



Residential Townhouse Development

Preliminary

Functional Servicing Report

Project Location:

494 Darcy Drive
Strathroy, ON

Prepared for:

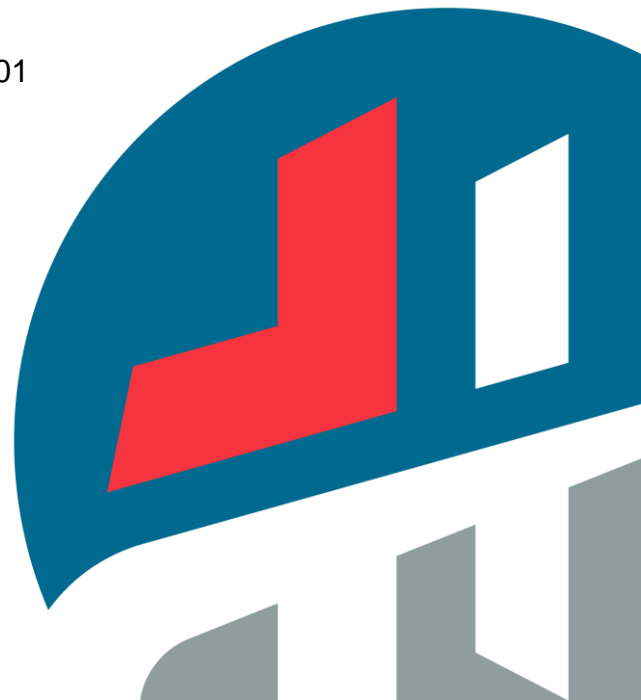
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MTE File No.: 60010_001



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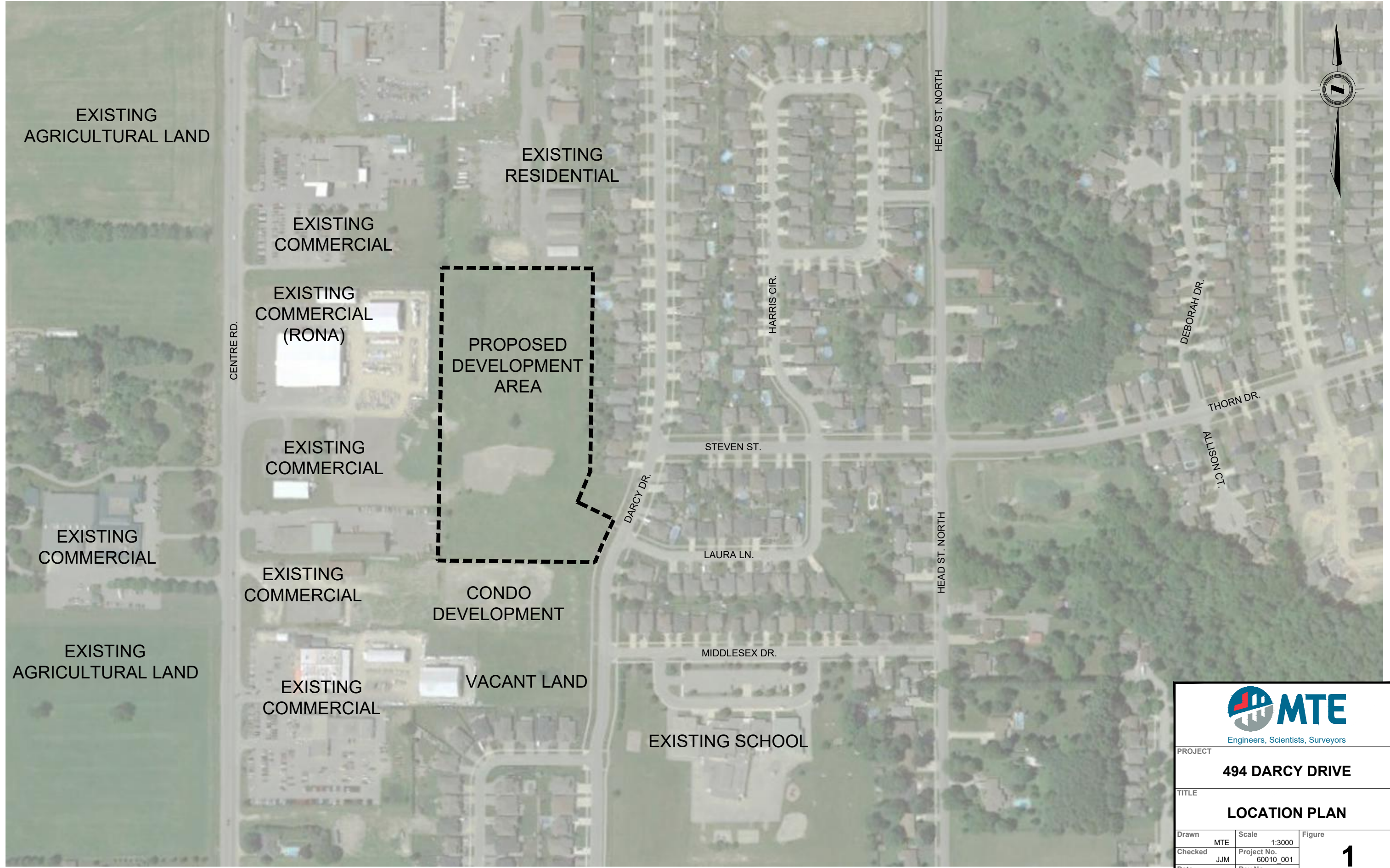
- APPENDIX A Sanitary Design Information
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1.0 Introduction

MTE Consultants Inc. (MTE) has been retained by Justin Tadjell to provide this Preliminary Functional Servicing Report. This report has been prepared in support of the site plan and zoning application for the proposed residential townhouse development facing Darcy Drive, in the Municipality of Strathroy-Caradoc (Municipality). The proposed townhouse development municipal address is 494 Darcy Drive, Strathroy, ON.

The subject land is currently bordered by the Darcy Drive Right-of-Way (R.O.W.) and residential development to the east; commercial properties (Rona, Napa Auto Parts and Ontario Provincial Police building) to the west; a townhouse development to the south (currently under construction); and commercial property to the north.

Figure 1 below depicts the site location. It is understood that the proposed townhouse development is to include 240 stacked townhouse units with an associated road, driveways, landscape areas and amenity areas. The proposed townhouse development is to be serviced with sanitary and water from the municipal mains located on Darcy Drive, while the storm outlet will be Cuddy Drain.



 MTE <small>Engineers, Scientists, Surveyors</small>		
PROJECT		
494 DARCY DRIVE		
TITLE		
LOCATION PLAN		
Drawn	Scale	Figure
MTE	1:3000	1
Checked	Project No.	
JJM	60010_001	
Date	Rev No.	
2025-04-23	0	

2.0 Sanitary Servicing Consideration

Proposed Sanitary servicing is conceptually shown on **Figure 2** of this report. A 200 mm sanitary sewer at a slope of 0.5 % is proposed to convey sanitary flows from the townhouse site to the existing 200 mm sanitary sewer on Darcy Drive. The sanitary flows from the proposed townhouse units can be conveyed by gravity to the proposed 200 mm sanitary sewer on the internal road.

A downstream capacity analysis has been completed to the trunk sanitary sewer (600 mm in diameter) located on Head Street to show that there is adequate capacity within the downstream sewers to accommodate the increased flow rate resulting from the proposed townhouse development. MTE's sanitary capacity analysis was based on the current Municipality of Strathroy-Caradoc Servicing Standards, October 2021 (S-CSS) and sewage flow of 300 L/Day/Capita. The sanitary flow for North Meadows Elementary School was estimated using an effective population of 150 persons (refer to the sanitary sewer design sheet provided in **Appendix A**). Beside the subject site sanitary consideration, the downstream sanitary capacity analysis was completed considering the Doug Milson Strathroy Subdivision Sanitary Drainage Areas / Sanitary Sewer Design Sheet (completed by Development Engineering in 1999), neighbouring townhouse development (located south of the subject site), and Middlesex Drive record information provided by Municipality of Strathroy-Caradoc.

As shown on MTE's Sanitary Sewer Design Sheet Provided in **Appendix A**, the capacity analysis was completed up until the 600 mm diameter trunk sewer, located on Head Street. As shown on the design sheet, there is sufficient capacity in the Middlesex Dr. 200mm sanitary sewer (before entering the 600mm trunk sewer on Head St.) to accommodate for sanitary effluent from the proposed townhouse site development. The most critical pipe flow is 96% of the maximum available pipe flow capacity.

3.0 Storm Servicing and Stormwater Management Consideration

The Stormwater Management (SWM) and storm servicing strategy is presented below.

3.1 Storm Servicing

It is proposed that minor system runoff from the subject site area is conveyed to the proposed catchbasins and manholes where it is collected and conveyed to the proposed SWM pond for quality control. Major system flow will be conveyed overland to the pond. Flow from the site will be controlled to pre-development flow rates and released to the Cuddy Drain which will be rerouted to accommodate the development. The controlled storm flows from the SWM pond are to be conveyed to an OGS for quality control prior to being conveyed to the Cuddy Drain.

For the proposed site servicing, refer to **Figure 2**, attached to this report.

3.2 Pre-Development Conditions

A brief description of the existing drainage conditions is outlined below. Pre-development conditions are presented in **Figure 3**, attached to this report.

3.2.1 Existing Drainage

The subject site, under the existing conditions, drains to Cuddy Drain. As shown on record drawings, the Cuddy Drain within the subject site consists of 525 mm and 400mm diameter concrete tile drains that outlet to an existing ditch inlet catchbasin (DICB) located within the property. The Cuddy Drain from the existing DICB is conveyed to the south via a 1350 mm diameter storm sewer at the slope of 0.25%.

The subject site (3.27 Ha) is presently vacant. Based on the information obtained from AG Maps (Ministry of Agriculture, Food and Rural Affairs), the local soils are determined to have hydrologic soil group (HSG) C. In general, the subject site drains to the existing DICB located within the eastern side of the site.

Pre-development catchment area parameters are summarized in **Table 1**.

Table 1 – Pre-Development Drainage Area Parameters

Catchment ID	Description	Area (ha)	Impervious Area (%)	CN Curve Number
101	Agricultural Land to Cuddy Drain	3.34	0	84

¹CN value of 84 was estimated in accordance with NRCS guidelines considering HSG'C' and Agricultural Land (row crops, good hydrologic condition)

3.2.2 Existing Hydrology

Existing hydrologic conditions were evaluated using SWMHYMO hydrologic simulation software. The existing catchment area parameters provided in **Table 1** above and shown in **Figure 3** were modelled to estimate the pre-development peak flows. The 5, 10, 25, 50, 100, and 250-year storm events were all modelled using design parameters outlined in the current Municipality of Strathroy-Caradoc Servicing Standards (October 2021) with a 3-hour duration.

The pre-development conditions input parameters and corresponding model output are presented in **Appendix B**. The model results are summarized in the following table.

Table 2 – Existing Conditions Peak Flows

Storm Event	Pre-Development Catchment 101 (m ³ /s)
5-year	0.123
10-year	0.165
25-year	0.223
100-year	0.317
250-year	0.372

3.2.3 Existing Municipal Drain Strategy

As presented on the Drainage Plan (by Spriet Associates, dated April, 1992), provided in **Appendix C**, the subject site is part of the Cuddy Drain Municipal Drain catchment area. In addition, Cuddy Drain Watershed & Location Plan (by Spriet Associates, dated May 20, 2016) provided in **Appendix C** shows that the upstream Cuddy Drain catchment area (drains to subject site) is approximately 46.75 ha.

As per our email communication with Spriet Associates (Spriet), the 100-year storm flow for the upstream portion (46.75 ha) of Cuddy Drain is 3.34 m³/s. However, there is no information available for the 250-year storm event. Therefore, the Cuddy Drain upstream portion 100-year and 250-year storm flows were evaluated using VO6 hydrologic simulation software. As shown in MTE's VO6 model output results, provided in **Appendix D**, the Cuddy Drain (upstream portion) 100-year and 250-year storm flows are estimated to be 3.40 m³/s and 3.97 m³/s, respectively.

The Development Engineering Site Servicing Plan (dated August 5, 2016) provided in **Appendix C** shows that the existing 525 mm and 400 mm diameter concrete tile drains at a slope of ±0.75% are used to convey a portion of storm flows from Cuddy Drain (upstream) and Rona Site (28444 Centre Road) to the exiting DICB, located at the subject site. The rest of the upstream storm flows are conveyed overland to the subject site.

The Cuddy Drain surface flows to the subject site were estimated by subtracting the capacity from the existing 525 mm (capacity approximately 0.37 m³/s) and 400 mm (capacity approximately 0.18 m³/s) diameter concrete tile drains from Cuddy Drain VO2 modeling results. Therefore, the Cuddy Drain surface flows (under the existing conditions) to the subject site during the 100-year and 250-year are 2.85 m³/s and 3.51 m³/s, respectively.

3.3 Post-Development Conditions

The proposed townhouse development is to include 240 stacked townhouse units with associated roads, driveways, landscape areas and amenity areas. The post-development conditions are illustrated in **Figure 4**, attached in this report. The SWM strategy explained below was developed to accommodate the stormwater from the proposed development without negative impacts to the subject site, neighbouring properties and receiving system.

3.3.1 Proposed Municipal Drain Strategy

It will be necessary to reroute the Cuddy Drain within the subject land to the accommodated proposed development. MTE has reached out to the Municipality concerning rerouting the drain and are currently going through the Drainage Act process.

As shown in **Figure 4**, the 1350mm section of the Cuddy Drain will be rerouted along the west and south property limits of the site to continue conveying runoff from the Rona Site to the downstream drain. The existing 525 mm and 400mm diameter concrete tile drains within the subject site and the existing 1350 mm Cuddy Drain storm sewer is to be removed / abandoned. The proposed Cuddy Drain (1350 mm storm sewer at 0.35%) will collect controlled storm flows from Rona site (28444 Centre Road) and Cuddy Drain. The Cuddy Drain is conveyed further southward via an existing 1350 mm diameter storm sewer at a slope of 0.25% and further eastward to Middlesex Drive.

Since the 1350 mm Cuddy Drain at 0.25% slope (Cuddy Drain has a slope of 0.25% at the neighboring property to the south) has a capacity of 2.67 m³/s which exceeds the capacity of the existing drainage infrastructure, it is proposed to utilize the conveyance capacity available within the drain, and that the flow rate which must be conveyed overland through the site will decrease to 0.73 m³/s and 1.39 m³/s, during the 100 and 250-year storm events respectively (3.40 - 2.67 = 0.73, 4.06 - 2.67 = 1.39).

The upstream portion of Cuddy Drain has a drainage area of 46.75 ha, including at least 3 SWM ponds (most likely some other SWM control facilities) and relatively big agricultural/undeveloped land. Therefore, it is reasonable to assume that the subject site and upstream Cuddy Drain peak flow hydrographs will not be coincident. As a result, the storm flows from the subject site will be conveyed to the proposed SWM pond and fill up the pond to design volume before external surface flows (during the 100-year and 250-year storm events) from Cuddy Drain enter the pond. Therefore, negative impacts to the operation of the proposed SWM facility due to the upstream Cuddy Drain surface flows are not expected.

3.3.2 Proposed SWM Strategy

The proposed SWM strategy was developed to meet Municipal (as outlined in S-CSS) and provincial requirements. The proposed drainage plan and SWM strategy are shown in **Figure 4**.

Based on our SWM assessment and previous discussion with the Municipality, it was determined that the most efficient option to provide quantity is through the implementation of a dry pond (with maximum pond side slopes 5:1), while quality control for the proposed subdivision will be provided by an oil/grit (OGS).

Runoff from minor storm events will be collected and conveyed by proposed local storm sewers. Similarly, major flows will be conveyed to the SWM area via a shallow surface flow on the proposed roads. The collected stormwater will be conveyed to the proposed stormwater management facility (SWM dry pond) for quantity control, further conveyed to the proposed OGS for quality control before releasing to the Cuddy Drain (1,350 mm diameter storm sewer).

As shown in **Figure 4**, the post-development drainage Area 201 will have an impervious area of 45%. It should be noted that the impervious area was measured from the proposed Site Plan. The proposed drainage parameters are presented in **Table 3** below.

Table 3 – Post-Development Catchment Areas Parameters

Catchment ID	Description	Area (ha)	Impervious Area (%)	CN Curve Number for Pervious Area
201	Post-Development area to Cuddy Drain	3.34	66	74

¹CN value of 74 for pervious area was estimated in accordance with NRCS guidelines considering HSG'C' and grass (good hydrologic condition)

The proposed hydrologic conditions were evaluated using SWMHYMO hydrologic simulation software. The proposed catchment area is illustrated in **Figure 4**, parameters are provided in **Table 3**. The catchment was modelled to estimate the peak flows directed to the SWM Pond (for quantity control) and Pond outflows to the Cuddy Drain (1,350 mm diameter storm sewer). The design storm parameters outlined in the S-CSS were used to model the storm events (5-year to 250-year). Design storms were modelled as Chicago Distributions with a 3-hour storm duration. The post-development conditions SWMHYMO input parameters and corresponding model output are presented in **Appendix E**.

3.3.3 Stormwater Management – Quantity Control

The S-CSS states the following: “All proposed developments must restrict their site outflow to equal or less than the pre-development release rates during all storm events. Sites (commercial, industrial, etc.) and smaller subdivisions shall include calculations for the 5,10, 25, 100 and 250-year storm events.”

Since the subject site SWM outlet is Cuddy Drain (1,350 mm diameter storm sewer), we conservatively proposed to control the post-development storm events including the 100-year storm to the 5-year pre-development flows while the post development 250-year storm to be controlled below 250-year pre-development flows.

A comparison of the target rate (5-year pre-development) and the post-development flow rates is provided in **Table 4**.

Table 4 – Target Rate (5 - year Pre-development Flow) and Post-development (Controlled) Flow Comparison

Storm Event	Target Release Rate (m ³ /s)	Post-Development Controlled Peak Discharges to Cuddy Drain (m ³ /s)
5-year	0.123	0.109
10-year	0.123	0.112
25-year	0.123	0.115
100-year	0.123	0.117
250-year	0.372	0.118

3.3.4 Preliminary Stage-Storage-Discharge Assessment

The preliminary stage-storage-discharge relationship for the proposed SWM ponding areas is presented in the following table. Note that the elevations provided in **Table 5** are conceptual to confirm pond sizing and site development feasibility. As shown in **Table 5** below, the proposed ponding areas have sufficient capacity to provide quantity control for the 250-year storm event to below the 5-year pre-development level. The complete stage-storage-discharge relationship is provided in **Appendix F**.

Table 5 – Stage Storage Discharge Relationship

Stage (conceptual)	Pond Storage Volume (m ³)	Discharge (m ³ /s)	Pond Design (m ³)
233.50	0	0.000	Outlet Elevation
233.80	123	0.039	
234.10	309	0.062	
234.40	558	0.078	
234.70	869	0.091	
235.00	1242	0.103	
235.30	1678	0.114	
235.50	2004	0.121	250 Year Ponding Elev.

3.3.5 Stormwater Management – Quality Control

The ‘Enhanced Level’ of stormwater quality control of 80% TSS removal is required for the subject site, as outlined in the S-CSS. The controlled flows from the dry pond are conveyed to the proposed CDS Stormwater Treatment Unit Model PMSU 3030_6 oil/grit separator prior to discharging to Cuddy Drain (1,350 mm diameter storm sewer). The calculated results (by the manufacturer) provided in **Appendix G** show that this model provides 80% (TSS) removal as defined in the Ministry of the Environment and Climate Control (MOECC) SWM Planning and Design Manual 2003 (SWMP&DM), and treats 97.0% of the runoff from the site.

A preliminary sizing report for the CDS Stormwater Treatment Unit is provided in **Appendix G**.

4.0 Water Servicing Consideration

The water servicing is presented in the below sections.

4.1 Existing Conditions

The water supply for the proposed townhouse development will be provided by the existing 300 mm diameter municipal watermain located to the east of the proposed development, in the Darcy Drive R.O.W.

4.2 Proposed Conditions

The subject site water distribution system will be provided by the proposed 200m watermain. The conceptual layout of the watermain within the site is illustrated in **Figure 2**. The proposed watermain will be downsized to 150 mm within the site.

4.3 Design Criteria

The design parameters outlined below are based on the current Municipality of Strathroy-Caradoc Servicing Standards:

- An average demand of 250 L/person/day
- Minimum water pressures to be maintained in the distribution system of:
 - Minimum of 140 kPa (20 psi) at ground level at maximum day demand flow plus fire flow
 - Minimum of 275 kPa (40 psi) at maximum hourly demand flow
 - Minimum of 275 kPa (40 psi) at average day demand flow
- Maximum residual pressure should not exceed 700 kPa (100 psi)
- Peaking factors of 3.5 for maximum day and 7.8 for maximum hour
- The maximum permissible velocity for normal rates of 1.5 m/s and 3.0 m/s for fire demand

4.4 Domestic Flow Consideration

The domestic water distribution flow rates are based on the above referenced municipal guidelines. The domestic flow rates for the subject site are calculated as follows:

Average Demand: 250 L/person/day or 0.003 L/s

Townhouse Site Population = 240 Units x 2.4 people/unit = 576 People

Average Day = (0.003 L/s) x (576 People) = 1.67 L/s

Maximum Day = 3.5 x 1.67 L/s = 5.83 L/s

Peak Hour = 7.8 x 1.68 L/s = 13.00 L/s

The peak hour flow can be supplied by a 200mm service at a maximum velocity of 0.41 m/s ($0.013 / (\pi \times (200/2000)^2) = 0.41$).

4.5 Firefighting Flow Consideration

The Municipality of Strathroy-Caradoc Servicing Standards states the following: “To estimate the fire flow requirements for a particular structure or area of a municipality, the designer should refer to the guide ‘Water Supply for Public Fire Protection - A Guide to Recommended Practice’, (latest revision) prepared by Fire Underwriters Survey, Insurers Advisory Organization.”

The Fire Underwriters Survey (FUS) manual was used to determine fire demand using the formula: $F = 220 \times C \times A^{1/2}$, where A is the total floor area in square meters (653 m² x 2 floors) and C is the coefficient related to the type of construction. For this calculation, a C value of 1.5 for wood frame combustible construction was used, low fire hazard occupancy (decrease of 25%), and an increase of 50% due to building exposure. This calculation produces a fire flow of about 13,400 L/min (223 L/s). Based on MTE’s experience with similar projects, we believe that calculations using the FUS manual may produce overestimated fire flow rates for the proposed development. We propose that the fire flow be calculated using Ontario Building Code, 2012 (OBC) procedure, which is the standard approach in many Municipalities (ie. City of London) for private sites. As shown in the OBC calculations, provided in **Appendix H**, the fire flow is calculated to be 5,400 L/min (90 L/s) which can be provided through the 200mm service at a velocity of 2.9 m/s. A model of the internal water distribution network will need to be completed as part of detailed design to demonstrate adequate water supply for domestic and fire flow usages within the proposed site as well as inform the location of hydrants within the site.

