Stantec Consulting Ltd.
400-1305 Riverbend Road
London ON N6K 0J5

October 16, 2024

Project/File: 161414301

City of London Development Services
300 Dufferin Avenue
London, Ontario N6A 4L9

Dear Reviewer,

Reference: 1484 Gore Road, London, ON - Stormwater Management Brief

1 Introduction

Stantec Consulting Ltd. (Stantec) has been retained by Richfield Custom Homes Inc. (Client) to assist with the consulting services, including the Stormwater Management (SWM) Plan for the proposed development located at 1484 Gore Road, London, Ontario. The property, approximately 0.55 ha, is bordered by existing residential and landscaped areas to the north, east, and west and by Gore Road to the south.

The proposed development consists of a stacked townhouse complex and additional townhouse units with associated driveways, access roads, sidewalks, parking lots, and landscaped areas as well as the proposed Gore Road widening as shown on the attached Site Plan. The following Design Brief outlines the SWM strategy for the proposed development. The approach involved the following components:

- Completion of background review of relevant, existing documents (listed in the following section).
- Design of the SWM Strategy for the proposed Site.
- Development of an erosion and sedimentation control plan.

2 Background

In preparation of this SWM brief, the following documents have been referenced:

- *Hydrological Investigation - 1484 Gore Road, London: Manual Water Levels and Elevations – Monitoring Wells,* EXP Services Inc., September 23, 2024.

- *Geotechnical Investigation - 1484 Gore Road, London, ON: Borehole Log,* EXP Services Inc., August 2024.
- *Geotechnical Investigation - 1484 Gore Road, London, ON: Mechanical Grain Size Analysis,* EXP Services Inc., August 2024.
- *Erosion and Sediment Control Guide for Urban Construction*, Toronto and Region Conservation Authority, 2019.
- *Design Specifications and Requirements Manual,* City of London, October 2003 (Updated January 2024).
- *Stormwater Management Planning and Design Manual (SWMPD Manual),* Ontario Ministry of the Environment, Conservation and Parks, March 2003.

3 Stormwater Management Criteria

The SWM criteria for the Site are established as per the SWM criteria and environmental targets identified in the Ministry of the Environment, Conservation and Parks (MECP) and the City of London Design Specifications and Requirements Manual (DSRM) standards. The SWM design criteria for the proposed development are determined considering that there is no approved outlet currently established for the proposed Site. The SWM criteria for the proposed development are as follows:

- **Water Quantity** – Provide sufficient water quantity control measures to control and retain 100% of the post-development runoff onsite for storms up to and including the 100-year storm event.
- **Water Quality** – Provide sufficient treatment measures to meet the Ministry of the Environment, Conservation and Parks, (MECP) *Enhanced* (80% TSS Removal) criteria.
- **Erosion and Sediment Control** – Provide appropriate erosion and sediment control during construction/area grading to protect adjacent properties from potential siltation.

4 Existing Site Conditions

The subject property is located approximately 170 m east of the intersection of Gore Road and Hamilton Road on the north side of Gore Road. The existing Site consists of two residential buildings with associated driveways, parking, and landscaped areas as well as undeveloped areas and open spaces at the rear of the residential lots.

Under the existing conditions, there is a high point in the southern half of the Site. Drainage from the northern portion of the site area flows north towards the existing residential lots along the northern boundary of the site. Drainage from the southern portion of the site flows south towards the Gore Road Right-Of-Way (ROW).

5 Target Drainage Conditions

5.1 Water Quantity Control

Under the existing conditions, the Site is not serviced by any storm infrastructure and no storm outlet has been identified for the Site.

Per the attached City of London Record Drawings #8244 and #8245, the storm sewer network along Gore Road starts at the intersection of Gore Road and Montebello Drive, running east, and ultimately discharging to the Pottersburg Creek. As shown in City Drawing #27025 (attached), the subject Site is not accounted for in the design of Gore Road Storm Sewer. Additionally, connection to the existing Gore Road storm sewer would require a 120 m extension which may cause issues concerning minimum cover.

As shown in City Drawing #8257, there is also stormwater infrastructure to the north of the subject Site on Fundy Avenue. Connection to this storm sewer would require the creation of servicing easements across existing municipal properties. Additionally, similar to the Gore Road storm sewer, flows from the Site area are not accounted for in the design of this 300 mm storm sewer.

Considering that no storm sewer outlet is available for the proposed Site, no outflows are allowed from the proposed development and all flows from the Site, up to the 100-year storm event, are required to be controlled and retained onsite.

5.2 Water Quality Control

Runoff from rooftop and landscaped areas is considered clean and sediment/contaminant loading to runoff from these areas is anticipated to be minimal.

Onsite water quality controls are required to provide *“Enhanced”* water quality treatment for runoff from the proposed access road and parking areas as dictated by the City of London and MECP standards.

6 Proposed Drainage Conditions

6.1 Hydrologic Modelling

A hydrologic model was prepared to simulate the proposed drainage conditions for the Site. The SWMHYMO Modelling software and design storm parameters were used to design SWM systems to ensure the previously mentioned criteria are achieved.

To address the criteria, proposed conditions were modeled for the 2-year to 100-year design storms, using the City of London Intensity-Duration-Frequency (IDF) Rainfall Curves. The IDF parameters are shown in **Table 1** below.

Table 1: City of London IDF Parameters

Return Period	A	B	C
2 Year	754.360	6.011	0.810
5 Year	1183.740	7.641	0.838
10 Year	1574.382	9.025	0.860
25 Year	2019.372	9.824	0.875
50 Year	2270.665	9.984	0.876
100 Year	2619.363	10.500	0.884

6.2 Stormwater Management Strategy

Stormwater runoff from the Site will be provided with on-site water quality and water quantity controls. Water quantity control will be provided via the proposed infiltration facility under the proposed parking lot and water quality control will be provided by the proposed Oil/Grit Separator. These controls are discussed in the following sections.

6.2.1 Water Quantity Control

Under the proposed conditions, the 0.55 ha Site will drain towards the proposed infiltration facility located under the proposed parking lot. No external areas will contribute to the proposed SWM infiltration facility.

Per the attached geotechnical assessment results provided by EXP on September 26, 2024, estimated unfactored infiltration rates within the Site generally range between 50 to 70 mm/hr. Therefore, Site infiltration rate was conservatively assumed to be 50 mm/hr. Additionally, a safety factor of 2.5 was applied to this infiltration rate reducing the assumed rate to 20 mm/hr.

The proposed infiltration facility provides a storage volume of 294 m^3 and is sized to infiltrate the 2-year runoff within 24 hours and the 100-year runoff within 48 hours. Characteristics of the proposed infiltration facility are summarized in **Table 2** while detailed calculations and modeling files are provided attached.

Table 2: Characteristics of the Proposed Infiltration SWM Facility

Total Storage	294 m^3
Total Depth	2.1 m
Outflow (i.e., Infiltration Rate)	0.0019 m^3/s
Overflow	0.0000 m^3/s
2-Year Storm Event	
Depth of Water Within the SWMF	0.70 m
Drawdown Time	14.0 hrs.
100-Year Storm Event	
Depth of Water Within the SWMF	2.03 m
Drawdown Time	40.6 hrs.

Overland flows will be safely conveyed by grading to the Gore Road right-of-way for any system overflow. Surface ponding will likely make such overflows rare and only in the most extreme events. This will be confirmed at detailed design.

6.2.2 Water Quality Control

Under the proposed conditions, quality control is required given the amount of surface parking and driveways proposed. The City of London standards state that an *Enhanced* water quality control (a minimum of 80% TSS removal) is required for the sites where the number of proposed/existing parking spaces exceeds 29.

As indicated in Section 5.2, runoff from rooftop and landscaped areas is considered clean and no water quality control is required for these areas. Quality treatment for the remaining Site areas, including roads (access road and proposed road widening), sidewalks, driveways, and parking spaces, will be provided using an Oil/Grit Separator (OGS) sized to provide a minimum of 80% TSS removal for the Site. The characteristics of this OGS are summarized in **Table 3** below while more details can be found in the attached OGS Sizing Report.

Table 3: Water Quality Control – OGS Sizing Summary

Drainage Area (ha)	OGS Location	Runoff Coefficient	OGS Model	TSS Removal (%)
0.23	Upstream of the proposed infiltration facility	0.9	EF4	92

Erosion and Sediment Control Plan

The details and locations of the proposed erosion and sediment control measures, the contingency plan, and inspection requirements for the proposed development will be established at the detailed design stage.

This section describes the Erosion and Sediment Control Plan that will be implemented during and immediately after construction to reduce the possibility of sediment being deposited downstream.

Reference: **1484 Gore Road, London, ON - Stormwater Management Brief**

Based on the preceding report, the proposed SWM strategy is sufficient to meet the stormwater management requirements for the subject Site. We trust this meets your needs at this time; however, should you have any questions, please do not hesitate to contact the undersigned at your convenience.

Regards,

STANTEC CONSULTING LTD.

Digitally signed by Yavarikia, Maryam
Date: 2024.10.16 12:15:04 -04'00'

Digitally signed by Kristoferson, Adam
Date: 2024.10.16 13:35:31-04'00'

Maryam Yavarikia M.Eng., EIT
Water Resources Engineering Intern
Phone: (519) 432 4227
maryam.yavarikia@stantec.com

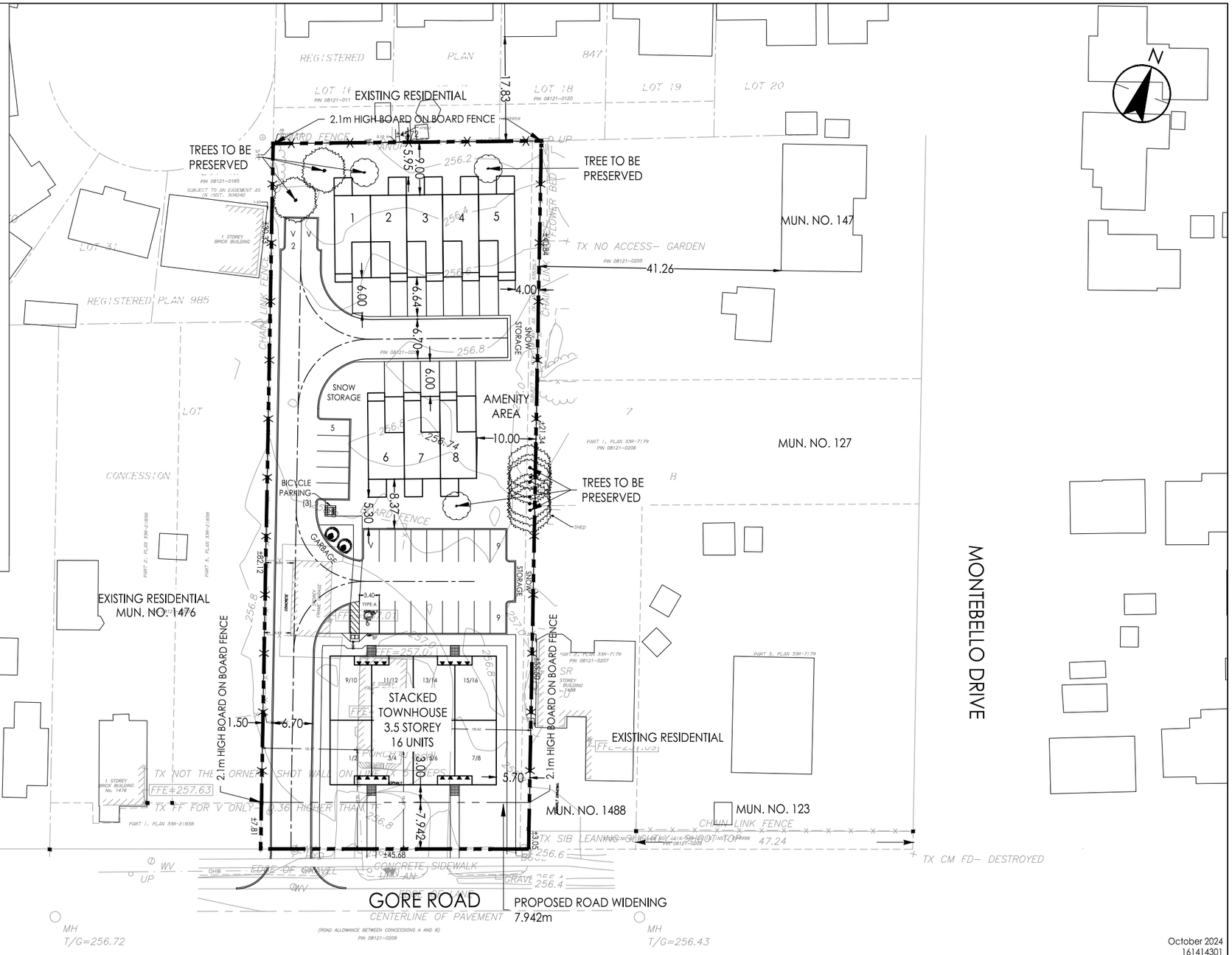
Adam Kristoferson P.Eng.
Senior Water Resources Engineer
Phone: (519) 675 - 6669
Fax: [(519) 645 - 6575
Adam.kristoferson@stantec.com

Attachment: Site Plan
SWM Calculations and SWMHYMO Modelling Files
Geotechnical Assessment Results
OGS Sizing Report

Design Data

Existing Zone:	R1-6	
Proposed Zone:	R5-6	
Proposed Use:	Townhouse & Stacked Townhouse - 24 Units	
Site Area (m²)	5,505 m² / 0.550 ha	
Regulation	**Requirement**	**As Shown on Plan**
Lot Area Minimum (m²)	1,000 m²	5,505 m²
Lot Frontage Minimum (m)	10.0 m	45.68 m
Front Yard Depth (m) minimum	8.0 m	3.0 m*
Exterior Side Yard Depth (m) minimum	N/A	N/A
Interior Side Yard Depth (m) minimum	2 Storey Townhouse - 4.0 m Stacked Townhouse - 6.5m	4.0 m 5.7m*
Rear Yard Depth (m) minimum	6.0 m	9.0 m
Landscaped Open Space (%) Minimum	30%	41.6%
Lot Coverage Maximum (%)	45%	24.1%
Height Maximum (m)	12 m	13.5 m*
Density - Units per Hectare Maximum	50 uph	44 uph
Off-Street Parking - Stacked Townhouse Off-Street Parking - Townhouse	16 Units x 0.5 = 8 8 Units x 1 = 8	21 surface spaces 8 driveway spaces + garage
Visitor Parking	1 space per 10 units = 3	3 surface spaces
Accessible Parking	4% of total surface parking = 1 space	1 surface space
Bicycle Parking	0.1 space per unit = 3	3 spaces

* Special provisions required



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2024-10-15 9:40 AM by: Turner, Rich

Stantec

400-1305 Riverbend Road
London ON N6K 0J5
Tel. 519-645-2007
www.stantec.com

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7.5 0 15m

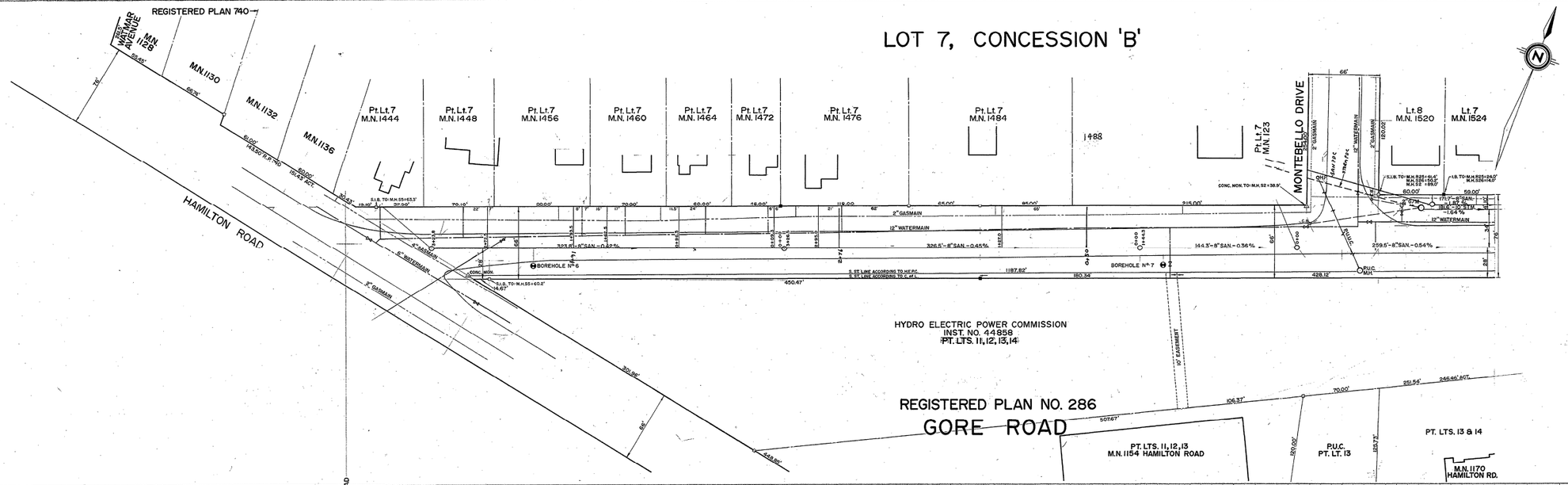
Client/Project
RICHFIELD CUSTOM HOMES
1484 GORE ROAD
London, ON Canada

