to inspect the slope and creek conditions. Selected photographs taken during our site visits are presented in **Appendix III**. The subject creek slopes are located between Lakeshore Blvd and about 100 m north of Lake Ontario.

For the convenience of discussion, Lakeshore Blvd. in the area is assumed in the east-west alignment. There is an existing bridge for the access road from WWTP to the site. According to the slope conditions, the creek slopes are considered consisting of 2 reaches as follows:

- Reach S2 is located from the access road bridge to Lake Ontario, along the WWTP and the access road.
- Reach S3 is located from Lakeshore Blvd to the access road bridge.

In the area of Reach S3 (north of bridge, see Photos 1 to 10 in **Appendix III**), the slope conditions are described as follows:

- The slope in Reach 3 area was generally 2 to 3 m in height, with steepness of 2H:1V to 3H:1V or flatter. In some areas, the lower portion of the slope near the creek bed was steeper than 2H:1V.
- The slope surface is generally well covered with trees, grasses, bushes and other vegetation.
- The width of the creek was generally within 2 to 3 m. The water depth of creek was within 0.4 m during our site visit.
- No evidence of slope failure was observed during our site visit. Some erosions of the slope toe at the creek water level were observed at various locations along the creek.

In the area of Reach S2 (south of bridge, see Photos 11 to 28 in **Appendix III**), the slope conditions are described as follows:

- The previous trees in the creek and slope area were removed. The slope was generally covered with grasses and some wood debris.

- There is a steel chain fence along the east side of the creek. There was a berm of about 1 to 2.5m high near and along the fence. At the north part and south part of the site, the berm was located to the east of the fence. In some areas at the middle part of the site, the berm was located at or to the west of the fence. The steepness of the berm slope facing the creek was typically 2H:1V to 3H:1V.

- The height of the east slope in Reach 2 area, including the berm, was typically 2 to 4 m from the creek bed level.

- The width of the creek was generally 2 to 3 m. The water depth of creek was generally within 0.3m during our site visit. However, the creek bed in the area near the access road bridge was dry.

- No evidence of slope failure was observed during our site visit. No active erosion at the creek level water level was observed, as he creek bed was mostly covered with wood debris, grasses and cobbles/boulders.

The existing slope profiles at 14 Sections (A-A to N-N, see Figure 1A for locations) were provided to us by Urbantech, as presented on Figures 2A to 15A.

5. EROSION CONSIDERATIONS

In the Geomorphic Assessment Report by Beacon Environmental Limited, a long-term toe erosion allowance of 8 m is recommended for the Serson Creek bank slopes across the site (Reach S2 and S3). This recommended toe erosion allowance for the creek bank slopes is used in the slope stability assessment.

6. SOIL PARAMETERS

Based on the borehole information and our site observations, soil parameters used in the slope stability analyses are given on **Table 6.1**.

Table 6.1: Soil Parameters for Long-term Slope Stability Analyses

Soil Type	Unit Weight (kN/m^3)	Cohesion c' (kPa)	Friction Angle ϕ' (degree)
Fill	20	0	30
Silty clay/clayey silt deposits	21	5	28
Compact sandy silt to sand	21	0	32
Dense sandy silt to sand	21	0	34

7. STABILITY ANALYSES OF SLOPES

The existing slope profiles at Sections A-A to N-N (see Figure 1A for locations) are presented on Figures 2A to 15A.

In the previous report (No. 18-519-102, dated July 19, 2019) by DS Consultants Ltd. for the stability assessment of the west slope of Serson Creek, stability analyses of existing slopes and stable slopes were carried out. It was concluded that a slope of 2.5H:1V, together with toe erosion allowance of 8m, is considered stable in terms of long-term stability for the west side slope of the creek. Based on the boreholes, the soil conditions at the east side of the creek are similar to the west side of the creek. Therefore, a slope of 2.5H:1V, together with toe erosion allowance of 8m, is also considered stable in terms of long-term stability for the east side slope of the creek.

As confirmatory analyses, stability analyses of the existing east slope at Section L-L has been carried out with the computer program SLIDE (Version 8) using the Simplified Bishop method, Simplified Janbu method and GLE/Morgenstern-Price method. The analysis results are presented in Figure 16A. The calculated factor of safety of the existing east slope at Section L-L is 2.08, which is greater than the CVC's minimum acceptable value of 1.5 for stable slope.

For long-term stability, a toe allowance of 8 m is also required for analysing the long-term stable slope.

In order to determine the long-term stable slope, analysis of a 2.5H:1V slope with a toe erosion allowance of 8 m at Section L-L have been carried out for the east slope, and the results are presented on Figure 17A. The calculated factor of safety of the 2.5H:1V slope at Section L-L is 2.25, which is greater than the minimum acceptable value of 1.5.

Based on the analysis results, it is confirmed that a slope of 2.5H:1V with a toe erosion allowance of 8m is stable and acceptable in terms of long-term stability for the east slope of Serson Creek.

8. LONG-TERM STABLE TOP OF SLOPE (LTSTOS)

Reach S3 (north of bridge):

Based on the slope stability analysis results presented above, Point "S12E" in Figure 17A represents the long-term stable top of slope (LTSTOS) of the east slope at Sections L-L. Accordingly, Point "S12E" is also shown in Figure 13A of the profile at Section L-L.

Similarly, the long-term stable top of slope (LTSTOS) of the east slope at other sections (J-J, K-K, M-M and N-N) can be obtained using a stable slope of 2.5H:1V and a toe erosion allowance of 8m, as shown in Figures 11A, 12A, 14A and 15A, respectively.

Based on the analysis results, the points representing the long-term stable top of slope (LTSTOS) at Sections J-J to N-N at the north part of the site are as follows.

- Point "S10E" on Figure 11A represents the long-term stable top of the east slope at Section J-J.
- Point "S11E" on Figure 12A represents the long-term stable top of the east slope at Section K-K.
- Point "S12E" on Figure 13A represents the long-term stable top of the east slope at Section L-L.
- Point "S13E" on Figure 14A represents the long-term stable top of the east slope at Section M-M.
- Point "S14E" on Figure 15A represents the long-term stable top of the east slope at Section N-N.

Based on the long-term stable top of slope (LTSTOS) at Sections J-J to N-N, and our field observations, the recommended long-term stable top of slope line (**Line S10E-S11E-S12E-S13E-S14E)** is shown on Figure 1A for east slope of Serson Creek at the north part of the site (Reach 3).

Reach S2 (South of Bridge):

In the area of Reach 2 to the south of the bridge, the existing slope profiles at Sections A-A to I-I, as shown in Figures 2A to 10A are provided up to the property line. The existing grade elevation to the east of the property line (i.e. beyond the property line) is not available. As shown in Figures 2A to 10A, the 2.5H:1V stable slope (with 8 m erosion allowable) extends beyond the property line. Because the existing ground profile beyond the property line is not available, the exact location of the long-term stable top of slope line (LTSTOS line) at the ground surface can not be determined.

The long-term stable top of slope line (LTSTOS line) at Sections A-A to I-I is located beyond the property line, i.e. to the east of the property line, and is located within WWPT property. As the existing ground profile beyond the property line is not available, the long-term stable top of slope line (LTSTOS line) at Sections A-A to I-I at the south part of the site can not be determined, and is not shown in Figure 1A.

9. GENERAL COMMENTS AND LIMITATIONS OF REPORT

DS Consultants Ltd. (DS) 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, DS will assume no responsibility for interpretation of the recommendations in the report.

This report is intended solely for the Client named. The material in it reflects our best judgment in light of the information available to DS at the time of preparation. Unless otherwise agreed in writing by DS, it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. No portion of this report may be used as a separate entity, it is written to be read in its entirety.

The conclusions and recommendations given in this report are based on information determined at the test hole locations. The information contained herein in no way reflects on the environment aspects of the project, unless otherwise stated. Subsurface and groundwater conditions between and beyond the test holes may differ from those encountered at the test hole locations, and conditions may become apparent during construction, which could not be detected or anticipated at the time of the site investigation. The benchmark and elevations used in this report are primarily to establish relative

elevation differences between the test hole locations and should not be used for other purposes, such as grading, excavating, planning, development, etc.

The design recommendations given in this report are applicable only to the project described in the text and then only if constructed substantially in accordance with the details stated in this report.

The comments made in this report on potential construction problems and possible methods are intended only for the guidance of the designer. The number of test holes may not be sufficient to determine all the factors that may affect construction methods and costs. For example, the thickness of surficial topsoil or fill layers may vary markedly and unpredictably. The contractors bidding on this project or undertaking the construction should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the subsurface conditions may affect their work. This work has been undertaken in accordance with normally accepted geotechnical engineering practices.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. DS accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report. We accept no responsibility for any decisions made or actions taken as a result of this report unless we are specifically advised of and participate in such action, in which case our responsibility will be as agreed to at that time.

We trust that the information contained in this report is satisfactory. Should you have any questions, please do not hesitate to contact this office.

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Figures

Long-Term Stable Top of Slope (LTSTOS) Line
(S10 - S11 .....S8 - S9) - West Slope

Long-Term Stable Top of Slope (LTSTOS) Line
(S10E - S11E - S12E - S13E - S14E) - East Slope

Note : LTSTOS Line from Section A-A to I - I is not shown, as it is beyond the Property Line

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE LOCATION PLAN**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
11 X 17	F.Z	S.Y	July 2020
Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. **1A**

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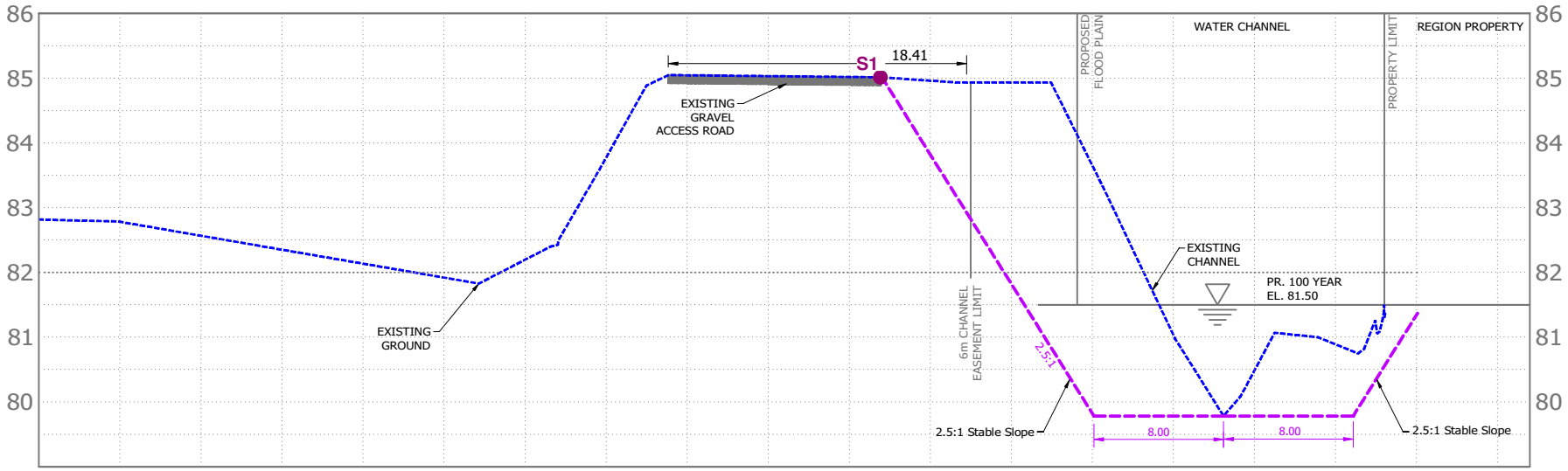

