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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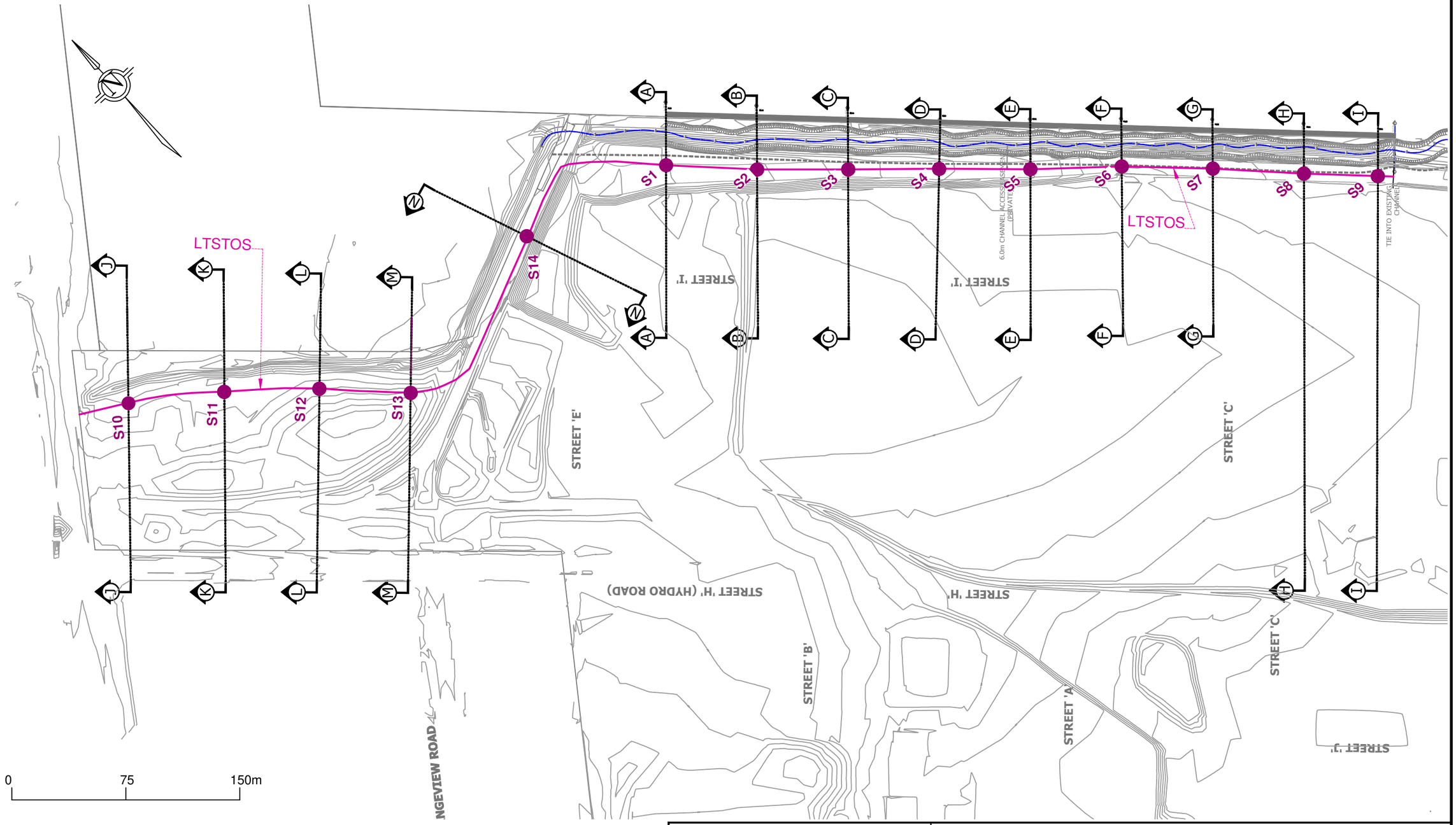
Figures



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

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Client: LAKEVIEW COMMUNITY PARTNERS LIMITED

Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

Title: **SLOPE PROFILE LOCATION PLAN**

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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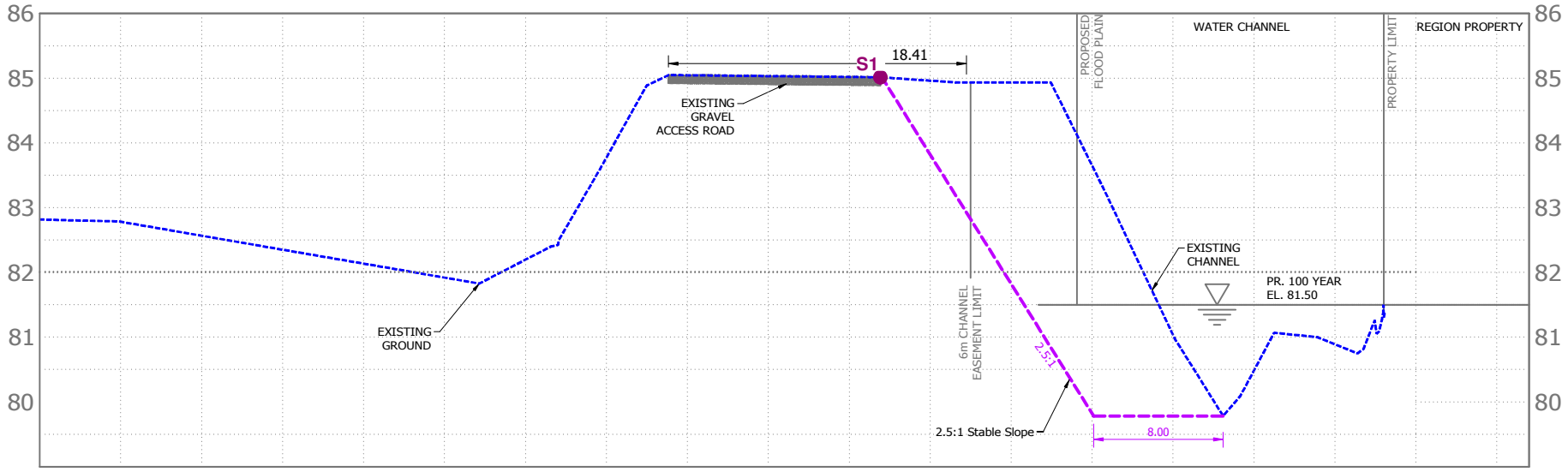

SECTION A-A
ALTERNATIVE
STA.0+087

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:
8.5 x 11	F.Z	S.Y	July 2019
Rev.	Scale:	Project No:	Figure No.
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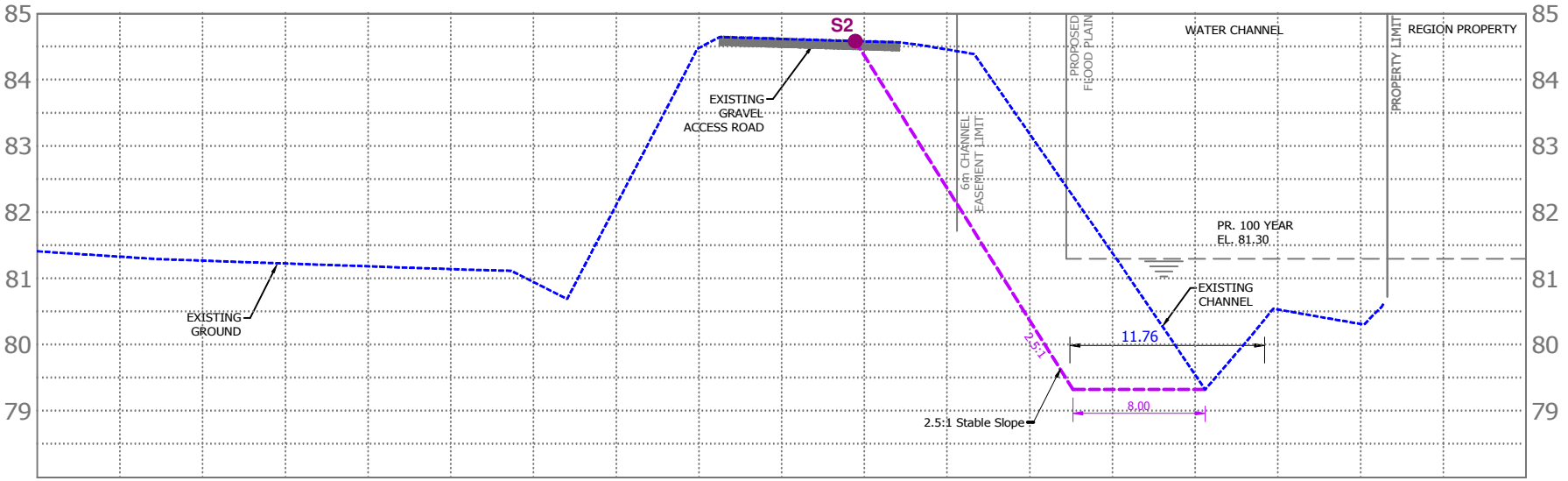

SECTION B-B
ALTERNATIVE
STA.0+147

0 5 10m

Horizontal Scale

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	Title: **SLOPE PROFILE AT SECTION B-B**			
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. **3**

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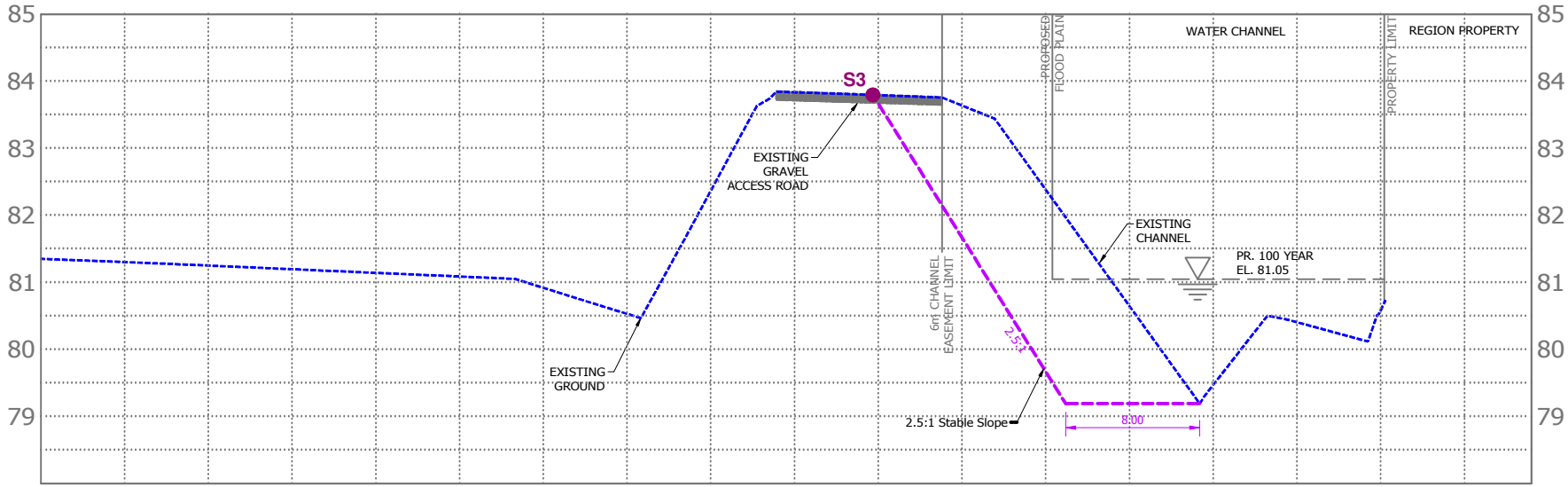