A hydrant flow test was completed using two hydrants on Darcy Drive, one located just north of Steven Street, the other just south of Laura Lane. The flow test indicated a static pressure of 52 psi (358 kPa) and that the system could provide a flow of 1,744 GPM (110 L/s) at a residual pressure of 51 psi (351 kPa). Thus, it is expected that the system will be able to adequately supply water for domestic and fire suppression purposes. A copy of the hydrant flow test results is included in **Appendix H**.

5.0 Conclusions and Recommendations

Based on the foregoing analysis, it is concluded that:

- i. The proposed sanitary, storm and water servicing as well as the proposed subject site SWM meet the Municipality of Strathroy-Caradoc requirements.

All of which is respectfully submitted,

MTE Consultants Inc.



Joshua Monster, P. Eng.

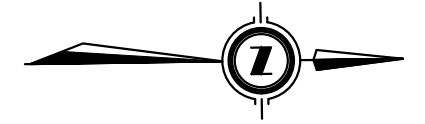
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JJM:cmg

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EXISTING COMMERCIAL
(RONA)

REMOVE EXISTING TILE DRAINS
AND CONNECT TO EXISTING
DICBMH (PERMISSION REQUIRED)

EX. DICBMH ON
RONA PROPERTY

EXISTING RESIDENTIAL

EXISTING CONDO SITE

AMENITY/SWM AREA

EXISTING
SEVERED
LOT 1

EXISTING
SEVERED
LOT 2









EXISTING RESIDENTIAL

EXISTING 1350mm
CUDDY DRAIN

DARCY DRIVE

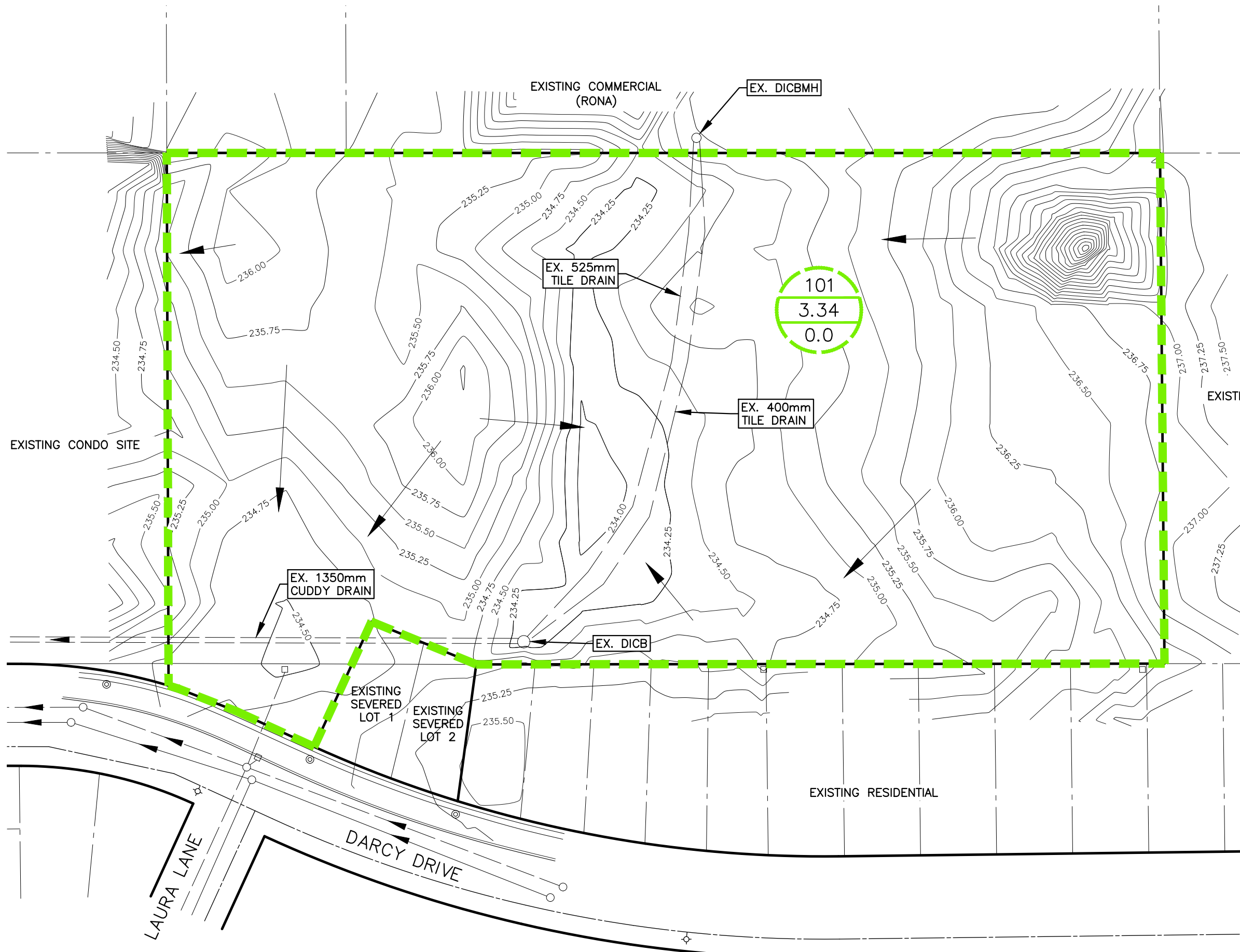
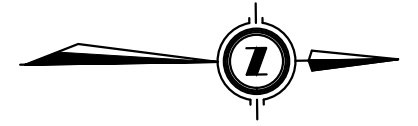
LAURA LANE

LEGEND

-  PROPOSED SANITARY SEWER & MANHOLE
-  CBMHS CB PROPOSED STORM SEWER CATCH BASIN MANHOLE/CATCH BASIN
-  CUDDY DRAIN RE-ALIGNMENT
-  PROPOSED 200mm WATERMAIN
-  PROPOSED 150mm WATERMAIN
-  EXISTING SANITARY SEWER & MANHOLE
-  EXISTING STORM SEWER & MANHOLE
-  EXISTING WATERMAIN




PROJECT			2
494 DARCY DRIVE			
TITLE			
CONCEPTUAL SERVICING PLAN			
Drawn	MTE	Scale 1:1000	
Checked	JJM	Project No. 60010_001	
Date	2025-04-23	Rev No. 0	



LEGEND

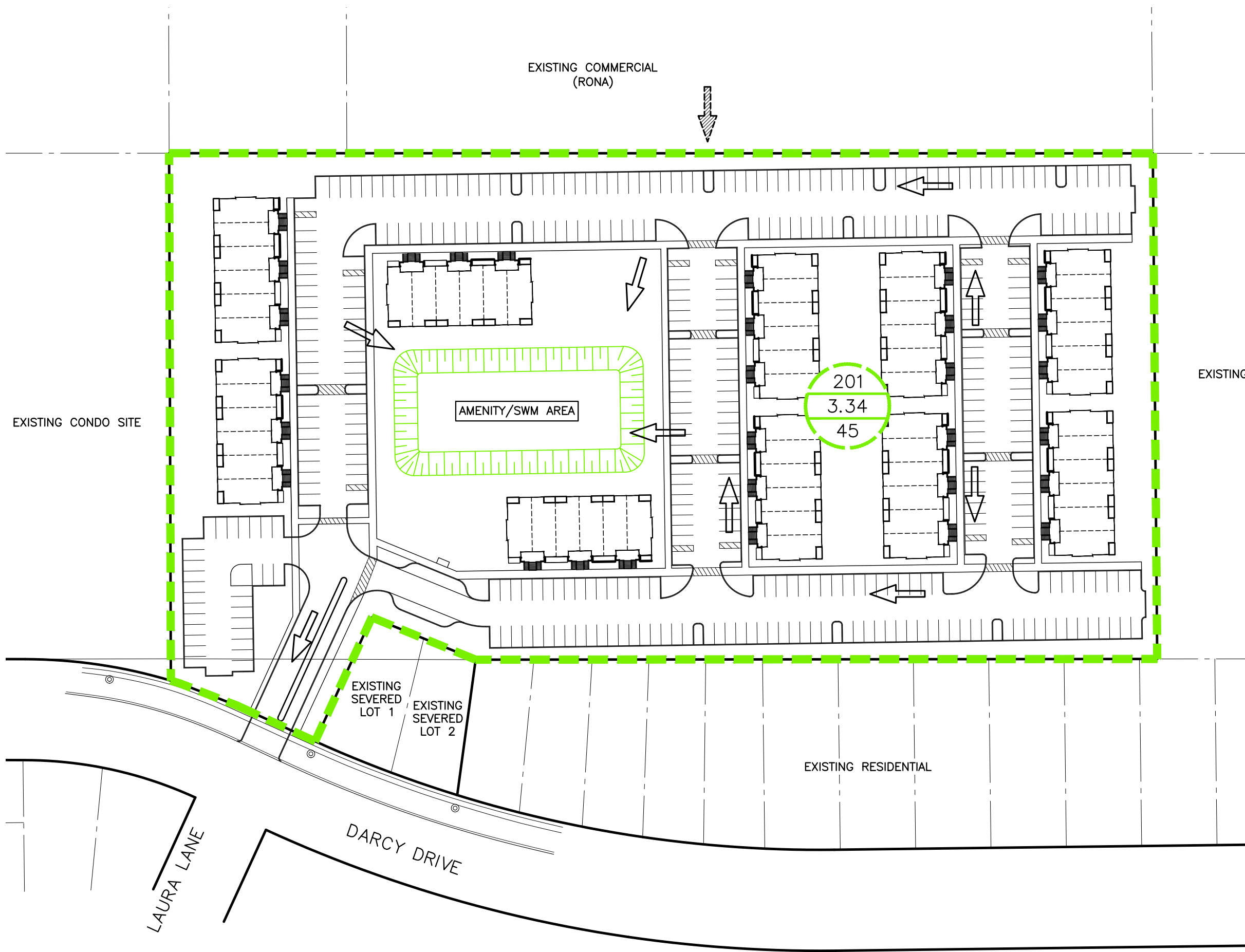
- EXISTING DRAINS
- EXISTING SANITARY SEWER & MANHOLE
- EXISTING STORM SEWER & MANHOLE
- EXISTING WATERMAIN
- CATCHMENT AREA 101

101	—	SUB-CATCHMENT AREA
3.34	—	AREA (Ha)
0.0	—	% IMPERVIOUS




MTE
Engineers, Scientists, Surveyors

PROJECT		
494 DARCY DRIVE		
TITLE		
PRE-DEVELOPMENT CONDITIONS		
Drawn	MTE	Scale 1:1000
Checked	JJM	Project No. 60010_001
Date	2025-04-23	Rev No. 0
		3



LEGEND

- CATCHMENT AREA 201
- OVERLAND FLOW ROUTE
- EXISTING EXTERNAL OVERLAND FLOW
- 201 — SUB-CATCHMENT AREA
3.34 — AREA (Ha)
45 — % IMPERVIOUS



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Engineers, Scientists, Surveyors

PROJECT		
494 DARCY DRIVE		
TITLE		
POST-DEVELOPMENT CONDITIONS		
Drawn	Scale	Figure
MTE	1:1000	4
Checked	Project No.	
JJM	60010_001	
Date	Rev No.	
2025-04-23	0	

Appendix A

Sanitary Design Information



SANITARY SEWER DESIGN SHEET

MUNICIPALITY OF STRATHROY-CARADOC

CITY ENGINEER'S DEPARTMENT

RESIDENTIAL POPULATION DENSITIES

THE FOLLOWING POPULATION ALLOWANCES WILL APPLY WHEN DESIGNING SANITARY SEWERS:

- (A) **HECTARE BASIS**
 LOW DENSITY (SINGLE FAMILY/SEMI-DETACHED) = 30 UNITS/HA @ 3 PEOPLE/UNIT
 MEDIUM DENSITY (TOWNHOUSES) = 75 UNITS/HA @ 2.4 PEOPLE/UNIT
 HIGH DENSITY (APARTMENTS) = 150-300 UNITS/HA @ 1.6 PEOPLE/UNIT
 COMMERCIAL / INSTITUTIONAL / CHURCH = 100 PEOPLE/HA
 ELEMENTARY SCHOOL = 400 PEOPLE
 SECONDARY SCHOOL = 1500 PEOPLE
- (B) **LOT BASIS**
 SINGLE FAMILY = 3 PEOPLE
 DUPLEX / SEMI = 6 PEOPLE

[REDACTED] - FUTURE/EXTERNAL/EXISTING DESIGN

PROJECT NAME : Darcy Drive Site Plan

DATE :
 DESIGNED BY :
 CHECKED BY :
 FILE No :
 SHEET :

May 2025
 JJM
 JJM
 60010_001
 1 of 1

DESIGN CRITERIA

SEWAGE = 300 L/DAY/CAP = 0.00347 l/s/person
 INFILTRATION = 6740 L/HA/DAY = infilt. of 0.078 l/s/ha
 PEAKING FACTOR = HARMON FORMULA $M = 1 + \frac{14}{4 + P^{0.5}}$

LOCATION				AREA (HECTARES)					POPULATION					SEWAGE FLOW				SEWER DESIGN					PROFILE						
AREA No.	STREET	FROM M.H.	TO M.H.	NET OR GROSS	DELTA AREA ha	Residential Area	Industrial Area	TOTAL AREA ha	PER ha	PER UNIT	No. OF UNITS	DELTA POP.	TOTAL POP.	M Min.2.0	SEWAGE l/s	INFILT. l/s	TOTAL l/s	DIA. mm	SLOPE %	VELOCITY n	CAP. m/s	I/s	LENGTH M	FALL IN SEWER	DROP IN HEADLOSS	INVERT ELEV. MANHOLE U.S.	D.S.		
	Existing Condition	13	Ex. MH5		8.22			8.22					464	4.39	7.07	0.64	7.71												
	Neighbouring Site to the South		13		0.80			0.80		2.4	80	192.00	192	4.57	3.04	0.06	3.10												
	Proposed Site (Severed Lots)		13		0.13			0.13		3	2	6.00	6	4.87	0.10	0.01	0.11												
	(Stacked Towns)				3.34			3.47		2.4	240	576.00	582	4.33	8.76	0.27	9.03												
	Darcy Drive	13	Ex. MH5					12.49					1238	4.11	17.68	0.97	18.65	200	0.35	0.013	0.62	19.40							
	Middlesex Dr.	Ex. MH5	Ex. MH4		0.33			12.82		3	4	12.00	1250	4.11	17.86	1.00	18.86	200	0.68	0.013	0.86	27.05							
	"	Ex. MH4	Ex. MH3		0.32			13.14		3	4	12.00	1262	4.10	17.98	1.02	19.00	200	0.57	0.013	0.79	24.76							
	*Ex North Meadows Elementary		Ex. MH3		4.12			4.12				150.00	150	4.61	2.40	0.32	2.72												
	Middlesex Dr.	Ex. MH3	Ex. MH2		0.57			17.83		3	7	21.00	1433	4.06	20.20	1.39	21.59	200	0.57	0.013	0.79	24.76							
	"	Ex. MH2	Ex. MH1		0.26			18.09		3	2	6.00	1439	4.06	20.28	1.41	21.69	200	0.51	0.013	0.75	23.42							
	"	Ex. MH1	SAMH7		0.00			18.09		3	0	0.00	1439	4.06	20.28	1.41	21.69	200	0.51	0.013	0.75	23.42							
*FLOW FROM THE ELEMENTARY SCHOOL WAS ESTIMATED IN KEEPING WITH THE CITY OF LONDON STANDARDS AS FOLLOWS:																													
POPULATION (STUDENTS AND STAFF) = 600																													
DAILY PER CAPITA USAGE = 30L / PERSON / SCHOOL DAY = 0.001 L / PERSON / s (SCHOOL DAY ASSUMED TO BE 8 HOURS)																													
AVERAGE EFFLUENT = 600 * 0.001 L / PERSON / SECOND = 0.6 L/s																													
EQUIVALENT RESIDENTIAL POPULATION = 0.6 L/s / 0.00422 L/s / PERSON = 142 PERSONS																													
A POPULATION OF 150 WAS USED FOR CONSERVATISM																													

Appendix B

Pre-Development Conditions Hydrologic Modelling Results

```

=====
SSSS W W M M H H Y Y M M 000      999 999  =====
S   W W W M M H H Y Y M M 0 0      9 9 9 9
SSSS W W W M M M H H H H Y M M M 0 0 ## 9 9 9 9 Ver 4.05
S   W W M M H H Y M M 0 0      9999 9999 Sept 2011
SSSS W W M M H H Y M M 000      9 9 9
StormWater Management HYdrologic Model      9 9 9 # 3053466
          999 999  =====

*****
***** SWMHYMO Ver/4.05 *****
***** A single event and continuous hydrologic simulation model *****
***** based on the principles of HYMO and its successors *****
***** OTTHYMO-83 and OTTHYMO-89. *****
***** Distributed by: J.F. Sabourin and Associates Inc. *****
***** Ottawa, Ontario: (613) 836-3884 *****
***** Gatineau, Quebec: (819) 243-6858 *****
***** E-Mail: swmhymo@jfsa.Com *****

+++++
+++++ Licensed user: MTE Consultants Inc. +++++
+++++ Burlington SERIAL#: 3053466 +++++

*****
***** +++++ PROGRAM ARRAY DIMENSIONS +++++ *****
***** Maximum value for ID numbers : 10 *****
***** Max. number of rainfall points: 105408 *****
***** Max. number of flow points : 105408 *****

***** DETAILED OUTPUT *****
*****
* DATE: 2025-04-09 TIME: 14:43:19 RUN COUNTER: 000479 *
*****
* Input filename: Q:\60010_-1\SWM\SWMHYMO\PRE.dat *
* Output filename: Q:\60010_-1\SWM\SWMHYMO\PRE.out *
* Summary filename: Q:\60010_-1\SWM\SWMHYMO\PRE.sum *
* User comments: *
* 1: _____ *
* 2: _____ *
* 3: _____ *
*****
-----
-
001:0001-----

```

```

-
*#*****
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Model Ier : [JJM]
*#*****
-----
| START | Project dir.: Q:\60010_-1\SWM\SWMHYMO\
-----
Rainfall dir.: Q:\60010_-1\SWM\SWMHYMO\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 01
NSTORM= 1
# 1=25mm. HYT

-----
001:0002-----
-
| READ STORM | Filename: 25mm Chicago 4-hr duration
| Ptotal = 24.83 mm | Comments: 25mm Chicago 4-hr duration

-----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
.08 1.326 | 1.17 3.978 | 2.25 4.889 | 3.33 1.844
.17 1.392 | 1.25 4.803 | 2.33 4.304 | 3.42 1.765
.25 1.466 | 1.33 6.089 | 2.42 3.849 | 3.50 1.693
.33 1.549 | 1.42 8.350 | 2.50 3.485 | 3.58 1.627
.42 1.643 | 1.50 13.259 | 2.58 3.187 | 3.67 1.567
.50 1.750 | 1.58 29.925 | 2.67 2.939 | 3.75 1.511
.58 1.875 | 1.67 75.600 | 2.75 2.729 | 3.83 1.460
.67 2.020 | 1.75 27.475 | 2.83 2.549 | 3.92 1.412
.75 2.193 | 1.83 15.856 | 2.92 2.392 | 4.00 1.368
.83 2.401 | 1.92 10.977 | 3.00 2.256 | 4.08 1.326
.92 2.657 | 2.00 8.363 | 3.08 2.135
1.00 2.981 | 2.08 6.752 | 3.17 2.027
1.08 3.404 | 2.17 5.667 | 3.25 1.930

-----
001:0003-----
-
*#-----
*#
*# AREAS TRIBUTARY TO THE NORTH SECTION OF THE WEST/SOUTH DITCH
*#
*#-----
*#
*# EXISTING SITE
*#-----

```

```

-----
| CALIB NASHYD | Area (ha)= 3.34 Curve Number (CN)=84.00
| 01:101 DT= 5.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00
-----
U.H. Tp(hrs)= .490

```

```

Unit Hyd Qpeak (cms)= .260

PEAK FLOW (cms)= .034 (i)
TIME TO PEAK (hrs)= 2.333
RUNOFF VOLUME (mm)= 5.766
TOTAL RAINFALL (mm)= 24.833
RUNOFF COEFFICIENT = .232

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0004-----

** END OF RUN : 4

```

-----
| START | Project dir.: Q:\60010_-1\SWM\SWMHYM0\
-----
Rainfall dir.: Q:\60010_-1\SWM\SWMHYM0\

```

```

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 005
NSTORM= 1
# 1=5YR. HYT

```

005:0002-----

```

*****
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Modeler : [JJM]
*****

```

005:0002-----

```

-----
| READ STORM | Filename: 2YR Chicago 3-hr duration
| Ptotal= 44.62 mm | Comments: 2YR Chicago 3-hr duration
-----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	2.985	.92	10.201	1.75	11.320	2.58	4.069
.17	3.200	1.00	13.641	1.83	9.576	2.67	3.833
.25	3.452	1.08	20.397	1.92	8.299	2.75	3.624
.33	3.751	1.17	38.309	2.00	7.325	2.83	3.438
.42	4.110	1.25	142.426	2.08	6.560	2.92	3.271
.50	4.551	1.33	75.882	2.17	5.943	3.00	3.121
.58	5.105	1.42	37.961	2.25	5.435	3.08	2.985
.67	5.822	1.50	24.380	2.33	5.010		
.75	6.785	1.58	17.710	2.42	4.649		
.83	8.145	1.67	13.829	2.50	4.339		

005:0003-----

```

*****
*#
*# AREAS TRIBUTARY TO THE NORTH SECTION OF THE WEST/SOUTH DITCH
*#
*# EXISTING SITE
*#
*****

```

```

-----
| CALIB NASHYD | Area (ha)= 3.34 Curve Number (CN)=84.00
| 01:101 DT= 5.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00
-----
U.H. Tp(hrs)= .490