SECTION A-A
ALTERNATIVE
STA.0+087

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION A-A**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2020
Rev.	**Scale:**	**Project No:**	**Figure No.**
	As Shown	18-519-102	**2A**

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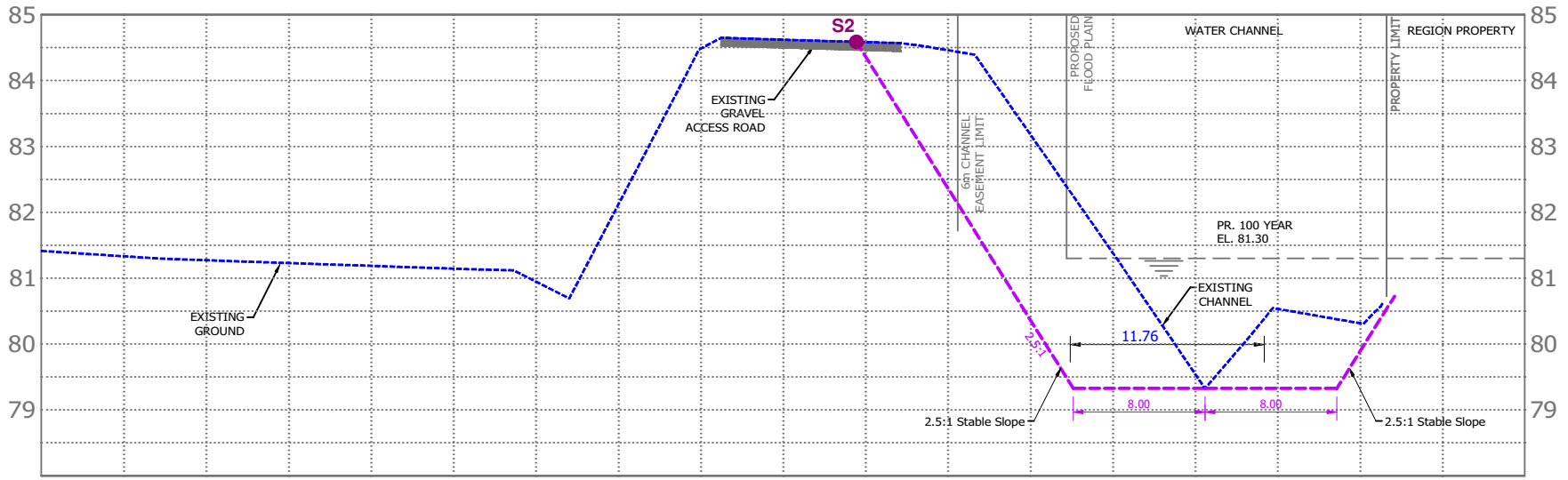

SECTION B-B
ALTERNATIVE
STA.0+147

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION B-B**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2020
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. **3A**

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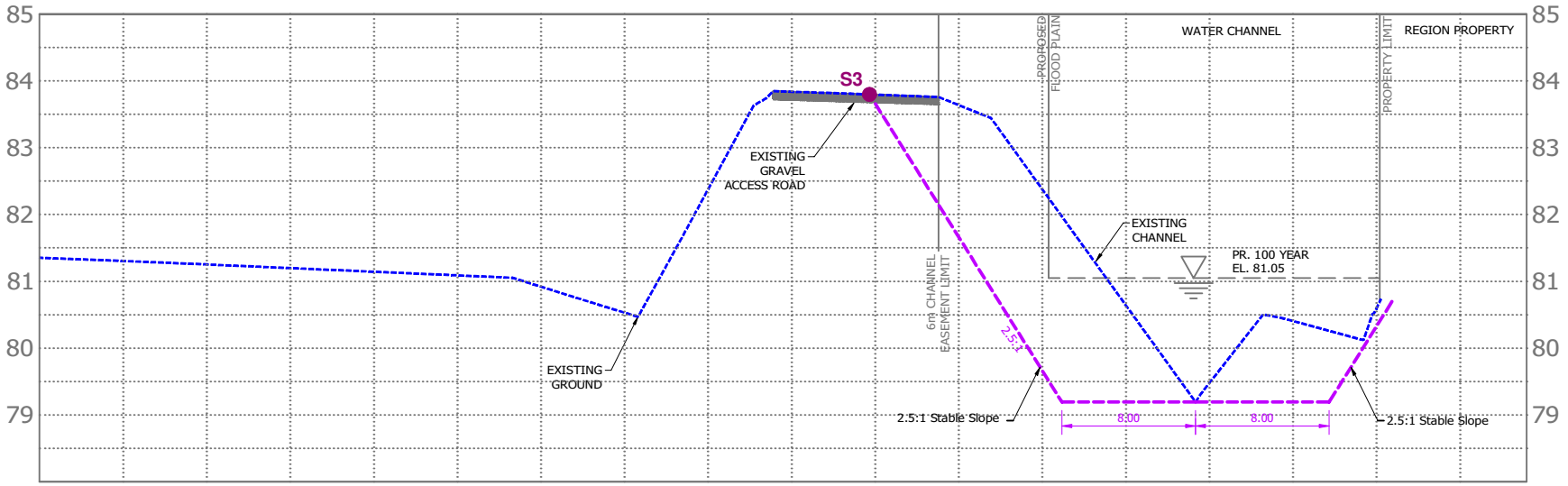

SECTION C-C
ALTERNATIVE
STA.0+207

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION C-C**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2020
Rev.	Scale:	Project No:	Figure No.
	As Shown	18-519-102	**4A**

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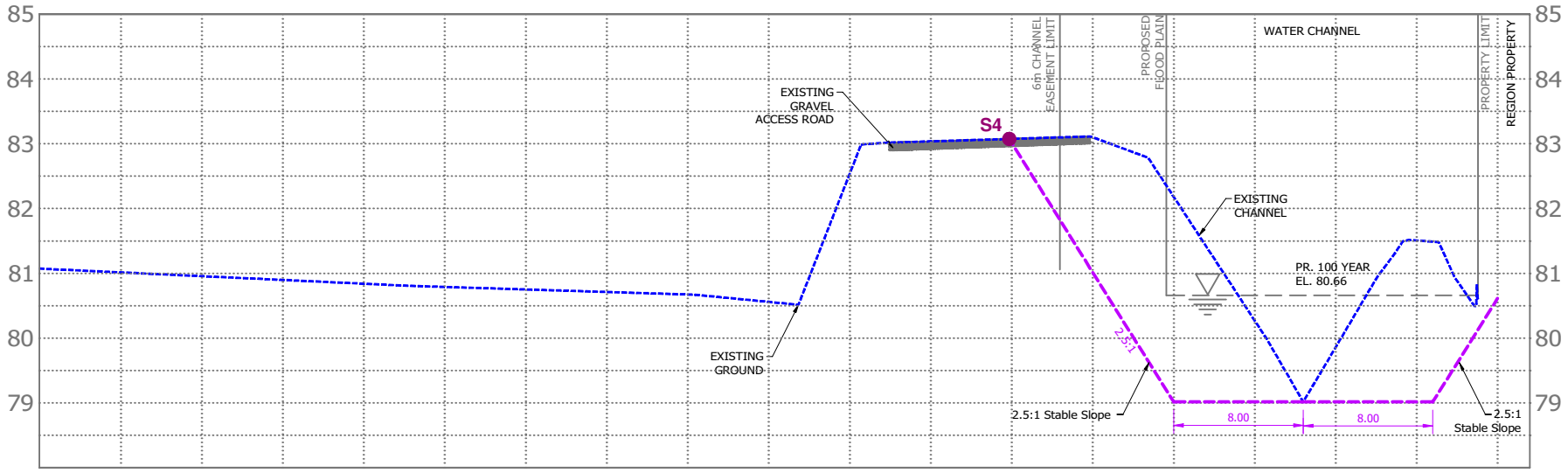

SECTION D-D
ALTERNATIVE
STA.0+268

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION D-D**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2020
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. **5A**

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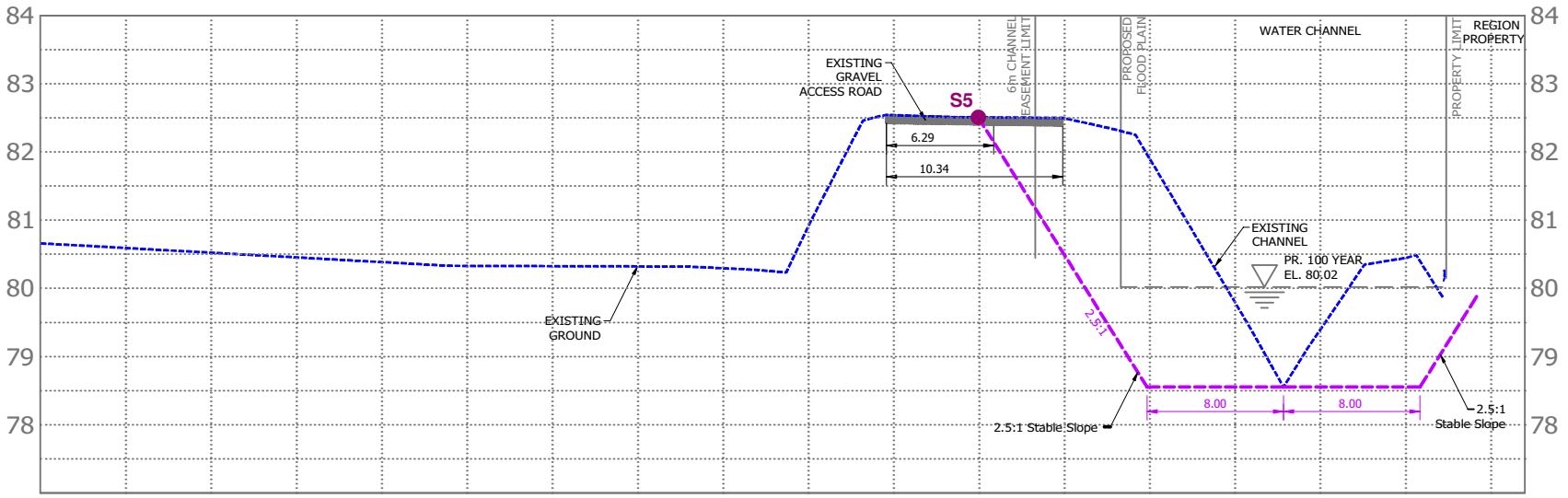

