



Perth County Ingredients, Building Additions

Stormwater Management Report

Project Location:

20 Thames Road North, St. Marys, ON

Prepared for:

Perth County Ingredients
20 Thames Road North
St. Marys, ON N4X 1C4

Prepared by:

MTE Consultants
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Stratford, ON N5A 2A5

January 12, 2013

MTE File No.: 44357-112





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Site Grading, Servicing General and Sediment & Erosion Control Plan MTE Drawing No. C2.1	Encl.
Construction Notes and Details MTE Drawing No. C2.2	Encl.

1.0 Introduction

MTE Consultants Inc. was retained by Perth County Ingredients to complete the stormwater management design for building additions to be located on 20 Thames Road North in the Town of St. Marys.

The subject property is generally bound by Thames Road North to the west, and lands zoned as Agricultural to the north and Light Industrial to the south and the east, as shown on Figure 1.

The purpose of this report is to address the stormwater management requirements set forth by the Town of St. Marys.

The whole property has an approximate area of 1.587ha.

The stormwater management details for the site are illustrated on the enclosed MTE engineering drawings C2.1, and C2.2.

2.0 Criteria

The stormwater management design criteria for the subject site, as recommended for the Town of St. Marys, are as follows:

- i. Attenuate the post development peak flow rate to the predevelopment (existing) peak flow rate using the City of Stratford IDF parameters for the 5 year through 100 year storm events (4 hour).
- ii. Post development flows are to obtain a minimum of Ministry of the Environment, Conservation and Parks (MECP) enhanced quality control (80% suspended solid removal).

3.0 Methodology

In order to successfully complete the stormwater management design for this site, the following specific tasks were undertaken in accordance with the Municipal Standards for Development:

- i. Calculate the allowable runoff rates using MIDUSS;
- ii. Determine the percentage imperviousness of the site and catchment parameters for MIDUSS modelling;
- iii. Calculate post development runoff hydrographs using MIDUSS;
- iv. Determine the required quantity control orifice and weir size, attenuation volumes and ponding elevations using MIDUSS and Civil 3D; and,
- v. Evaluate the Stormwater Quality requirements.



SITE LOCATION

THAMES ROAD NORTH

QUEEN STREET WEST

PERTH ROAD 139



FIGURE 1

Date: MAY 24/22
Scale: NTS

SITE LOCATION



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4.0 Stormwater Management

4.1. Existing Site Characteristics

The existing topographic survey demonstrated the site consists of some vegetation to the north, gravel area and two existing buildings: a large industrial located centrally in the property and a house close to the southwest corner. Minor and major flows from the northwest part of the site discharge to Thames Road, either directly or through the ditch running along the north property boundary. Minor and major flows from the southeast part discharge to the neighbouring property at the south (Veterinary Purchasing Co Ltd.). A Stormwater Management report, dated July 24, 2020, that takes into accounts these flows for the development of the neighbouring site has been approved by the Town of St. Marys. The final outlet of these flows is also Thames Road.

As recommended by the Town of St. Marys, post development flows generated by this development must be controlled to their corresponding predevelopment existing flow rate. In order to achieve this, stormwater quantity controls will be required.

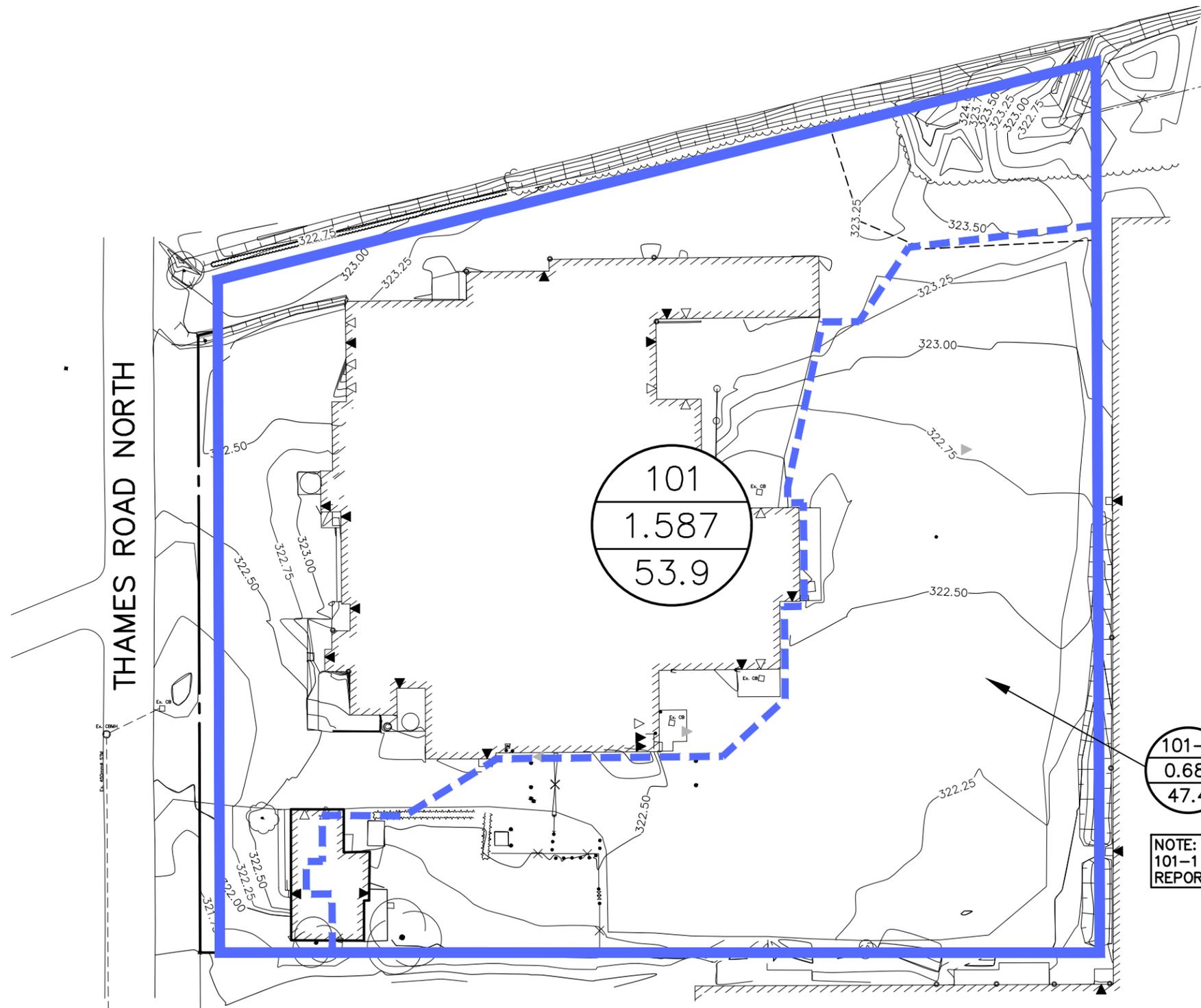
4.2. Catchment Parameters

Due to the characteristics of the site and drainage area, MIDUSS was chosen as the hydrological modeling method to determine the stormwater runoff for this site. The following table summarizes the existing and proposed conditions for each catchment of the site.

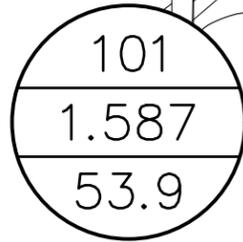
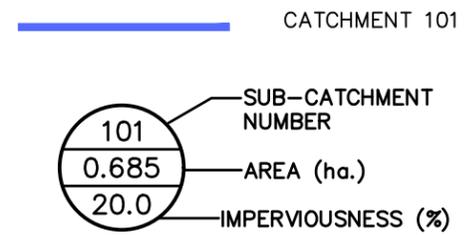
Table 1 – Site Characteristics

No.	Catchment	Area (ha)	% Impervious	Pervious CN	Impervious CN	Slope (%)	Flow Length (m)
Predevelopment Catchment Area							
101	Uncontrolled Catchment	1.587	53.9	75	98	2.0	10
Post Development Catchment Area							
201	Uncontrolled Catchment	0.564	80.2	75	98	2.0	10
202	Uncontrolled Catchment	0.091	13.5	75	98	4.0	5
203	Controlled Catchment	0.111	49.6	75	98	2.0	10
204	Controlled Catchment	0.130	51.5	75	98	2.0	10
205	Controlled Catchment	0.699	67.8	75	98	2.0	10

Figure 2 illustrates the predevelopment (existing) catchment areas and Figure 3 illustrates the post development catchment areas.



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CATCHMENT AREA CHARACTERISTICS			
CATCHMENT No.	AREA	IMP. AREA	% IMP
101	1.587ha	0.855ha	53.9%
101-1	0.681ha	0.323ha	47.4%

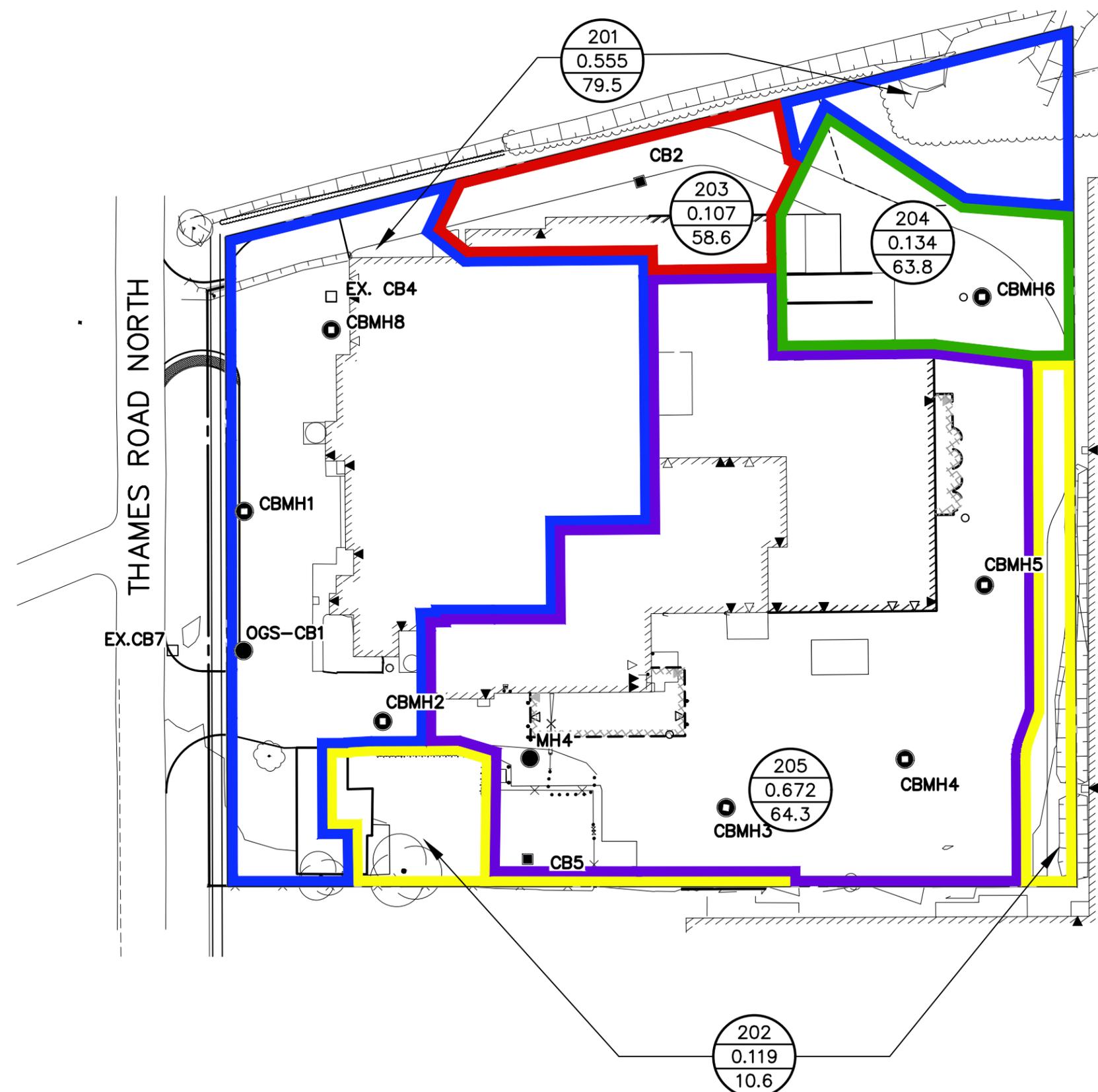
NOTE:
101-1 AREA INCLUDED IN THE SWM
REPORT OF NEIGHBOURING PROPERTY

FIGURE 2 Date: MAY 24/22
Scale: 1:750

**PREDEVELOPMENT
CATCHMENT AREAS**

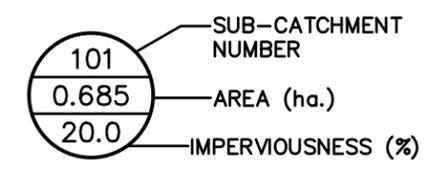
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LEGEND

- █ CATCHMENT 201
- █ CATCHMENT 202
- █ CATCHMENT 203
- █ CATCHMENT 204
- █ CATCHMENT 205



CATCHMENT AREA CHARACTERISTICS			
CATCHMENT No.	AREA	IMP. AREA	% IMP
201	0.564ha	0.452ha	80.1%
202	0.091ha	0.012ha	13.2%
203	0.111ha	0.055ha	49.55%
204	0.130ha	0.067ha	51.5%
205	0.699ha	0.474ha	67.8%
TOTAL	1.587ha	1.060ha	66.8%

FIGURE 3 Date: DEC. 19/22
Scale: 1:750

**POST-DEVELOPMENT
CATCHMENT AREAS**



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4.3. Water Quantity – Modeling Results

Building additions will be built and pavement will be laid on a portion of existing gravel area. Hence, the imperviousness of the site will increase and stormwater quantity control will be needed in order to meet the municipal requirements. Stormwater from post development catchments will be directed and controlled as described below:

Catchment 201: Runoff will run uncontrolled to Thames Rd in front of the property.

Catchment 202: Runoff will run uncontrolled to the neighbouring property to the south and eventually to Thames Rd. Table 2 below shows the allowable flowrate (as per the aforementioned Stormwater Management report for Veterinary Purchasing Co Ltd. - adjusted for the part of the runoff contributed from the Perth County Ingredients site) and the one that will end up there after the development for the 100-yr storm events. Post development flow rates are significantly lower than the allowable.

Table 2 – Stormwater peak flowrates to neighbouring land to the south

Storm Event (Years)	Predevelopment	Post Development
	Allowable as per SWM report for Veterinary Purchasing (L/s)	Overland flow from Catchment 202 (L/s)
5	48	7
10	57	10
25	69	15
50	78	18
100	89	21

Catchment 203: Runoff will be controlled by an orifice and the grading of the site that will function as a weir. Minor and major flows will discharge to the north, to the ditch running along the north property line that finally discharges to Thames Rd.

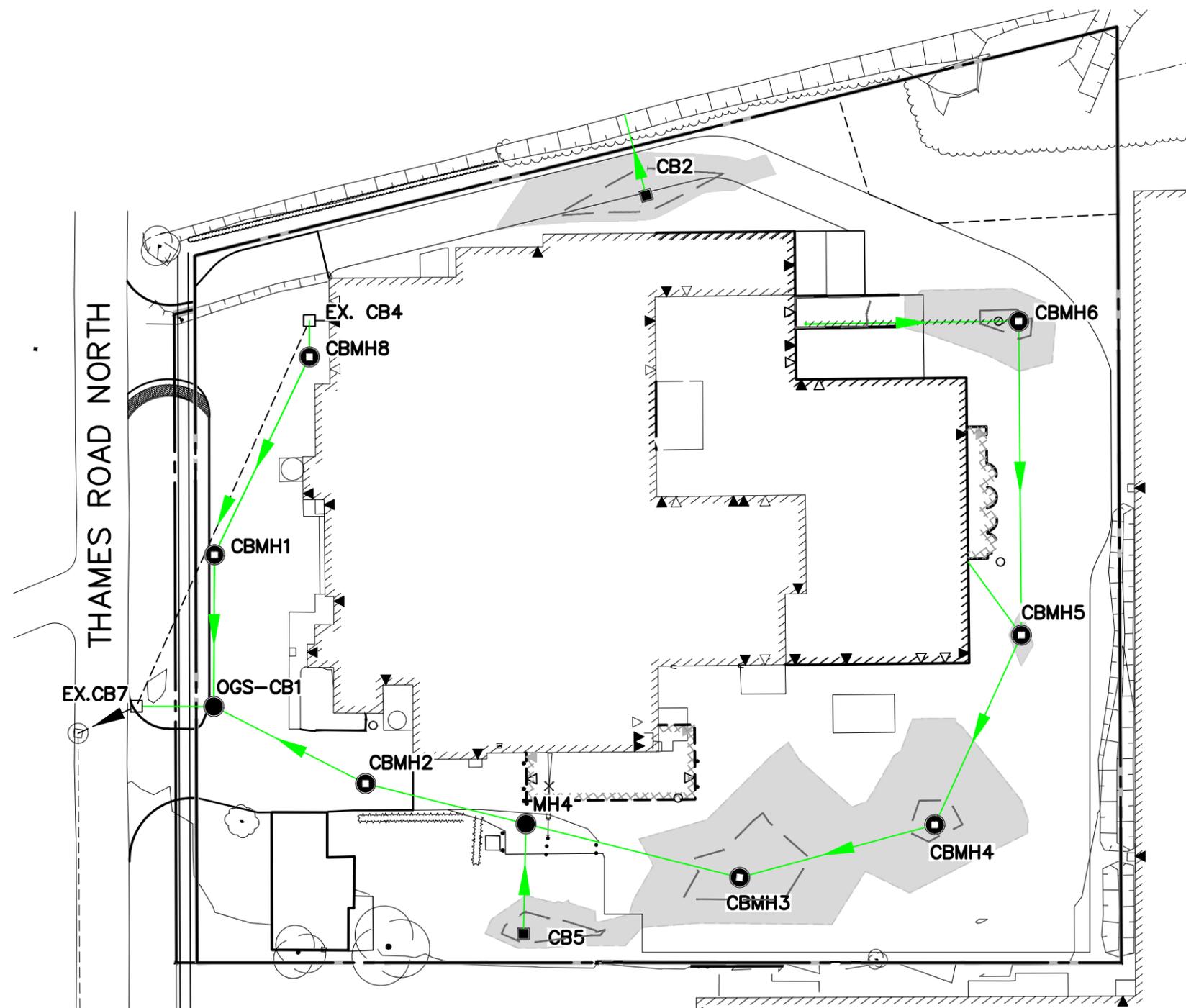
Catchment 204: Runoff will be controlled by an orifice and the grading of the site that will function as a weir. Minor and major flows will discharge to the south, to Catchment 205.