SECTION C-C
ALTERNATIVE
STA.0+207

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 2019
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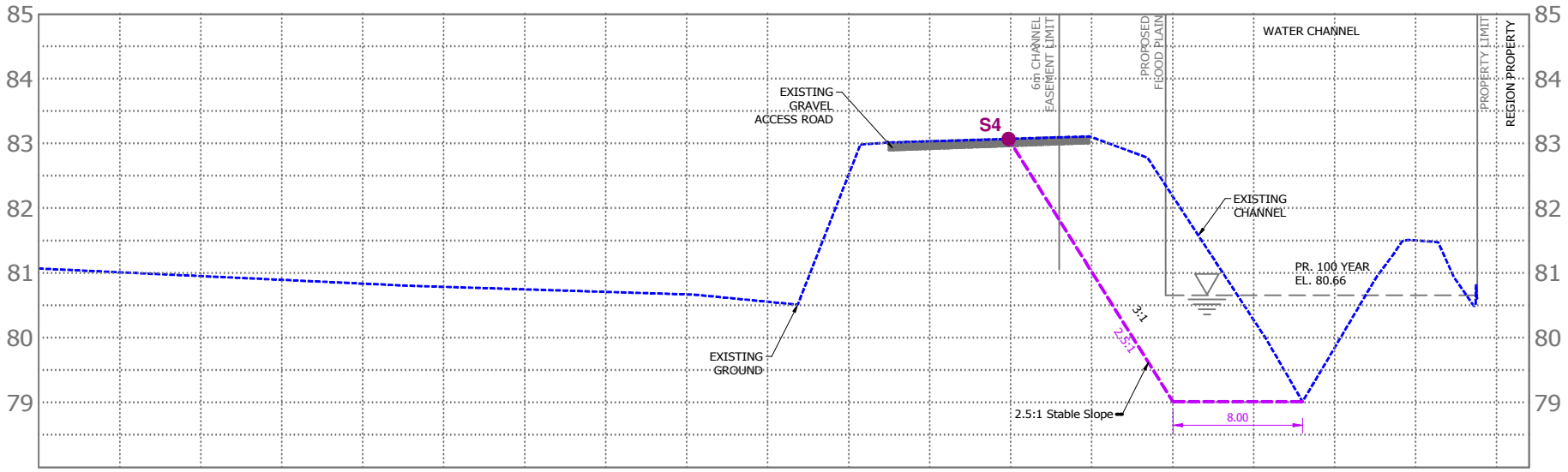

SECTION D-D
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Horizontal Scale

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

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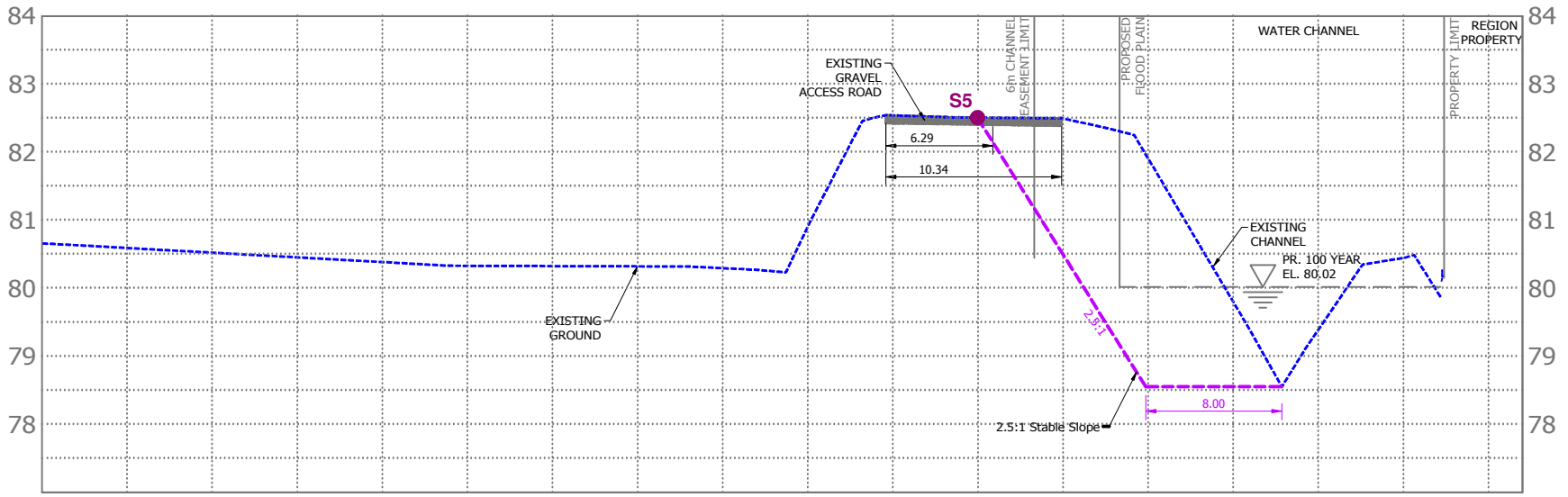

SECTION E-E
ALTERNATIVE
STA.0+328

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

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

Client:	Size:	Approved By:	Drawn By:	Date:
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	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. 6

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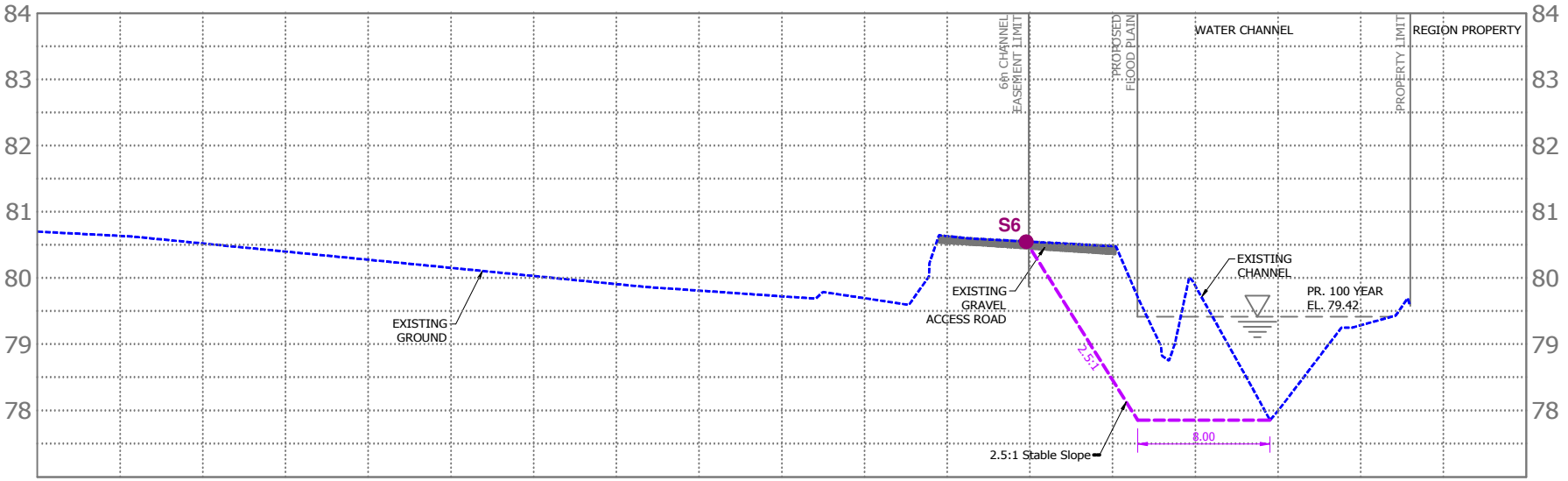

SECTION F-F
ALTERNATIVE
STA.0+389

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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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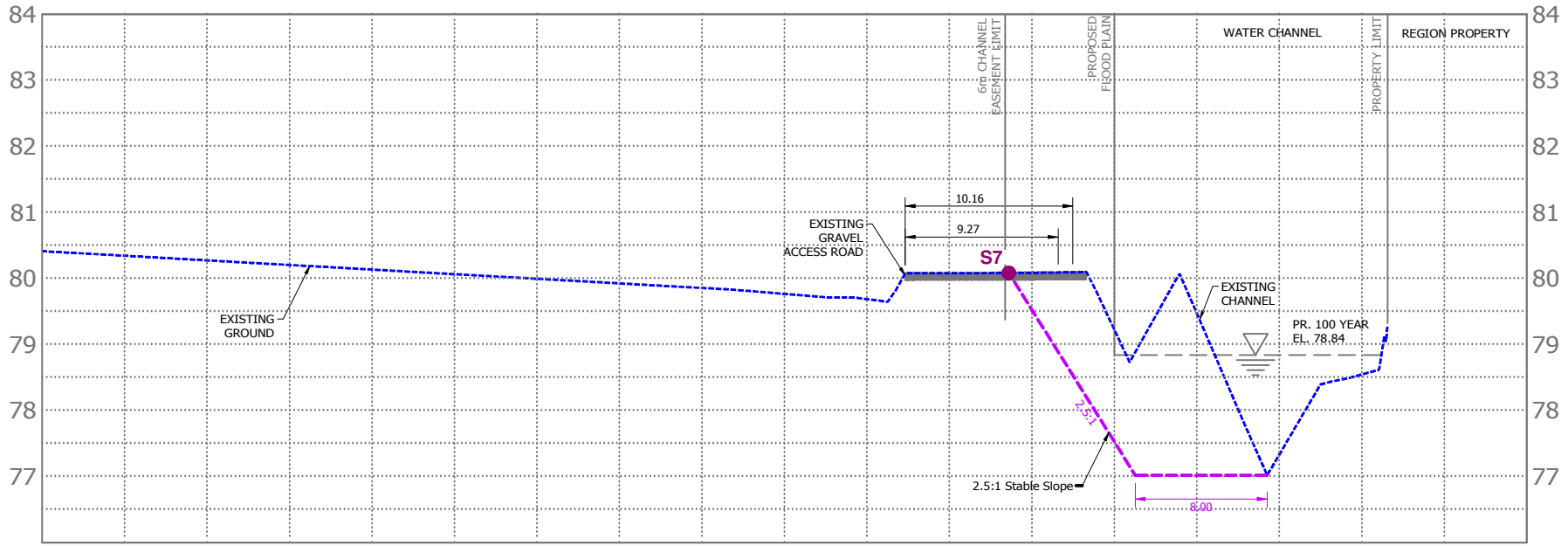