```

```

Unit Hyd Qpeak (cms)= .260

PEAK FLOW (cms)= .123 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 17.838
TOTAL RAINFALL (mm)= 44.620
RUNOFF COEFFICIENT = .400

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

005:0004-----

005:0002-----

** END OF RUN : 9

| START | Project dir.: Q:\60010_~1\SWM\SWMHYM\

----- Rainfall dir.: Q:\60010_~1\SWM\SWMHYM\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 010
NSTORM= 1
1=10YR. HYT

010: 0002-----

*#*****

*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Modeler : [JJM]
*#*****

010: 0002-----

| READ STORM | Filename: 10YR Chicago 3-hr duration
| Ptotal = 52.12 mm | Comments: 10YR Chicago 3-hr duration

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	3.290	.92	11.676	1.75	13.008	2.58	4.527
.17	3.534	1.00	15.747	1.83	10.946	2.67	4.256
.25	3.821	1.08	23.802	1.92	9.443	2.75	4.017
.33	4.162	1.17	45.296	2.00	8.302	2.83	3.805
.42	4.573	1.25	169.701	2.08	7.408	2.92	3.615
.50	5.079	1.33	90.886	2.17	6.690	3.00	3.444
.58	5.718	1.42	45.008	2.25	6.101	3.08	3.290
.67	6.548	1.50	28.625	2.33	5.609		
.75	7.668	1.58	20.619	2.42	5.193		
.83	9.258	1.67	15.987	2.50	4.836		

010: 0003-----

*#-----
*#
*# AREAS TRIBUTARY TO THE NORTH SECTION OF THE WEST/SOUTH DITCH
*#
*#-----
*# EXISTING SITE
*#-----

| CALIB NASHYD | Area (ha)= 3.34 Curve Number (CN)=84.00
| 01:101 DT= 5.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00
----- U. H. Tp(hrs)= .490

Unit Hyd Qpeak (cms)= .260

PEAK FLOW (cms)= .165 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 23.252
TOTAL RAINFALL (mm)= 52.124
RUNOFF COEFFICIENT = .446

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

010: 0004-----

010: 0002-----

010: 0002-----

** END OF RUN : 24

| START | Project dir.: Q:\60010_~1\SWM\SWMHYM\

----- Rainfall dir.: Q:\60010_~1\SWM\SWMHYM\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 025
NSTORM= 1

1=25YR. HYT

025: 0002

*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Modeler : [JJM]

025: 0002

READ STORM | Filename: 25YR Chicago 3-hr duration
Ptotal = 61.91 mm | Comments: 25YR Chicago 3-hr duration

Table with 8 columns: TIME, RAIN, TIME, RAIN, TIME, RAIN, TIME, RAIN. Rows show time intervals and rainfall amounts.

025: 0003

*# AREAS TRIBUTARY TO THE NORTH SECTION OF THE WEST/SOUTH DITCH
*# EXISTING SITE

CALIB NASHYD | Area (ha)= 3.34 Curve Number (CN)=84.00
01:101 DT= 5.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00
U. H. Tp(hrs)= .490

Unit Hyd Qpeak (cms)= .260

PEAK FLOW (cms)= .223 (i)
TIME TO PEAK (hrs)= 1.833

RUNOFF VOLUME (mm)= 30.759
TOTAL RAINFALL (mm)= 61.909
RUNOFF COEFFICIENT = .497

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

025: 0004

025: 0002

025: 0002

025: 0002

** END OF RUN : 49

START | Project dir.: Q:\60010_~1\SWM\SWMHYM0\

Rainfall dir.: Q:\60010_~1\SWM\SWMHYM0\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 050
NSTORM= 1
1=50YR. HYT

050: 0002

*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Modeler : [JJM]

050: 0002-----

| READ STORM | Filename: 50YR Chicago 3-hr duration
| Ptotal = 69.93 mm | Comments: 50YR Chicago 3-hr duration

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	3.916	.92	15.404	1.75	17.302	2.58	5.533
.17	4.232	1.00	21.199	1.83	14.379	2.67	5.175
.25	4.604	1.08	32.765	1.92	12.265	2.75	4.861
.33	5.050	1.17	63.497	2.00	10.673	2.83	4.584
.42	5.593	1.25	227.877	2.08	9.436	2.92	4.337
.50	6.268	1.33	126.828	2.17	8.450	3.00	4.115
.58	7.126	1.42	63.208	2.25	7.646	3.08	3.916
.67	8.254	1.50	39.749	2.33	6.981		
.75	9.792	1.58	28.214	2.42	6.421		
.83	12.001	1.67	21.558	2.50	5.944		

050: 0003-----

*#=====
*#
*# AREAS TRIBUTARY TO THE NORTH SECTION OF THE WEST/SOUTH DITCH
*#
*# EXISTING SITE
*#=====

| CALIB NASHYD | Area (ha)= 3.34 Curve Number (CN)=84.00
| 01:101 DT= 5.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00

U. H. Tp(hrs)= .490

Unit Hyd Qpeak (cms)= .260
PEAK FLOW (cms)= .273 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 37.206
TOTAL RAINFALL (mm)= 69.930
RUNOFF COEFFICIENT = .532

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

050: 0004-----

050: 0002-----

050: 0002-----

050: 0002-----

050: 0002-----

** END OF RUN : 99

| START | Project dir.: Q:\60010_~1\SWM\SWMHYM0\

----- Rainfall dir.: Q:\60010_~1\SWM\SWMHYM0\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 100
NSTORM= 1
1=100YR.HYT

100: 0002-----

*#=====
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Modeler : [JJM]
*#=====

100: 0002-----

| READ STORM | Filename: 100YR Chicago 3-hr duration
| Ptotal = 76.58 mm | Comments: 100YR Chicago 3-hr duration

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr

.08	4.124	.92	16.827	1.75	18.954	2.58	5.884
.17	4.466	1.00	23.309	1.83	15.688	2.67	5.494
.25	4.871	1.08	36.264	1.92	13.330	2.75	5.151
.33	5.357	1.17	70.558	2.00	11.559	2.83	4.849
.42	5.950	1.25	248.539	2.08	10.186	2.92	4.580
.50	6.689	1.33	140.446	2.17	9.094	3.00	4.340
.58	7.633	1.42	70.312	2.25	8.207	3.08	4.124
.67	8.876	1.50	44.113	2.33	7.473		
.75	10.579	1.58	31.184	2.42	6.858		
.83	13.034	1.67	23.720	2.50	6.334		

100: 0003-----

*#-----
*#
*# AREAS TRIBUTARY TO THE NORTH SECTION OF THE WEST/SOUTH DITCH
*#
*#-----
*# EXISTING SITE
*#-----
*#-----

| CALIB NASHYD | Area (ha)= 3.34 Curve Number (CN)=84.00
| 01:101 DT= 5.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00

U. H. Tp(hrs)= .490

Unit Hyd Qpeak (cms)= .260

PEAK FLOW (cms)= .317 (i)
TIME TO PEAK (hrs)= 1.833
RUNOFF VOLUME (mm)= 42.711
TOTAL RAINFALL (mm)= 76.580
RUNOFF COEFFICIENT = .558

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100: 0004-----

100: 0002-----

100: 0002-----

100: 0002-----

100: 0002-----

100: 0002-----

** END OF RUN : 249

| START | Project dir.: Q:\60010_-1\SWM\SWMHYM\

----- Rainfall dir.: Q:\60010_-1\SWM\SWMHYM\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 250
NSTORM= 1
1=250YR. HYT

250: 0002-----

*#-----
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Modeler : [JJM]
*#-----

250: 0002-----

| READ STORM | Filename: 250YR Chicago 3-hr duration
| Ptotal = 85.83 mm | Comments: 250YR Chicago 3-hr duration

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	4.587	.92	21.539	1.75	20.546	2.58	6.559
.17	4.994	1.00	31.394	1.83	17.167	2.67	6.123
.25	5.481	1.08	53.230	1.92	14.680	2.75	5.739
.33	6.071	1.17	124.286	2.00	12.786	2.83	5.401

.42	6.799	1.25	274.700	2.08	11.300	2.92	5.099
.50	7.719	1.33	115.167	2.17	10.109	3.00	4.830
.58	8.914	1.42	66.257	2.25	9.135	3.08	4.587
.67	10.518	1.50	44.425	2.33	8.325		
.75	12.772	1.58	32.586	2.42	7.643		
.83	16.125	1.67	25.348	2.50	7.061		

 250: 0003-----

*#-----
 *#
 *# AREAS TRIBUTARY TO THE NORTH SECTION OF THE WEST/SOUTH DITCH
 *#
 *#-----
 *# EXISTING SITE
 *#-----

CALIB NASHYD	Area (ha)=	3.34	Curve Number (CN)=	84.00
01:101 DT= 5.00	la (mm)=	5.000	# of Linear Res. (N)=	3.00
	U.H. Tp(hrs)=	.490		

Unit Hyd Qpeak (cms)= .260
 PEAK FLOW (cms)= .372 (i)
 TIME TO PEAK (hrs)= 1.833
 RUNOFF VOLUME (mm)= 50.568
 TOTAL RAINFALL (mm)= 85.833
 RUNOFF COEFFICIENT = .589

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 250: 0004-----

 250: 0002-----

 250: 0002-----

 250: 0002-----

250: 0002-----

250: 0002-----

250: 0002-----

FINISH

 *

WARNINGS / ERRORS / NOTES

Simulation ended on 2025-04-09 at 14:43:21

 =

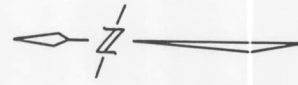
Appendix C

Cuddy Drain Information

CONCESSION 2 S.E.R.

CONCESSION 3 S.E.R.

CON. 4 S.E.R.



LOT 23

LOT 22

LOT 21

TOWN OF STRATHROY

150-064 (R.L.T. PROPERTIES LTD.) 66.2 ha.

RIVERVIEW DRIVE

LAMORE CRESCENT

HEAD STREET

TANYA ST.

DERUITER ST.

PINE TREE

PENNY LANE

MARTIN CR.

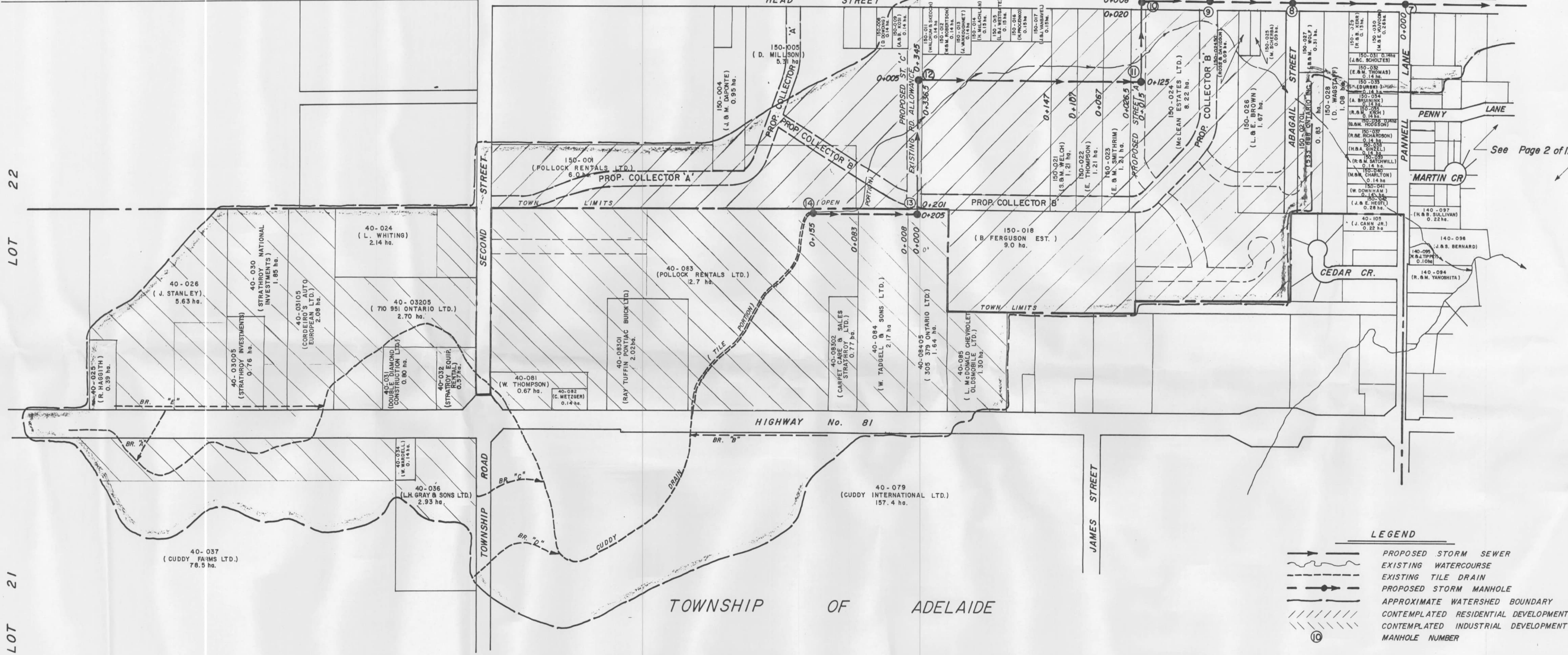
CEDAR CR.

SECOND STREET

JAMES STREET

HIGHWAY No. 81

TOWNSHIP OF ADELAIDE



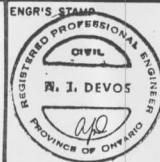
LEGEND

- PROPOSED STORM SEWER
- EXISTING WATERCOURSE
- EXISTING TILE DRAIN
- PROPOSED STORM MANHOLE
- APPROXIMATE WATERSHED BOUNDARY
- CONTEMPLATED RESIDENTIAL DEVELOPMENT
- CONTEMPLATED INDUSTRIAL DEVELOPMENT
- MANHOLE NUMBER

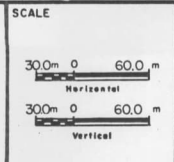
NOV 17 1994

AS CONSTRUCTED NOTES	AS CONSTRUCTED SERVICES	COMPLETION	No.	REVISIONS	DATE	BY	CONSULTANT
			1	DESIGN AK	APRIL/92	A.J.D.	
				DRAWN AK			
				CHECKED A.J.D.			
				APPROVED A.J.D.			
				DATE APR. 17, 1990			

SPRIET ASSOCIATES
 Consulting Engineers
 LONDON — SUDBURY



PLAN
 (Portion North of
 Pannell Lane)



TITLE
CUDDY DRAIN EXTENSION
 TOWN OF STRATHROY

CONSTRUCTION JOB NO.	92065
REPORT JOB NO.	88131
SHEET No.	1 of 12
PLAN FILE No.	

LOT 21

LOT 22

CONCESSION 2 S.E.R

CONCESSION 3 S.E.R



PLAN SCALE 1 : 2,500

PLAN LEGEND

	LIMIT OF WATERSHED AREA
	PROPOSED OVERFLOW SWALE
	PROPOSED DRAINAGE WORKS
	EXTENSION OR INTERIOR WATERSHED
	EXISTING TILES TO BE ABANDONED AS MUNICIPAL DRAIN
	EXIST. MUNICIPAL DRAIN
	LIMIT OF TOWNSHIP/MUNICIPALITY
	10 - 075 ASSESSMENT ROLL NUMBER I. 075H OWNER'S NAME
	● MAINTENANCE HOLE
	■ CATCH-BASIN

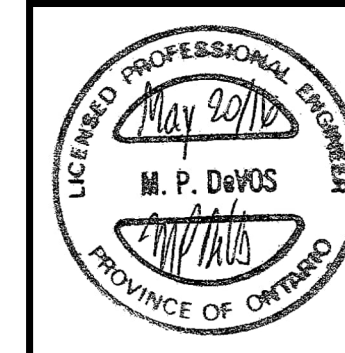
GENERAL NOTES

- 1/ THE WORKING WIDTH AVAILABLE TO FOR FUTURE MAINTENANCE OF THE NEW DRAIN SHALL CONSIST OF THOSE LANDS IMMEDIATELY ADJACENT TO THE DRAIN AND SHALL BE AS FOLLOWS:
3m EACH SIDE OF SEWER PIPE PLUS FULL WIDTH OF OVERFLOW SWALE.
- 2/ MAINTENANCE ACCESS TO THE PIPE AND SWALE SHALL BE ALONG THE ROUTE OF THE PIPE/SWALE
- 3/ DRAWING "FIG 2 -CUDDY DRAIN RE-ALIGNMENT PLAN AND PROFILE" PROVIDED BY THE OWNER'S ENGINEERS, DEVELOPMENT ENGINEER LTD, PROJECT NO. DEL13-098, DATED AND SEALED MAY 20 2016, FORMS PART OF THIS REPORT. IT SHOWS AND DESCRIBES IN DETAIL THE LOCATION, GRADES, ELEVATIONS AND EXTENT OF THE STORM SEWER, APPURTENANCES AND OVERFLOW SWALE.



CUDDY DRAIN 2016
TOWNSHIP OF ADELAIDE-METCALFE

Drainage Superintendent: JIM REEVE 519 - 241 - 3887	No.	REVISIONS	DATE
---	-----	-----------	------



Drawn By: RK	Field Book: N/A	JOB No. 216002	Drawing No. 1 of 1
--------------	-----------------	----------------	--------------------

SPRIET ASSOCIATES LIMITED
LONDON CONSULTING ENGINEERS
155 YORK STREET - LONDON ONTARIO
(519) 872-4100 - (NEA 148)

EX. COMMERCIAL

FUTURE RESIDENTIAL
(BY OTHERS)

EX. COMMERCIAL

COUNTY ROAD # 81 (CENTRE RD.)

- LEGEND**
- EX. SHM DENOTES EXISTING STORM MANHOLE
 - EX. SHM DENOTES EXISTING SANITARY MANHOLE
