March 17, 2022
Our File: 222042

Via Email: gcooper@cfcrozier.ca

Don McCullough
53 Georgian Meadows Drive
Collingwood, ON L9y 5H4

C/o George Cooper – Crozier Consulting Engineers

Re: Initial Soils Investigation
Proposed Severances – Sideroad 23
343019 Side Road 23
Municipality of Meaford

Dear Mr. McCullough,

It is understood that you are proposing a residential development within the Municipality of Meaford. The site is located along Bayshore Road, north of the community of Leith.

The conceptual drawings provided from Crozier Consulting Engineers indicate the development will be comprised of five lots with individual drilled wells and sewage systems. The lots will be accessed by an internal street (McCullough Way) from Sideroad 23.

This letter report is to provide a summary of the soil conditions observed during the testhole excavation and recommendations with regards to the soil conditions for septic and infiltration features and the roadway construction and general comments on the foundation construction for the proposed residential development.

Site Setting

The site is located along Bayshore Road and will be accessed from Sideroad 23. An existing easement from Sideroad 23 exists and runs along the east side of 343011 Sideroad 23. Bayshore Road is considered to run in a north-south direction. Currently, the site is undeveloped and features a rolling terrain within the development area. Generally, the site slopes from east to west, from the open fields upgradient down towards Bayshore Road. The west side of the property is bordered with a treed area between the proposed development and Bayshore Road. Within the treed area there is a "bluff" and the grade changes rapidly towards Bayshore Road. There are four (4) existing drainage features that drain surface water from the upgradient lands to the east, through the site and west to the ditch that runs along the east side of Bayshore Road.

Site Investigation

A initial site visit was conducted on February 4, 2022 to layout the testholes and verify the access of the excavator to the site from the neighboring property. This testhole layout was provided to Crozier for review prior to conducting the site investigation. The excavation of the testholes was undertaken on February 18, 2022 and included twelve (12) testholes across the development area. A CAT 350 excavator provided and operated by R.F. King Excavating was utilized for the excavation of the testholes. The locations were selected to cover the general area of each proposed

septic bed area, infiltration feature and for general spatial coverage. The testhole locations were surveyed and tied into the site datum provided by Crozier and the locations are shown on the appended Figure No. 1.

The soil stratigraphy was observed, the overburden soils probed to infer the relative density, and the groundwater observations were noted. The testhole logs describing the soil stratigraphy are appended to this letter.

In general, the subsurface consisted of a surficial layer of topsoil and organic material, underlain by clayey silt till with some gravel. Some of the testholes intercepted a hard grey clay layer. In the area of TH-1, a sand with a little silt and gravel was encountered.

Foundation Loading

Since the proposed development is still in a conceptual phase, final floor elevations for the houses have not been finalized. Frost protected foundations are to be extended down to suitable inorganic bearing soil. For the Owen Sound area, frost penetration is considered to be 1.2 mbgs. Based on the anticipated lot grading, the houses are expected to be founded on the native undisturbed clayey silt till with sand and some gravel.

Conventional foundations governed by the Ontario Building Code are expected. Therefore, recommended design bearing capacities are 75 kPa at SLS and 100 kPa at ULS. The maximum total and differential settlements of footings which are designed based on the above noted capacities are expected to be less than 25mm and 15mm respectively

Slab-on-Grade Construction

Where a conventional slab-on-grade construction element is proposed, all topsoil and organics must be removed down to suitable underlying inorganic subgrade soils. The underlying clayey silt soils would generally be considered suitable. A proof-roll with compaction equipment can be performed to confirm suitability. A minimum 150mm lift of compacted Granular A, meeting the OPSS 1010 specifications and compacted to 100% of the material's SPMDD, is to be placed below the proposed concrete slab-on-grade. Where greater depth of backfill is required, imported sand or Granular "B" is recommended with a minimum compaction of 95% SPMDD.

Excavations and Dewatering

Excavations for the foundations will terminate in the native clayey silt soil. Temporary excavations must comply with Ontario Occupational Health and Safety Act for Construction Projects (O.Reg. 213/91). The overburden soils fall into the Type 2 as defined in the regulation and therefore, temporary side slopes in Type 2 soils must be sloped to 1.2 metres or less from its bottom at an inclination of 1 horizontal to 1 vertical (exclusive to groundwater effects).

During the excavation of the testholes, minor shallow groundwater infiltration was noted at some of the locations. The water was found to infiltrate between 1.0m to 1.6m below ground surface. These shallow ground water conditions can be attributed to the recent fluctuations in temperature causing snow melt. At the location of TH-10, towards the west end of infiltration trench #3, significant groundwater infiltration was noted at a depth of 1.4m.

Since there are predominately fine-grained soils located across the site, perched groundwater conditions are likely to develop during the wetter seasons. Temporary dewatering with conventional sump pumps at excavated low points may be necessary to control the seepage of water from the layers of till during construction.

Septic Design

The five lots are proposed to have their own individual septic systems located to the rear of the lots (west side) and typically downgradient of the dwelling. A testhole was excavated within each proposed septic bed area, with a subgrade soil being generally consistent for 4 of the 5 septic areas. For Lots 1, 2, 3, and 5, the encountered subgrade soils in the area of the septic bed was clayey silt till with sand and some to trace gravel. A representative sample collected from TH-6 was selected for grain-size analysis and yielded 21.4% gravel, 35.5% sand, 33.6% silt and 17.5% clay. Therefore, the estimated coefficient of permeability for this material is 1.6×10^{-7} cm/sec which translates to a "T" Time for the bed greater than 50 mins/cm. Based on this result, it is not feasible to construct "in-ground" septic beds for these lots, and the design should feature a raised bed constructed of approved imported material.