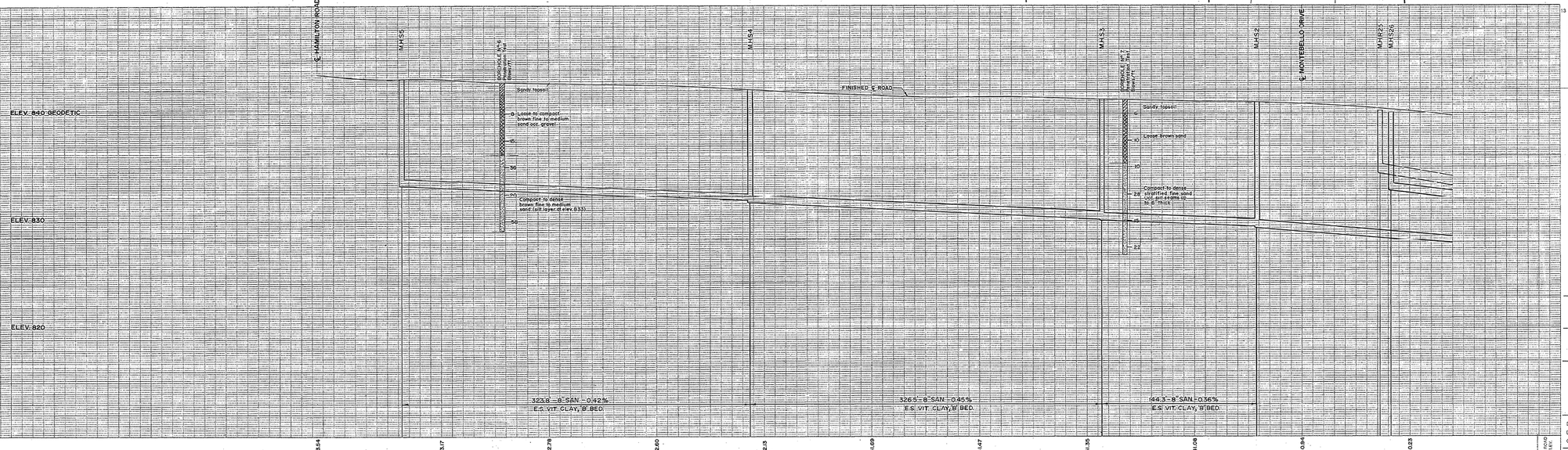
Figure No.
1.0

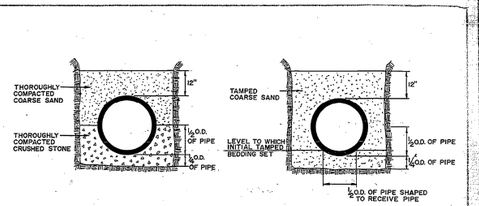
Title
SITE PLAN

October 2024
161414301

LOT 7, CONCESSION 'B'





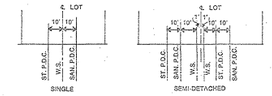


CLASS 'B' BEDDING DETAIL N.T.S.

CLASS 'C' BEDDING DETAIL N.T.S.

NOTES

1. COVER OVER WATERMAIN TOP OF MAIN TO ROAD CENTRELINE, IS 5'-6" TO 6'-0" UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER RADII 25' UNLESS OTHERWISE NOTED.
3. CATCH BASINS AT INTERSECTIONS ARE LOCATED 2 FT. FROM B.H.C. OR E.H.C. CURVES UNLESS OTHERWISE SHOWN.
4. FOR NOTES AND DETAILS APPLICABLE TO THIS DRAWING SEE DRAWING No.
5. P.D.C. AND C.B. CONNECTIONS AT MAINS ARE MEASURED FROM ℄ OF MANHOLE FRAME AND COVER.
6. STRUCTURAL DESIGN OF THE SEWERS ARE BASED ON THE TRANSITION WIDTH UNLESS OTHERWISE NOTED ON PROFILE
7. ALL ELEVATIONS RELATED TO CITY OF LONDON BENCH MARK No. **S-104** ELEVATION **845.716**
8. TYPE OF SUBSOIL IN THIS AREA IS **SAND.**
9. DEGREE OF COMPACTION IN THE TRENCH BACKFILL **90** % STANDARD PROCTOR (CAPITAL WORKS & ASSUMED STREETS)
10. METHOD OF COMPACTION IN THE TRENCH BACKFILL — (SUBDIVISIONS) — **ROLLER VIBRATOR.**
11. ℄ LOT



P.D.C.'s AND WATER SERVICES ARE INSTALLED IN STANDARD LOCATIONS AS ABOVE UNLESS OTHERWISE SHOWN AND NOTED.

12

	SIZE	STRENGTH	MAT'L	JOINT	BEDDING	MANUFACTURER
SAN. P.D.C.s	4"	1500	A.C.	R.G.	C	
ST. P.D.C.s	4"	1500	A.C.	R.G.	C	
C.B. CONNECTIONS	8"	E.S.	CONC.	R.G.	C	
PRE-CAST CONC. M.H.s	48"	3000	CONC.	R.G.	N/A	

13

SERVICES	COMPLETION	CONTRACTOR
SANITARY SEWERS P.D.C.'s & M.H.'s	AUGUST 1971	ELGIN CONST.
STORM SEWERS, P.D.C.'s, M.H.'s & C.B.'s		
WATERMAINS & WATER SERVICES		
GRANULAR ROAD BASE		
CURB & GUTTER		
SIDEWALKS		
PAVING		

Caution:
Private Drain Connection (PDC) information has been added to this plan. The location of PDC's along the mains are believed to be accurate to within 3 feet (1 meter) but the direction of the PDC from the main to the property line has not been verified. Caution must be exercised when using this information to locate PDC's. The City of London does not accept any responsibility for the information on this plan, and is not responsible for any expenses or damages incurred directly or indirectly resulting from the use of such information.

REGISTERED PROFESSIONAL ENGINEER W. E. FELLNER PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	BY
1	"AS CONSTRUCTED DRAWING"	MAR.6/73	E.W.H.

CITY OF LONDON

MISCELLANEOUS SEWER PROJECTS NO. 2 (1969)
SEWER PROJECT NO. 69-SC13-22

GORE ROAD

MONTEBELLO DRIVE TO HAMILTON ROAD

DESIGN BY : L.G.W.SMITH
DRAWN BY : E.W.HODGINS
CHECKED BY : R.F.FELLNER

FIELD BOOK : 33,40,63,63A
SCALE : HORIZ.:1"=40' VERT.:1"=4'
DATE : MAR.6,1973

DEVELOPMENT ENGINEERING (LONDON) LIMITED
650 WATERLOO ST., SUITE 'A'
LONDON ONTARIO

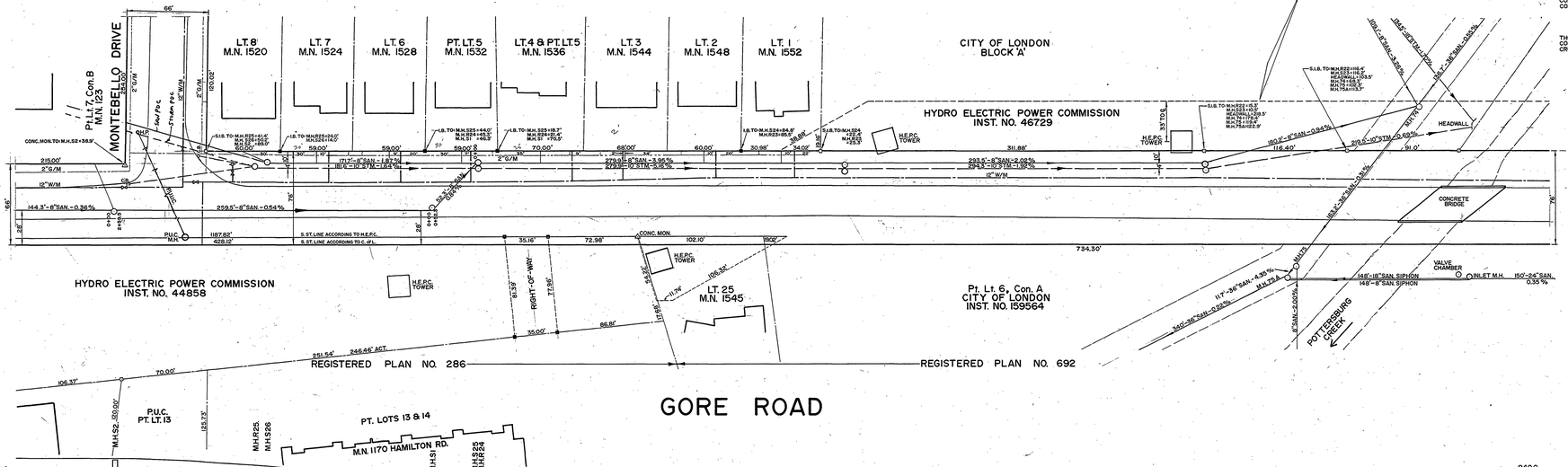
PROJECT NO.-L6939
DRAWING NO.-1

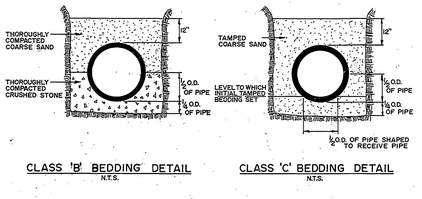
APPROVED BY :
SECTION HEAD
CITY ENGINEER

CITY ENGINEER'S DEPARTMENT
PROJECT NO. : SC 7-9
DRAWING NO. :
8244

8244

REGISTERED PLAN NO. 871





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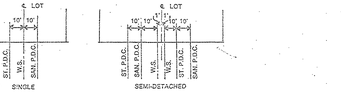

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PAVING		

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REGISTERED PROFESSIONAL ENGINEER R. F. FELLNER PROVINCE OF ONTARIO

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CITY OF LONDON

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SEWER PROJECT NO. 69-SC13-22

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MONTEBELLO DRIVE TO POTTERSBURG CREEK

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FIELD BOOK : 33, 40, 63, 63A
SCALE : HORIZ.-1"=50' VERT.-1"=5'
DATE : MAR. 6, 1973

DEVELOPMENT ENGINEERING (LONDON) LIMITED
650 WATERLOO ST., SUITE 'A' LONDON ONTARIO
PROJECT NO.- L6939
DRAWING NO.- 2

APPROVED BY :
SECTION HEAD
CITY ENGINEER

CITY ENGINEER'S DEPARTMENT
PROJECT NO. : SC 7-9
DRAWING NO. :
8245

8245

LEGEND:

- PROPOSED STORM SEWER DRAINAGE AREA
- EX 43.6–375 ST@2.2% EXISTING STORM SEWER
- 54.9–600 ST @0.29% STORM SEWER
- 049 EXISTING STORM MAINTENANCE HOLE
- 6R95 STORM MAINTENANCE HOLE
- 152 A=0.08ha C=0.50 CATCHMENT ID, A – AREA IN ha, C – RUNOFF COEFFICIENT

STRATHCONA DR
HAMBER CT
NIAGARA ST
MONTEBELLO DR
WATMAR AVE
FUNDY AVE
MARBENOR CRESCENT
ROCKWYN CRESCENT
COLDSTREAM CRESCENT
ELDORADO AVE
FIRESTONE BLVD
POTTERSBURG CREEK
SEE INSET
OUTLET
GORE RD
DENGATE CRESCENT
BRAESYDE AVE
SELKIRK ST
CLASSIC CRESCENT
CLASSIC DR
QUAIL RIDGE CRESCENT

100 A=0.18ha C=0.50
101 A=0.86ha C=0.50
102 A=0.20ha C=0.50
103 A=0.83ha C=0.50
104 A=0.48ha C=0.50
105 A=0.82ha C=0.50
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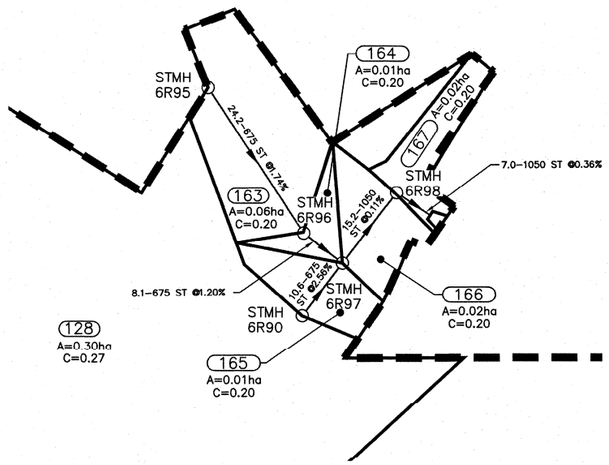
170 A=0.01ha C=0.30
171 A=0.16ha C=0.35

STMH 6R58, 6R59, 6R86, 6R87, 6R88, 6R89, 6R90, 6R91, 6R92, 6R93, 6R94, 6R95, 6R96, 6R97, 6R98, 5

EX 37m–250@ 0.4%; EX 92m–250 @0.4%; EX 50.8m–250 @0.4%; EX 98.3–350ST @0.70%; EX 92–300ST @0.40%; EX 109.1–250ST @0.40%; EX 88–375STM @0.40%; EX 79.3–250 ST@0.40%; EX 75.6–250 ST@1.30%; EX 52.7–375 ST@1.0%; EX 43.6–375 ST@2.2%; EX 64–250 ST@0.40%; EX 59.4–250 ST@0.40%; EX 81–250 ST@0.40%; EX 86.0–250 ST@0.40%; EX 64.4–250 ST@0.40%; EX 49.4–250 ST@0.50%; EX 29.0–250 ST@0.50%; EX 104.7–250 ST@0.40%; EX 34–300 ST@0.60%; EX 42.7–300 ST@0.50%; EX 54.6–600 ST@0.29%; EX 250 ST; 7.2–450 ST @ 1.25%; 79.5–600 ST @ 0.32%; 55.4–600 ST @1.07%; 45.7–750 ST@ 2.52%; 29.5–600 ST @0.23%; 4.3–900 ST @0.70%; 43.0–750 ST–1.37%; 41.0–750 ST @1.37%; 20.3–600 ST @0.25%; 64.5–675 ST–0.86%



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION

DETAILS	
DESIGN	FHC
DRAWN BY	SJM
CHECKED	FHC
APPROVED	BGH
DATE	NOV 2014

No.	REVISIONS	DATE	CONSULTANT
1	ISSUED TO CLIENT FOR 50% REVIEW	DECEMBER 2013	DILLON CONSULTING
2	ISSUED TO CLIENT FOR 90% REVIEW	JANUARY 2014	DILLON CONSULTING
3	ISSUED FOR PRE-TENDER REVIEW	FEBRUARY 2014	DILLON CONSULTING
4	ISSUED FOR TENDER	MARCH 2014	DILLON CONSULTING
5	ISSUED FOR ECA	MARCH 2014	DILLON CONSULTING
6	ISSUED FOR CONSTRUCTION	APRIL 2014	DILLON CONSULTING
7	ISSUED FOR ENGINEERING RECORD DRAWINGS	MARCH 2017	DILLON CONSULTING