 - EX. CBM DENOTES EXISTING CATCHBASIN
 - EX. HY DENOTES EXISTING HYDRANT
 - EX. V DENOTES EXISTING VALVE
 - EX. WM DENOTES EXISTING WATERMAIN
 - EX. F DENOTES EXISTING FENCE
 - EX. G DENOTES EXISTING GAS MAIN
 - EX. H DENOTES EXISTING HYDRO PILE
 - EX. B DENOTES EXISTING BELL MANHOLE
 - EX. E DENOTES EXISTING ELECTRICAL CABLE
 - EX. P DENOTES EXISTING HYDRO POLE/LIGHT STANDARD
 - EX. S DENOTES EXISTING STORM MANHOLE
 - EX. SB DENOTES EXISTING SANITARY MANHOLE
 - EX. CBM DENOTES EXISTING CATCHBASIN
 - EX. CBM1 DENOTES EXISTING BELL CATCHBASIN MANHOLE
 - EX. CBM2 DENOTES EXISTING STANDARD CATCHBASIN
 - EX. CBM3 DENOTES EXISTING 150mm PERFORATED SUBDRAIN
 - EX. CBM4 DENOTES EXISTING 200mm PERFORATED SUBDRAIN
 - EX. CBM5 DENOTES EXISTING 400mm PERFORATED SUBDRAIN
 - EX. B1 DENOTES EXISTING BOREHOLE LOCATION PER EXP SERVICES, INC. (MARCH, 2016)

- GRADING NOTES**
- Existing drainage of abutting lands is not to be disturbed
 - Retaining walls, 1.0m high or greater, are to be designed by and constructed to the specifications of a registered professional engineer in accordance with the Ontario Building Code.
 - Pump pump discharge must be directed away from driveways and sidewalks.
 - Roads as shown represent dimension to edge of pavement.

NOTE: UNDERGROUND SERVICES AND UTILITIES NOT SHOWN FOR CLARITY

THE CONTRACTOR SHALL MAKE EVERY EFFORT TO LOCATE ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF CONSTRUCTION. CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED. ALL EXISTING UTILITIES MAY NOT BE SHOWN.

UNLESS SPECIFIED OTHERWISE, GRASSED AREAS DISTURBED DURING CONSTRUCTION SHALL BE RESEED WITH 150mm PERFORATED SUBDRAIN AND HYDROSEEDED WITH STANDARD ROADSIDE MIX PER OPS 804. SEED TO BE WATERED UNTIL ESTABLISHED (MIN 60 DAYS) AS APPROVED BY THE ENGINEER.

NOTE TO CONTRACTOR: SURFACE DRAINAGE IS REQUIRED IN PAVED AREAS TO COMPENSATE NATIVE SUBSOIL IN ACCORDANCE WITH GEOTECHNICAL INVESTIGATION

ALL SIDE SLOPES SHALL HAVE SUBGRADE FACES LIGHTLY SCARIFIED PRIOR TO PLACING 150mm ORGANIC TOPSOIL DRESSING.

BIDDING CONTRACTORS SHALL SATISFY THEMSELVES OF THE STATE OF SITE GRADES DURING BID PHASE.

MUNICIPAL DRAIN LOCATION AND SIZE ON PLANS SHOULD BE CONSIDERED APPROXIMATE. REFER TO CLOUTY MANHOLES REPORT BY SPRETT ASSOCIATES FOR ADDITIONAL DETAILS.

MATERIAL CONFORMANCE: PRIOR TO ADDITION OF MATERIALS TO THE WORK SITE THE CONTRACTOR SHALL MAKE ARRANGEMENTS FOR THE GEOTECHNICAL ANALYSIS OF GRANULAR A AND B MATERIALS TO PROVE CONFORMANCE WITH OPS 1010.

RIP RAP ARMOURING SHALL INCLUDE 100-200mm ANGULAR QUARRY STONE (200-150mm) OR 200mm ROUND STONE PLACED 400mm DEEP UNLESS OTHERWISE NOTED ON THE PLANS. AN UNDERLAY OF TERRAFIX 270R GEOTEXTILE (CLASS 2 OPS 1850) OR APPROVED EQUIVALENT SHALL BE PROVIDED WITH MINIMUM OVERLAPS OF 300mm IN THE DOWN GRADIENT DIRECTION AND PROPER KEY ANCHORING AT BOUNDARIES.

THE OWNERS CONSULTING ENGINEER IS REQUIRED TO INSPECT THE INSTALLATION OF SERVICES INCLUDED IN THIS PROJECT. IN ACCORDANCE WITH THE GENERAL REVIEW COMMENT CERTIFICATION PROTOCOLS, THE CONTRACTOR IS TO ADVISE DEVELOPMENT ENGINEERING (LONDON) LTD. (519-472-8510) AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION ON THE SITE SERVICES.

PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL OBTAIN LOCATES FOR EXPOSED AND CONFIRM LOCATION OF ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF CONSTRUCTION. CONTRACTOR SHALL SUPPORT EXISTING UNDERGROUND UTILITIES AS REQUIRED. ALL EXISTING UTILITIES MAY NOT BE SHOWN.

FOR ARCHITECTURAL DETAILS REFER TO PLANS BY AGR-URBAN BUILDINGS INC. (AUB)

REFER TO STRUCTURAL PLANS BY T.C. LUI ENGINEERING FOR BUILDING DETAILS

REFER TO MECHANICAL PLANS BY AGR-URBAN BUILDINGS INC. (AUB) FOR PLUMBING DETAILS

CONTRACTOR TO ENSURE POSITIVE SURFACE DRAINAGE TO APPEARANCES AND SWALES/DITCHES IS ACHIEVED

NOTE TO CONTRACTOR: SUB EXCAVATION IS REQUIRED IN PAVED AREAS TO COMPENSATE NATIVE SUBSOIL IN ACCORDANCE WITH GEOTECHNICAL INVESTIGATION

REF: GEOTECHNICAL REPORT PREPARED BY EXP SERVICES, INC. DATED MARCH 30, 2016, REPORT NO. LON-20031485-02

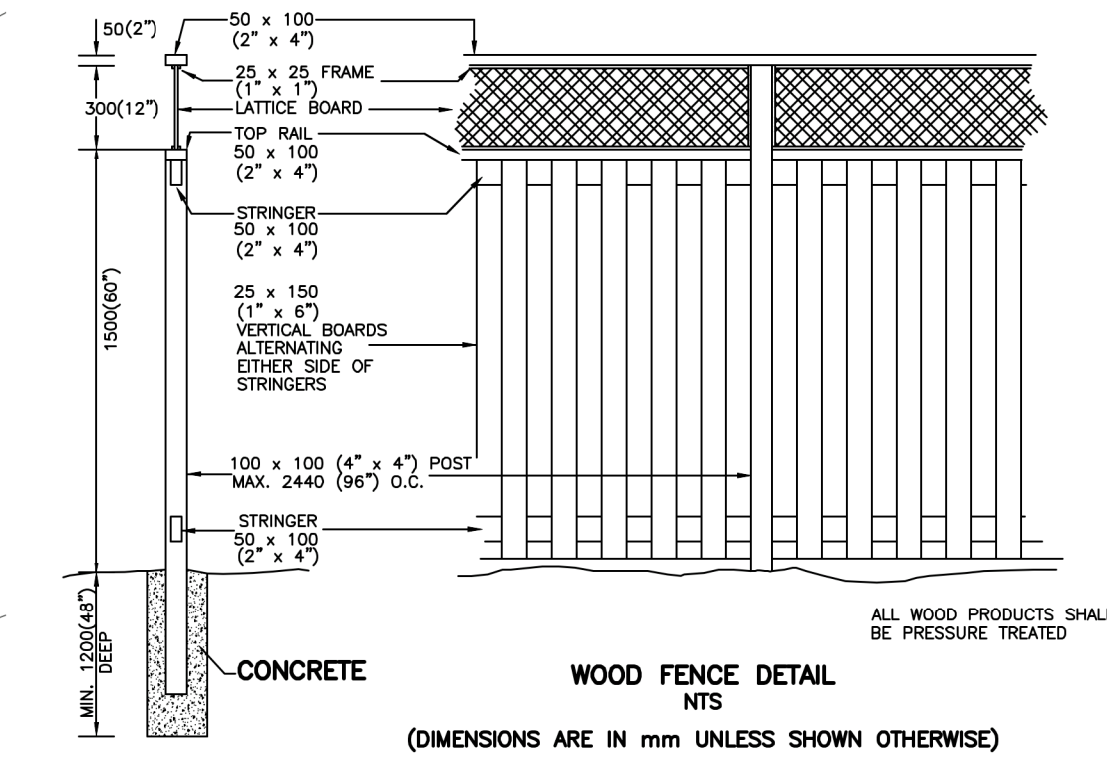
NOTE: BOREHOLE LOCATIONS SHOWN ARE APPROXIMATE. SEE GEOTECHNICAL REPORT BY EXP SERVICES, INC.

LOCATION OF SHOWN UTILITIES ARE APPROXIMATE AND CONTRACTOR TO CONFIRM EXACT LOCATIONS PRIOR TO CONSTRUCTION. NOTE, ALL EXISTING UTILITIES MAY NOT BE SHOWN.

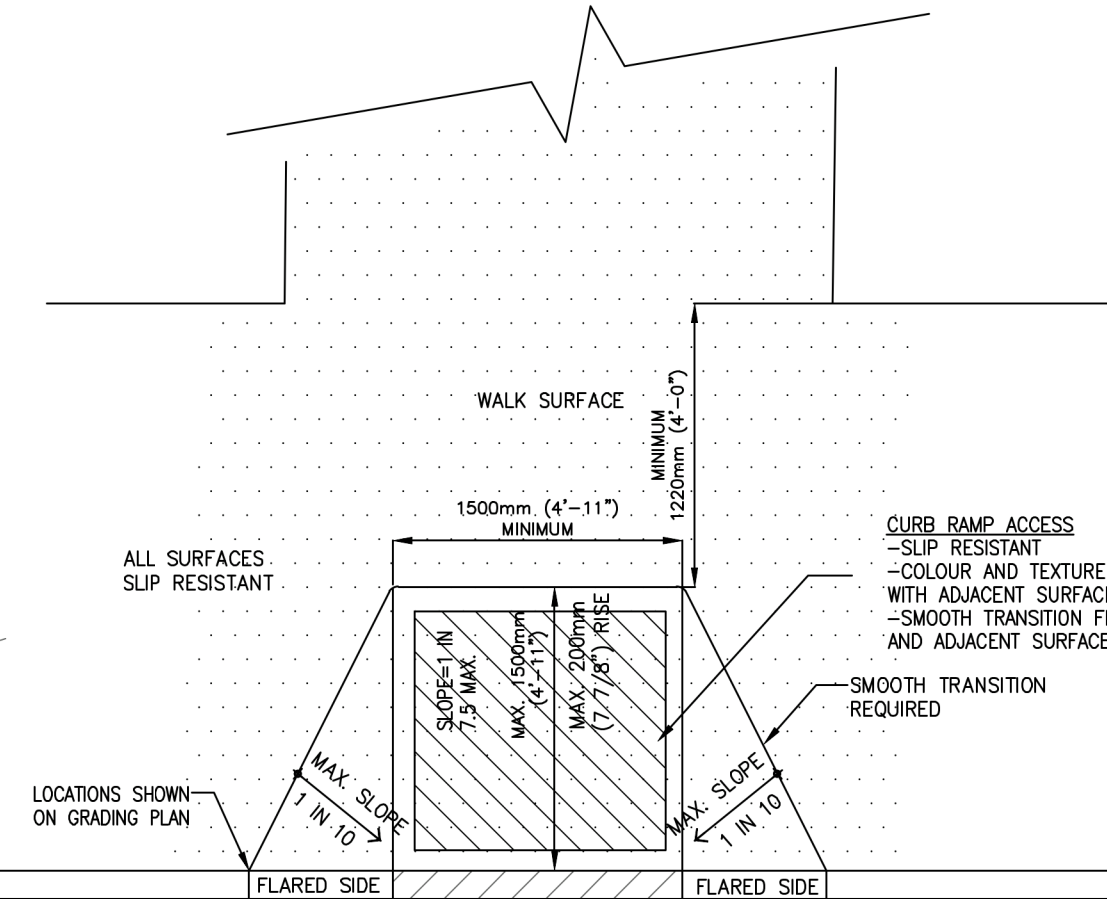
CONTRACTOR SHALL TAKE ALL REASONABLE MEASURES TO AVOID MIXING TOPSOIL WITH SUBSOIL, WHERE REQUIRED FOR REUSE ON SITE.

WHEN WORKING WITHIN THE VICINITY (20m) OF GAS MAIN, UNION GAS SHALL BE PROPERLY NOTIFIED IN ADVANCE OF ANY CONSTRUCTION ACTIVITY.

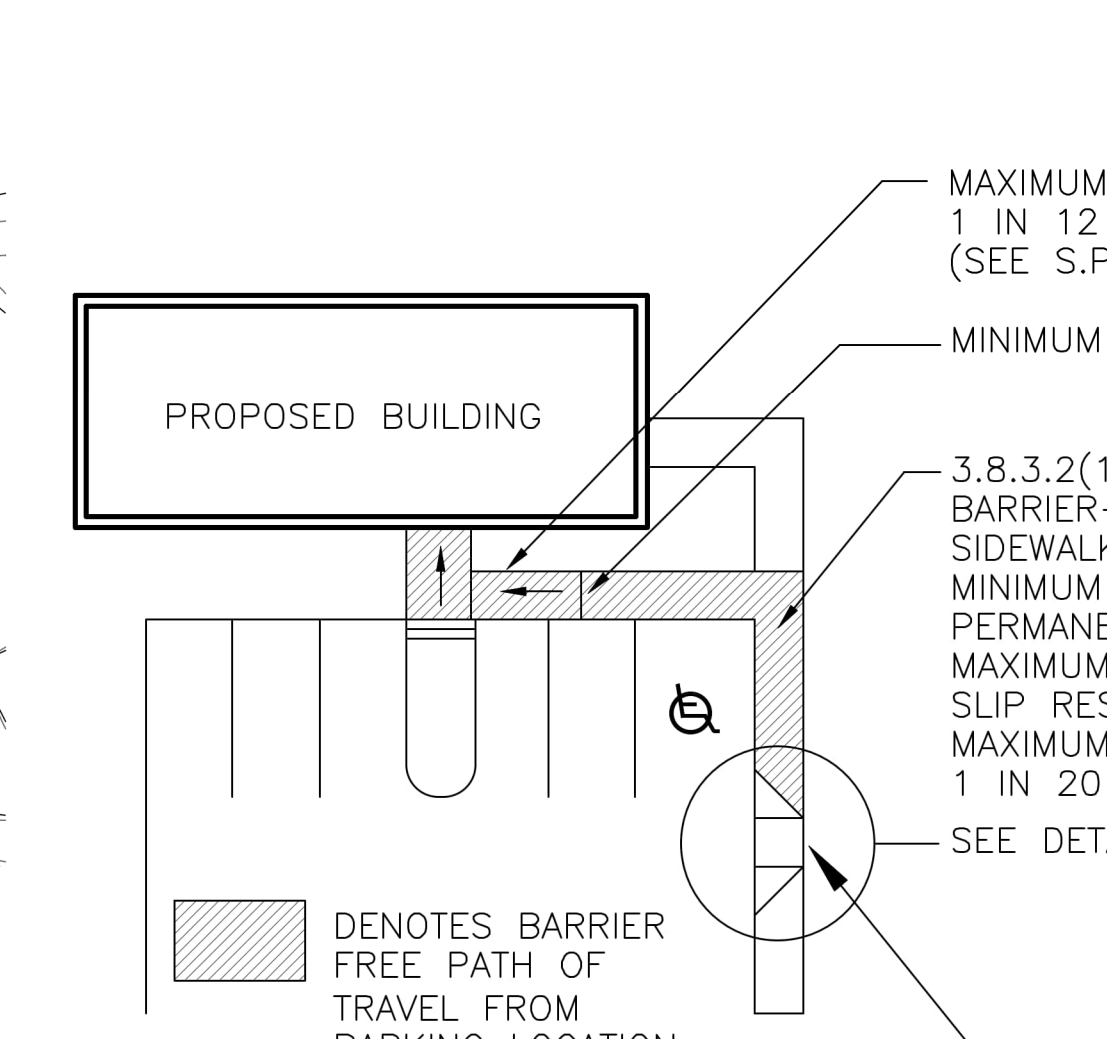
TYPICAL PRIVATE SUBDRAIN INSTALLATION
1:20



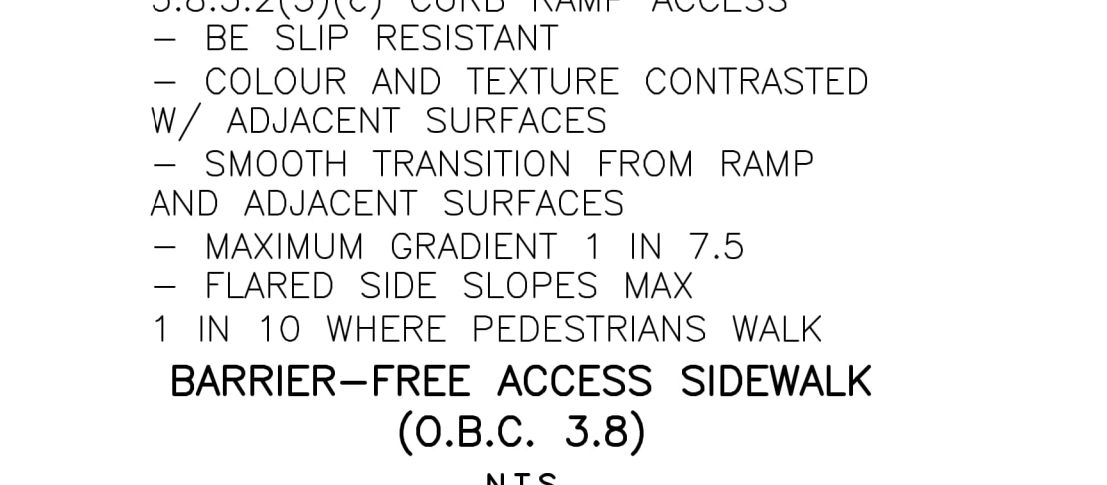
SIDEWALK RAMP DETAIL FOR BARRIER FREE ACCESS
N.T.S.



TYPICAL PRIVATE SUBDRAIN INSTALLATION
1:20



3.8.3.2(1)(b) BARRIER-FREE ACCESS
SIDEWALK TO BE MINIMUM 1100mm PERMANENT, FIRM AND MAXIMUM GRADIENT SIDEWALK TO BE MAXIMUM GRADIENT 1 IN 20 SEE DETAIL TO RIGHT



3.8.3.2(3)(c) CURB RAMP ACCESS - BE SLIP RESISTANT - COLOUR AND TEXTURE CONTRASTED W/ ADJACENT SURFACES - SMOOTH TRANSITION FROM RAMP AND ADJACENT SURFACES - MAXIMUM GRADIENT 1 IN 7.5 - FLARED SIDE SLOPES MAX 1 IN 10 WHERE PEDESTRIANS WALK BARRIER-FREE ACCESS SIDEWALK (O.B.C. 3.8) N.T.S.

MAXIMUM GRADIENT 1 IN 12 RAMP (SEE S.P. BF.1)

MINIMUM 1100mm WIDTH

3.8.3.2(1)(b) BARRIER-FREE ACCESS SIDEWALK TO BE MINIMUM 1100mm PERMANENT, FIRM AND MAXIMUM GRADIENT SIDEWALK TO BE MAXIMUM GRADIENT 1 IN 20

SEE DETAIL TO RIGHT

DENOTES BARRIER FREE PATH OF TRAVEL FROM PARKING LOCATION

150mm CLEARSTONE C/W SWALE (MINIMAL COMPACTION)

VARIES

150mm FLEXIBLE PERFORATED SUBDRAIN

150mm CLEARSTONE c/w NON-WOVEN GEOTEXTILE (TERRAFIX 270R OR APPROVED EQUIVALENT)

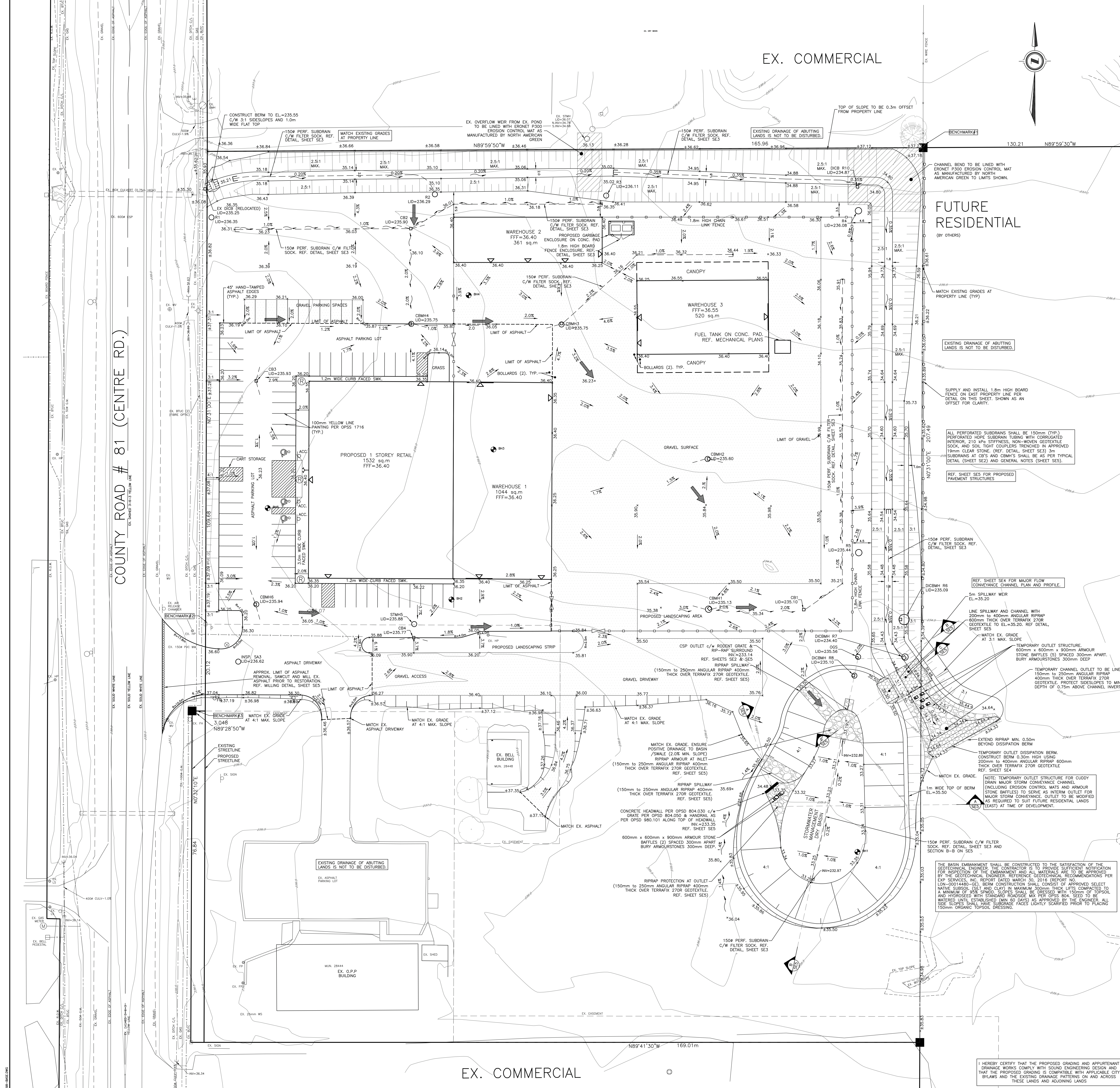
100

SUPPLY & INSTALL PREFAB CAP ON ENDS OF SUBDRAIN

SUBDRAIN TO FOLLOW LINE AND GRADE OF GRASS SWALE.

TYPICAL PRIVATE SUBDRAIN IN SWM POND INSTALLATION
1:20

HEREBY CERTIFY THAT THE PROPOSED GRADING AND APPURTENANT DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING DESIGN AND THAT THE PROPOSED GRADING IS COMPATIBLE WITH APPLICABLE CITY BYLAWS AND THE EXISTING DRAINAGE PATTERNS ON AND ACROSS THESE LANDS AND ADJOINING LANDS



EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION	DETAILS	NO.	REVISIONS	DATE	CONSULTANT
	DESIGN	02/22/2018	DESIGN FOR SITE PERM APPROVAL	JAN 22, 2018		1			
	DESIGN	02/22/2018	DESIGN FOR SITE PERM APPROVAL	MAY 25, 2018		2			
	CHECKED	06/01/2018	REVISED FOR SUBMISSION	JUNE 26, 2018		3			
	APPROVED	06/01/2018	REVISED PER COMMENTS	JULY 18, 2018		4			
	DATE	08/02/2018	REVISED PER COMMENTS	JULY 28, 2018		5			
	FILE	08/02/2018	REVISED PER COMMENTS	AUG 03, 2018		6			

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41 Adelaide St. N., Unit 71
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Phone: (519) 872-8310
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development engineering
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LONDON (ON) PROFESSIONAL ENGINEERING SOCIETY
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LONDON (ON) PROFESSIONAL ENGINEERING SOCIETY

MOFFATT & POWELL
the LUMBER STORE

SCALE = 1:300

28444 CENTRE ROAD, ADELAIDE-METCALFE
COMMERCIAL BLOCK, LOT 22 CONCESSION 3 SOUTH OF EGDORNT ROAD, PART 3, 33R-

PROJECT NO. DEL13-098
SHEET NO. SE3
PLAN FILE NO.

EX. COMMERCIAL

FUTURE RESIDENTIAL
(BY OTHERS)

EX. COMMERCIAL

COUNTY ROAD # 81 (CENTRE RD.)

- LEGEND**
- EX. SHM DENOTES EXISTING STORM MANHOLE
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 - EX. H DENOTES EXISTING HYDRO PILE
 - EX. B DENOTES EXISTING BELL MANHOLE
 - EX. B DENOTES EXISTING BELL CABLE
 - EX. E DENOTES EXISTING ELECTRICAL CABLE
 - EX. P DENOTES EXISTING HYDRO POLE/LIGHT STANDARD
 - R1 DENOTES PROPOSED STORM MANHOLE
 - S1 DENOTES PROPOSED SANITARY MANHOLE
 - CBM1 DENOTES PROPOSED CATCHBASIN MANHOLE
 - CBM1 DENOTES PROPOSED DITCH INLET CATCHBASIN MANHOLE
 - CBM1 DENOTES PROPOSED STANDARD CATCHBASIN
 - WM DENOTES PROPOSED WM TEE, GATE VALVE & 3-WAY HYDRANT WITH STORZ CONNECTION
 - V DENOTES PROPOSED VALVE
 - CON DENOTES PROPOSED CONCRETE
 - AS DENOTES PROPOSED ASPHALT
 - GR DENOTES PROPOSED GRADE
 - EX GR DENOTES EX. GRADE TO BE MATCHED
 - SW DENOTES PROPOSED SWALE
 - OF DENOTES OVERLAND FLOW DIRECTION
 - 150 PER DENOTES 150mm PERFORATED SUBDRAIN
 - ACC DENOTES PROPOSED ACCESSIBLE PARKING SPACE
 - ER DENOTES ERONET P300 EROSION CONTROL MAT
 - 200 DENOTES PROPOSED 200mm TO 200mm ANNUAL RIP-RAP 400mm THICK OVER TERRAFIX 270R GEOTEXTILE
 - 400 DENOTES PROPOSED 200mm TO 400mm ANNUAL RIP-RAP 400mm THICK OVER TERRAFIX 270R GEOTEXTILE
 - GRV DENOTES PROPOSED GRAVEL
 - BH DENOTES EXISTING BOREHOLE LOCATION PER EXP SERVICES, INC. (MARCH, 2016)

- GRADING NOTES**
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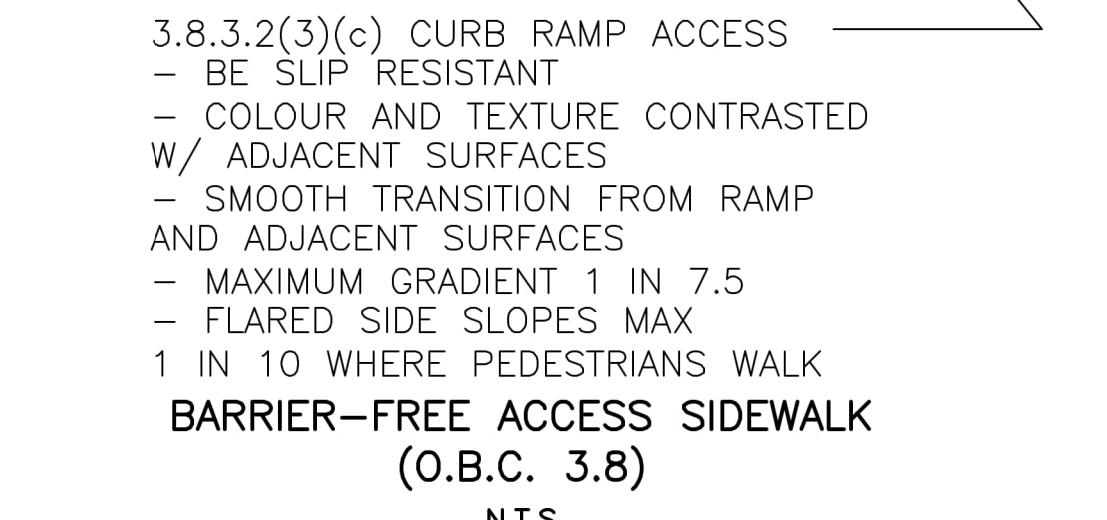
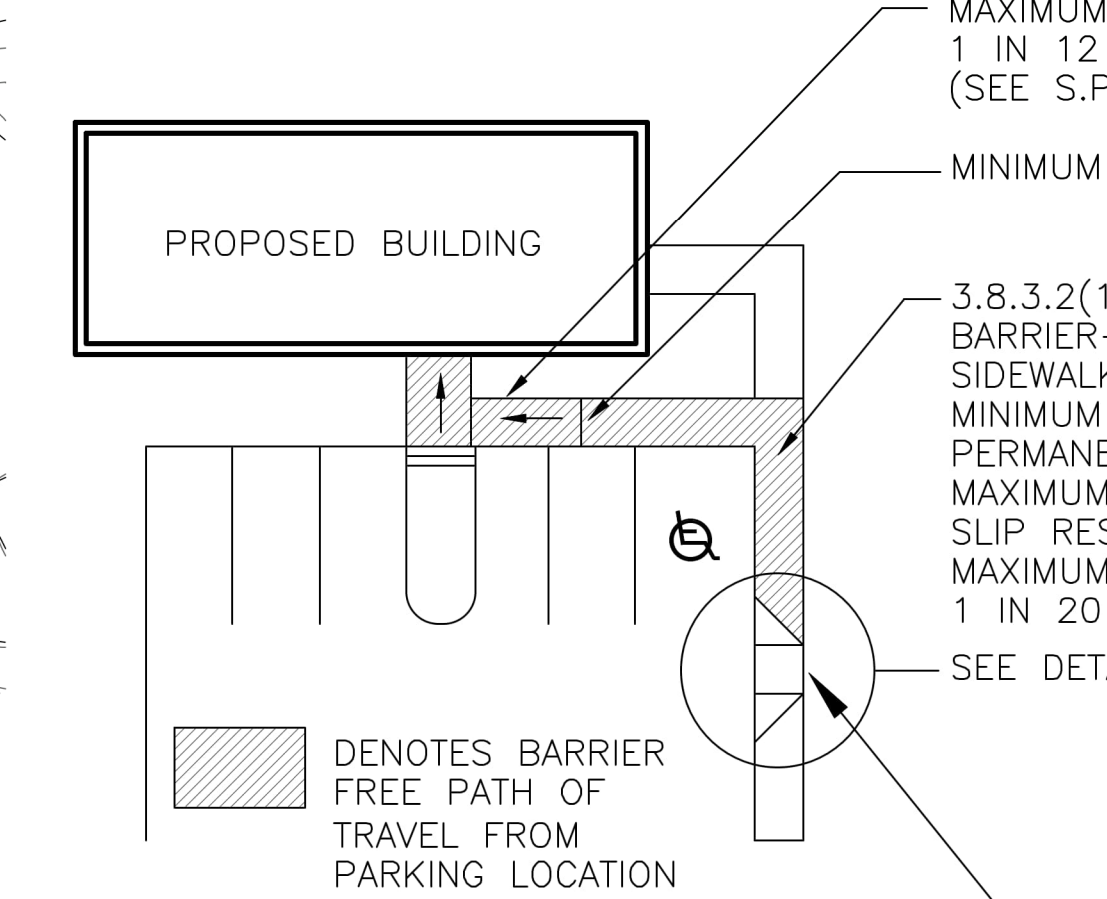
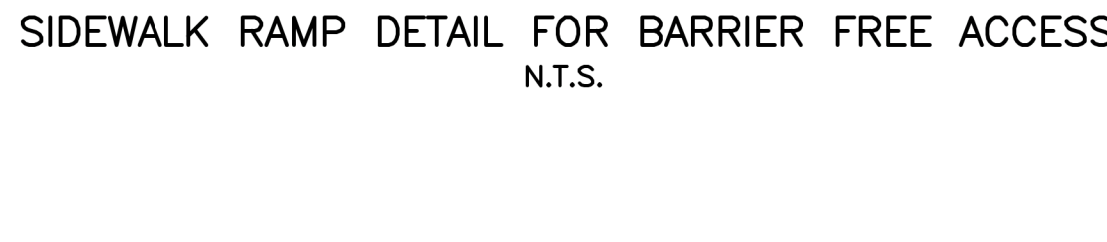
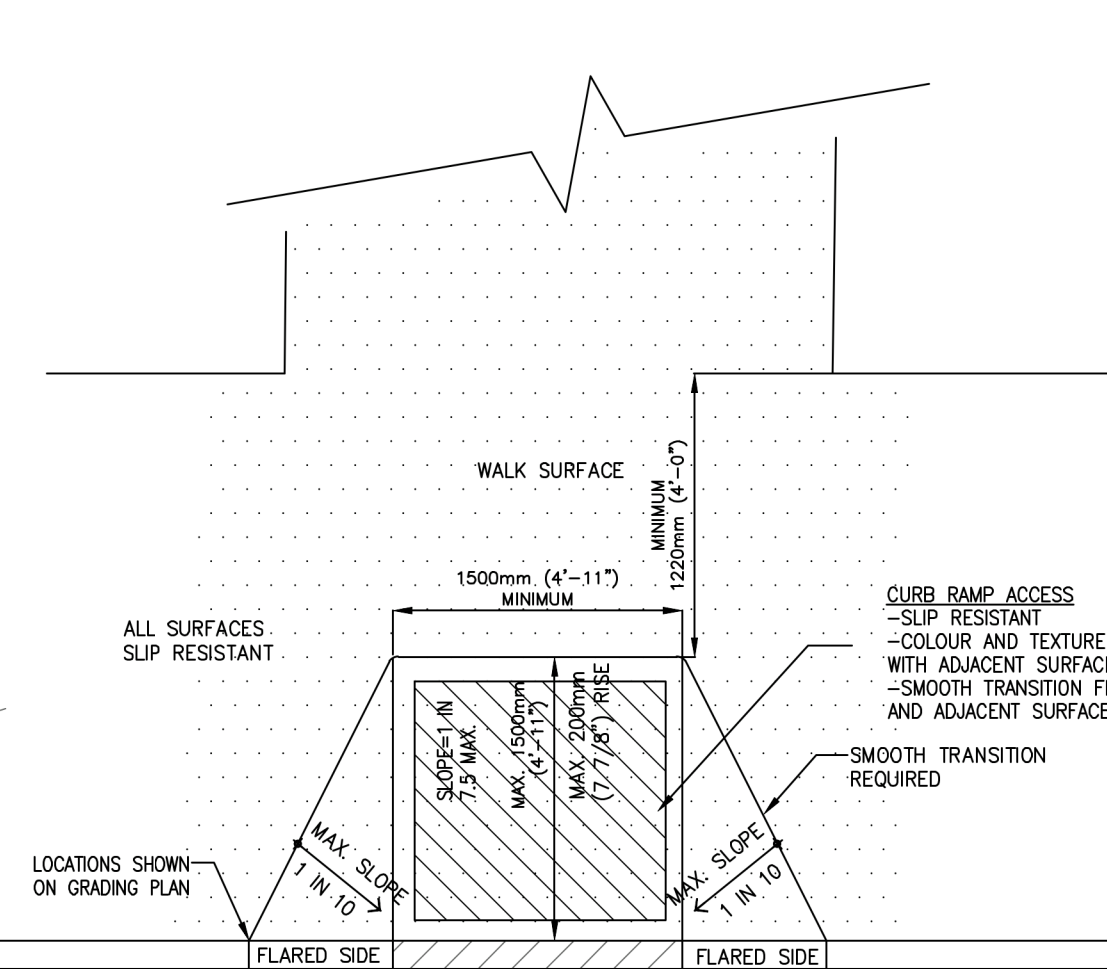
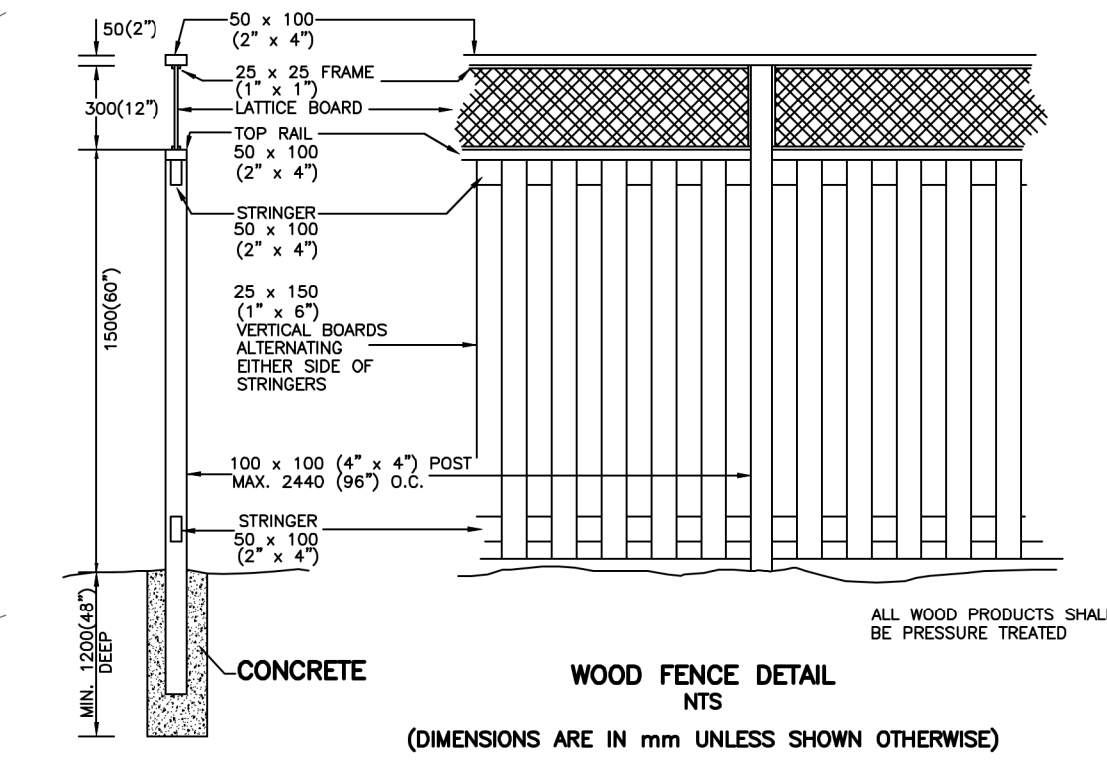
REF: GEOTECHNICAL REPORT PREPARED BY EXP SERVICES, INC., DATED MARCH 30, 2016, REPORT NO. LON-20031480-02

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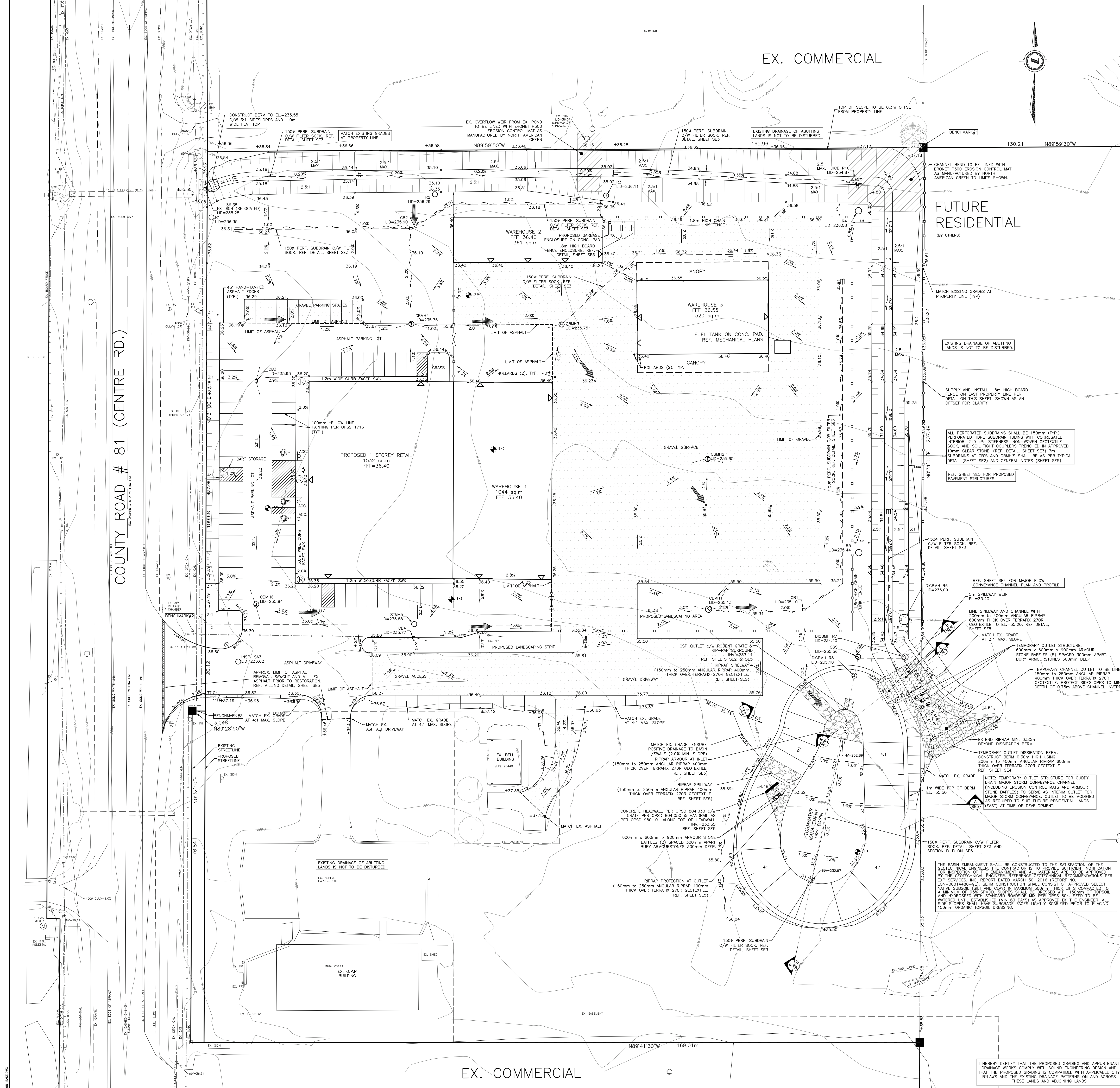
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EXISTING SERVICES	DRAWING #, SOURCE	DATE	AS CONSTRUCTED SERVICES	COMPLETION	DETAILS	NO.	REVISIONS	DATE	CONSULTANT
						1	ISSUED FOR PERM APPROVAL	JAN 22, 2018	
						2	REVISED PER STREET COMMENTS	MAY 25, 2018	
						3	REVISED PER SPA SUBMISSION	JUNE 26, 2018	
						4	REVISED PER COMMENTS	JULY 18, 2018	
						5	REVISED PER STREET COMMENTS	JULY 28, 2018	
						6	REVISED PER COMMENTS	AUG 03, 2018	

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development engineering
CONSULTING CIVIL ENGINEERS

ENGINEER'S STAMP
LONDON (ON) PROFESSIONAL ENGINEERING SOCIETY
L. ALBERTINI
10070727
PROF. OF CIVIL

MOFFATT & POWELL
the LUMBER STORE

SCALE = 1:300

28444 CENTRE ROAD, ADELAIDE-METCALFE
COMMERCIAL BLOCK, LOT 22 CONCESSION 3 SOUTH OF EGDORNT ROAD, PART 3, 33R-

PROJECT NO. DEL13-098
SHEET NO. SE3

Appendix D

Cuddy Drain Hydrologic Modelling Results