SECTION G-G
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STA.0+448

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Horizontal Scale

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

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	Rev.	Scale: As Shown	Project No: 18-519-102	Figure No. 8

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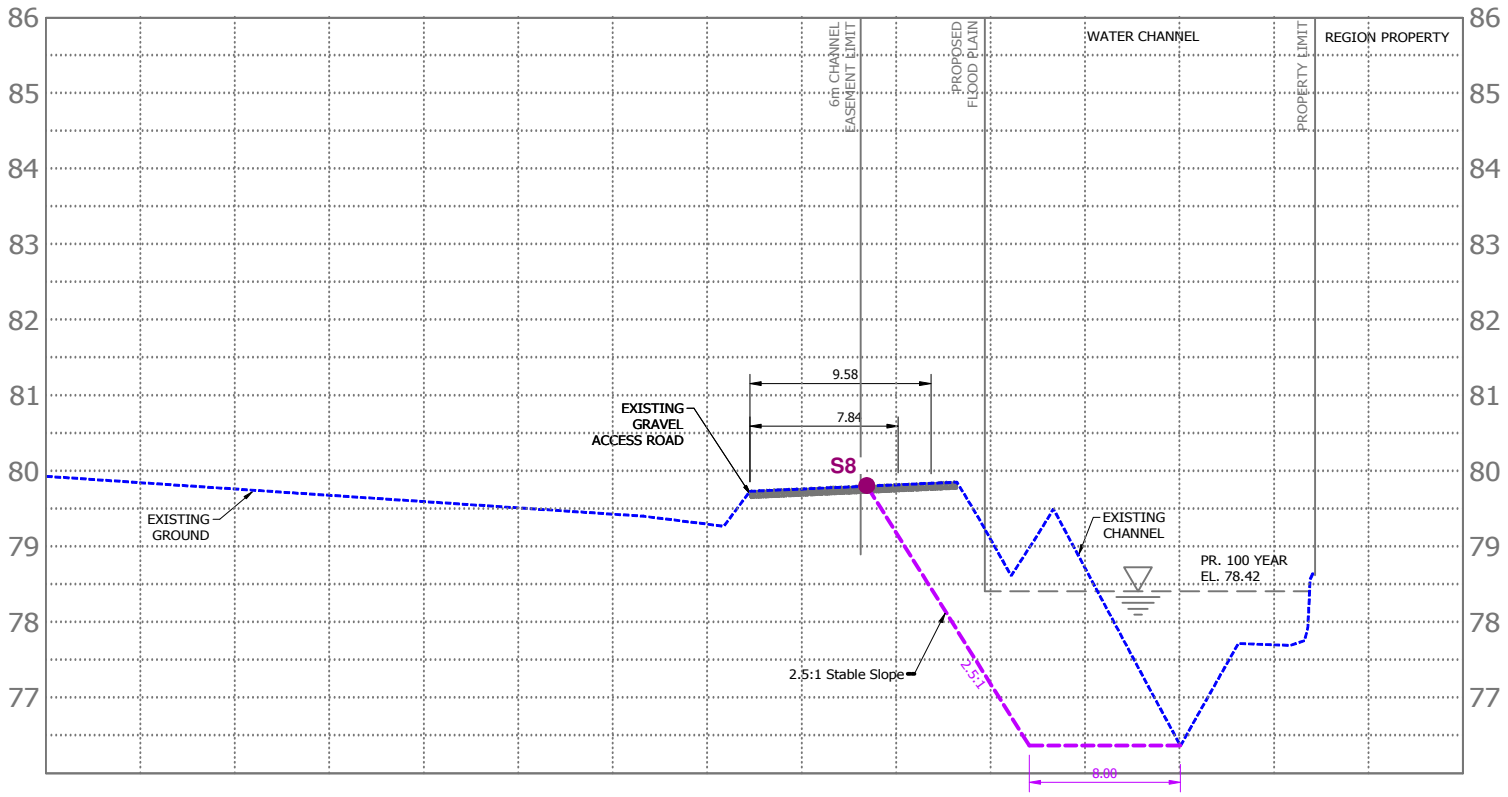

SECTION H-H
ALTERNATIVE
STA.0+510

0 5 10m

Horizontal Scale

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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 2019
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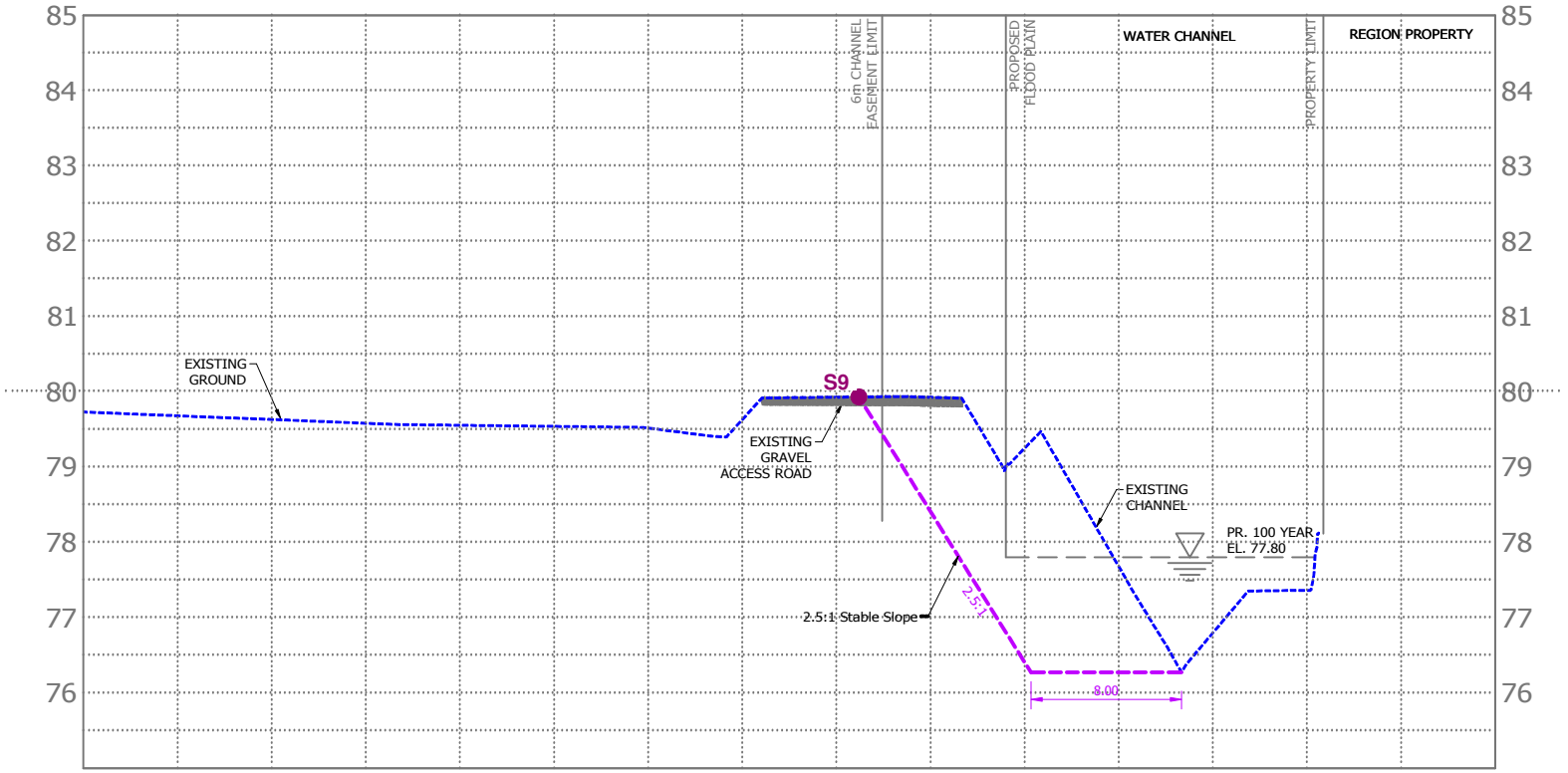

SECTION I-I
ALTERNATIVE
STA.0+087

0 5 10m

Horizontal Scale

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	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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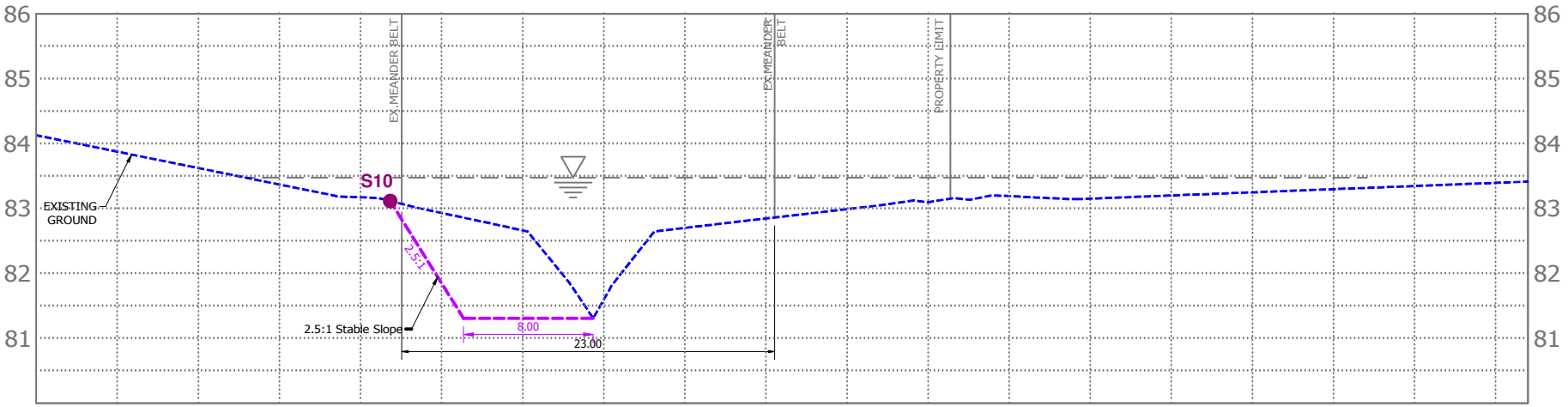

