MTE Consultants
123 St. George St., London, Ontario N6A 3A1

October 15, 2024

MTE File No.: 43353-100

Development Service
City of London
300 Dufferin Avenue
London, ON N6A 4L9

Attention: Mr. Brent Lambert, CET

RE: 459 HALE STREET: PROPOSED TEN UNIT VACANT LAND CONDO (VLC) PRELIMINARY STORMWATER (SWM) BRIEF

MTE Consultants Inc. was retained to undertake a Stormwater Management Study for the above noted site. It is proposed to develop seven units within 'Block A' and three units within 'Block B' vacant land condo (VLC) at the rear of 459 Hale Street. The existing house will remain. The site is approximately 0.33 Ha in size. This brief addresses the proposed SWM for this development.

Review of Groundwater and Infiltration Measures

The subject site development consists of ten residential condo units with associated driveways and landscaped areas. The total site is approximately 0.33 Ha plus external drainage areas of 0.01 from Mn#461. However, only 0.22 Ha will be controlled in the proposed SWM facility, due to existing grading. The area of 0.052 Ha represents rear yard area which will run off-site in the north-west corner of the property. The remaining (approximately 0.07 Ha) of uncontrolled area represents a portion of the proposed laneway and majority of the existing lot at 459 Hale Street which will drain toward Hale Street, as per the existing drainage pattern. For more details refer to attached Figure 1.

The area contributing to the proposed SWM facility was calculated to be comprised of approximately 69% impervious surfaces. As per the City of London Design Specifications & Requirements Manual, the site runoff coefficient ('C') was estimated to be 0.68.

Our review of the City's record drawings has revealed that the existing Hale Street storm sewer has capacity deficiencies. Therefore, it is proposed that the SWM quantity control be achieved by infiltration. The post-development runoff will be conveyed to the proposed infiltration pond. The infiltration pond will have rectangular shape and a clear stone bottom. Pond dimensions and volume are provided in the attached calculations. The pond is to be located within common element at the north property line (refer to attached engineering plan). The top area of the pond is approximately 184m^2.

The Hydraulic Conductivity in the vicinity of the infiltration pond (Test Pit 2) is 0.01 cm/sec (sand), as shown in the attached Geotechnical Report (1791231-L01) by Golder Associates, dated November 28, 2017. The Appendix C – Site Evaluation and Soil Testing Protocol for Stormwater Infiltration (Low Impact Development Stormwater Management Planning and Design Guide) was used to convert Hydraulic Conductivity to Infiltration Rate. The Infiltration Rate (using Table C1 from referenced document above) with safety factor of 2.5 was estimated to be 60 mm/hour or 1.67E-05 m/s.

The attached geotechnical report, notes that groundwater was not encountered at TP-201 which is located in the pond facility area was excavated to a depth of 4.27m. The existing ground elevation at this location is 258.25m. As such, TP-201 was excavated to an approximate bottom elevation of 254.00 and there was no ground water observed to this elevation.

The bottom of the proposed stone gallery is 256.80. As such, there will be at least 2.8m of vertical clearance between the bottom of the pond and the groundwater elevation.

The table below summarizes the pond data:

Return Period of Storm	Required Storage Volume (m^3)	*Provided Storage Volume (m^3)	Surface Ponding Depth (m)	Drawdown Time (hrs)
1:5-year	44.30	94.71	0.69	10.59
1:250-year	94.26	94.71	1.1	13.95

*The provided storage includes both storage within the pond and within the stone gallery.

The proposed infiltration facility will be underlain by a stone infiltration gallery founded on the native sand. The proposed pond has a top area of approximately 184.1 m^2 at the maximum ponding elevation and is 1.4 m deep. Side slopes of 3:1 were utilized for the pond and the area at the bottom of the dry pond is around 25 m^2. The proposed stone gallery has a footprint of approximately 72.0 m^2 and is 0.30 m deep. As shown in the attached calculations, the max ponding depth (1:250 year) of the proposed infiltration pond is 1.1 m and total pond volume is approximately 86 m^3 (pond area approximately 140.4 m^2). The pond and gallery have a combined storage volume of 94.71 m^3.

The pond area at the 5-year and 250-year ponding elevation (80% of area was conservatively used) was used as the contact area to determine the infiltration rate. Please refer to the attached calculations for the exfiltration rate calculation and storage volume calculations during the 5-year and 250-year storm.

The provided pond storage of 94.71 m^3 at the top of 250-year ponding is larger than the storage of 94.26 m^3 required to infiltrate the 250-year storm. Therefore, the infiltration pond has been sized to store and infiltrate the entire post-development 2-year to 250-year design storms, without pond overtopping and a minimum freeboard of 0.3m.

Quality Control

The entire minor and major flows (including 250-year storm) will be infiltrated within SWM infiltration pond. Therefore, there are no quality control requirements for this site. In addition, the residential laneway and driveway areas within the proposed site are relatively small (0.14 Ha in size). This area is not large enough to warrant an OGS unit for quality control.