The excavation of TH-1, located within the proposed septic area for Lot 4, encountered below the till and at a depth of 1.0 m, a sandier soil with silt, gravel, and clay still present. A sample collected from TH-1 was analyzed for grain-size distribution and yielded 15.0% gravel, 63.9% sand, 16.6% silt and 4.5% clay. The estimated coefficient of permeability for this sample is 1.6×10^{-3} cm/sec and a "T" Time of 12 to 15 mins/cm. While this soil would be somewhat more conducive to a "in-ground" septic bed, the consistent clay and silt subgrade findings above and below the minor sandy layer in this testhole and the clay and silt from the other testholes would impact the performance of the septic bed and therefore raised beds are recommended. In addition, diverting surface water away from the raised system will be critical to reduce potential saturation of the imported sand, utilized to construct the onsite systems.

Stormwater Management

As shown on the conceptual design for the development, several infiltration trenches are included to manage the stormwater on site. There are four (4) existing drainage features identified on the site that drain surface water from the upgradient lands to the east, through the site west to the ditch that runs along the east side of Bayshore Road.

The proposed construction includes ditches on either side of McCullough Way, that direct the surface water towards infiltration trenches located along the existing drainage features. TH-4 was excavated within the area of infiltration trench #4 near drainage feature 1, located on Lot 2. TH-10 and TH-11 were located along the area of infiltration trench #3 located between Lots 4 and 5. TH-12 is located near infiltration trenches #1 and #2, near drainage feature 3. The fourth drainage feature is located towards the south end of McCullough Way.

The findings of the testholes at these areas was relatively consistent, with surficial topsoil and organics underlain by the clayey silt till with sand and some gravel. Samples from TH-4, TH-10 were selected for grain-size analysis to determine estimated infiltration rates of the soil. The sample collected from TH-4 yielded a grain-size distribution of 11.8% gravel, 37.1% sand, 33.6% silt and 17.5% clay. The sample collected from TH-10 yielded a grain-size distribution of 5.0% gravel, 41.5% sand, 40.4% silt and 13.1% clay. The estimated coefficient of permeability for the samples from TH-4 and TH-10 are 1.0×10^{-8} cm/sec and 1.6×10^{-7} cm/sec respectively.

During the excavation of the testholes, the inferred density of the material was estimated from probing the soils with a steel rod. The clayey silt till was noted to be stiff to very stiff when probed. Combining this with the low estimated coefficient of permeability and low infiltration rates, it is interpreted that the infiltration of stormwater would be very low and should be considered negligible as part of the stormwater design.

Roadway Construction

The five lots will front on McCullough Way, which will be a private roadway which is proposed to be constructed to connect the lots to Sideroad 23. The subgrade for the roadway will likely be the clayey silt till with sand and some gravel. Depending on the time of year, the moisture conditions at the time of construction, and the quality of the soils, surplus harvested materials may be able to be used as subgrade material.

It is recommended the final subgrade surface be proof rolled to determine any loose, soft, or unstable areas of the subgrade. Any areas which reveal unsuitable conditions should be sub-excavated and backfilled using suitable materials such as imported Granular "B" which must be compacted to at least 95% of the material's SPMDD at the subgrade level. The recommended road structure is outlined in the table below.

Internal Roadways	Component Thickness (mm)	Specified Compaction (%)
OPSS Granular "A"	200	100% SPMDD
OPSS Granular "B"	350	100% SPMDD
Subgrade Fill	Varies	95 to 98% SPMDD

STATEMENT OF LIMITATIONS

The discussion and recommendations in this report are based upon information gathered at the testhole locations and available geological and physiographical information of general nature for the area. Sub-surface and groundwater conditions are variable and will differ in area beyond the investigated testholes. As a result, conditions may become apparent during further investigation or construction, which would not be detected or anticipated at the time the site investigation was performed and when this report was prepared.

The information in this report is intended for the sole use of Mr. Don McCullough and his agents. GM BluePlan Engineering Limited accepts no liability for use of this information by third parties on the basis of the interpretation of the information provided in this preliminary report are made at the sole risk of the third parties.

The final shape and location of the proposed site developments have not been confirmed and therefore, comments made within this report are made in general only to assist the owner and designers involved with the project in question. Furthermore, the number of testholes may not be sufficient to determine all the factors that may affect the design, construction methods and costs. Additional investigation would be necessary to increase the confidence level. For this reason, Contractors bidding on this project or undertaking the construction should make their own interpretation of the factual information presented within this report and then draw their own conclusion on the sub-surface conditions and how it will affect the methods and cost of construction.

We recommend that we be retained to provide comment for the selected roadway design and during construction to ensure that all the necessary stripping, sub-grade preparation, and compaction requirements are met, and to be available to confirm that the soil conditions do not deviate from those presented within this report

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED

Per:

Ethan Webb

Ethan C.J. Webb, P.Eng.
EW/md

Reviewed by:

