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June 25, 2019

China Canada Jing Bei Xin Min International Co. Ltd.
118 Gemini Crescent
Richmond Hill, ON. L4S 2K7

Attn: Zheng Li c/o Greg Wells (EcoVue Consulting Services Inc.)

Re: Hidden Ridge Development – Soil Characterization (6199-002)

Dear, Mr. Li,

Cambium Inc. (Cambium) is pleased to provide China Canada Jing Bei Xin Min International Co. Ltd. (Client) with this letter report outlining the results of the soil sampling and characterization at the proposed development of Hidden Ridge Subdivision in Zephyr, Ontario (Site). If is Cambium's understanding that the Client requires soil analysis in the form of particle size distribution in order to characterize the type of soil and assess it's potential for erosion along ditches at the proposed grades on site. Soil samples are to be evaluated based on the December 2006 Erosion and Sediment Control Guidelines for Urban Construction (The Guidelines).

FIELD INVESTIGATION

A field investigation that was completed on June 4, 2019, included soil sampling from proposed final grades, via six (6) test pits, spaced evenly along the portion of roads with anticipated grades exceeding 3.5%, as shown in Figure 1. Site plans showing the areas with grades exceeding 3.5% are provided in Appendix A. The field investigation work is summarized below.

As part of the sampling program, six (6) test pits identified as TP101-19 through TP106-19 were completed in selected representative locations shown in Figure 1. Test pits were advanced to predetermined depths ranging from 0.9 m below ground surface (mbgs) to 4.3 mbgs, outlined in Table 1, based on the proposed final grades. The test pit was excavated using a backhoe, under the supervision of a Cambium technician. Dynamic Probe Penetration Test (DPT) values were recorded for the sampled intervals as the number of blows required to drive a 19 mm diameter steel rod 150 mm into the soil with an 8 kg hammer falling 750 mm.

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The DPT values are used in this report to assess consistency of cohesive soils and relative density of non-cohesive materials. The encountered soil units were logged in the field using visual and tactile methods, and samples were placed in labelled plastic bags for transport, future reference, possible laboratory testing, and storage. The open test pit was checked for groundwater and general stability prior to backfilling. The test pit was backfilled with the excavated material and compacted with the backhoe bucket and the Site was restored as close to pre-investigation conditions as possible.

PHYSICAL LABORATORY SOIL ANALYSIS

Physical laboratory testing, including six (6) particle size distribution analyses (LS-702,705), was completed on selected soil samples to confirm textural classification under both the Unified Soil Classification System (USCS) and United States Department of Agriculture (USDA) soil classification system. USCS is the most common classification system for the purposes of geotechnical engineering. The results are presented in Appendix B and summarized in Table 1, providing evidence that soils were extremely variable on site ranging from Clayey Silt to Silty Gravelly Sand. Soils at the sample depths were found to be moist or drier than the plastic limit, with the exception of sample GS1 from test pit TP101-19, where the soil was moist to wet. Based on DPT results from test pits TP101-19 and TP104-19 throughTP106-19, the soil encountered at the predetermined depth was found to have a compact relative density, or firm consistency in the case of test pit TP106-19. DPT testing was not completed for soils in test pits TP102-19 and TP103-19 due to the inaccessibility of pits at that depth.

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June 25, 2019

Table 1 USCS Particle Size Distribution Analysis

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)							
Sample	Depth (mbgs)	Soil	% Gravel	% Sand	% Silt	% Clay	% Moisture Content
TP101-19 GS1	0.8	SILT, trace Sand, Clay and Gravel	1	8	84	7	17.2
TP102-19 GS2A	4.25	Clayey SILT, some Sand, trace Gravel	2	16	48	34	12.4
TP103-19 GS1	3.5	Silty Gravelly SAND, trace Clay	29	43	23	5	5.8
TP104-19 GS1	1.5	Sandy SILT, trace Clay and Gravel	5	31	58	6	13.9
TP105-19 GS1	2.0	Silty SAND, some Gravel, trace Clay	18	50	28	4	8.0
TP106-19 GS1	1.75	Clayey Sandy SILT, trace Gravel	9	30	34	27	14.1

The USDA classification system is a separate system that classifies the soil based on material passing the number 10 sieve (particles less than 2 mm in diameter). USDA results are presented in Appendix C and summarized in Table 2 and Table 3. Three samples are considered Sandy Loams, while each of the other samples is different from the other and are considered a Clay Loam, Silty Clay Loam, and Silt Loam. Based on Table A1 of The Guidelines provided in Appendix D, all soil samples are considered to have a medium soil erodibility rating, with the exception of Sample TP101-19 GS1, which is considered to have a high soil erodibility rating.

Table 2 USDA Soil Classification

United States Department of Agriculture (USDA) Soil Classification						
Sample	Depth (mbgs)	% Particles < 2mm Φ	Portion Sand	Potion Silt	Portion Clay	USDA Soil Characterization
TP101-19 GS1	0.8	99	27	66	7	Silt Loam
TP102-19 GS2A	4.25	97	17	48	35	Silty Clay Loam
TP103-19 GS1	3.5	65	63	29	8	Sandy Loam
TP104-19 GS1	1.5	93	51	43	6	Sandy Loam
TP105-19 GS1	2.0	74	69	26	5	Sandy Loam
TP106-19 GS1	1.75	88	34	35	31	Clay Loam

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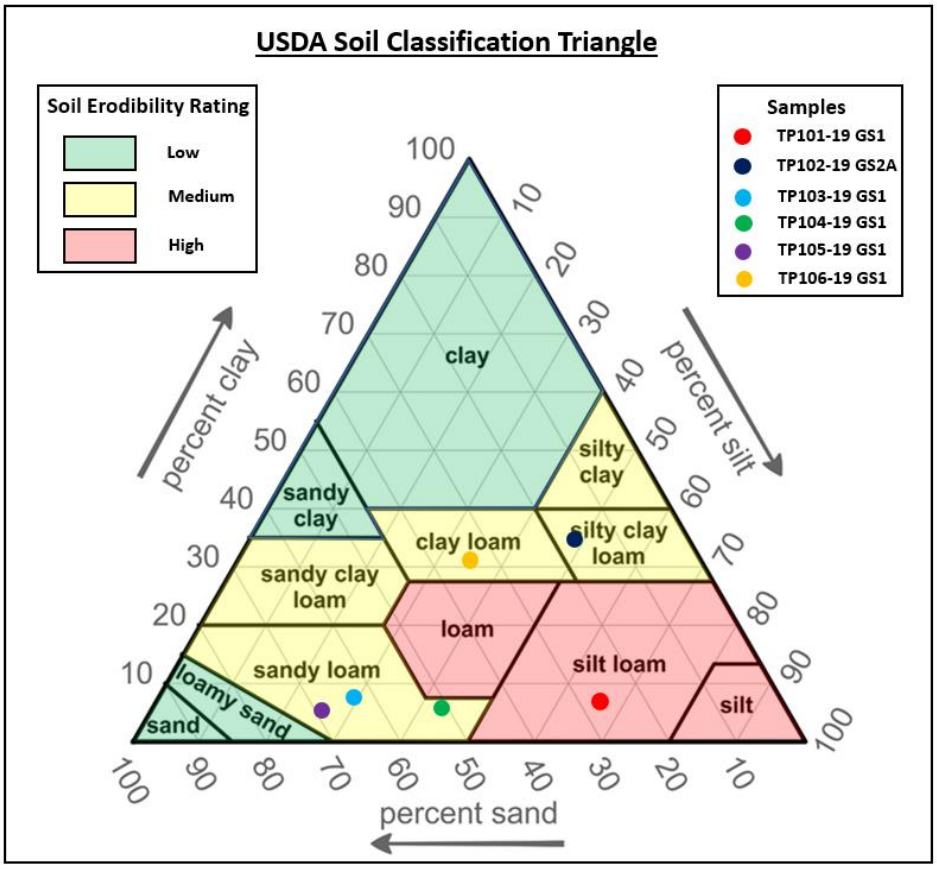
June 25, 2019

Table 3 USDA Soil Classification Triangle



It is understood that the proposed grades of the ditching on either side of the road are to have moderate slopes between 3.5% and 10%, and will on average have ditches sloping for greater than 30 m lengths. Based on this understanding, and Table A3 of The Guideline provided in Appendix D, each location is considered to have high potential for erosion. These results are summarized in Table 4.

Table 4 Erosion Potential for Graded Conveyance Channels

Sample	Soil Erodibility	Channel Gradient	Slope Length	Erosion Potential
TP101-19 GS1	High	Moderate slope	>30m	High
TP102-19 GS2A	Medium	Moderate slope	>30m	High
TP103-19 GS1	Medium	Moderate slope	>30m	High
TP104-19 GS1	Medium	Moderate slope	>30m	High
TP105-19 GS1	Medium	Moderate slope	>30m	High
TP106-19 GS1	Medium	Moderate slope	>30m	High

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June 25, 2019

PERCOLATION RATES

Additionally, percolation rates (T-times) were estimated for each soil sample based on the particle size distribution. Results in minutes per centimeter are presented in Appendix B and summarized in Table 4.

Table 5 Percolation Rates

Sample	Percolation Rate (min/cm)
TP101-19 GS1	20
TP102-19 GS2A	>50
TP103-19 GS1	20
TP104-19 GS1	20
TP105-19 GS1	12
TP106-19 GS1	50

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June 25, 2019

CLOSING

It is Cambium's understanding that the Client requires the provided soil classifications in order to aid in classification of erodibility of the soil at the proposed grade elevations.

We trust the information in this report is sufficient for your current needs. If you have questions or comments regarding this document, please do not hesitate to contact Mr. Baird at (705) 742-7900 ext. 332 or Mr. Peterkin at ext. 301.