```

=====
SSSS W W M M H H Y Y M M 000      999 999  =====
S   W W W MM MM H H Y Y MM MM 0 0   9 9 9 9
SSSS W W W M M M H H H H Y M M M 0 0 ## 9 9 9 9 Ver 4.05
S   W W M M H H Y M M 0 0           9999 9999 Sept 2011
SSSS W W M M H H Y M M 000          9 9
StormWater Management HYdrologic Model 999 999 # 3053466
=====

*****
***** SWMHYMO Ver/4.05 *****
***** A single event and continuous hydrologic simulation model *****
***** based on the principles of HYMO and its successors *****
***** OTTHYMO-83 and OTTHYMO-89. *****
***** Distributed by: J.F. Sabourin and Associates Inc. *****
***** Ottawa, Ontario: (613) 836-3884 *****
***** Gatineau, Quebec: (819) 243-6858 *****
***** E-Mail: swmhymo@jfsa.Com *****

+++++ Licensed user: MTE Consultants Inc. +++++
+++++ Burlington SERIAL#: 3053466 +++++

*****
***** +++++ PROGRAM ARRAY DIMENSIONS +++++ *****
***** Maximum value for ID numbers : 10 *****
***** Max. number of rainfall points: 105408 *****
***** Max. number of flow points : 105408 *****

***** DETAILED OUTPUT *****
*****
* DATE: 2025-04-25 TIME: 12:46:13 RUN COUNTER: 000524 *
*****
* Input filename: Q:\60010_-1\SWM\SWMHYMO\Cuddy.dat *
* Output filename: Q:\60010_-1\SWM\SWMHYMO\Cuddy.out *
* Summary filename: Q:\60010_-1\SWM\SWMHYMO\Cuddy.sum *
* User comments: *
* 1: _____ *
* 2: _____ *
* 3: _____ *
*****

-----
-
001:0001-----

```

```

-
*#*****
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Model Ier : [JJM]
*#*****
** END OF RUN : 99

*****

-----
| START | Project dir.: Q:\60010_-1\SWM\SWMHYMO\
-----
Rainfall dir.: Q:\60010_-1\SWM\SWMHYMO\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 100
NSTORM= 1
# 1=100YR.HYT

-----
-
100:0002-----
-
*#*****
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Model Ier : [JJM]
*#*****

-----
-
100:0002-----
-
| READ STORM | Filename: 100YR Chicago 3-hr duration
| Ptotal = 76.58 mm | Comments: 100YR Chicago 3-hr duration