Catchment 205: Runoff will be controlled by an orifice and. The grading of the site will function as a weir towards the neighbouring property to the south only under emergency conditions. Under normal conditions, minor and major flows will be directed to the storm pipe network through MH4, where the orifice is to be installed.

Table 3 – Total Stormwater peak flowrates

Storm Event (Years)	Predevelopment	Post Development				Total Site Runoff (L/s)
	Catchment 101 Allowable (L/s)	Catchment 201 Uncontrolled- to ditch at north/ Thames Rd (L/s)	Catchment 202 Uncontrolled- to neighbouring property at south (L/s)	Catchment 203 Controlled- to ditch at north (L/s)	Catchments 204-205 Controlled- to Thames Rd (L/s)	
5	263	126	7	10	116	257
10	315	149	10	11	118	285
25	381	176	15	11	121	318
50	435	197	18	11	123	345
100	493	220	21	15	124	372

Table 3 above shows the pre (allowable) and post-development flows for all the design storm events. It can be seen that the post-development peak flowrates will not exceed the allowable values. Refer to Appendix A for the MIDUSS stormwater calculations and Figure 4 for ponding depths. Ponding volumes were calculated using Civil 3D - refer to Appendix A.



LEGEND



PEAK FLOWS, PONDING VOLUMES & DEPTHS (CATCHMENT 203)

STORM EVENT	PEAK FLOW (m³/s)	ELEV. (m)	DEPTH AT CB2 (m)	VOL. (m³)
5-Year	0.010	323.21	0.11	2.5
10-Year	0.011	323.24	0.14	5.2
25-Year	0.011	323.28	0.18	9.7
50-Year	0.011	323.30	0.20	13.8
100-Year	0.012	323.32	0.22	17.5

PEAK FLOWS, PONDING VOLUMES & DEPTHS (CATCHMENT 204)

STORM EVENT	PEAK FLOW (m³/s)	ELEV. (m)	DEPTH AT CBMH6 (m)	VOL. (m³)
5-Year	0.011	322.43	0.03	4.3
10-Year	0.012	322.50	0.10	7.9
25-Year	0.012	322.55	0.15	13.4
50-Year	0.012	322.58	0.18	18.5
100-Year	0.012	322.61	0.21	24.1

PEAK FLOWS, PONDING VOLUMES & DEPTHS (CATCHMENT 205)

STORM EVENT	PEAK FLOW (m³/s)	ELEV. (m)	DEPTH AT CBMH3 (m)	VOL. (m³)
5-Year	0.116	322.10	0.11	8.9
10-Year	0.118	322.14	0.15	22.1
25-Year	0.121	322.18	0.19	44.7
50-Year	0.123	322.20	0.21	65.6
100-Year	0.124	322.22	0.23	90.3

FIGURE 4 Date: DEC. 19/22
Scale: 1:750

**STORMWATER
MANAGEMENT SKETCH**

Engineers, Scientists, Surveyors

Project No.: 44357-112

4.4. Water Quality

Stormwater quality control will meet the 'Enhanced' level of treatment in accordance with the MECP guidelines and the Town of St. Marys requirements. The 'Enhanced' level of treatment requires the long term removal of at least 80% of suspended solids.

Quality control will be provided by directing the 5-year storm through an ADS Canada oil grit separator model ADS-FD-4HC Stormwater Treatment Unit or approved equivalent. Water from uncontrolled areas will not be treated but it will run overland through landscaped areas or in swales. This water will not include runoff from an areas paved with asphalt or concrete.

The predicted net annual load removal efficiency of the ADS-FD-4HC unit for the total suspended solids for a fine particle distribution will be 84.0%. It is recommended that the manufacturer verify actual percentages of flow treated to ensure a minimum 80% removal and recommend an appropriate maintenance plan for the separator to the owner.

4.5. Erosion & Sediment Control

Sediment and erosion controls will be provided for the proposed site as detailed on the engineering drawings C2.1 and C2.2. The contractor will be responsible for maintaining all sediment and erosion control measures until the site is stabilized. Should any materials be tracked off site, it will be the contractor's responsibility to clean the roadway or affected property as per standard construction practices.

5.0 Conclusions and Recommendations

In accordance with this report's objectives, our analysis of the proposed development can be summarized as follows:

- i. The imperviousness of the site will be increased from allowable levels, therefore to meet the Town of St. Mary's recommended objective by controlling post development flow rates to their corresponding predevelopment flow rate; stormwater quantity control is required;
- ii. The post development flows from Catchment 203 will be controlled by an online orifice installed on CB2 at an elevation of 322.45m and by site grading that will function as a weir at an elevation of 323.32m; as shown on Drawings C2.1 and C2.2;
- iii. The post development flows from Catchment 204 will be controlled by an online orifice installed on CBMH6 at an elevation of 321.55m and by site grading that will function as a weir at an elevation of 322.70m; as shown on Drawings C2.1 and C2.2;
- iv. The post development flows from Catchment 205 will be controlled by an online orifice installed on CBMH4 at an elevation of 321.10m; as shown on Drawings C2.1 and C2.2;
- v. The stormwater will be treated by a ADS Canada Oil Grit Separator model ADS-FD-4HC or approved equivalent; as shown on Drawing C2.1;
- vi. The grading of the site will be done as per engineering drawing C2.1 to provide sufficient storage on ground to control minor and major storm events and outlet for overland flows under emergency conditions;
- vii. The outlet controls will restrict the post development peak minor and major flows to be less than the predevelopment peak flows; and;
- viii. Erosion and sediment controls are to be installed and maintained as per Drawing C2.1 and C2.2.

It is recommended that:

- i. One online orifice installed on CB2 at an elevation of 322.45m and grading is done as shown on Drawings C2.1 and C2.2;
- ii. One an online orifice installed on CBMH6 at an elevation of 321.55m and grading is done as shown on Drawings C2.1 and C2.2;
- iii. One an online orifice installed on MH4 at an elevation of 321.10m and grading is done as shown on Drawings C2.1 and C2.2;
- iv. One Hydro First Defense model ADS-FD-4HC Storm Water Treatment Unit or approved equivalent is installed as shown on Drawing C2.1;
- v. Site grading is constructed as per the design on the enclosed engineering Drawing C2.1; and,
- vi. Erosion and sediment control measures are to be installed along the perimeter of the site as per Drawing C2.1 and C2.2.

All of which is respectfully submitted,

MTE Consultants Inc.

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SXA:cmb

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Appendix A

MIDUSS Modeling Output

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rev. 473"
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7, 2010"
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"
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" 33          CATCHMENT 101"
"          1  Triangular SCS"
"          2  Proportional to %"
"          1  SCS method"
"          101  WHOLE SITE"
"          53.900  % Impervious"
"          1.587  Total Area"
"          10.000  Flow length"
"          2.000  Overland Slope"
"          0.732  Pervious Area"
"          10.000  Pervious length"
"          2.000  Pervious slope"
"          0.855  Impervious Area"
"          11.692  Impervious length"
"          2.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          75.000  Pervious SCS Curve No."
"          0.286  Pervious Runoff coefficient"
"          0.100  Pervious Ia/S coefficient"

```

"	8.467	Pervious Initial abstraction"				
"	0.015	Impervious Manning 'n'"				
"	98.000	Impervious SCS Curve No."				
"	0.879	Impervious Runoff coefficient"				
"	0.100	Impervious Ia/S coefficient"				
"	0.518	Impervious Initial abstraction"				
"			0.263	0.000	0.000	0.000 c.m/sec"
"		Catchment 101		Pervious	Impervious	Total Area "
"		Surface Area		0.732	0.855	1.587
hectare"						
"		Time of concentration	9.559	1.180	3.003	
minutes"						
"		Time to Centroid	147.581	117.513	124.053	
minutes"						
"		Rainfall depth	52.484	52.484	52.484	mm"
"		Rainfall volume	383.98	448.94	832.92	
c.m"						
"		Rainfall losses	37.488	6.347	20.703	mm"
"		Runoff depth	14.996	46.137	31.781	mm"
"		Runoff volume	109.71	394.65	504.37	
c.m"						
"		Runoff coefficient	0.286	0.879	0.606	"
"		Maximum flow	0.042	0.249	0.263	
c.m/sec"						

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"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.343 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
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"          98.000 Impervious SCS Curve No."
"          0.893 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.315 0.000 0.000 0.000 c.m/sec"
"          Catchment 101 Pervious Impervious Total Area "
"          Surface Area 0.732 0.855 1.587 hectare"
"          Time of concentration 8.344 1.119 2.906 minutes"
"          Time to Centroid 144.518 116.899 123.729 minutes"
"          Rainfall depth 64.136 64.136 64.136 mm"
"          Rainfall volume 469.23 548.62 1017.84 c.m"
"          Rainfall losses 42.130 6.843 23.111 mm"
"          Runoff depth 22.006 57.293 41.026 mm"
"          Runoff volume 161.00 490.08 651.08 c.m"
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"          10.000 Flow length"
"          2.000 Overland Slope"
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"          10.000 Pervious length"
"          2.000 Pervious slope"
"          0.855 Impervious Area"
"          11.692 Impervious length"
"          2.000 Impervious slope"
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"          75.000 Pervious SCS Curve No."
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"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
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"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.381 0.000 0.000 0.000 c.m/sec"
"          Catchment 101 Pervious Impervious Total Area "
"          Surface Area 0.732 0.855 1.587 hectare"
"          Time of concentration 7.330 1.056 2.782 minutes"
"          Time to Centroid 141.727 116.275 123.274 minutes"
"          Rainfall depth 78.434 78.434 78.434 mm"
"          Rainfall volume 573.83 670.92 1244.74 c.m"
"          Rainfall losses 46.955 7.449 25.661 mm"
"          Runoff depth 31.478 70.985 52.772 mm"
"          Runoff volume 230.30 607.20 837.50 c.m"
"          Runoff coefficient 0.401 0.905 0.673 "
"          Maximum flow 0.107 0.332 0.381 c.m/sec"

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"          1 SCS method"
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"          53.900 % Impervious"
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"          10.000 Flow length"
"          2.000 Overland Slope"
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"          2.000 Pervious slope"
"          0.855 Impervious Area"
"          11.692 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.440 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.912 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.435 0.000 0.000 0.000 c.m/sec"
"          Catchment 101 Pervious Impervious Total Area "
"          Surface Area 0.732 0.855 1.587 hectare"
"          Time of concentration 6.797 1.022 2.708 minutes"
"          Time to Centroid 140.075 115.950 122.996 minutes"
"          Rainfall depth 89.814 89.814 89.814 mm"
"          Rainfall volume 657.09 768.27 1425.35 c.m"
"          Rainfall losses 50.293 7.888 27.437 mm"
"          Runoff depth 39.521 81.927 62.378 mm"
"          Runoff volume 289.14 700.79 989.94 c.m"
"          Runoff coefficient 0.440 0.912 0.695 "
"          Maximum flow 0.129 0.362 0.435 c.m/sec"

```

```

PRE-100YR
"          MIDUSS Output ----->"
"          MIDUSS version                Version 2.25 rev. 473"
"          MIDUSS created                Sunday, February 7, 2010"
"          10 Units used:                ie METRIC"
"          Job folder:                   Q:\44357\112\SWM\MIDUSS"
"          Output filename:              44357-PRE-100YR_rev_0.out"
"          Licensee name:                A"
"          Company                       "
"          Date & Time last used:        5/16/2022 at 6:45:12 PM"
" 31          TIME PARAMETERS"
"          5.000 Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 47          FILEI_O Read/Open Stratford-100yr.stm"
"          1 1=read/open; 2=write/save"
"          1 1=rainfall; 2=hydrograph"
"          1 1=rain; 2=imperv; 3=perv"
"          Stratford-100yr.stm"
"          Enter a description for file identification."
"          New storm defined"
"          Total depth                    101.000 mm"
"          Maximum intensity              185.623 mm/hr"
"          Duration                      240.000 minutes"
"          0.000 0.000 0.000 0.000 c.m/sec"
"          6 100hyd Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"          1 Triangular SCS"
"          2 Proportional to %"
"          1 SCS method"
"          101 WHOLE SITE"
"          53.900 % Impervious"
"          1.587 Total Area"
"          10.000 Flow length"
"          2.000 Overland Slope"
"          0.732 Pervious Area"
"          10.000 Pervious length"
"          2.000 Pervious slope"
"          0.855 Impervious Area"
"          11.692 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.475 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.918 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.493 0.000 0.000 0.000 c.m/sec"
"          Catchment 101 Pervious Impervious Total Area "
"          Surface Area 0.732 0.855 1.587 hectare"
"          Time of concentration 6.362 0.989 2.638 minutes"
"          Time to Centroid 138.449 115.687 122.674 minutes"
"          Rainfall depth 101.000 101.000 101.000 mm"
"          Rainfall volume 738.92 863.95 1602.87 c.m"
"          Rainfall losses 53.005 8.329 28.925 mm"
"          Runoff depth 47.995 92.671 72.075 mm"
"          Runoff volume 351.13 792.70 1143.84 c.m"
"          Runoff coefficient 0.475 0.918 0.714 "
"          Maximum flow 0.159 0.393 0.493 c.m/sec"