Respectfully submitted,

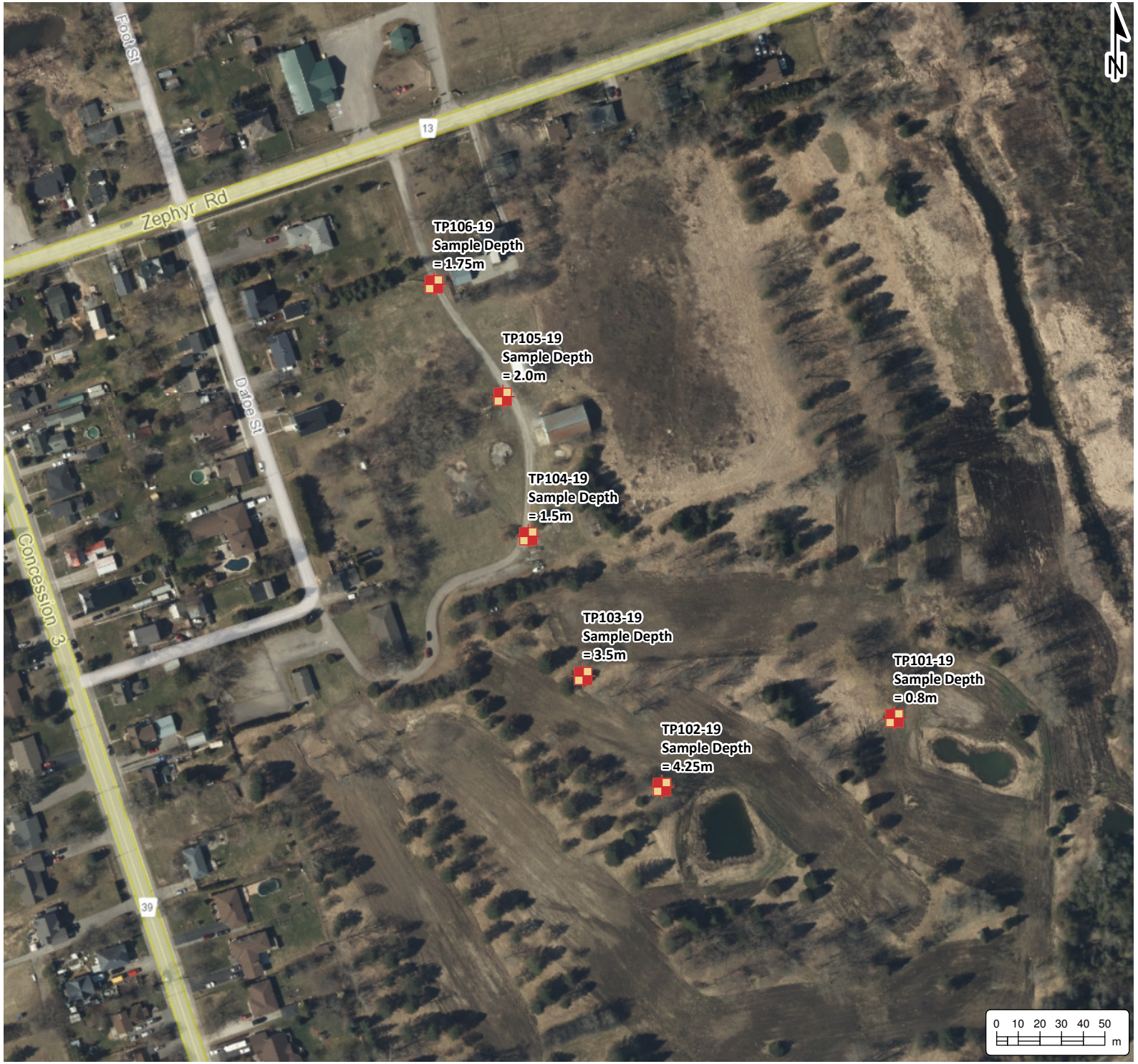
Cambium Inc.

Stuart Baird, P.Eng.
General Manager - Geotechnical

Brian Peterkin, M.Eng., P.Geo.
Senior Project Manager.

SEB/bjp
P:\9200 to 9299\9291-001 Adam Dragisic - Bow Lake Slope Stability\Deliverables\2019-06-17 - RPT - Ida Ho Lane Slope Stability Report.docx

Encl:
Figure 1 – Test Pit & Sample Locations
Appendix A – Site Plans
Appendix B – USCS Soil Characterization
Appendix C – USDA Soil Characterization
Appendix C – Tables from Erosion and Sedimentation Control Guidelines for Urban Construction (December 2006)



HIDDEN RIDGE
SOIL CHARACTERIZATION

CHINA CANADA JING
BEI XIN MIN INTL
Hidden Ridge Subdivision,
Zephyr, Ontario

LEGEND

Test Pit Location

Notes:
- Service Layer Credits: © 2017 Regional Municipality of Durham; 2016 Orthophotography provided by © First Base Solutions Inc.; © Queen's Printer for Ontario, 2017.
- Distances on this plan are in metres and can be converted to feet by dividing by 0.3048.
- Cambium Inc. makes every effort to ensure this map is free from errors but cannot be held responsible for any damages due to error or omissions. This map should not be used for navigation or legal purposes. It is intended for general reference use only.

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SOIL SAMPLE LOCATIONS

Project No.:	6199-002	Date:	June 2019
		Rev.:	
Scale:	1:2,500	Projection:	NAD 1983 UTM Zone 17N
Created by:	TLC	Checked by:	BPT
Figure:	1		

O:\GIS\project_MXDs\6100-6199\6199-002 EcoVue Consulting Services Inc. - Hidden Ridge - Soil Characterization\2019-06-21 FIG 1 - Soil Sample Locations.mxd

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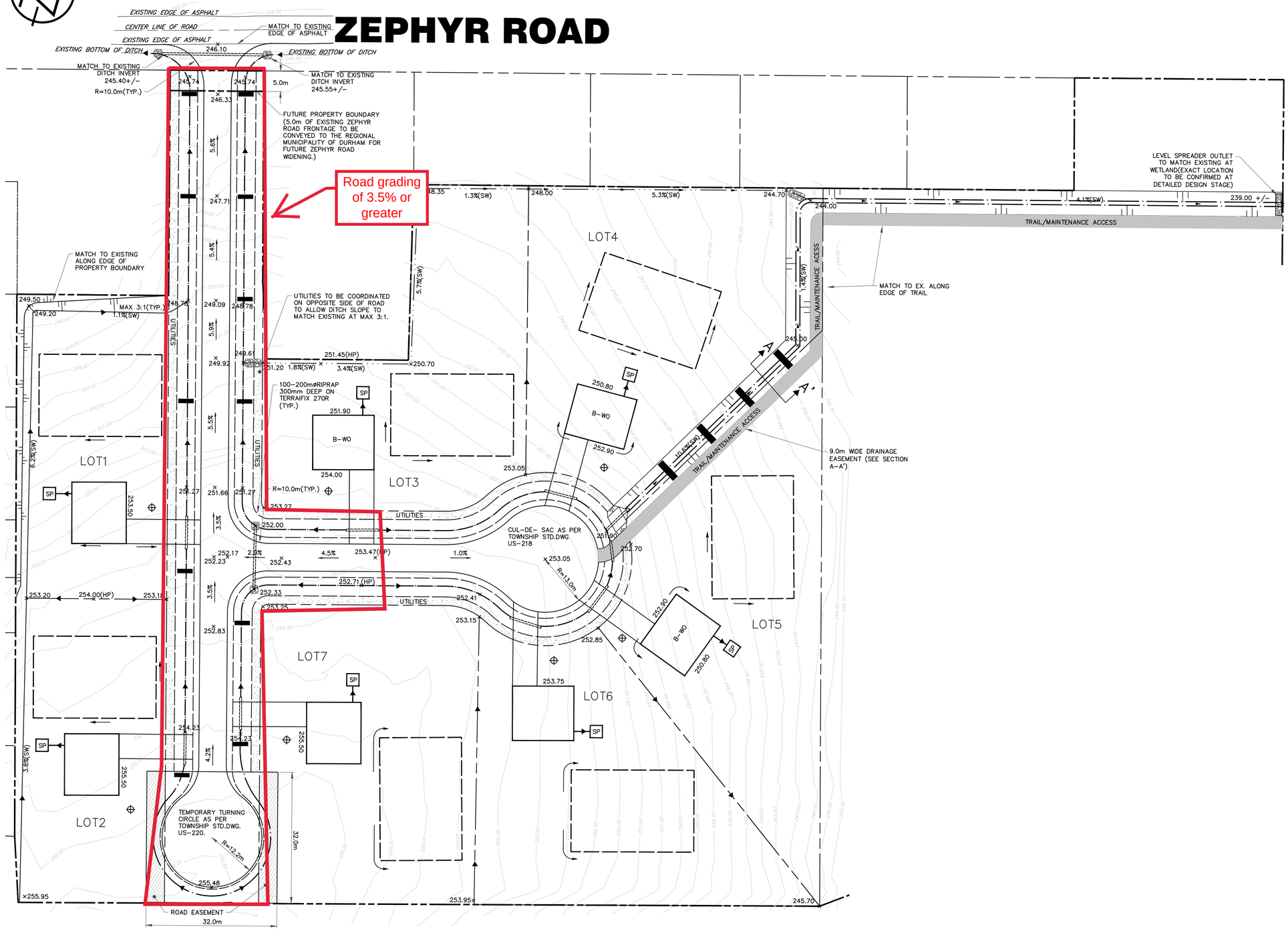
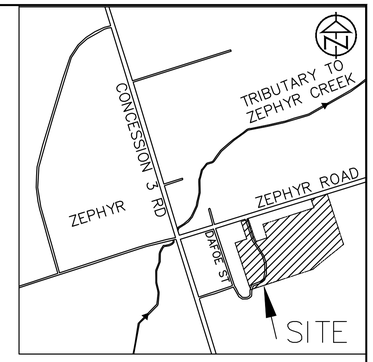
Appendix A
Site Plans

ZEPHYR ROAD





GEND

21.35	PROPOSED GRADE
	PROPERTY BOUNDARY
21.35	EXISTING CONTOUR
	PROPOSED CULVERT
1.0%(SW)	PROPOSED SWALE SLOPE
	PROPOSED 0.5m HIGH EARTH BERM
	SIDE/REAR YARD SWALE
	WELL
SP	SOAKAWAY PIT