However, the following soft measures will be implemented and will provide some quality treatment of stormwater before entering infiltration pond:

- A 1200mm CBMH will be located upstream of the infiltration basin and will be constructed with a 600mm sump. The sump will remove some sediment from the site runoff prior to discharging to the proposed SWM facility. The sump will be cleaned out on a regular basis (see Required Regular Maintenance section below).
- The bottom of the SWM facility will contain 290mm depth of small diameter clear stone. This stone will provide some sediment capture. The stone (and associated sediment) will be excavated, removed and replaced every five year period (see Required Regular Maintenance section).

Construction Staging

The pond shall not be constructed until after the site construction is fully completed including asphalt, vegetation and sodding.

During the site construction, the pond shall be excavated to the bottom elevation of 257.10 and rough graded. This will act as an infiltration area during construction.

After site construction is completed and all areas are sodded, the pond bottom shall be further excavated to elevation 256.80 and the clear stone layer shall be installed as per the engineering plans. The top of the native sand (just below the stone layer) shall not be compacted and this sand layer shall be scarified prior to the installation of the stone.

After the installation of the stone, the pond shall be fine graded, topsoiled and seeded.

Topsoil Mix for Pond Side Slopes

The pond bottom will be stone and the pond side slopes will be topsoil and seed. It is important that the topsoil on the side slopes is mixed with sand prior to installation. A 30/70 sand to topsoil mix shall be used for the topsoil layer within the pond. The topsoil layer shall only be 100mm thick and shall be seeded (not sodded).

Provisional Storm Sewer Outlet

As outlined in this report the storm sewer system on Hale Street does not have capacity for the development site. At some point in the future, it is likely that the storm sewer on Hale Street will be replaced and/or upgraded.

If the Hale Street storm sewer is upgraded in the future, it is feasible that the site could connect to this future storm sewer or possibly the site infiltration pond could be provided with a storm sewer outlet.

As such, a provisional 300mm diameter storm sewer has been allowed for in the site design. The storm sewer will be installed at this time and will be capped at the upstream end (by the infiltration pond) and at the downstream end (adjacent to the Hale Street property line). The storm sewer will be 300mm diameter PVC at 0.54%.

Required Regular Maintenance of Infiltration Facility

The facility will be privately owned and operated by the condo board. The condo board shall complete yearly monitoring and maintenance of the infiltration pond.

The condo board shall undertake the following maintenance and shall allow for the associated costs in the condo board reserve fund:

- The grass areas within the pond shall be cut on a regular basis and the bottom of the pond shall be kept free of garbage and debris.

- There is a CBMH with a 1.2m diameter x 0.60m deep sump located immediately upstream of the facility. This CBMH sump shall be cleaned (completely vacuumed out) every 6 months on a pre-established maintenance schedule.
- Every five (5) years, the pond bottom shall be fully excavated and the 0.30m depth of stone shall be removed and replaced with new washed clear stone. Furthermore, the top 0.15m depth of native sand shall be also be excavated, removed and replaced with a clean layer of sand with no fines. The replacement of these materials every 5 years will be required in order to keep the infiltration functioning.

We trust this meets your satisfaction and current needs. Should you have any questions or require additional information, please do not hesitate to contact undersigned.

Yours truly,

MTE Consultants Inc.

Joshua Monster, P.Eng.
Technical Practice Leader
519-204-6510 ext. 2202
jmonster@mte85.com
JJM:

Attch:
SWM Calculations
Figure 1
Geotechnical Report (1791231-L01) by Golder Associates, dated November 28, 2017.

M:\43353\100\SWM\43353-100 459 Hale Street SWM Brief Oct-15-2024.docx

MTE Consultants
123 St. George St., London, Ontario N6A 3A1

SWM Calculations-Infiltration Pond Calcualtion

DATE:	October 16, 2024
JOB NO.:	43353-100

Client:	Artisan Homes Inc.
Project:	10 Unit Vacant Land Condo
Location:	459 Hale Street, London, ON

PRE-DEVELOPMENT CONDITIONS

	Area (m2)	C	A*C
Total Site Area:	3212.49		
Building Area:	0.00	0.9	0.00
Concrete/Asphalt:	0.00	0.9	0.00
Gravel:	0.00	0.7	0.00
Landscaped/Open:	3212.49	0.2	642.50
Totals:	3212.49		642.50
Ceq = Sum(A*C)/Sum(A)	0.20		

CITY OF LONDON-3 HOUR CHICAGO RAINFALL DISTRIBUTION PARAMETERS*

Return Period (years)	A,B,C Parameters		
	A	B	C
2	754.360	6.011	0.810
5	1183.740	7.641	0.838
10	1574.382	9.025	0.860
25	2019.372	9.824	0.875
50	2270.665	9.984	0.876
100	2619.363	10.500	0.884
250	3048.220	10.030	0.888

*Intensity i=A/(t+B)^C (mm/hr)

* Refer to the City of London Design Specification & Requirments Manual (DS&RM), Section 6.