SECTION E-E
ALTERNATIVE
STA.0+328

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION E-E**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2020
Rev.	**Scale:**	**Project No:**	**Figure No.**
	As Shown	18-519-102	**6A**

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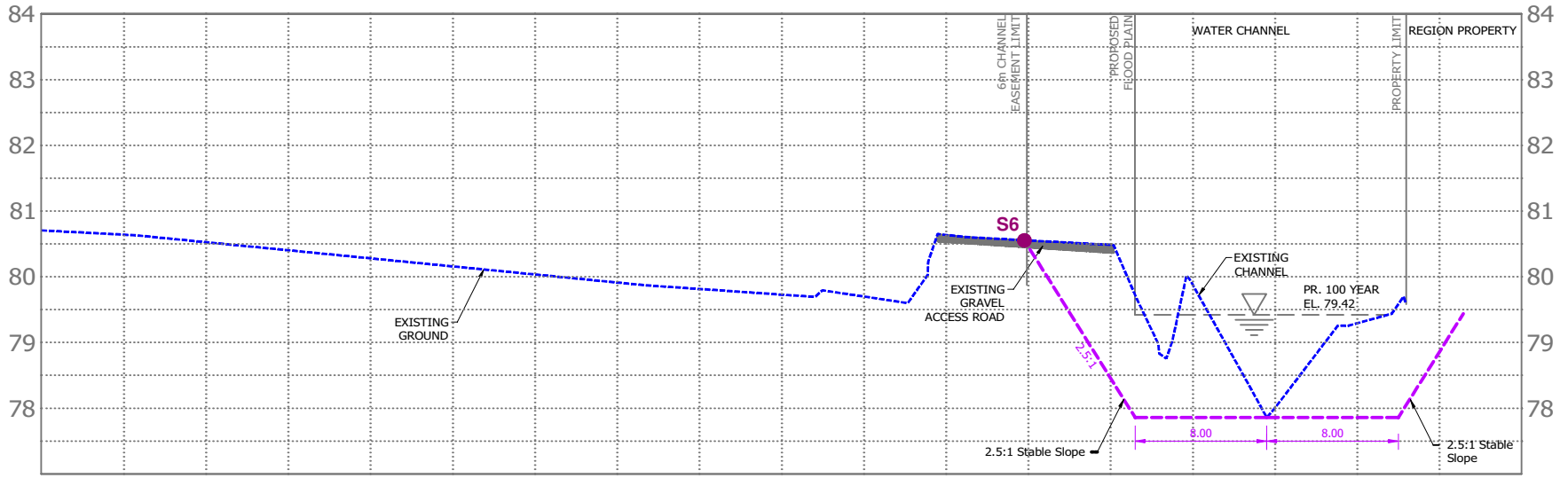

SECTION F-F
ALTERNATIVE
STA.0+389

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION F-F**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2020
Rev.	**Scale:**	**Project No:**	**Figure No.**
	As Shown	18-519-102	**7A**

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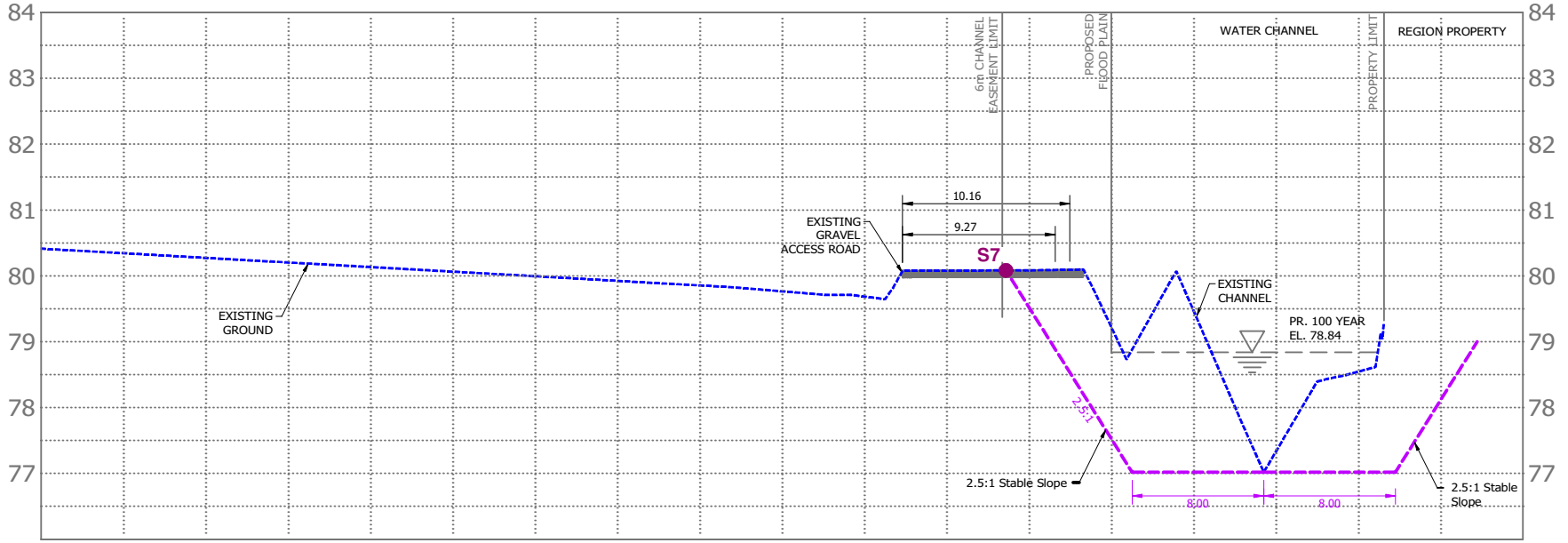

SECTION G-G
ALTERNATIVE
STA.0+448

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION G-G**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2020
Rev.	Scale:	Project No:	Figure No.
	As Shown	18-519-102	**8A**

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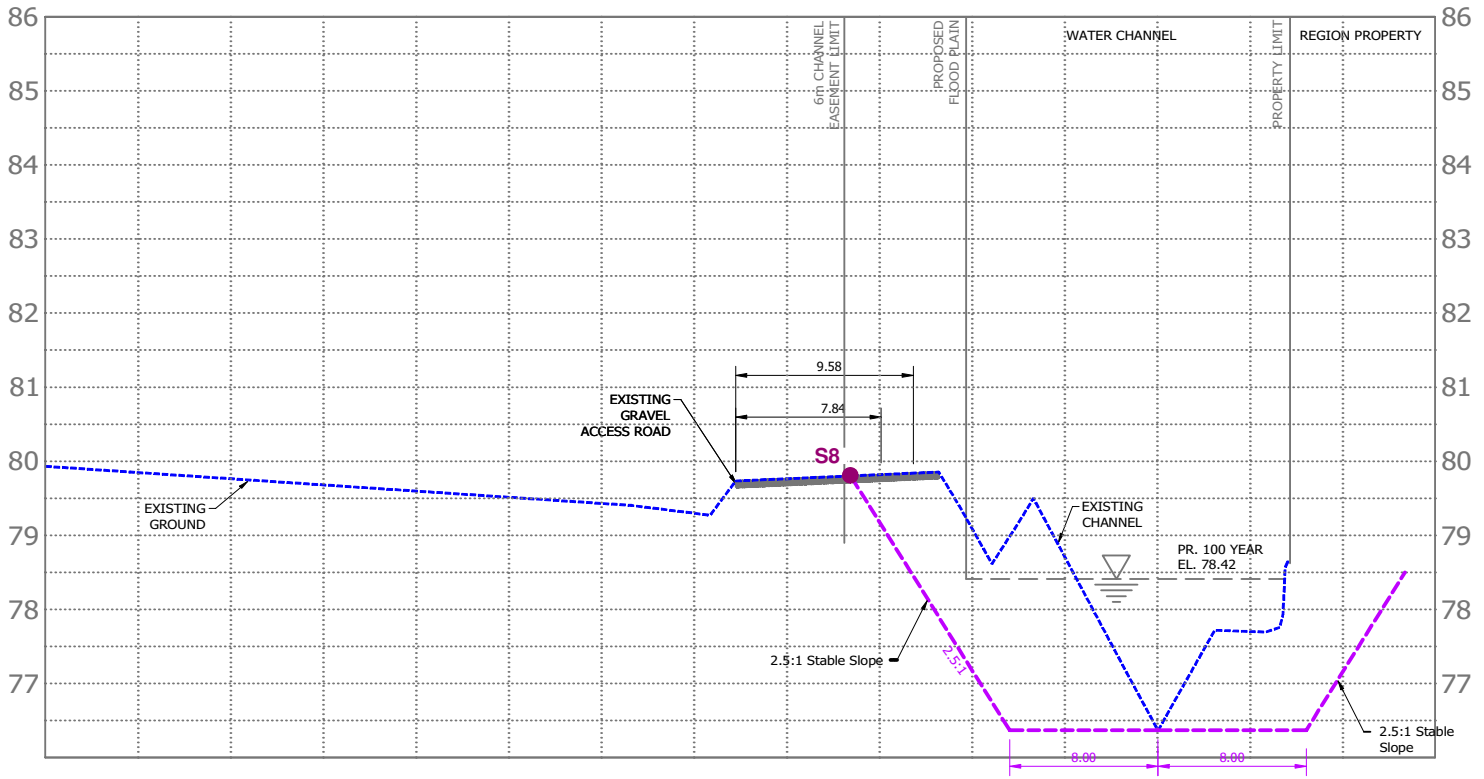

SECTION H-H
ALTERNATIVE
STA.0+510

0 5 10m
Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION H-H**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2020
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. **9A**