LEGEND

CONTRACT DRAWINGS

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

NO.	REVISIONS	DATE	INITIAL
2.	REV. FOR TOWNSHIP STANDARD DEVIATION	JUNE 2018	JA

APPROVED

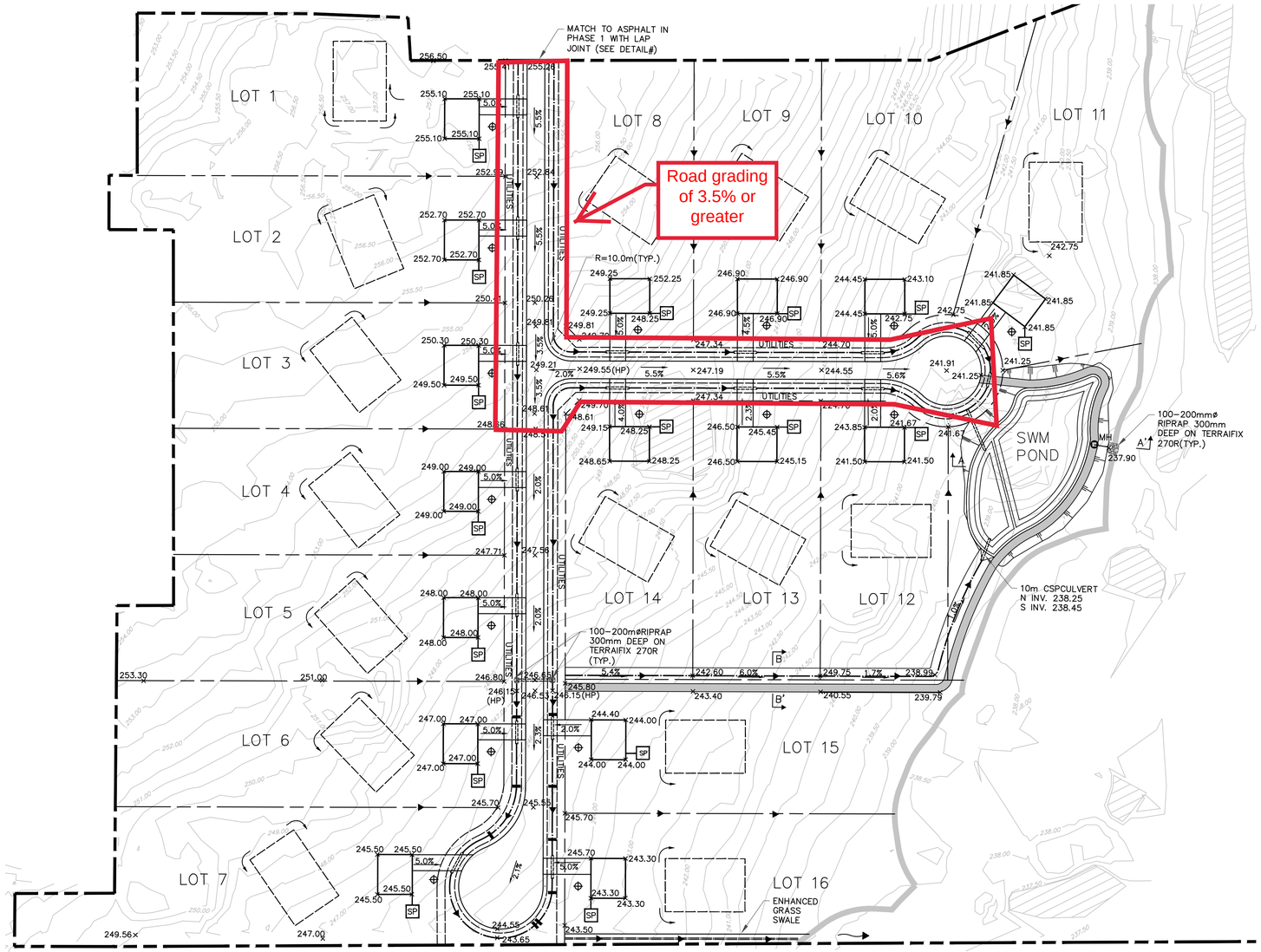
DRAFT FOR DISCUSSION PURPOSES ONLY

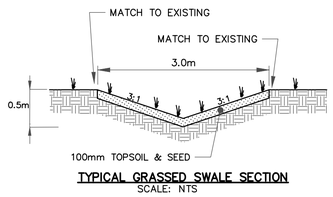
HIDDEN RIDGE SUBDIVISION
TOWNSHIP OF UXBRIDGE

PRELIMINARY GRADING AND SERVICING PLAN

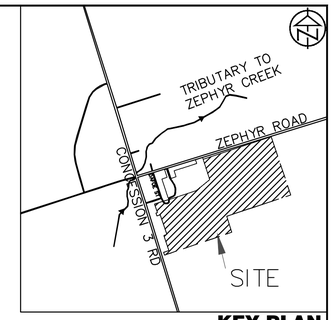
C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1:500		JOB NO. 516655
DESIGN: JA/HY	CHECKED: JA	DWG. **GS-1**
DRAWN: HY	DATE: APRIL 2017	

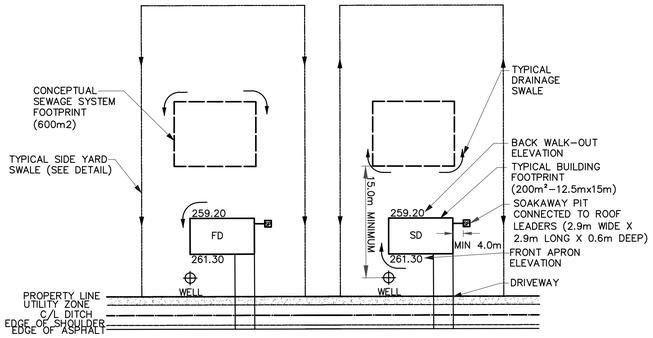




TYPICAL GRASSED SWALE SECTION
SCALE: NTS

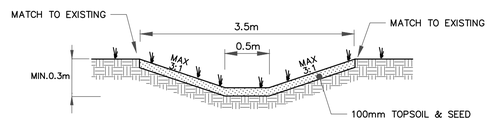


KEY PLAN
N.T.S



TYPICAL GRADING DETAILS
SCALE: NTS

NOTE: WALK–OUTS REQUIRE 2.4m ELEVATION DIFFERENCE FROM FRONT TO BACK OF HOUSE.



ENHANCED GRASSED SWALE SECTION
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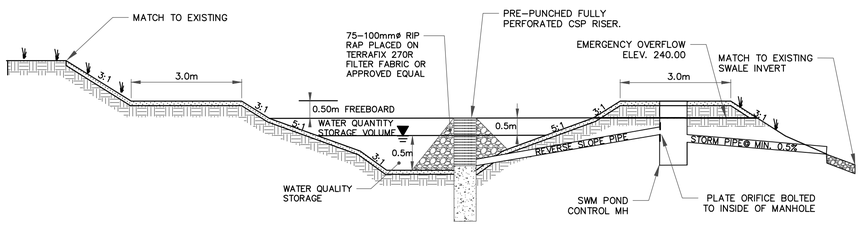
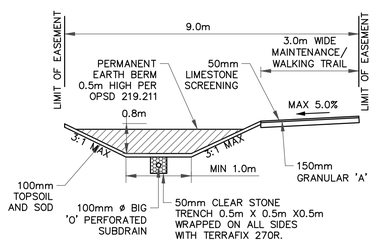
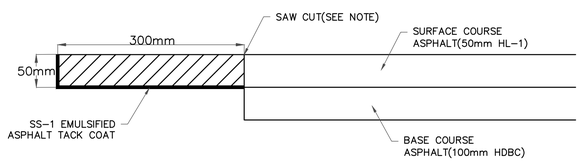


POND SECTION A–A'
SCALE: NTS



SECTION B–B'–DRAINAGE EASEMENT
SCALE: NTS



DETAIL 1– LAP JOINT DETAIL
SCALE: NTS

NOTES: ADD FROM ENGAGE NOTES, EDIT #1 AS FOLLOW:
1. TRANSITION TREATMENT (LAP JOINT) REQUIRED AT ALL LOCATIONS WHERE MATCHING TO AN EXISTING ASPHALT SURFACE. THE EXISTING PAVEMENT EDGES SHALL BE"SAW CUT" TO FORM A STRAIGHT, CLEAN VERTICAL FACE.
2. APPLY UNIFORM COATING OF SS–1 EMULSIFIED TACK COAT TO EXISTING ASPHALT AT THE TRANSITION TREATMENT AREA.

LEGEND

×221.35	PROPOSED GRADE
	PROPERTY BOUNDARY
221.35	EXISTING CONTOUR
	PROPOSED CULVERT
1.0%(SW)	PROPOSED SWALE SLOPE
	SIDE/REAR YARD SWALE
⊕	WELL
SP	SOAKAWAY PIT

LEGEND

CONTRACT DRAWINGS

CONTRACTOR MUST VERIFY ALL DIMENSIONS AND BE RESPONSIBLE FOR SAME. ANY DISCREPANCIES MUST BE REPORTED TO THE ENGINEER BEFORE COMMENCING WORK. DRAWINGS ARE NOT TO BE SCALED.