POST-DEVELOPMENT CONDITIONS

	Area (m2)	C	A*C
Total Area Contributing to SWM Facility:	2204.00		
Total Impervious Area:	1511.00	0.9	1359.90
Total Pervious Area:	693.00	0.2	138.60
Totals:	2204.00		1498.50
Ceq = Sum(A*C)/Sum(A)	0.68		
	68.56%		

ENTIRE 5 YR TO 250-YEAR POST-DEVELOPMENT FLOWS TO BE INFILTRATED/STORED ON THE SITE.

RECTANGULAR POND DESIGN PARAMETERS

Pond Length

Top of the Pond Length (L+2zd)	14.66 m
Depth of the Pond	1.1 m
Pond Slope (z)	3
Pond Bottom Length **L= (L+2zd)-2zd**	8.06 m

Pond Width

Top of the Pond Width (W+2zd)	9.6 m
Depth of the Pond	1.1 m
Pond Slope (z)	3
Pond Bottom Width **W=(W+2zd)-2zd**	3 m

Pond Top Area	140.736 m^2

S= Rectangular Pond Volume* (m^3)

$S = L*W*d+(L+W)*z*d^2+4/3*z^2*d^3$ (m^3)

S= **86.07** (m^3)

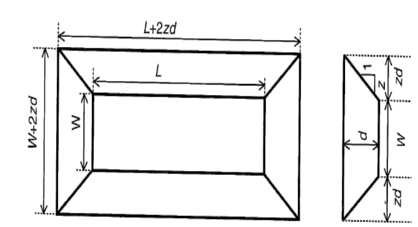


FIGURE 7.2. Elements of a trapezoidal basin.

*Refer to Urban Hydrology, Hydraulics and Stormwater Quality (A. Osman Akan and Robert J. Houghtalen) pg. 219

STORAGE REQUIREMENTS

	250-Year			5-Year	
	Pond Length			**Pond Length**	
	Pond Length at the Top of the 250-year Ponding **(L+2zd)**	14.66 m		Pond Length at the Top of the 2-year Ponding **(L+2zd)**	12.2 m
	Ponding Depth (during the 250-year Storm)	1.1 m		Ponding Depth (during the 2-year Storm)	0.69 m
	Pond Slope (z)	3		Pond Slope (z)	3
	Pond Bottom Length **L= (L+2zd)-2zd**	8.06 m		Pond Bottom Length L=	8.06 m
	Pond Width			**Pond Width**	
	Pond Width at the Top of the 250-year Ponding **(W+2zd)**	9.6 m		Pond Width at the Top of the 2-year Ponding **(W+2zd)**	7.14 m
	Ponding Depth (during the 250-year Storm)	1.1 m		Ponding Depth (during the 2-year Storm)	0.69 m
	Pond Slope (z)	3		Pond Slope (z)	3
	Pond Bottom Width **W=(**W+2zd**)-2zd**	3 m		Width of the Pond Bottom W	3 m

			140.736		
S= Rectangular Pond Volume*		(m^3)	24.18	S= Rectangular Pond Volume *	(m^3)
S= L*W*d+(L+W)*z*d²+4/3*z²*d³		(m^3)		S= L*W*d+(L+W)*z*d²+4/3*z²*d³	(m^3)
S=	**86.07**	(m^3)	90.7038	S= **36.42**	(m^3)

EXFILTRATION PARAMETERS

Stone Gallery			250-year			5-year	
Stone Gallery		Trapezodal Pond Depth=	1.1	m	Trapezodal Pond Depth=	0.69	m
Length (m)	12.0	Pond Width at the Top of the 250-year Ponding =	9.60	m	Pond Width at the Top of the 5-year Ponding =	7.14	m
Width (m)	6.0	Infiltration Pond Bottom Width=	3	m	Infiltration Pond Bottom Width=	3	m
Height (m)	0.30	Pond Length at the Top of the 250-year Ponding =	14.66	m	Pond Length at the Top of the 5-year Ponding =	12.20	m
Void Ratio	0.4	Infiltration Pond Bottom Length=	8.06	m	Infiltration Pond Bottom Length=	8.06	m
Storage Volume (m^3)	8.64	Pond Area at the Top of the 250-year Ponding =	140.74	m^2	Pond Area at the Top of the 5-year Ponding =	87.11	m^2
		Bottom Pond Area=	24.18	m^2	Bottom Pond Area=	24.18	m^2
		Hydraulic Conductivity (TP2)=	0.01	cm/sec**	Hydraulic Conductivity (TP2)=	0.01	cm/sec**
		Infiltration Rate (with 2.5 safety factor)	60	mm/hour****	Infiltration Rate (with 2.5 safety factor)=	60	mm/hour****
		Infiltration Rate (with 2.5 safety factor)	1.66667E-05	m/s	Infiltration Rate (with 2.5 safety factor)=	1.66667E-05	m/s
		Pond Storage During the 250-year Storm=	94.71	m^3	Pond Storage During the 5-Year Storm =	45.06	m^3
		****Contact Area to Soil =	112.59	m^2	*****Contact Area to Soil =	69.69	m^2

**Refer to Geotechnical Report (1791231-L01) by Golder Associates, dated November 28, 2017
***Refer to LID-SWM Planning and Design Guide -Appendix C
****Since Pond slope are 3:1, the horizontal projection of the top of the 250-year ponding was used as contact area (Conservativelly 80% of area of 140.74 m^2 used) .
*****Since Pond slope are 3:1, the horizontal projection of the top of the 5-year ponding was used as contact area (Conservativelly 80% of area of 85.95 m^2 used) .