CONSULTANT OR DIVISION
DILLON CONSULTING

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER
March 8/17
B.G. HUSTON
21055503
PROVINCE OF ONTARIO

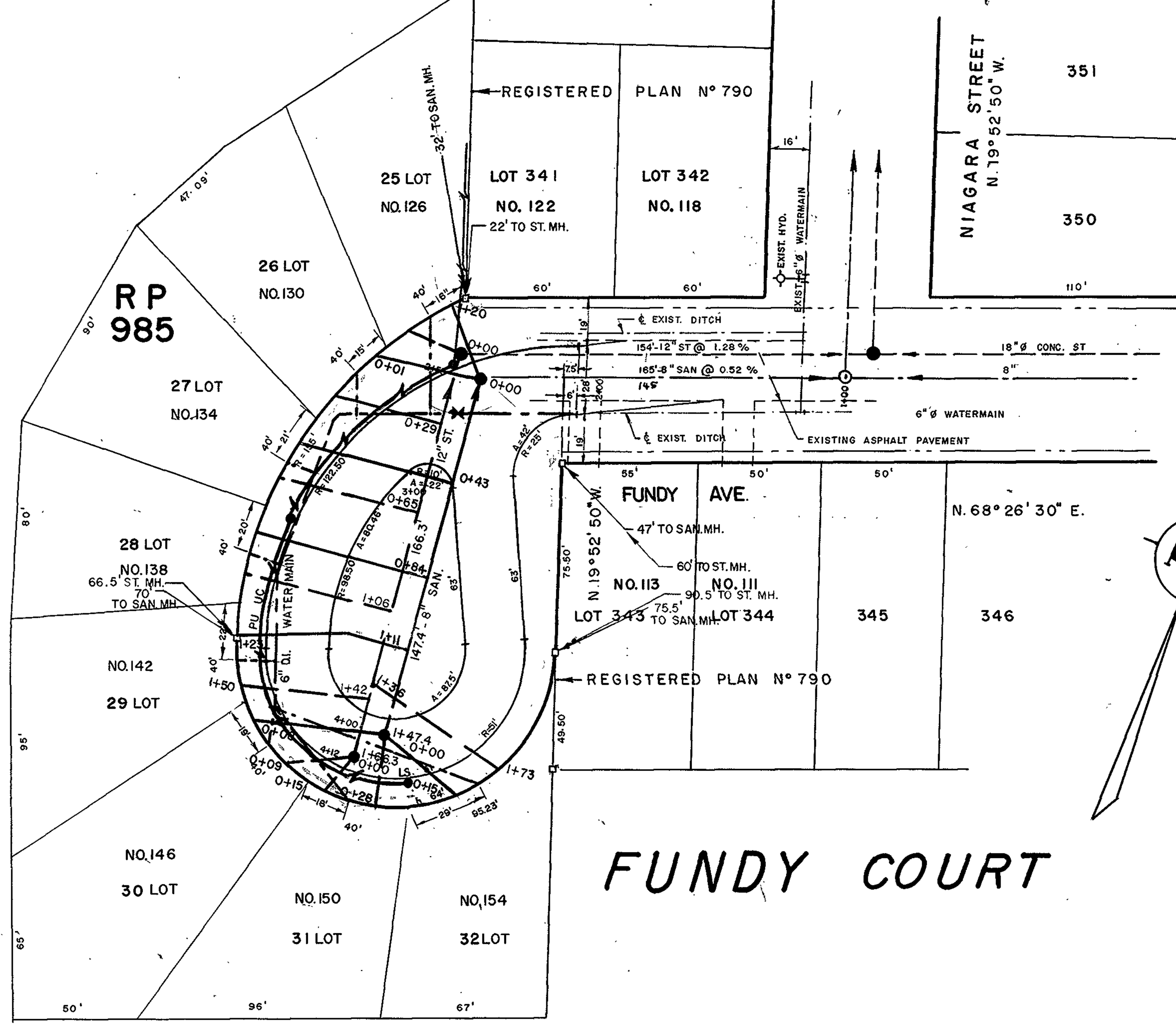
London CANADA
CORPORATION OF THE CITY OF LONDON

SCALE
NTS

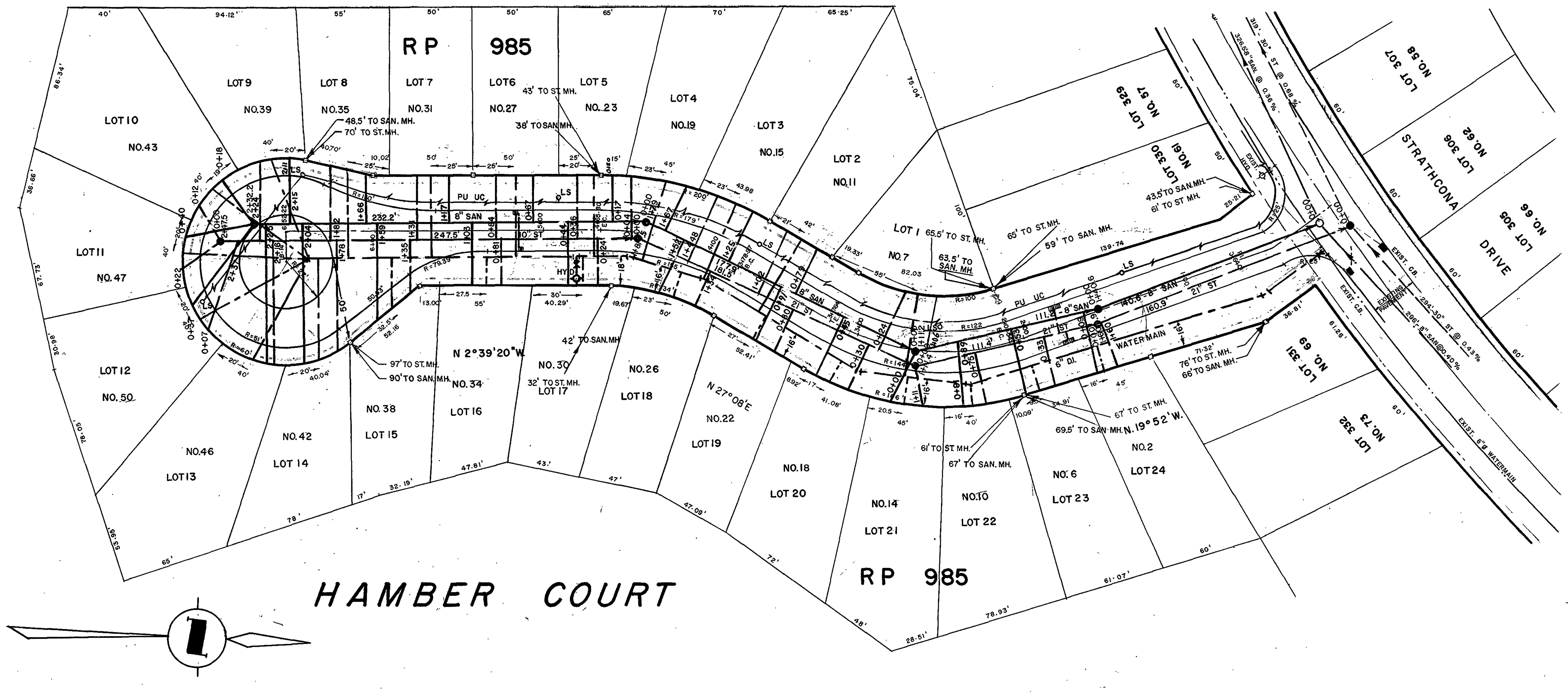
TITLE
GORE ROAD BRIDGE REPLACEMENT
OVER POTTERSBURG CREEK – TENDER No. T14–26
STORM SEWER SYSTEM
DRAINAGE AREA PLAN

PROJECT No. 126524
SHEET No. C14
F 27025

G:\CAD\126524\02–CIVIL\01–Contract\126524–02–STMA–CON.dwg

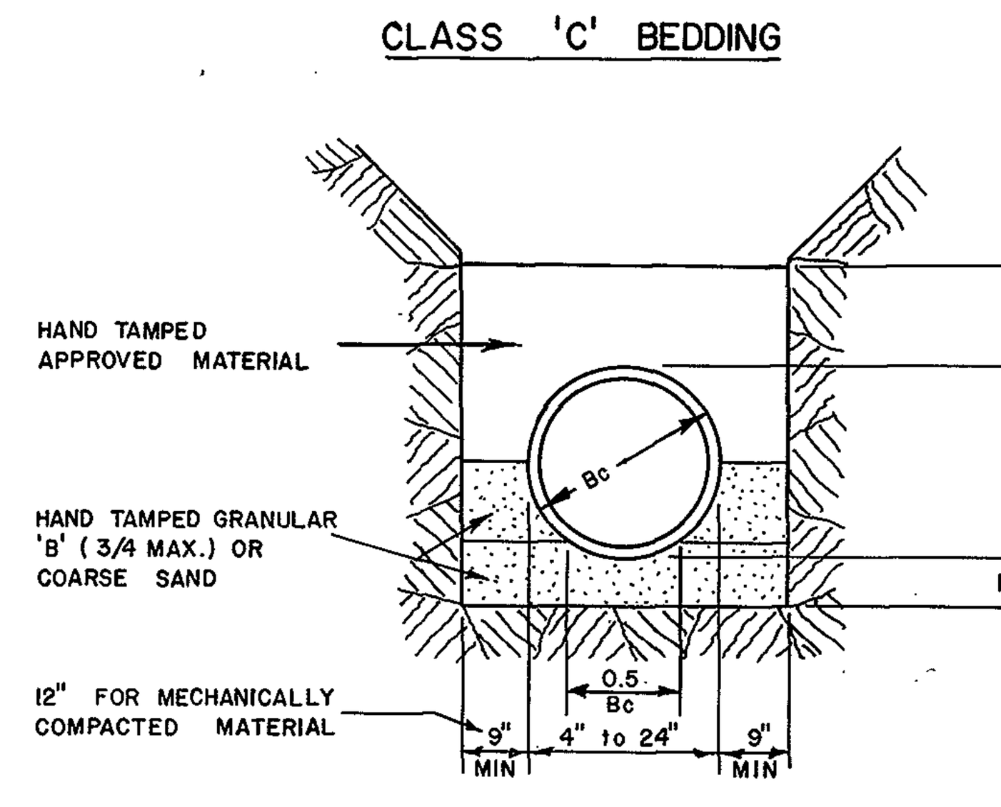


FUNDY COURT



HAMBER COURT

CLASS 'C' BEDDING



1. COVER OVER WATERMAIN TOP OF MAIN TO ROAD CENTRELINE, IS 5'-6" TO 6'-0" UNLESS OTHERWISE NOTED.
2. ALL CURB AND GUTTER RADII 25' UNLESS OTHERWISE NOTED.
3. CATCH BASINS AT INTERSECTIONS ARE LOCATED 2 FT. FROM B.H.C. OR E.H.C. CURVES UNLESS OTHERWISE SHOWN.
4. FOR NOTES AND DETAILS APPLICABLE TO THIS DRAWING NO. STD-3,-21,-1006,-1009,-1010.
5. P.D.C. AND C.B. CONNECTIONS AT MAINS ARE MEASURED FROM ℄ OF MANHOLE FRAME AND COVER.
6. STRUCTURAL DESIGN OF THE SEWERS ARE BASED ON THE TRANSITION WIDTH UNLESS OTHERWISE NOTED ON PROFILE
7. ALL ELEVATIONS RELATED TO CITY OF LONDON BENCH MARK NO. S 104 ELEVATION 845.716
8. TYPE OF SUBSOIL IN THIS AREA IS CLAYEY SILT TO SAND
9. DEGREE OF COMPACTION IN THE TRENCH BACKFILL IS 95% STANDARD PROCTOR
10. METHOD OF COMPACTION IN THE TRENCH BACKFILL WERE PLATE VIBRATORS & VIBRATORY DRUM ROLLERS
11. ℄ LOT — 10' 10' — ST. P.D.C. / W.S. / SAN. P.D.C.; ℄ LOT — 10' 10' 1' 1' 10' 10' — ST. P.D.C. / SAN. P.D.C. / W.S. / W.S. / SAN. P.D.C. / ST. P.D.C.

P.D.C.s AND WATER SERVICES ARE INSTALLED IN STANDARD LOCATION AS ABOVE UNLESS OTHERWISE SHOWN AND NOTED

12.

	SIZE	STRENGTH	MAT'L	JOINT	BEDDING	MANUFACTURER
SAN. P.D.C.	4"	C 428/71T	A.C.	RG	'C'	JOHNS MANVILLE ltd
ST. P.D.C.	4"	C 428/71T	A.C.	RG	C	" " "
C.B. CONNECTIONS	8"	C14 ES/68	CONC.	RG	C	CONCRETE PIPE ltd.
PRE-CAST CONC.M.Hs	48"	C 478/69T	CONC	RG	N/A	OAKS PRECAST ltd.

13.

SERVICES	COMPLETION	CONTRACTOR
SANITARY SEWERS P.D.C.'s & MH	DEC. /69	M.MOL CONST.
STORM SEWERS, P.D.C.'s, M.H.'s, & C.B.'s	DEC. /69	"
WATERMAINS & WATER SERVICES	DEC. /69	"
GRANULAR ROAD BASE	AUG. /70	"
CURB & GUTTER	AUG. /70	"
SIDEWALKS		
PAVING	SEPT. /70	"

14. ______ INDICATES POSITION P.D.C. AS LOCATED IN FIELD

15. PAVEMENT MATERIAL DEPTHS OF ALL ROADWAYS ARE
a) ASPHALT PAVEMENT I) SURFACE COURSE 1" C. OF L. SHEET
II) BASE COURSE 1 1/2" C. OF L. BASE
b) 4" OF 3/4" CRUSHED GRAVEL
c) 12" OF GRANULAR 'B' BASE

16. ALL P.U.C. HYDRO AND BELL TEL. CABLE SERVICE CONNECTIONS ARE LOCATED AT REAR OF LOTS

Caution:
Private Drain Connection (PDC) information has been added to this plan. The location of PDC's along the main are believed to be accurate to within 3 feet (1 meter) but the direction of the PDC from the main to the property line has not been verified. Caution must be exercised when using this information to locate PDC's. The City of London does not accept any responsibility for the information on this plan, and is not responsible for any expenses or damages incurred directly or indirectly resulting from the use of such information.

REGISTERED PROFESSIONAL ENGINEER — D. R. BARKER — PROVINCE OF ONTARIO

NO.	REVISIONS	DATE	BY
1	AS CONSTRUCTED	NOV/ 73	B. Lloyd

CITY OF LONDON

PULZONI SUBDIVISION

ROMANO PULZONI REAL ESTATE LTD.

HAMBER COURT

FROM STRATHCONA DRIVE TO CUL-DE-SAC.

FUNDY COURT

FROM NIAGARA STREET TO CUL-DE-SAC.

DESIGN BY P. HARRIS
DRAWN BY J. BENEDET & K. LEE.
CHECKED BY : D. VAN BIELEN

FIELD BOOK :
SCALE : HOR. 1" = 40'-0" VERT. 1" = 4'-0"
DATE : MAY 1969

G. V. KLEINFELDT & ASSOCIATES LTD.
CONSULTING ENGINEERS & COMMUNITY PLANNERS
BRAMPTON TORONTO LONDON WINDSOR KITCHENER

PROJECT NO. 4-526
DRAWING NO. 2

CITY ENGINEER'S DEPARTMENT
PROJECT NO. :
DRAWING NO. :
8257

8257

-LEGEND-

BH1 Approximate Borehole Location

-NOTES-

1. The boundaries and soil types have been established only at test hole locations. Between test holes they are assumed and may be subject to considerable error.
2. Soil samples will be retained in storage for 3 months and then destroyed unless client advises that an extended time period is required.
3. Topsoil quantities should not be established from the information provided at the test hole locations.
4. The site plan was reproduced from Google Earth Pro and should be read in conjunction with EXP Geotechnical Report LON-24008797-A0.