NO.	REVISIONS	DATE	INITIAL

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HIDDEN RIDGE SUBDIVISION
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PHASE 2 PRELIMINARY GRADING AND SERVICING PLAN

C.C. Tatham & Associates Ltd.
Consulting Engineers
Collingwood Bracebridge Orillia Barrie Ottawa

SCALE: 1:1000		JOB NO. 516655–02
DESIGN: BC/HY	CHECKED: JA	DWG. **GS-1**
DRAWN: HY	DATE: APRIL 2017	

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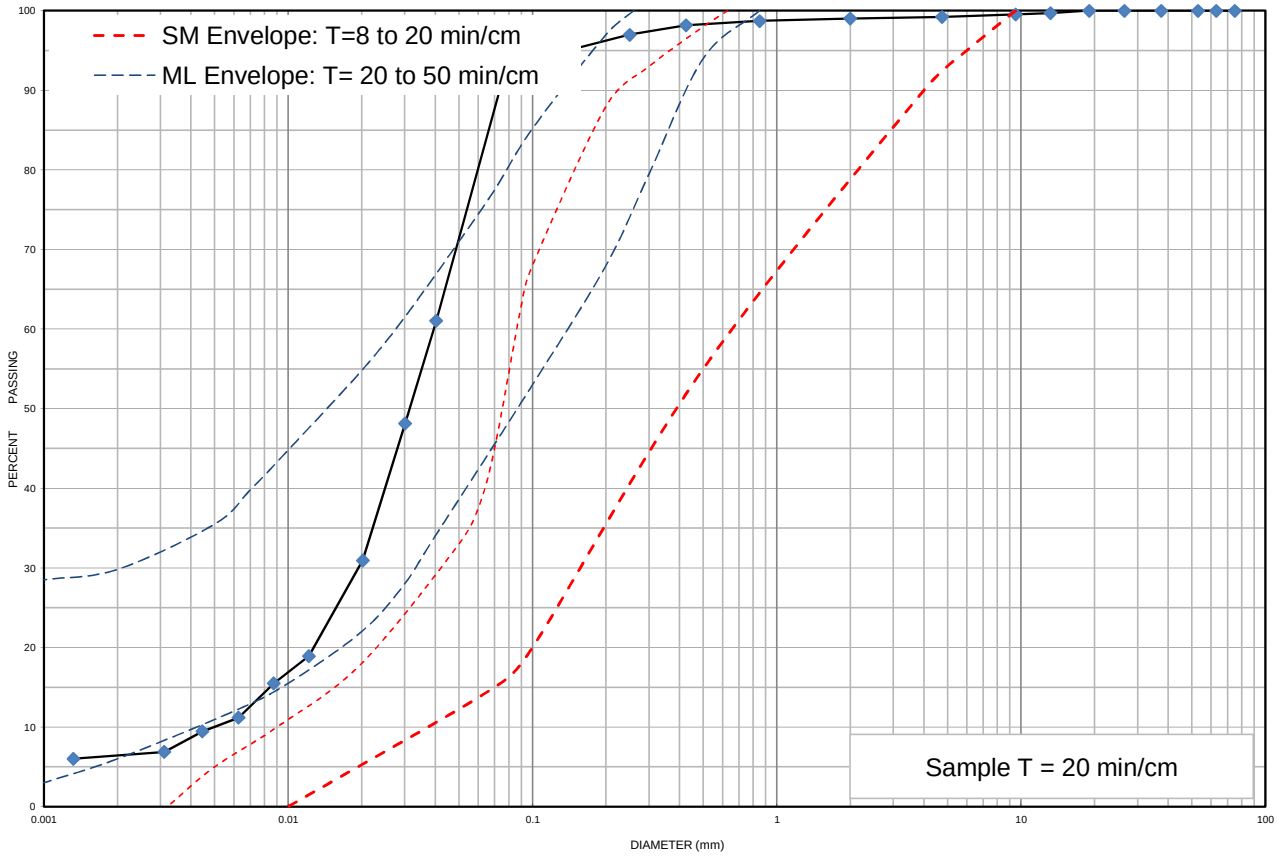
Appendix B

USCS Soil Characterization

Grain Size Distribution Chart

Project Number:	*6199-002*	**Client:**	*EcoVue Consulting Services Inc.*		
Project Name:	*Hidden Ridge - Soil Characterization*				
Sample Date:	*June 4, 2019*	**Sampled By:**	*Luke Jenkins - Cambium Inc.*		
Location:	*TP 101-19 GS 1*	**Depth:**	*0.8 m*	**Lab Sample No:**	*S-19-0367*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 101-19	GS 1	0.8 m	1	8	91		17.2

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silt trace Sand trace Clay trace Gravel	ML	0.040	0.019	0.005	8.00	1.81

Issued By: _____ *Date Issued:* *June 18, 2019*

(Senior Project Manager)

Cambium Inc. (Laboratory)
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701 The Queensway | Units 5-6 | Peterborough | ON | K9J 7J6

Grain Size Distribution Chart

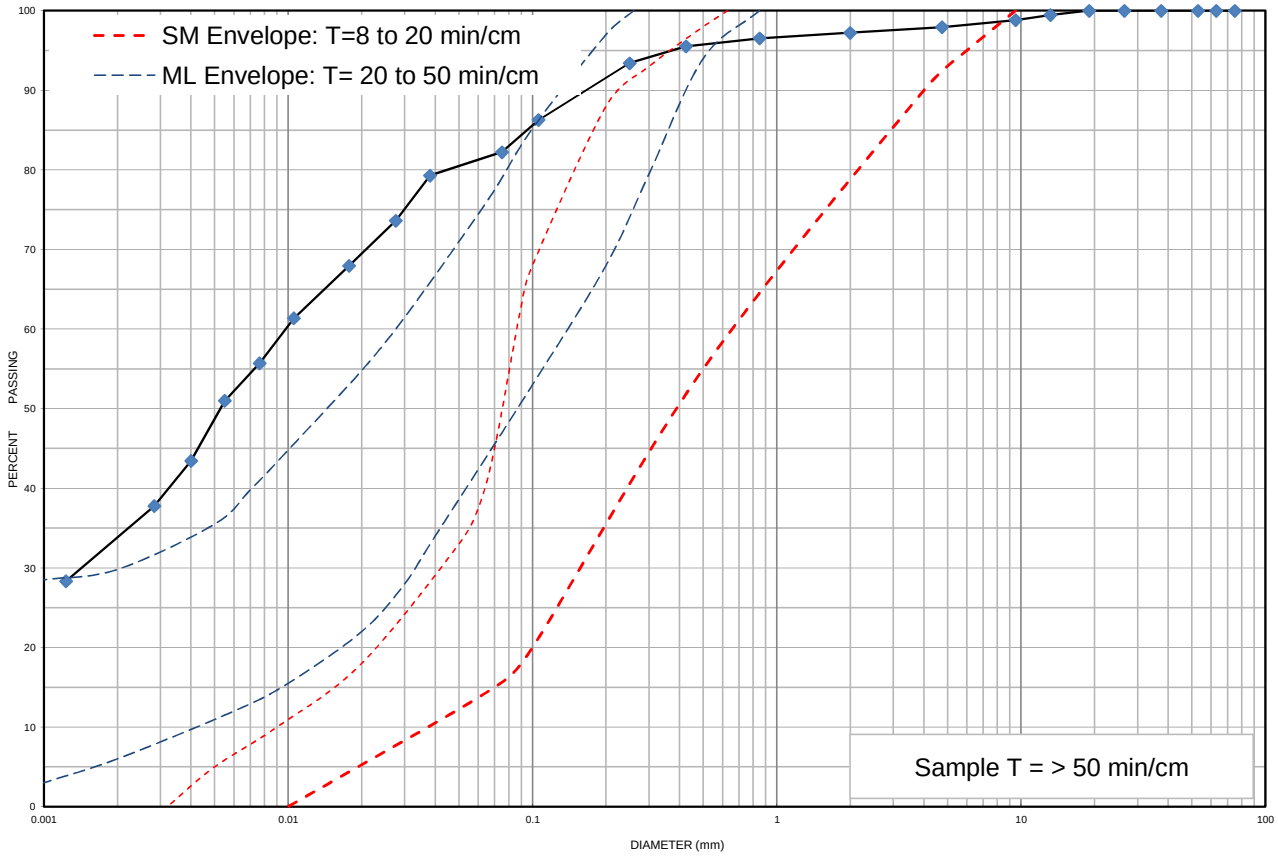
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 102-19 GS 2A* **Depth:** *4.3 m* **Lab Sample No:** *S-19-0368*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 102-19	GS 2A	4.3 m	2	16	82		12.4

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Clayey Silt some Sand trace Gravel	ML	0.0098	0.0015	-	-	-

Issued By: _____ *Date Issued:* *June 18, 2019*

(Senior Project Manager)

Cambium Inc. (Laboratory)

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Grain Size Distribution Chart

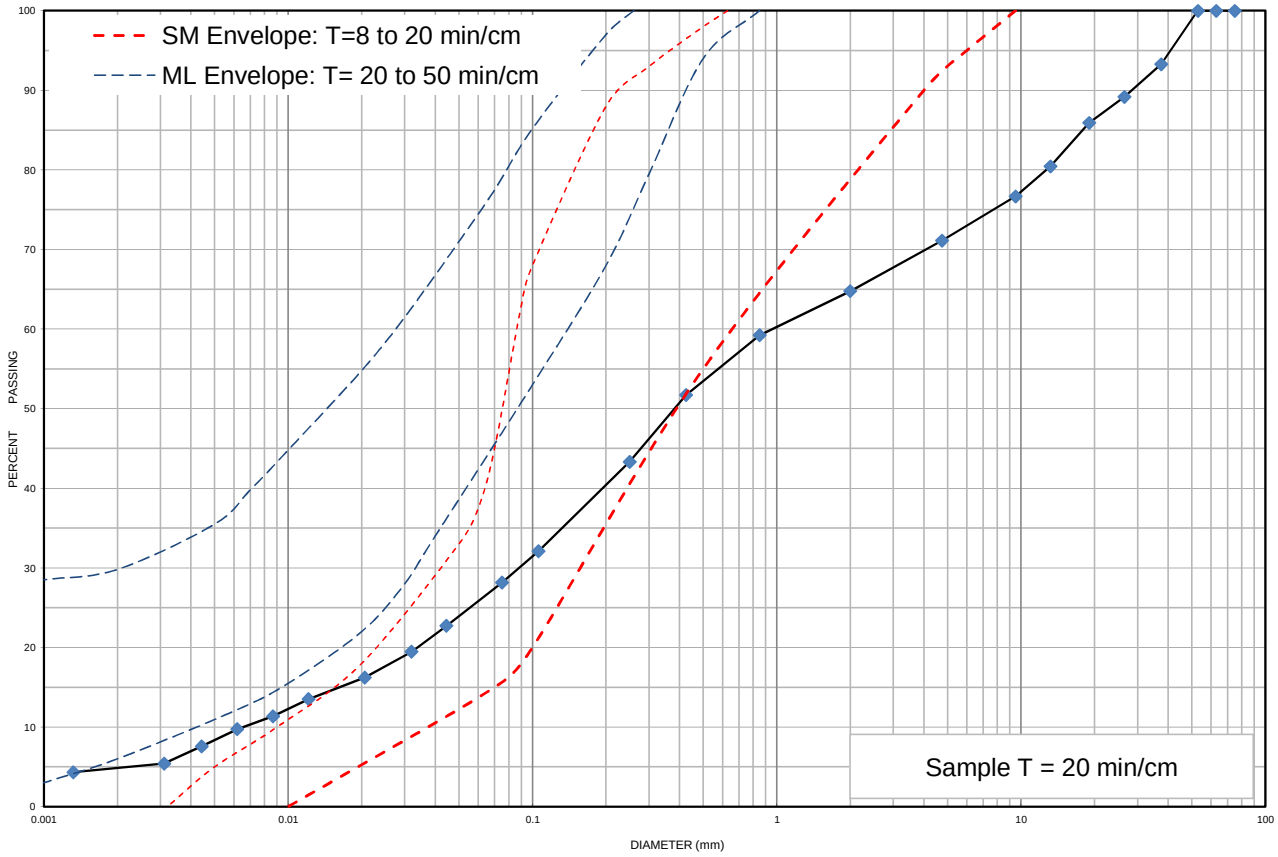
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 103-19 GS 1* **Depth:** *3.5 m* **Lab Sample No:** *S-19-0369*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 103-19	GS 1	3.5 m	29	43	28		5.8