EXFILTRATION RATE CALCULATIONS-250-YEAR STORM

Contact Area to Soil (A) =	112.589	m^2
Infiltration Rate (I) =	0.00001667	m/s
A*I =	0.00188	m^3/s

EXFILTRATION RATE CALCULATIONS-5-YEAR STORM

Contact Area to Soil (A) =	69.686	m^2
Infiltration Rate (I) =	0.00001667	m/s
A*I =	0.00116	m^3/s

Rainfall Data - London Rainfall Intensity Duration

RAINFALL DATA

STORAGE CALCULATIONS

5 Yr Stm Event

Duration (min.)	Intensity "i" (mm/hr)
5	141.24
10	106.82
15	86.67
30	56.60
60	34.64
120	20.34
180	14.73

Inflow, Q_i 2.78*C*i*A (l/s)	Volume In Q_i*t*60/1000 (m^3)	Realease Rate Outflow, Q_o (l/s)	Release Vol. Q_o*t*60/1000 (m^3)	Exfiltration Volume (m^3)	Total Outflow (m^3)	Difference/ Storage (m^3)
58.84	17.65	1.16	0.35	0.35	0.70	16.95
44.50	26.70	1.16	0.70	0.70	1.39	25.31
36.10	32.49	1.16	1.05	1.05	2.09	30.40
23.58	42.44	1.16	2.09	2.09	4.18	38.26
14.43	51.95	1.16	4.18	4.18	8.36	43.58
8.47	61.02	1.16	8.36	8.36	16.72	44.30
6.14	66.27	1.16	12.54	12.54	25.09	41.19

Required Storage Volume (m^3) = 44.30

Drawdown Time (hr)= 10.59

250 Yr Stm Event

Duration (min.)	Intensity "i" (mm/hr)
5	274.73
10	212.89
15	174.67
30	115.11
60	70.05
120	40.44
180	28.87

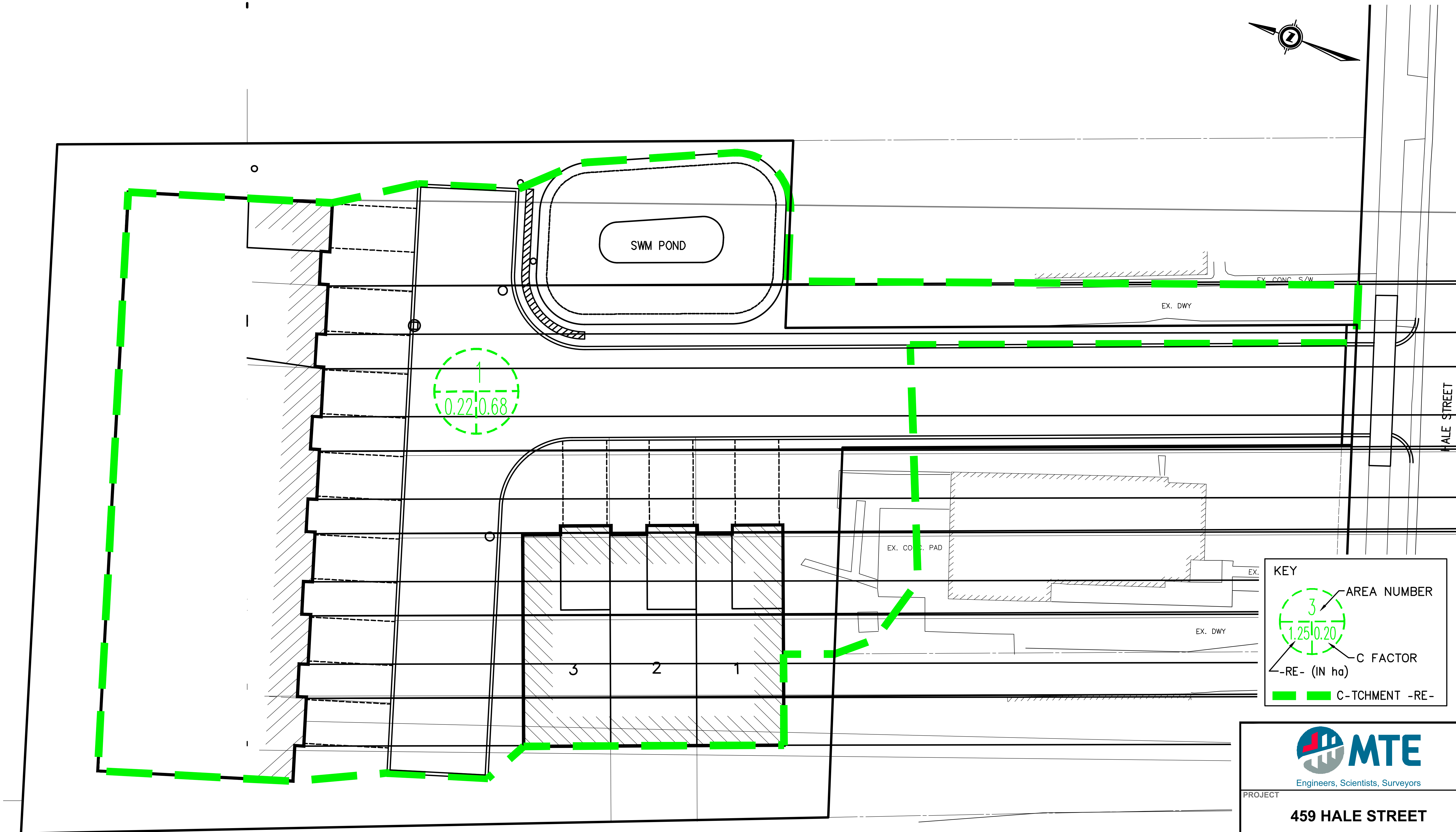
Inflow, Q_i 2.78*C*i*A (l/s)	Volume In Q_i*t*60/1000 (m^3)	Realease Rate Outflow, Q_o (l/s)	Release Vol. Q_o*t*60/1000 (m^3)	Exfiltration Volume (m^3)	Total Outflow (m^3)	Difference/ Storage (m^3)
114.45	34.33	1.88	0.56	0.56	1.13	33.21
88.69	53.21	1.88	1.13	1.13	2.25	50.96
72.76	65.49	1.88	1.69	1.69	3.38	62.11
47.95	86.32	1.88	3.38	3.38	6.76	79.56
29.18	105.06	1.88	6.76	6.76	13.51	91.55
16.85	121.29	1.88	13.51	13.51	27.02	94.26
12.03	129.89	1.88	20.27	20.27	40.53	89.36