SECTION
J-J (1)

0 5 10m

Horizontal Scale

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Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

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

Client: 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.
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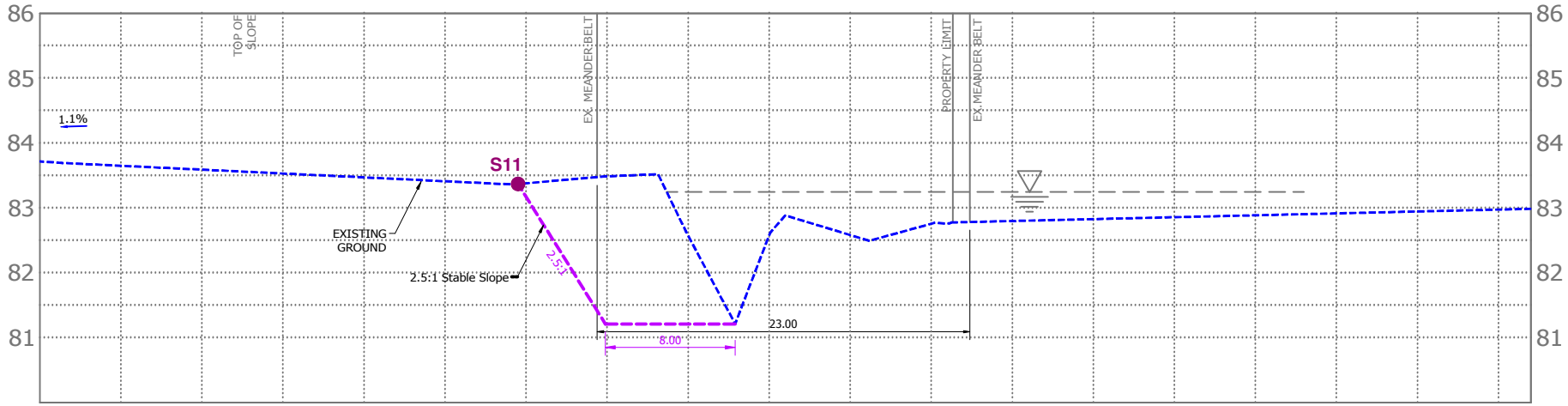

SECTION
K-K (1)

0 5 10m

Horizontal Scale

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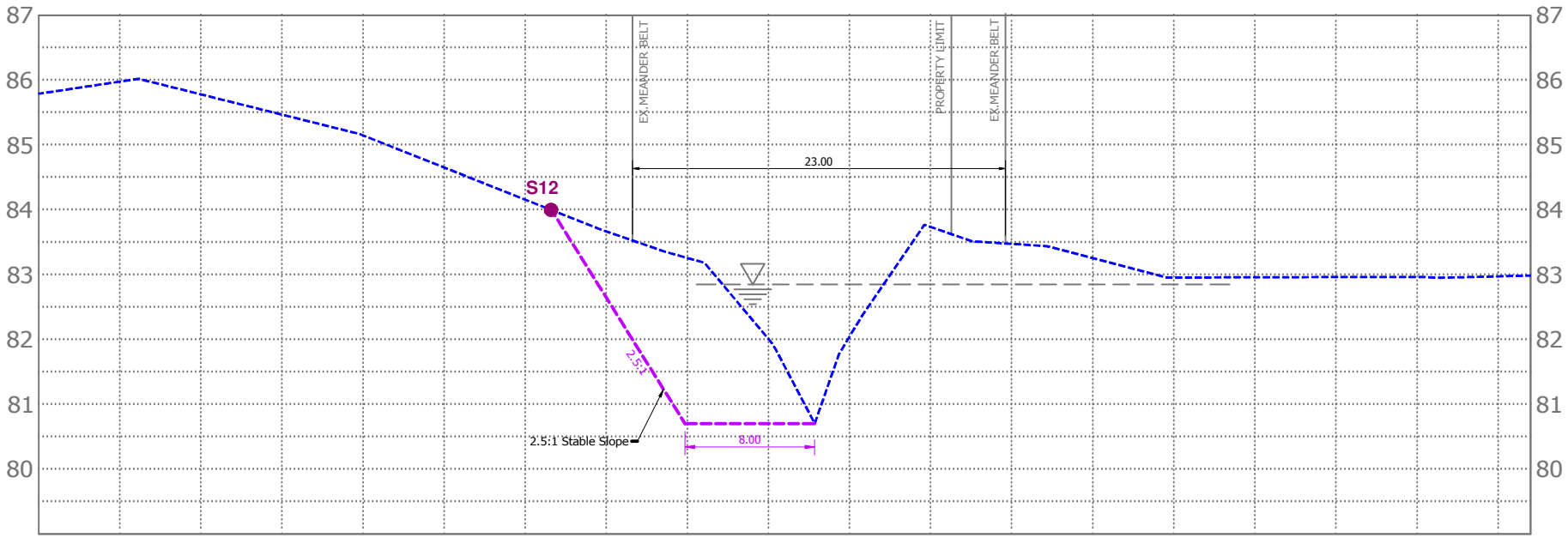
Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

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

Client:	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. 12

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
L-L (1)

0 5 10m

Horizontal Scale

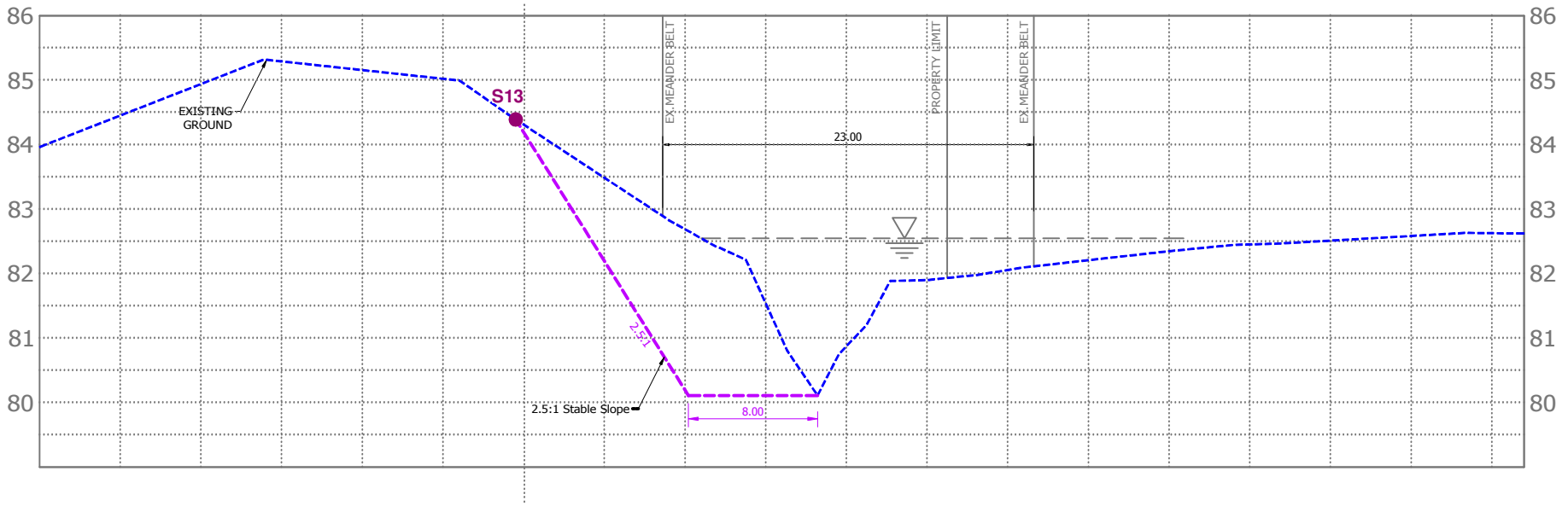
DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

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

Client:	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. 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

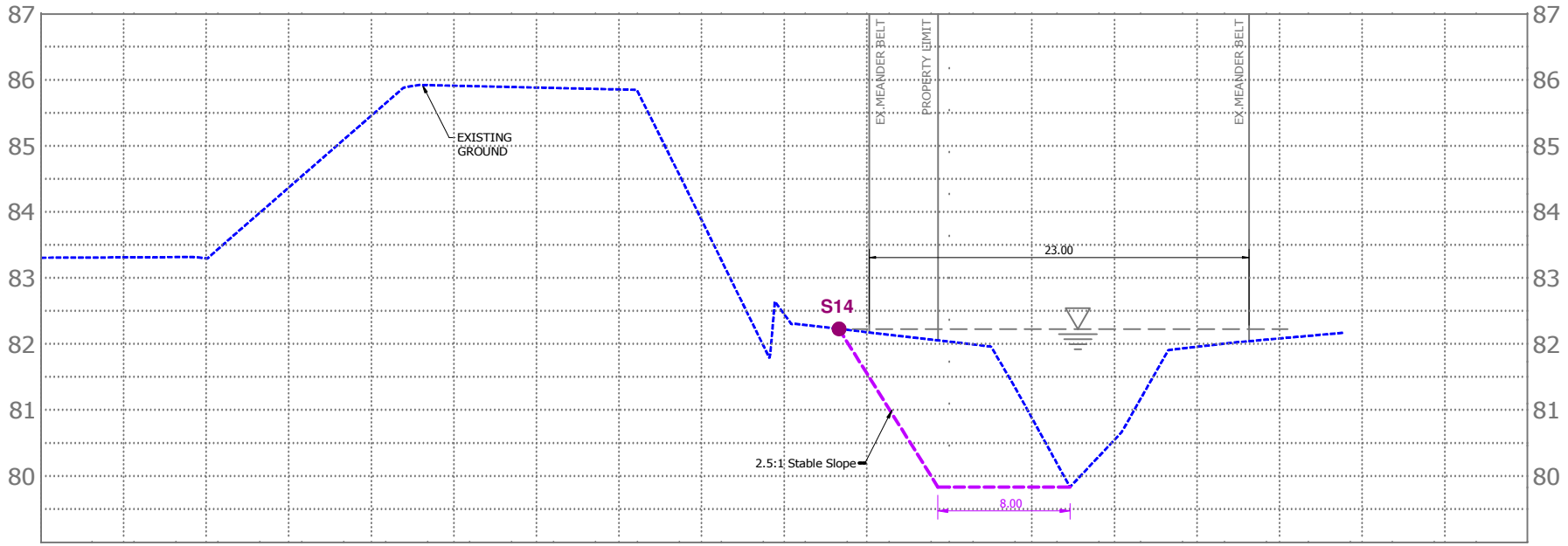
DS CONSULTANTS LTD.
6221 Highway 7, UNIT 16
Vaughan, Ontario L4H 0K8
Telephone: (905) 264-9393
www.dsconsultants.ca