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silty Gravelly Sand trace Clay	SW	0.970	0.088	0.0062	156.45	1.29

Issued By: _____ *Date Issued:* *June 18, 2019*

(Senior Project Manager)

Cambium Inc. (Laboratory)

866.217.7900 | cambium-inc.com

701 The Queensway | Units 5-6 | Peterborough | ON | K9J 7J6

Grain Size Distribution Chart

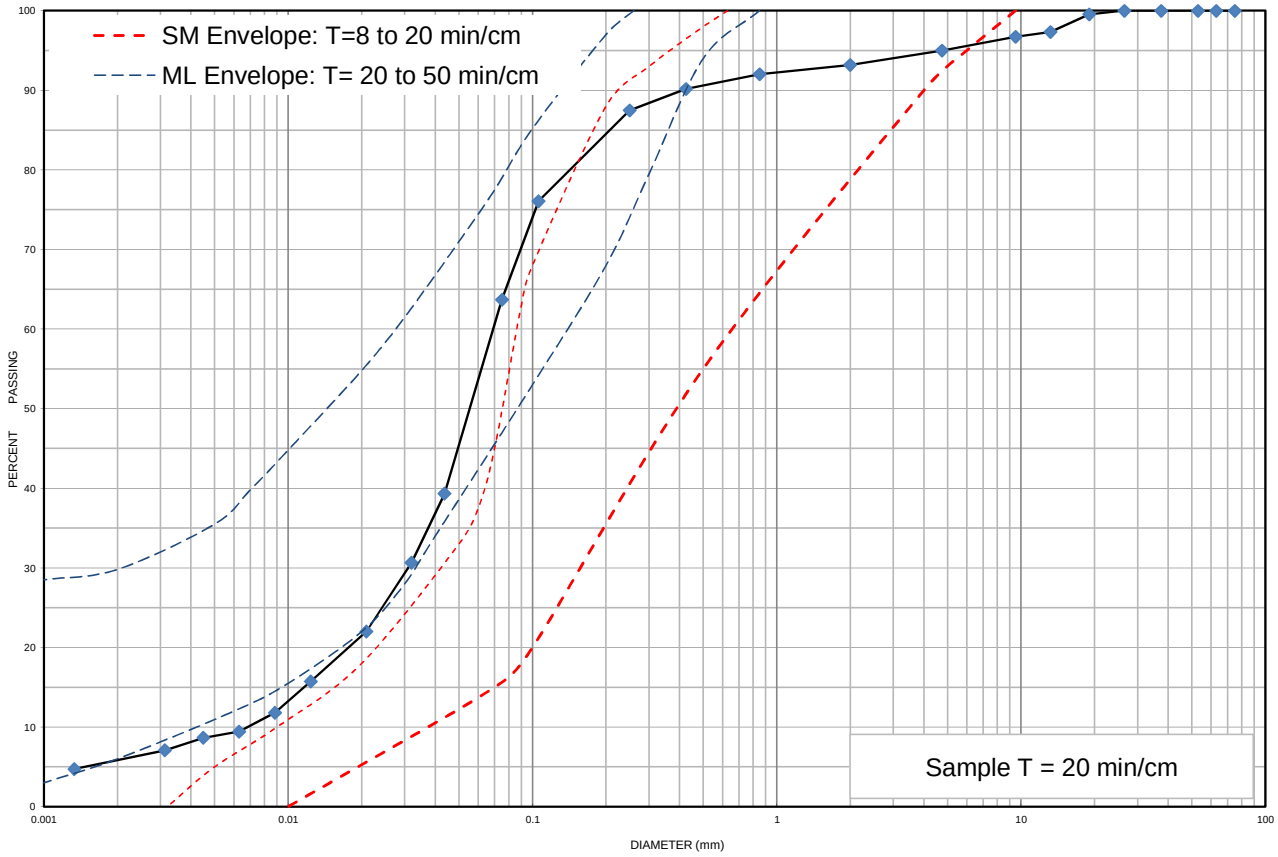
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 104-19 GS 1* **Depth:** *1.5 m* **Lab Sample No:** *S-19-0370*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 104-19	GS 1	1.5 m	5	31	64		13.9

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Silt trace Clay trace Gravel	ML	0.069	0.031	0.0068	10.15	2.05

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Grain Size Distribution Chart

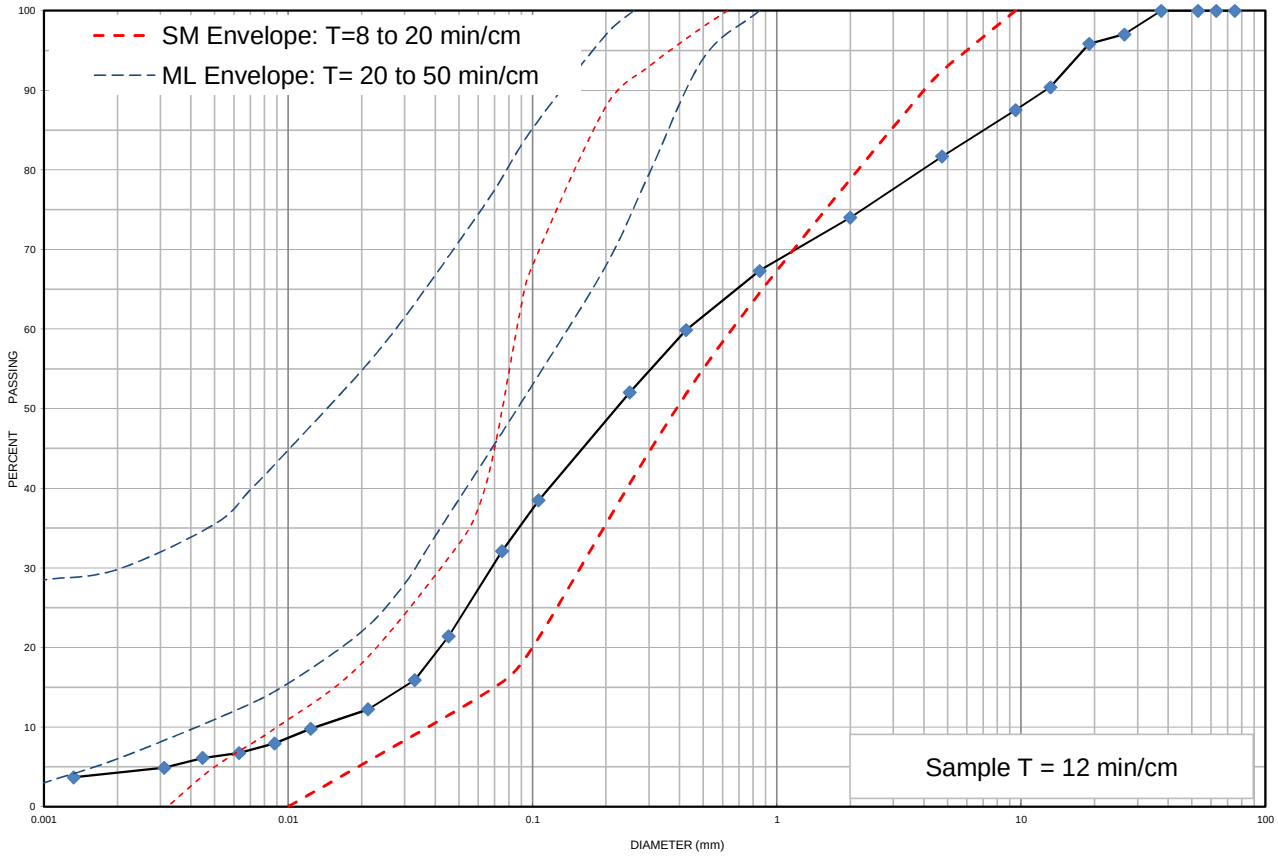
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 105-19 GS 1* **Depth:** *2 m* **Lab Sample No:** *S-19-0371*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 105-19	GS 1	2 m	18	50	32		8.0

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silty Sand some Gravel trace Clay	SM	0.430	0.068	0.014	30.71	0.77

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Grain Size Distribution Chart