Required Storage Volume (m^3) = 94.26

Drawdown Time (hr)= 13.95

Required Storage Volume to Store/Infiltrate Post-Development 5-year Storm (m^3) =	44.30
Required Storage Volume to Store/Infiltrate Post-Development 250-year Storm (m^3) =	94.26
Provided Infiltration Pond Storage Volume (m^3) =	94.71

Therefore, the infiltration pond has been sized to store and infiltrate the entire post-development 5-year to 250-year design storms



MTE
Engineers, Scientists, Surveyors

PROJECT	459 HALE STREET	
TITLE	SWM DRAINAGE AREA PLAN	
Drawn: AH	Scale: 1:250	Figure
Checked: KM	Project No.: 43353-100	1
Date: 2024-10-11	Rev No.: 0	

GOLDER

November 28, 2017
Revised July 5, 2018

Project No. 1791231-L01

Mr. Jerry Knoester
Artisan Homes Inc.
826 Colborne Street
London, Ontario
N6A 4A2

GEOTECHNICAL SERVICES
PROPOSED DEVELOPMENT
459 HALE STREET
LONDON, ONTARIO

Dear Mr. Knoester:

This letter provides the results of the test pit exploration and related laboratory testing carried out for the above-noted site. Test pits were excavated on November 14, 2017 by Artisan Homes Inc., and logged by a member of our engineering staff. An additional test pit (TP-201) was excavated by Artisan Homes Inc. on June 26, 2018.

Five test pits were advanced in the area of the proposed development at the approximate locations shown on Figure 1. Soil conditions encountered in the test pits are provided in Table I, attached. Test pit TP-101 was excavated in the existing driveway of 459 Hale Street. The test pit encountered approximately 30 millimetres of asphalt overlying about 110 millimetres of granular fill. Test pits TP-102 to TP-104 and TP-201 encountered surficial topsoil at the ground surface ranging from about 280 to 460 millimetres in thickness. Beneath the surficial topsoil or pavement structure, all test pits encountered, and were terminated in, silty sand to sand. Grain size distribution curves for samples of the sand and silty sand recovered from the test pits are provided on Figures 2 and 3, attached.

No free water was encountered in the test pits to a depth of about 1.6 metres during excavation on November 14, 2017 and to a depth of about 4.3 metres on June 26, 2018. Groundwater conditions should be expected to fluctuate seasonally and in response to significant precipitation events.

The estimated 'T' times based on the evaluation of grain size characteristics of the sand and silty sand are about 2 to 9 minutes per centimetre (min/cm). These are based on estimated hydraulic conductivity values of $1x10^{-2}$ for the sand and $4x10^{-4}$ for the silty sand.