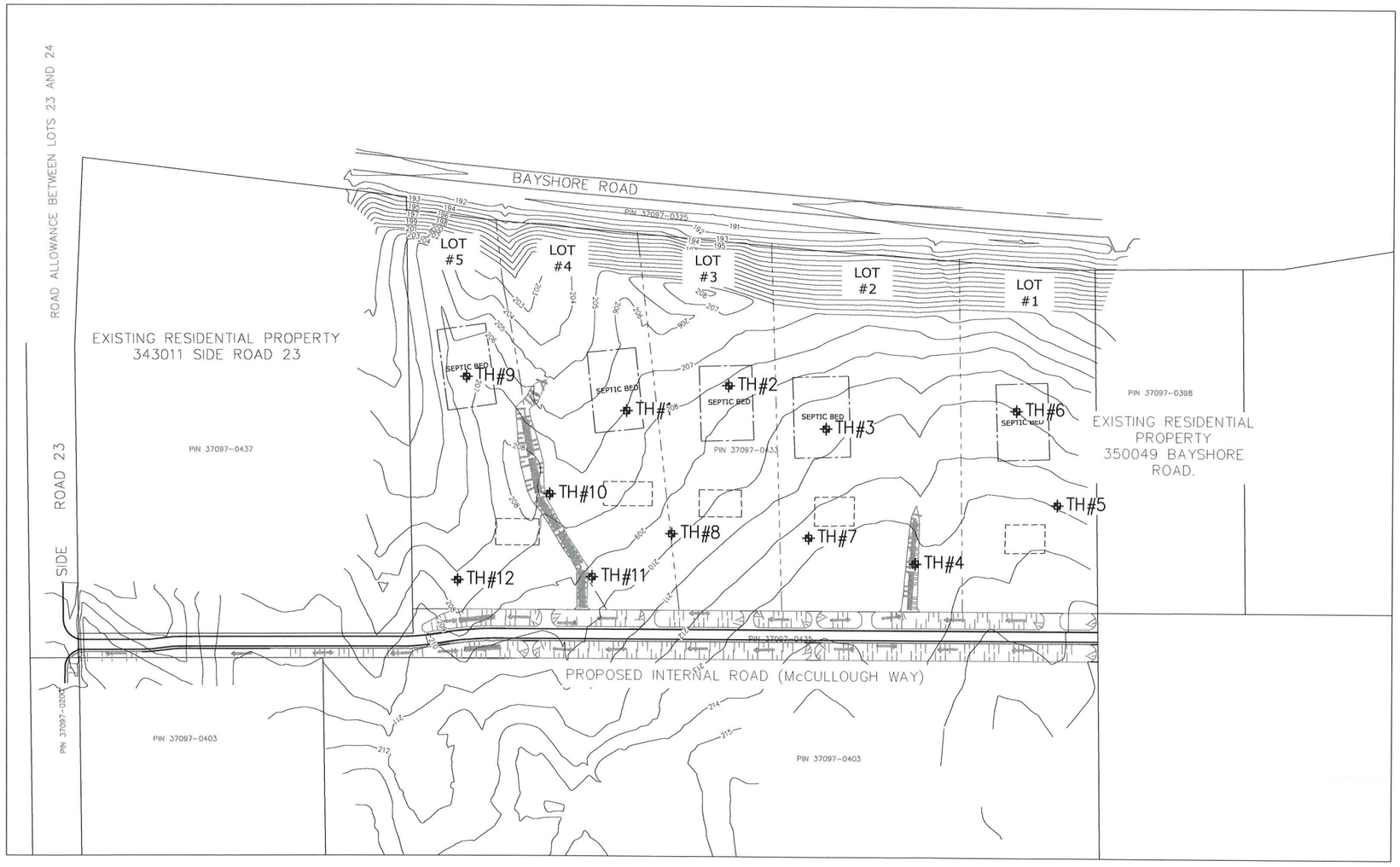
Wm. E. Dubeau, P.Eng.

LICENSED PROFESSIONAL ENGINEER
Mar 17/22
W. E. DUBEAU
PROVINCE OF ONTARIO

Encl.

cc: File No. 222042

222042
SOILS INVESTIGATION
PROPOSED SEVERANCE
SIDEROAD 23, MEAFORD



LEGEND

- PROPOSED TESTHOLE
- CONCEPTUAL LOCATION OF RESIDENCE
- CONCEPTUAL LOCATION OF SEPTIC BED

SCALE = 1:2000

FEBRUARY 2022

TESTHOLE LOCATIONS

Mr. Don McCullough

Municipality of Meaford

Figure No. 1

BluePlan ENGINEERING

Log of Testhole: 1

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	206.96		Ground Surface		
	206.56		Black topsoil and organics.		
2			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		
3 / 1	205.96				
4			Silty Sand and Gravel. Moist and Compact when probed with a steel rod.		Minor Infiltration @ 1.1m
5					Sample Collected @ 1.4m
6					Minor Infiltration @ 1.6m
2	204.96				
7	204.76		Grey Clayey Silt Till. Moist and Hard from resistence in excavation.		
8					
9					
10 / 3					
11					
12					
13 / 4					
14					
15					
16					

Notes:

Equipment: CAT 350 Excavator

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, Exeter, Hamilton, GTA

1260 Second Ave East, Unit 1, Owen Sound, ON N4K 2J3

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Log of Testhole: 2

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	208.22		Ground Surface		
	208.02		Black topsoil and organics.		
1 / 1			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		
2 / 2	206.12				
7 / 2	205.92		Grey Clayey Silt Till. Moist and Hard from resistence in excavation.		
10 / 3					
13 / 4					
16					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 3

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	210.52		Ground Surface		
	210.32		Black topsoil and organics.		
1 – 4 / 1			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		Minor Infiltration @ 1.1m
6 – 7 / 2	208.42				
	208.22		Grey Clayey Silt Till. Moist and Hard from resistence in excavation.		
8 – 13 / 3 – 4					
14 – 16					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 4

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	213.27		Ground Surface		
	213.07		Black topsoil and organics.		
1 / 2 / 3 / 4 / 5 / 6 / 7 / 1 / 2			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		Sample Collected @ 1.2m
	210.97				
8 / 9 / 10 / 11 / 12 / 13 / 14 / 15 / 16 / 3 / 4					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 5

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	217.87		Ground Surface		
	217.67		Black topsoil and organics.		
1 – 6 / 1			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		Minor Infiltration @ 1.0m
	215.97				
7 – 16 / 2 – 4					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 6