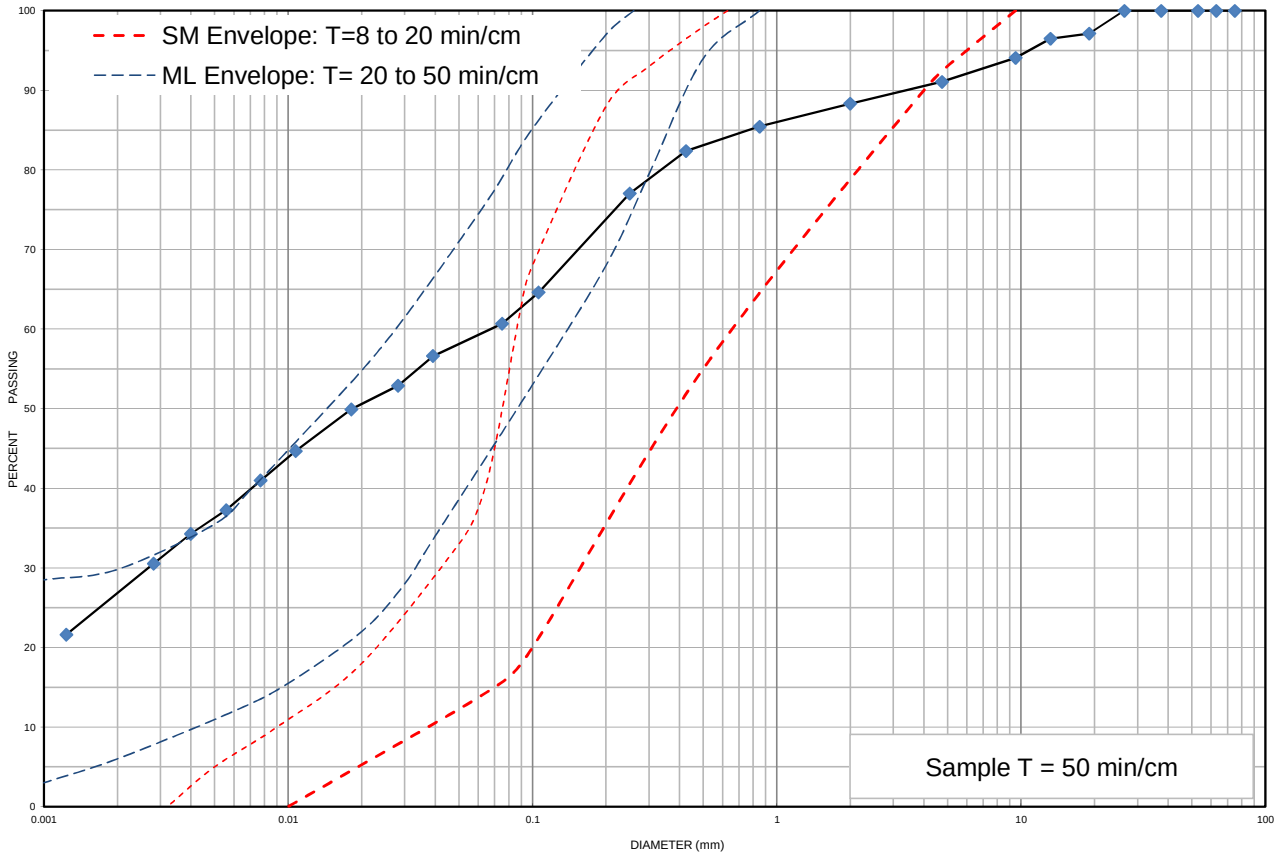
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 106-19 GS 1* **Depth:** *1.8 m* **Lab Sample No:** *S-19-0372*

UNIFIED SOIL CLASSIFICATION SYSTEM					
CLAY & SILT (<0.075 mm)	SAND (<4.75 mm to 0.075 mm)			GRAVEL (>4.75 mm)	
	FINE	MEDIUM	COARSE	FINE	COARSE



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 106-19	GS 1	1.8 m	9	30	61		14.1

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Clayey Sandy Silt trace Gravel	ML	0.068	0.0027	-	-	-

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Appendix C

USDA Soil Characterization

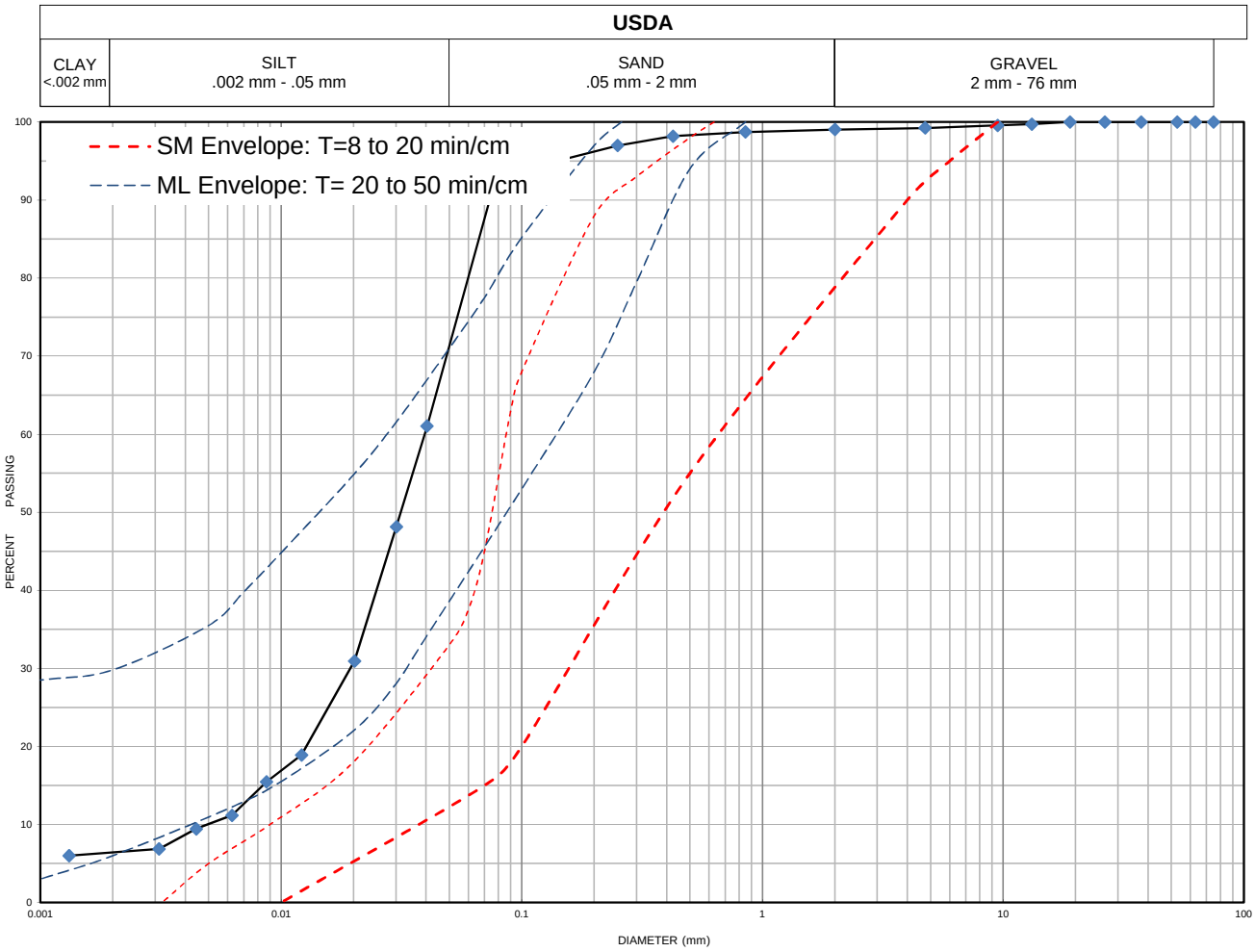
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 101-19 GS 1* **Depth:** *0.8 m* **Lab Sample No:** *S-19-0367*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 101-19	GS 1	0.8 m	1	27	65	7	17.2

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silt Loam	-	0.040	0.019	0.005	8.00	1.81

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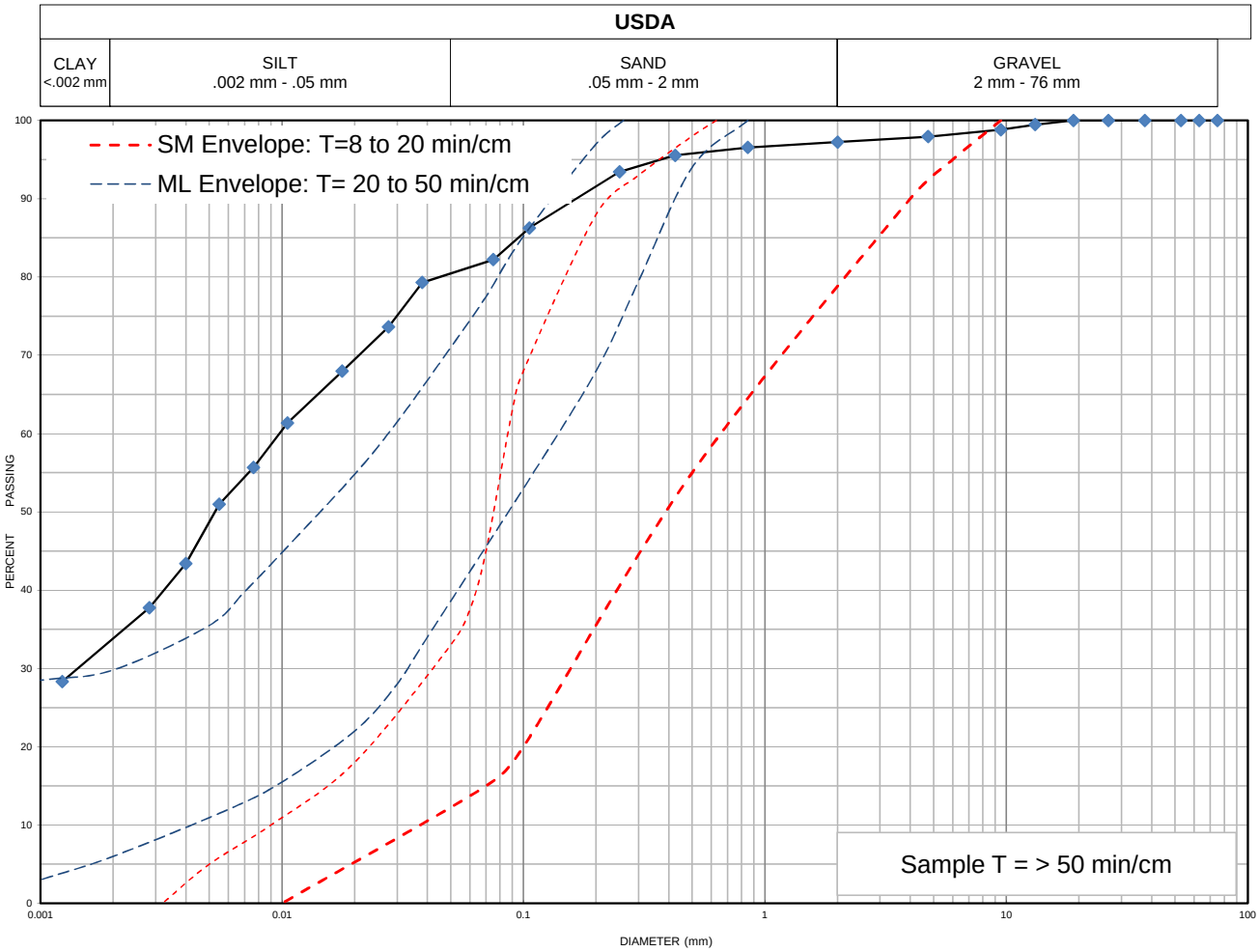
Grain Size Distribution Chart