```

POST-5YR

```
"          MIDUSS Output ----->"
"          MIDUSS version                Version 2.25 rev. 473"
"          MIDUSS created                Sunday, February 7, 2010"
"          10 Units used:                ie METRIC"
"          Job folder:                   Q:\44357\112\SWM\MIDUSS"
"          Output filename:              44357-POST-5YR_rev_24.out"
"          Licensee name:                A"
"          Company                       "
"          Date & Time last used:        12/9/2022 at 4:25:25 PM"
" 31          TIME PARAMETERS"
"          5.000 Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 47          FILEI_O Read/Open Stratford-5yr.stm"
"          1 1=read/open; 2=write/save"
"          1 1=rainfall; 2=hydrograph"
"          1 1=rain; 2=imperv; 3=perv"
"          Stratford-5yr.stm"
"          Enter a description for file identification."
"          New storm defined"
"          Total depth                    52.484 mm"
"          Maximum intensity              122.128 mm/hr"
"          Duration                      240.000 minutes"
"          0.000 0.000 0.000 0.000 c.m/sec"
"          6 005hyd Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"          1 Triangular SCS"
"          2 Proportional to %"
"          1 SCS method"
"          201 UNCONTROLLED (TO THAMES ST.)"
"          80.200 % Impervious"
"          0.564 Total Area"
"          10.000 Flow length"
"          2.000 Overland Slope"
"          0.112 Pervious Area"
"          10.000 Pervious length"
"          2.000 Pervious slope"
"          0.452 Impervious Area"
"          40.505 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.286 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.886 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.126 0.000 0.000 0.000 c.m/sec"
"          Catchment 201 Pervious Impervious Total Area "
"          Surface Area 0.112 0.452 0.564 hectare"
"          Time of concentration 9.559 2.487 3.009 minutes"
"          Time to Centroid 147.581 119.694 121.751 minutes"
"          Rainfall depth 52.484 52.484 52.484 mm"
"          Rainfall volume 58.61 237.40 296.01 c.m"
"          Rainfall losses 37.488 5.997 12.232 mm"
"          Runoff depth 14.996 46.487 40.252 mm"
"          Runoff volume 16.75 210.27 227.02 c.m"
"          Runoff coefficient 0.286 0.886 0.767 "
"          Maximum flow 0.006 0.124 0.126 c.m/sec"
```

```

" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.126      0.126      0.000      0.000"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.126      0.126      0.126      0.000"
" 40      HYDROGRAPH Combine 1"
"          6  Combine "
"          1  Node #"
"          TOTAL SITE FLOW"
"          Maximum flow              0.126      c.m/sec"
"          Hydrograph volume          227.021      c.m"
"              0.126      0.126      0.126      0.126"
" 40      HYDROGRAPH Start - New Tributary"
"          2  Start - New Tributary"
"              0.126      0.000      0.126      0.126"
" 33      CATCHMENT 202"
"          1  Triangular SCS"
"          2  Proportional to %"
"          1  SCS method"
"          202 UNCONTROLLED (TO NEIGHBOURING PROPERTY)"
"          13.500 % Impervious"
"          0.091 Total Area"
"          5.000 Flow length"
"          4.000 Overland Slope"
"          0.079 Pervious Area"
"          5.000 Pervious length"
"          4.000 Pervious slope"
"          0.012 Impervious Area"
"          0.780 Impervious length"
"          4.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.285 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.772 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"              0.007      0.000      0.126      0.126 c.m/sec"
"          Catchment 202      Pervious      Impervious Total Area "
"          Surface Area          0.079      0.012      0.091      hectare"
"          Time of concentration  5.122      0.189      3.658      minutes"
"          Time to Centroid      141.540     115.347     133.766     minutes"
"          Rainfall depth        52.484     52.484     52.484     mm"
"          Rainfall volume        41.31      6.45      47.76      c.m"
"          Rainfall losses        37.510     11.984     34.064     mm"
"          Runoff depth           14.975     40.500     18.420     mm"
"          Runoff volume           11.79      4.98      16.76      c.m"
"          Runoff coefficient      0.285     0.772     0.351      "
"          Maximum flow           0.006     0.004     0.007     c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.007      0.007      0.126      0.126"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.007      0.007      0.007      0.126"
" 40      HYDROGRAPH Combine 1"
"          6  Combine "
"          1  Node #"
"          TOTAL SITE FLOW"

```

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"           Maximum flow           0.133   c.m/sec"
"           Hydrograph volume       243.784   c.m"
"           0.007   0.007   0.007   0.133"
" 40      HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"           0.007   0.000   0.007   0.133"
" 33      CATCHMENT 203"
"           1   Triangular SCS"
"           2   Proportional to %"
"           1   SCS method"
"           203 CONTROLLED (NORTH OF BLDG)"
"           49.600 % Impervious"
"           0.111 Total Area"
"           10.000 Flow length"
"           2.000 Overland Slope"
"           0.056 Pervious Area"
"           10.000 Pervious length"
"           2.000 Pervious slope"
"           0.055 Impervious Area"
"           9.841 Impervious length"
"           2.000 Impervious slope"
"           0.250 Pervious Manning 'n'"
"           75.000 Pervious SCS Curve No."
"           0.286 Pervious Runoff coefficient"
"           0.100 Pervious Ia/S coefficient"
"           8.467 Pervious Initial abstraction"
"           0.015 Impervious Manning 'n'"
"           98.000 Impervious SCS Curve No."
"           0.874 Impervious Runoff coefficient"
"           0.100 Impervious Ia/S coefficient"
"           0.518 Impervious Initial abstraction"
"           0.017   0.000   0.007   0.133 c.m/sec"
"           Catchment 203           Pervious   Impervious Total Area "
"           Surface Area           0.056       0.055       0.111       hectare"
"           Time of concentration   9.559       1.064       3.182       minutes"
"           Time to Centroid       147.581    117.245    124.807    minutes"
"           Rainfall depth         52.484     52.484     52.484     mm"
"           Rainfall volume        29.36      28.90      58.26      c.m"
"           Rainfall losses        37.488     6.590     22.162     mm"
"           Runoff depth           14.996     45.894     30.322     mm"
"           Runoff volume           8.39       25.27     33.66      c.m"
"           Runoff coefficient      0.286     0.874     0.578      "
"           Maximum flow           0.003     0.016     0.017     c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"           0.017   0.017   0.007   0.133"
" 54      POND DESIGN"
"           0.017 Current peak flow   c.m/sec"
"           0.005 Target outflow     c.m/sec"
"           33.7 Hydrograph volume   c.m"
"           9. Number of stages"
"           323.100 Minimum water level   metre"
"           323.390 Maximum water level   metre"
"           323.100 Starting water level   metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"           Level Discharge         Volume"
"           323.100   0.000   0.000"
"           323.140   0.00986   0.2000"
"           323.170   0.01009   1.000"
"           323.210   0.01039   2.000"
"           323.240   0.01061   5.000"
"           323.280   0.01089   9.000"
"           323.320   0.01116   17.000"

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```

"          323.350    0.07666    26.000"
"          323.390    0.2857    42.000"
"    1. WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          323.320    0.900    7.100    97.700    0.000"
"    1. ORIFICES"
"          Orifice  Orifice  Orifice Number of"
"          invert coefficie diameter orifices"
"          322.450    0.630    0.0750    1.000"
"          Peak outflow                0.010    c.m/sec"
"          Maximum level                323.215    metre"
"          Maximum storage                2.515    c.m"
"          Centroidal lag                2.103    hours"
"          0.017    0.017    0.010    0.133 c.m/sec"
" 40 HYDROGRAPH Combine 1"
"    6 Combine "
"    1 Node #"
"          TOTAL SITE FLOW"
"          Maximum flow                0.144    c.m/sec"
"          Hydrograph volume                278.467    c.m"
"          0.017    0.017    0.010    0.144"
" 40 HYDROGRAPH Start - New Tributary"
"    2 Start - New Tributary"
"          0.017    0.000    0.010    0.144"
" 33 CATCHMENT 204"
"    1 Triangular SCS"
"    2 Proportional to %"
"    1 SCS method"
"    204 CONTROLLE (EAST OF BLDG)"
"    51.500 % Impervious"
"    0.130 Total Area"
"    10.000 Flow length"
"    2.000 Overland Slope"
"    0.063 Pervious Area"
"    10.000 Pervious length"
"    2.000 Pervious slope"
"    0.067 Impervious Area"
"    10.619 Impervious length"
"    2.000 Impervious slope"
"    0.250 Pervious Manning 'n'"
"    75.000 Pervious SCS Curve No."
"    0.286 Pervious Runoff coefficient"
"    0.100 Pervious Ia/S coefficient"
"    8.467 Pervious Initial abstraction"
"    0.015 Impervious Manning 'n'"
"    98.000 Impervious SCS Curve No."
"    0.877 Impervious Runoff coefficient"
"    0.100 Impervious Ia/S coefficient"
"    0.518 Impervious Initial abstraction"
"          0.021    0.000    0.010    0.144 c.m/sec"
"          Catchment 204      Pervious      Impervious      Total Area "
"          Surface Area                0.063    0.067    0.130    hectare"
"          Time of concentration  9.559    1.114    3.097    minutes"
"          Time to Centroid    147.581    117.356    124.456    minutes"
"          Rainfall depth    52.484    52.484    52.484    mm"
"          Rainfall volume    33.09    35.14    68.23    c.m"
"          Rainfall losses    37.488    6.481    21.519    mm"
"          Runoff depth    14.996    46.003    30.965    mm"
"          Runoff volume    9.46    30.80    40.25    c.m"
"          Runoff coefficient    0.286    0.877    0.590    "
"          Maximum flow    0.004    0.019    0.021    c.m/sec"
" 40 HYDROGRAPH Add Runoff "

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```

"          4  Add Runoff "
"          0.021      0.021      0.010      0.144"
" 54      POND DESIGN"
"          0.021  Current peak flow      c.m/sec"
"          0.005  Target outflow      c.m/sec"
"          40.3   Hydrograph volume      c.m"
"          12.   Number of stages"
"          322.250  Minimum water level      metre"
"          322.800  Maximum water level      metre"
"          322.250  Starting water level      metre"
"          0      Keep Design Data: 1 = True; 0 = False"
"              Level Discharge      Volume"
"          322.250      0.000      0.000"
"          322.300      0.01031      0.4500"
"          322.350      0.01068      2.000"
"          322.400      0.01103      3.000"
"          322.450      0.01137      5.000"
"          322.500      0.01170      8.000"
"          322.550      0.01202      13.000"
"          322.600      0.01233      21.000"
"          322.650      0.01263      32.000"
"          322.700      0.01293      46.000"
"          322.750      0.01322      64.000"
"          322.800      0.06386      85.000"
"          1.  WEIRS"
"              Crest      Weir      Crest      Left      Right"
"              elevation coefficie      breadth sideslope sideslope"
"          322.750      0.900      0.000      79.000      79.000"
"          1.  ORIFICES"
"              Orifice      Orifice      Orifice      Number of"
"              invert coefficie      diameter orifices"
"          321.550      0.630      0.0750      1.000"
"              Peak outflow      0.011      c.m/sec"
"              Maximum level      322.434      metre"
"              Maximum storage      4.346      c.m"
"              Centroidal lag      2.116      hours"
"              0.021      0.021      0.011      0.144 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5  Next link "
"              0.021      0.011      0.011      0.144"
" 33      CATCHMENT 205"
"          1  Triangular SCS"
"          2  Proportional to %"
"          1  SCS method"
"          205  CONTROLLED (South OF BLDG)"
"          67.800  % Impervious"
"          0.699  Total Area"
"          10.000  Flow length"
"          2.000  Overland Slope"
"          0.225  Pervious Area"
"          10.000  Pervious length"
"          2.000  Pervious slope"
"          0.474  Impervious Area"
"          21.056  Impervious length"
"          2.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          75.000  Pervious SCS Curve No."
"          0.286  Pervious Runoff coefficient"
"          0.100  Pervious Ia/S coefficient"
"          8.467  Pervious Initial abstraction"
"          0.015  Impervious Manning 'n'"
"          98.000  Impervious SCS Curve No."
"          0.887  Impervious Runoff coefficient"

```

```

"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"              0.140      0.011      0.011      0.144 c.m/sec"
"      Catchment 205      Pervious      Impervious Total Area  "
"      Surface Area      0.225      0.474      0.699      hectare"
"      Time of concentration  9.559      1.680      2.725      minutes"
"      Time to Centroid      147.581      118.300      122.186      minutes"
"      Rainfall depth      52.484      52.484      52.484      mm"
"      Rainfall volume      118.13      248.73      366.86      c.m"
"      Rainfall losses      37.488      5.940      16.098      mm"
"      Runoff depth      14.996      46.544      36.386      mm"
"      Runoff volume      33.75      220.58      254.34      c.m"
"      Runoff coefficient      0.286      0.887      0.693      "
"      Maximum flow      0.013      0.135      0.140      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"              0.140      0.150      0.011      0.144"
" 54      POND DESIGN"
"      0.150  Current peak flow      c.m/sec"
"      0.005  Target outflow      c.m/sec"
"      294.7  Hydrograph volume      c.m"
"      8.      Number of stages"
"      321.940  Minimum water level      metre"
"      322.300  Maximum water level      metre"
"      321.940  Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"              Level Discharge      Volume"
"      321.940      0.000      0.000"
"      321.990      0.1079      0.1000"
"      322.040      0.1115      1.000"
"      322.090      0.1150      6.000"
"      322.150      0.1191      25.000"
"      322.200      0.1224      61.000"
"      322.240      0.1250      107.000"
"      322.300      0.1740      208.000"
"      1.      WEIRS"
"              Crest      Weir      Crest      Left      Right"
"              elevation coefficie      breadth sideslope sideslope"
"      322.240      0.900      0.000      45.000      45.000"
"      1.      ORIFICES"
"              Orifice      Orifice      Orifice Number of"
"              invert coefficie      diameter orifices"
"      321.100      0.630      0.2400      1.000"
"      Peak outflow      0.116      c.m/sec"
"      Maximum level      322.099      metre"
"      Maximum storage      8.858      c.m"
"      Centroidal lag      2.020      hours"
"              0.140      0.150      0.116      0.144 c.m/sec"
" 40      HYDROGRAPH Combine      1"
"      6      Combine  "
"      1      Node #"
"      TOTAL SITE FLOW"
"      Maximum flow      0.257      c.m/sec"
"      Hydrograph volume      561.311      c.m"
"              0.140      0.150      0.116      0.257"

```

POST-10YR

```
"          MIDUSS Output ----->"
"          MIDUSS version                Version 2.25 rev. 473"
"          MIDUSS created                Sunday, February 7, 2010"
"          10 Units used:                ie METRIC"
"          Job folder:                   Q:\44357\112\SWM\MIDUSS"
"          Output filename:              44357-POST-10YR_rev_24.out"
"          Licensee name:                A"
"          Company                       "
"          Date & Time last used:        12/9/2022 at 4:28:25 PM"
" 31          TIME PARAMETERS"
"          5.000 Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 47          FILEI_O Read/Open Stratford-10yr.stm"
"          1 1=read/open; 2=write/save"
"          1 1=rainfall; 2=hydrograph"
"          1 1=rain; 2=imperv; 3=perv"
"          Stratford-10yr.stm"
"          Enter a description for file identification."
"          New storm defined"
"          Total depth                    64.136 mm"
"          Maximum intensity              137.992 mm/hr"
"          Duration                       240.000 minutes"
"          0.000 0.000 0.000 0.000 c.m/sec"
"          6 010hyd Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"          1 Triangular SCS"
"          2 Proportional to %"
"          1 SCS method"
"          201 UNCONTROLLED (TO THAMES ST.)"
"          80.200 % Impervious"
"          0.564 Total Area"
"          10.000 Flow length"
"          2.000 Overland Slope"
"          0.112 Pervious Area"
"          10.000 Pervious length"
"          2.000 Pervious slope"
"          0.452 Impervious Area"
"          40.505 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.343 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.903 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.149 0.000 0.000 0.000 c.m/sec"
"          Catchment 201 Pervious Impervious Total Area "
"          Surface Area 0.112 0.452 0.564 hectare"
"          Time of concentration 8.344 2.359 2.872 minutes"
"          Time to Centroid 144.518 119.068 121.250 minutes"
"          Rainfall depth 64.136 64.136 64.136 mm"
"          Rainfall volume 71.62 290.11 361.73 c.m"
"          Rainfall losses 42.130 6.204 13.317 mm"
"          Runoff depth 22.006 57.932 50.819 mm"
"          Runoff volume 24.57 262.04 286.62 c.m"
"          Runoff coefficient 0.343 0.903 0.792 "
"          Maximum flow 0.010 0.144 0.149 c.m/sec"
```

```

" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.149      0.149      0.000      0.000"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.149      0.149      0.149      0.000"
" 40      HYDROGRAPH Combine 1"
"          6  Combine "
"          1  Node #"
"          TOTAL SITE FLOW"
"          Maximum flow              0.149      c.m/sec"
"          Hydrograph volume          286.618      c.m"
"              0.149      0.149      0.149      0.149"
" 40      HYDROGRAPH Start - New Tributary"
"          2  Start - New Tributary"
"              0.149      0.000      0.149      0.149"
" 33      CATCHMENT 202"
"          1  Triangular SCS"
"          2  Proportional to %"
"          1  SCS method"
"          202 UNCONTROLLED (TO NEIGHBOURING PROPERTY)"
"          13.500 % Impervious"
"          0.091 Total Area"
"          5.000 Flow length"
"          4.000 Overland Slope"
"          0.079 Pervious Area"
"          5.000 Pervious length"
"          4.000 Pervious slope"
"          0.012 Impervious Area"
"          0.780 Impervious length"
"          4.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.341 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.785 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"              0.010      0.000      0.149      0.149 c.m/sec"
"          Catchment 202      Pervious      Impervious Total Area "
"          Surface Area          0.079      0.012      0.091      hectare"
"          Time of concentration  4.471      0.179      3.337      minutes"
"          Time to Centroid      139.361     114.783     132.866     minutes"
"          Rainfall depth        64.136     64.136     64.136     mm"
"          Rainfall volume       50.48      7.88      58.36      c.m"
"          Rainfall losses       42.262     13.795     38.419     mm"
"          Runoff depth          21.874     50.341     25.717     mm"
"          Runoff volume         17.22      6.18      23.40      c.m"
"          Runoff coefficient     0.341     0.785     0.401      "
"          Maximum flow          0.009     0.004     0.010     c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.010      0.010      0.149      0.149"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.010      0.010      0.010      0.149"
" 40      HYDROGRAPH Combine 1"
"          6  Combine "
"          1  Node #"
"          TOTAL SITE FLOW"