Geotechnical Investigation

Proposed Residential Development

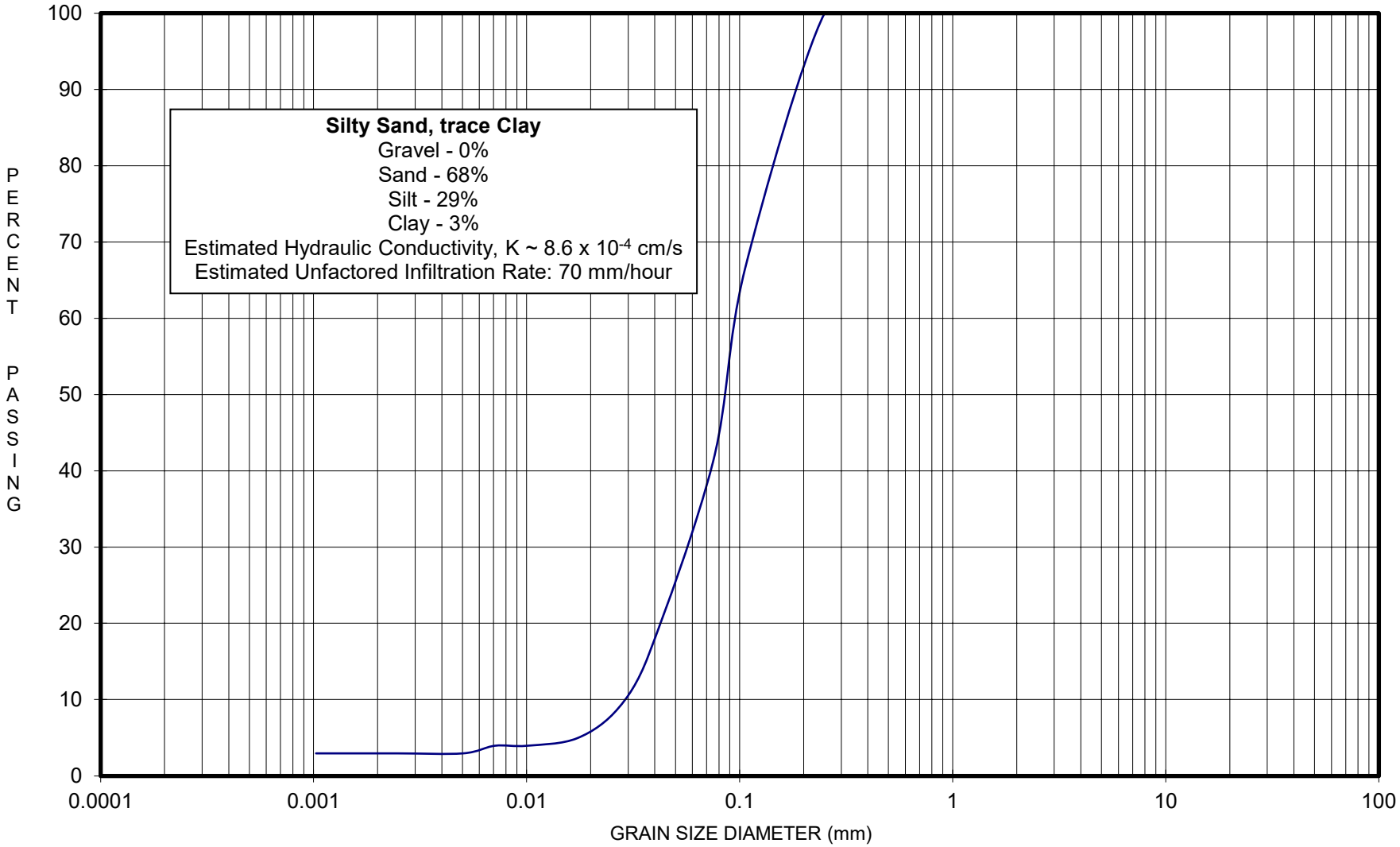
1484 Gore Road, London, Ontario

CLIENT	Richfield Custom Homes (London) Inc.
TITLE	Borehole Location Plan
Prepared By: E.B.	Reviewed By: D.S.

EXP Services Inc.
15701 Robin's Hill Road, London, ON, N5V 0A5

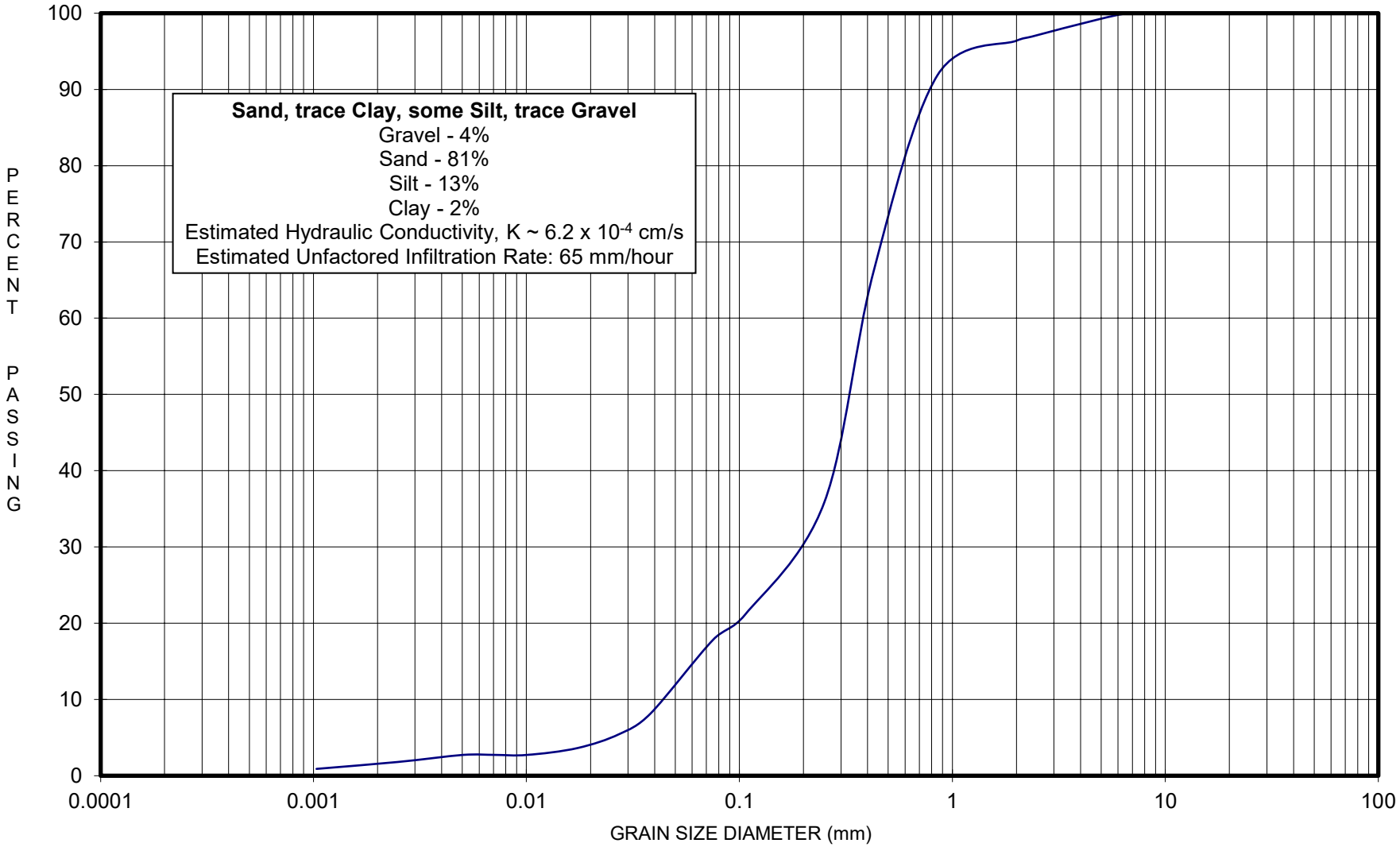
DATE	APPROXIMATE SCALE	PROJECT NO.	DWG.
SEPTEMBER 2024	1:1,000	LON-24008797-A0	1

MECHANICAL GRAIN SIZE ANALYSIS



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
	SILT			SAND			GRAVEL			
MODIFIED M.I.T. CLASSIFICATION	**Sample Description:** **Silty Sand (BH1 SA4, 3.0 to 3.5 m depth)**						**1484 Gore Road, London** **Project: LON-24008797-A0**			**Figure 1**

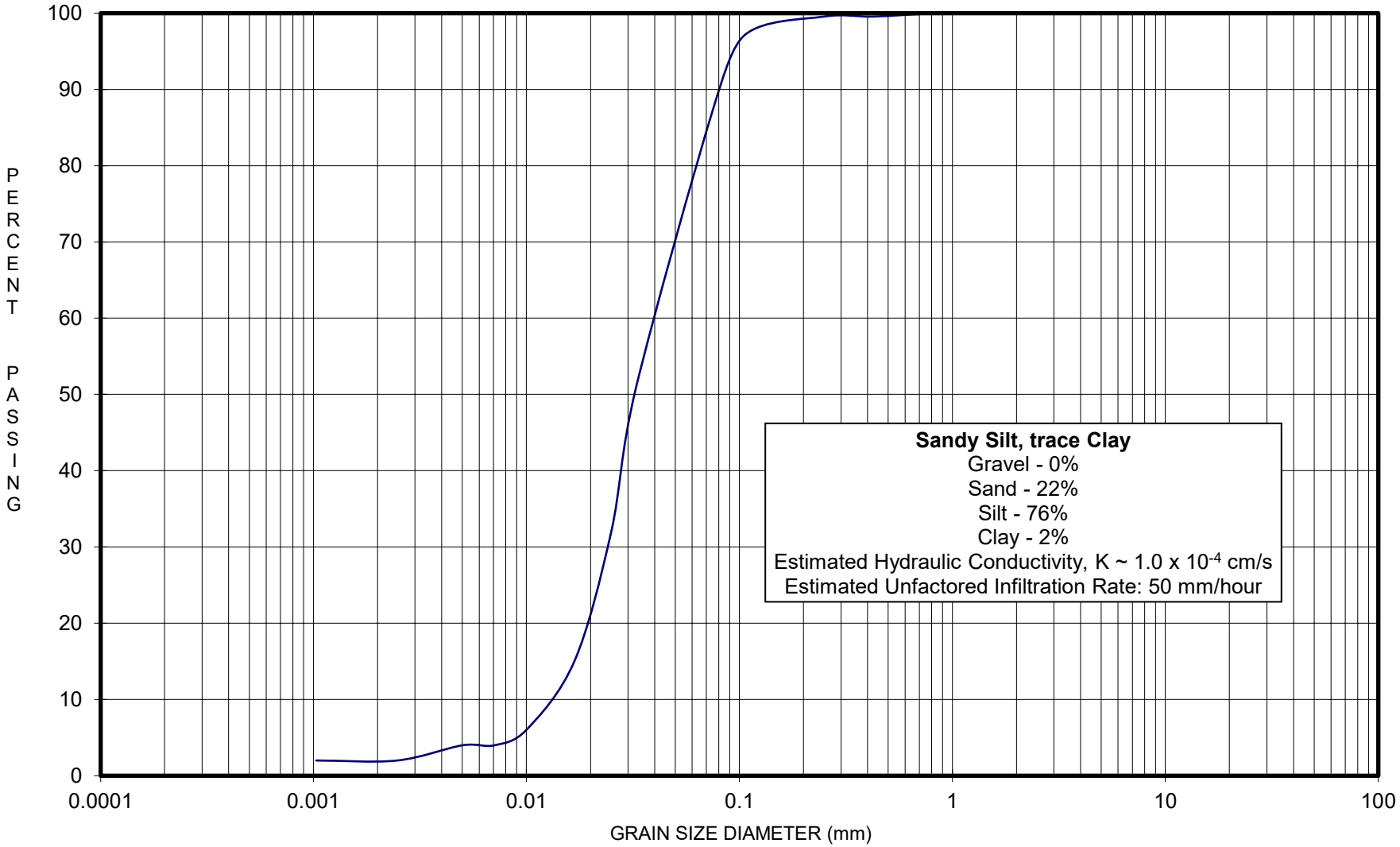
MECHANICAL GRAIN SIZE ANALYSIS



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
	SILT			SAND			GRAVEL			

MODIFIED M.I.T. CLASSIFICATION	**Sample Description:** **Sand (BH3 SA3, 2.3 to 2.7 m depth)**	**1484 Gore Road, London** **Project: LON-24008797-A0**	**Figure 2**

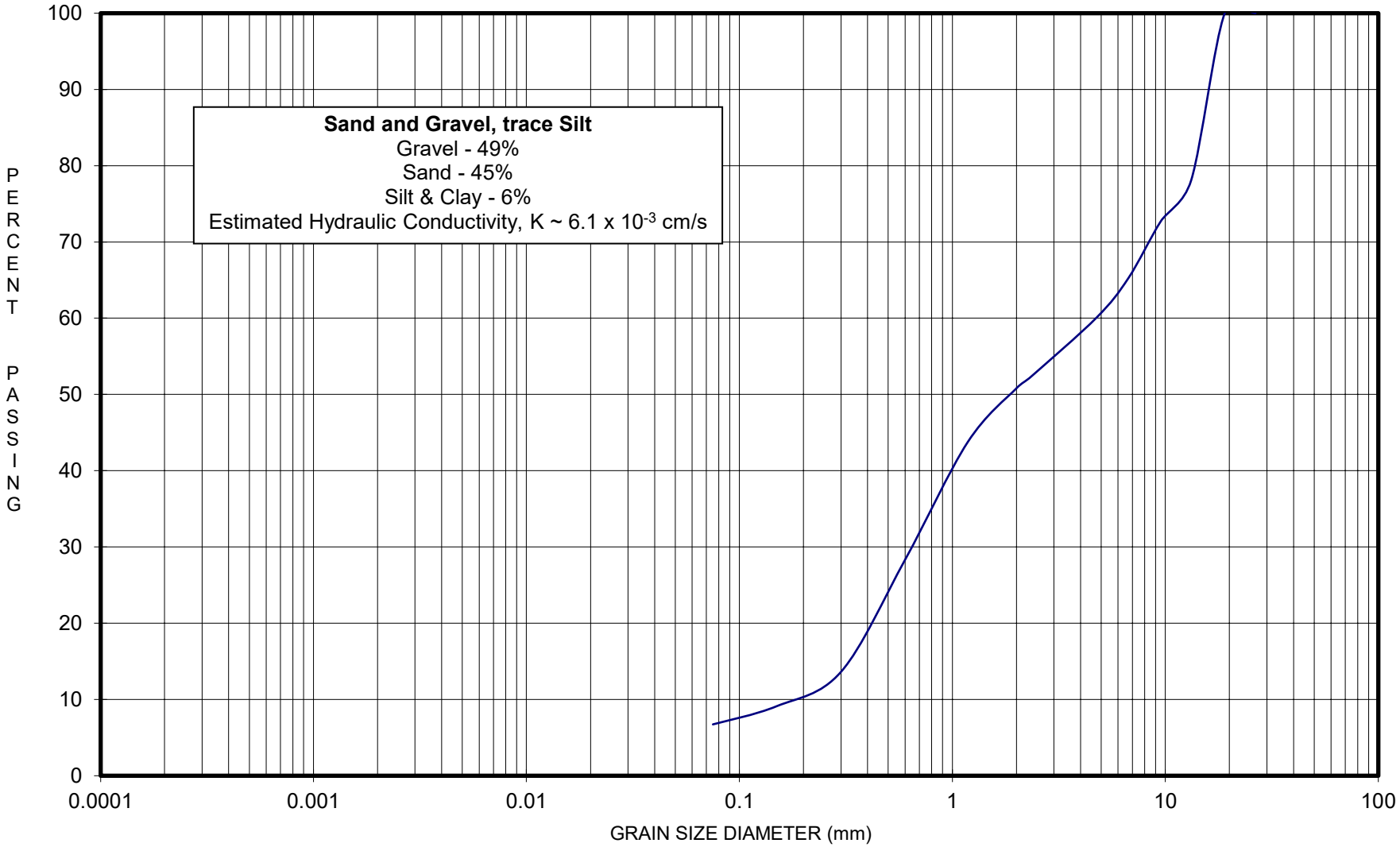
MECHANICAL GRAIN SIZE ANALYSIS



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
	SILT			SAND			GRAVEL			

MODIFIED M.I.T. CLASSIFICATION	**Sample Description:** **Sandy Silt (BH6 SA3, 2.3 to 2.7 m depth)**	**1484 Gore Road, London** **Project: LON-24008797-A0**	**Figure 3**