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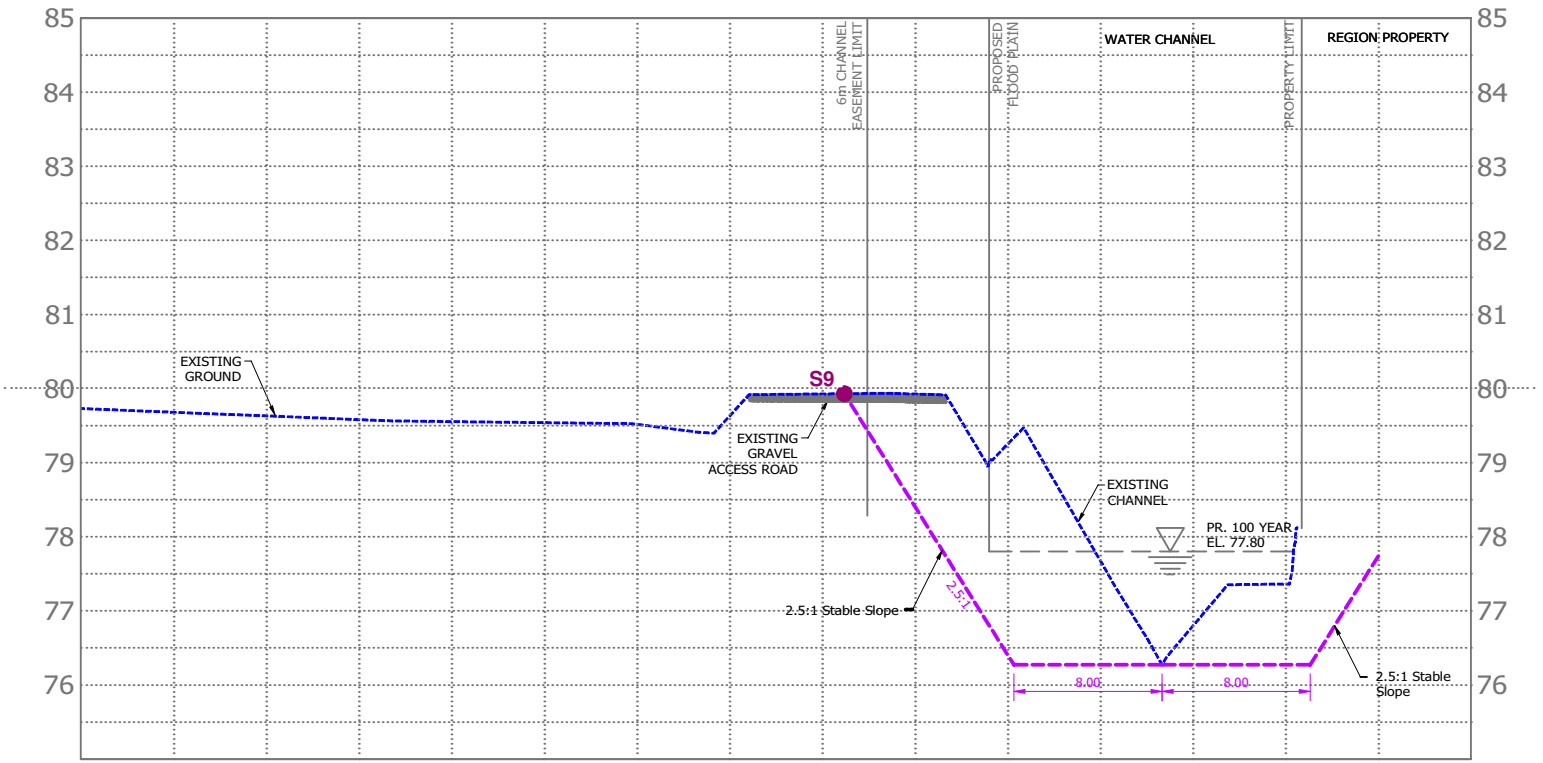

SECTION I-I
ALTERNATIVE
STA.0+087

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION I-I**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2020
Rev.	Scale:	Project No:	Figure No.
	As Shown	18-519-102	**10A**

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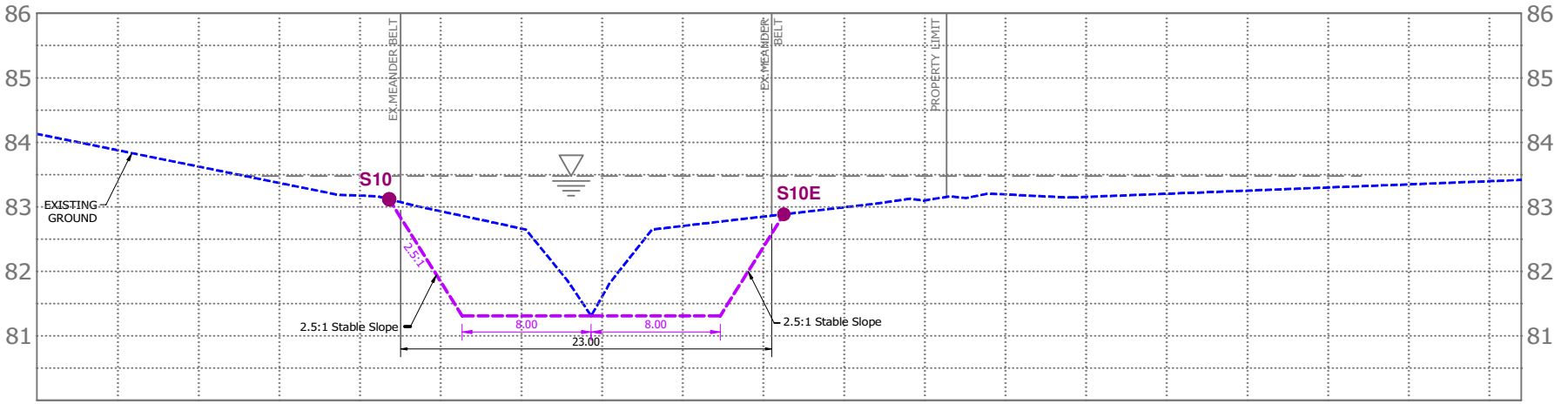

SECTION
J-J (1)

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION J-J**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2020
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. **11A**

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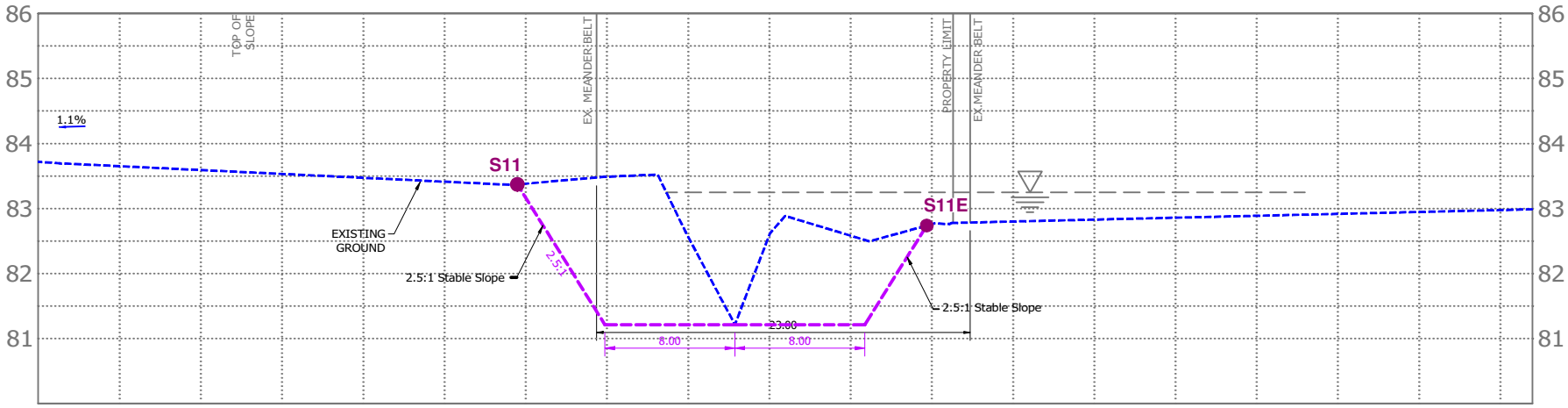

SECTION
K-K (1)

0 5 10m

Horizontal Scale

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Telephone: (905) 264-9393
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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION K-K**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2020
Rev.	Scale:	Project No:	Figure No.
	As Shown	18-519-102	**12A**

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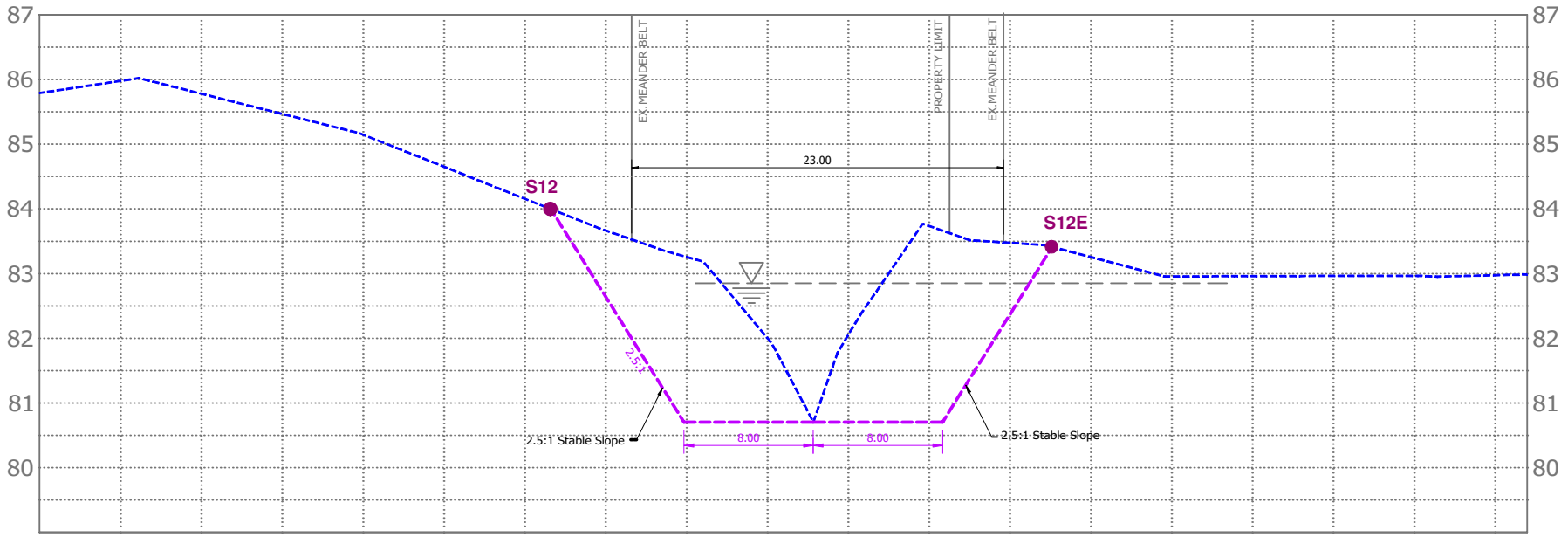

SECTION
L-L (1)

0 5 10m

Horizontal Scale

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6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION L-L**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2020
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. **13A**