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	210.97		Ground Surface		
	210.77		Black topsoil and organics.		
1 – 4 / 1			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		Sample Collected @ 1.2m
7 / 2	208.67				
8 – 16 / 3 – 4					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 7

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	210.97		Ground Surface		
0	210.82		Black topsoil and organics.		
1 – 8 / 0 – 2			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		
8 / 2	208.47				
9 / 3	208.17		Grey Clayey Silt Till. Moist and Hard from resistence in excavation.		
10 – 16 / 3 – 4					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 8

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	209.62		Ground Surface		
	209.32		Black topsoil and organics.		
1 – 3 / 1			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		
4 – 7 / 2	207.32				
8 – 16 / 3 – 4					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 9

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	206.81		Ground Surface		
	206.66		Black topsoil and organics.		
1			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		
2					
3 / 1					
4					
5					
6					
7 / 2					
8					
	204.11				
9	203.91		Grey Clayey Silt Till. Moist and Hard from resistence in excavation.		
10 / 3					
11					
12					
13 / 4					
14					
15					
16					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 10

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	207.80		Ground Surface		
0 – 1 / 0	207.40		Black topsoil and organics.		
1 – 6 / 0 – 2	205.70		Sandy Silt with a little Clay. Moist and Loose to Compact when probed with a steel rod.		Sample Collected @ 1.0m Major Infiltration @ 1.4m
7 / 2	205.40		Grey Clayey Silt Till. Moist and Hard from resistence in excavation.		
8 – 16 / 2 – 4					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 11

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	209.17		Ground Surface		
			Black topsoil and organics.		
1 / 2 / 3 / 4 / 5 / 6 / 1			Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		Major Infiltration @ 1.4m
7 / 2	207.07				
8 / 9 / 10 / 3 / 11 / 12 / 13 / 4 / 14 / 15 / 16					

Notes:

Equipment: CAT 350 Excavator

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Log of Testhole: 12

Project No: 222042

Project: Sideroad 23 - Severences

Client: Mr. Don McCullough

Location: Municipality of Meaford

Excavation Date: February 18, 2022

Field Technician: E. Webb.

Excavation Company: R.F. King Excavating

SUBSURFACE PROFILE				PROPERTIES	HYDROLOGY
Depth (ft / m)	Elevation	Symbol	Description	% Moisture (5 – 15 – 25)	Ground Water and Sampling Details
0 / 0	207.20		Ground Surface		
			Black topsoil and organics.		
1	206.85		Brown Clayey Silt Till with a some Gravel. Grey Mottled. Moist and Stiff when probed with a steel rod.		
2					
3 / 1	206.10				Minor Infiltration @ 1.0m
4	205.90		Grey Clayey Silt Till. Moist and Hard from resistence in excavation.		
5					
6 / 2					
7					
8					
9					
10 / 3					
11					
12					
13 / 4					
14					
15					
16					

Notes:

Equipment: CAT 350 Excavator

GM BluePlan Engineering Limited

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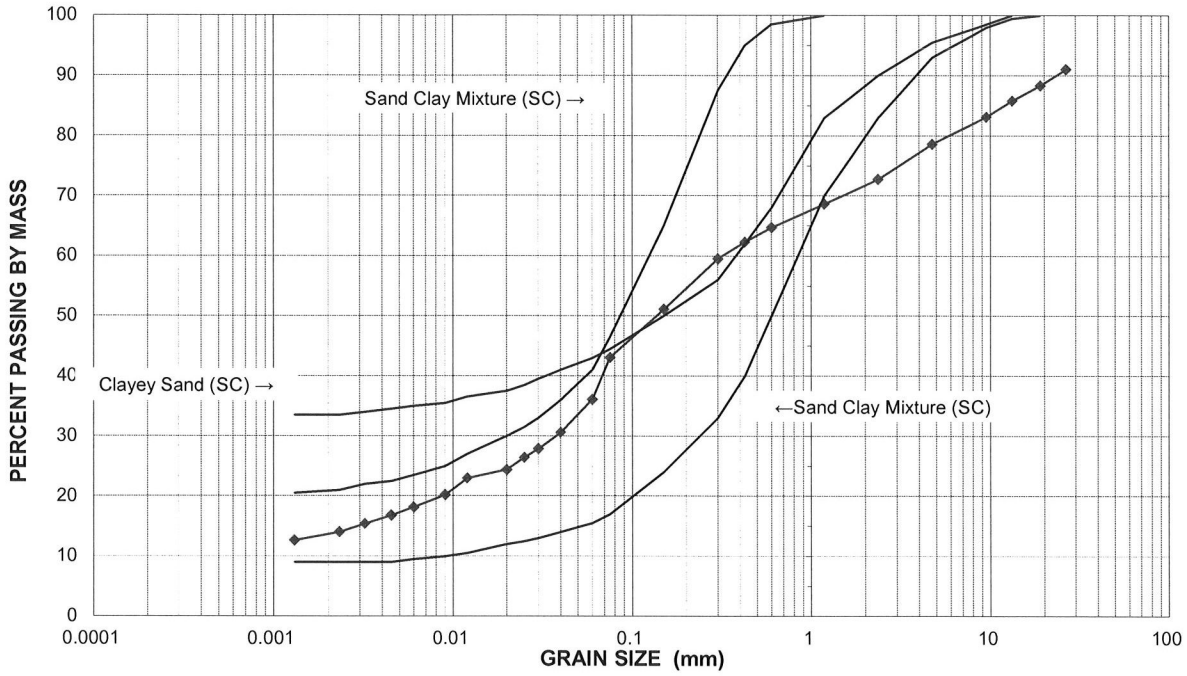
PARTICLE SIZE ANALYSIS