The pavements for the entrance laneway into the development should be reconstructed using the following configuration, placed on a properly prepared and shaped subgrade:

Pavement Component	Design Thickness (mm)
HL3 Surface Asphalt	40
HL8 Binder Asphalt	50
Granular A Base	150
Granular B Subbase	300

Following removal of the existing pavements or surficial topsoil, excavation to subgrade level and subexcavation of any unsuitable materials, such as topsoil, organic, wet, or deleterious materials, as required, the subgrade should be heavily proofrolled under the direction of the geotechnical engineer.

The Granular B and Granular A materials should be placed in maximum 300 and 150 millimetre thick loose lifts and uniformly compacted to at least 98 and 100 per cent of standard Proctor maximum dry density, respectively. The granular materials should be placed over the full width of the paved areas and daylight into ditches with inverts at least 0.5 metres below subgrade level, or to suitable catchbasins provided with perforated, filtered stub drains. The asphalt should be produced, placed and compacted in accordance with the current Ontario Provincial Standard Specifications (OPSS).

We trust that this letter and the attached provide sufficient information for your immediate requirements. If any point requires further clarification, or if we can be of additional assistance, please contact this office.

Yours truly,

Golder Associates Ltd.

Brett Thorner, P.Eng.
Geotechnical Engineer

Mark A. Swallow, P.E., P.Eng
Principal and Senior Practice Leader

BT/MAS/vf

Attachments: Table I – Summary of Test Pits
Figure 1 – Location Plan
Figure 2 - Grain Size Distribution - Sand
Figure 3 - Grain Size Distribution – Silty Sand

https://golderassociates.sharepoint.com/sites/20979g/deliverables/l01/revised/1791231-l01 jul 5 18 (rev) - 459 hale stjuly 5.docx

TABLE I

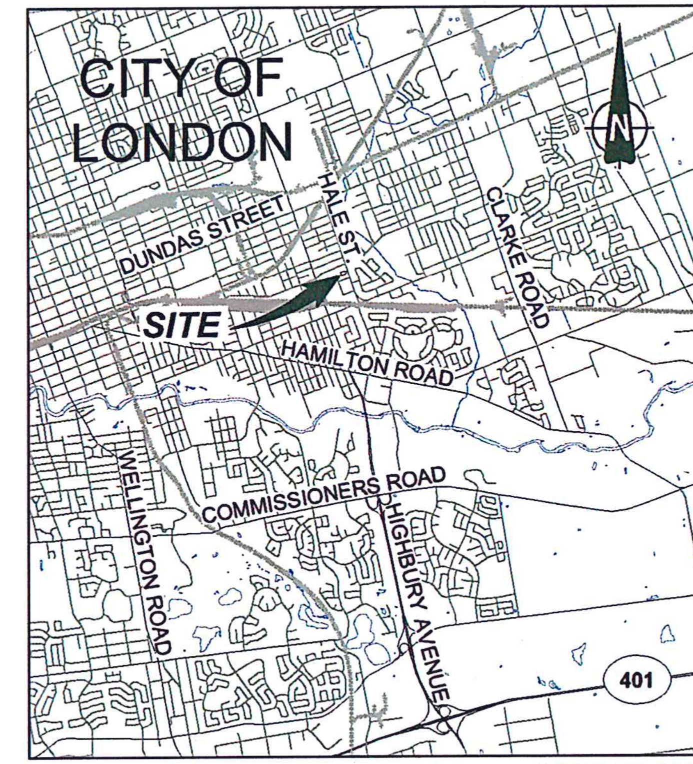
SUMMARY OF TEST PITS

459 Hale Street
London, Ontario

TEST PIT	DEPTH (m)	DESCRIPTION	REMARKS
101	0.00 to 0.03	**ASPHALT**	Test pit dry.
	0.03 to 0.14	**FILL** - gravelly sand, some silt, brown	
	0.14 to 0.57	(SM) - **SILTY SAND**, trace topsoil, with roots, brown	
	0.57 to 1.10	(SP) - **SAND**, some silt with silty sand layers, brown	
102	0.00 to 0.40	**TOPSOIL** - sandy, brown	Test pit dry.
	0.40 to 0.70	(SM) - **SILTY SAND**, trace topsoil, with roots, brown	
	0.70 to 1.20	(SP) - **SAND**, some silt, trace gravel, brown	
103	0.00 to 0.28	**TOPSOIL** - sandy, brown	Test pit dry.
	0.28 to 0.97	(SM) - **SILTY SAND**, trace topsoil, with roots, brown	
	0.97 to 1.15	(SP) - **SAND**, some silt, trace gravel, brown	
104	0.00 to 0.32	**TOPSOIL** - sandy, brown	Test pit dry.
	0.32 to 0.93	(SM) - **SILTY SAND**, trace topsoil, with roots, brown	
	0.93 to 1.60	(SP) - **SAND**, some silt, trace gravel, brown	
201	0.00 to 0.46	**TOPSOIL** - sandy, brown	Test pit dry.
	0.46 to 0.98	(SM) - **SILTY SAND**, trace gravel, trace topsoil, with roots, brown	
	0.98 to 4.27	(SP) - **SAND**, trace silt, trace gravel, brown	

NOTES: 1. Table to be read in conjuction with accompanying letter.