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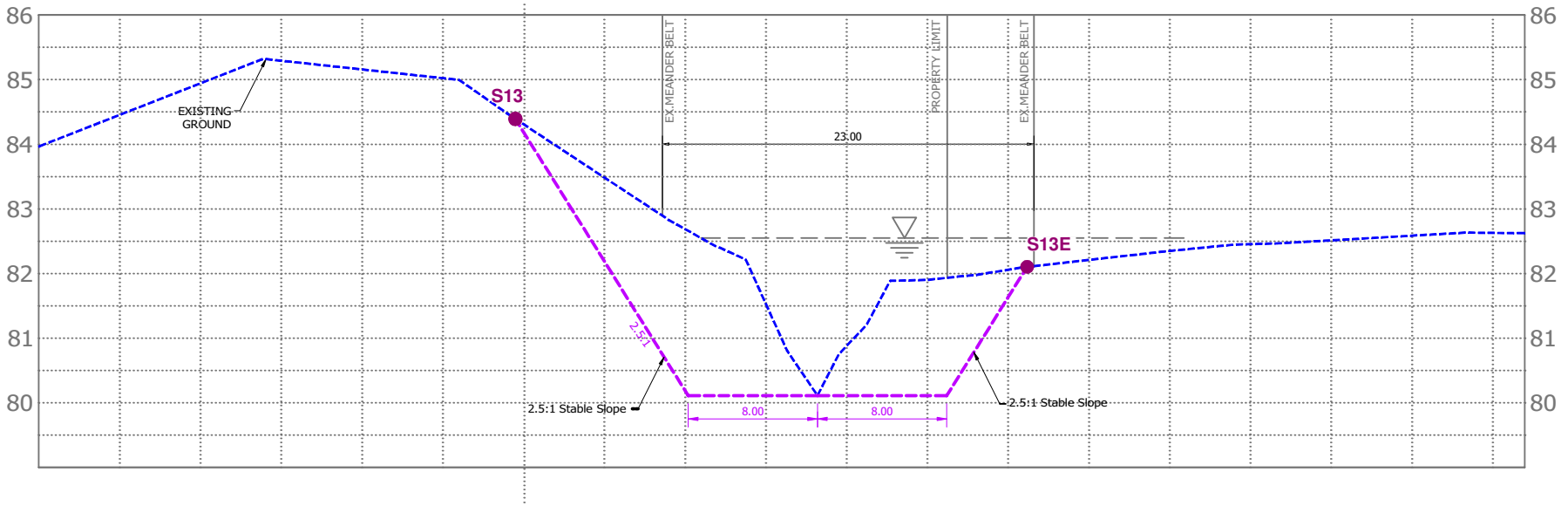

SECTION
M-M (1)

0 5 10m

Horizontal Scale

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Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION M-M**

Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	F.Z	S.Y	July 2020
Rev.	Scale:	Project No:	Figure No.
	As Shown	18-519-102	**14A**

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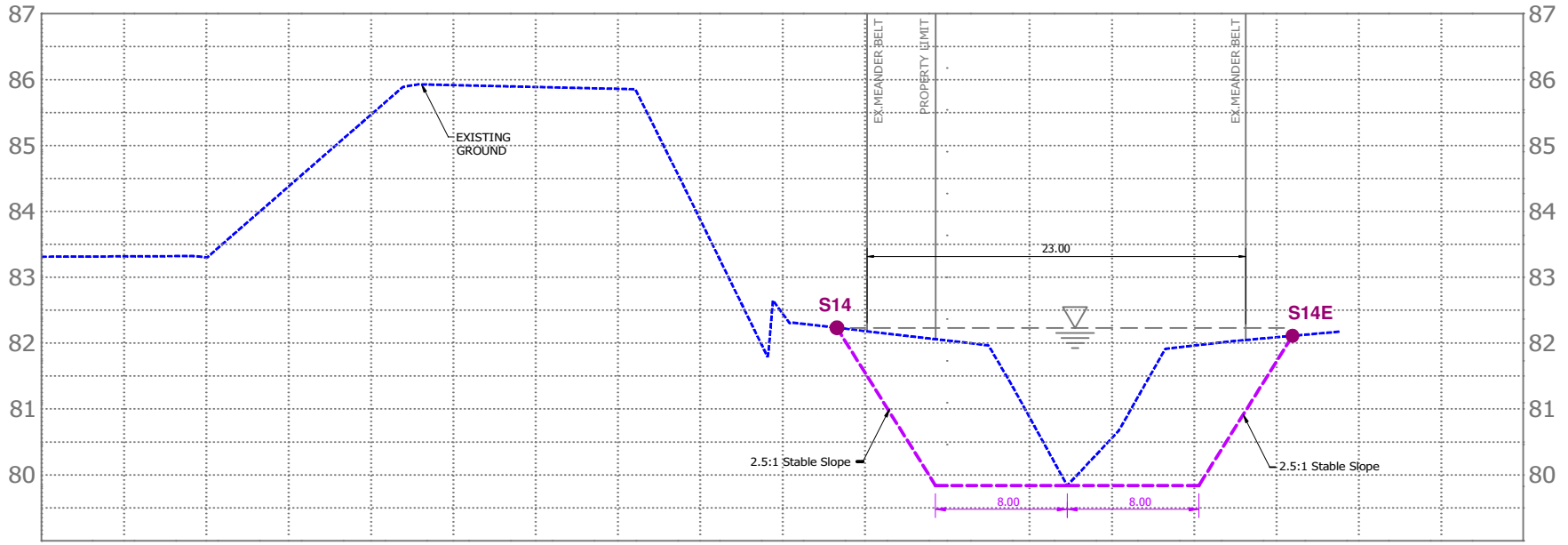

SECTION
N-N

0 5 10m

Horizontal Scale

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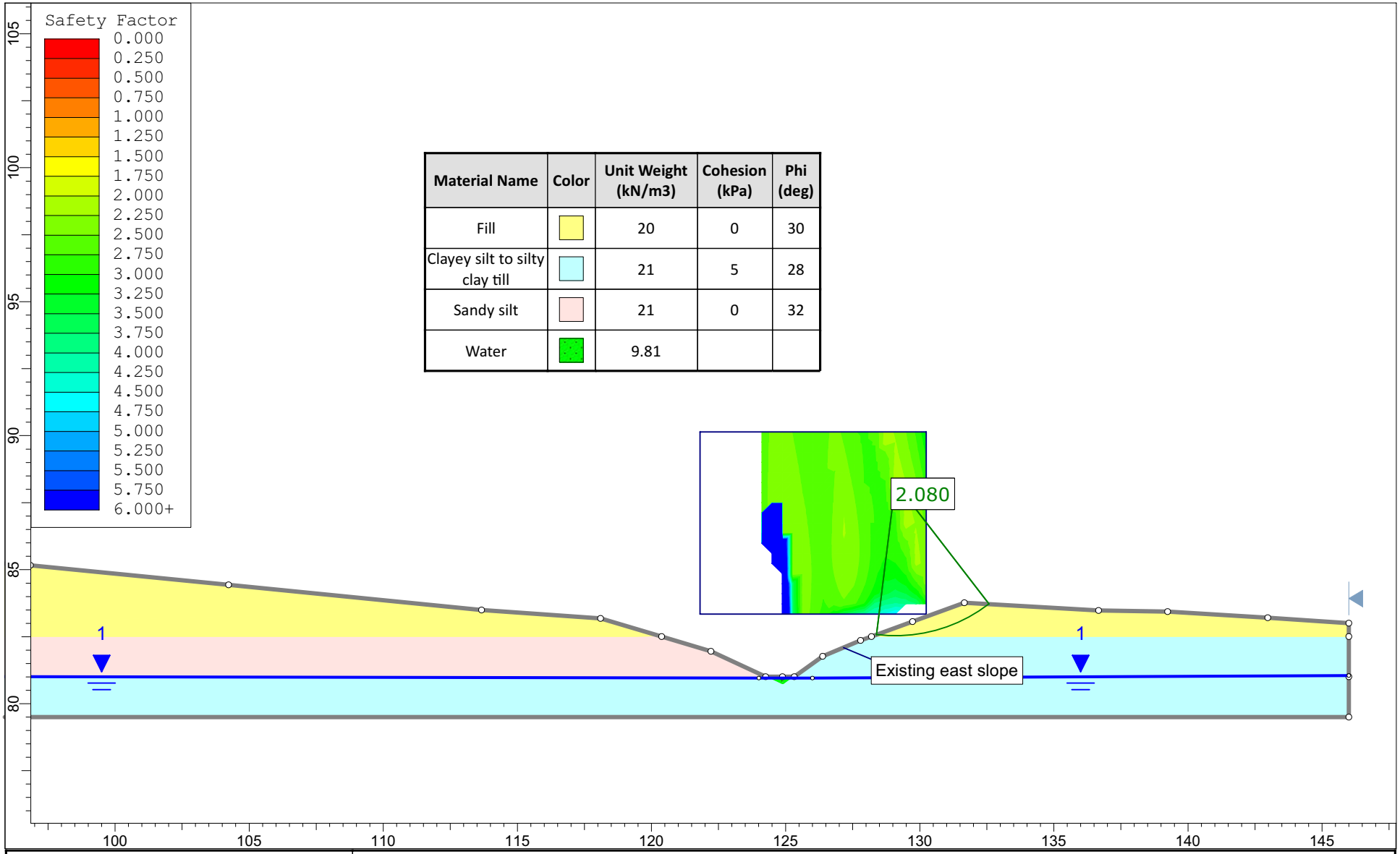
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE AT SECTION N-N**

Client:	Size:	Approved By:	Drawn By:	Date:
LAKEVIEW COMMUNITY PARTNERS LIMITED	8.5 x 11	F.Z	S.Y	July 2020
	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. **15A**

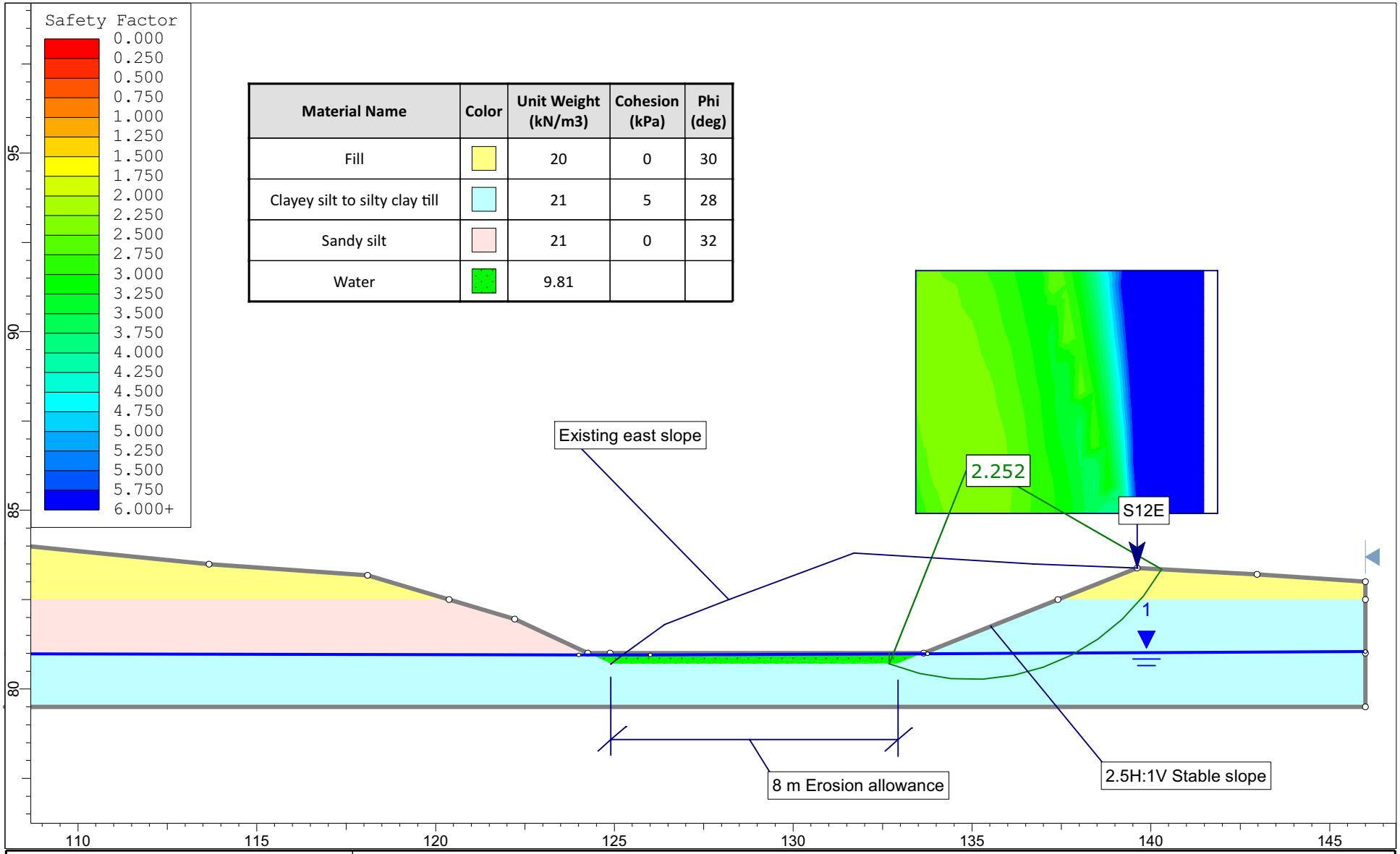


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Clayey silt to silty clay till		21	5	28
Sandy silt		21	0	32
Water		9.81		