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"           Maximum flow           0.159   c.m/sec"
"           Hydrograph volume       310.021 c.m"
"           0.010   0.010   0.010   0.159"
" 40      HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"           0.010   0.000   0.010   0.159"
" 33      CATCHMENT 203"
"           1   Triangular SCS"
"           2   Proportional to %"
"           1   SCS method"
"           203 CONTROLLED (NORTH OF BLDG)"
"           49.600 % Impervious"
"           0.111 Total Area"
"           10.000 Flow length"
"           2.000 Overland Slope"
"           0.056 Pervious Area"
"           10.000 Pervious length"
"           2.000 Pervious slope"
"           0.055 Impervious Area"
"           9.841 Impervious length"
"           2.000 Impervious slope"
"           0.250 Pervious Manning 'n'"
"           75.000 Pervious SCS Curve No."
"           0.343 Pervious Runoff coefficient"
"           0.100 Pervious Ia/S coefficient"
"           8.467 Pervious Initial abstraction"
"           0.015 Impervious Manning 'n'"
"           98.000 Impervious SCS Curve No."
"           0.889 Impervious Runoff coefficient"
"           0.100 Impervious Ia/S coefficient"
"           0.518 Impervious Initial abstraction"
"           0.021   0.000   0.010   0.159 c.m/sec"
"           Catchment 203           Pervious   Impervious Total Area "
"           Surface Area           0.056       0.055       0.111       hectare"
"           Time of concentration  8.344       1.009       3.076       minutes"
"           Time to Centroid      144.518     116.710     124.544     minutes"
"           Rainfall depth        64.136     64.136     64.136     mm"
"           Rainfall volume       35.88      35.31      71.19      c.m"
"           Rainfall losses       42.130     7.125     24.768     mm"
"           Runoff depth          22.006     57.011     39.369     mm"
"           Runoff volume         12.31      31.39     43.70      c.m"
"           Runoff coefficient     0.343     0.889     0.614      "
"           Maximum flow          0.005     0.018     0.021     c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"           0.021   0.021   0.010   0.159"
" 54      POND DESIGN"
"           0.021 Current peak flow   c.m/sec"
"           0.005 Target outflow     c.m/sec"
"           43.7 Hydrograph volume   c.m"
"           9. Number of stages"
"           323.100 Minimum water level  metre"
"           323.390 Maximum water level  metre"
"           323.100 Starting water level  metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"           Level Discharge       Volume"
"           323.100   0.000       0.000"
"           323.140   0.00986     0.2000"
"           323.170   0.01009     1.000"
"           323.210   0.01039     2.000"
"           323.240   0.01061     5.000"
"           323.280   0.01089     9.000"
"           323.320   0.01116    17.000"

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"          323.350  0.07666  26.000"
"          323.390  0.2857  42.000"
"    1. WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          323.320  0.900      7.100  97.700  0.000"
"    1. ORIFICES"
"          Orifice  Orifice  Orifice Number of"
"          invert coefficie diameter orifices"
"          322.450  0.630  0.0750  1.000"
"          Peak outflow 0.011 c.m/sec"
"          Maximum level 323.242 metre"
"          Maximum storage 5.159 c.m"
"          Centroidal lag 2.119 hours"
"          0.021  0.021  0.011  0.159 c.m/sec"
" 40 HYDROGRAPH Combine 1"
"    6 Combine "
"    1 Node #"
"          TOTAL SITE FLOW"
"          Maximum flow 0.169 c.m/sec"
"          Hydrograph volume 352.624 c.m"
"          0.021  0.021  0.011  0.169"
" 40 HYDROGRAPH Start - New Tributary"
"    2 Start - New Tributary"
"          0.021  0.000  0.011  0.169"
" 33 CATCHMENT 204"
"    1 Triangular SCS"
"    2 Proportional to %"
"    1 SCS method"
"    204 CONTROLLE (EAST OF BLDG)"
"    51.500 % Impervious"
"    0.130 Total Area"
"    10.000 Flow length"
"    2.000 Overland Slope"
"    0.063 Pervious Area"
"    10.000 Pervious length"
"    2.000 Pervious slope"
"    0.067 Impervious Area"
"    10.619 Impervious length"
"    2.000 Impervious slope"
"    0.250 Pervious Manning 'n'"
"    75.000 Pervious SCS Curve No."
"    0.343 Pervious Runoff coefficient"
"    0.100 Pervious Ia/S coefficient"
"    8.467 Pervious Initial abstraction"
"    0.015 Impervious Manning 'n'"
"    98.000 Impervious SCS Curve No."
"    0.891 Impervious Runoff coefficient"
"    0.100 Impervious Ia/S coefficient"
"    0.518 Impervious Initial abstraction"
"          0.025  0.000  0.011  0.169 c.m/sec"
"          Catchment 204 Pervious Impervious Total Area "
"          Surface Area 0.063 0.067 0.130 hectare"
"          Time of concentration 8.344 1.056 2.996 minutes"
"          Time to Centroid 144.518 116.777 124.161 minutes"
"          Rainfall depth 64.136 64.136 64.136 mm"
"          Rainfall volume 40.44 42.94 83.38 c.m"
"          Rainfall losses 42.130 7.004 24.040 mm"
"          Runoff depth 22.006 57.133 40.096 mm"
"          Runoff volume 13.87 38.25 52.12 c.m"
"          Runoff coefficient 0.343 0.891 0.625 "
"          Maximum flow 0.006 0.022 0.025 c.m/sec"
" 40 HYDROGRAPH Add Runoff "

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"          4  Add Runoff "
"          0.025      0.025      0.011      0.169"
" 54      POND DESIGN"
"          0.025  Current peak flow      c.m/sec"
"          0.005  Target outflow      c.m/sec"
"          52.1  Hydrograph volume      c.m"
"          12.   Number of stages"
"          322.250  Minimum water level      metre"
"          322.800  Maximum water level      metre"
"          322.250  Starting water level      metre"
"          0      Keep Design Data: 1 = True; 0 = False"
"              Level Discharge      Volume"
"          322.250      0.000      0.000"
"          322.300      0.01031      0.4500"
"          322.350      0.01068      2.000"
"          322.400      0.01103      3.000"
"          322.450      0.01137      5.000"
"          322.500      0.01170      8.000"
"          322.550      0.01202      13.000"
"          322.600      0.01233      21.000"
"          322.650      0.01263      32.000"
"          322.700      0.01293      46.000"
"          322.750      0.01322      64.000"
"          322.800      0.06386      85.000"
"          1.  WEIRS"
"              Crest      Weir      Crest      Left      Right"
"              elevation coefficie      breadth sideslope sideslope"
"          322.750      0.900      0.000      79.000      79.000"
"          1.  ORIFICES"
"              Orifice      Orifice      Orifice      Number of"
"              invert coefficie      diameter orifices"
"          321.550      0.630      0.0750      1.000"
"          Peak outflow      0.012      c.m/sec"
"          Maximum level      322.498      metre"
"          Maximum storage      7.868      c.m"
"          Centroidal lag      2.145      hours"
"          0.025      0.025      0.012      0.169 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5  Next link "
"          0.025      0.012      0.012      0.169"
" 33      CATCHMENT 205"
"          1  Triangular SCS"
"          2  Proportional to %"
"          1  SCS method"
"          205  CONTROLLED (South OF BLDG)"
"          67.800  % Impervious"
"          0.699  Total Area"
"          10.000  Flow length"
"          2.000  Overland Slope"
"          0.225  Pervious Area"
"          10.000  Pervious length"
"          2.000  Pervious slope"
"          0.474  Impervious Area"
"          21.056  Impervious length"
"          2.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          75.000  Pervious SCS Curve No."
"          0.343  Pervious Runoff coefficient"
"          0.100  Pervious Ia/S coefficient"
"          8.467  Pervious Initial abstraction"
"          0.015  Impervious Manning 'n'"
"          98.000  Impervious SCS Curve No."
"          0.904  Impervious Runoff coefficient"

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"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"          0.166      0.012      0.012      0.169 c.m/sec"
"      Catchment 205      Pervious      Impervious Total Area  "
"      Surface Area      0.225      0.474      0.699      hectare"
"      Time of concentration  8.344      1.593      2.624      minutes"
"      Time to Centroid      144.518      117.819      121.898      minutes"
"      Rainfall depth      64.136      64.136      64.136      mm"
"      Rainfall volume      144.36      303.96      448.31      c.m"
"      Rainfall losses      42.130      6.179      17.755      mm"
"      Runoff depth      22.006      57.957      46.381      mm"
"      Runoff volume      49.53      274.67      324.20      c.m"
"      Runoff coefficient      0.343      0.904      0.723      "
"      Maximum flow      0.020      0.157      0.166      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"          4      Add Runoff  "
"          0.166      0.177      0.012      0.169"
" 54      POND DESIGN"
"      0.177      Current peak flow      c.m/sec"
"      0.005      Target outflow      c.m/sec"
"      376.5      Hydrograph volume      c.m"
"      8.      Number of stages"
"      321.940      Minimum water level      metre"
"      322.300      Maximum water level      metre"
"      321.940      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"          321.940      0.000      0.000"
"          321.990      0.1079      0.1000"
"          322.040      0.1115      1.000"
"          322.090      0.1150      6.000"
"          322.150      0.1191      25.000"
"          322.200      0.1224      61.000"
"          322.240      0.1250      107.000"
"          322.300      0.1740      208.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"          322.240      0.900      0.000      45.000      45.000"
"      1.      ORIFICES"
"          Orifice      Orifice      Orifice Number of"
"          invert coefficie      diameter orifices"
"          321.100      0.630      0.2400      1.000"
"          Peak outflow      0.118      c.m/sec"
"          Maximum level      322.141      metre"
"          Maximum storage      22.094      c.m"
"          Centroidal lag      1.892      hours"
"          0.166      0.177      0.118      0.169 c.m/sec"
" 40      HYDROGRAPH Combine      1"
"          6      Combine  "
"          1      Node #"
"          TOTAL SITE FLOW"
"          Maximum flow      0.285      c.m/sec"
"          Hydrograph volume      656.296      c.m"
"          0.166      0.177      0.118      0.285"

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POST-25YR

```
"          MIDUSS Output ----->"
"          MIDUSS version                Version 2.25 rev. 473"
"          MIDUSS created                Sunday, February 7, 2010"
"          10 Units used:                ie METRIC"
"          Job folder:                   Q:\44357\112\SWM\MIDUSS"
"          Output filename:              44357-POST-25YR_rev_24.out"
"          Licensee name:                A"
"          Company                       "
"          Date & Time last used:        12/9/2022 at 4:30:06 PM"
" 31          TIME PARAMETERS"
"          5.000 Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 47          FILEI_O Read/Open Stratford-25yr.stm"
"          1 1=read/open; 2=write/save"
"          1 1=rainfall; 2=hydrograph"
"          1 1=rain; 2=imperv; 3=perv"
"          Stratford-25yr.stm"
"          Enter a description for file identification."
"          New storm defined"
"          Total depth                    78.434 mm"
"          Maximum intensity              158.318 mm/hr"
"          Duration                      240.000 minutes"
"          0.000 0.000 0.000 0.000 c.m/sec"
"          6 025hyd Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"          1 Triangular SCS"
"          2 Proportional to %"
"          1 SCS method"
"          201 UNCONTROLLED (TO THAMES ST.)"
"          80.200 % Impervious"
"          0.564 Total Area"
"          10.000 Flow length"
"          2.000 Overland Slope"
"          0.112 Pervious Area"
"          10.000 Pervious length"
"          2.000 Pervious slope"
"          0.452 Impervious Area"
"          40.505 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.401 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.916 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.176 0.000 0.000 0.000 c.m/sec"
"          Catchment 201 Pervious Impervious Total Area "
"          Surface Area 0.112 0.452 0.564 hectare"
"          Time of concentration 7.330 2.226 2.724 minutes"
"          Time to Centroid 141.727 118.334 120.616 minutes"
"          Rainfall depth 78.434 78.434 78.434 mm"
"          Rainfall volume 87.59 354.78 442.37 c.m"
"          Rainfall losses 46.955 6.556 14.555 mm"
"          Runoff depth 31.478 71.878 63.879 mm"
"          Runoff volume 35.15 325.12 360.28 c.m"
"          Runoff coefficient 0.401 0.916 0.814 "
"          Maximum flow 0.016 0.168 0.176 c.m/sec"
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" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.176      0.176      0.000      0.000"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.176      0.176      0.176      0.000"
" 40      HYDROGRAPH Combine 1"
"          6  Combine "
"          1  Node #"
"          TOTAL SITE FLOW"
"          Maximum flow              0.176      c.m/sec"
"          Hydrograph volume          360.276      c.m"
"              0.176      0.176      0.176      0.176"
" 40      HYDROGRAPH Start - New Tributary"
"          2  Start - New Tributary"
"              0.176      0.000      0.176      0.176"
" 33      CATCHMENT 202"
"          1  Triangular SCS"
"          2  Proportional to %"
"          1  SCS method"
"          202 UNCONTROLLED (TO NEIGHBOURING PROPERTY)"
"          13.500 % Impervious"
"          0.091 Total Area"
"          5.000 Flow length"
"          4.000 Overland Slope"
"          0.079 Pervious Area"
"          5.000 Pervious length"
"          4.000 Pervious slope"
"          0.012 Impervious Area"
"          0.780 Impervious length"
"          4.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.399 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.797 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"              0.015      0.000      0.176      0.176 c.m/sec"
"          Catchment 202      Pervious      Impervious Total Area "
"          Surface Area          0.079      0.012      0.091      hectare"
"          Time of concentration  3.928      0.169      3.034      minutes"
"          Time to Centroid      137.219      114.191      131.742      minutes"
"          Rainfall depth          78.434      78.434      78.434      mm"
"          Rainfall volume          61.74      9.64      71.37      c.m"
"          Rainfall losses          47.169      15.928      42.952      mm"
"          Runoff depth            31.265      62.506      35.482      mm"
"          Runoff volume            24.61      7.68      32.29      c.m"
"          Runoff coefficient        0.399      0.797      0.452      "
"          Maximum flow            0.012      0.005      0.015      c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.015      0.015      0.176      0.176"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.015      0.015      0.015      0.176"
" 40      HYDROGRAPH Combine 1"
"          6  Combine "
"          1  Node #"
"          TOTAL SITE FLOW"

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"           Maximum flow           0.191   c.m/sec"
"           Hydrograph volume       392.565   c.m"
"           0.015   0.015   0.015   0.191"
" 40      HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"           0.015   0.000   0.015   0.191"
" 33      CATCHMENT 203"
"           1   Triangular SCS"
"           2   Proportional to %"
"           1   SCS method"
"           203  CONTROLLED (NORTH OF BLDG)"
"           49.600 % Impervious"
"           0.111  Total Area"
"           10.000  Flow length"
"           2.000  Overland Slope"
"           0.056  Pervious Area"
"           10.000  Pervious length"
"           2.000  Pervious slope"
"           0.055  Impervious Area"
"           9.841  Impervious length"
"           2.000  Impervious slope"
"           0.250  Pervious Manning 'n'"
"           75.000  Pervious SCS Curve No."
"           0.401  Pervious Runoff coefficient"
"           0.100  Pervious Ia/S coefficient"
"           8.467  Pervious Initial abstraction"
"           0.015  Impervious Manning 'n'"
"           98.000  Impervious SCS Curve No."
"           0.901  Impervious Runoff coefficient"
"           0.100  Impervious Ia/S coefficient"
"           0.518  Impervious Initial abstraction"
"           0.025   0.000   0.015   0.191 c.m/sec"
"           Catchment 203      Pervious  Impervious  Total Area  "
"           Surface Area      0.056     0.055     0.111     hectare"
"           Time of concentration  7.330     0.953     2.940     minutes"
"           Time to Centroid    141.727   116.256   124.192   minutes"
"           Rainfall depth     78.434     78.434     78.434     mm"
"           Rainfall volume    43.88      43.18     87.06     c.m"
"           Rainfall losses    46.956     7.757     27.513     mm"
"           Runoff depth       31.478     70.676     50.921     mm"
"           Runoff volume      17.61      38.91     56.52     c.m"
"           Runoff coefficient  0.401     0.901     0.649     "
"           Maximum flow      0.008     0.021     0.025     c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"           0.025   0.025   0.015   0.191"
" 54      POND DESIGN"
"           0.025  Current peak flow   c.m/sec"
"           0.005  Target outflow     c.m/sec"
"           56.5  Hydrograph volume   c.m"
"           9.    Number of stages"
"           323.100  Minimum water level   metre"
"           323.390  Maximum water level   metre"
"           323.100  Starting water level   metre"
"           0      Keep Design Data: 1 = True; 0 = False"
"           Level Discharge   Volume"
"           323.100   0.000   0.000"
"           323.140   0.00986  0.2000"
"           323.170   0.01009  1.000"
"           323.210   0.01039  2.000"
"           323.240   0.01061  5.000"
"           323.280   0.01089  9.000"
"           323.320   0.01116  17.000"

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"          323.350    0.07666    26.000"
"          323.390    0.2857    42.000"
"    1. WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          323.320    0.900      7.100    97.700    0.000"
"    1. ORIFICES"
"          Orifice  Orifice  Orifice Number of"
"          invert coefficie diameter orifices"
"          322.450    0.630      0.0750    1.000"
"          Peak outflow                0.011    c.m/sec"
"          Maximum level                323.284    metre"
"          Maximum storage                9.733    c.m"
"          Centroidal lag                2.168    hours"
"          0.025    0.025    0.011    0.191 c.m/sec"
" 40 HYDROGRAPH Combine 1"
"    6 Combine "
"    1 Node #"
"          TOTAL SITE FLOW"
"          Maximum flow                0.201    c.m/sec"
"          Hydrograph volume                448.779    c.m"
"          0.025    0.025    0.011    0.201"
" 40 HYDROGRAPH Start - New Tributary"
"    2 Start - New Tributary"
"          0.025    0.000    0.011    0.201"
" 33 CATCHMENT 204"
"    1 Triangular SCS"
"    2 Proportional to %"
"    1 SCS method"
"    204 CONTROLLE (EAST OF BLDG)"
"    51.500 % Impervious"
"    0.130 Total Area"
"    10.000 Flow length"
"    2.000 Overland Slope"
"    0.063 Pervious Area"
"    10.000 Pervious length"
"    2.000 Pervious slope"
"    0.067 Impervious Area"
"    10.619 Impervious length"
"    2.000 Impervious slope"
"    0.250 Pervious Manning 'n'"
"    75.000 Pervious SCS Curve No."
"    0.401 Pervious Runoff coefficient"
"    0.100 Pervious Ia/S coefficient"
"    8.467 Pervious Initial abstraction"
"    0.015 Impervious Manning 'n'"
"    98.000 Impervious SCS Curve No."
"    0.903 Impervious Runoff coefficient"
"    0.100 Impervious Ia/S coefficient"
"    0.518 Impervious Initial abstraction"
"          0.030    0.000    0.011    0.201 c.m/sec"
"          Catchment 204      Pervious      Impervious      Total Area "
"          Surface Area                0.063      0.067      0.130      hectare"
"          Time of concentration      7.330      0.997      2.866      minutes"
"          Time to Centroid      141.727      116.231      123.755      minutes"
"          Rainfall depth      78.434      78.434      78.434      mm"
"          Rainfall volume      49.45      52.51      101.96      c.m"
"          Rainfall losses      46.956      7.628      26.702      mm"
"          Runoff depth      31.478      70.805      51.732      mm"
"          Runoff volume      19.85      47.40      67.25      c.m"
"          Runoff coefficient      0.401      0.903      0.660      "
"          Maximum flow      0.009      0.026      0.030      c.m/sec"
" 40 HYDROGRAPH Add Runoff "