MECHANICAL GRAIN SIZE ANALYSIS



CLAY	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	
	SILT			SAND			GRAVEL			
MODIFIED M.I.T. CLASSIFICATION	**Sample Description:** **Sand and Gravel (BH7 SA7, 7.6 to 8.1 m depth)**						**1484 Gore Road, London** **Project: LON-24008797-A0**			**Figure 4**

Subject: **Runoff Coefficient Calculations**

Project: **1484 Gore Road**

Project No.: **1614-14301**

Date: **October 2, 2024**

Site Plan:

Area Description	Area (ha)	Runoff Coefficient
Roads	0.14	0.90
Rooftop, garage, and porch	0.14	0.90
Driveways and Parking Spaces	0.07	0.90
Sidewalks	0.03	0.90
Landscaped	0.18	0.20
Total Site	0.55	0.67

161414301 - 1484 Gore Road

NRCS (SCS) Curve Number Determination

Post-Development Conditions

TABLE OF CURVE NUMBERS (CN's)									
		Hydrologic Soil Type							Manning's
Land Use		A	AB	B	BC	C	CD	D	'n'
Meadow	"Good"	30	44	58	64.5	71	74.5	78	0.40
Woodlot	"Fair"	36	48	60	66.5	73	76	79	0.40
Gravel		76	80.5	85	87	89	90	91	0.30
Lawns	"Good"	39	50	61	67.5	74	77	80	0.25
Pasture/Range		58	61.5	65	70.5	76	78.5	81	0.17
Crop		66	70	74	78	82	84	86	0.13
Fallow (Bare)		77	82	86	89	91	93	94	0.05
Impervious		98	98	98	98	98	98	98	0.01

Notes:

1. MTO Drainage Manual (1997), Design Chart 1.09-Soil/Land Use Curve Numbers

2. Chin (2000), Water-Resources Engineering, Table 6.13-Curve Numbers for Various Urban Land Uses

HYDROLOGIC SOIL TYPE (%)								
	Hydrologic Soil Type							
Catchment	A	AB	B	BC	C	CD	D	TOTAL
Internal Catchments								
Total Site			100.0					100

LAND USE (%)									
Catchment	Meadow	Woodlot	Gravel	Lawns	Pasture Range	Crop	Fallow (Bare)	Impervious (see note)	Total
Internal Catchments									
Total Site				32				68	100

CURVE NUMBER (CN)										
Catchment	Meadow	Woodlot	Gravel	Lawns	Pasture Range	Crop	Fallow (Bare)	Impervious	Weighted CN	Pervious CN
Internal Catchments										
Total Site	0.0	0.0	0.0	19.6	0.0	0.0	0.0	66.5	86	61

SWMHYMO Parameters

161414301 - 1484 Gore Road

Post-Development Conditions

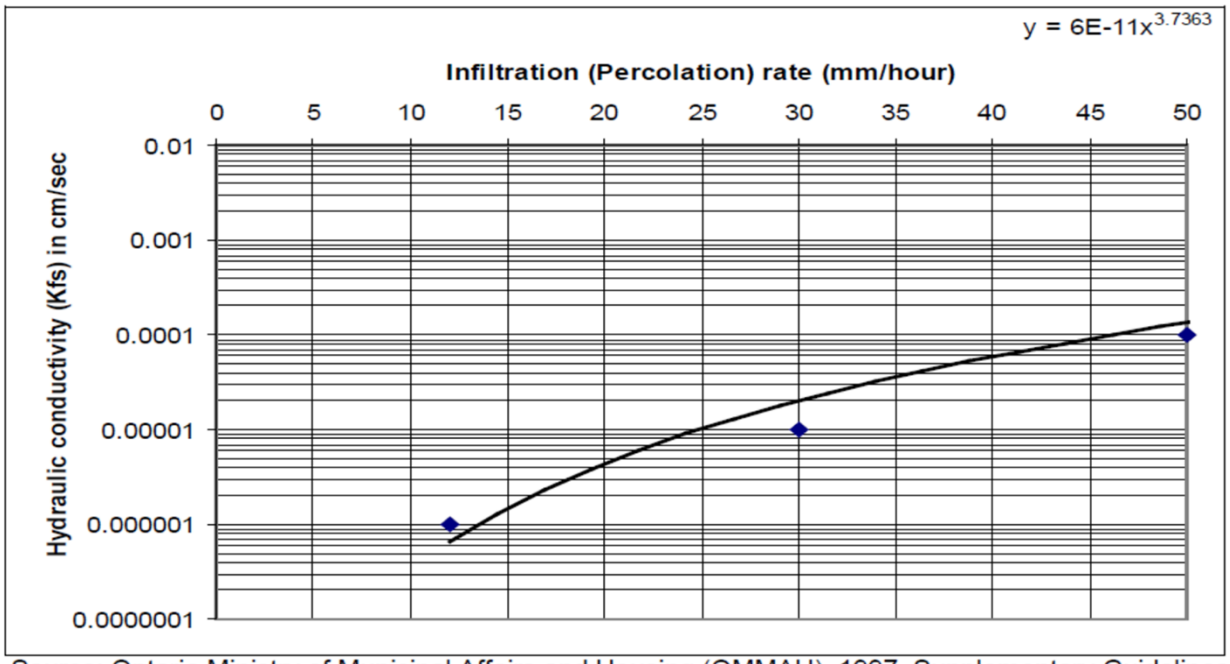
Area Description	Catchment ID	Area (ha)	CN	TIMP	XIMP	Slope (%)	Length P (m)	Length IMP (m)
Draining to the Proposed SWMF	Total Site	0.55	61	68%	61%	2.00	30	90

Notes:

TIMP ..... *Total percent impervious*

XIMP ..... *Percent impervious directly connected*

Subject: Infiltration Rate
Project: 1484 Gore Road
Project #: 1614-14301
Date: 2-Oct-24



Source: Ontario Ministry of Municipal Affairs and Housing (OMMAH). 1997. Supplementary Guidelines to the Ontario Building Code 1997. SG-6 Percolation Time and Soil Descriptions. Toronto, Ontario.

y (K (cm/s))	x (Inf (mm/hr))
1.00E-04	50

Safety Factor	2.5	
Modified Infiltration Rate	20	mm/hr
Footprint Area	350	m^2
Outflow Rate	0.0019	m^3/s

161414301 - 1484 Gore Road

Stormwater Management Facility Design Calculations

Rating Curve			Estimated Detention	Volume Estimation					Outlet Structure Controls	
Elevation (m)	Discharge (m^3/s)	Storage (m^3)	Time (hrs)	Elevation (m)	Area (m^2)	Volume (m^3)	Volume ha.m	Depth (m)	Elevation (m)	Infiltration Rate (m^3/s)
253.00				253.00					253.0	0.0019
253.10	0.0019	14	2.0	253.10	350	14	0.0014	0.1	253.1	0.0019
253.20	0.0019	28	4.0	253.20	350	28	0.0028	0.2	253.2	0.0019
253.30	0.0019	42	6.0	253.30	350	42	0.0042	0.3	253.3	0.0019
253.40	0.0019	56	8.0	253.40	350	56	0.0056	0.4	253.4	0.0019
253.50	0.0019	70	10.0	253.50	350	70	0.0070	0.5	253.5	0.0019
253.60	0.0019	84	12.0	253.60	350	84	0.0084	0.6	253.6	0.0019
253.70	0.0019	98	14.0	253.70	350	98	0.0098	0.7	253.7	0.0019
253.80	0.0019	112	16.0	253.80	350	112	0.0112	0.8	253.8	0.0019
253.90	0.0019	126	18.0	253.90	350	126	0.0126	0.9	253.9	0.0019
254.00	0.0019	140	20.0	254.00	350	140	0.0140	1.0	254.0	0.0019
254.10	0.0019	154	22.0	254.10	350	154	0.0154	1.1	254.1	0.0019
254.20	0.0019	168	24.0	254.20	350	168	0.0168	1.2	254.2	0.0019
254.30	0.0019	182	26.0	254.30	350	182	0.0182	1.3	254.3	0.0019
254.40	0.0019	196	28.0	254.40	350	196	0.0196	1.4	254.4	0.0019
254.50	0.0019	210	30.0	254.50	350	210	0.0210	1.5	254.5	0.0019
254.60	0.0019	224	32.0	254.60	350	224	0.0224	1.6	254.6	0.0019
254.70	0.0019	238	34.0	254.70	350	238	0.0238	1.7	254.7	0.0019
254.80	0.0019	252	36.0	254.80	350	252	0.0252	1.8	254.8	0.0019
254.90	0.0019	266	38.0	254.90	350	266	0.0266	1.9	254.9	0.0019
255.00	0.0019	280	40.0	255.00	350	280	0.0280	2.0	255.0	0.0019
255.10	0.0019	294	42.0	255.10	350	294	0.0294	2.1	255.1	0.0019