PROJECT:	Soils Investigation - Proposed Severance - Sideroad 23	FILE NO.:	222042
LOCATION:	Municipality of Meaford	LAB SAMPLE NO.:	S-4445 (RCVD Feb 18)
CLIENT :	Don McCullough	SAMPLE DATE:	February 18, 2022
SOIL TYPE:	Clayey Silt with Sand and some Gravel	SAMPLED BY:	EW
GRAPH # :	8 - Clayey Sands, Sand-Clay Mixtures	SOURCE:	TH-6 @ 1.2m

PARTICLE SIZE DISTRIBUTION



←		FINE	MEDIUM	COARSE	FINE	COARSE
CLAY	SILT	SAND			GRAVEL	

SIEVE SIZE PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE	HYDROMETER PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE
26.5	91.0	0.0600	36.1
19	88.4	0.0400	30.6
13.2	85.8	0.0300	27.8
9.5	83.1	0.0250	26.4
4.75	78.6	0.0200	24.4
2.36	72.7	0.0120	23.0
1.180	68.6	0.0090	20.2
0.600	64.7	0.0060	18.2
0.425	62.4	0.0045	16.8
0.300	59.5	0.0032	15.4
0.150	51.1	0.0023	14.0
0.075	43.1	0.0013	12.6

D_{10} : 0.0004 mm **D_{60} :** 0.32 mm **Cu :** 800

Coefficient of Permeability: 1.6×10^{-7} cm/sec **"T" Time :** > 50 mins/cm

Comments: D10 is extrapolated.

GM BluePlan Engineering Limited

Guelph, Owen Sound, Listowel, Kitchener, London, Hamilton, GTA

1260 - 2nd Avenue E., Unit 1 Owen Sound, ON N4K 2J3

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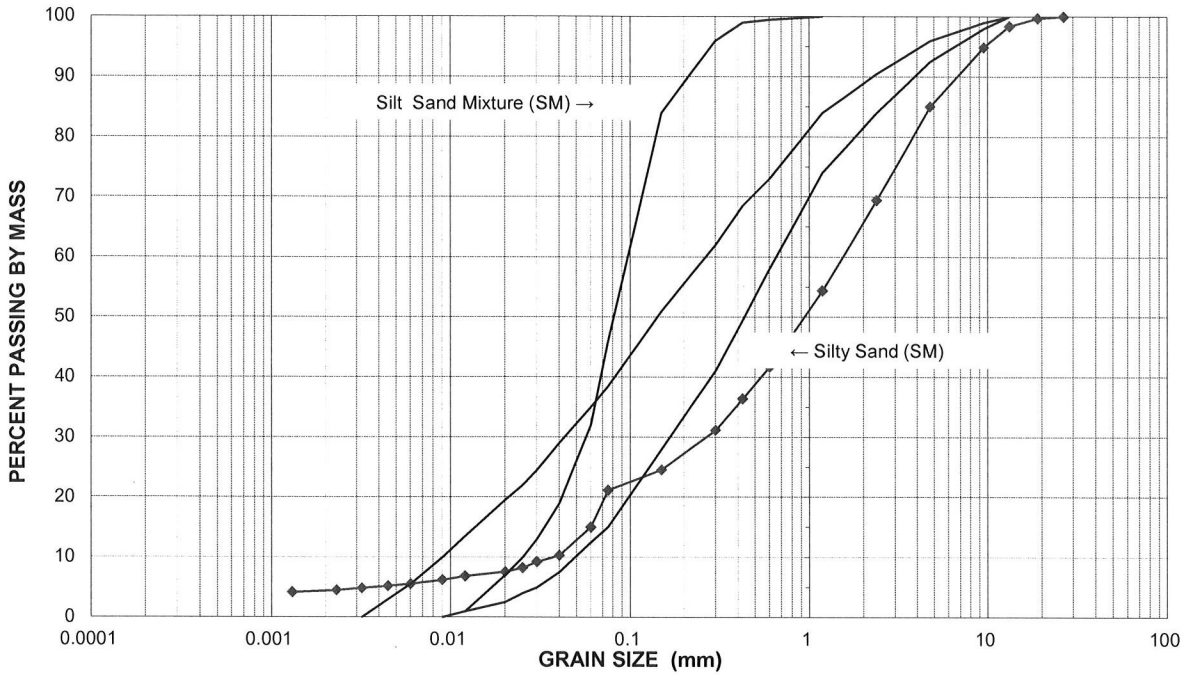
PARTICLE SIZE ANALYSIS

PROJECT:	Soils Investigation - Propose Severance - Sideroad 23	FILE NO.:	222042
LOCATION:	Municipality of Meaford	LAB SAMPLE NO.:	S-4446 (RCVD Feb 18)
CLIENT :	Don McCullough	SAMPLE DATE:	February 18, 2022
SOIL TYPE:	Sand with a little Silt and Gravel and a trace of Clay	SAMPLED BY:	EW
GRAPH # :	7 - Silty Sands, Sand-Silt Mixture	SOURCE:	TH-1 @ 1.4m

PARTICLE SIZE DISTRIBUTION



←		FINE	MEDIUM	COARSE	FINE	COARSE
CLAY	SILT	SAND			GRAVEL	

SIEVE SIZE PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE	HYDROMETER PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE
26.5	100.0	0.0600	15.0
19	99.7	0.0400	10.3
13.2	98.4	0.0300	9.2
9.5	94.9	0.0250	8.2
4.75	85.0	0.0200	7.6
2.36	69.4	0.0120	6.9
1.180	54.4	0.0090	6.2
0.600	41.7	0.0060	5.5
0.425	36.4	0.0045	5.2
0.300	31.1	0.0032	4.8
0.150	24.6	0.0023	4.5
0.075	21.1	0.0013	4.2