-----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
.08 4.124 | .92 16.827 | 1.75 18.954 | 2.58 5.884
.17 4.466 | 1.00 23.309 | 1.83 15.688 | 2.67 5.494
.25 4.871 | 1.08 36.264 | 1.92 13.330 | 2.75 5.151
.33 5.357 | 1.17 70.558 | 2.00 11.559 | 2.83 4.849
.42 5.950 | 1.25 248.539 | 2.08 10.186 | 2.92 4.580
.50 6.689 | 1.33 140.446 | 2.17 9.094 | 3.00 4.340
.58 7.633 | 1.42 70.312 | 2.25 8.207 | 3.08 4.124
.67 8.876 | 1.50 44.113 | 2.33 7.473 |

```

.75 10.579 | 1.58 31.184 | 2.42 6.858 |
.83 13.034 | 1.67 23.720 | 2.50 6.334 |

100:0003

*#
*# CUDDY DRAIN
*#

CALIB NASHYD | Area (ha)= 3.66 Curve Number (CN)=82.00
01:101 DT= 1.00 | la (mm)= 5.000 # of Linear Res. (N)= 3.00
U.H. Tp(hrs)= .750

Unit Hyd Qpeak (cms)= .186

PEAK FLOW (cms)= .235 (i)
TIME TO PEAK (hrs)= 2.167
RUNOFF VOLUME (mm)= 40.237
TOTAL RAINFALL (mm)= 76.580
RUNOFF COEFFICIENT = .525

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100:0004

CALIB NASHYD | Area (ha)= 12.48 Curve Number (CN)=82.00
02:102 DT= 1.00 | la (mm)= 5.000 # of Linear Res. (N)= 3.00
U.H. Tp(hrs)= .670

Unit Hyd Qpeak (cms)= .711

PEAK FLOW (cms)= .876 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 40.237
TOTAL RAINFALL (mm)= 76.580
RUNOFF COEFFICIENT = .525

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100:0005

CALIB NASHYD | Area (ha)= 2.11 Curve Number (CN)=82.00
03:103 DT= 1.00 | la (mm)= 5.000 # of Linear Res. (N)= 3.00
U.H. Tp(hrs)= .670

Unit Hyd Qpeak (cms)= .120

PEAK FLOW (cms)= .148 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 40.237
TOTAL RAINFALL (mm)= 76.580
RUNOFF COEFFICIENT = .525

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100:0006

CALIB NASHYD | Area (ha)= 2.10 Curve Number (CN)=82.00
04:104 DT= 1.00 | la (mm)= 5.000 # of Linear Res. (N)= 3.00
U.H. Tp(hrs)= .430

Unit Hyd Qpeak (cms)= .187

PEAK FLOW (cms)= .206 (i)
TIME TO PEAK (hrs)= 1.783
RUNOFF VOLUME (mm)= 40.237
TOTAL RAINFALL (mm)= 76.580
RUNOFF COEFFICIENT = .525

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100:0007

CALIB NASHYD | Area (ha)= 3.40 Curve Number (CN)=70.00
05:105 DT= 1.00 | la (mm)= 5.000 # of Linear Res. (N)= 3.00
U.H. Tp(hrs)= 1.400

Unit Hyd Qpeak (cms)= .093

PEAK FLOW (cms)= .093 (i)
TIME TO PEAK (hrs)= 2.983
RUNOFF VOLUME (mm)= 28.396
TOTAL RAINFALL (mm)= 76.580
RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100: 0008

CALIB NASHYD Area (ha)= 7.69 Curve Number (CN)=82.00
07:107 DT= 1.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00
U. H. Tp(hrs)= .670

Unit Hyd Qpeak (cms)= .438
PEAK FLOW (cms)= .540 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 40.237
TOTAL RAINFALL (mm)= 76.580
RUNOFF COEFFICIENT = .525

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100: 0009

CALIB STANDHYD Area (ha)= 6.36
06:106 DT= 1.00 | Total Imp(%)= 44.00 Dir. Conn. (%)= 34.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 2.80 3.56
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.00 2.00
Length (m)= 988.00 40.00
Mannings n = .013 .250

Max. eff. Inten. (mm/hr)= 217.66 90.30
over (min)= 7.00 15.00
Storage Coeff. (min)= 7.40 (ii) 14.75 (ii)
Unit Hyd. Tpeak (min)= 7.00 15.00
Unit Hyd. peak (cms)= .16 .08

PEAK FLOW (cms)= .87 .53 *TOTALS*
TIME TO PEAK (hrs)= 1.35 1.53 1.194 (iii)
RUNOFF VOLUME (mm)= 74.58 35.34 1.417
TOTAL RAINFALL (mm)= 76.58 76.58 48.683
RUNOFF COEFFICIENT = .97 .46 76.580
.636

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

100: 0010

CALIB STANDHYD Area (ha)= 1.22
08:112 DT= 1.00 | Total Imp(%)= 52.00 Dir. Conn. (%)= 45.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= .63 .59
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.00 2.00
Length (m)= 90.00 40.00
Mannings n = .013 .250

Max. eff. Inten. (mm/hr)= 248.54 105.91
over (min)= 2.00 9.00
Storage Coeff. (min)= 1.67 (ii) 8.56 (ii)
Unit Hyd. Tpeak (min)= 2.00 9.00
Unit Hyd. peak (cms)= .63 .13

PEAK FLOW (cms)= .36 .11 *TOTALS*
TIME TO PEAK (hrs)= 1.25 1.42 .394 (iii)
RUNOFF VOLUME (mm)= 74.58 34.74 1.250
TOTAL RAINFALL (mm)= 76.58 76.58 52.670
RUNOFF COEFFICIENT = .97 .45 76.580
.688

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100: 0011

CALIB STANDHYD Area (ha)= 2.19
09:111 DT= 1.00 | Total Imp(%)= 43.00 Dir. Conn. (%)= 33.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= .94 1.25
Dep. Storage (mm)= 2.00 5.00
Average Slope (%)= 1.00 2.00
Length (m)= 120.00 40.00
Mannings n = .013 .250

Max. eff. Inten. (mm/hr)= 248.54 110.49

over (min) 2.00 9.00
 Storage Coeff. (min)= 1.98 (ii) 8.76 (ii)
 Unit Hyd. Tpeak (min)= 2.00 9.00
 Unit Hyd. peak (cms)= .56 .13

TOTALS
 PEAK FLOW (cms)= .46 .24 .537 (iii)
 TIME TO PEAK (hrs)= 1.25 1.42 1.267
 RUNOFF VOLUME (mm)= 74.58 35.28 48.253
 TOTAL RAINFALL (mm)= 76.58 76.58 76.580
 RUNOFF COEFFICIENT = .97 .46 .630

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100:0012

ADD HYD (CONF1)	ID: NHYD	AREA (ha)	OPEAK (cms)	TPEAK (hrs)	R. V. (mm)	DWF (cms)
ID1 01:101		3.66	.235	2.17	40.24	.000
+ID2 02:102		12.48	.876	2.08	40.24	.000
+ID3 03:103		2.11	.148	2.08	40.24	.000
+ID4 04:104		2.10	.206	1.78	40.24	.000
+ID5 05:105		3.40	.093	2.98	28.40	.000
+ID6 06:106		6.36	1.194	1.42	48.68	.000
+ID7 07:107		7.69	.540	2.08	40.24	.000
+ID8 08:112		1.22	.394	1.25	52.67	.000
+ID9 09:111		2.19	.537	1.27	48.25	.000
=====						
SUM 10: CONF1		41.21	2.510	1.83	41.36	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

100:0013

CALIB STANDHYD | Area (ha)= 2.13
 01:110 DT= 1.00 | Total Imp(%)= 46.00 Dir. Conn.(%)= 36.00

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= .98 1.15
 Dep. Storage (mm)= 2.00 5.00
 Average Slope (%)= 1.00 2.00
 Length (m)= 119.00 40.00
 Mannings n = .013 .250

Max. eff. Inten. (mm/hr)= 248.54 112.01
 over (min) 2.00 9.00
 Storage Coeff. (min)= 1.97 (ii) 8.71 (ii)
 Unit Hyd. Tpeak (min)= 2.00 9.00
 Unit Hyd. peak (cms)= .56 .13

TOTALS
 PEAK FLOW (cms)= .49 .23 .561 (iii)
 TIME TO PEAK (hrs)= 1.25 1.42 1.250
 RUNOFF VOLUME (mm)= 74.58 35.46 49.544
 TOTAL RAINFALL (mm)= 76.58 76.58 76.580
 RUNOFF COEFFICIENT = .97 .46 .647

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100:0014

CALIB STANDHYD | Area (ha)= .80
 02:109 DT= 1.00 | Total Imp(%)= 46.00 Dir. Conn.(%)= 36.00

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= .37 .43
 Dep. Storage (mm)= 2.00 5.00
 Average Slope (%)= 1.00 2.00
 Length (m)= 73.00 40.00
 Mannings n = .013 .250

Max. eff. Inten. (mm/hr)= 248.54 113.32
 over (min) 1.00 8.00
 Storage Coeff. (min)= 1.47 (ii) 8.18 (ii)
 Unit Hyd. Tpeak (min)= 1.00 8.00
 Unit Hyd. peak (cms)= .84 .14

TOTALS

PEAK FLOW (cms)= .19 .09 .226 (iii)
 TIME TO PEAK (hrs)= 1.25 1.40 1.250
 RUNOFF VOLUME (mm)= 74.58 35.46 49.543
 TOTAL RAINFALL (mm)= 76.58 76.58 76.580
 RUNOFF COEFFICIENT = .97 .46 .647

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100:0015

CALIB STANDHYD | Area (ha)= 2.61
 03:108 DT= 1.00 | Total Imp(%)= 25.00 Dir. Conn.(%)= 25.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.65	1.96
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	132.00	40.00
Mannings n =	.013	.250

Max. eff. Inten. (mm/hr)=	248.54	82.39
over (min)	2.00	10.00
Storage Coeff. (min)=	2.10 (ii)	9.72 (ii)
Unit Hyd. Tpeak (min)=	2.00	10.00
Unit Hyd. peak (cms)=	.54	.12

TOTALS
 PEAK FLOW (cms)= .41 .28 .488 (iii)
 TIME TO PEAK (hrs)= 1.25 1.45 1.267
 RUNOFF VOLUME (mm)= 74.58 31.86 42.539
 TOTAL RAINFALL (mm)= 76.58 76.58 76.580
 RUNOFF COEFFICIENT = .97 .42 .555

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

100:0016

| ADD HYD (CONF) | ID: NHYD AREA OPEAK TPEAK R.V. DWF

	(ha)	(cms)	(hrs)	(mm)	(cms)
ID1 10: CONF1	41.21	2.510	1.83	41.36	.000
+ID2 01:110	2.13	.561	1.25	49.54	.000
+ID3 02:109	.80	.226	1.25	49.54	.000
+ID4 03:108	2.61	.488	1.27	42.54	.000
SUM 04: CONF	46.75	3.339	1.35	41.94	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

100:0017

** END OF RUN : 249

| START | Project dir.: Q:\60010_1\SWM\SWMHYM0\
 Rainfall dir.: Q:\60010_1\SWM\SWMHYM0\

TZERO = .00 hrs on 0
 METOUT= 2 (output = METRIC)
 NRUN = 250
 NSTORM= 1
 # 1=250YR. HYT

250:0002

*# Project Name: [Darcy Drive] Project Number: [60010-001]
 *# Date : March 2025
 *# Modeler : [JJM]

250:0002

READ STORM | Filename: 250YR Chicago 3-hr duration
 Ptotal = 85.83 mm | Comments: 250YR Chicago 3-hr duration

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	4.587	.92	21.539	1.75	20.546	2.58	6.559
.17	4.994	1.00	31.394	1.83	17.167	2.67	6.123
.25	5.481	1.08	53.230	1.92	14.680	2.75	5.739
.33	6.071	1.17	124.286	2.00	12.786	2.83	5.401
.42	6.799	1.25	274.700	2.08	11.300	2.92	5.099
.50	7.719	1.33	115.167	2.17	10.109	3.00	4.830
.58	8.914	1.42	66.257	2.25	9.135	3.08	4.587
.67	10.518	1.50	44.425	2.33	8.325		
.75	12.772	1.58	32.586	2.42	7.643		
.83	16.125	1.67	25.348	2.50	7.061		

PEAK FLOW (cms) = 1.037 (i)
 TIME TO PEAK (hrs) = 2.050
 RUNOFF VOLUME (mm) = 47.837
 TOTAL RAINFALL (mm) = 85.833
 RUNOFF COEFFICIENT = .557

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

250: 0003

*#-----
 *#
 *# CUDDY DRAIN
 *#
 *#-----

CALIB NASHYD | Area (ha) = 3.66 Curve Number (CN) = 82.00
 01:101 DT = 1.00 | Ia (mm) = 5.000 # of Linear Res. (N) = 3.00
 U. H. Tp (hrs) = .750

Unit Hyd Qpeak (cms) = .186

PEAK FLOW (cms) = .279 (i)
 TIME TO PEAK (hrs) = 2.150
 RUNOFF VOLUME (mm) = 47.837
 TOTAL RAINFALL (mm) = 85.833
 RUNOFF COEFFICIENT = .557

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

250: 0004

CALIB NASHYD | Area (ha) = 12.48 Curve Number (CN) = 82.00
 02:102 DT = 1.00 | Ia (mm) = 5.000 # of Linear Res. (N) = 3.00
 U. H. Tp (hrs) = .670

Unit Hyd Qpeak (cms) = .711

250: 0005

CALIB NASHYD | Area (ha) = 2.11 Curve Number (CN) = 82.00
 03:103 DT = 1.00 | Ia (mm) = 5.000 # of Linear Res. (N) = 3.00
 U. H. Tp (hrs) = .670

Unit Hyd Qpeak (cms) = .120

PEAK FLOW (cms) = .175 (i)
 TIME TO PEAK (hrs) = 2.050
 RUNOFF VOLUME (mm) = 47.837
 TOTAL RAINFALL (mm) = 85.833
 RUNOFF COEFFICIENT = .557

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

250: 0006

CALIB NASHYD | Area (ha) = 2.10 Curve Number (CN) = 82.00
 04:104 DT = 1.00 | Ia (mm) = 5.000 # of Linear Res. (N) = 3.00
 U. H. Tp (hrs) = .430

Unit Hyd Qpeak (cms) = .187

PEAK FLOW (cms) = .243 (i)
 TIME TO PEAK (hrs) = 1.767
 RUNOFF VOLUME (mm) = 47.837
 TOTAL RAINFALL (mm) = 85.833
 RUNOFF COEFFICIENT = .557

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

250: 0007

 | CALIB NASHYD | Area (ha)= 3.40 Curve Number (CN)=70.00
 | 05:105 DT= 1.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00

 U. H. Tp(hrs)= 1.400

Unit Hyd Qpeak (cms)= .093
 PEAK FLOW (cms)= .112 (i)
 TIME TO PEAK (hrs)= 2.950
 RUNOFF VOLUME (mm)= 34.446
 TOTAL RAINFALL (mm)= 85.833
 RUNOFF COEFFICIENT = .401

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 250:0008-----
 -

 | CALIB NASHYD | Area (ha)= 7.69 Curve Number (CN)=82.00
 | 07:107 DT= 1.00 | Ia (mm)= 5.000 # of Linear Res. (N)= 3.00

 U. H. Tp(hrs)= .670

Unit Hyd Qpeak (cms)= .438
 PEAK FLOW (cms)= .639 (i)
 TIME TO PEAK (hrs)= 2.050
 RUNOFF VOLUME (mm)= 47.837
 TOTAL RAINFALL (mm)= 85.833
 RUNOFF COEFFICIENT = .557

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 250:0009-----
 -

 | CALIB STANDHYD | Area (ha)= 6.36
 | 06:106 DT= 1.00 | Total Imp(%)= 44.00 Dir. Conn. (%)= 34.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.80	3.56
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	988.00	40.00
Mannings n =	.013	.250

Max. eff. Inten. (mm/hr)= 231.72 105.35
 over (min) 7.00 14.00
 Storage Coeff. (min)= 7.21 (ii) 14.13 (ii)

Unit Hyd. Tpeak (min)= 7.00 14.00
 Unit Hyd. peak (cms)= .16 .08

			TOTALS
PEAK FLOW (cms)=	.98	.65	1.398 (iii)
TIME TO PEAK (hrs)=	1.33	1.47	1.367
RUNOFF VOLUME (mm)=	83.83	42.32	56.433
TOTAL RAINFALL (mm)=	85.83	85.83	85.833
RUNOFF COEFFICIENT =	.98	.49	.657

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 250:0010-----
 -

 | CALIB STANDHYD | Area (ha)= 1.22
 | 08:112 DT= 1.00 | Total Imp(%)= 52.00 Dir. Conn. (%)= 45.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.63	.59
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	90.00	40.00
Mannings n =	.013	.250

Max. eff. Inten. (mm/hr)= 274.70 129.55
 over (min) 2.00 8.00
 Storage Coeff. (min)= 1.60 (ii) 7.96 (ii)
 Unit Hyd. Tpeak (min)= 2.00 8.00
 Unit Hyd. peak (cms)= .64 .14

			TOTALS
PEAK FLOW (cms)=	.40	.14	.474 (iii)
TIME TO PEAK (hrs)=	1.25	1.37	1.250
RUNOFF VOLUME (mm)=	83.83	41.65	60.633
TOTAL RAINFALL (mm)=	85.83	85.83	85.833
RUNOFF COEFFICIENT =	.98	.49	.706

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 250:0011-----
 -

CALIB STANDHYD	Area (ha)=	2.19	
09:111 DT= 1.00	Total Imp(%)=	43.00	Dir. Conn. (%)= 33.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	.94	1.25	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	1.00	2.00	
Length (m)=	120.00	40.00	
Mannings n =	.013	.250	
Max. eff. Inten. (mm/hr)=	274.70	135.00	
over (min)	2.00	8.00	
Storage Coeff. (min)=	1.90 (ii)	8.16 (ii)	
Unit Hyd. Tpeak (min)=	2.00	8.00	
Unit Hyd. peak (cms)=	.58	.14	
			TOTALS
PEAK FLOW (cms)=	.52	.31	.675 (iii)
TIME TO PEAK (hrs)=	1.25	1.37	1.250
RUNOFF VOLUME (mm)=	83.83	42.25	55.976
TOTAL RAINFALL (mm)=	85.83	85.83	85.833
RUNOFF COEFFICIENT =	.98	.49	.652

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

250:0012-----							

ADD HYD (CONF1)	ID: NHYD	AREA (ha)	OPEAK (cms)	TPEAK (hrs)	R. V. (mm)	DWF (cms)	
	ID1 01:101	3.66	.279	2.15	47.84	.000	
	+ID2 02:102	12.48	1.037	2.05	47.84	.000	
	+ID3 03:103	2.11	.175	2.05	47.84	.000	
	+ID4 04:104	2.10	.243	1.77	47.84	.000	
	+ID5 05:105	3.40	.112	2.95	34.45	.000	
	+ID6 06:106	6.36	1.398	1.37	56.43	.000	
	+ID7 07:107	7.69	.639	2.05	47.84	.000	

+ID8 08:112	1.22	.474	1.25	60.63	.000
+ID9 09:111	2.19	.675	1.25	55.98	.000
=====					
SUM 10: CONF1	41.21	2.948	1.83	48.87	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

250:0013-----			

CALIB STANDHYD	Area (ha)=	2.13	
01:110 DT= 1.00	Total Imp(%)=	46.00	Dir. Conn. (%)= 36.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	.98	1.15	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	1.00	2.00	
Length (m)=	119.00	40.00	
Mannings n =	.013	.250	
Max. eff. Inten. (mm/hr)=	274.70	136.80	
over (min)	2.00	8.00	
Storage Coeff. (min)=	1.89 (ii)	8.12 (ii)	
Unit Hyd. Tpeak (min)=	2.00	8.00	
Unit Hyd. peak (cms)=	.58	.14	
			TOTALS
PEAK FLOW (cms)=	.55	.29	.698 (iii)
TIME TO PEAK (hrs)=	1.25	1.37	1.250
RUNOFF VOLUME (mm)=	83.83	42.45	57.348
TOTAL RAINFALL (mm)=	85.83	85.83	85.833
RUNOFF COEFFICIENT =	.98	.49	.668

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

250:0014-----			

CALIB STANDHYD	Area (ha)=	.80	
02:109 DT= 1.00	Total Imp(%)=	46.00	Dir. Conn. (%)= 36.00

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= .37 .43
 Dep. Storage (mm)= 2.00 5.00
 Average Slope (%)= 1.00 2.00
 Length (m)= 73.00 40.00
 Mannings n = .013 .250

Max. eff. Inten. (mm/hr)= 274.70 136.80
 over (min)= 1.00 8.00
 Storage Coeff. (min)= 1.41 (ii) 7.64 (ii)
 Unit Hyd. Tpeak (min)= 1.00 8.00
 Unit Hyd. peak (cms)= .86 .15

PEAK FLOW (cms)= .22 .11
 TIME TO PEAK (hrs)= 1.25 1.37
 RUNOFF VOLUME (mm)= 83.83 42.45
 TOTAL RAINFALL (mm)= 85.83 85.83
 RUNOFF COEFFICIENT = .98 .49

TOTALS
 .273 (iii)
 1.250
 57.348
 85.833
 .668

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 -
 250:0015-----
 -

CALIB STANDHYD	Area (ha)=	2.61
03:108 DT= 1.00	Total Imp(%)=	25.00 Dir. Conn.(%)= 25.00

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= .65 1.96
 Dep. Storage (mm)= 2.00 5.00
 Average Slope (%)= 1.00 2.00
 Length (m)= 132.00 40.00
 Mannings n = .013 .250

Max. eff. Inten. (mm/hr)= 274.70 99.58
 over (min)= 2.00 9.00
 Storage Coeff. (min)= 2.01 (ii) 9.08 (ii)
 Unit Hyd. Tpeak (min)= 2.00 9.00
 Unit Hyd. peak (cms)= .56 .12

PEAK FLOW (cms)= .47 .35
 TIME TO PEAK (hrs)= 1.25 1.38
 RUNOFF VOLUME (mm)= 83.83 38.42
 TOTAL RAINFALL (mm)= 85.83 85.83
 RUNOFF COEFFICIENT = .98 .45

TOTALS
 .617 (iii)
 1.250
 49.772
 85.833
 .580

 -
 250:0016-----
 -

ADD HYD (CONF)	ID: NHYD	AREA (ha)	OPEAK (cms)	TPEAK (hrs)	R. V. (mm)	DWF (cms)
	ID1 10: CONF1	41.21	2.948	1.83	48.87	.000
	+ID2 01:110	2.13	.698	1.25	57.35	.000
	+ID3 02:109	.80	.273	1.25	57.35	.000
	+ID4 03:108	2.61	.617	1.25	49.77	.000
=====						
	SUM 04: CONF	46.75	3.967	1.35	49.45	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 -
 250:0017-----
 -

 -
 250:0002-----
 -

FINISH

 -

 *
 WARNINGS / ERRORS / NOTES

 Simulation ended on 2025-04-25 at 12:46:14

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Appendix E

Post-Development Conditions Hydrologic Modelling Results

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=====
SSSS W W M M H H Y Y M M 000      999 999  =====
S   W W W MM MM H H Y Y MM MM 0 0   9 9 9 9
SSSS W W W M M M H H H H Y M M M 0 0 ## 9 9 9 9 Ver 4.05
S   W W M M H H Y M M 0 0           9999 9999 Sept 2011
SSSS W W M M H H Y M M 000          9 9  =====
StormWater Management HYdrologic Model 9 9 9 9 # 3053466
999 999  =====

*****
***** SWMHYMO Ver/4.05 *****
***** A single event and continuous hydrologic simulation model *****
***** based on the principles of HYMO and its successors *****
***** OTTHYMO-83 and OTTHYMO-89. *****
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***** Gatineau, Quebec: (819) 243-6858 *****
***** E-Mail: swmhymo@fsa.Com *****

+++++
+++++ Licensed user: MTE Consultants Inc. +++++
+++++ Burlington SERIAL#: 3053466 +++++