Project: SERSON CREEK SLOPE STABILITY ASSESSMENT

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

Client:	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. **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

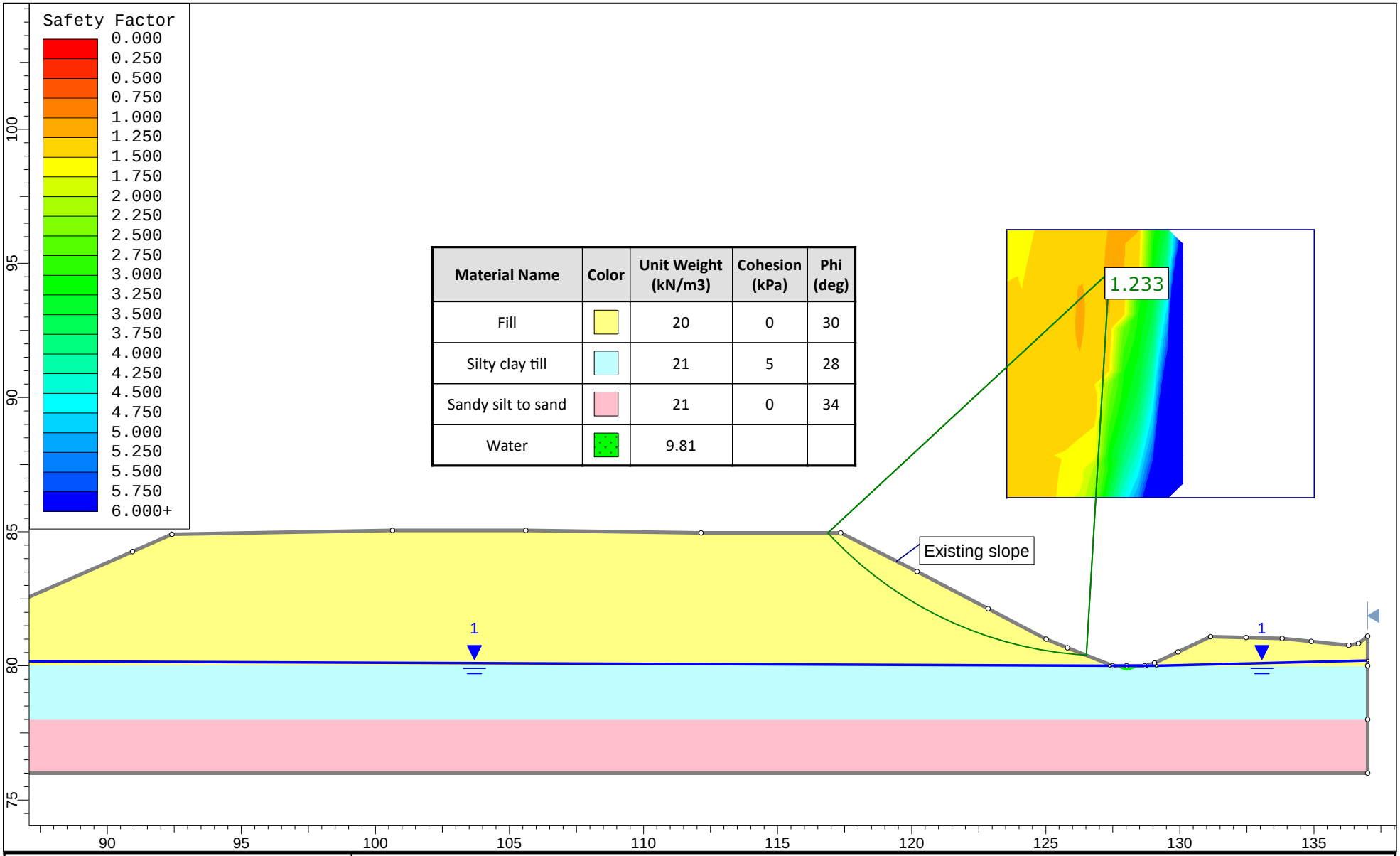
Horizontal Scale

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

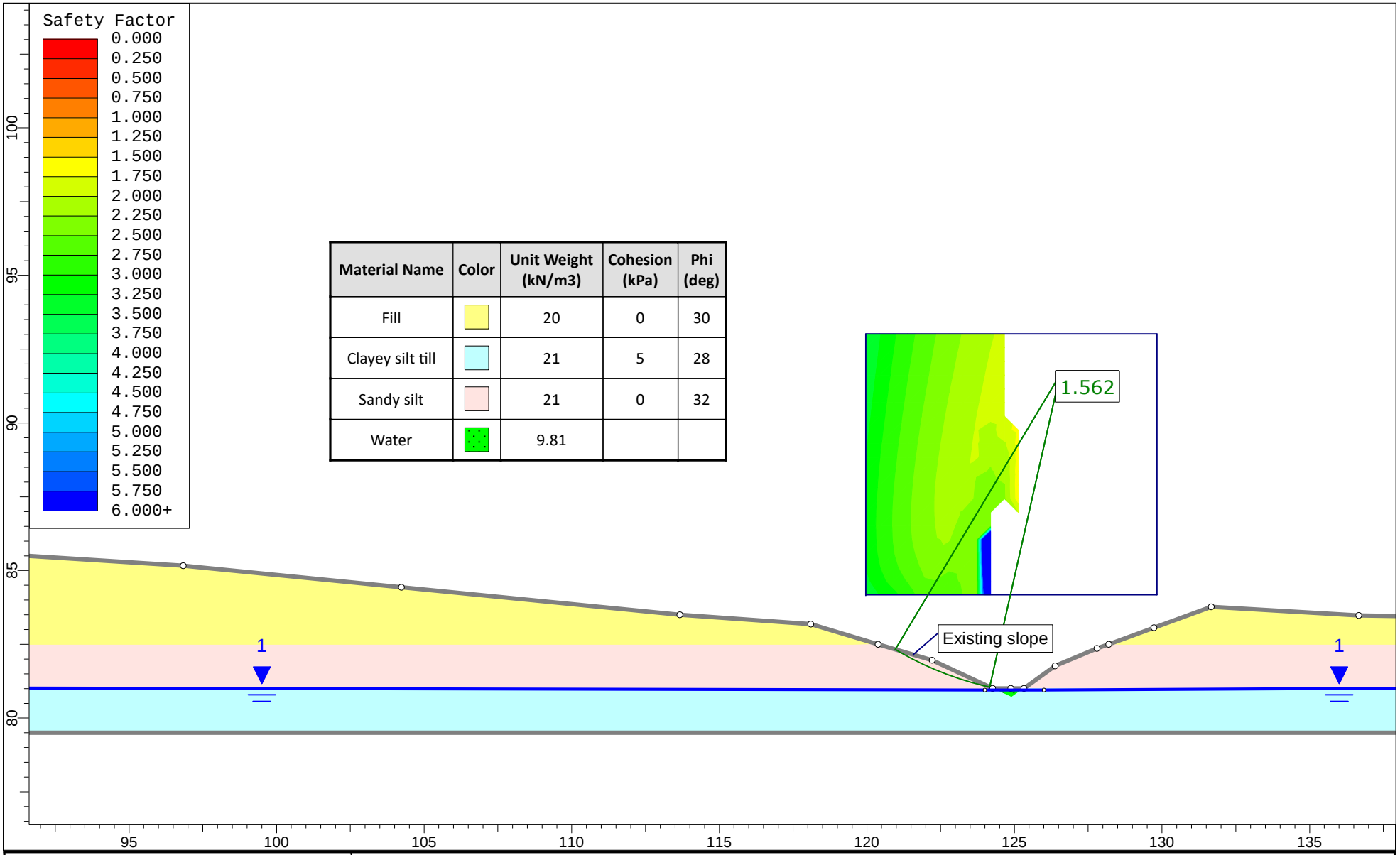


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Silty clay till		21	5	28
Sandy silt to sand		21	0	34
Water		9.81		

rocscience

SLIDEINTERPRET 8.024

Project	Slope Stability of Serson Creek Bank Slopes		
Analysis Description	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