```

```

"          4  Add Runoff "
"          0.030      0.030      0.011      0.201"
" 54  POND DESIGN"
"    0.030  Current peak flow      c.m/sec"
"    0.005  Target outflow      c.m/sec"
"    67.3   Hydrograph volume      c.m"
"    12.    Number of stages"
"    322.250  Minimum water level      metre"
"    322.800  Maximum water level      metre"
"    322.250  Starting water level      metre"
"    0       Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"    322.250      0.000      0.000"
"    322.300      0.01031      0.4500"
"    322.350      0.01068      2.000"
"    322.400      0.01103      3.000"
"    322.450      0.01137      5.000"
"    322.500      0.01170      8.000"
"    322.550      0.01202      13.000"
"    322.600      0.01233      21.000"
"    322.650      0.01263      32.000"
"    322.700      0.01293      46.000"
"    322.750      0.01322      64.000"
"    322.800      0.06386      85.000"
"    1.  WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"    322.750      0.900      0.000      79.000      79.000"
"    1.  ORIFICES"
"          Orifice      Orifice      Orifice      Number of"
"          invert coefficie      diameter orifices"
"    321.550      0.630      0.0750      1.000"
"          Peak outflow      0.012      c.m/sec"
"          Maximum level      322.553      metre"
"          Maximum storage      13.453      c.m"
"          Centroidal lag      2.194      hours"
"          0.030      0.030      0.012      0.201 c.m/sec"
" 40  HYDROGRAPH Next link "
"    5  Next link "
"          0.030      0.012      0.012      0.201"
" 33  CATCHMENT 205"
"    1  Triangular SCS"
"    2  Proportional to %"
"    1  SCS method"
"    205  CONTROLLED (South OF BLDG)"
"    67.800  % Impervious"
"    0.699  Total Area"
"    10.000  Flow length"
"    2.000  Overland Slope"
"    0.225  Pervious Area"
"    10.000  Pervious length"
"    2.000  Pervious slope"
"    0.474  Impervious Area"
"    21.056  Impervious length"
"    2.000  Impervious slope"
"    0.250  Pervious Manning 'n'"
"    75.000  Pervious SCS Curve No."
"    0.401  Pervious Runoff coefficient"
"    0.100  Pervious Ia/S coefficient"
"    8.467  Pervious Initial abstraction"
"    0.015  Impervious Manning 'n'"
"    98.000  Impervious SCS Curve No."
"    0.917  Impervious Runoff coefficient"

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"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"          0.199      0.012      0.012      0.201 c.m/sec"
"      Catchment 205      Pervious      Impervious Total Area  "
"      Surface Area      0.225      0.474      0.699      hectare"
"      Time of concentration      7.330      1.503      2.506      minutes"
"      Time to Centroid      141.727      117.192      121.415      minutes"
"      Rainfall depth      78.434      78.434      78.434      mm"
"      Rainfall volume      176.54      371.71      548.25      c.m"
"      Rainfall losses      46.956      6.517      19.538      mm"
"      Runoff depth      31.478      71.916      58.895      mm"
"      Runoff volume      70.85      340.83      411.68      c.m"
"      Runoff coefficient      0.401      0.917      0.751      "
"      Maximum flow      0.033      0.184      0.199      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"          4      Add Runoff  "
"          0.199      0.210      0.012      0.201"
" 54      POND DESIGN"
"      0.210      Current peak flow      c.m/sec"
"      0.005      Target outflow      c.m/sec"
"      478.4      Hydrograph volume      c.m"
"      8.      Number of stages"
"      321.940      Minimum water level      metre"
"      322.300      Maximum water level      metre"
"      321.940      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"          321.940      0.000      0.000"
"          321.990      0.1079      0.1000"
"          322.040      0.1115      1.000"
"          322.090      0.1150      6.000"
"          322.150      0.1191      25.000"
"          322.200      0.1224      61.000"
"          322.240      0.1250      107.000"
"          322.300      0.1740      208.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"          322.240      0.900      0.000      45.000      45.000"
"      1.      ORIFICES"
"          Orifice      Orifice      Orifice Number of"
"          invert coefficie      diameter orifices"
"          321.100      0.630      0.2400      1.000"
"          Peak outflow      0.121      c.m/sec"
"          Maximum level      322.177      metre"
"          Maximum storage      44.720      c.m"
"          Centroidal lag      2.084      hours"
"          0.199      0.210      0.121      0.201 c.m/sec"
" 40      HYDROGRAPH Combine      1"
"          6      Combine  "
"          1      Node #"
"          TOTAL SITE FLOW"
"          Maximum flow      0.318      c.m/sec"
"          Hydrograph volume      928.679      c.m"
"          0.199      0.210      0.121      0.318"

```

POST-50YR

```
"          MIDUSS Output ----->"
"          MIDUSS version                Version 2.25 rev. 473"
"          MIDUSS created                Sunday, February 7, 2010"
"          10 Units used:                  ie METRIC"
"          Job folder:                    Q:\44357\112\SWM\MIDUSS"
"          Output filename:              44357-POST-50YR_rev_24.out"
"          Licensee name:                 A"
"          Company                        "
"          Date & Time last used:         12/9/2022 at 4:31:59 PM"
" 31          TIME PARAMETERS"
"          5.000 Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 47          FILEI_O Read/Open Stratford-50yr.stm"
"          1 1=read/open; 2=write/save"
"          1 1=rainfall; 2=hydrograph"
"          1 1=rain; 2=imperv; 3=perv"
"          Stratford-50yr.stm"
"          Enter a description for file identification."
"          New storm defined"
"          Total depth                    89.814 mm"
"          Maximum intensity              171.458 mm/hr"
"          Duration                      240.000 minutes"
"          0.000 0.000 0.000 0.000 c.m/sec"
"          6 050hyd Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"          1 Triangular SCS"
"          2 Proportional to %"
"          1 SCS method"
"          201 UNCONTROLLED (TO THAMES ST.)"
"          80.200 % Impervious"
"          0.564 Total Area"
"          10.000 Flow length"
"          2.000 Overland Slope"
"          0.112 Pervious Area"
"          10.000 Pervious length"
"          2.000 Pervious slope"
"          0.452 Impervious Area"
"          40.505 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.440 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.925 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.197 0.000 0.000 0.000 c.m/sec"
"          Catchment 201 Pervious Impervious Total Area "
"          Surface Area 0.112 0.452 0.564 hectare"
"          Time of concentration 6.797 2.153 2.641 minutes"
"          Time to Centroid 140.074 117.830 120.168 minutes"
"          Rainfall depth 89.814 89.814 89.814 mm"
"          Rainfall volume 100.30 406.26 506.55 c.m"
"          Rainfall losses 50.293 6.758 15.378 mm"
"          Runoff depth 39.521 83.057 74.437 mm"
"          Runoff volume 44.13 375.69 419.82 c.m"
"          Runoff coefficient 0.440 0.925 0.829 "
"          Maximum flow 0.020 0.186 0.197 c.m/sec"
```

"	40	HYDROGRAPH Add Runoff "				
"		4 Add Runoff "				
"			0.197	0.197	0.000	0.000"
"	40	HYDROGRAPH Copy to Outflow"				
"		8 Copy to Outflow"				
"			0.197	0.197	0.197	0.000"
"	40	HYDROGRAPH Combine 1"				
"		6 Combine "				
"		1 Node #"				
"		TOTAL SITE FLOW"				
"		Maximum flow		0.197		c.m/sec"
"		Hydrograph volume		419.823		c.m"
"			0.197	0.197	0.197	0.197"
"	40	HYDROGRAPH Start - New Tributary"				
"		2 Start - New Tributary"				
"			0.197	0.000	0.197	0.197"
"	33	CATCHMENT 202"				
"		1 Triangular SCS"				
"		2 Proportional to %"				
"		1 SCS method"				
"		202 UNCONTROLLED (TO NEIGHBOURING PROPERTY) "				
"	13.500	% Impervious"				
"		0.091 Total Area"				
"		5.000 Flow length"				
"		4.000 Overland Slope"				
"		0.079 Pervious Area"				
"		5.000 Pervious length"				
"		4.000 Pervious slope"				
"		0.012 Impervious Area"				
"		0.780 Impervious length"				
"		4.000 Impervious slope"				
"		0.250 Pervious Manning 'n' "				
"	75.000	Pervious SCS Curve No. "				
"		0.436 Pervious Runoff coefficient"				
"		0.100 Pervious Ia/S coefficient"				
"		8.467 Pervious Initial abstraction"				
"		0.015 Impervious Manning 'n' "				
"	98.000	Impervious SCS Curve No. "				
"		0.804 Impervious Runoff coefficient"				
"		0.100 Impervious Ia/S coefficient"				
"		0.518 Impervious Initial abstraction"				
"			0.018	0.000	0.197	0.197 c.m/sec"
"		Catchment 202	Pervious	Impervious	Total Area	"
"		Surface Area	0.079	0.012	0.091	hectare"
"		Time of concentration	3.642	0.164	2.865	minutes"
"		Time to Centroid	135.932	113.853	130.995	minutes"
"		Rainfall depth	89.814	89.814	89.814	mm"
"		Rainfall volume	70.70	11.03	81.73	c.m"
"		Rainfall losses	50.662	17.569	46.194	mm"
"		Runoff depth	39.152	72.245	43.620	mm"
"		Runoff volume	30.82	8.88	39.69	c.m"
"		Runoff coefficient	0.436	0.804	0.486	"
"		Maximum flow	0.014	0.005	0.018	c.m/sec"
"	40	HYDROGRAPH Add Runoff "				
"		4 Add Runoff "				
"			0.018	0.018	0.197	0.197"
"	40	HYDROGRAPH Copy to Outflow"				
"		8 Copy to Outflow"				
"			0.018	0.018	0.018	0.197"
"	40	HYDROGRAPH Combine 1"				
"		6 Combine "				
"		1 Node #"				
"		TOTAL SITE FLOW"				

```

"           Maximum flow           0.215    c.m/sec"
"           Hydrograph volume       459.517  c.m"
"           0.018    0.018    0.018    0.215"
" 40      HYDROGRAPH Start - New Tributary"
"           2    Start - New Tributary"
"           0.018    0.000    0.018    0.215"
" 33      CATCHMENT 203"
"           1    Triangular SCS"
"           2    Proportional to %"
"           1    SCS method"
"           203  CONTROLLED (NORTH OF BLDG)"
"           49.600 % Impervious"
"           0.111  Total Area"
"           10.000 Flow length"
"           2.000  Overland Slope"
"           0.056  Pervious Area"
"           10.000 Pervious length"
"           2.000  Pervious slope"
"           0.055  Impervious Area"
"           9.841  Impervious length"
"           2.000  Impervious slope"
"           0.250  Pervious Manning 'n'"
"           75.000 Pervious SCS Curve No."
"           0.440  Pervious Runoff coefficient"
"           0.100  Pervious Ia/S coefficient"
"           8.467  Pervious Initial abstraction"
"           0.015  Impervious Manning 'n'"
"           98.000 Impervious SCS Curve No."
"           0.908  Impervious Runoff coefficient"
"           0.100  Impervious Ia/S coefficient"
"           0.518  Impervious Initial abstraction"
"           0.029    0.000    0.018    0.215 c.m/sec"
"           Catchment 203      Pervious  Impervious Total Area "
"           Surface Area      0.056    0.055    0.111    hectare"
"           Time of concentration 6.797    0.921    2.859    minutes"
"           Time to Centroid    140.075  116.054  123.977  minutes"
"           Rainfall depth      89.814    89.814    89.814    mm"
"           Rainfall volume     50.25    49.45    99.69    c.m"
"           Rainfall losses     50.293    8.225    29.427    mm"
"           Runoff depth        39.521    81.589    60.387    mm"
"           Runoff volume       22.11    44.92    67.03    c.m"
"           Runoff coefficient   0.440    0.908    0.672    "
"           Maximum flow        0.010    0.023    0.029    c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"           4    Add Runoff "
"           0.029    0.029    0.018    0.215"
" 54      POND DESIGN"
"           0.029  Current peak flow    c.m/sec"
"           0.005  Target outflow      c.m/sec"
"           67.0  Hydrograph volume     c.m"
"           9.    Number of stages"
"           323.100 Minimum water level    metre"
"           323.390 Maximum water level    metre"
"           323.100 Starting water level    metre"
"           0    Keep Design Data: 1 = True; 0 = False"
"           Level Discharge      Volume"
"           323.100    0.000    0.000"
"           323.140    0.00986    0.2000"
"           323.170    0.01009    1.000"
"           323.210    0.01039    2.000"
"           323.240    0.01061    5.000"
"           323.280    0.01089    9.000"
"           323.320    0.01116    17.000"

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"          323.350    0.07666    26.000"
"          323.390    0.2857    42.000"
"    1. WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          323.320    0.900    7.100    97.700    0.000"
"    1. ORIFICES"
"          Orifice      Orifice      Orifice Number of"
"          invert coefficie diameter orifices"
"          322.450    0.630    0.0750    1.000"
"          Peak outflow                0.011    c.m/sec"
"          Maximum level                323.304    metre"
"          Maximum storage                13.786    c.m"
"          Centroidal lag                2.204    hours"
"          0.029    0.029    0.011    0.215 c.m/sec"
" 40 HYDROGRAPH Combine 1"
"    6 Combine "
"    1 Node #"
"          TOTAL SITE FLOW"
"          Maximum flow                0.226    c.m/sec"
"          Hydrograph volume                525.227    c.m"
"          0.029    0.029    0.011    0.226"
" 40 HYDROGRAPH Start - New Tributary"
"    2 Start - New Tributary"
"          0.029    0.000    0.011    0.226"
" 33 CATCHMENT 204"
"    1 Triangular SCS"
"    2 Proportional to %"
"    1 SCS method"
"    204 CONTROLLE (EAST OF BLDG)"
"    51.500 % Impervious"
"    0.130 Total Area"
"    10.000 Flow length"
"    2.000 Overland Slope"
"    0.063 Pervious Area"
"    10.000 Pervious length"
"    2.000 Pervious slope"
"    0.067 Impervious Area"
"    10.619 Impervious length"
"    2.000 Impervious slope"
"    0.250 Pervious Manning 'n'"
"    75.000 Pervious SCS Curve No."
"    0.440 Pervious Runoff coefficient"
"    0.100 Pervious Ia/S coefficient"
"    8.467 Pervious Initial abstraction"
"    0.015 Impervious Manning 'n'"
"    98.000 Impervious SCS Curve No."
"    0.910 Impervious Runoff coefficient"
"    0.100 Impervious Ia/S coefficient"
"    0.518 Impervious Initial abstraction"
"          0.035    0.000    0.011    0.226 c.m/sec"
"          Catchment 204      Pervious      Impervious Total Area "
"          Surface Area                0.063    0.067    0.130    hectare"
"          Time of concentration  6.797    0.964    2.789    minutes"
"          Time to Centroid        140.075    115.984    123.521    minutes"
"          Rainfall depth          89.814    89.814    89.814    mm"
"          Rainfall volume          56.63    60.13    116.76    c.m"
"          Rainfall losses          50.293    8.070    28.548    mm"
"          Runoff depth             39.521    81.744    61.266    mm"
"          Runoff volume            24.92    54.73    79.65    c.m"
"          Runoff coefficient        0.440    0.910    0.682    "
"          Maximum flow             0.011    0.028    0.035    c.m/sec"
" 40 HYDROGRAPH Add Runoff "

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"          4  Add Runoff "
"          0.035      0.035      0.011      0.226"
" 54      POND DESIGN"
"          0.035  Current peak flow      c.m/sec"
"          0.005  Target outflow      c.m/sec"
"          79.6   Hydrograph volume      c.m"
"          12.   Number of stages"
"          322.250 Minimum water level      metre"
"          322.800 Maximum water level      metre"
"          322.250 Starting water level      metre"
"          0     Keep Design Data: 1 = True; 0 = False"
"              Level Discharge      Volume"
"          322.250      0.000      0.000"
"          322.300      0.01031      0.4500"
"          322.350      0.01068      2.000"
"          322.400      0.01103      3.000"
"          322.450      0.01137      5.000"
"          322.500      0.01170      8.000"
"          322.550      0.01202      13.000"
"          322.600      0.01233      21.000"
"          322.650      0.01263      32.000"
"          322.700      0.01293      46.000"
"          322.750      0.01322      64.000"
"          322.800      0.06386      85.000"
"          1.   WEIRS"
"              Crest      Weir      Crest      Left      Right"
"              elevation coefficie      breadth sideslope sideslope"
"          322.750      0.900      0.000      79.000      79.000"
"          1.   ORIFICES"
"              Orifice      Orifice      Orifice      Number of"
"              invert coefficie      diameter orifices"
"          321.550      0.630      0.0750      1.000"
"          Peak outflow      0.012      c.m/sec"
"          Maximum level      322.584      metre"
"          Maximum storage      18.460      c.m"
"          Centroidal lag      2.243      hours"
"          0.035      0.035      0.012      0.226 c.m/sec"
" 40      HYDROGRAPH Next link "
"          5  Next link "
"          0.035      0.012      0.012      0.226"
" 33      CATCHMENT 205"
"          1  Triangular SCS"
"          2  Proportional to %"
"          1  SCS method"
"          205  CONTROLLED (South OF BLDG)"
"          67.800  % Impervious"
"          0.699  Total Area"
"          10.000  Flow length"
"          2.000  Overland Slope"
"          0.225  Pervious Area"
"          10.000  Pervious length"
"          2.000  Pervious slope"
"          0.474  Impervious Area"
"          21.056  Impervious length"
"          2.000  Impervious slope"
"          0.250  Pervious Manning 'n'"
"          75.000  Pervious SCS Curve No."
"          0.440  Pervious Runoff coefficient"
"          0.100  Pervious Ia/S coefficient"
"          8.467  Pervious Initial abstraction"
"          0.015  Impervious Manning 'n'"
"          98.000  Impervious SCS Curve No."
"          0.924  Impervious Runoff coefficient"

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"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"              0.224      0.012      0.012      0.226 c.m/sec"
"      Catchment 205      Pervious      Impervious Total Area  "
"      Surface Area      0.225      0.474      0.699      hectare"
"      Time of concentration  6.797      1.454      2.439      minutes"
"      Time to Centroid      140.075      116.769      121.066      minutes"
"      Rainfall depth      89.814      89.814      89.814      mm"
"      Rainfall volume      202.15      425.65      627.80      c.m"
"      Rainfall losses      50.293      6.796      20.802      mm"
"      Runoff depth      39.521      83.018      69.012      mm"
"      Runoff volume      88.95      393.44      482.40      c.m"
"      Runoff coefficient      0.440      0.924      0.768      "
"      Maximum flow      0.040      0.202      0.224      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"      4      Add Runoff  "
"              0.224      0.236      0.012      0.226"
" 54      POND DESIGN"
"      0.236  Current peak flow      c.m/sec"
"      0.005  Target outflow      c.m/sec"
"      561.3  Hydrograph volume      c.m"
"      8.      Number of stages"
"      321.940  Minimum water level      metre"
"      322.300  Maximum water level      metre"
"      321.940  Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"              Level Discharge      Volume"
"      321.940      0.000      0.000"
"      321.990      0.1079      0.1000"
"      322.040      0.1115      1.000"
"      322.090      0.1150      6.000"
"      322.150      0.1191      25.000"
"      322.200      0.1224      61.000"
"      322.240      0.1250      107.000"
"      322.300      0.1740      208.000"
"      1.      WEIRS"
"              Crest      Weir      Crest      Left      Right"
"              elevation coefficie      breadth sideslope sideslope"
"      322.240      0.900      0.000      45.000      45.000"
"      1.      ORIFICES"
"              Orifice      Orifice      Orifice Number of"
"              invert coefficie      diameter orifices"
"      321.100      0.630      0.2400      1.000"
"      Peak outflow      0.123      c.m/sec"
"      Maximum level      322.204      metre"
"      Maximum storage      65.584      c.m"
"      Centroidal lag      2.153      hours"
"      0.224      0.236      0.123      0.226 c.m/sec"
" 40      HYDROGRAPH Combine      1"
"      6      Combine  "
"      1      Node #"
"      TOTAL SITE FLOW"
"      Maximum flow      0.345      c.m/sec"
"      Hydrograph volume      1158.926      c.m"
"              0.224      0.236      0.123      0.345"