*****
***** +++++ PROGRAM ARRAY DIMENSIONS +++++ *****
***** Maximum value for ID numbers : 10 *****
***** Max. number of rainfall points: 105408 *****
***** Max. number of flow points : 105408 *****

***** DETAILED OUTPUT *****
*****
* DATE: 2025-04-21 TIME: 15:13:49 RUN COUNTER: 000492 *
*****
* Input filename: Q:\60010_-1\SWM\SWMHYMO\POST.dat *
* Output filename: Q:\60010_-1\SWM\SWMHYMO\POST.out *
* Summary filename: Q:\60010_-1\SWM\SWMHYMO\POST.sum *
* User comments: *
* 1: _____ *
* 2: _____ *
* 3: _____ *
*****
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001:0001-----

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-
*#*****
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Model Ier : [JJM]
*#*****
-----
| START | Project dir.: Q:\60010_-1\SWM\SWMHYMO\
----- Rainfall dir.: Q:\60010_-1\SWM\SWMHYMO\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 001
NSTORM= 1
# 1=25mm. HYT

-----
001:0002-----
-----
| READ STORM | Filename: 25mm Chicago 4-hr duration
| Ptotal = 24.83 mm | Comments: 25mm Chicago 4-hr duration

-----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
.08 1.326 | 1.17 3.978 | 2.25 4.889 | 3.33 1.844
.17 1.392 | 1.25 4.803 | 2.33 4.304 | 3.42 1.765
.25 1.466 | 1.33 6.089 | 2.42 3.849 | 3.50 1.693
.33 1.549 | 1.42 8.350 | 2.50 3.485 | 3.58 1.627
.42 1.643 | 1.50 13.259 | 2.58 3.187 | 3.67 1.567
.50 1.750 | 1.58 29.925 | 2.67 2.939 | 3.75 1.511
.58 1.875 | 1.67 75.600 | 2.75 2.729 | 3.83 1.460
.67 2.020 | 1.75 27.475 | 2.83 2.549 | 3.92 1.412
.75 2.193 | 1.83 15.856 | 2.92 2.392 | 4.00 1.368
.83 2.401 | 1.92 10.977 | 3.00 2.256 | 4.08 1.326
.92 2.657 | 2.00 8.363 | 3.08 2.135
1.00 2.981 | 2.08 6.752 | 3.17 2.027
1.08 3.404 | 2.17 5.667 | 3.25 1.930

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001:0003-----
-
*#-----
*# UNCONTROLLED AREAS
*#
*#-----
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| CALIB STANDHYD | Area (ha)= .08

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| 01:201 DT= 1.00 | Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.04	.04
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	30.00
Mannings n =	.015	.250
Max. eff. Inten. (mm/hr)=	75.60	4.99
over (min)	1.00	21.00
Storage Coeff. (min)=	1.23 (ii)	20.93 (ii)
Unit Hyd. Tpeak (min)=	1.00	21.00
Unit Hyd. peak (cms)=	.95	.05

TOTALS

PEAK FLOW (cms)=	.01	.00	.008 (iii)
TIME TO PEAK (hrs)=	1.67	2.07	1.667
RUNOFF VOLUME (mm)=	22.83	3.61	13.219
TOTAL RAINFALL (mm)=	24.83	24.83	24.833
RUNOFF COEFFICIENT =	.92	.15	.532

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0004-----

| CALIB STANDHYD | Area (ha)= 3.26
| 02:202 DT= 2.00 | Total Imp(%)= 66.00 Dir. Conn.(%)= 56.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.15	1.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	.30	2.00
Length (m)=	200.00	30.00
Mannings n =	.015	.250
Max. eff. Inten. (mm/hr)=	60.38	8.60
over (min)	7.50	22.50
Storage Coeff. (min)=	7.41 (ii)	23.25 (ii)
Unit Hyd. Tpeak (min)=	7.50	22.50
Unit Hyd. peak (cms)=	.15	.05

TOTALS

PEAK FLOW (cms)=	.22	.02	.221 (iii)
TIME TO PEAK (hrs)=	1.75	2.08	1.750
RUNOFF VOLUME (mm)=	22.83	4.89	14.938

TOTAL RAINFALL (mm)= 24.83 24.83 24.833
RUNOFF COEFFICIENT = .92 .20 .602

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

001:0005-----

| ROUTE RESERVOIR | Requested routing time step = 2.0 min.
| IN>02: (202) |
| OUT<03: (003001) |

=====	OUTFLOW STORAGE	=====	OUTFLOW STORAGE	=====
(cms)	(ha.m.)	(cms)	(ha.m.)	
.000	.0000E+00	.091	.8690E-01	
.039	.1230E-01	.103	.1242E+00	
.062	.3090E-01	.114	.1678E+00	
.078	.5580E-01	.121	.2004E+00	

ROUTING RESULTS	AREA	OPEAK	TPEAK	R. V.
-----	(ha)	(cms)	(hrs)	(mm)
INFLOW >02: (202)	3.26	.221	1.750	14.938
OUTFLOW<03: (003001)	3.26	.053	2.250	14.938
OVERFLOW<04: (003002)	.00	.000	.000	.000

TOTAL NUMBER OF SIMULATED OVERFLOWS = 0
CUMULATIVE TIME OF OVERFLOWS (hours)= .00
PERCENTAGE OF TIME OVERFLOWING (%)= .00

PEAK FLOW REDUCTION [Qout/Qin](%)= 23.836
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= .2344E-01

001:0006-----

ADD HYD (CONF) ID: NHYD	AREA	OPEAK	TPEAK	R. V.	DWF
-----	(ha)	(cms)	(hrs)	(mm)	(cms)
ID1 01: 201	.08	.008	1.67	13.22	.000
+ID2 03:	3001	3.26	.053	2.25	14.94
+ID3 04:	3002	.00	.000	.00	.000

DRY

=====
SUM 05: CONF 3.34 .054 2.22 14.90 .000

Table with 8 columns of numerical data, likely representing flow rates or volumes at different time intervals.

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

001:0007

** END OF RUN : 1

START Project dir.: Q:\60010_~1\SWM\SWMHYM\

Rainfall dir.: Q:\60010_~1\SWM\SWMHYM\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 002
NSTORM= 1
1=2YR. HYT

002:0002

*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Model Ier : [JJM]

002:0002

READ STORM Filename: 2YR Chicago 3-hr duration
Ptotal = 40.18 mm Comments: 2YR Chicago 3-hr duration

Table with 8 columns: TIME, RAIN, TIME, RAIN, TIME, RAIN, TIME, RAIN. Shows time intervals and corresponding rainfall amounts.

002:0003

*# UNCONTROLLED AREAS

CALIB STANDHYD Area (ha)= .08
01:201 DT= 1.00 Total Imp(%)= 50.00 Dir. Conn. (%)= 50.00

Table with 3 columns: IMPERVIOUS, PERVIOUS (i). Rows include Surface Area, Dep. Storage, Average Slope, Length, Mannings n, Max. eff. Inten., Storage Coeff., Unit Hyd. Tpeak, and Unit Hyd. peak.

Table with 3 columns: PEAK FLOW, TIME TO PEAK, RUNOFF VOLUME, TOTAL RAINFALL, RUNOFF COEFFICIENT. Includes a *TOTALS* row.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 74.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

002:0004

CALIB STANDHYD | Area (ha)= 3.26
 02:202 DT= 2.00 | Total Imp(%)= 66.00 Dir. Conn. (%)= 56.00

PERCENTAGE OF TIME OVERFLOWING (%)= .00

PEAK FLOW REDUCTION [Qout/Qin] (%)= 15.393
 TIME SHIFT OF PEAK FLOW (min)= 35.00
 MAXIMUM STORAGE USED (ha.m.)= 5640E-01

IMPERVIOUS PVIOUS (i)
 Surface Area (ha)= 2.15 1.11
 Dep. Storage (mm)= 2.00 5.00
 Average Slope (%)= .30 2.00
 Length (m)= 200.00 30.00
 Mannings n = .015 .250

Max. eff. Inten. (mm/hr)= 142.60 37.69
 over (min)= 5.00 15.00
 Storage Coeff. (min)= 5.25 (ii) 14.03 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= .22 .08

TOTALS
 PEAK FLOW (cms)= .49 .07 .508 (iii)
 TIME TO PEAK (hrs)= 1.29 1.54 1.292
 RUNOFF VOLUME (mm)= 38.18 12.53 26.894
 TOTAL RAINFALL (mm)= 40.18 40.18 40.181
 RUNOFF COEFFICIENT = .95 .31 .669

- (i) CN PROCEDURE SELECTED FOR PVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

002:0005

ROUTE RESERVOIR
 IN>02: (202)
 OUT<03: (003001)

Requested routing time step = 2.0 min.

===== OUTFLOW STORAGE TABLE =====			
OUTFLOW	STORAGE	OUTFLOW	STORAGE
(cms)	(ha.m.)	(cms)	(ha.m.)
.000	.0000E+00	.091	.8690E-01
.039	.1230E-01	.103	.1242E+00
.062	.3090E-01	.114	.1678E+00
.078	.5580E-01	.121	.2004E+00

ROUTING RESULTS	AREA	OPEAK	TPEAK	R. V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW >02: (202)	3.26	.508	1.292	26.894
OUTFLOW<03: (003001)	3.26	.078	1.875	26.894
OVERFLOW<04: (003002)	.00	.000	.000	.000

TOTAL NUMBER OF SIMULATED OVERFLOWS = 0
 CUMULATIVE TIME OF OVERFLOWS (hours)= .00

002:0006

ADD HYD (CONF)	ID: NHYD	AREA (ha)	OPEAK (cms)	TPEAK (hrs)	R. V. (mm)	DWF (cms)	
	ID1 01:201	.08	.016	1.25	24.06	.000	
	+ID2 03:	3001	3.26	.078	1.88	26.89	.000
	+ID3 04:	3002	.00	.000	.00	.00	.000
DRY							
=====							
	SUM 05: CONF	3.34	.080	1.75	26.83	.000	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

002:0007

002:0002

** END OF RUN : 4

START | Project dir.: Q:\60010_~1\SWM\SWMHYM\

Rainfall dir.: Q:\60010_~1\SWM\SWMHYM\

TZERO = .00 hrs on 0
 METOUT= 2 (output = METRIC)
 NRUN = 005
 NSTORM= 1

1=5YR. HYT

 005:0002-----

*#*****
 *# Project Name: [Darcy Drive] Project Number: [60010-001]
 *# Date : March 2025
 *# Modeler : [JJM]
 *#*****

 005:0002-----

READ STORM	Filename: 2YR Chicago 3-hr duration
Ptotal = 44.62 mm	Comments: 2YR Chicago 3-hr duration

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	2.985	.92	10.201	1.75	11.320	2.58	4.069
.17	3.200	1.00	13.641	1.83	9.576	2.67	3.833
.25	3.452	1.08	20.397	1.92	8.299	2.75	3.624
.33	3.751	1.17	38.309	2.00	7.325	2.83	3.438
.42	4.110	1.25	142.426	2.08	6.560	2.92	3.271
.50	4.551	1.33	75.882	2.17	5.943	3.00	3.121
.58	5.105	1.42	37.961	2.25	5.435	3.08	2.985
.67	5.822	1.50	24.380	2.33	5.010		
.75	6.785	1.58	17.710	2.42	4.649		
.83	8.145	1.67	13.829	2.50	4.339		

 005:0003-----

*#-----
 *# UNCONTROLLED AREAS
 *#-----
 *#-----

CALIB STANDHYD	Area (ha)= .08
01:201 DT= 1.00	Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.04	.04
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	30.00
Mannings n =	.015	.250

Max. eff. Inten. (mm/hr)= 142.43 27.22
 over (min) 1.00 11.00
 Storage Coeff. (min)= .95 (ii) 10.95 (ii)
 Unit Hyd. Tpeak (min)= 1.00 11.00
 Unit Hyd. peak (cms)= 1.10 .10

PEAK FLOW (cms)= .02 .00
 TIME TO PEAK (hrs)= 1.25 1.48
 RUNOFF VOLUME (mm)= 42.62 12.18
 TOTAL RAINFALL (mm)= 44.62 44.62
 RUNOFF COEFFICIENT = .96 .27

TOTALS

.016 (iii)
 1.250
 27.401
 44.620
 .614

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 005:0004-----

CALIB STANDHYD	Area (ha)= 3.26
02:202 DT= 2.00	Total Imp(%)= 66.00 Dir. Conn.(%)= 56.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.15	1.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	.30	2.00
Length (m)=	200.00	30.00
Mannings n =	.015	.250

Max. eff. Inten. (mm/hr)= 142.43 42.52
 over (min) 5.00 12.50
 Storage Coeff. (min)= 5.26 (ii) 13.62 (ii)
 Unit Hyd. Tpeak (min)= 5.00 12.50
 Unit Hyd. peak (cms)= .22 .09

PEAK FLOW (cms)= .48 .08
 TIME TO PEAK (hrs)= 1.29 1.50
 RUNOFF VOLUME (mm)= 42.62 15.14
 TOTAL RAINFALL (mm)= 44.62 44.62
 RUNOFF COEFFICIENT = .96 .34

TOTALS

.513 (iii)
 1.292
 30.529
 44.620
 .684

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

005: 0005

ROUTE RESERVOIR
IN>02: (202)
OUT<03: (003001)

Requested routing time step = 2.0 min.

===== OUTFLOW STORAGE TABLE =====			
OUTFLOW (cms)	STORAGE (ha. m.)	OUTFLOW (cms)	STORAGE (ha. m.)
.000	.0000E+00	.091	.8690E-01
.039	.1230E-01	.103	.1242E+00
.062	.3090E-01	.114	.1678E+00
.078	.5580E-01	.121	.2004E+00

ROUTING RESULTS	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R. V. (mm)
INFLOW >02: (202)	3.26	.513	1.292	30.529
OUTFLOW<03: (003001)	3.26	.080	1.958	30.529
OVERFLOW<04: (003002)	.00	.000	.000	.000

TOTAL NUMBER OF SIMULATED OVERFLOWS = 0
 CUMULATIVE TIME OF OVERFLOWS (hours)= .00
 PERCENTAGE OF TIME OVERFLOWING (%)= .00

PEAK FLOW REDUCTION [Qout/Qin] (%)= 15.525
 TIME SHIFT OF PEAK FLOW (min)= 40.00
 MAXIMUM STORAGE USED (ha. m.)= .5967E-01

005: 0006

ADD HYD (CONF)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R. V. (mm)	DWF (cms)	
	ID1 01: 201	.08	.016	1.25	27.40	.000	
	+ID2 03:	3001	3.26	.080	1.96	30.53	.000
	+ID3 04:	3002	.00	.000	.00	.000	
=====							
	SUM 05: CONF	3.34	.081	1.83	30.45	.000	

DRY

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

005: 0007

005: 0002

005: 0002

** END OF RUN : 9

START | Project dir.: Q:\60010_1\SWM\SWMHYM0\

Rainfall dir.: Q:\60010_1\SWM\SWMHYM0\

TZERO = .00 hrs on 0
 METOUT= 2 (output = METRIC)
 NRUN = 010
 NSTORM= 1
 # 1=10YR. HYT

010: 0002

*# Project Name: [Darcy Drive] Project Number: [60010-001]
 *# Date : March 2025
 *# Modeler : [JJM]

010: 0002

READ STORM | Filename: 10YR Chicago 3-hr duration
 Ptotal = 52.12 mm | Comments: 10YR Chicago 3-hr duration

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	3.290	.92	11.676	1.75	13.008	2.58	4.527
.17	3.534	1.00	15.747	1.83	10.946	2.67	4.256
.25	3.821	1.08	23.802	1.92	9.443	2.75	4.017
.33	4.162	1.17	45.296	2.00	8.302	2.83	3.805

.42	4.573	1.25	169.701	2.08	7.408	2.92	3.615
.50	5.079	1.33	90.886	2.17	6.690	3.00	3.444
.58	5.718	1.42	45.008	2.25	6.101	3.08	3.290
.67	6.548	1.50	28.625	2.33	5.609		
.75	7.668	1.58	20.619	2.42	5.193		
.83	9.258	1.67	15.987	2.50	4.836		

| 02:202 DT= 2.00 | Total Imp(%)= 66.00 Dir. Conn.(%)= 56.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	2.15	1.11	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	.30	2.00	
Length (m)=	200.00	30.00	
Mannings n =	.015	.250	
Max. eff. Inten. (mm/hr)=	169.70	57.82	
over (min)	5.00	12.50	
Storage Coeff. (min)=	4.90 (ii)	12.29 (ii)	
Unit Hyd. Tpeak (min)=	5.00	12.50	
Unit Hyd. peak (cms)=	.23	.09	
			TOTALS
PEAK FLOW (cms)=	.59	.11	.634 (iii)
TIME TO PEAK (hrs)=	1.29	1.50	1.292
RUNOFF VOLUME (mm)=	50.12	19.87	36.812
TOTAL RAINFALL (mm)=	52.12	52.12	52.124
RUNOFF COEFFICIENT =	.96	.38	.706

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

010:0003-----

*#-----
*# UNCONTROLLED AREAS
*#-----
*#-----

| CALIB STANDHYD | Area (ha)= .08
| 01:201 DT= 1.00 | Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.04	.04
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	30.00
Mannings n =	.015	.250
Max. eff. Inten. (mm/hr)=	169.70	40.92
over (min)	1.00	9.00
Storage Coeff. (min)=	.89 (ii)	9.38 (ii)
Unit Hyd. Tpeak (min)=	1.00	9.00
Unit Hyd. peak (cms)=	1.15	.12

		TOTALS
PEAK FLOW (cms)=	.02	.00
TIME TO PEAK (hrs)=	1.25	1.43
RUNOFF VOLUME (mm)=	50.12	16.28
TOTAL RAINFALL (mm)=	52.12	52.12
RUNOFF COEFFICIENT =	.96	.31
		.637

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

010:0004-----

| CALIB STANDHYD | Area (ha)= 3.26

010:0005-----

ROUTE RESERVOIR	Requested routing time step = 2.0 min.			
IN>02: (202)	===== OUTFLOW STORAGE TABLE =====			
OUT<03: (003001)	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	.000	.0000E+00	.091	.8690E-01
	.039	.1230E-01	.103	.1242E+00
	.062	.3090E-01	.114	.1678E+00
	.078	.5580E-01	.121	.2004E+00

ROUTING RESULTS	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R. V. (mm)
INFLOW >02: (202)	3.26	.634	1.292	36.812
OUTFLOW<03: (003001)	3.26	.086	2.000	36.812
OVERFLOW<04: (003002)	.00	.000	.000	.000

TOTAL NUMBER OF SIMULATED OVERFLOWS = 0
CUMULATIVE TIME OF OVERFLOWS (hours)= .00
PERCENTAGE OF TIME OVERFLOWING (%)= .00

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.589
 TIME SHIFT OF PEAK FLOW (min)= 42.50
 MAXIMUM STORAGE USED (ha.m.)= 7541E-01

010: 0006

ADD HYD (CONF)	ID: NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R. V. (mm)	DWF (cms)
ID1 01: 201		.08	.020	1.25	33.20	.000
+ID2 03:	3001	3.26	.086	2.00	36.81	.000
+ID3 04:	3002	.00	.000	.00	.00	.000
DRY						
SUM 05: CONF		3.34	.088	1.83	36.73	.000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

010: 0007

010: 0002

010: 0002

010: 0002

** END OF RUN : 24

START | Project dir.: Q:\60010_-1\SWM\SWMHYM0\

Rainfall dir.: Q:\60010_-1\SWM\SWMHYM0\

TZERO = .00 hrs on 0
 METOUT= 2 (output = METRIC)
 NRUN = 025
 NSTORM= 1
 # 1=25YR. HYT

025: 0002

 *# Project Name: [Darcy Drive] Project Number: [60010-001]
 *# Date : March 2025
 *# Modeler : [JJM]

025: 0002

READ STORM | Filename: 25YR Chicago 3-hr duration
 Ptotal = 61.91 mm | Comments: 25YR Chicago 3-hr duration

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	3.654	.92	13.643	1.75	15.267	2.58	5.093
.17	3.937	1.00	18.597	1.83	12.764	2.67	4.777
.25	4.269	1.08	28.462	1.92	10.948	2.75	4.498
.33	4.666	1.17	54.858	2.00	9.575	2.83	4.251
.42	5.147	1.25	203.805	2.08	8.505	2.92	4.031
.50	5.741	1.33	110.631	2.17	7.648	3.00	3.833
.58	6.494	1.42	54.598	2.25	6.948	3.08	3.654
.67	7.478	1.50	34.426	2.33	6.366		
.75	8.813	1.58	24.578	2.42	5.875		
.83	10.721	1.67	18.902	2.50	5.456		

025: 0003

 *# UNCONTROLLED AREAS
 *#
 *#

CALIB STANDHYD | Area (ha)= .08
 01: 201 DT= 1.00 | Total Imp(%)= 50.00 Dir. Conn.(%)= 50.00

SUM 05: CONF 3.34 .097 1.83 45.12 .000

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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025: 0007-----
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025: 0002-----
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025: 0002-----
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025: 0002-----
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025: 0002-----
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025: 0002-----
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** END OF RUN : 99

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| START | Project dir.: Q:\60010_-1\SWM\SWMHYM\
-----
Rainfall dir.: Q:\60010_-1\SWM\SWMHYM\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 100
NSTORM= 1
# 1=100YR. HYT
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100: 0002-----

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*****
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Modeler : [JJM]

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*#*****

100: 0002-----

READ STORM		Filename: 100YR Chicago 3-hr duration					
Ptotal = 76.58 mm		Comments: 100YR Chicago 3-hr duration					
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	4.124	.92	16.827	1.75	18.954	2.58	5.884
.17	4.466	1.00	23.309	1.83	15.688	2.67	5.494
.25	4.871	1.08	36.264	1.92	13.330	2.75	5.151
.33	5.357	1.17	70.558	2.00	11.559	2.83	4.849
.42	5.950	1.25	248.539	2.08	10.186	2.92	4.580
.50	6.689	1.33	140.446	2.17	9.094	3.00	4.340
.58	7.633	1.42	70.312	2.25	8.207	3.08	4.124
.67	8.876	1.50	44.113	2.33	7.473		
.75	10.579	1.58	31.184	2.42	6.858		
.83	13.034	1.67	23.720	2.50	6.334		

100: 0003-----

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*#-----
*#
*# UNCONTROLLED AREAS
*#
*#-----

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CALIB STANDHYD		Area (ha)= .08	
01: 201 DT= 1.00		Total Imp(%)= 50.00 Dir. Conn. (%)= 50.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.04	.04
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	30.00
Mannings n =	.015	.250
Max. eff. Inten. (mm/hr)=	248.54	86.16
over (min)	1.00	7.00
Storage Coeff. (min)=	.76 (ii)	7.07 (ii)
Unit Hyd. Tpeak (min)=	1.00	7.00
Unit Hyd. peak (cms)=	1.24	.16