Rainfall Event	Elevation	Depth	Volume	Drawdown	Flow from Table
2-year	253.70	0.70	98	14.00	0.002
5-year	254.04	1.04	145	20.71	0.002
10-year	254.27	1.27	178	25.43	0.002
25-year	254.56	1.56	219	31.29	0.002
50-year	254.80	1.80	252	36.00	0.002
100-year	255.03	2.03	284	40.57	0.002

```
2     Metric units
*#*************************************************************************
*#  Project Name: [1484 Gore Rd]    Project Number: [161414301]
*#  Date         : 2024-10-02
*#  Modeller     : [MYK]
*#  Company      : Stantec Consulting Ltd. (London)
*#  License #   : 4730904
*#*************************************************************************
*#*************************************************************************
*#
*#  This model represents the hydologic characteristics of the Proposed conditio
*#  Storm events modeled are:
*#  2YR, 5YR, 10YR, 25YR, 50YR, and 100YR 3hr Chicago Storm
*#
*#*************************************************************************
*%-----------------|-------------------------------------------------------|
START               TZERO=[0.0],  METOUT=[2],  NSTORM=[1],  NRUN=[2]
*%                   ["21ldn2YR.3hr"] <--storm filename, one per line for NSTORM
*%-----------------|-------------------------------------------------------|
READ STORM          STORM_FILENAME=["STORM.001"]
*%-----------------|-------------------------------------------------------|

*#*************************************************************************
*#
*#  Proposed conditions
*#
*#*************************************************************************
CALIB STANDHYD      ID=[01], NHYD=["Site"], DT=[1](min), AREA=[0.55](ha),
                    XIMP=[0.61], TIMP=[0.68], DWF=[0.0](cms), LOSS=[2],
                    SCS curve number CN=[61],
                    Pervious   surfaces: IAper=[5](mm), SLPP=[2](%),
                                         LGP=[30](m), MNP=[0.24], SCP=[0](min),
                    Impervious surfaces: IAimp=[2](mm), SLPI=[2](%),
                                         LGI=[90](m), MNI=[0.013], SCI=[0](min),
                    RAINFALL=[ ,  ,  ,  , ](mm/hr) ,  END=-1
*%-----------------|-------------------------------------------------------|
ROUTE RESERVOIR     IDout=[02],   NHYD=["Infiltration"],  IDin=[01],
                    RDT=[1](min),
                          TABLE of ( OUTFLOW-STORAGE ) values
                                     (cms) - (ha-m)
                                   [   0.0000 , 0.0000 ]
                                   [   0.0019 , 0.0014 ]
                                   [   0.0019 , 0.0294 ]
                                   [   -1  ,  -1  ]  (max twenty pts)
                               IDovf=[03], NHYDovf=["Overflow"]
*%-----------------|-------------------------------------------------------|

*%-----------------|-------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[5]
*                   ["ldn5YR.3hr"] <--storm filename, one per line for NSTORM ti
*%-----------------|-------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[10]
*                   ["ldn10YR.3hr"] <--storm filename, one per line for NSTORM t
*%-----------------|-------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[25]
*                   ["ldn25YR.3hr"] <--storm filename, one per line for NSTORM t
*%-----------------|-------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[50]
*                   ["ldn50YR.3hr"] <--storm filename, one per line for NSTORM t
*%-----------------|-------------------------------------------------------|
START               TZERO=[0.0]hrs or date,  METOUT=[2],  NSTORM=[1],  NRUN=[100
*                   ["ldn100YR.3hr"] <--storm filename, one per line for NSTORM
*%-----------------|-------------------------------------------------------|
FINISH
```

```
00001> ================================================================================
00002>
00003>    SSSSS  W   W  M   M  H   H  Y   Y  M   M   OOO        999    999    =========
00004>    S      W W W  MM MM  H   H   Y Y   MM MM  O   O      9   9  9   9
00005>    SSSSS  W W W  M M M  HHHHH    Y    M M M  O   O  ##  9   9  9   9   Ver  4.05
00006>        S  W W W  M   M  H   H    Y    M   M  O   O       9999   9999   Sept 2011
00007>    SSSSS   W W   M   M  H   H    Y    M   M   OOO           9      9    =========
00008>                                                          9   9  9   9   # 4730904
00009>          StormWater Management HYdrologic Model           999    999    =========
00010>
00011>  ********************************************************************************
00012>  ***************************** SWMHYMO Ver/4.05  ********************************
00013>  *********  A single event and continuous hydrologic simulation model  *********
00014>  *********     based on the principles of HYMO and its successors      *********
00015>  *********                  OTTHYMO-83 and OTTHYMO-89.                  *********
00016>  ********************************************************************************
00017>  ********* Distributed by:  J.F. Sabourin and Associates Inc.           *********
00018>  *********                  Ottawa,  Ontario: (613) 836-3884            *********
00019>  *********                  Gatineau, Quebec: (819) 243-6858            *********
00020>  *********                  E-Mail: swmhymo@jfsa.com                    *********
00021>  ********************************************************************************
00022>
00023>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00024>  +++++++++ Licensed user: Stantec Consulting Ltd. (Kitchener)          +++++++++
00025>  +++++++++                 Kitchener            SERIAL#:4730904       +++++++++
00026>  ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
00027>
00028>  ********************************************************************************
00029>  *********            ++++++ PROGRAM ARRAY DIMENSIONS ++++++            *********
00030>  *********           Maximum value for ID numbers  :    10              *********
00031>  *********           Max. number of rainfall points: 105408             *********
00032>  *********           Max. number of flow points    : 105408             *********
00033>  ********************************************************************************
00034>
00035>
00036>  *********************   D E T A I L E D   O U T P U T   **********************
00037>  ********************************************************************************
00038>  *         DATE: 2024-10-02     TIME: 14:32:50     RUN COUNTER: 000068         *
00039>  ********************************************************************************
00040>  * Input   filename: C:\SWM-MO~1\SWMHYMO\1484GO~1\swm.dat                       *
00041>  * Output  filename: C:\SWM-MO~1\SWMHYMO\1484GO~1\swm.out                       *
00042>  * Summary filename: C:\SWM-MO~1\SWMHYMO\1484GO~1\swm.sum                       *
00043>  * User comments:                                                              *
00044>  * 1:_____________________________________________________________________*
00045>  * 2:_____________________________________________________________________*
00046>  * 3:_____________________________________________________________________*
00047>  ********************************************************************************
00048>
00049> -------------------------------------------------------------------------------
00050> 001:0001-------------------------------------------------------------------------
00051> *#*****************************************************************************
00052> *#  Project Name: [1484 Gore Rd]    Project Number: [161414301]
00053> *#  Date        : 2024-10-02
00054> *#  Modeller    : [MYK]
00055> *#  Company     : Stantec Consulting Ltd. (London)
00056> *#  License #   : 4730904
00057> *#*****************************************************************************
00058> *#*****************************************************************************
00059> *#
00060> *#  This model represents the hydologic characteristics of the Proposed conditio
00061> *#  Storm events modeled are:
00062> *#  2YR, 5YR, 10YR, 25YR, 50YR, and 100YR 3hr Chicago Storm
00063> *#
00064> *#*****************************************************************************
00065>   ** END OF RUN :   1
00066>
00067> ********************************************************************************
00068>
00069>
00070>
00071>
00072>
00073> ---------------------
00074> | START            |  Project  dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00075> ---------------------  Rainfall dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00076>     TZERO =   .00 hrs on        0
00077>     METOUT=   2 (output = METRIC)
00078>     NRUN  = 002
00079>     NSTORM=   1
00080>            #  1=21ldn2YR.3hr
00081> -------------------------------------------------------------------------------
00082> 002:0002-------------------------------------------------------------------------
00083> *#*****************************************************************************
00084> *#  Project Name: [1484 Gore Rd]    Project Number: [161414301]
00085> *#  Date        : 2024-10-02
00086> *#  Modeller    : [MYK]
00087> *#  Company     : Stantec Consulting Ltd. (London)
00088> *#  License #   : 4730904
00089> *#*****************************************************************************
00090> *#*****************************************************************************
00091> *#
00092> *#  This model represents the hydologic characteristics of the Proposed conditio
00093> *#  Storm events modeled are:
00094> *#  2YR, 5YR, 10YR, 25YR, 50YR, and 100YR 3hr Chicago Storm
00095> *#
00096> *#*****************************************************************************
00097> -------------------------------------------------------------------------------
00098> 002:0002-------------------------------------------------------------------------
00099> ---------------------
00100> | READ STORM       |    Filename: 2-yr, 3hr Chicago Storm from 2021 London
00101> | Ptotal=  32.83 mm|    Comments: 2-yr, 3hr Chicago Storm from 2021 London
00102> ---------------------
00103>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00104>               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00105>               .08   2.574 |    .83  14.974 |   1.58   7.501 |   2.33   3.414
00106>               .17   2.812 |    .92  35.641 |   1.67   6.585 |   2.42   3.229
00107>               .25   3.105 |   1.00 108.068 |   1.75   5.876 |   2.50   3.064
00108>               .33   3.472 |   1.08  46.277 |   1.83   5.310 |   2.58   2.917
00109>               .42   3.949 |   1.17  25.470 |   1.92   4.849 |   2.67   2.784
00110>               .50   4.594 |   1.25  17.290 |   2.00   4.465 |   2.75   2.663
00111>               .58   5.517 |   1.33  13.030 |   2.08   4.141 |   2.83   2.554
00112>               .67   6.947 |   1.42  10.448 |   2.17   3.864 |   2.92   2.454
00113>               .75   9.460 |   1.50   8.726 |   2.25   3.624 |   3.00   2.362
00114>
00115> -------------------------------------------------------------------------------
00116> 002:0003-------------------------------------------------------------------------
00117> *#*****************************************************************************
00118> *#
00119> *#  Proposed conditions
00120> *#
00121> *#*****************************************************************************
00122> ----------------------
00123> | CALIB STANDHYD     |   Area    (ha)=     .55
00124> | 01:Site   DT= 1.00 |   Total Imp(%)=   68.00   Dir. Conn.(%)=   61.00
00125> ----------------------
00126>                              IMPERVIOUS    PERVIOUS (i)
00127>      Surface Area     (ha)=        .37          .18
00128>      Dep. Storage     (mm)=       2.00         5.00
00129>      Average Slope     (%)=       2.00         2.00
00130>      Length            (m)=      90.00        30.00
00131>      Mannings n            =       .013         .240
00132>
00133>      Max.eff.Inten.(mm/hr)=     108.07        10.31
00134>                 over (min)        2.00        16.00
00135>      Storage Coeff.  (min)=       1.89 (ii)   16.27 (ii)
00136>      Unit Hyd. Tpeak (min)=       2.00        16.00
00137>      Unit Hyd. peak  (cms)=        .58          .07
00138>                                                          *TOTALS*
00139>      PEAK FLOW       (cms)=        .09          .00          .094 (iii)
00140>      TIME TO PEAK    (hrs)=       1.00         1.33         1.000
00141>      RUNOFF VOLUME    (mm)=      30.83         5.10        20.796
00142>      TOTAL RAINFALL   (mm)=      32.83        32.83        32.834
00143>      RUNOFF COEFFICIENT   =        .94          .16          .633
00144>
00145>         (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00146>             CN* =  61.0    Ia = Dep. Storage  (Above)
00147>        (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00148>             THAN THE STORAGE COEFFICIENT.
00149>       (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00150>
00151> -------------------------------------------------------------------------------
00152> 002:0004-------------------------------------------------------------------------
00153> ----------------------
00154> | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00155> |  IN>01:(Site  )    |
00156> | OUT<02:(Infilt)    |    =========  OUTFLOW STORAGE TABLE  =========
00157> ----------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00158>                             (cms)    (ha.m.)   |    (cms)    (ha.m.)
00159>                              .000  .0000E+00   |     .002  .2940E-01
00160>                              .002  .1400E-02   |     .000  .0000E+00
00161>
00162>      ROUTING RESULTS             AREA     QPEAK     TPEAK        R.V.
00163>      -------------------         (ha)     (cms)     (hrs)        (mm)
00164>      INFLOW >01: (Site  )         .55      .094     1.000      20.796
00165>      OUTFLOW<02: (Infilt)         .55      .002      .933      20.796
00166>     OVERFLOW<03: (Overfl)         .00      .000      .000        .000
00167>
00168>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =         0
00169>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=       .00
00170>                    PERCENTAGE OF TIME OVERFLOWING    (%)=       .00
00171>
00172>
00173>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=     2.018
00174>                    TIME SHIFT OF PEAK FLOW          (min)=    -4.00
00175>                    MAXIMUM  STORAGE   USED       (ha.m.)=.9833E-02
00176>
00177> -------------------------------------------------------------------------------
00178> 002:0005-------------------------------------------------------------------------
00179>   ** END OF RUN :   4
00180>
00181> ********************************************************************************
00182>
00183>
00184>
00185>
00186>
00187> ---------------------
00188> | START            |  Project  dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00189> ---------------------  Rainfall dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00190>     TZERO =   .00 hrs on        0
00191>     METOUT=   2 (output = METRIC)
00192>     NRUN  = 005
00193>     NSTORM=   1
00194>            #  1=ldn5YR.3hr
00195> -------------------------------------------------------------------------------
00196> 005:0002-------------------------------------------------------------------------
00197> *#*****************************************************************************
00198> *#  Project Name: [1484 Gore Rd]    Project Number: [161414301]
00199> *#  Date        : 2024-10-02
00200> *#  Modeller    : [MYK]
00201> *#  Company     : Stantec Consulting Ltd. (London)
00202> *#  License #   : 4730904
00203> *#*****************************************************************************
00204> *#*****************************************************************************
00205> *#
00206> *#  This model represents the hydologic characteristics of the Proposed conditio
00207> *#  Storm events modeled are:
00208> *#  2YR, 5YR, 10YR, 25YR, 50YR, and 100YR 3hr Chicago Storm
00209> *#
00210> *#*****************************************************************************
00211> -------------------------------------------------------------------------------
00212> 005:0002-------------------------------------------------------------------------
00213> ---------------------
00214> | READ STORM       |    Filename: 5-yr, 3hr Chicago Storm from London IDF
00215> | Ptotal=  44.19 mm|    Comments: 5-yr, 3hr Chicago Storm from London IDF
00216> ---------------------
00217>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00218>               hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00219>               .08   3.164 |    .83  21.025 |   1.58  10.072 |   2.33   4.293
00220>               .17   3.481 |    .92  50.463 |   1.67   8.751 |   2.42   4.042
00221>               .25   3.874 |   1.00 141.242 |   1.75   7.736 |   2.50   3.819
00222>               .33   4.373 |   1.08  65.260 |   1.83   6.932 |   2.58   3.620
00223>               .42   5.028 |   1.17  36.321 |   1.92   6.282 |   2.67   3.443
00224>               .50   5.925 |   1.25  24.430 |   2.00   5.745 |   2.75   3.282
00225>               .58   7.226 |   1.33  18.167 |   2.08   5.294 |   2.83   3.137
00226>               .67   9.274 |   1.42  14.372 |   2.17   4.910 |   2.92   3.005
00227>               .75  12.926 |   1.50  11.853 |   2.25   4.580 |   3.00   2.884
00228>
00229> -------------------------------------------------------------------------------
00230> 005:0003-------------------------------------------------------------------------
00231> *#*****************************************************************************
00232> *#
00233> *#  Proposed conditions
00234> *#
00235> *#*****************************************************************************
00236> ----------------------
00237> | CALIB STANDHYD     |   Area    (ha)=     .55
00238> | 01:Site   DT= 1.00 |   Total Imp(%)=   68.00   Dir. Conn.(%)=   61.00
00239> ----------------------
00240>                              IMPERVIOUS    PERVIOUS (i)
00241>      Surface Area     (ha)=        .37          .18
00242>      Dep. Storage     (mm)=       2.00         5.00
00243>      Average Slope     (%)=       2.00         2.00
00244>      Length            (m)=      90.00        30.00
00245>      Mannings n            =       .013         .240
00246>
00247>      Max.eff.Inten.(mm/hr)=     141.24        22.03
00248>                 over (min)        2.00        12.00
00249>      Storage Coeff.  (min)=       1.70 (ii)   12.31 (ii)
00250>      Unit Hyd. Tpeak (min)=       2.00        12.00
00251>      Unit Hyd. peak  (cms)=        .62          .09
00252>                                                          *TOTALS*
00253>      PEAK FLOW       (cms)=        .12          .01          .126 (iii)
00254>      TIME TO PEAK    (hrs)=       1.00         1.25         1.000
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00255>      RUNOFF VOLUME    (mm)=      42.19         9.27         29.349
00256>      TOTAL RAINFALL   (mm)=      44.19        44.19         44.186
00257>      RUNOFF COEFFICIENT   =        .95          .21           .664
00258>
00259>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00260>            CN* =  61.0    Ia = Dep. Storage  (Above)
00261>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00262>            THAN THE STORAGE COEFFICIENT.
00263>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00264>
00265> ---------------------------------------------------------------------------
00266> 005:0004-----------------------------------------------------------------
00267> --------------------
00268> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00269> |  IN>01:(Site  )   |
00270> | OUT<02:(Infilt)   |    =========  OUTLFOW STORAGE TABLE  =========
00271> --------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00272>                           (cms)     (ha.m.)   |    (cms)    (ha.m.)
00273>                            .000  .0000E+00    |     .002  .2940E-01
00274>                            .002  .1400E-02    |     .000  .0000E+00
00275>
00276>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00277>      --------------------       (ha)     (cms)     (hrs)       (mm)
00278>      INFLOW >01: (Site  )        .55      .126     1.000     29.349
00279>      OUTFLOW<02: (Infilt)        .55      .002      .867     29.348
00280>     OVERFLOW<03: (Overfl)        .00      .000      .000       .000
00281>
00282>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00283>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00284>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00285>
00286>
00287>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    1.506
00288>                    TIME SHIFT OF PEAK FLOW         (min)=    -8.00
00289>                    MAXIMUM  STORAGE   USED       (ha.m.)=.1448E-01
00290>
00291> ---------------------------------------------------------------------------
00292> 005:0005-----------------------------------------------------------------
00293> ---------------------------------------------------------------------------
00294> 005:0002-----------------------------------------------------------------
00295>   ** END OF RUN :   9
00296>
00297> ***************************************************************************
00298>
00299>
00300>
00301>
00302>
00303> --------------------
00304> | START            |  Project  dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00305> --------------------  Rainfall dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00306>     TZERO =   .00 hrs on        0
00307>     METOUT=   2 (output = METRIC)
00308>     NRUN  = 010
00309>     NSTORM=   1
00310>               #  1=ldn10YR.3hr
00311> ---------------------------------------------------------------------------
00312> 010:0002-----------------------------------------------------------------
00313> *#************************************************************************
00314> *#  Project Name: [1484 Gore Rd]    Project Number: [161414301]
00315> *#  Date        : 2024-10-02
00316> *#  Modeller    : [MYK]
00317> *#  Company     : Stantec Consulting Ltd. (London)
00318> *#  License #   : 4730904
00319> *#************************************************************************
00320> *#************************************************************************
00321> *#
00322> *#  This model represents the hydologic characteristics of the Proposed conditio
00323> *#  Storm events modeled are:
00324> *#  2YR, 5YR, 10YR, 25YR, 50YR, and 100YR 3hr Chicago Storm
00325> *#
00326> *#************************************************************************
00327> ---------------------------------------------------------------------------
00328> 010:0002-----------------------------------------------------------------
00329> --------------------
00330> | READ STORM       |    Filename: 10-yr, 3hr Chicago Storm from London IDF
00331> | Ptotal=  52.05 mm|    Comments: 10-yr, 3hr Chicago Storm from London IDF
00332> --------------------
00333>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00334>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00335>                .08   3.462 |    .83  25.620 |   1.58  11.888 |   2.33   4.796
00336>                .17   3.833 |    .92  61.474 |   1.67  10.245 |   2.42   4.496
00337>                .25   4.297 |   1.00 162.470 |   1.75   8.987 |   2.50   4.231
00338>                .33   4.891 |   1.08  79.139 |   1.83   7.997 |   2.58   3.997
00339>                .42   5.677 |   1.17  44.600 |   1.92   7.200 |   2.67   3.788
00340>                .50   6.765 |   1.25  29.885 |   2.00   6.545 |   2.75   3.600
00341>                .58   8.360 |   1.33  22.041 |   2.08   5.998 |   2.83   3.430
00342>                .67  10.895 |   1.42  17.275 |   2.17   5.535 |   2.92   3.276
00343>                .75  15.461 |   1.50  14.115 |   2.25   5.139 |   3.00   3.135
00344>
00345> ---------------------------------------------------------------------------
00346> 010:0003-----------------------------------------------------------------
00347> *#************************************************************************
00348> *#
00349> *#  Proposed conditions
00350> *#
00351> *#************************************************************************
00352> ---------------------
00353> | CALIB STANDHYD    |   Area    (ha)=     .55
00354> | 01:Site   DT= 1.00 |   Total Imp(%)=   68.00   Dir. Conn.(%)=   61.00
00355> ---------------------
00356>                              IMPERVIOUS    PERVIOUS (i)
00357>      Surface Area     (ha)=        .37          .18