D_{10} : 0.04 mm **D_{60} : 1.62 mm** **Cu : 40.5**

Coefficient of Permeability: 1.6×10^{-3} cm/sec **"T" Time : 12 to 15 mins/cm**

Comments:

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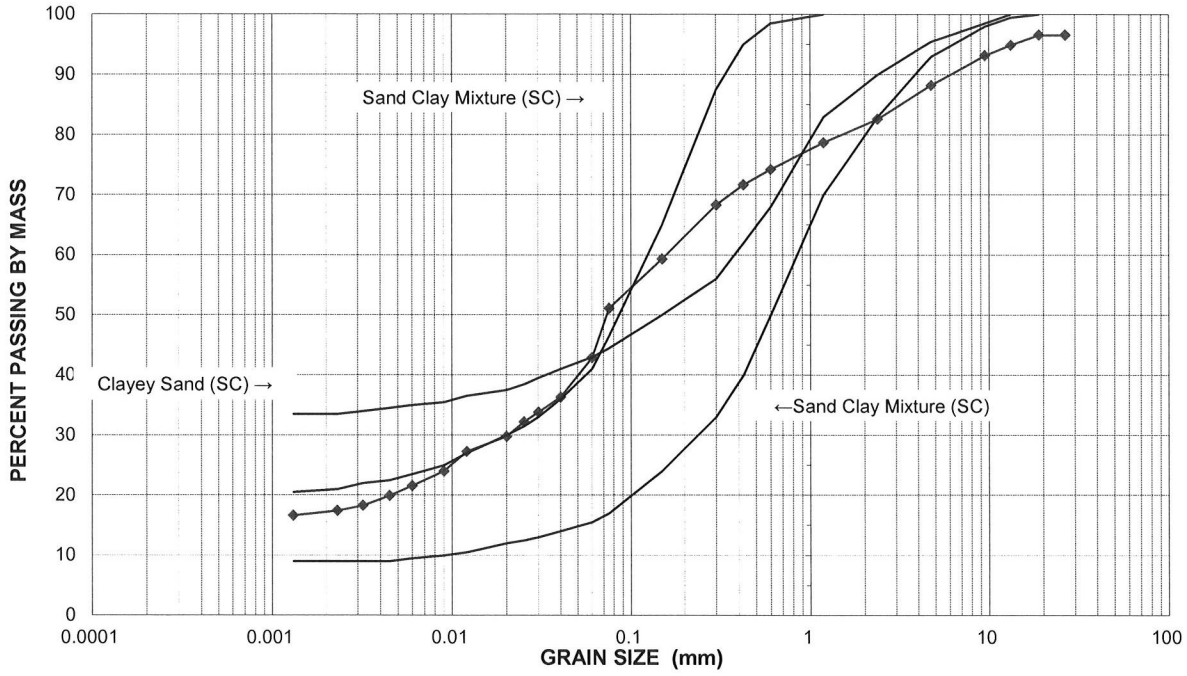
PARTICLE SIZE ANALYSIS

PROJECT:	Soils Investigation - Proposed Severance - Sideroad 23	FILE NO.:	222042
LOCATION:	Municipality of Meaford	LAB SAMPLE NO.:	S-4447 (RCVD Feb 18)
CLIENT :	Don McCullough	SAMPLE DATE:	February 18, 2022
SOIL TYPE:	Clayey Silt with Sand and a little Gravel	SAMPLED BY:	EW
GRAPH # :	8 - Clayey Sands, Sand-Clay Mixtures	SOURCE:	TH-4 @ 1.2m

PARTICLE SIZE DISTRIBUTION



←		FINE	MEDIUM	COARSE	FINE	COARSE
CLAY	SILT	SAND			GRAVEL	

SIEVE SIZE PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE	HYDROMETER PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE
26.5	96.6	0.0600	42.9
19	96.6	0.0400	36.3
13.2	94.9	0.0300	33.9
9.5	93.2	0.0250	32.2
4.75	88.2	0.0200	29.8
2.36	82.6	0.0120	27.3
1.180	78.7	0.0090	24.0
0.600	74.2	0.0060	21.6
0.425	71.7	0.0045	19.9
0.300	68.3	0.0032	18.3
0.150	59.3	0.0023	17.5
0.075	51.1	0.0013	16.6

D_{10} : 0.0001 mm **D_{60} :** 0.16 mm **Cu :** 1600

Coefficient of Permeability: 1.0×10^{-8} cm/sec **"T" Time :** > 50 mins/cm

Comments: D10 is extrapolated.