```

POST-100YR

```
"          MIDUSS Output ----->"
"          MIDUSS version                Version 2.25 rev. 473"
"          MIDUSS created                Sunday, February 7, 2010"
"          10 Units used:                ie METRIC"
"          Job folder:                   Q:\44357\112\SWM\MIDUSS"
"          Output filename:              44357-POST-100YR_rev_24.out"
"          Licensee name:                A"
"          Company                       "
"          Date & Time last used:        12/9/2022 at 4:33:36 PM"
" 31          TIME PARAMETERS"
"          5.000 Time Step"
"          240.000 Max. Storm length"
"          1500.000 Max. Hydrograph"
" 47          FILEI_O Read/Open Stratford-100yr.stm"
"          1 1=read/open; 2=write/save"
"          1 1=rainfall; 2=hydrograph"
"          1 1=rain; 2=imperv; 3=perv"
"          Stratford-100yr.stm"
"          Enter a description for file identification."
"          New storm defined"
"          Total depth                    101.000 mm"
"          Maximum intensity              185.623 mm/hr"
"          Duration                      240.000 minutes"
"          0.000 0.000 0.000 0.000 c.m/sec"
"          6 100hyd Hydrograph extension used in this file"
" 33          CATCHMENT 201"
"          1 Triangular SCS"
"          2 Proportional to %"
"          1 SCS method"
"          201 UNCONTROLLED (TO THAMES ST.)"
"          80.200 % Impervious"
"          0.564 Total Area"
"          10.000 Flow length"
"          2.000 Overland Slope"
"          0.112 Pervious Area"
"          10.000 Pervious length"
"          2.000 Pervious slope"
"          0.452 Impervious Area"
"          40.505 Impervious length"
"          2.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.475 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.931 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"          0.220 0.000 0.000 0.000 c.m/sec"
"          Catchment 201 Pervious Impervious Total Area "
"          Surface Area 0.112 0.452 0.564 hectare"
"          Time of concentration 6.362 2.084 2.562 minutes"
"          Time to Centroid 138.449 117.363 119.722 minutes"
"          Rainfall depth 101.000 101.000 101.000 mm"
"          Rainfall volume 112.79 456.85 569.64 c.m"
"          Rainfall losses 53.005 6.954 16.072 mm"
"          Runoff depth 47.995 94.046 84.928 mm"
"          Runoff volume 53.60 425.40 478.99 c.m"
"          Runoff coefficient 0.475 0.931 0.841 "
"          Maximum flow 0.024 0.205 0.220 c.m/sec"
```

```

" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.220      0.220      0.000      0.000"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.220      0.220      0.220      0.000"
" 40      HYDROGRAPH Combine 1"
"          6  Combine "
"          1  Node #"
"          TOTAL SITE FLOW"
"          Maximum flow              0.220      c.m/sec"
"          Hydrograph volume          478.992      c.m"
"              0.220      0.220      0.220      0.220"
" 40      HYDROGRAPH Start - New Tributary"
"          2  Start - New Tributary"
"              0.220      0.000      0.220      0.220"
" 33      CATCHMENT 202"
"          1  Triangular SCS"
"          2  Proportional to %"
"          1  SCS method"
"          202 UNCONTROLLED (TO NEIGHBOURING PROPERTY)"
"          13.500 % Impervious"
"          0.091 Total Area"
"          5.000 Flow length"
"          4.000 Overland Slope"
"          0.079 Pervious Area"
"          5.000 Pervious length"
"          4.000 Pervious slope"
"          0.012 Impervious Area"
"          0.780 Impervious length"
"          4.000 Impervious slope"
"          0.250 Pervious Manning 'n'"
"          75.000 Pervious SCS Curve No."
"          0.470 Pervious Runoff coefficient"
"          0.100 Pervious Ia/S coefficient"
"          8.467 Pervious Initial abstraction"
"          0.015 Impervious Manning 'n'"
"          98.000 Impervious SCS Curve No."
"          0.811 Impervious Runoff coefficient"
"          0.100 Impervious Ia/S coefficient"
"          0.518 Impervious Initial abstraction"
"              0.021      0.000      0.220      0.220 c.m/sec"
"          Catchment 202      Pervious      Impervious Total Area "
"          Surface Area          0.079      0.012      0.091      hectare"
"          Time of concentration  3.409      0.158      2.719      minutes"
"          Time to Centroid      134.610     113.547     130.141     minutes"
"          Rainfall depth        101.000     101.000     101.000     mm"
"          Rainfall volume        79.50       12.41       91.91       c.m"
"          Rainfall losses        53.560     19.130     48.912     mm"
"          Runoff depth          47.440     81.870     52.088     mm"
"          Runoff volume          37.34       10.06       47.40       c.m"
"          Runoff coefficient      0.470       0.811       0.516       "
"          Maximum flow          0.017       0.005       0.021       c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"          4  Add Runoff "
"              0.021      0.021      0.220      0.220"
" 40      HYDROGRAPH Copy to Outflow"
"          8  Copy to Outflow"
"              0.021      0.021      0.021      0.220"
" 40      HYDROGRAPH Combine 1"
"          6  Combine "
"          1  Node #"
"          TOTAL SITE FLOW"

```

```

"           Maximum flow           0.241   c.m/sec"
"           Hydrograph volume       526.392 c.m"
"           0.021   0.021   0.021   0.241"
" 40      HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"           0.021   0.000   0.021   0.241"
" 33      CATCHMENT 203"
"           1   Triangular SCS"
"           2   Proportional to %"
"           1   SCS method"
"           203 CONTROLLED (NORTH OF BLDG)"
"           49.600 % Impervious"
"           0.111 Total Area"
"           10.000 Flow length"
"           2.000 Overland Slope"
"           0.056 Pervious Area"
"           10.000 Pervious length"
"           2.000 Pervious slope"
"           0.055 Impervious Area"
"           9.841 Impervious length"
"           2.000 Impervious slope"
"           0.250 Pervious Manning 'n'"
"           75.000 Pervious SCS Curve No."
"           0.475 Pervious Runoff coefficient"
"           0.100 Pervious Ia/S coefficient"
"           8.467 Pervious Initial abstraction"
"           0.015 Impervious Manning 'n'"
"           98.000 Impervious SCS Curve No."
"           0.913 Impervious Runoff coefficient"
"           0.100 Impervious Ia/S coefficient"
"           0.518 Impervious Initial abstraction"
"           0.033   0.000   0.021   0.241 c.m/sec"
"           Catchment 203           Pervious Impervious Total Area "
"           Surface Area           0.056   0.055   0.111   hectare"
"           Time of concentration  6.362   0.892   2.783   minutes"
"           Time to Centroid       138.449 115.823 123.649 minutes"
"           Rainfall depth         101.000 101.000 101.000 mm"
"           Rainfall volume        56.50   55.61   112.11 c.m"
"           Rainfall losses        53.005   8.764   31.062 mm"
"           Runoff depth           47.995   92.236  69.938 mm"
"           Runoff volume          26.85   50.78   77.63 c.m"
"           Runoff coefficient      0.475   0.913   0.692 "
"           Maximum flow           0.012   0.025   0.033 c.m/sec"
" 40      HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"           0.033   0.033   0.021   0.241"
" 54      POND DESIGN"
"           0.033 Current peak flow c.m/sec"
"           0.005 Target outflow c.m/sec"
"           77.6 Hydrograph volume c.m"
"           9. Number of stages"
"           323.100 Minimum water level metre"
"           323.390 Maximum water level metre"
"           323.100 Starting water level metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"           Level Discharge Volume"
"           323.100   0.000   0.000"
"           323.140   0.00986 0.2000"
"           323.170   0.01009 1.000"
"           323.210   0.01039 2.000"
"           323.240   0.01061 5.000"
"           323.280   0.01089 9.000"
"           323.320   0.01116 17.000"

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```

"          323.350  0.07666  26.000"
"          323.390  0.2857  42.000"
"    1. WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"          323.320  0.900      7.100  97.700  0.000"
"    1. ORIFICES"
"          Orifice  Orifice  Orifice Number of"
"          invert coefficie diameter orifices"
"          322.450  0.630      0.0750  1.000"
"          Peak outflow                0.015  c.m/sec"
"          Maximum level                323.322  metre"
"          Maximum storage              17.504  c.m"
"          Centroidal lag                2.262  hours"
"          0.033  0.033      0.015  0.241 c.m/sec"
" 40 HYDROGRAPH Combine 1"
"    6 Combine "
"    1 Node #"
"      TOTAL SITE FLOW"
"          Maximum flow                0.252  c.m/sec"
"          Hydrograph volume          605.467  c.m"
"          0.033  0.033  0.015  0.252"
" 40 HYDROGRAPH Start - New Tributary"
"    2 Start - New Tributary"
"          0.033  0.000  0.015  0.252"
" 33 CATCHMENT 204"
"    1 Triangular SCS"
"    2 Proportional to %"
"    1 SCS method"
"    204 CONTROLLE (EAST OF BLDG)"
"    51.500 % Impervious"
"    0.130 Total Area"
"    10.000 Flow length"
"    2.000 Overland Slope"
"    0.063 Pervious Area"
"    10.000 Pervious length"
"    2.000 Pervious slope"
"    0.067 Impervious Area"
"    10.619 Impervious length"
"    2.000 Impervious slope"
"    0.250 Pervious Manning 'n'"
"    75.000 Pervious SCS Curve No."
"    0.475 Pervious Runoff coefficient"
"    0.100 Pervious Ia/S coefficient"
"    8.467 Pervious Initial abstraction"
"    0.015 Impervious Manning 'n'"
"    98.000 Impervious SCS Curve No."
"    0.915 Impervious Runoff coefficient"
"    0.100 Impervious Ia/S coefficient"
"    0.518 Impervious Initial abstraction"
"          0.039  0.000  0.015  0.252 c.m/sec"
"    Catchment 204      Pervious  Impervious Total Area "
"    Surface Area      0.063  0.067  0.130  hectare"
"    Time of concentration  6.362  0.933  2.716  minutes"
"    Time to Centroid    138.449  115.767  123.215  minutes"
"    Rainfall depth     101.000  101.000  101.000  mm"
"    Rainfall volume     63.68  67.62  131.30  c.m"
"    Rainfall losses     53.005  8.545  30.108  mm"
"    Runoff depth        47.995  92.455  70.892  mm"
"    Runoff volume       30.26  61.90  92.16  c.m"
"    Runoff coefficient  0.475  0.915  0.702  "
"    Maximum flow       0.014  0.031  0.039  c.m/sec"
" 40 HYDROGRAPH Add Runoff "

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```

"          4  Add Runoff "
"          0.039      0.039      0.015      0.252"
" 54  POND DESIGN"
"    0.039  Current peak flow      c.m/sec"
"    0.005  Target outflow      c.m/sec"
"    92.2   Hydrograph volume      c.m"
"    12.    Number of stages"
"   322.250 Minimum water level      metre"
"   322.800 Maximum water level      metre"
"   322.250 Starting water level      metre"
"    0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"   322.250      0.000      0.000"
"   322.300      0.01031      0.4500"
"   322.350      0.01068      2.000"
"   322.400      0.01103      3.000"
"   322.450      0.01137      5.000"
"   322.500      0.01170      8.000"
"   322.550      0.01202     13.000"
"   322.600      0.01233     21.000"
"   322.650      0.01263     32.000"
"   322.700      0.01293     46.000"
"   322.750      0.01322     64.000"
"   322.800      0.06386     85.000"
"    1.  WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie breadth sideslope sideslope"
"   322.750      0.900      0.000      79.000      79.000"
"    1.  ORIFICES"
"          Orifice      Orifice      Orifice      Number of"
"          invert coefficie diameter orifices"
"   321.550      0.630      0.0750      1.000"
"          Peak outflow      0.012      c.m/sec"
"          Maximum level      322.614      metre"
"          Maximum storage      24.086      c.m"
"          Centroidal lag      2.310      hours"
"          0.039      0.039      0.012      0.252 c.m/sec"
" 40  HYDROGRAPH Next link "
"    5  Next link "
"          0.039      0.012      0.012      0.252"
" 33  CATCHMENT 205"
"    1  Triangular SCS"
"    2  Proportional to %"
"    1  SCS method"
"   205  CONTROLLED (South OF BLDG)"
"   67.800 % Impervious"
"    0.699 Total Area"
"   10.000 Flow length"
"    2.000 Overland Slope"
"    0.225 Pervious Area"
"   10.000 Pervious length"
"    2.000 Pervious slope"
"    0.474 Impervious Area"
"   21.056 Impervious length"
"    2.000 Impervious slope"
"    0.250 Pervious Manning 'n'"
"   75.000 Pervious SCS Curve No."
"    0.475 Pervious Runoff coefficient"
"    0.100 Pervious Ia/S coefficient"
"    8.467 Pervious Initial abstraction"
"    0.015 Impervious Manning 'n'"
"   98.000 Impervious SCS Curve No."
"    0.930 Impervious Runoff coefficient"

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"      0.100  Impervious Ia/S coefficient"
"      0.518  Impervious Initial abstraction"
"          0.251      0.012      0.012      0.252 c.m/sec"
"      Catchment 205      Pervious      Impervious Total Area  "
"      Surface Area      0.225      0.474      0.699      hectare"
"      Time of concentration  6.362      1.407      2.375      minutes"
"      Time to Centroid      138.449      116.357      120.671      minutes"
"      Rainfall depth      101.000      101.000      101.000      mm"
"      Rainfall volume      227.33      478.66      705.99      c.m"
"      Rainfall losses      53.005      7.085      21.871      mm"
"      Runoff depth      47.995      93.915      79.129      mm"
"      Runoff volume      108.03      445.08      553.11      c.m"
"      Runoff coefficient      0.475      0.930      0.783      "
"      Maximum flow      0.049      0.220      0.251      c.m/sec"
" 40      HYDROGRAPH Add Runoff  "
"          4      Add Runoff  "
"          0.251      0.262      0.012      0.252"
" 54      POND DESIGN"
"      0.262      Current peak flow      c.m/sec"
"      0.005      Target outflow      c.m/sec"
"      645.2      Hydrograph volume      c.m"
"      8.      Number of stages"
"      321.940      Minimum water level      metre"
"      322.300      Maximum water level      metre"
"      321.940      Starting water level      metre"
"      0      Keep Design Data: 1 = True; 0 = False"
"          Level Discharge      Volume"
"          321.940      0.000      0.000"
"          321.990      0.1079      0.1000"
"          322.040      0.1115      1.000"
"          322.090      0.1150      6.000"
"          322.150      0.1191      25.000"
"          322.200      0.1224      61.000"
"          322.240      0.1250      107.000"
"          322.300      0.1740      208.000"
"      1.      WEIRS"
"          Crest      Weir      Crest      Left      Right"
"          elevation coefficie      breadth sideslope sideslope"
"          322.240      0.900      0.000      45.000      45.000"
"      1.      ORIFICES"
"          Orifice      Orifice      Orifice Number of"
"          invert coefficie      diameter orifices"
"          321.100      0.630      0.2400      1.000"
"          Peak outflow      0.124      c.m/sec"
"          Maximum level      322.225      metre"
"          Maximum storage      90.227      c.m"
"          Centroidal lag      2.247      hours"
"          0.251      0.262      0.124      0.252 c.m/sec"
" 40      HYDROGRAPH Combine      1"
"          6      Combine  "
"          1      Node #"
"          TOTAL SITE FLOW"
"          Maximum flow      0.372      c.m/sec"
"          Hydrograph volume      1331.868      c.m"
"          0.251      0.262      0.124      0.372"