00358>      Dep. Storage     (mm)=       2.00         5.00
00359>      Average Slope     (%)=       2.00         2.00
00360>      Length            (m)=      90.00        30.00
00361>      Mannings n            =       .013         .240
00362>
00363>      Max.eff.Inten.(mm/hr)=     162.47        31.83
00364>                 over (min)        2.00        11.00
00365>      Storage Coeff.  (min)=       1.60 (ii)   10.76 (ii)
00366>      Unit Hyd. Tpeak (min)=       2.00        11.00
00367>      Unit Hyd. peak  (cms)=        .64          .10
00368>                                                          *TOTALS*
00369>      PEAK FLOW       (cms)=        .15          .01          .147 (iii)
00370>      TIME TO PEAK    (hrs)=       1.00         1.22         1.000
00371>      RUNOFF VOLUME    (mm)=      50.04        12.69        35.475
00372>      TOTAL RAINFALL   (mm)=      52.05        52.05        52.045
00373>      RUNOFF COEFFICIENT   =        .96          .24          .682
00374>
00375>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00376>            CN* =  61.0    Ia = Dep. Storage  (Above)
00377>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00378>            THAN THE STORAGE COEFFICIENT.
00379>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00380>
00381> ---------------------------------------------------------------------------
00382> 010:0004-----------------------------------------------------------------
00383> --------------------
00384> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00385> |  IN>01:(Site  )   |
00386> | OUT<02:(Infilt)   |    =========  OUTLFOW STORAGE TABLE  =========
00387> --------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00388>                           (cms)     (ha.m.)   |    (cms)    (ha.m.)
00389>                            .000  .0000E+00    |     .002  .2940E-01
00390>                            .002  .1400E-02    |     .000  .0000E+00
00391>
00392>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00393>      --------------------       (ha)     (cms)     (hrs)       (mm)
00394>      INFLOW >01: (Site  )        .55      .147     1.000     35.475
00395>      OUTFLOW<02: (Infilt)        .55      .002      .833     35.475
00396>     OVERFLOW<03: (Overfl)        .00      .000      .000       .000
00397>
00398>                    TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00399>                    CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00400>                    PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00401>
00402>
00403>                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=    1.291
00404>                    TIME SHIFT OF PEAK FLOW         (min)=   -10.00
00405>                    MAXIMUM  STORAGE   USED       (ha.m.)=.1782E-01
00406>
00407> ---------------------------------------------------------------------------
00408> 010:0005-----------------------------------------------------------------
00409> ---------------------------------------------------------------------------
00410> 010:0002-----------------------------------------------------------------
00411> ---------------------------------------------------------------------------
00412> 010:0002-----------------------------------------------------------------
00413>   ** END OF RUN :  24
00414>
00415> ***************************************************************************
00416>
00417>
00418>
00419>
00420>
00421> --------------------
00422> | START            |  Project  dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00423> --------------------  Rainfall dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00424>     TZERO =   .00 hrs on        0
00425>     METOUT=   2 (output = METRIC)
00426>     NRUN  = 025
00427>     NSTORM=   1
00428>               #  1=ldn25YR.3hr
00429> ---------------------------------------------------------------------------
00430> 025:0002-----------------------------------------------------------------
00431> *#************************************************************************
00432> *#  Project Name: [1484 Gore Rd]    Project Number: [161414301]
00433> *#  Date        : 2024-10-02
00434> *#  Modeller    : [MYK]
00435> *#  Company     : Stantec Consulting Ltd. (London)
00436> *#  License #   : 4730904
00437> *#************************************************************************
00438> *#************************************************************************
00439> *#
00440> *#  This model represents the hydologic characteristics of the Proposed conditio
00441> *#  Storm events modeled are:
00442> *#  2YR, 5YR, 10YR, 25YR, 50YR, and 100YR 3hr Chicago Storm
00443> *#
00444> *#************************************************************************
00445> ---------------------------------------------------------------------------
00446> 025:0002-----------------------------------------------------------------
00447> --------------------
00448> | READ STORM       |    Filename: 25-yr, 3hr Chicago Storm from London IDF
00449> | Ptotal=  61.48 mm|    Comments: 25-yr, 3hr Chicago Storm from London IDF
00450> --------------------
00451>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00452>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00453>                .08   3.863 |    .83  30.802 |   1.58  13.993 |   2.33   5.432
00454>                .17   4.298 |    .92  74.085 |   1.67  11.991 |   2.42   5.077
00455>                .25   4.843 |   1.00 190.819 |   1.75  10.465 |   2.50   4.766
00456>                .33   5.545 |   1.08  95.197 |   1.83   9.267 |   2.58   4.490
00457>                .42   6.481 |   1.17  53.926 |   1.92   8.306 |   2.67   4.244
00458>                .50   7.783 |   1.25  36.022 |   2.00   7.519 |   2.75   4.024
00459>                .58   9.705 |   1.33  26.421 |   2.08   6.864 |   2.83   3.826
00460>                .67  12.783 |   1.42  20.579 |   2.17   6.312 |   2.92   3.646
00461>                .75  18.359 |   1.50  16.712 |   2.25   5.840 |   3.00   3.483
00462>
00463> ---------------------------------------------------------------------------
00464> 025:0003-----------------------------------------------------------------
00465> *#************************************************************************
00466> *#
00467> *#  Proposed conditions
00468> *#
00469> *#************************************************************************
00470> ---------------------
00471> | CALIB STANDHYD    |   Area    (ha)=     .55
00472> | 01:Site   DT= 1.00 |   Total Imp(%)=   68.00   Dir. Conn.(%)=   61.00
00473> ---------------------
00474>                              IMPERVIOUS    PERVIOUS (i)
00475>      Surface Area     (ha)=        .37          .18
00476>      Dep. Storage     (mm)=       2.00         5.00
00477>      Average Slope     (%)=       2.00         2.00
00478>      Length            (m)=      90.00        30.00
00479>      Mannings n            =       .013         .240
00480>
00481>      Max.eff.Inten.(mm/hr)=     190.82        47.23
00482>                 over (min)        2.00         9.00
00483>      Storage Coeff.  (min)=       1.50 (ii)    9.33 (ii)
00484>      Unit Hyd. Tpeak (min)=       2.00         9.00
00485>      Unit Hyd. peak  (cms)=        .66          .12
00486>                                                          *TOTALS*
00487>      PEAK FLOW       (cms)=        .17          .01          .176 (iii)
00488>      TIME TO PEAK    (hrs)=       1.00         1.18         1.000
00489>      RUNOFF VOLUME    (mm)=      59.48        17.27        43.019
00490>      TOTAL RAINFALL   (mm)=      61.48        61.48        61.481
00491>      RUNOFF COEFFICIENT   =        .97          .28          .700
00492>
00493>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00494>            CN* =  61.0    Ia = Dep. Storage  (Above)
00495>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00496>            THAN THE STORAGE COEFFICIENT.
00497>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00498>
00499> ---------------------------------------------------------------------------
00500> 025:0004-----------------------------------------------------------------
00501> --------------------
00502> | ROUTE RESERVOIR   |    Requested routing time step =  1.0 min.
00503> |  IN>01:(Site  )   |
00504> | OUT<02:(Infilt)   |    =========  OUTLFOW STORAGE TABLE  =========
00505> --------------------    OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
00506>                           (cms)     (ha.m.)   |    (cms)    (ha.m.)
00507>                            .000  .0000E+00    |     .002  .2940E-01
00508>                            .002  .1400E-02    |     .000  .0000E+00
```

```
00509>
00510>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00511>      --------------------       (ha)     (cms)     (hrs)       (mm)
00512>      INFLOW >01: (Site  )        .55      .176     1.000     43.019
00513>      OUTFLOW<02: (Infilt)        .55      .002      .800     43.019
00514>     OVERFLOW<03: (Overfl)        .00      .000      .000       .000
00515>
00516>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00517>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00518>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00519>
00520>
00521>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=    1.079
00522>                     TIME SHIFT OF PEAK FLOW          (min)=  -12.00
00523>                     MAXIMUM  STORAGE   USED       (ha.m.)=.2194E-01
00524>
00525> ------------------------------------------------------------------------------
00526> 025:0005--------------------------------------------------------------------
00527> ------------------------------------------------------------------------------
00528> 025:0002--------------------------------------------------------------------
00529> ------------------------------------------------------------------------------
00530> 025:0002--------------------------------------------------------------------
00531> ------------------------------------------------------------------------------
00532> 025:0002--------------------------------------------------------------------
00533>   ** END OF RUN :  49
00534>
00535> ******************************************************************************
00536>
00537>
00538>
00539>
00540>
00541> --------------------
00542> | START            |  Project  dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00543> --------------------  Rainfall dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00544>     TZERO =   .00 hrs on        0
00545>     METOUT=   2 (output = METRIC)
00546>     NRUN  = 050
00547>     NSTORM=   1
00548>              #  1=ldn50YR.3hr
00549> ------------------------------------------------------------------------------
00550> 050:0002--------------------------------------------------------------------
00551> *#****************************************************************************
00552> *#  Project Name: [1484 Gore Rd]    Project Number: [161414301]
00553> *#  Date        : 2024-10-02
00554> *#  Modeller    : [MYK]
00555> *#  Company     : Stantec Consulting Ltd. (London)
00556> *#  License #   : 4730904
00557> *#****************************************************************************
00558> *#****************************************************************************
00559> *#
00560> *#  This model represents the hydologic characteristics of the Proposed conditio
00561> *#  Storm events modeled are:
00562> *#  2YR, 5YR, 10YR, 25YR, 50YR, and 100YR 3hr Chicago Storm
00563> *#
00564> *#****************************************************************************
00565> ------------------------------------------------------------------------------
00566> 050:0002--------------------------------------------------------------------
00567> --------------------
00568> | READ STORM       |    Filename: 50-yr, 3hr Chicago Storm from London IDF
00569> | Ptotal=  68.72 mm|    Comments: 50-yr, 3hr Chicago Storm from London IDF
00570> --------------------
00571>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00572>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00573>                .08   4.313 |    .83  34.573 |   1.58  15.695 |   2.33   6.074
00574>                .17   4.801 |    .92  82.919 |   1.67  13.445 |   2.42   5.676
00575>                .25   5.412 |   1.00 211.984 |   1.75  11.729 |   2.50   5.326
00576>                .33   6.201 |   1.08 106.433 |   1.83  10.383 |   2.58   5.017
00577>                .42   7.252 |   1.17  60.466 |   1.92   9.302 |   2.67   4.741
00578>                .50   8.715 |   1.25  40.428 |   2.00   8.418 |   2.75   4.494
00579>                .58  10.876 |   1.33  29.658 |   2.08   7.682 |   2.83   4.272
00580>                .67  14.336 |   1.42  23.098 |   2.17   7.062 |   2.92   4.070
00581>                .75  20.603 |   1.50  18.752 |   2.25   6.532 |   3.00   3.887
00582>
00583> ------------------------------------------------------------------------------
00584> 050:0003--------------------------------------------------------------------
00585> *#****************************************************************************
00586> *#
00587> *#  Proposed conditions
00588> *#
00589> *#****************************************************************************
00590> ----------------------
00591> | CALIB STANDHYD     |   Area    (ha)=     .55
00592> | 01:Site   DT= 1.00 |   Total Imp(%)=   68.00   Dir. Conn.(%)=   61.00
00593> ----------------------
00594>                              IMPERVIOUS    PERVIOUS (i)
00595>      Surface Area     (ha)=        .37          .18
00596>      Dep. Storage     (mm)=       2.00         5.00
00597>      Average Slope     (%)=       2.00         2.00
00598>      Length            (m)=      90.00        30.00
00599>      Mannings n           =       .013         .240
00600>
00601>      Max.eff.Inten.(mm/hr)=     211.98        57.97
00602>                  over (min)        1.00         9.00
00603>      Storage Coeff.  (min)=       1.44 (ii)    8.65 (ii)
00604>      Unit Hyd. Tpeak (min)=       1.00         9.00
00605>      Unit Hyd. peak  (cms)=        .85          .13
00606>                                                          *TOTALS*
00607>      PEAK FLOW       (cms)=        .19          .02          .200 (iii)
00608>      TIME TO PEAK    (hrs)=       1.00         1.18         1.000
00609>      RUNOFF VOLUME    (mm)=      66.72        21.10        48.928
00610>      TOTAL RAINFALL   (mm)=      68.72        68.72        68.719
00611>      RUNOFF COEFFICIENT   =        .97          .31          .712
00612>
00613>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00614>            CN* =  61.0    Ia = Dep. Storage  (Above)
00615>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00616>            THAN THE STORAGE COEFFICIENT.
00617>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00618>
00619> ------------------------------------------------------------------------------
00620> 050:0004--------------------------------------------------------------------
00621> ----------------------
00622> | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00623> |  IN>01:(Site  )    |
00624> | OUT<02:(Infilt)    |    =========  OUTLFOW STORAGE TABLE  =========
00625> ----------------------    OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
00626>                             (cms)     (ha.m.)    |    (cms)     (ha.m.)
00627>                              .000  .0000E+00    |     .002  .2940E-01
00628>                              .002  .1400E-02    |     .000  .0000E+00
00629>
00630>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00631>      --------------------       (ha)     (cms)     (hrs)       (mm)
00632>      INFLOW >01: (Site  )        .55      .200     1.000     48.928
00633>      OUTFLOW<02: (Infilt)        .55      .002      .767     48.928
00634>     OVERFLOW<03: (Overfl)        .00      .000      .000       .000
00635>
00636>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00637>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00638>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00639>
00640>
00641>                     PEAK   FLOW   REDUCTION [Qout/Qin](%)=     .951
00642>                     TIME SHIFT OF PEAK FLOW          (min)=   -14.00
00643>                     MAXIMUM  STORAGE   USED       (ha.m.)=.2515E-01
00644>
00645> ------------------------------------------------------------------------------
00646> 050:0005--------------------------------------------------------------------
00647> ------------------------------------------------------------------------------
00648> 050:0002--------------------------------------------------------------------
00649> ------------------------------------------------------------------------------
00650> 050:0002--------------------------------------------------------------------
00651> ------------------------------------------------------------------------------
00652> 050:0002--------------------------------------------------------------------
00653> ------------------------------------------------------------------------------
00654> 050:0002--------------------------------------------------------------------
00655>   ** END OF RUN :  99
00656>
00657> ******************************************************************************
00658>
00659>
00660>
00661>
00662>
00663> --------------------
00664> | START            |  Project  dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00665> --------------------  Rainfall dir.: C:\SWM-MO~1\SWMHYMO\1484GO~1\
00666>     TZERO =   .00 hrs on        0
00667>     METOUT=   2 (output = METRIC)
00668>     NRUN  = 100
00669>     NSTORM=   1
00670>              #  1=ldn100YR.3hr
00671> ------------------------------------------------------------------------------
00672> 100:0002-------------------------------------------------------------------
00673> *#****************************************************************************
00674> *#  Project Name: [1484 Gore Rd]    Project Number: [161414301]
00675> *#  Date        : 2024-10-02
00676> *#  Modeller    : [MYK]
00677> *#  Company     : Stantec Consulting Ltd. (London)
00678> *#  License #   : 4730904
00679> *#****************************************************************************
00680> *#****************************************************************************
00681> *#
00682> *#  This model represents the hydologic characteristics of the Proposed conditio
00683> *#  Storm events modeled are:
00684> *#  2YR, 5YR, 10YR, 25YR, 50YR, and 100YR 3hr Chicago Storm
00685> *#
00686> *#****************************************************************************
00687> ------------------------------------------------------------------------------
00688> 100:0002-------------------------------------------------------------------
00689> --------------------
00690> | READ STORM       |    Filename: 100-yr, 3hr Chicago Storm from London ID
00691> | Ptotal=  75.83 mm|    Comments: 100-yr, 3hr Chicago Storm from London ID
00692> --------------------
00693>               TIME    RAIN |   TIME    RAIN |   TIME    RAIN |   TIME    RAIN
00694>                hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr |    hrs   mm/hr
00695>                .08   4.623 |    .83  38.591 |   1.58  17.341 |   2.33   6.569
00696>                .17   5.160 |    .92  92.413 |   1.67  14.811 |   2.42   6.127
00697>                .25   5.836 |   1.00 232.243 |   1.75  12.884 |   2.50   5.740
00698>                .33   6.709 |   1.08 118.408 |   1.83  11.375 |   2.58   5.398
00699>                .42   7.878 |   1.17  67.596 |   1.92  10.166 |   2.67   5.094
00700>                .50   9.510 |   1.25  45.175 |   2.00   9.178 |   2.75   4.822
00701>                .58  11.928 |   1.33  33.066 |   2.08   8.357 |   2.83   4.577
00702>                .67  15.813 |   1.42  25.678 |   2.17   7.666 |   2.92   4.356
00703>                .75  22.868 |   1.50  20.783 |   2.25   7.077 |   3.00   4.155
00704>
00705> ------------------------------------------------------------------------------
00706> 100:0003-------------------------------------------------------------------
00707> *#****************************************************************************
00708> *#
00709> *#  Proposed conditions
00710> *#
00711> *#****************************************************************************
00712> ----------------------
00713> | CALIB STANDHYD     |   Area    (ha)=     .55
00714> | 01:Site   DT= 1.00 |   Total Imp(%)=   68.00   Dir. Conn.(%)=   61.00
00715> ----------------------
00716>                              IMPERVIOUS    PERVIOUS (i)
00717>      Surface Area     (ha)=        .37          .18
00718>      Dep. Storage     (mm)=       2.00         5.00
00719>      Average Slope     (%)=       2.00         2.00
00720>      Length            (m)=      90.00        30.00
00721>      Mannings n           =       .013         .240
00722>
00723>      Max.eff.Inten.(mm/hr)=     232.24        70.41
00724>                  over (min)        1.00         8.00
00725>      Storage Coeff.  (min)=       1.39 (ii)    8.06 (ii)
00726>      Unit Hyd. Tpeak (min)=       1.00         8.00
00727>      Unit Hyd. peak  (cms)=        .87          .14
00728>                                                          *TOTALS*
00729>      PEAK FLOW       (cms)=        .21          .02          .222 (iii)
00730>      TIME TO PEAK    (hrs)=       1.00         1.17         1.000
00731>      RUNOFF VOLUME    (mm)=      73.83        25.10        54.826
00732>      TOTAL RAINFALL   (mm)=      75.83        75.83        75.831
00733>      RUNOFF COEFFICIENT   =        .97          .33          .723
00734>
00735>        (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
00736>            CN* =  61.0    Ia = Dep. Storage  (Above)
00737>       (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
00738>            THAN THE STORAGE COEFFICIENT.
00739>      (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
00740>
00741> ------------------------------------------------------------------------------
00742> 100:0004-------------------------------------------------------------------
00743> ----------------------
00744> | ROUTE RESERVOIR    |    Requested routing time step =  1.0 min.
00745> |  IN>01:(Site  )    |
00746> | OUT<02:(Infilt)    |    =========  OUTLFOW STORAGE TABLE  =========
00747> ----------------------    OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
00748>                             (cms)     (ha.m.)    |    (cms)     (ha.m.)
00749>                              .000  .0000E+00    |     .002  .2940E-01
00750>                              .002  .1400E-02    |     .000  .0000E+00
00751>
00752>      ROUTING RESULTS            AREA     QPEAK     TPEAK       R.V.
00753>      --------------------       (ha)     (cms)     (hrs)       (mm)
00754>      INFLOW >01: (Site  )        .55      .222     1.000     54.826
00755>      OUTFLOW<02: (Infilt)        .55      .002      .733     54.826
00756>     OVERFLOW<03: (Overfl)        .00      .000      .000       .000
00757>
00758>                     TOTAL NUMBER OF SIMULATED OVERFLOWS  =        0
00759>                     CUMULATIVE TIME OF OVERFLOWS  (hours)=      .00
00760>                     PERCENTAGE OF TIME OVERFLOWING    (%)=      .00
00761>
00762>
```

```
                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=     .858
                    TIME SHIFT OF PEAK FLOW         (min)=   -16.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=.2838E-01

--------------------------------------------------------------------------------
100:0005--------------------------------------------------------------------------
--------------------------------------------------------------------------------
100:0002--------------------------------------------------------------------------
--------------------------------------------------------------------------------
100:0002--------------------------------------------------------------------------
--------------------------------------------------------------------------------
100:0002--------------------------------------------------------------------------
--------------------------------------------------------------------------------
100:0002--------------------------------------------------------------------------
--------------------------------------------------------------------------------
100:0002--------------------------------------------------------------------------
      FINISH
--------------------------------------------------------------------------------
********************************************************************************
     WARNINGS / ERRORS / NOTES
     -------------------------
   Simulation ended on 2024-10-02     at 14:32:51
================================================================================
```