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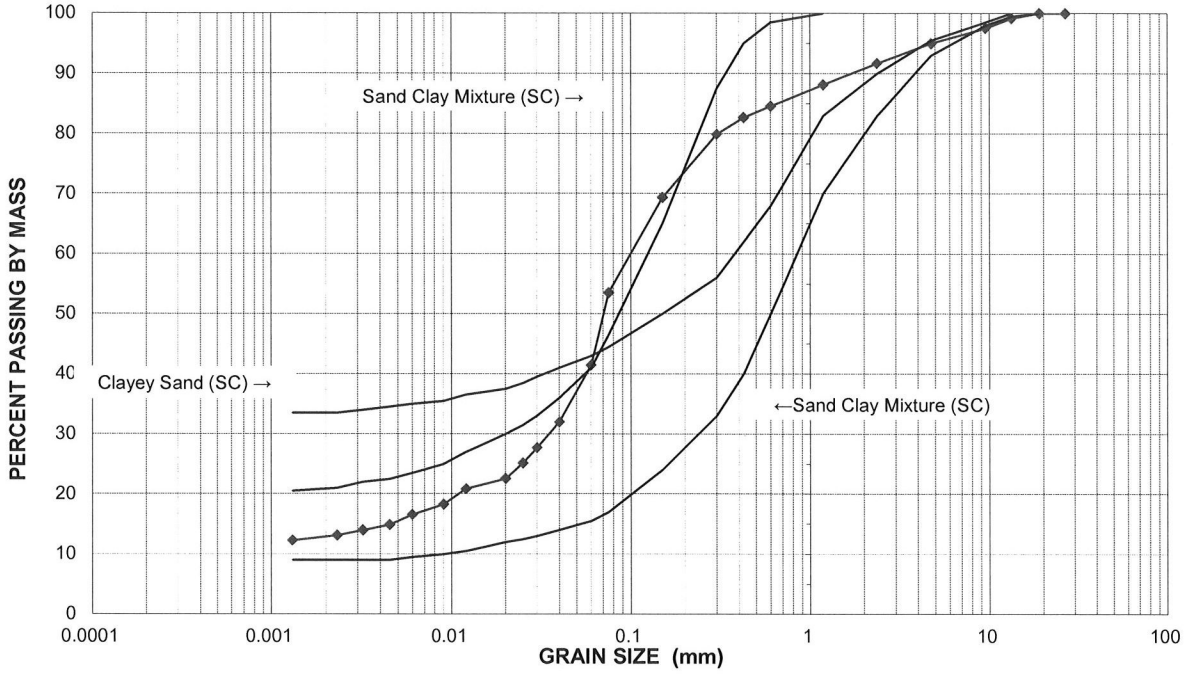
PARTICLE SIZE ANALYSIS

PROJECT:	Soils Investigation - Proposed Severance - Sideroad 23	FILE NO.:	222042
LOCATION:	Municipality of Meaford	LAB SAMPLE NO.:	S-4448 (RCVD Feb 18)
CLIENT :	Don McCullough	SAMPLE DATE:	February 18, 2022
SOIL TYPE:	Silty Sand with a little Clay and trace of Gravel	SAMPLED BY:	EW
GRAPH # :	8 - Clayey Sands, Sand-Clay Mixtures	SOURCE:	TH-10 @ 1.0m

PARTICLE SIZE DISTRIBUTION



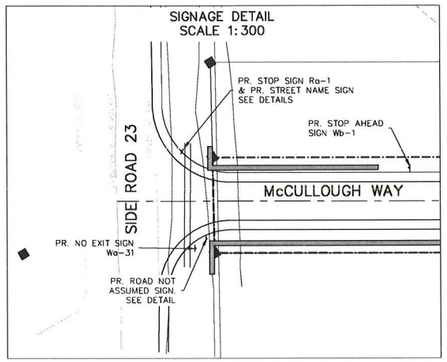
←		FINE	MEDIUM	COARSE	FINE	COARSE
CLAY	SILT	SAND			GRAVEL	

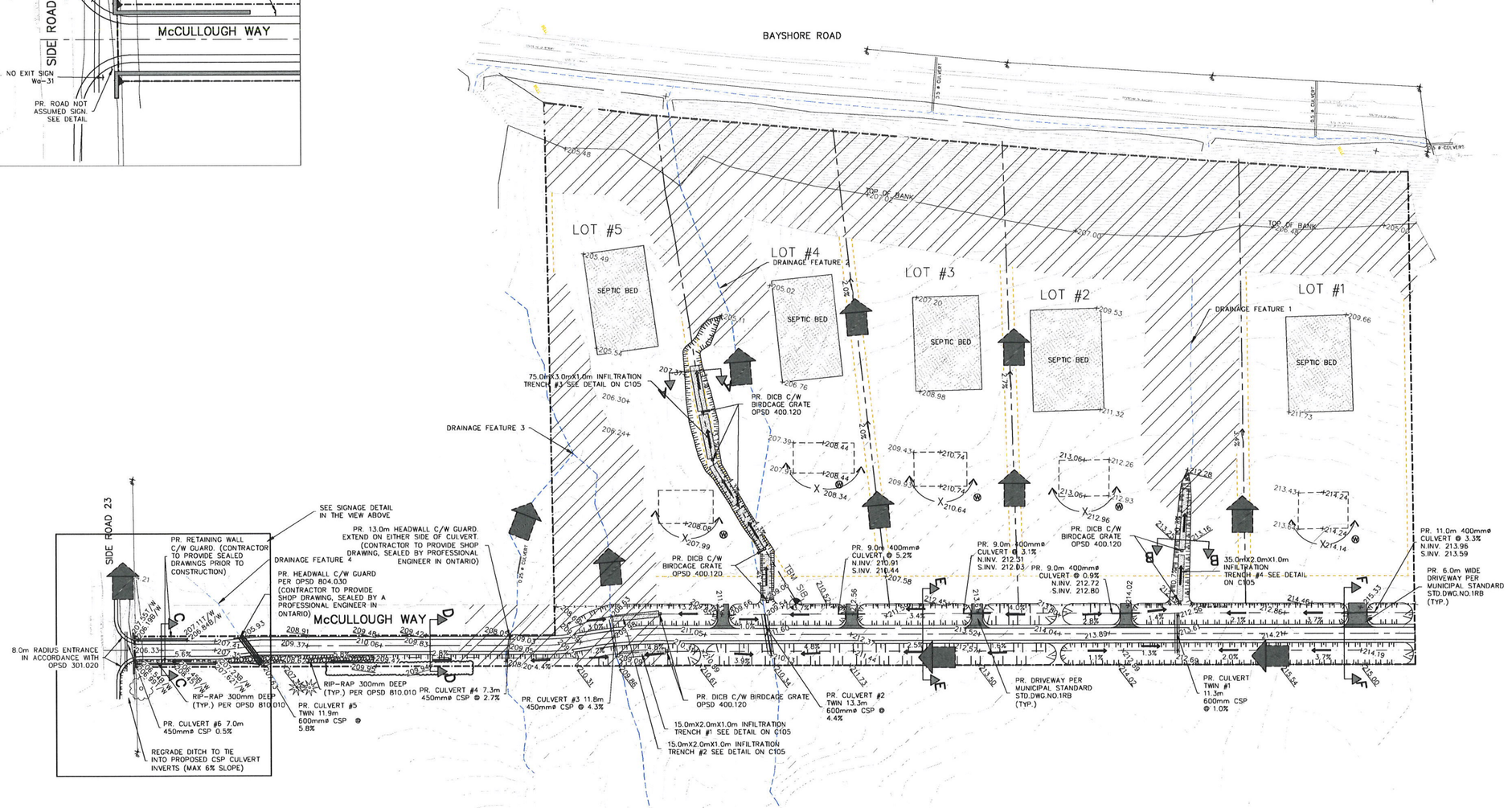
SIEVE SIZE PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE	HYDROMETER PARTICLE DIA. (mm)	PERCENT PASSING SAMPLE
26.5	100.0	0.0600	41.5
19	100.0	0.0400	32.0
13.2	99.2	0.0300	27.7
9.5	97.5	0.0250	25.1
4.75	95.0	0.0200	22.6
2.36	91.7	0.0120	20.9
1.180	88.2	0.0090	18.3
0.600	84.6	0.0060	16.6
0.425	82.7	0.0045	14.8
0.300	79.9	0.0032	14.0
0.150	69.4	0.0023	13.1
0.075	53.5	0.0013	12.3