```

Appendix B

Quality Control Structure



ADS OGS Sizing Summary

Project Name:	Perth County Ingredients	
Consulting Engineer:	MTE	
Location:	St. Mary's, ON	
Sizing Completed By:	C. Neath	Email: cody.neath@ads-pipe.com

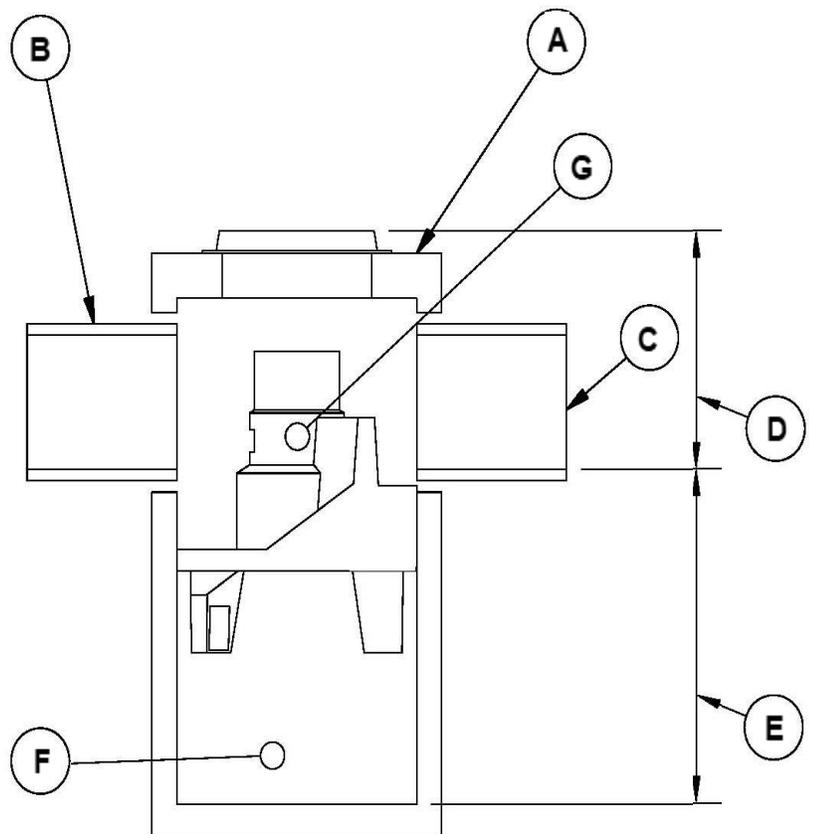
Treatment Requirements		
Treatment Goal:	Enhanced (MOE)	
Selected Parameters:	80% TSS	90% Volume
Selected Unit:	FD-4HC	

Site Details	
Site Area:	1.48 ha
% Impervious:	65%
Rational C:	0.69
Rainfall Station:	Stratford, ONT
Particle Size Distribution:	Fine
Peak Flowrate:	395 L/s

Summary of Results		
Model	TSS Removal	Volume Treated
FD-4HC	84.0%	>90%
FD-5HC	88.0%	>90%
FD-6HC	90.0%	>90%
FD-8HC	94.0%	>90%
FD-10HC	96.0%	>90%

FD-4HC Specification	
Unit Diameter (A):	1,200 mm
Inlet Pipe Diameter (B):	300 mm
Outlet Pipe Diameter (C):	300 mm
Height, T/G to Outlet Invert (D):	2000 mm
Height, Outlet Invert to Sump (E):	1515 mm
Sediment Storage Capacity (F):	0.78 m ³
Oil Storage Capacity (G):	723 L
Recommended Sediment Depth for Maintenance:	440 mm
Max. Pipe Diameter:	600 mm
Peak Flow Capacity:	510 L/s

Site Elevations:	
Rim Elevation:	100.00
Inlet Pipe Elevation:	98.00
Outlet Pipe Elevation:	98.00



Notes:

Removal efficiencies are based on NJDEP Test Protocols and independently verified.

All units supplied by ADS have numerous local, provincial, and international certifications (copies of which can be provided upon request). The design engineer is responsible for ensuring compliance with applicable regulations.



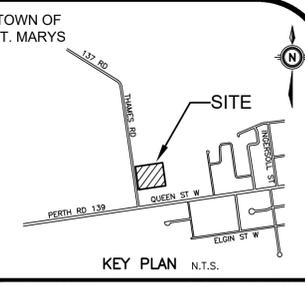
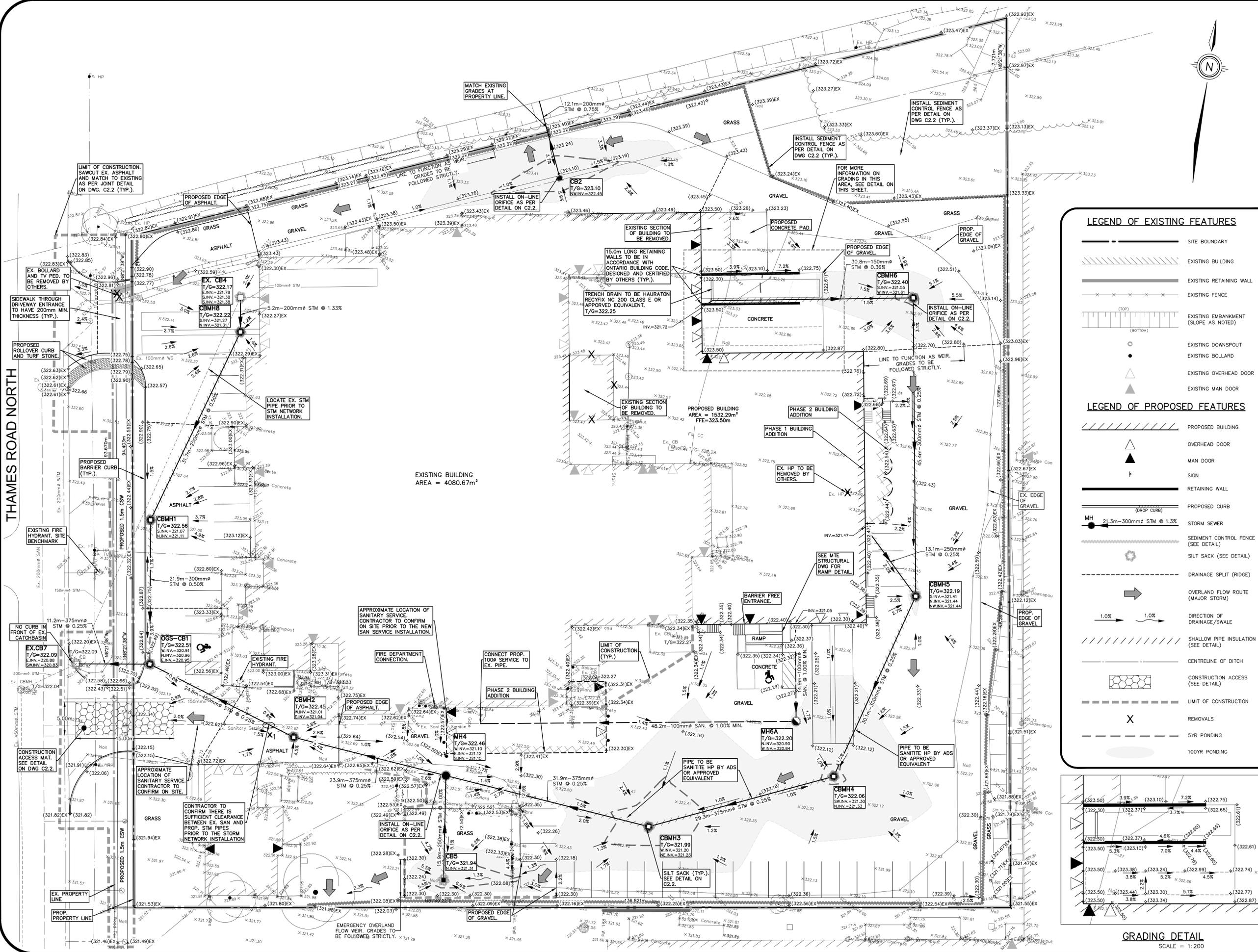
Project Name: Perth County Ingredients
 Consulting Engineer: MTE
 Location: St. Mary's, ON

Net Annual Removal Efficiency Summary: FD-4HC

Rainfall Intensity ⁽¹⁾	Fraction of Rainfall ⁽¹⁾	FD-4HC Removal Efficiency ⁽²⁾	Weighted Net-Annual Removal Efficiency
mm/hr	%	%	%
0.50	0.3%	100.0%	0.3%
1.00	15.5%	94.3%	14.6%
1.50	14.3%	90.9%	13.0%
2.00	13.6%	88.5%	12.0%
2.50	4.0%	86.6%	3.5%
3.00	2.3%	85.2%	2.0%
3.50	8.4%	84.0%	7.1%
4.00	4.6%	82.9%	3.8%
4.50	1.7%	82.0%	1.4%
5.00	4.8%	81.2%	3.9%
6.00	3.8%	79.9%	3.0%
7.00	4.2%	78.7%	3.3%
8.00	3.0%	77.8%	2.3%
9.00	2.2%	76.9%	1.7%
10.00	2.3%	76.2%	1.7%
20.00	9.3%	71.4%	6.7%
30.00	2.8%	68.8%	2.0%
40.00	1.2%	66.9%	0.8%
50.00	0.6%	65.6%	0.4%
100.00	0.8%	61.5%	0.5%
150.00	0.1%	59.2%	0.1%
200.00	0.0%	57.6%	0.0%
Total Net Annual Removal Efficiency:			84.0%
Total Runoff Volume Treated:			99.9%

Notes:

- (1) Rainfall Data: 1965:2007, HLY03, Stratford, ON, 6148105.
- (2) Based on third party verified data and approximating the removal of a PSD similar to the STC Fine distribution
- (3) Rainfall adjusted to 5 min peak intensity based on hourly average.



TOWN OF ST. MARYS

GEODETIC BM ELEV. = 321.731m
 BM 01019890457, BC IN CURB, FLUSH WITH GRADE. MONUMENT ON QUEEN STREET WEST, 40.0M EAST OF CENTRELINE OF WILLIAM STREET NORTH, 4.7M SOUTH OF THE CENTRELINE OF QUEEN STREET, IN THE TOWN OF ST. MARYS.

SITE BENCHMARK ELEV. = 323.007m
 FIRE HYDRANT TOP OF NUT ON THE WEST SIDE OF THE SITE. LOCATED BETWEEN BOTH ENTRANCES TO THE PROPERTY, PERPENDICULAR TO THE THAMES ROAD TRAILER PARK ENTRANCE.

LEGEND OF EXISTING FEATURES	
	SITE BOUNDARY
	EXISTING BUILDING
	EXISTING RETAINING WALL
	EXISTING FENCE
	EXISTING EMBANKMENT (SLOPE AS NOTED)
	EXISTING DOWNSPOUT
	EXISTING BOLLARD
	EXISTING OVERHEAD DOOR
	EXISTING MAN DOOR
LEGEND OF PROPOSED FEATURES	
	PROPOSED BUILDING
	OVERHEAD DOOR
	MAN DOOR
	SIGN
	RETAINING WALL
	PROPOSED CURB (DROP CURB)
	STORM SEWER (21.3m-300mm STM @ 1.3%)
	SEDIMENT CONTROL FENCE (SEE DETAIL)
	SILT SACK (SEE DETAIL)
	DRAINAGE SPLIT (RIDGE)
	OVERLAND FLOW ROUTE (MAJOR STORM)
	DIRECTION OF DRAINAGE/SWALE
	SHALLOW PIPE INSULATION (SEE DETAIL)
	CENTRELINE OF DITCH
	CONSTRUCTION ACCESS (SEE DETAIL)
	LIMIT OF CONSTRUCTION
	REMOVALS
	5YR PONDING
	100YR PONDING

NOTE TO CONTRACTOR :
 DO NOT SCALE DRAWINGS.
 CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS BEFORE PROCEEDING WITH THE WORK.
 ALL DRAWINGS REMAIN THE PROPERTY OF THE ENGINEER AND SHALL NOT BE REPRODUCED OR REUSED WITHOUT THE ENGINEER'S WRITTEN PERMISSION.
 THE OWNER/ARCHITECT/CONTRACTOR IS ADVISED THAT M.T.E. CONSULTANTS INC. CANNOT CERTIFY ANY COMPONENT OF THE SITE WORKS NOT INSPECTED DURING CONSTRUCTION. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO NOTIFY M.T.E. CONSULTANTS INC. PRIOR TO COMMENCEMENT OF CONSTRUCTION TO ARRANGE FOR INSPECTION.