```

*TOTALS*
PEAK FLOW (cms)= .03 .01 .030 (iii)
TIME TO PEAK (hrs)= 1.25 1.38 1.250
RUNOFF VOLUME (mm)= 74.58 31.86 53.219

```

TOTAL RAINFALL (mm)= 76.58 76.58 76.580
 RUNOFF COEFFICIENT = .97 .42 .695

(cms)	(ha. m.)	(cms)	(ha. m.)
.000	.0000E+00	.091	.8690E-01
.039	.1230E-01	.103	.1242E+00
.062	.3090E-01	.114	.1678E+00
.078	.5580E-01	.121	.2004E+00

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ROUTING RESULTS	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R. V. (mm)
INFLOW >02: (202)	3.26	1.056	1.292	58.186
OUTFLOW <03: (003001)	3.26	.105	2.083	58.186
OVERFLOW <04: (003002)	.00	.000	.000	.000

 100:0004-----

CALIB STANDHYD	Area (ha)	Imp(%)	Dir. Conn. (%)
02:202 DT= 2.00	3.26	66.00	56.00

TOTAL NUMBER OF SIMULATED OVERFLOWS = 0
 CUMULATIVE TIME OF OVERFLOWS (hours)= .00
 PERCENTAGE OF TIME OVERFLOWING (%)= .00

PEAK FLOW REDUCTION [Qout/Qin] (%)= 9.942
 TIME SHIFT OF PEAK FLOW (min)= 47.50
 MAXIMUM STORAGE USED (ha. m.)= 1321E+00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.15	1.11
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	.30	2.00
Length (m)=	200.00	30.00
Mannings n =	.015	.250

Max. eff. Inten. (mm/hr)=	248.54	127.54
over (min)	5.00	10.00
Storage Coeff. (min)=	4.21 (ii)	9.60 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	.25	.12

TOTALS
 1.056 (iii)

PEAK FLOW (cms)=	.92	.24	1.056 (iii)
TIME TO PEAK (hrs)=	1.29	1.42	1.292
RUNOFF VOLUME (mm)=	74.58	37.32	58.186
TOTAL RAINFALL (mm)=	76.58	76.58	76.580
RUNOFF COEFFICIENT =	.97	.49	.760

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 100:0006-----

ADD HYD (CONF)	ID	NHYD	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R. V. (mm)	DWF (cms)	
	ID1	01:201	.08	.030	1.25	53.22	.000	
	+ID2	03:	3001	3.26	.105	2.08	58.19	.000
	+ID3	04:	3002	.00	.000	.00	.00	.000
DRY								
=====								
	SUM	05:CONF	3.34	.108	1.75	58.07	.000	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 100:0005-----

ROUTE RESERVOIR	Requested routing time step = 2.0 min.
IN>02: (202)	
OUT<03: (003001)	===== OUTFLOW STORAGE TABLE =====
	OUTFLOW STORAGE OUTFLOW STORAGE

 100:0007-----

 100:0002-----

 100:0002-----

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100: 0002-----
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100: 0002-----
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.17	4.994	1.00	31.394	1.83	17.167	2.67	6.123
.25	5.481	1.08	53.230	1.92	14.680	2.75	5.739
.33	6.071	1.17	124.286	2.00	12.786	2.83	5.401
.42	6.799	1.25	274.700	2.08	11.300	2.92	5.099
.50	7.719	1.33	115.167	2.17	10.109	3.00	4.830
.58	8.914	1.42	66.257	2.25	9.135	3.08	4.587
.67	10.518	1.50	44.425	2.33	8.325		
.75	12.772	1.58	32.586	2.42	7.643		
.83	16.125	1.67	25.348	2.50	7.061		

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100: 0002-----
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** END OF RUN : 249

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| START | Project dir.: Q:\60010_~1\SWM\SWMHYM\
-----
Rainfall dir.: Q:\60010_~1\SWM\SWMHYM\

TZERO = .00 hrs on 0
METOUT= 2 (output = METRIC)
NRUN = 250
NSTORM= 1
# 1=250YR.HYT
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250: 0002-----
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*#*****
*# Project Name: [Darcy Drive] Project Number: [60010-001]
*# Date : March 2025
*# Modeler : [JJM]
*#*****
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250: 0002-----
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| READ STORM | Filename: 250YR Chicago 3-hr duration
| Ptotal = 85.83 mm | Comments: 250YR Chicago 3-hr duration
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TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.08	4.587	.92	21.539	1.75	20.546	2.58	6.559

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250: 0003-----
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*#=====
*#
*# UNCONTROLLED AREAS
*#
*#=====

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CALIB	STANDHYD	Area (ha)=	.08
01:201	DT= 1.00	Total Imp(%)=	50.00
		Dir. Conn.(%)=	50.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	.04	.04
Dep. Storage (mm)=	2.00	5.00
Average Slope (%)=	2.00	2.00
Length (m)=	30.00	30.00
Mannings n =	.015	.250
Max. eff. Inten. (mm/hr)=	274.70	115.83
over (min)	1.00	6.00
Storage Coeff. (min)=	.73 (ii)	6.33 (ii)
Unit Hyd. Tpeak (min)=	1.00	6.00
Unit Hyd. peak (cms)=	1.26	.18

	TOTALS		
PEAK FLOW (cms)=	.03	.01	.036 (iii)
TIME TO PEAK (hrs)=	1.25	1.33	1.250
RUNOFF VOLUME (mm)=	83.83	38.42	61.126
TOTAL RAINFALL (mm)=	85.83	85.83	85.833
RUNOFF COEFFICIENT =	.98	.45	.712

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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250: 0004-----
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 | CALIB STANDHYD | Area (ha)= 3.26
 | 02:202 DT= 2.00 | Total Imp(%)= 66.00 Dir. Conn.(%)= 56.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	2.15	1.11	
Dep. Storage (mm)=	2.00	5.00	
Average Slope (%)=	.30	2.00	
Length (m)=	200.00	30.00	
Mannings n =	.015	.250	
Max. eff. Inten. (mm/hr)=	274.70	146.12	
over (min)	5.00	10.00	
Storage Coeff. (min)=	4.04 (ii)	9.14 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	.25	.12	
			TOTALS
PEAK FLOW (cms)=	1.03	.30	1.243 (iii)
TIME TO PEAK (hrs)=	1.29	1.38	1.292
RUNOFF VOLUME (mm)=	83.83	44.52	66.534
TOTAL RAINFALL (mm)=	85.83	85.83	85.833
RUNOFF COEFFICIENT =	.98	.52	.775

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 74.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 250:0005-----

 | ROUTE RESERVOIR |
 | IN>02: (202) |
OUT<03: (003001)

Requested routing time step = 2.0 min.

=====	OUTFLOW STORAGE TABLE	=====
OUTFLOW STORAGE	OUTFLOW STORAGE	
(cms) (ha.m.)	(cms) (ha.m.)	
.000 .0000E+00	.091 .8690E-01	
.039 .1230E-01	.103 .1242E+00	
.062 .3090E-01	.114 .1678E+00	
.078 .5580E-01	.121 .2004E+00	

ROUTING RESULTS	AREA	QPEAK	TPEAK	R. V.
-----	(ha)	(cms)	(hrs)	(mm)
INFLOW >02: (202)	3.26	1.243	1.292	66.534
OUTFLOW<03: (003001)	3.26	.110	2.125	66.534
OVERFLOW<04: (003002)	.00	.000	.000	.000

TOTAL NUMBER OF SIMULATED OVERFLOWS = 0
 CUMULATIVE TIME OF OVERFLOWS (hours)= .00
 PERCENTAGE OF TIME OVERFLOWING (%)= .00

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.877
 TIME SHIFT OF PEAK FLOW (min)= 50.00
 MAXIMUM STORAGE USED (ha.m.)= 1534E+00

 250:0006-----

ADD HYD (CONF)	ID: NHYD	AREA	QPEAK	TPEAK	R. V.	DWF	
-----	-----	(ha)	(cms)	(hrs)	(mm)	(cms)	
	ID1 01:201	.08	.036	1.25	61.13	.000	
	+ID2 03:	3001	3.26	.110	2.13	66.53	.000
	+ID3 04:	3002	.00	.000	.00	.00	.000
DRY							
	=====	=====	=====	=====	=====	=====	
	SUM 05: CONF	3.34	.113	1.75	66.40	.000	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 250:0007-----

 250:0002-----

 250:0002-----

 250:0002-----

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 250:0002-----

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250:0002-----
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      FINISH
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*
      WARNINGS / ERRORS / NOTES
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Simulation ended on 2025-04-21    at 15:13:51
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Appendix F

Pond Design Information



**DARCY DRIVE SITE PLAN
STORMWATER MANAGEMENT**

Strathroy, Ontario

Project Number: 60010_001
 Date: April 21, 2025
 Design By: JJM
 File: Q:\60010_001\SWM\SWMHYMO\60010-001 - Master SWM Facility Design Sheet.xlsx

STAGE-STORAGE RELATIONSHIP

Stage	Active Depth	Surface Ponding			Main Pond			Total Pond Volume	Active Storage Volume	Volume Summary	Ponding Elevation	Comments	Stage
		Area	Volume	Cumulative Volume	Area	Volume	Cumulative Volume						
<i>m</i>	<i>m</i>	<i>m²</i>	<i>m³</i>	<i>m³</i>	<i>m²</i>	<i>m³</i>	<i>m³</i>	<i>m³</i>	<i>m³</i>	<i>m³</i>	<i>m</i>		<i>m</i>
232.90	0.00				307	0	0	0	0				232.90
233.00	0.10				377	34	34	34	34				233.00
233.10	0.20				446	41	75	75	75				233.10
233.20	0.30				516	48	123	123	123				233.20
233.30	0.40				585	55	178	178	178				233.30
233.40	0.50				655	62	240	240	240	234	233.39	25mm Event	233.40
233.50	0.60				724	69	309	309	309				233.50
233.60	0.70				794	76	385	385	385				233.60
233.70	0.80				863	83	468	468	468				233.70
233.80	0.90				933	90	558	558	558	564	233.81	1:2 Year Event	233.80
233.90	1.00				1002	97	654	654	654	596	233.84	1:5 Year Event	233.90
234.00	1.10				1072	104	758	758	758	754	234.00	1:10 Year Event	234.00
234.10	1.20				1141	111	869	869	869			1:25 Year Event	234.10
234.20	1.30				1211	118	986	986	986	975	234.20	1:25 Year Event	234.20
234.30	1.40				1280	125	1111	1111	1111				234.30
234.40	1.50				1350	131	1242	1242	1242				234.40
234.50	1.60				1419	138	1381	1381	1381	1321	234.46	1:100 Year Event	234.50
234.60	1.70				1489	145	1526	1526	1526				234.60
234.70	1.80				1558	152	1678	1678	1678	1534	234.61	Maximum Ponding (1:250)	234.70
234.80	1.90				1628	159	1838	1838	1838				234.80
234.90	2.00				1697	166	2004	2004	2004				234.90
235.00	2.10											Freeboard	235.00



DARCY DRIVE SITE PLAN
STORMWATER MANAGEMENT
 Strathroy, Ontario

Project Number: 60010_001
 Date: April 21, 2025
 Design By: JJM
 File: Q:\60010_001\SWM\SWMHYMO\60010-001 - Master SWM Facility Design Sheet.xlsx

Orifice Calculations			
$Q_o = C_d * A_o * (2 * g * H_o)^{0.5}$			
	Orifice 1	Orifice 2	Orifice 3
C_d	0.63	0.63	0.63
Invert (m)	232.90	500.00	500.00
Width (m)			
Diameter/Height (m)	0.200		
Type (H/V)	V	V	V

C_d	Description
0.63	Orifice Plate
0.80	Orifice Tube

Weir Calculations		
$Q_w = 2/3 * C_d * (2g)^{1/2} * L * H_w^{3/2} + 8/15 * C_d * (2g)^{1/2} * \tan\theta * H_w^{5/2}$		
	0.50	0.50
C_d	0.50	0.50
Invert (m)	500.00	500.00
Length (m)		
Side Slope (H:V)	1	1
Side Slope (rad)	0.785	0.785

STAGE-DISCHARGE RELATIONSHIP

Stage	Active Volume	Orifice 1			Orifice 2			Orifice 3			Weir 1 Flow	Weir 2 Flow	Total Flow	Average Discharge	Increment Volume	Increment Dewatering Time	Extended Detention	Erosion Control
		Area	H_o	Flow	Area	H_o	Flow	Area	H_o	Flow							Cumulative Dewatering Time	Cumulative Dewatering Time
m	m^3	m^2	m	m^3/s	m^2	m	m^3/s	m^2	m	m^3/s	m^3/s	m^3/s	m^3/s	m^3	hours	hours	hours	
232.90	0	0.00	0.00	0.0000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0000	0.0049	34	1.94	2.55	4.28
233.00	34	0.02	0.05	0.0098	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0098	0.0188	41	0.61	0.61	2.34
233.10	75	0.03	0.10	0.0277	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0277	0.0335	48	0.40		1.73
233.20	123	0.03	0.20	0.0392	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0392	0.0436	55	0.35		1.33
233.30	178	0.03	0.30	0.0480	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0480	0.0517	62	0.33		0.98
233.40	240	0.03	0.40	0.0554	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0554	0.0587	69	0.33		0.65
233.50	309	0.03	0.50	0.0620	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0620	0.0649	76	0.32		0.32
233.60	385	0.03	0.60	0.0679	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0679	0.0706	83	0.33		
233.70	468	0.03	0.70	0.0733	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0733	0.0759	90	0.33		
233.80	558	0.03	0.80	0.0784	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0784	0.0808	97	0.33		
233.90	654	0.03	0.90	0.0832	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0832	0.0854	104	0.34		
234.00	758	0.03	1.00	0.0877	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0877	0.0898	111	0.34		
234.10	869	0.03	1.10	0.0919	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0919	0.0940	118	0.35		
234.20	986	0.03	1.20	0.0960	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.0960	0.0980	125	0.35		
234.30	1111	0.03	1.30	0.1000	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.1000	0.1018	131	0.36		
234.40	1242	0.03	1.40	0.1037	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.1037	0.1056	138	0.36		
234.50	1381	0.03	1.50	0.1074	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.1074	0.1091	145	0.37		
234.60	1526	0.03	1.60	0.1109	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.1109	0.1126	152	0.38		
234.70	1678	0.03	1.70	0.1143	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.1143	0.1160	159	0.38		
234.80	1838	0.03	1.80	0.1176	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.1176	0.1192	166	0.39		
234.90	2004	0.03	1.90	0.1208	0.00	0.00	0.0000	0.00	0.00	0.0000	0.0000	0.0000	0.1208	0.0604				

Appendix G

CDS Stormwater Treatment Unit (OGS) Information

**CDS ESTIMATED NET ANNUAL TSS LOAD REDUCTION
BASED ON THE RATIONAL RAINFALL METHOD
AND A FINE PARTICLE SIZE DISTRIBUTION**



Echelon Environmental

55 Albert Street, Suite #200 | Markham, ON, L3P 2T4

www.echelonenvironmental.ca

info@echelonenvironmental.ca

[905-948-0000](tel:905-948-0000)

Project Name: 2844 Centre Road

Engineer: MTE

Location: Strathroy, ON

Contact: Joshua Monster, P.Eng

OGS ID: 1

Report Date: 22-Apr-25

Area: 3.270 ha

Rainfall Station # 195

C Value: 0.66

Particle Size Distribution FINE

CDS Model: PMSU3030-6

CDS Treatment Capacity: 85 l/s

<u>Rainfall Intensity¹</u> <u>(mm/hr)</u>	<u>Percent Rainfall Volume¹</u>	<u>Cumulative Rainfall Volume</u>	<u>Total Flowrate (l/s)</u>	<u>Treated Flowrate (l/s)</u>	<u>Operating Rate (%)</u>	<u>Removal Efficiency (%)</u>	<u>Incremental Removal (%)</u>
0.5	9.8%	9.8%	3.0	3.0	3.5	97.8	9.6
1.0	10.3%	20.1%	6.0	6.0	7.1	96.8	9.9
1.5	9.7%	29.7%	9.0	9.0	10.6	95.8	9.3
2.0	8.9%	38.6%	12.0	12.0	14.1	94.8	8.4
2.5	7.7%	46.2%	15.0	15.0	17.7	93.8	7.2
3.0	6.5%	52.7%	18.0	18.0	21.2	92.8	6.0
3.5	4.2%	56.9%	21.0	21.0	24.7	91.8	3.9
4.0	4.7%	61.6%	24.0	24.0	28.2	90.8	4.2
4.5	3.9%	65.4%	27.0	27.0	31.8	89.7	3.5
5.0	3.4%	68.8%	30.0	30.0	35.3	88.7	3.0
6.0	4.7%	73.6%	36.0	36.0	42.4	86.7	4.1
7.0	4.6%	78.2%	42.0	42.0	49.4	84.7	3.9
8.0	3.5%	81.7%	48.0	48.0	56.5	82.7	2.9
9.0	2.3%	84.0%	54.0	54.0	63.6	80.6	1.9
10.0	2.6%	86.6%	60.0	60.0	70.6	78.6	2.0
15.0	6.7%	93.3%	90.0	85.0	100.0	66.3	4.5
20.0	2.7%	96.0%	120.0	85.0	100.0	49.7	1.3
25.0	1.7%	97.7%	120.0	85.0	100.0	49.7	0.9
30.0	1.3%	99.0%	120.0	85.0	100.0	49.7	0.7
35.0	0.6%	99.6%	120.0	85.0	100.0	49.7	0.3
40.0	0.3%	99.8%	120.0	85.0	100.0	49.7	0.1
45.0	0.0%	99.8%	120.0	85.0	100.0	49.7	0.0
50.0	0.2%	100.0%	120.0	85.0	100.0	49.7	0.1

87.5

Removal Efficiency Adjustment² = 6.5%

Predicted Net Annual TSS Removal Efficiency = 81.0%

Predicted Annual Rainfall Treated = 97.0%

1 - Based on 44 years of hourly rainfall data from Canadian Station 6144475, London ON

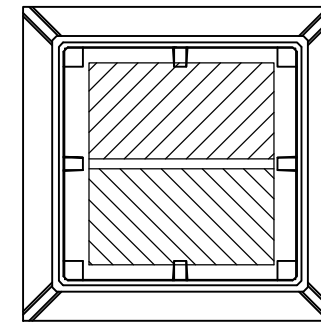
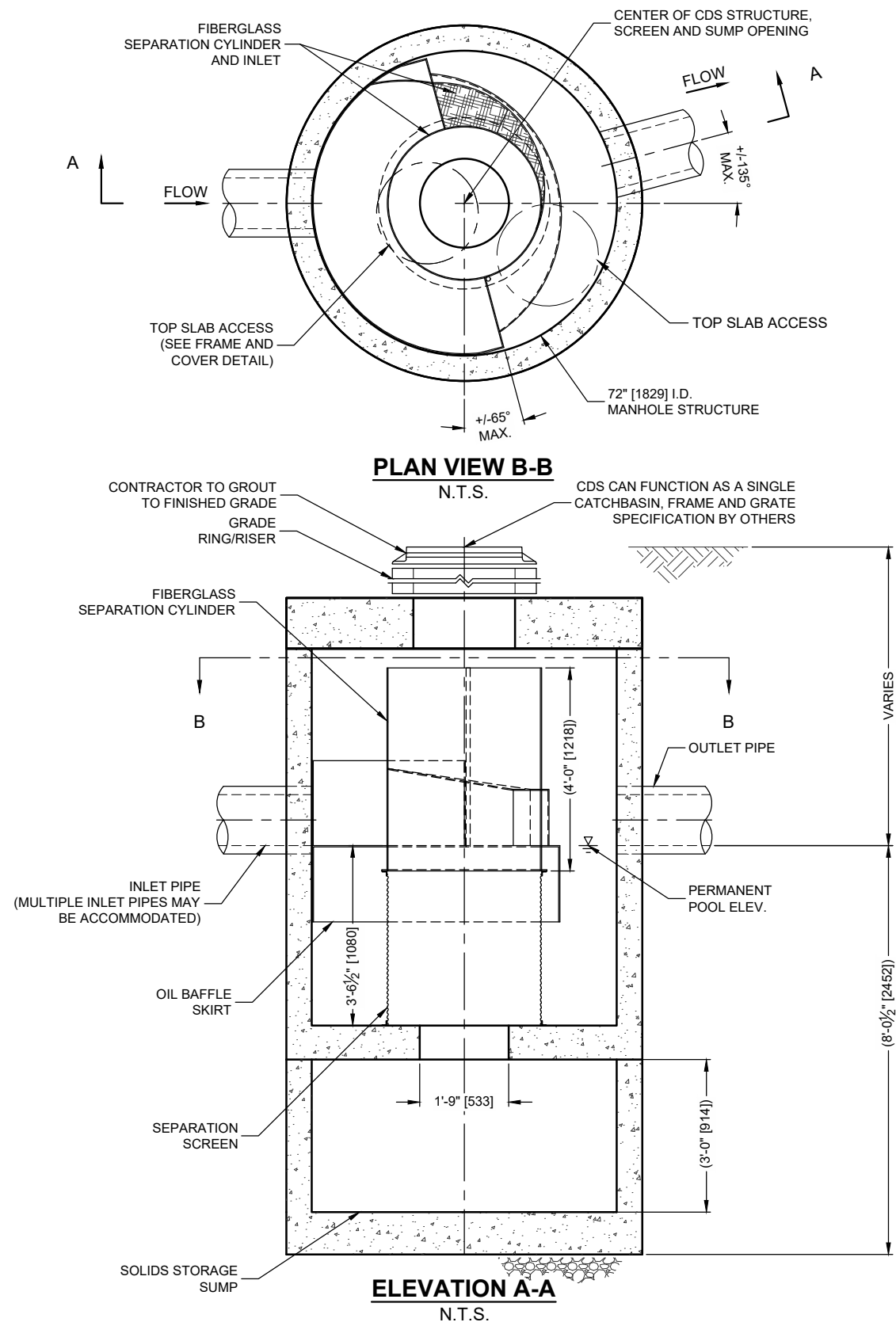
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

3 - CDS Efficiency based on testing conducted at the University of Central Florida

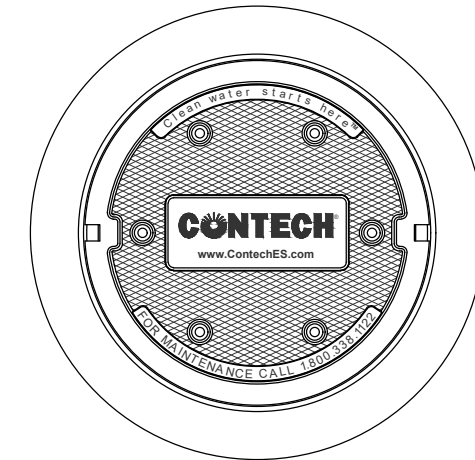
4 - CDS design flowrate and scaling based on standard manufacturer model & product specifications

CDS PMSU-3030-6-C DESIGN NOTES

THE STANDARD CDS PMSU-3030-6-C CONFIGURATION IS SHOWN.
 ANTI-BUOYANCY SLAB MAY BE INCLUDED (NOT SHOWN).
 SUMP DEPTH SHOWN IS TYPICAL, CAN BE EXTENDED AS REQUIRED.
 HYDRAULIC CHARACTERISTICS VARY BASED ON PIPE SIZE, MATERIAL, AND CDS UNIT SELECTION. FOR CUSTOM HYDRAULIC ANALYSIS PLEASE CONTACT ECHELON ENVIRONMENTAL.
 FOR SITE SPECIFIC DRAWINGS PLEASE CONTACT ECHELON ENVIRONMENTAL.



FRAME AND GRATE
(DIMENSIONS VARIES)
N.T.S.



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

GENERAL NOTES

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH () ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
- CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
- STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET HS20 (AASHTO M 306) AND BE CAST WITH THE CONTECH LOGO.
- IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES

- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
- CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS, AND ASSEMBLE STRUCTURE.
- CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

Appendix H

OBC Fire Flow Calculations

Project: Darcy Drive Site Plan
Project No: 60010_001
Designer: JJM
Date: Apr-25



TABLE 1 - OBC Div. B - A-3.2.5.7

	A-2 B-1 B-2 B-3 C D	A-4 F-3	A-1 A-3	E F-2	F-1
noncombustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches.	10	12	14	17	23
noncombustible construction or of heavy timber construction conforming to Article 3.1.4.6. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, loadbearing walls, columns and arches do not have a fire-resistance rating.	16	19	22	27	37
combustible construction with fire separations and fire-resistance ratings provided in accordance with Subsection 3.2.2., including loadbearing walls, columns and arches. Noncombustible construction may be used in lieu of fire-resistance rating where permitted in Subsection 3.2.2.	18	22	25	31	41
combustible construction. Floor assemblies are fire separations but with no fire-resistance rating. Roof assemblies, mezzanines, load bearing walls, columns and arches do not have a fire-resistance rating.	23	28	32	39	53

$Q = KVS$
 $Q = 180,228 \text{ m}^3$

$K = 23$ (Water Supply Coefficient From Tbl 1)
 $V = 3918.0$ (Volume of Building m^3)
 $S = 2$ (Spatial Coefficient, Max Value = 2)

$V = 3918.0 \text{ m}^3$
 $A = 653$ Gross Footprint area (m^2)
 $H = 6$ Building Height (m)

TABLE 2 - OBC Div. B - A-3.2.5.7

Q ≤ 108,000L	2700
108,000L ≤ Q ≤ 135,000L	3600
135,000L ≤ Q ≤ 162,000L	4500
162,000L ≤ Q ≤ 190,000L	5400
190,000L ≤ Q ≤ 270,000L	6300
270,000L ≤ Q	9000

Fire Flow Required = 5400 L/min
 = 90.00 L/s
 = 1426.50 USGPM
 = 1187.76 IGPM

Building Volume Calculation:

Footprint Area: 653 m^2
 # Storeys: 2 (2 storey + basement)
 Floor height: 3 m (9' ceiling)
 Floor Thickness: 0 m (1')
 Total Volume: 3918 m^3