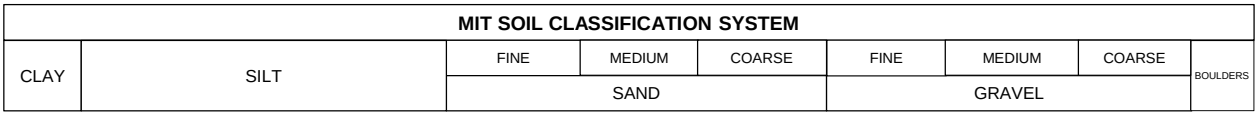
Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 102-19 GS 2A* **Depth:** *4.3 m* **Lab Sample No:** *S-19-0368*





Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 102-19	GS 2A	4.3 m	3	16	47	31	12.4

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Silty Clay Loam	-	0.0098	0.0015	-	-	-

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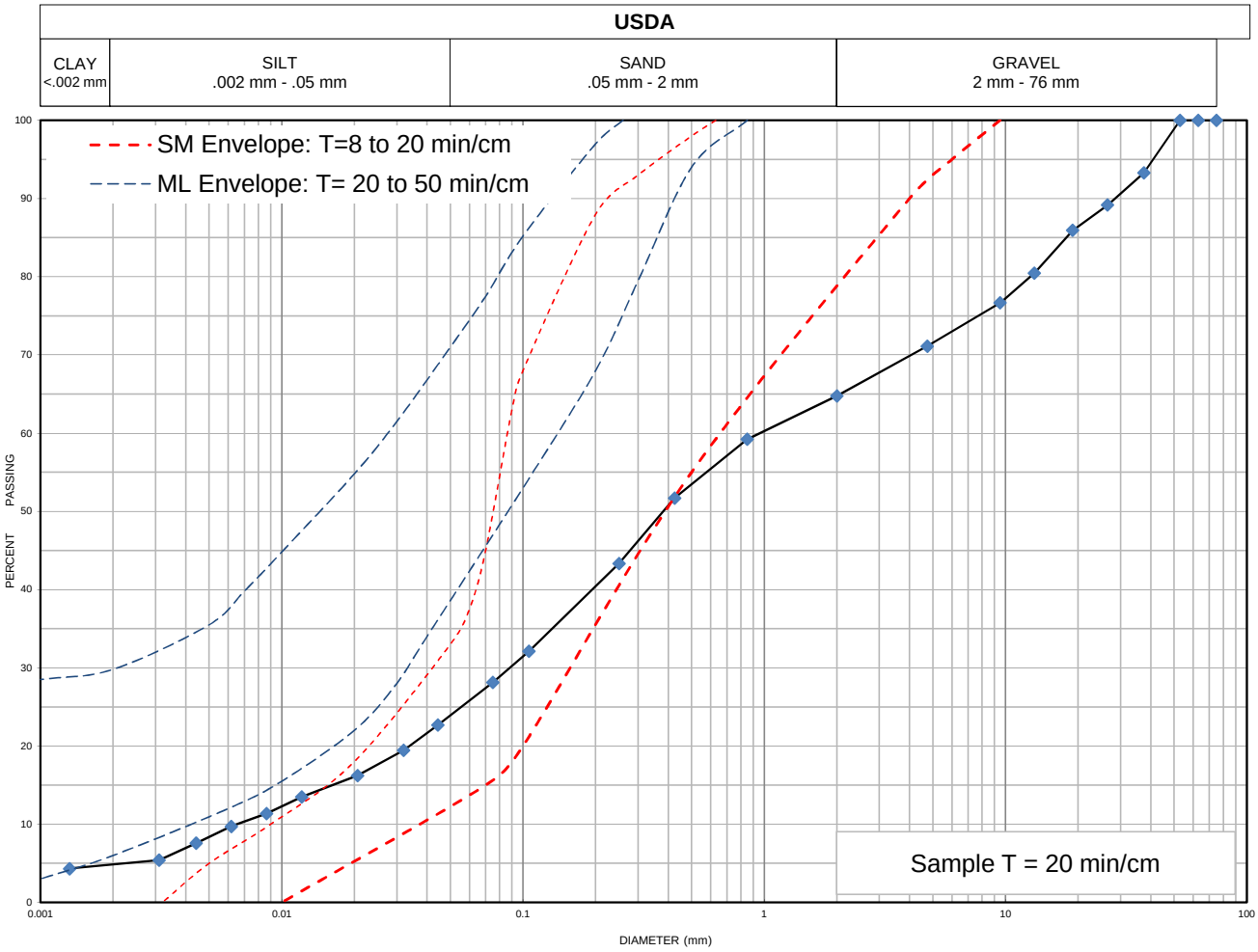
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 103-19 GS 1* **Depth:** *3.5 m* **Lab Sample No:** *S-19-0369*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 103-19	GS 1	3.5 m	35	41	19	5	5.8

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Loam	-	0.970	0.088	0.0062	156.45	1.29

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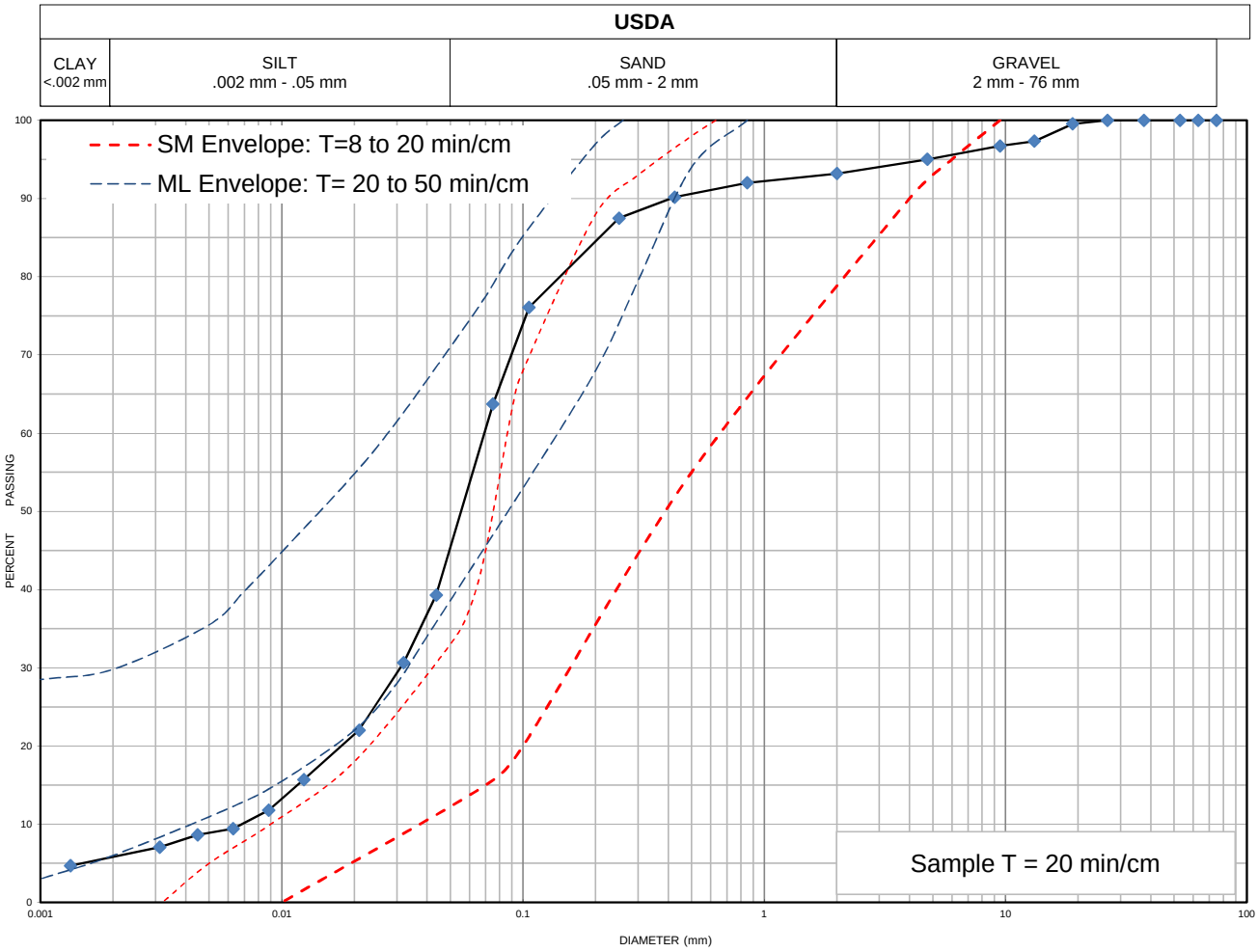
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 104-19 GS 1* **Depth:** *1.5 m* **Lab Sample No:** *S-19-0370*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 104-19	GS 1	1.5 m	7	47	40	6	13.9

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Loam	-	0.069	0.031	0.0068	10.15	2.05