rocscience

SLIDEINTERPRET 8.024

Project	Slope Stability of Serson Creek Bank Slopes		
Analysis Description	Existing East Slope at Section L-L		
Drawn By	DS	*Scale* 1:200	*Company* DS Consultants Ltd.
Date	July 2020	*File Name*	Figure 16A - Existing East Slope at Section L-L.slmd



Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Clayey silt to silty clay till		21	5	28
Sandy silt		21	0	32
Water		9.81		

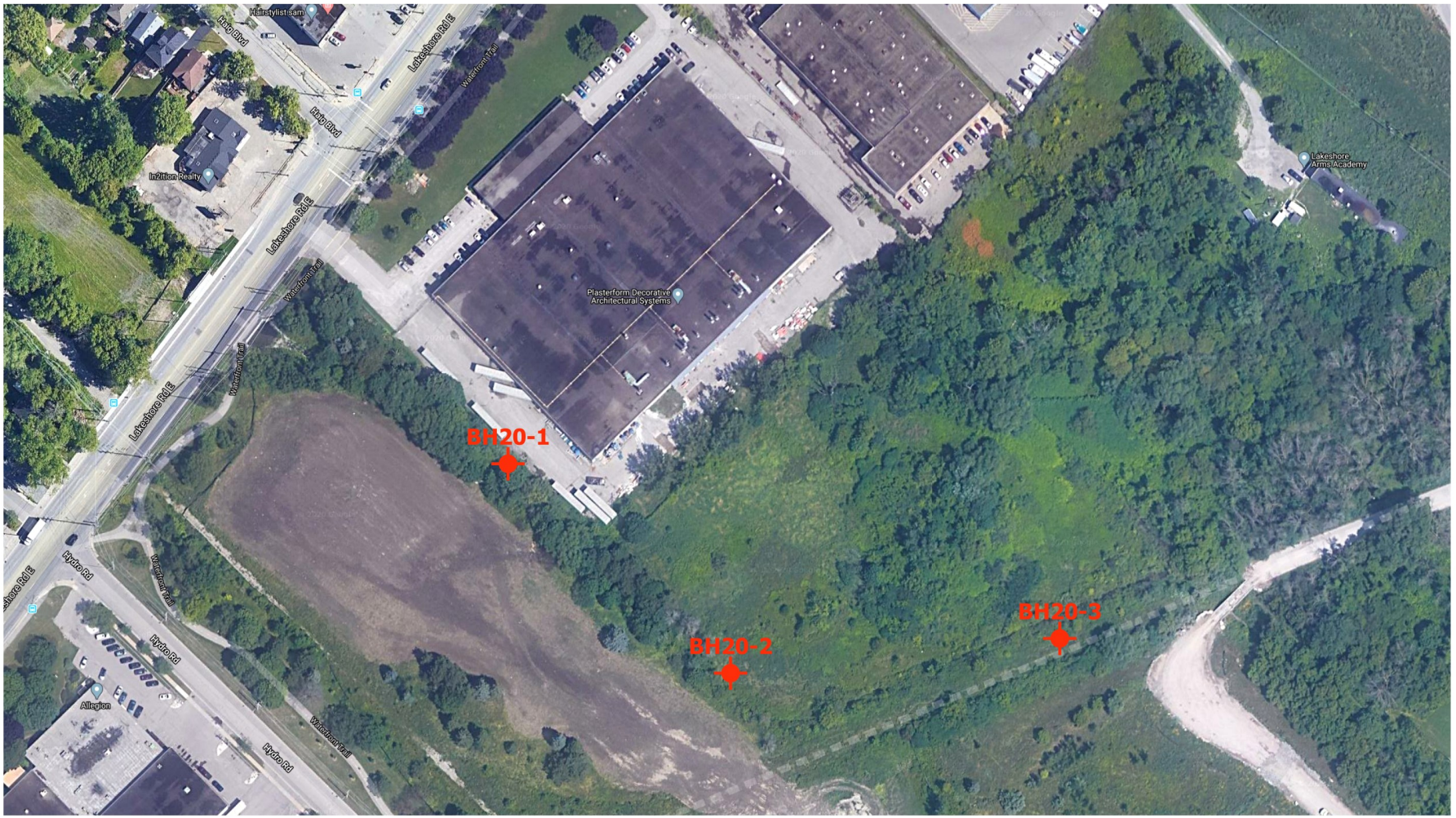
rocscience

SLIDEINTERPRET 8.024

Project	Slope Stability of Serson Creek Bank Slopes		
Analysis Description	Stable East Slope at Section L-L		
Drawn By	DS	*Scale* 1:150	*Company* DS Consultants Ltd.
Date	July 2020	*File Name*	Figure 17A - Stable East Slope at Section L-L.slmd

Appendix I

Location Plan and Logs of Boreholes by DS Consultants Ltd.



Legend

Borehole Location

DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: Geotechnical Investigation - Slope Stability at Serson Creek, ON

Title: **Borehole Location Plan**

Client: Lakeview Community Partners Limited

Size:	Approved By:	Drawn By:	Date:
8.5 x 11	FZ	MM	July, 2020
Rev: 0	Scale: As Shown	Project No.: 18-519-102	Figure No.: 1

Image/Map Source *Google Satellite Image*

DS CONSULTANTS LTD.
Geotechnical ❖ Environmental ❖ Materials ❖ Hydrogeology

LOG OF BOREHOLE BH20-1

PROJECT: Slope Stability at Serson Creek
CLIENT: Lakeview Community Partners Limited
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4826107.86 E 616676.52

DRILLING DATA
Method: Manual SPT
Diameter: 50 mm
Date: Jun/30/2020

REF. NO.: 18-519-102
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS/0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
83.1 / 0.0	**TOPSOIL** 150mm						83					
83.0 / 0.2	**FILL:** clayey silt, trace topsoil, trace rootlets, brown, moist, stiff (possible weathered soil)		1	SPT	11				○			
82.3 / 0.8	**SILTY CLAY TILL:** some sand, trace gravel/ cobble, brown, moist, hard		2	SPT	44			Slotted pipe in sand	○			11 15 46 28
			3	SPT	62		81		○			
80.5 / 2.6	grey below 2.3m		4	SPT	50/150mm				○			
	END OF BOREHOLE:											

Notes:
1) Piezometer installed at 2.3m depth.
2) Water level Readings:

Date:	Water Depth (mbgs)
July 21, 2020	Dry

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ❖ Environmental ❖ Materials ❖ Hydrogeology

LOG OF BOREHOLE BH20-2

PROJECT: Slope Stability at Serson Creek
CLIENT: Lakeview Community Partners Limited
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4826031.43 E 616760.9

DRILLING DATA
Method: Manual SPT
Diameter: 50 mm
Date: Jul/07/2020

REF. NO.: 18-519-102
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION
82.0							
0.0 / 81.8	**TOPSOIL** 200mm						
0.2	**FILL:** clayey silt, trace gravel, trace topsoil/ organics, brown, moist, stiff (possible weathered soil)		1	SPT	9		
			2	SPT	13		81
80.5							Slotted pipe in sand
1.5	**SILTY CLAY TILL:** some sand, trace gravel/ cobble, sand seams, brown, moist, very stiff to hard		3	SPT	28		80
	grey below 2.3m		4	SPT	50/ 75		
79.5							
2.5	**END OF BOREHOLE:**						

Notes:
1) Piezometer installed at 2.3m depth.
2) Water level Readings:

Date:	Water Depth (mbgs)
July 21, 2020	Dry

DYNAMIC CONE PENETRATION RESISTANCE PLOT
20 40 60 80 100
SHEAR STRENGTH (kPa)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
20 40 60 80 100

PLASTIC LIMIT W_P — NATURAL MOISTURE CONTENT W — LIQUID LIMIT W_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

METHANE AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

DS CONSULTANTS LTD.
Geotechnical ❖ Environmental ❖ Materials ❖ Hydrogeology

LOG OF BOREHOLE BH20-3

PROJECT: Slope Stability at Serson Creek
CLIENT: Lakeview Community Partners Limited
PROJECT LOCATION: 800 Hydro Road, Mississauga, ON
DATUM: Geodetic
BOREHOLE LOCATION: See Drawing 1 N 4826046.48 E 616883.77

DRILLING DATA
Method: Manual SPT
Diameter: 50 mm
Date: Jul/07/2020

REF. NO.: 18-519-102
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS / 0.3 m "N"	GROUND WATER CONDITIONS	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT W_P / NATURAL MOISTURE CONTENT W / LIQUID LIMIT W_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	METHANE AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.1												
0.0 / 81.9	**TOPSOIL** 180mm						82					
0.2	**FILL:** clayey silt, trace gravel, trace limestone, trace topsoil, brown, moist, very stiff (possible weathered soil)		1	SPT	15							
							Slotted pipe in sand					
			2	SPT	15		81					
80.6												
1.5 / 80.2	**SILTY CLAY TILL:** some sand, trace gravel, sand seams, brown, moist, hard		3	SPT	50/ 200mm							3 11 49 37
1.9	**END OF BOREHOLE:**											