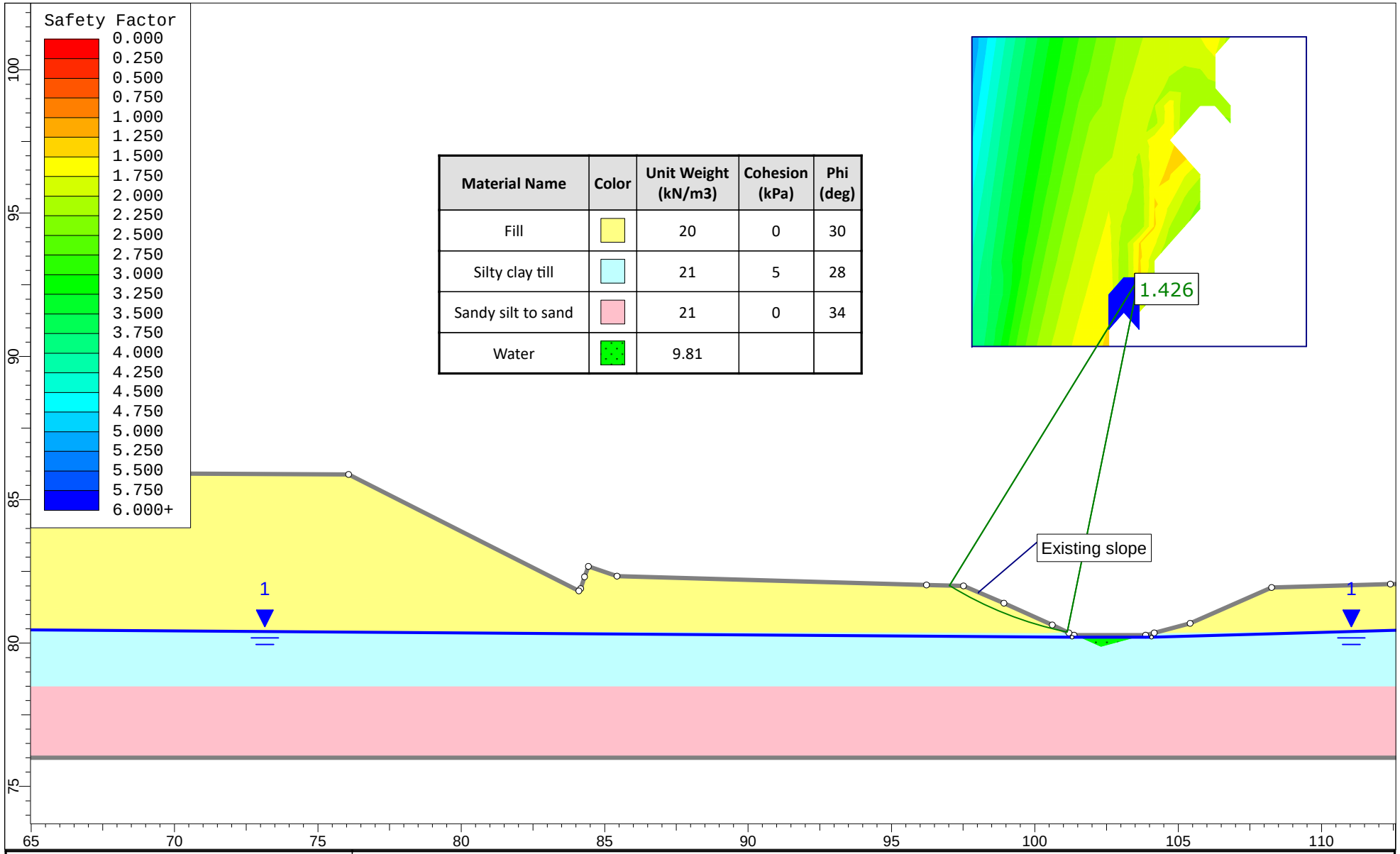


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Clayey silt till		21	5	28
Sandy silt		21	0	32
Water		9.81		

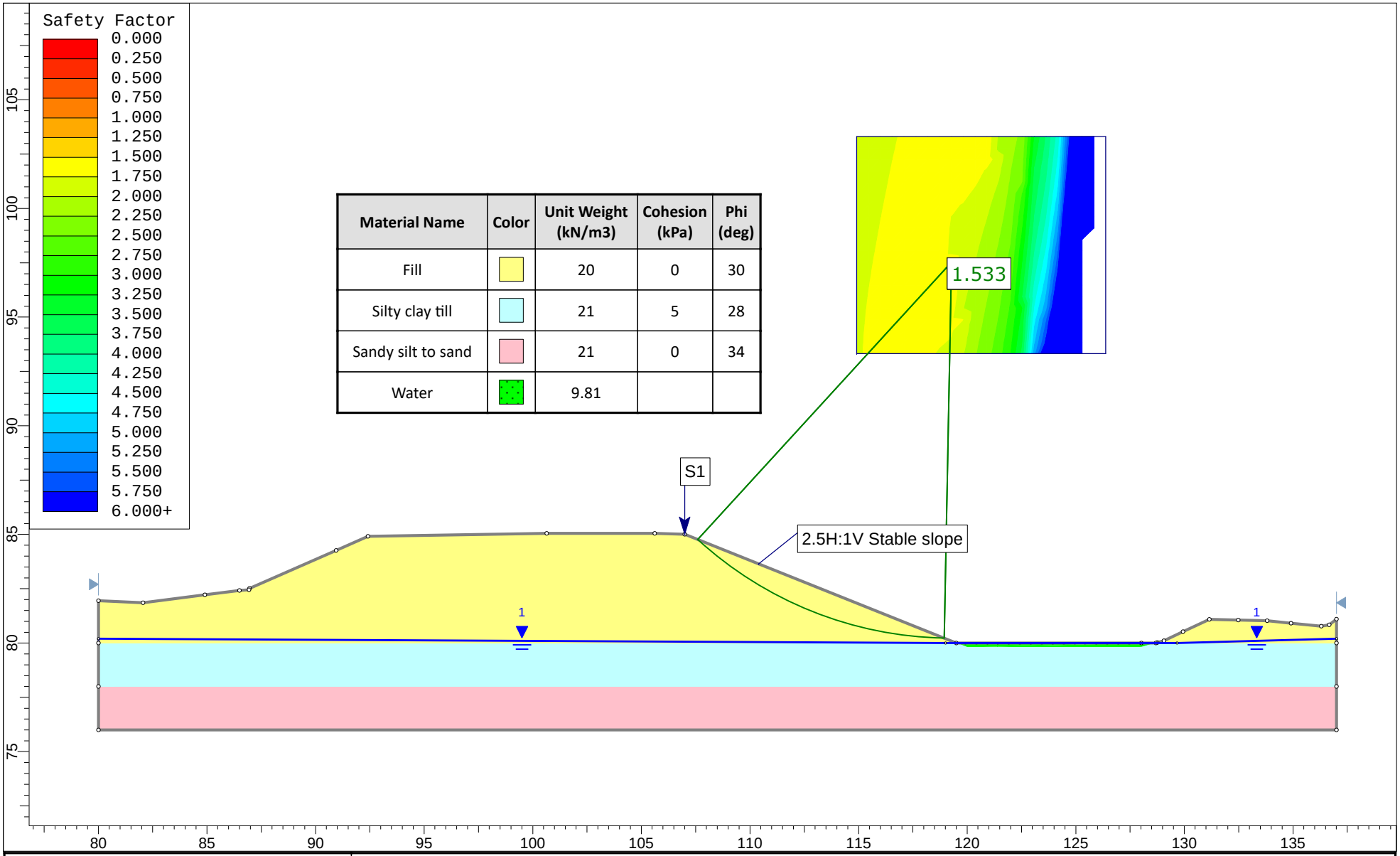
rocscience

SLIDEINTERPRET 8.024

Project	Slope Stability of Serson Creek Bank Slopes		
Analysis Description	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



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.
SLIDEINTERPRET 8.024	Date	July 2019		File Name Figure 18 - Existing South Bank at Section N-N.slmd

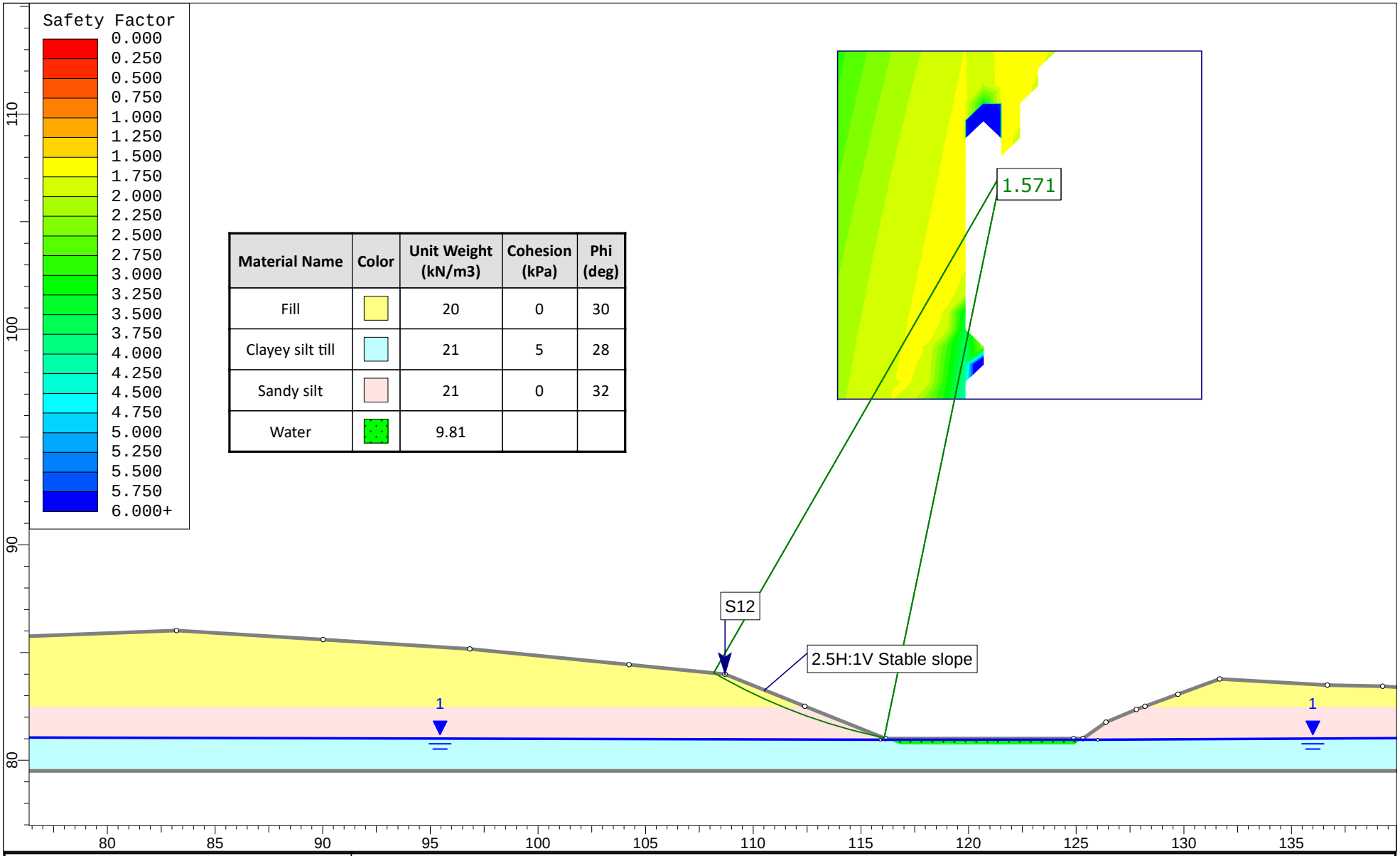


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Silty clay till		21	5	28
Sandy silt to sand		21	0	34
Water		9.81		

rocscience

SLIDEINTERPRET 8.024

Project	Slope Stability of Serson Creek Bank Slopes			
Analysis Description	Long-term Stable 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