Stormceptor®

Rinker MATERIALS

Stormceptor® EF Sizing Report

Imbrium® Systems
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

10/09/2024

Province:	Ontario
City:	London
Nearest Rainfall Station:	LONDON CS
Climate Station Id:	6144478
Years of Rainfall Data:	20

Site Name:	1484 Gore Road

Drainage Area (ha):	0.23
% Imperviousness:	100.00

Runoff Coefficient 'c': 0.90

Particle Size Distribution:	Fine
Target TSS Removal (%):	80.0

Required Water Quality Runoff Volume Capture (%):	90.00
Estimated Water Quality Flow Rate (L/s):	7.56
Oil / Fuel Spill Risk Site?	No
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	
Influent TSS Concentration (mg/L):	100
Estimated Average Annual Sediment Load (kg/yr):	151
Estimated Average Annual Sediment Volume (L/yr):	122

Project Name:	1484 Gore Road
Project Number:	161414301
Designer Name:	Maryam Yavarikia
Designer Company:	Stantec
Designer Email:	maryam.yavarikia@stantec.com
Designer Phone:	548-888-1590
EOR Name:	
EOR Company:	
EOR Email:	
EOR Phone:	###-###-####

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EF4	92
EF6	97
EF8	99
EF10	100
EF12	100

Recommended Stormceptor EF Model: EF4

Estimated Net Annual Sediment (TSS) Load Reduction (%): 92

Water Quality Runoff Volume Capture (%): > 90

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THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

►The **Canadian ETV PSD** shown in the table below was used, or in part, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

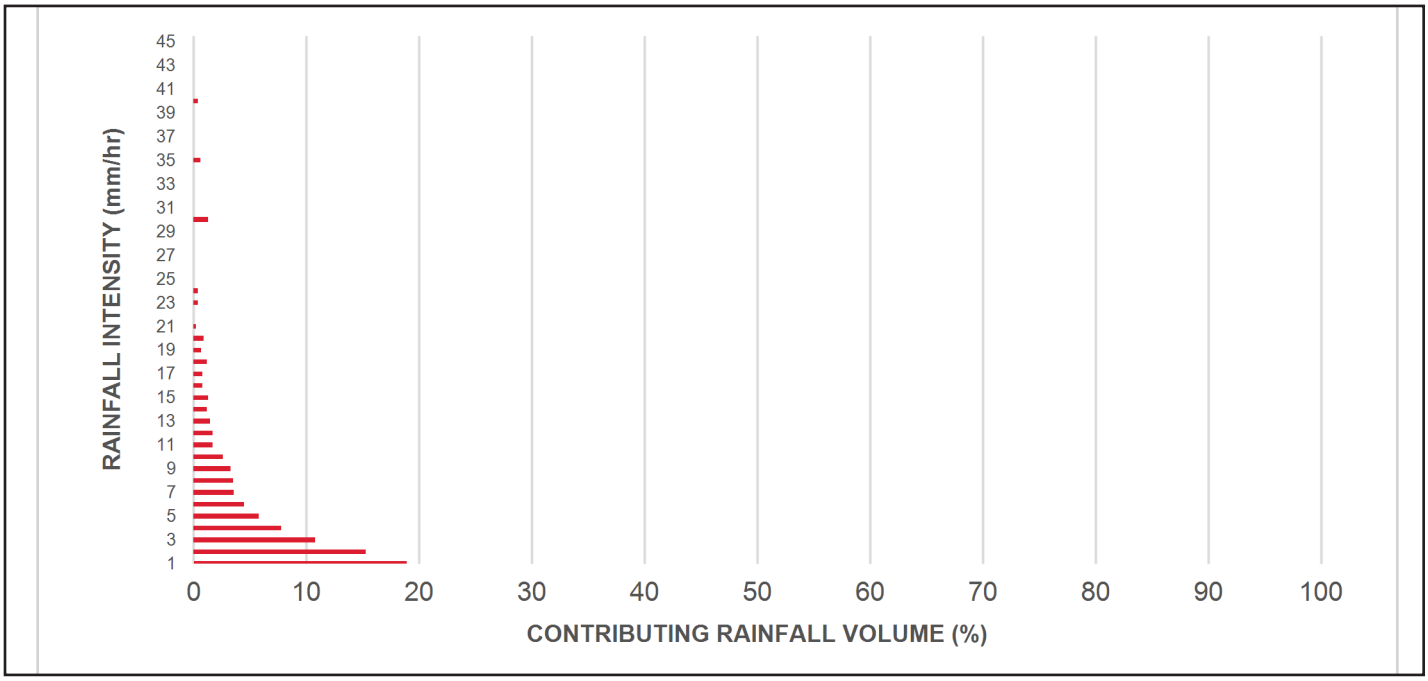
imbrium

Stormceptor® EF Sizing Report

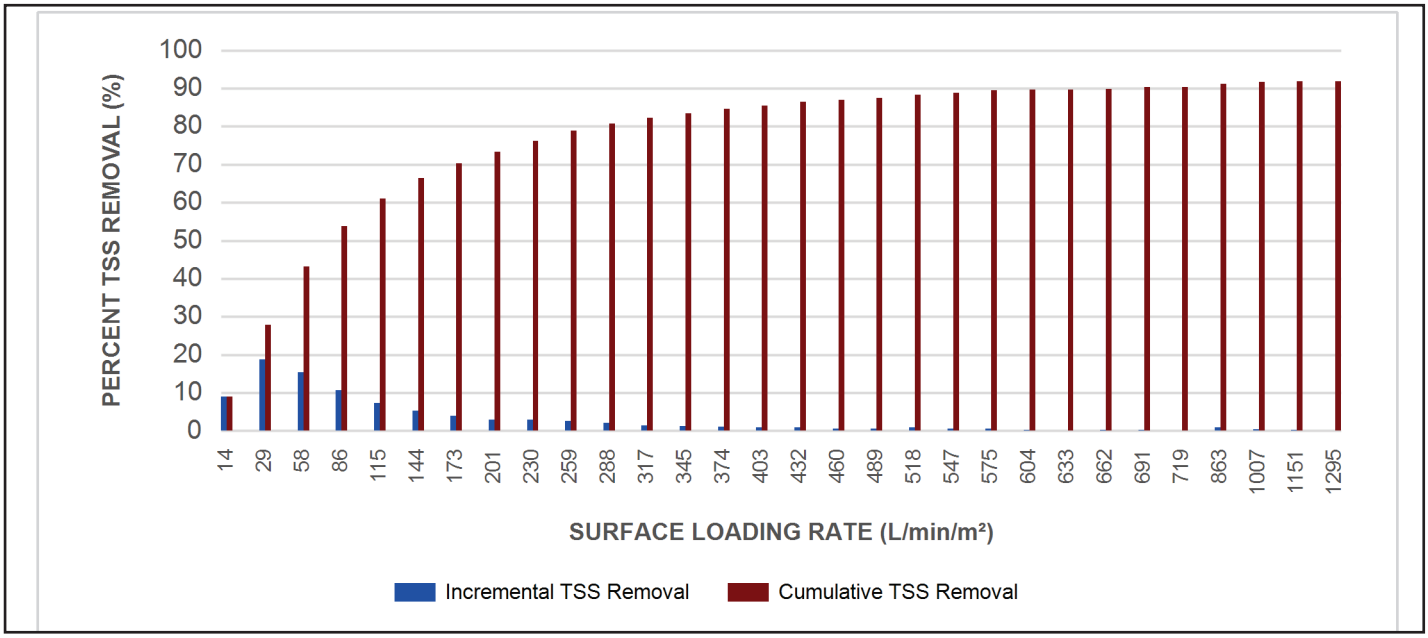
Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
0.50	9.0	9.0	0.29	17.0	14.0	100	9.0	9.0
1.00	18.9	27.8	0.58	35.0	29.0	100	18.9	27.8
2.00	15.3	43.2	1.15	69.0	58.0	100	15.3	43.2
3.00	10.8	53.9	1.73	104.0	86.0	98	10.6	53.8
4.00	7.8	61.7	2.30	138.0	115.0	95	7.4	61.1
5.00	5.8	67.5	2.88	173.0	144.0	91	5.3	66.4
6.00	4.5	72.0	3.45	207.0	173.0	87	3.9	70.3
7.00	3.6	75.6	4.03	242.0	201.0	83	3.0	73.3
8.00	3.5	79.1	4.60	276.0	230.0	82	2.9	76.1
9.00	3.3	82.4	5.18	311.0	259.0	81	2.6	78.8
10.00	2.6	85.0	5.75	345.0	288.0	79	2.1	80.8
11.00	1.7	86.7	6.33	380.0	317.0	78	1.3	82.2
12.00	1.7	88.4	6.91	414.0	345.0	77	1.3	83.5
13.00	1.5	89.8	7.48	449.0	374.0	75	1.1	84.6
14.00	1.2	91.0	8.06	483.0	403.0	74	0.9	85.4
15.00	1.3	92.3	8.63	518.0	432.0	73	0.9	86.4
16.00	0.8	93.0	9.21	552.0	460.0	73	0.6	86.9
17.00	0.8	93.8	9.78	587.0	489.0	72	0.6	87.5
18.00	1.2	95.0	10.36	621.0	518.0	72	0.8	88.3
19.00	0.7	95.7	10.93	656.0	547.0	72	0.5	88.8
20.00	0.9	96.6	11.51	691.0	575.0	71	0.7	89.5
21.00	0.2	96.8	12.08	725.0	604.0	71	0.1	89.6
22.00	0.0	96.8	12.66	760.0	633.0	71	0.0	89.6
23.00	0.4	97.2	13.24	794.0	662.0	70	0.3	89.9
24.00	0.4	97.7	13.81	829.0	691.0	70	0.3	90.3
25.00	0.0	97.7	14.39	863.0	719.0	70	0.0	90.3
30.00	1.3	99.0	17.26	1036.0	863.0	69	0.9	91.1
35.00	0.6	99.6	20.14	1208.0	1007.0	68	0.4	91.6
40.00	0.4	100.0	23.02	1381.0	1151.0	71	0.3	91.8
45.00	0.0	100.0	25.90	1554.0	1295.0	73	0.0	91.8
Estimated Net Annual Sediment (TSS) Load Reduction =								**92 %**

Climate Station ID: 6144478 *Years of Rainfall Data*: 20

RAINFALL DATA FROM LONDON CS RAINFALL STATION



INCREMENTAL AND CUMULATIVE TSS REMOVAL FOR THE RECOMMENDED STORMCEPTOR® MODEL



Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

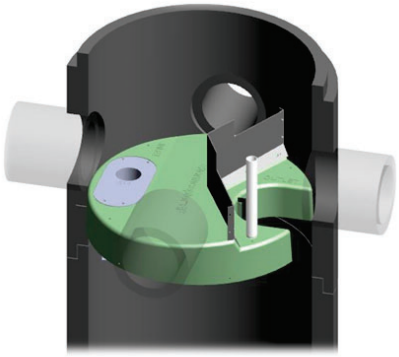
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

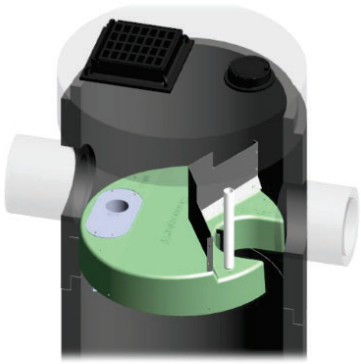
DESIGN FLEXIBILITY

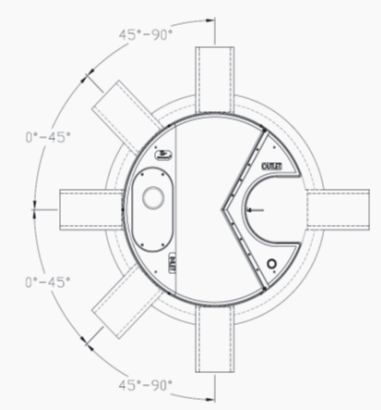
►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.







INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

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STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The **minimum** sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing of the OGS shall be determined by use of a minimum ten (10) years of local historical rainfall data provided by Environment Canada. Sizing shall also be determined by use of the sediment removal performance data derived from the ISO 14034 ETV third-party verified laboratory testing data from testing conducted in accordance with the Canadian ETV protocol Procedure for Laboratory Testing of Oil-Grit Separators, as follows:

3.2.1 Sediment removal efficiency for a given surface loading rate and its associated flow rate shall be based on sediment removal efficiency demonstrated at the seven (7) tested surface loading rates specified in the protocol, ranging 40 L/min/m^2 to 1400 L/min/m^2, and as stated in the ISO 14034 ETV Verification Statement for the OGS device.

3.2.2 Sediment removal efficiency for surface loading rates between 40 L/min/m^2 and 1400 L/min/m^2 shall be based on linear interpolation of data between consecutive tested surface loading rates.

3.2.3 Sediment removal efficiency for surface loading rates less than the lowest tested surface loading rate of 40 L/min/m^2 shall be assumed to be identical to the sediment removal efficiency at 40 L/min/m^2. No extrapolation shall be allowed that results in a sediment removal efficiency that is greater than that demonstrated at 40 L/min/m^2.

3.2.4 Sediment removal efficiency for surface loading rates greater than the highest tested surface loading rate of 1400 L/min/m^2 shall assume zero sediment removal for the portion of flow that exceeds 1400 L/min/m^2, and shall be calculated using a simple proportioning formula, with 1400 L/min/m^2 in the numerator and the higher surface loading rate in the denominator, and multiplying the resulting fraction times the sediment removal efficiency at 1400 L/min/m^2.

The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.