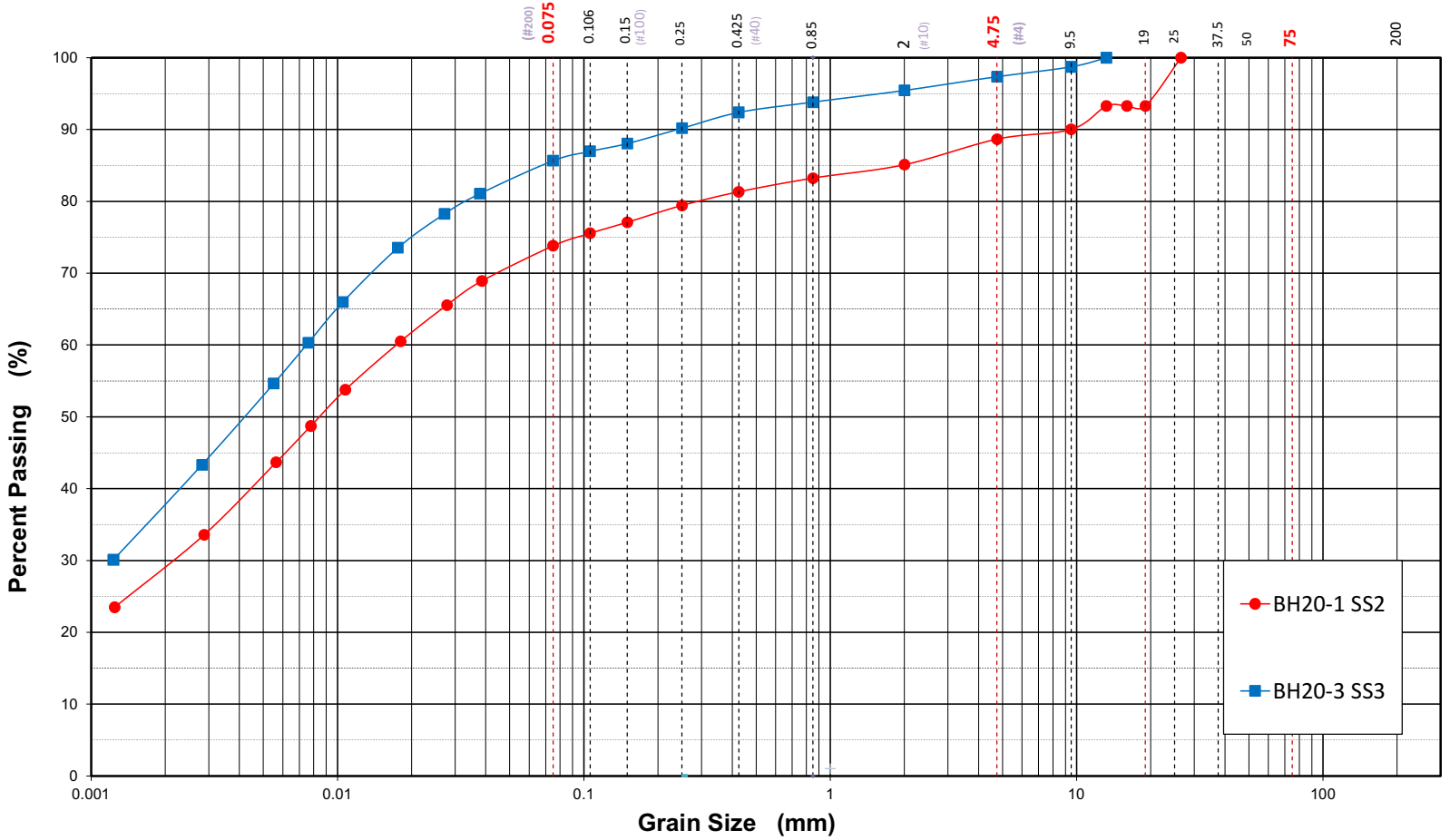
Notes:
1) Piezometer installed at 1.5m depth.
2) Water level Readings:

Date:	Water Depth (mbgs)
July 21, 2020	Dry

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

Particle Size Distribution (ASTM-D421/D422)



Silt and Clay		Sand			Gravel		Cobble +
Clay	Silt	Fine	Medium	Coarse	Fine	Coarse	

DS CONSULTANTS LTD.
6221 Highway 7, Unit 16
Vaughan, Ontario, L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project	**Serson Creek Slope Stability**	Project No	**18-519-102**
Location	**800 Hydro Road**	Date	**Jul/16/2020**
Client	**Lakeview Community Partners Limited**	Encl. No	5

Appendix II

Location Plan and Logs of Previous Boreholes by WSP

Legend:

- Previous WSP Borehole
- Previous WSP Borehole with Monitoring Well
- Current WSP Borehole
- Current WSP Borehole with Monitoring Well

Client:	CIMA			Project No.: 171-16737-00	Drawing No.: 1
Drawn: TJ		Approved: LC		Title: BOREHOLE LOCATION PLAN	
Date: APRIL, 2018		Scale: As shown		Project: GEOTECHNICAL INVESTIGATION - G. E. Booth (Lakeview) WWTP - Watermain Extension, Mississauga, ON	
Original Size: Tabloid		Rev: N/A		51 Constellation Court Toronto, Ontario M9W 1K4	

T:\Geotech\171 WSP Projects\171-16737-00 GE Booth WTP\Drawings\171-16737-00 Borehole Location Plan-2018-04-03.dwg

WSP

LOG OF BOREHOLE BH16-1

PROJECT: Geotechnical Investigation - GE Booth WWTP

CLIENT: Region of Peel

PROJECT LOCATION: 1300 Lakeshore Road E, Mississauga, ON

DATUM: Geodetic

BH LOCATION: N 4825675 E 617129

Method: Solid Stem Auger

Diameter: 115mm

Date: Oct/24/2016

REF. NO.: 161-14544-00

ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE "N" BLOW / 0.3 m	GROUND WATER CONDITION	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARK AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
79.5	Ground Surface											
79.4	**ASPHALT:** 100 mm											
79.2	**GRANULAR:** 180 mm (sand and gravel)		1	S	29		79		○			
0.3												
78.7	**FILL:** sand, some silt, some gravel, brown, moist, compact											
0.8			2	S	29				○			
1	**FILL:** clayey silt to silty clay, some sand, trace to some gravel, brown to grey, moist, firm to hard						78					
	some gravel above 1.5 m											
	trace organics below 1.5 m		3	S	6				○			
2												
	inferred cobble/boulder		4	S	50/ 50mm		77		○			
3												
76.4												
3.1	**SANDY SILT:** trace clay, contains sand layers, brown, moist to wet, very dense		5	S	54		76		○			0 38 54 8
4												
74.9												
4.6	**SANDY SILT TILL:** trace clay, trace gravel, occasional cobble/boulder, grey, moist, very dense		6	S	50/ 125mm		75		○			
5	wet below 5.2 m											
6							74					
			7	S	50/ 25mm				○			
7							73					
71.9							72					
7.6	**END OF THE BOREHOLE**											

Note:
1) Water level was at 5.2 m during drilling.

GROUNDWATER ELEVATION

Measurement 1st 2nd 3rd 4th

GRAPH NOTE $+^3$, $\times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH16-2

PROJECT: Geotechnical Investigation - GE Booth WWTP

CLIENT: Region of Peel

PROJECT LOCATION: 1300 Lakeshore Road E, Mississauga, ON

DATUM: Geodetic

BH LOCATION: N 4825731 E 617094

Method: Hollow Stem Auger

Diameter: 203mm

Date: Oct/24/2016

REF. NO.: 161-14544-00

ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOW 0.3 m "N"	GROUND WATER CONDITION	ELEVATION
80.1	Ground Surface					80
80.0	**ASPHALT:** 80 mm					
79.9 / 0.2	**GRANULAR:** 150 mm (sand and gravel)	1	S	12		
	FILL: clayey silt, some sand, trace gravel, trace organics, brown to grey, moist, firm to very stiff	2	S	9		79
		3	S	7		78
77.8 / 2.3	**CLAYEY SILT TILL:** some sand, trace gravel, brown, moist, very stiff	4	S	28		
77.0 / 3.1	**SANDY SILT TILL:** trace clay, some gravel, occasional cobble/boulder, brown, moist, very dense	5	S	50/ 100mm		77
	grey below 4.6 m	6	S	50/ 150mm	W. L. 75.1 m Nov 03, 2016	76
74.0 / 6.1	**SILTY SAND:** trace clay, contains silt seams, grey, wet to saturated, dense	7	S	34		74
72.5 / 7.6	**SAND:** coarse, some silt, trace clay, trace gravel, embedded layers of silty sand till, grey, wet, very dense	8	S	55		73
71.0 / 9.1	**GRAVELLY SAND:** trace silt, trace clay, grey, saturated, dense	9	S	45		72
69.4 / 10.7	**SANDY SILT TILL:** trace clay, some gravel, sand seams/layers, grey, moist, very dense	10	S	50/ 50mm		71
						70
						69

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARK AND GRAIN SIZE DISTRIBUTION (%)

GR	SA	SI	CL
7	77	12	4

Continued Next Page

GROUNDWATER ELEVATION

Measurement 1st 2nd 3rd 4th

GRAPH NOTE: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH16-2

PROJECT: Geotechnical Investigation - GE Booth WWTP

CLIENT: Region of Peel

PROJECT LOCATION: 1300 Lakeshore Road E, Mississauga, ON

DATUM: Geodetic

BH LOCATION: N 4825731 E 617094

Method: Hollow Stem Auger

Diameter: 203mm

Date: Oct/24/2016

REF. NO.: 161-14544-00

ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE "N" BLOW / 0.3 m	GROUND WATER CONDITION	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARK AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
	Continued											
67.9							68					
12.2 67.7	**SILTY SAND TILL:** gravelly, trace clay, grey, wet, very dense		11	S	50/ (75mm)				○			
12.4	**END OF THE BOREHOLE**											

Note:
1) 50 mm monitoring well was installed upon completion of drilling.
2) Water Level Readings:

Date	W.L.Depth (m)
November 1, 2016	5.0
November 3, 2016	5.0

GROUNDWATER ELEVATION
Measurement 1st ▽ 2nd ▼ 3rd ▼ 4th ▼

GRAPH NOTE: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH16-3

PROJECT: Geotechnical Investigation - GE Booth WWTP

CLIENT: Region of Peel

PROJECT LOCATION: 1300 Lakeshore Road E, Mississauga, ON

DATUM: Geodetic

BH LOCATION: N 4825803 E 617009

Method: Hollow Stem Auger

Diameter: 203mm

Date: Oct/20/2016

REF. NO.: 161-14544-00

ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	"N" BLOW / 0.3 m
81.0	Ground Surface			
80.9 / 0.1	**TOPSOIL:** 100 mm			
	FILL: sand and gravel, trace topsoil, trace rootlets, brown, moist, compact	1	S	19
80.2 / 0.8	**FILL:** clayey silt, sandy, trace gravel, trace organics, brown, moist, very stiff	2	S	17
79.8 / 1.2	**CLAYEY SILT:** trace sand, contains silt seams, brown, moist, very stiff to hard	3	S	36
78.7 / 2.3	**CLAYEY SILT TILL:** some sand, trace gravel, occasional cobble/boulder, brown, moist, hard	4	S	39
77.8 / 3.2	**SANDY SILT:** seams of clayey silt, brown, moist to wet, very dense	5	S	56
		6	S	70
	grey, wet below 4.6 m	7	S	60
75.7 / 5.3	**SILTY SAND:** trace clay, trace gravel, grey, wet, very dense	8	S	57
74.9 / 6.1	**SAND:** trace silt, trace clay, seams of clayey silt, trace gravel, grey, wet, very dense	9	S	52
74.1 / 6.9	**SILTY SAND:** trace clay, grey, saturated, dense to very dense	10	S	46
	seams of clayey silt above 6.9 m	11	S	52
		12	S	55
71.9 / 9.1	**SILT:** some sand, trace clay, grey, saturated, very dense	13	S	55
71.3 / 9.7	**END OF THE BOREHOLE**			