D_{10} : 0.0004 mm **D_{60} : 0.11 mm** **Cu : 275**

Coefficient of Permeability: 1.6×10^{-7} cm/sec **"T" Time : > 50 mins/cm**

Comments: D10 is extrapolated.





LEGEND

- PROPOSED BUILDING ENVELOPE
- PROPOSED WELL LOCATION
- ENVIRONMENTAL PROTECTED/HAZARD AREAS
- INFILTRATION TRENCH
- PROPOSED CONVENTIONAL SEPTIC DISPOSAL AREA (633m²)
- PROPOSED RESIDENCE (325m²)
- PROPOSED SWALE (2.5%)
- +213.05 EXISTING GRADE
- +213.05 PROPOSED GRADE
- +212.89 PROPOSED GRADE (MATCH EXISTING)
- PROPOSED OVERLAND FLOW DIRECTION
- INTERCEPTOR SWALE
- RETAINING WALL
- RIP RAP

SIGN DETAILS

60cmx60cm
Ra-1 STOP SIGN

75cmx75cm
Wb-1 STOP AHEAD SIGN

ROAD NOT ASSUMED SIGN

STREET NAME SIGN

45cmX45cm
Wa-31 NO EXIT SIGN

GENERAL GRADING NOTES:

1. REFER TO DRAWING C102 FOR CROSS-SECTION DETAILS.
2. PROPOSED INFILTRATION TRENCHES HAVE BEEN DESIGNED TO PROVIDE THE REQUIRED QUANTITY CONTROLS FOR FULL BUILD-OUT OF THE DEVELOPMENT AND QUALITY FOR THE PROPOSED ROADWAY. QUALITY CONTROLS FOR INDIVIDUAL LOTS TO BE DESIGNED BY OTHERS AT BUILDING PERMIT STAGE (IF REQUIRED)
3. 150mmø RIP RAP (300mm DEEP) TO BE PROVIDED IN DITCHES THAT EXCEED A SLOPE OF 5.0%

GENERAL SERVICING NOTES:

1. DETAILED SEPTIC DESIGN AND LOCATION, AND WELL LOCATION TO BE CONFIRMED AT TIME OF DETAILED LOT DESIGN/BUILDING PERMIT.
2. SEPTIC BEDS TO MAINTAIN MINIMUM 15m SEPARATION FROM PROPOSED WELLS AND INFILTRATION FACILITIES.
3. SEPTIC BEDS TO MAINTAIN MINIMUM 3m SEPARATION FROM PROPERTY LINES.

TEMPORARY BENCHMARKS

TBM#1- SQUARE IRON BAR (SIB), ELEVATION = 210.299
SURVEY COMPLETED BY VAN HARTEN ON JANUARY 29TH 2019

Town

No.	ISSUE	DATE: MM/DD/YYYY
0	ISSUED FOR CLIENT REVIEW	07/28/2020
1	RE-ISSUED FOR CLIENT REVIEW	08/18/2021
2	ISSUED FOR SECOND SUBMISSION	11/18/2021

Engineer

Engineer

Project: LEITH-BAYSHORE ROAD
MUNICIPALITY OF MEAFORD

Drawing: MASTER SERVICING & GRADING PLAN

CROZIER CONSULTING ENGINEERS
ADMIRAL BUILDING
1 FIRST STREET, SUITE 200
COLLINGWOOD, ON, L9Y 1A1
705-446-3510 T
705-446-3520 F
WWW.CFCROZIER.CA
INFO@CFCROZIER.CA

Drawn By	N.L.	Design By	N.L./G.C.	Project	903-3780
Check By	G.C.	Check By	R.A.	Scale 1:750	Drawing C101

J:\900\903 - McCullough\3780 - Leith Bayshore Rd\CAD\C3D\SHEETS\3780_C100-C103_(With Retaining Wall).dwg, 2021-11-18 4:43:14 PM, _AutoCAD PDF (General Documentation).pc3