Prepared By: BT
Checked By: MAS



KEY PLAN

LEGEND

⊕ TEST PIT

REFERENCE

PLAN BASED ON CITY OF LONDON CITYCD V2014; AND CANMAP STREETFILES V.2008.4.

NOTES

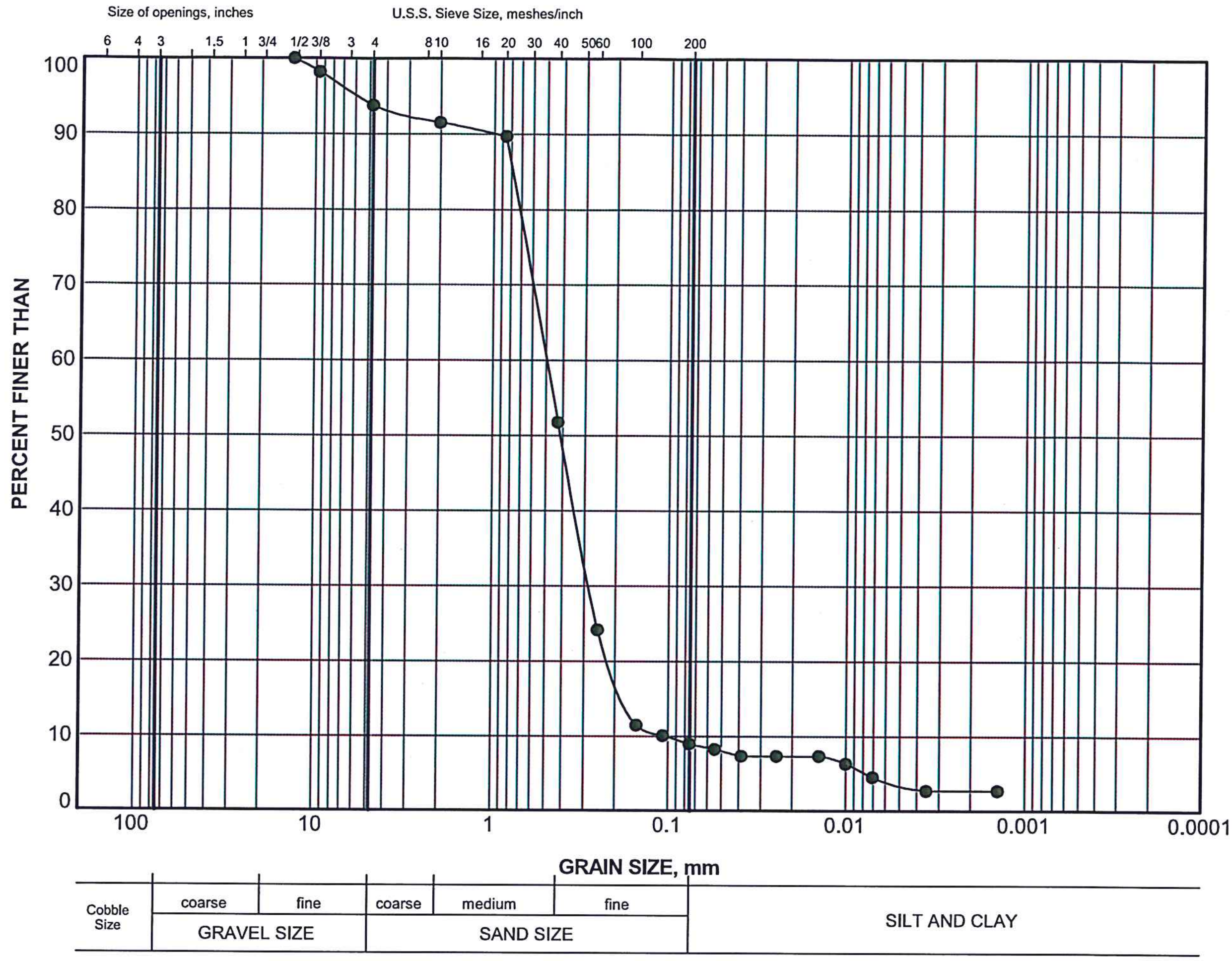
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING TEXT.

ALL LOCATIONS ARE APPROXIMATE ONLY.