Notes:
1) 50 mm monitoring well was installed upon completion of drilling.
2) Water Level Readings:

Date	W.L.Depth (m)
November 1, 2016	4.6
November 3, 2016	4.7

W. L. 76.4 m
Nov 03, 2016

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)

SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE

PLASTIC LIMIT w_P — NATURAL MOISTURE CONTENT w — LIQUID LIMIT w_L

WATER CONTENT (%) (10 20 30)

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

REMARK AND GRAIN SIZE DISTRIBUTION (%)

GR SA SI CL

GROUNDWATER ELEVATION

Measurement 1st 2nd 3rd 4th

GRAPH NOTE $+^3$, $\times^3$: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-1

PROJECT: Geotechnical Investigation - G. E. Booth (Lakeview) WWTP - Watermain Extension | REF. NO.: 171-16737-00
CLIENT: CIMA | Method: Solid Stem Auger | ENCL NO.: 1
PROJECT LOCATION: 1300 Lakeshore Road E, City of Mississauga, ON | Diameter: 150mm | ORIGINATED BY FO
DATUM: Geodetic | Date: Jan/19/2018 | COMPILED BY MW
BH LOCATION: See Borehole Location Plan N 4825834.795 E 617213.0793 | Eqipment: Pontil Drilling CME 75 (Track) | CHECKED BY LC

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE "N" BLOW / 0.3 m	GROUND WATER CONDITION	ELEVATION	DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100) / SHEAR STRENGTH (kPa) ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE (20 40 60 80 100)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%) (10 20 30)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARK AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
78.9	Ground Surface											
78.7 0.0	**TOPSOIL:** 150mm.											
0.2	**FILL:** silty clay, trace sand, trace rootlets, moist, stiff to har		1	S	14				○			
1 77.8			2	S	34		78		○			
1.1 77.5	**FILL:** sandy silt, some clay, brown, moist, dense											
1.4	**FILL:**silty clay, trace sand, trace gravel, brown, moist, very stiff		3	S	25				○			
2 76.3			4	S	24		77		○			
2.6	**SILTY CLAY TILL:** some sand, trace gravel, trace oxidized, grey , moist, very stiff											
3			5	S	17		76		○			9 10 56 25
75.1												
3.8 4	**SILTY CLAY TILL/SHALE COMPLEX:** some sand to sandy, trace gravel, contains boulder/cobbles and rock fregments/slabs, grey, moist, har		6	S	50/ 75mm		75		○			
			7	S	100/ 125mm		74		○			
5	boulder/cobble (inferred)		8	S	50/ 150mm				○			Spoon bouncing
6 72.6			9	S	50/ (50mm)		73		○			
6.3	**END OF BOREHOLE**											

Note:
1) Borehole was dry and caved in at 5.6m upon completion.

GROUNDWATER ELEVATION
Shallow/ Single Installation 1st ▽ 2nd ▼ Deep/Dual Installation 1st ▼ 2n ▼

GRAPH NOTE + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-2

PROJECT: Geotechnical Investigation - G. E. Booth (Lakeview) WWTP - Watermain Extension | REF. NO.: 171-16737-00
CLIENT: CIMA | Method: Solid Stem Auger | ENCL NO.: 2
PROJECT LOCATION: 1300 Lakeshore Road E, City of Mississauga, ON | Diameter: 150mm | ORIGINATED BY FO
DATUM: Geodetic | Date: Jan/19/2018 | COMPILED BY MW
BH LOCATION: See Borehole Location Plan N 4825807.268 E 617292.627 | Eqipment: Pontil Drilling CME 75 (Track) | CHECKED BY LC

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOW / 0.3 m	GROUND WATER CONDITION	ELEVATION	REMARK AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
78.7	Ground Surface							
78.6 / 0.1	**ASPHALT:** 100mm.							
78.4 / 0.4	**GRANULAR BASE/SUBBASE:** 270mm gravelly sand, trace silt, moist, very dense		1	S	50			
	FILL: clayey silt to silty clay, trace sand, moist, firm to stiff		2	S	11		78	
			3	S	7		77	
76.4 / 2.3	**SILTY CLAY:** trace sand, trace gravel, brown, moist, very stiff		4	S	16		76	0 1 76 23
			5	S	21		75	
74.9 / 3.8	**SILTY CLAY TILL:** some sand to sandy , trace gravel, grey, moist, har		6	S	50/ 125mm		74	
74.2 / 4.6	**SILTY CLAY TILL/SHALE COMPLEX:** some sand to sandy, trace gravel, contains boulder/cobbles and rock fregments/slabs, grey, moist, har		7	S	50/ 100mm		73	
			8	S	50/ 75mm			
72.4			9	S	50/ (75mm)			
6.3	**END OF BOREHOLE**							

Note:
1) Borehole was dry and caved in at 5.5m upon completion.

DYNAMIC CONE PENETRATION RESISTANCE PLOT (20 40 60 80 100)
SHEAR STRENGTH (kPa) (20 40 60 80 100)
○ UNCONFINED + FIELD VANE & Sensitivity
● QUICK TRIAXIAL × LAB VANE
PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%) (10 20 30)
POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATION
Shallow/ Single Installation 1st 2nd Deep/Dual Installation 1st 2n

GRAPH NOTE + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

LOG OF BOREHOLE BH17-4

PROJECT: Geotechnical Investigation - G. E. Booth (Lakeview) WWTP - Watermain Extension
REF. NO.: 171-16737-00
CLIENT: CIMA
Method: Solid Stem Auger
ENCL NO.: 4
PROJECT LOCATION: 1300 Lakeshore Road E, City of Mississauga, ON
Diameter: 150mm
ORIGINATED BY FO
DATUM: Geodetic
Date: Jan/19/2018
COMPILED BY MW
BH LOCATION: See Borehole Location Plan N 4826075.007 E 616967.0517
Eqipment: Pontil Drilling CME 75 (Track)
CHECKED BY LC

(m) ELEV / DEPTH	DESCRIPTION	NUMBER	TYPE	BLOW / 0.3 m "N"	GROUND WATER CONDITION	ELEVATION	REMARK AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
82.9	Ground Surface						
82.8 / 0.1	**ASPHALT:** 125mm.						
82.5 / 0.3	**GRANULAR BASE/SUBBASE:** sand and gravel, trace silt, moist, very dense	1	S	50		cement	
	FILL: sand, some gravel, trace silt, moist, very dense						
1		2	S	49		82	
81.5	boulder/cobble (inferred)						
1.4	**FILL:** silty clay, trace sand, trace rootlets, brown, moist, very stiff	3	S	17		81	Auger grinding at 1.35m
2						holeplug	
	trace sandy silt layers below 2.6m	4	S	26		80	
3							
79.5		5	S	22			
3.4 / 79.1	**SILTY CLAY:** trace sand, trace gravel, brown, moist, very stiff						
3.8	**SAND:** some silt to silty, trace clay, greyish brown, moist, dense to very dense	6	S	50		79	
4						san	
		7T	S	35		78	
5 77.9							
5.0 / 77.6	**SILTY CLAY:** trace sand, trace gravel, brown to grey , moist, har	7B	S				
5.3	**SILTY SAND TO SAND AND SILT:** trace clay, brown to grey, moist, dense to very dense	8T	S	50/ 275mm	▽		
	trace clayey silt layers from 5.6m to 5.8m	8B	S			W. L. 77.2 m Jan 31, 2018	
6						screen	
		9	S	50			0 51 46 3
7						76	
		10	S	30		san 5	
8 74.7							
8.2	**END OF BOREHOLE**						

Notes:
1) Borehole caved in at 7.5m upon completion.
2) 50mm monitoring well installe upon completion of drilling.
3) Water Level Readings:
Date W. L. Depth (m)
Jan 31, 2018 5.68m

DYNAMIC CONE PENETRATION RESISTANCE PLOT — 20 40 60 80 100

SHEAR STRENGTH (kPa) — ○ UNCONFINED ● QUICK TRIAXIAL + FIELD VANE & Sensitivity × LAB VANE — 20 40 60 80 100

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L

WATER CONTENT (%) — 10 20 30

POCKET PEN. (Cu) (kPa)

NATURAL UNIT WT (kN/m³)

GROUNDWATER ELEVATION
Shallow/ Single Installation 1st ▽ 2nd ▼ Deep/Dual Installation 1st ▼ 2n ▼

GRAPH NOTE + 3, × 3: Numbers refer to Sensitivity ○ ε=3% Strain at Failure

Appendix III

Site Photographs
(taken on July 20, 2020)

Photo 1: Creek and concrete culvert at Lakeshore Blvd (looking north - upstream)

Photo 2: Creek conditions at south of Lakeshore Blvd (looking south - downstream)

Photo 3: Top of slope area at BH20-1 (looking south)

Photo 4: Creek conditions near BH20-1 (looking south - downstream)

Photo 5: Top of slope conditions to north of Section L-L (looking north toward Lakeshore Blvd)

Photo 6: Creek conditions to north of Section L-L (looking northeast)

Photo 7: Top of slope area to north of Section M-M (looking northwest)

Photo 8: Top of slope conditions in area of and to west of Section N-N (looking east)

Photo 9: Creek conditions at west of Section N-N (looking west)

Photo 10: Creek conditions to east of Section N-N and to north of bridge (looking west)

Photo 11: Road Bridge to north of Section A-A (looking west)

Photo 12: Creek and east slope conditions in Reach S2 (looking south from road bridge)

Photo 13: Creek conditions to south of road bridge (looking north - upstream)

Photo 14: Creek and slope conditions to south of road bridge (looking south – downstream)

Photo 15: East slope near fence at north part of Reach S2 area (looing south - downstream)

Photo 16: Conditions to east of fence at north part of Reach S2 area (looing south)

Photo 17: Creek conditions at middle-north part of Reach S2 (looking north - upstream)

Photo 18: Creek conditions at middle-north part of Reach S2 (looking south - downstream)

Photo 19: East slope near fence at middle-north part of Reach S2 (looking north - upstream)

Photo 20: East slope near fence at middle-north part of Reach S2 (looking south - downstream)

Photo 21: East slope near fence at middle-south part of Reach S2 (looking north - upstream)

Photo 22: East slope near fence at middle-south part of Reach S2 (looking south - downstream)

Photo 23: Creek conditions at middle-south part of Reach S2 (looking north - upstream)

Photo 24: Creek conditions at middle-south part of Reach S2 (looking south - downstream)

Photo 25: East slope near fence at south part of Reach S2 (looking northeast)

Photo 26: Creek conditions at south part of Reach S2 (looking north - upstream)

Photo 27: South end of Reach S2 (looking southeast from west side of creek)

Photo 28: South part of Reach S2 (looking northeast from west side of creek)