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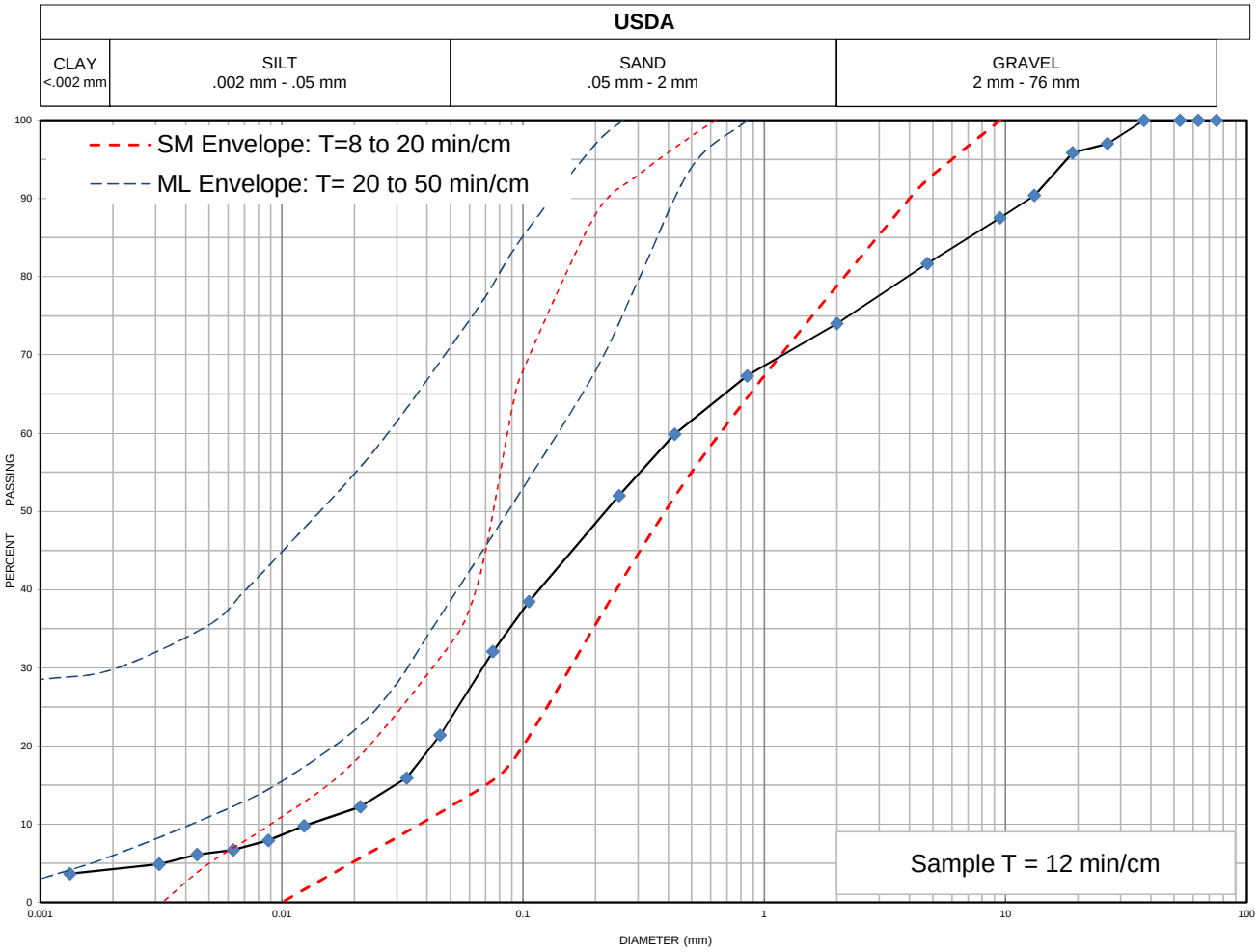
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 105-19 GS 1* **Depth:** *2 m* **Lab Sample No:** *S-19-0371*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 105-19	GS 1	2 m	26	51	19	4	8.0

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Sandy Loam	-	0.430	0.068	0.014	30.71	0.77

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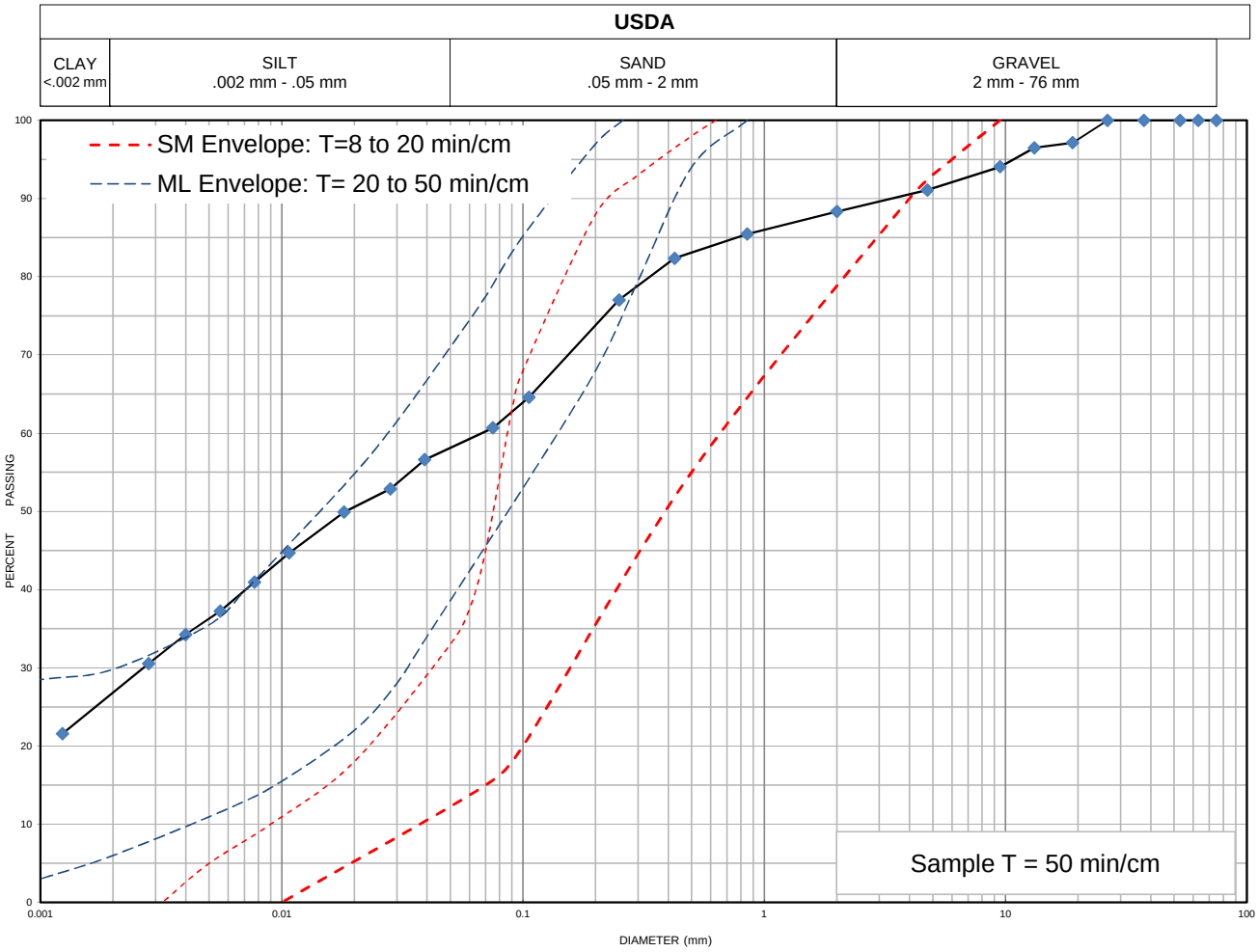
Grain Size Distribution Chart

Project Number: *6199-002* **Client:** *EcoVue Consulting Services Inc.*

Project Name: *Hidden Ridge - Soil Characterization*

Sample Date: *June 4, 2019* **Sampled By:** *Luke Jenkins - Cambium Inc.*

Location: *TP 106-19 GS 1* **Depth:** *1.8 m* **Lab Sample No:** *S-19-0372*



MIT SOIL CLASSIFICATION SYSTEM								
CLAY	SILT	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	BOULDERS
		SAND			GRAVEL			

Borehole No.	Sample No.	Depth	Gravel	Sand	Silt	Clay	Moisture
TP 106-19	GS 1	1.8 m	12	30	31	27	14.1

Description	Classification	D_{60}	D_{30}	D_{10}	C_u	C_c
Clay Loam	-	0.068	0.0027	-	-	-

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Appendix D

Tables from Erosion and Sedimentation Control Guidelines for Urban Construction (December 2006)

Table A1 classifies erodibility for the various soil types. The texture and drainage of the soil are considered when estimating its erodibility.

Table A1: Hierarchy of Soil Erodibility

Soil Type	Erodibility Classification	Soil Erodibibility Rating
Silt	Most	High
Silt Loam		High
Loam		High
Silty Sand		High
Sandy Loam		Medium
Silty Clay Loam		Medium
Sany Clay Loam		Medium
Silty Clay		Medium
Sandy Clay		Low
Clay		Low
Heavy Clay		Low
Loamy Sand		Low
Sand		Low
Poorly Graded Gravel		Low
Well Graded Gravel	Least	Low

Source: Adapted from Guidelines on Erosion and Sediment Control for Urban Construction Sites (MNR *et al.*,1987)

Table A3 shows erosion potential based on soil erodibility, channel slope, and slope length of channel.

Table A3: Erosion Potential for Graded Conveyance Channels

Channel Gradient	Soil Erodibility	Slope Length	
		< 30 m	> 30 m
< 2 % Gentle Slope	Low	Low	Moderate
	Medium	Moderate	Moderate
	High	Moderate	High
2 – 10 % Moderate Slope	Low	Low	Moderate
	Medium	Moderate	High
	High	High	High
> 10 % Steep Slope	Low	Low	Moderate
	Medium	High	High
	High	High	High

Source: Adapted from Guidelines on Erosion and Sediment Control for Urban Construction Sites (MNR *et al.*,1987)