PROJECT	GEOTECHNICAL SERVICES 459 HALE STREET LONDON, ONTARIO
TITLE	LOCATION PLAN

Golder Associates	PROJECT No.	1791231	FILE No.	1791231-L01001
	CADD	LMK/ZJB July 4/18	SCALE AS SHOWN	REV.
	CHECK		FIGURE 1	

Drawing file: 1791231-L01001.dwg Jul 04, 2018 - 3:49pm



LEGEND

SYMBOL	TEST PIT	SAMPLE	DEPTH
●	TP-102	1	0.9m

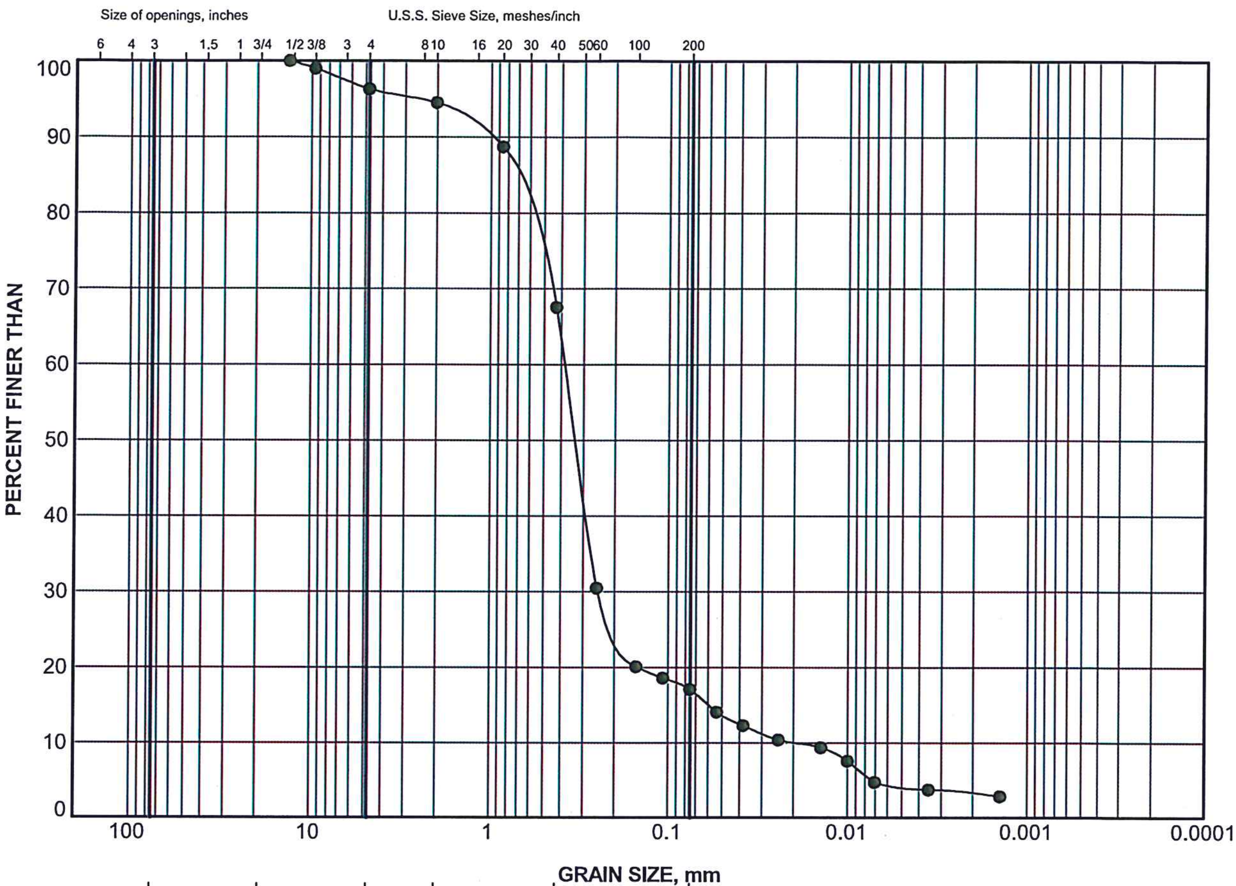
PROJECT
GEOTECHNICAL SERVICES
459 HALE STREET
LONDON, ONTARIO

TITLE
GRAIN SIZE DISTRIBUTION
SAND

Golder Associates

PROJECT No.		1791231	FILE No.	1791231-L01002
			SCALE N/A	REV.
DRAWN	LMK	Nov 22/17	FIGURE 2	
CHECK	SI			

LDN_GSD GLDR_LDN.GDT 22/11/17 11:17



Cobble Size	coarse	fine	coarse	medium	fine	SILT AND CLAY
	GRAVEL SIZE		SAND SIZE			

LEGEND

SYMBOL	TEST PIT	SAMPLE	DEPTH
●	TP-103	1	0.5m

PROJECT
GEOTECHNICAL SERVICES
459 HALE STREET
LONDON, ONTARIO

TITLE

GRAIN SIZE DISTRIBUTION

SILTY SAND

Golder Associates

PROJECT No.		1791231	FILE No. 1791231-L01003
			SCALE N/A REV.
DRAWN	LMK	Nov 22/17	
CHECK	BT		**FIGURE 3**

LDN_GSD GLDR_LDN.GDT 22/11/17 11:23