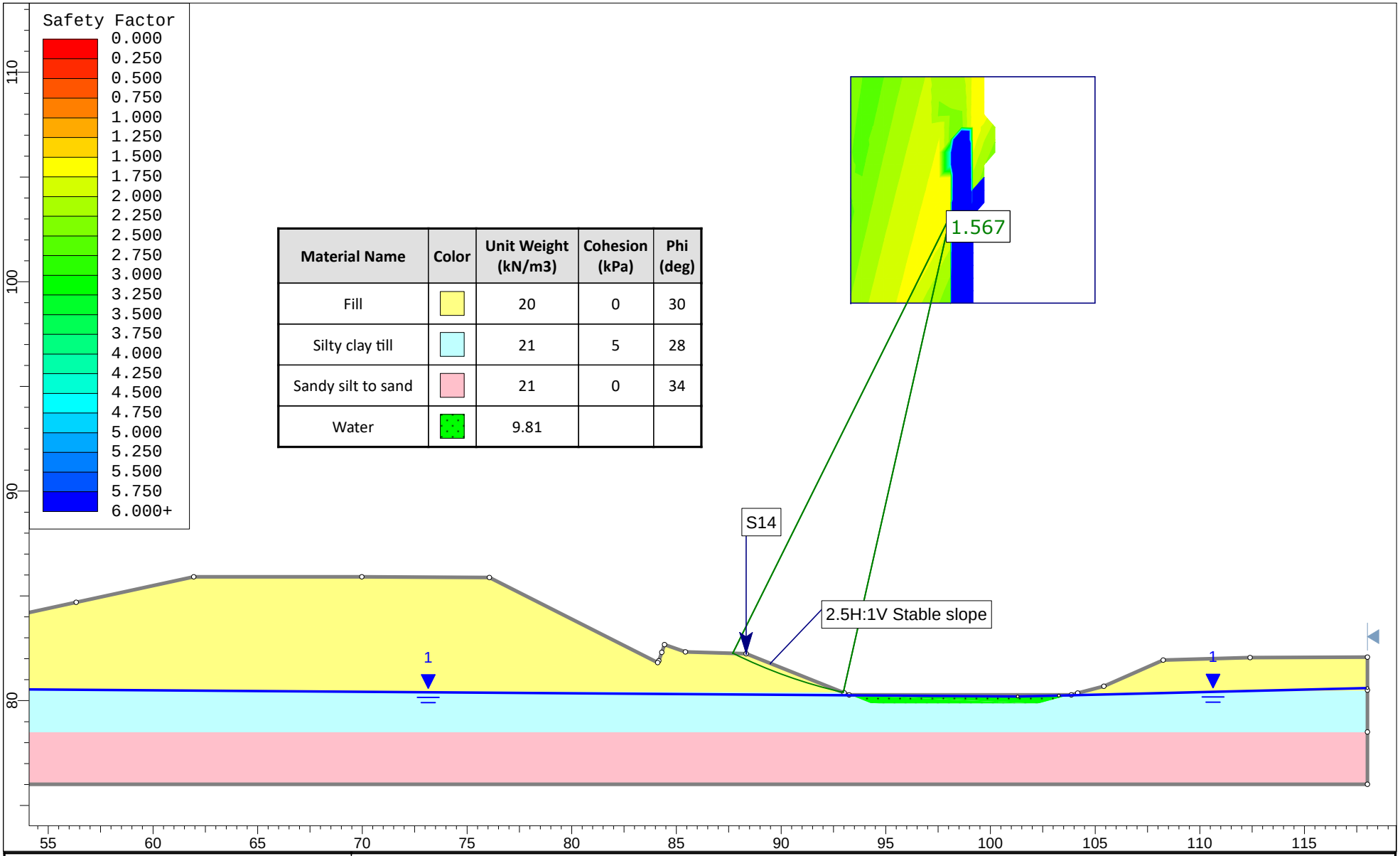


Material Name	Color	Unit Weight (kN/m3)	Cohesion (kPa)	Phi (deg)
Fill		20	0	30
Clayey silt till		21	5	28
Sandy silt		21	0	32
Water		9.81		

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
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www.dsconsultants.ca

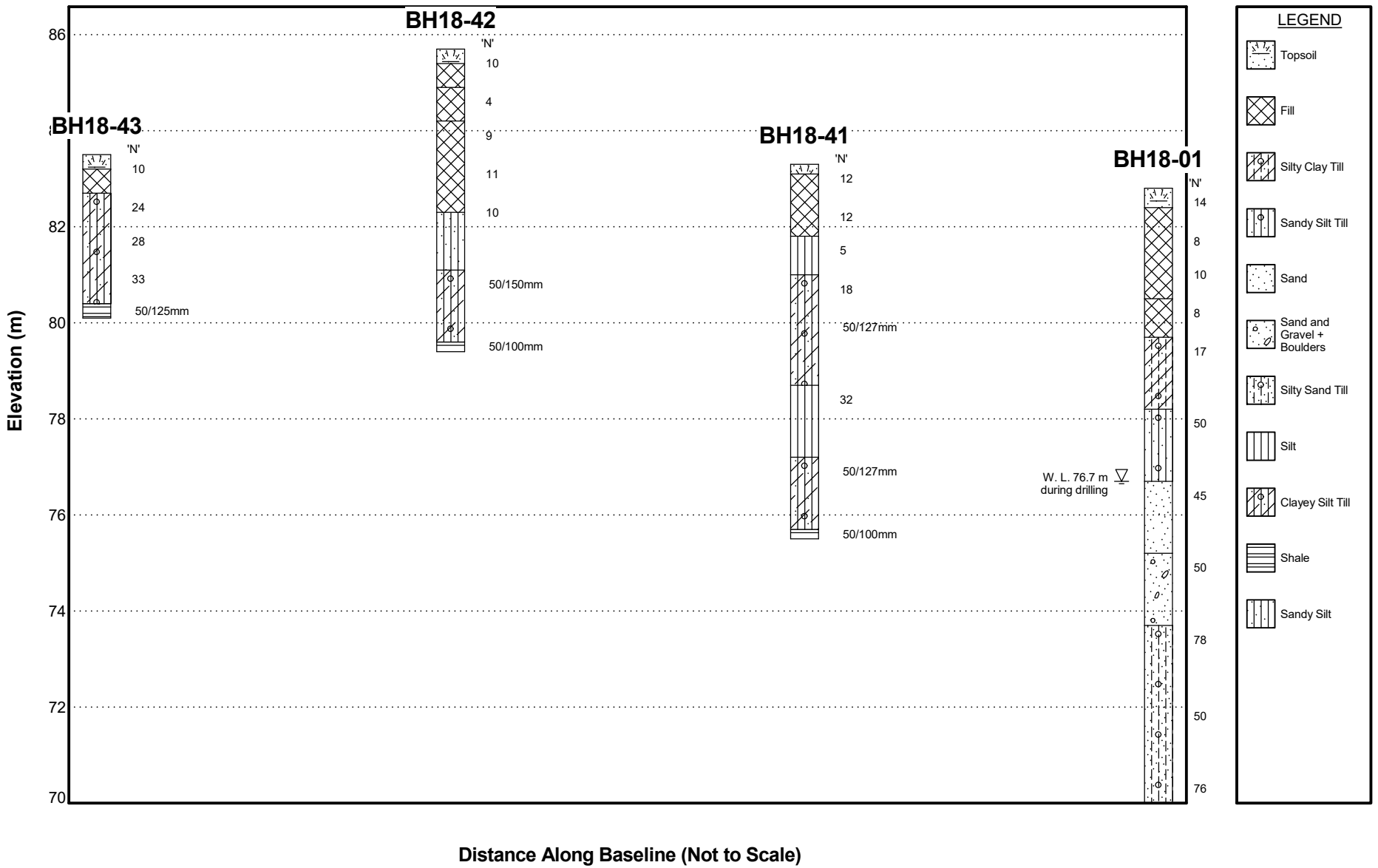
Client:
INFRASTRUCTURE ONTARIO
800 Hydro Road
Mississauga, ON

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

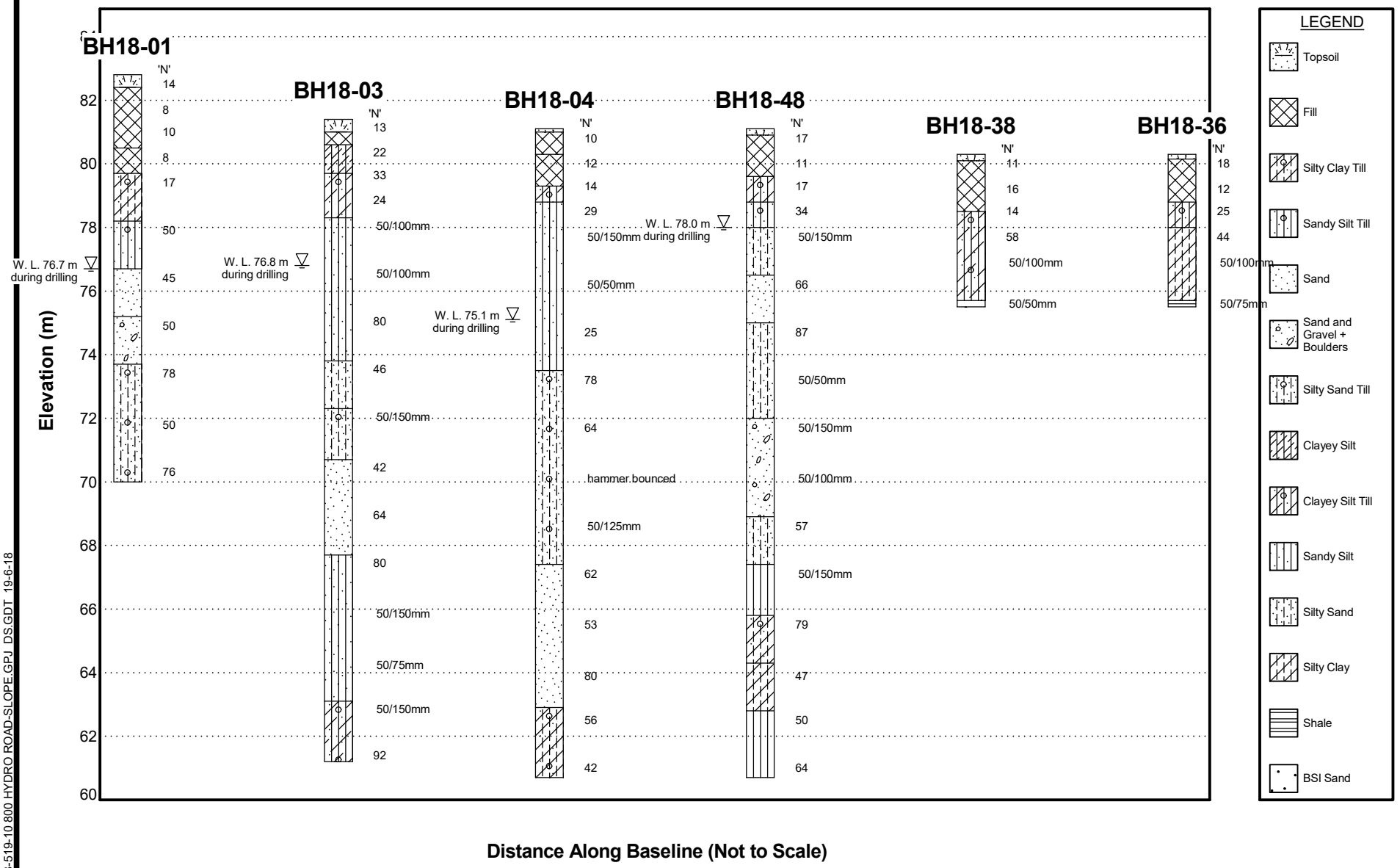


DS CONSULTANTS LTD.
Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

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)

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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	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
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	**FILL:** sandy silt, some organics, grey, moist, loose		4	SS	8		80
3 / 79.7							
3.1	**SILTY CLAY TILL:** some sand, trace gravel, brown, moist, very stiff		5	SS	17		79
4 / 78.2							
4.6	**SANDY SILT TILL:** trace to some clay, trace gravel, grey, moist, very dense		6	SS	50		78
5 / 6 / 76.7						▽	77
6.1	**SAND:** trace silt, brown, wet, dense		7	SS	45		76
7 / 75.2							
7.6	**SAND AND GRAVEL:** trace silt, brown, wet, very dense		8	SS	50		75
8 / 9 / 73.7							74
9.1	**SILTY SAND TILL:** some gravel to gravelly, occassional cobble/boulders, trace clay, grey, moist to wet, very dense		9	SS	78		73
10							

W. L. 76.7 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

225 — 1 15 47 37

Continued Next Page

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

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 "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: 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											

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

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

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

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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	"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
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					
73.8			7	SS	80		76					
7.6 / 72.3	**SILTY SAND TO SAND:** trace clay, grey, wet, dense		8	SS	46		75					
9.1	**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_f=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	STRATA PLOT	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES "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
70.7	**SILTY SAND TILL:** trace to some clay, trace gravel, occasional cobble/boulder, grey, wet, very dense(Continued)						71					
10.7	**SAND:** trace silt, grey, wet, dense to very dense		10	SS	42				○			0 95 (5)
11							70					
12			11	SS	64		69		○			
13												
67.7							68					
13.7	**SANDY SILT TO SILTY SAND:** trace to some clay, some gravel, grey, wet, very dense		12	SS	80				○			
14							67					
15			13	SS	50/ 150mm		66		○			
16							65					
17			14	SS	50/ 75mm				○			
18							64					
63.1												
18.3	**CLAYEY SILT TILL:** sandy, trace gravel, occasssional cobble/boulders, grey, moist, hard		15	SS	50/ 150mm		63		○			
19							62					
20												

Continued Next Page

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

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 (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	BLOWS "N" 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
61.2			16	SS	92					>225	
20.2	**END OF BOREHOLE** Notes: 1) Water level at 4.6 mbgl during drilling										

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

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	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
81.1 / 0.0	**TOPSOIL:** 150mm						81
0.1 / 80.3	**FILL:** silty sand and gravel, brown, moist, compact		1	SS	10		
0.8 / 79.3	**FILL:** silt to clayey silt, trace organics, trace gravel, grey, moist, compact		2	SS	12		80
			3	SS	14		
1.8 / 78.8	**CLAYEY SILT TILL:** sandy, trace gravel, trace cobble, brown, moist, very stiff						79
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		7	SS	25	▽	76
7.6 / 73.5	**SILTY SAND TILL:** trace clay, some gravel, occassional cobble/boulders, grey, wet, very dense		8	SS	78		74
			9	SS	64		73
							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

(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
	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											
14			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											
19			15	SS	56				○		>225	
							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	"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
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										

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

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

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

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Geotechnical ◆ Environmental ◆ Materials ◆ Hydrogeology

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

SOIL PROFILE			SAMPLES			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 (%)
(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	BLOWS 0.3 m "N"							GR SA SI CL
80.3												
80.2 0.2	**TOPSOIL :**150 mm											
	FILL: clayey silt, trace asphalt/concrete fragments, trace organics, grey to dark grey, moist, compact		1	SS	18		80					
1			2	SS	12		79					
78.8 1.5	**CLAYEY SILT TILL:** sandy, trace gravel, brown, moist, very stiff		3	SS	25							
2 78.0 2.3	**SILTY CLAY:**some sand, brown, moist, hard		4	SS	44		78					0 11 57 32
3			5	SS	50/ 100mm		77					
4 75.7 75.5 4.6 4.8	**SHALE:** Georgian Bay Formation, weathered, grey		6	SS	50/ 75mm		76					
	END OF BOREHOLE: Notes: 1) Borehole dry and open upon completion.											

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

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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		
81.8 / 1.5	**SILT :** some sand, trace clay, brown, wet, loose		3	SS	5		82
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, ×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 BH18-42

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
85.7 / 0.0	**TOPSOIL:** 350 mm						
85.4 / 0.3	**FILL:** silty sand, trace topsoil/rootlets, some gravel, brown, moist, compact		1	SS	10		
84.9 / 0.8	**FILL:**sandy silt, trace clay, brown, wet, loose		2	SS	4		85
84.2 / 1.5	**FILL:** clayey silt, trace organics, grey, moist, stiff		3	SS	9		
			4	SS	11		84
82.3 / 3.4	**SANDY SILT:** trace clay, brown, moist, compact		5	SS	10		83
81.1 / 4.6	**CLAYEY SILT TILL:** trace gravel, brown, moist, hard		6	SS	50/ 150mm		82
79.6 / 6.1	**SHALE:** Georgian Bay Formation, weathered, grey		7	SS	50/ 100mm		81
79.4 / 6.3	**END OF BOREHOLE**						80

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)
>225

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 BH18-43

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 (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
83.5												
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				○			
1			3	SS	28		82		○	>225		
2	grey below 2.3 m		4	SS	33		81		○			
3 / 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

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 BH18-48

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	"N" BLOWS 0.3 m	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 / 76.5 / 4.6	**SAND:** trace silt, trace gravel, grey, wet, very dense		6	SS	66		77
5 / 75.0 / 6.1	**SILTY SAND:** trace clay, grey, wet, very dense		7	SS	87		76
6 / 7							75
8			8	SS	50/ 50mm		74
9 / 72.0 / 9.1	**SAND AND GRAVEL:** trace silt, grey, wet, very dense		9	SS	50/ 150mm		73
10							72

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

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

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS 0.3 m	GROUND WATER CONDITIONS	ELEVATION
	SAND AND GRAVEL: trace silt, grey, wet, very dense(Continued)						71
11			10	SS	50/ 100mm		70
12 68.9							69
12.2	**SILTY SAND:** trace clay, grey, wet, very dense		11	SS	57		
13 67.4							68
13.7 14	**SILT :** trace clay, grey, wet, very dense		12	SS	50/ 150mm		67
15 65.8							66
15.3	**SILTY CLAY TILL :** some sand to sandy, trace gravel, grey, moist hard		13	SS	79		
16 64.3							65
16.8 17	**SILTY CLAY:** trace sand, grey, moist, hard		14	SS	47		64
18 62.8							63
18.3	**SILT TO CLAYEY SILT:** trace sand, grey, very moist, very dense		15	SS	50		
19							62
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		

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
○ 8=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 (m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES 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
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										

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

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)

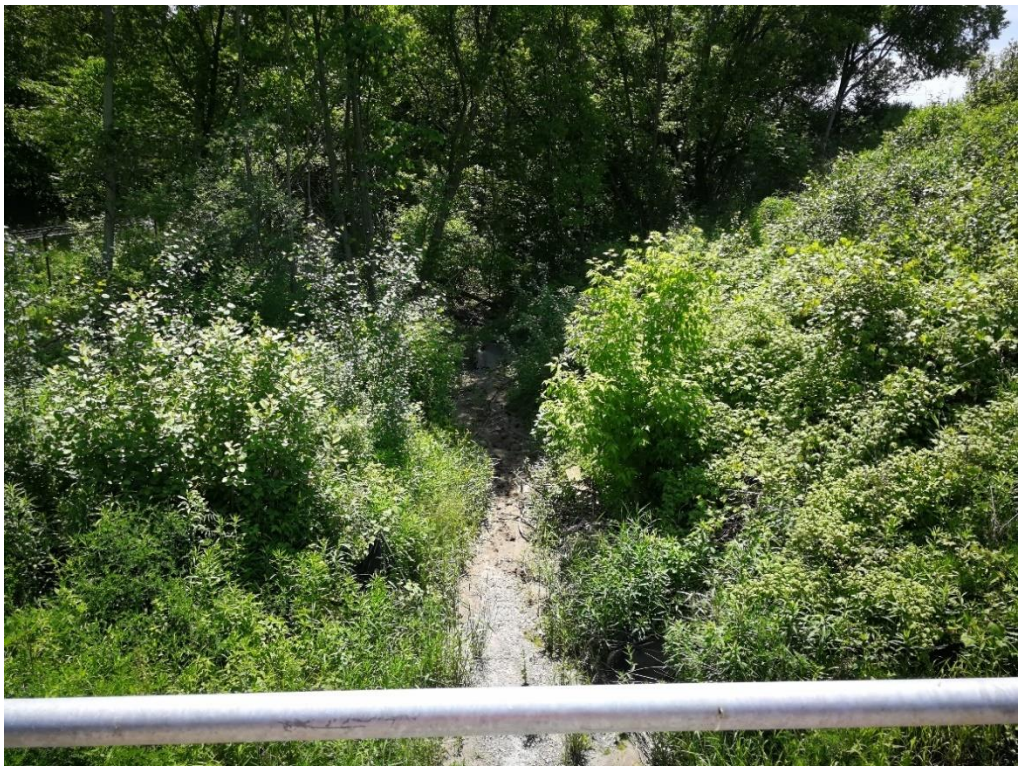

Photo B16: Creek and slope conditions to south of bridge (looking south from bridge – looking downstream)

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)