X1 CAUTION: CROSSING BETWEEN STM AND SAN SERVICES
 STM INV. = 321.00

NO.	REVISION	BY	DATE
8.			
7.			
6.			
5.			
4.	ISSUED FOR APPROVAL	MEW	2023-01-12
3.	ISSUED FOR CLIENT REVIEW	MEW	2022-12-12
2.	ISSUED FOR APPROVAL	MEW	2022-09-24
1.	ISSUED FOR CLIENT REVIEW	MEW	2022-09-08

MTE
 Engineers, Scientists, Surveyors

519-271-7952

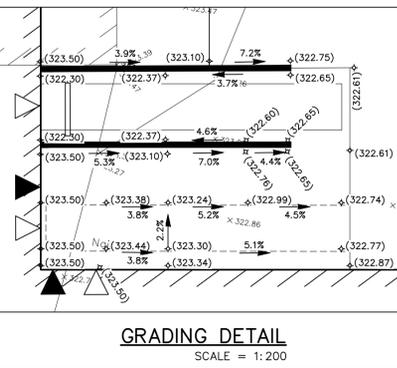
LICENSED PROFESSIONAL ENGINEER
 S. ANTHOULAKIS
 100516499
 PROVINCE OF ONTARIO

OWNER
PERTH COUNTY INGREDIENTS
 20 THAMES ROAD ST. MARYS, ONTARIO

PROJECT
 2022 BUILDING ADDITIONS
 20 THAMES ROAD ST. MARYS, ONTARIO

DRAWING
SITE GRADING, SERVICING AND EROSION & SEDIMENT CONTROL PLAN

Project Manager	M. WHITTEMORE	Project No.	44357-112
Design By	SXP	Checked By	JMD
Drawn By	MRB	Checked By	MEW
Surveyed By	MTE OLS	Drawing No.	C2.1
Date	Jan. 12/23		
Scale	1:250	Sheet 4 of 5	



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ME FILE PATH:

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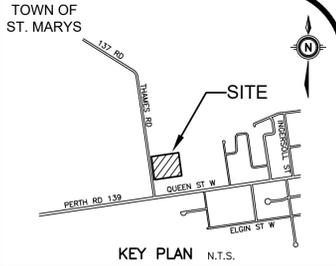
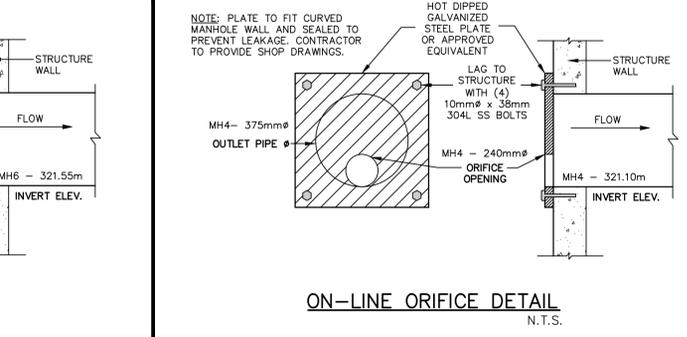
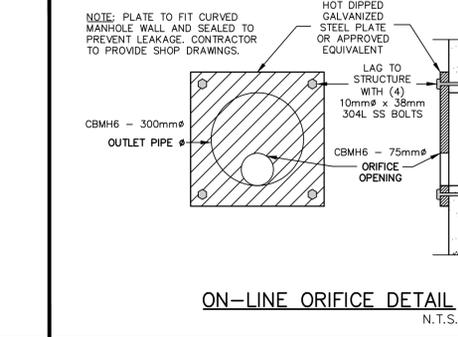
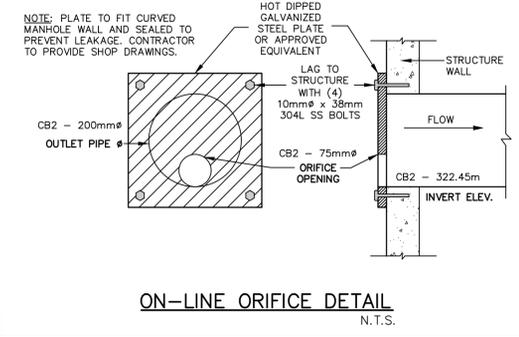
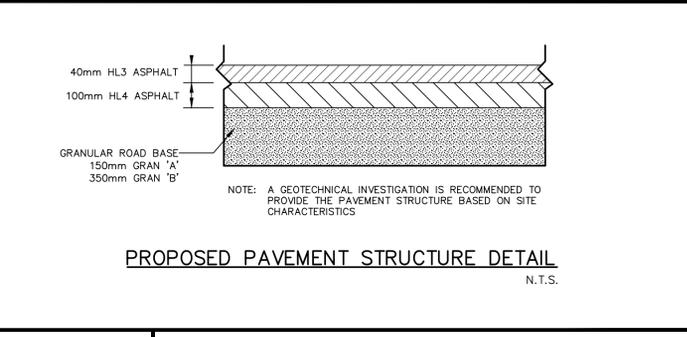
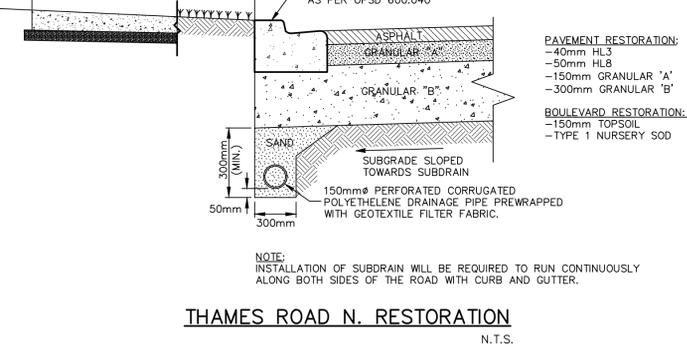
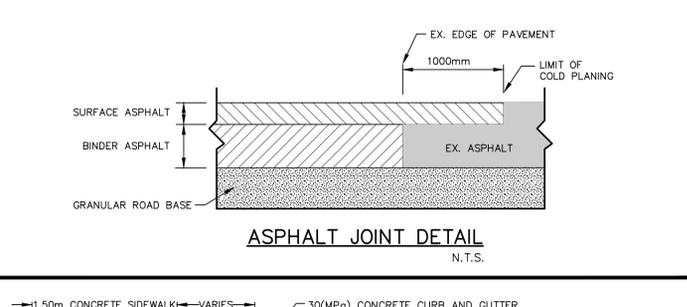
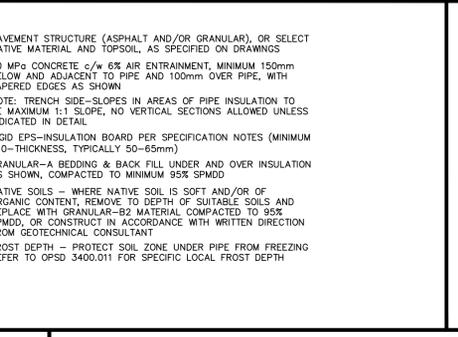
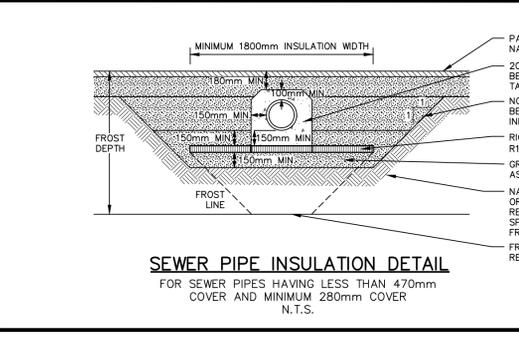
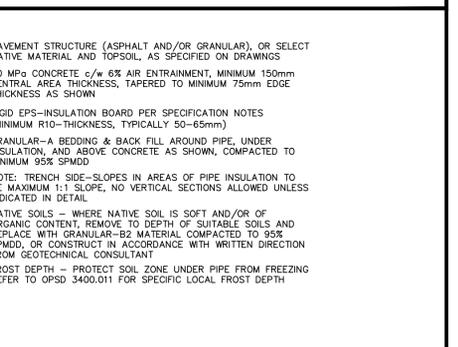
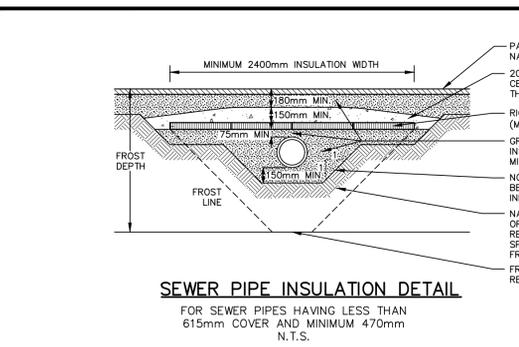
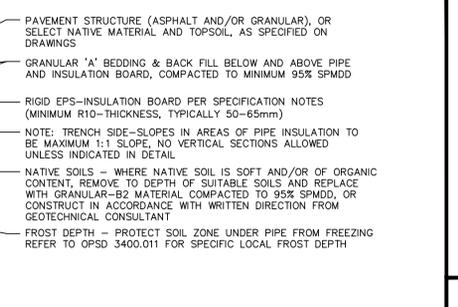
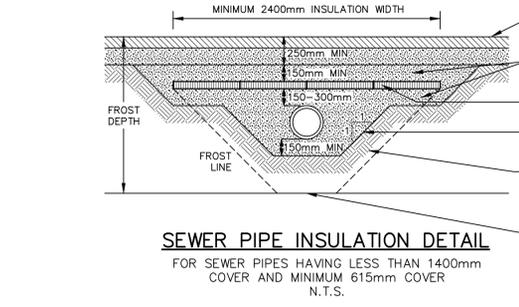
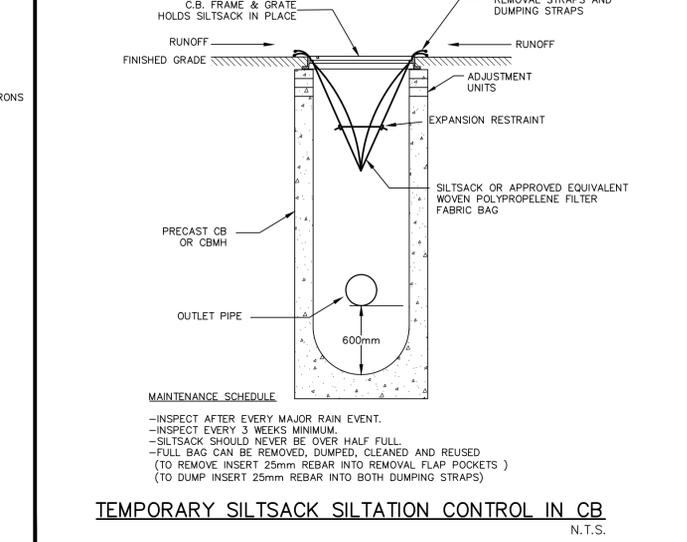
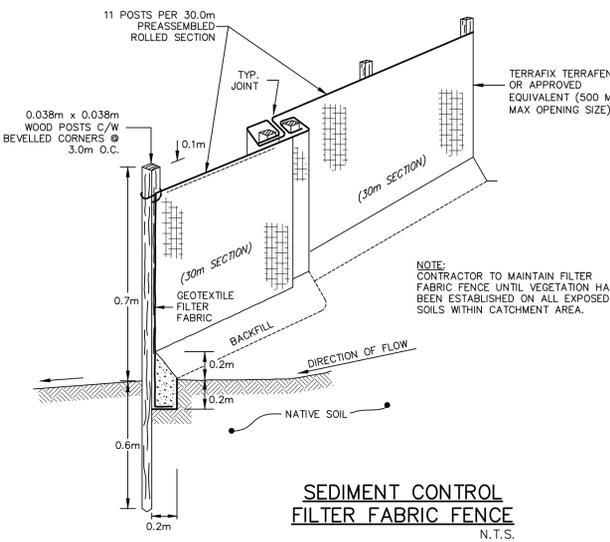
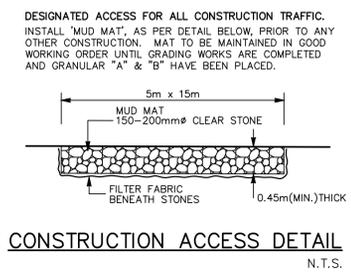
- 1.1. THESE PLANS ARE NOT FOR CONSTRUCTION UNTIL SIGNED AND SEALED BY ENGINEER AND APPROVED BY THE TOWN OF ST. MARYS.
1.2. THESE PLANS ARE TO BE USED FOR SERVING AND GRADING ONLY; ANY OTHER INFORMATION SHOWN IS FOR ILLUSTRATION PURPOSES ONLY.
1.3. NO CHANGES ARE TO BE MADE WITHOUT THE APPROVAL OF THE DESIGN ENGINEER.
1.4. THESE PLANS ARE NOT TO BE REPRODUCED IN WHOLE OR IN PART WITHOUT THE PERMISSION OF MTE CONSULTANTS INC.
1.5. PRIOR TO CONSTRUCTION, THE CONTRACTOR MUST:
1.5.1. CHECK AND VERIFY ALL EXISTING CONDITIONS, LOCATIONS AND ELEVATIONS WHICH INCLUDES BUT IS NOT LIMITED TO THE BENCHMARK ELEVATIONS, EXISTING SERVICE CONNECTIONS AND EXISTING INVERTS, REPORT ALL DISCREPANCIES TO THE ENGINEER PRIOR TO PROCEEDING.
1.5.2. OBTAIN ALL UTILITY LOCATES AND REQUIRED PERMITS AND LICENSES.
1.5.3. VERIFY THAT THE FINISHED FLOOR ELEVATIONS AND BASEMENT FLOOR ELEVATIONS (WHICH MAY APPEAR ON THIS PLAN) COMPLY WITH THE FINAL ARCHITECTURAL DRAWINGS.
1.5.4. CONFIRM ALL DRAWINGS USED FOR CONSTRUCTION ARE OF THE MOST RECENT REVISION.
1.6. THE CONTRACTOR SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO EXISTING WORKS. THE CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ALL DAMAGED AND/OR DISTURBED PROPERTY WITHIN THE MUNICIPAL RIGHT-OF-WAY TO THE TOWN OF ST. MARYS' STANDARDS.
1.7. ALL WORKS ON A MUNICIPAL RIGHT-OF-WAY WITH THE EXCEPTION OF WATERMAIN TAPPING, TO BE INSTALLED BY THE OWNER'S CONTRACTOR AT OWNER'S EXPENSE IN ACCORDANCE WITH THE TOWN OF ST. MARYS' PROCEDURE FOR OFF-SITE WORKS BY PRIVATE CONTRACTOR. THE OWNER AND CONTRACTOR ARE TO ENSURE OFF-SITE WORKS PERMIT IS IN PLACE PRIOR TO CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR RESTORATION OF ALL AFFECTED PROPERTY TO ORIGINAL CONDITION. ALL BOULEVARD AREAS SHALL BE RESTORED WITH 200mm TOPSOIL AND SOD.
1.8. ALL UNDERGROUND SERVICES ARE TO BE CONSTRUCTED IN FULL COMPLIANCE WITH THE ONTARIO PROVINCIAL BUILDING CODE (PART 7, PLUMBING), THE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS (SPSS) AND THE REQUIREMENTS OF THE TOWN OF ST. MARYS; WHICH CODES AND REGULATIONS SHALL SUPERSEDE ALL OTHERS.
1.9. CONTRACTOR IS RESPONSIBLE FOR CONTACTING ENGINEER 48 HRS PRIOR TO COMMENCING WORK TO ARRANGE FOR INSPECTION ENGINEER TO DETERMINE DEGREE OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION OF UNDERGROUND SERVICE INSTALLATION AS MANDATED BY ONTARIO BUILDING CODE, DIVISION C, PART 1, SECTION 1.2.2, GENERAL REVIEW. FAILURE TO NOTIFY ENGINEER WILL RESULT IN EXTENSIVE POST CONSTRUCTION INSPECTION AT CONTRACTORS EXPENSE.
1.10. PLAN TO BE READ IN CONJUNCTION WITH SWM REPORT AND DRAWING C2.1 PREPARED BY MTE CONSULTANTS INC.
1.11. EXISTING TOPOGRAPHIC INFORMATION TAKEN FROM SURVEY CONDUCTED BY MTE CONSULTANTS INC, ON FEBRUARY 9, 2022.
1.12. CONTRACTOR TO OBTAIN WRITTEN PERMISSION FROM ADJACENT PROPERTY OWNER PRIOR TO ENTERING UPON NEIGHBOURING LANDS TO UNDERTAKE ANY WORK. COPIES OF THESE LETTERS OF CONSENT SHALL BE SUBMITTED TO THE DEPARTMENT OF PUBLIC WORKS FOR APPROVAL PRIOR TO ANY WORK BEING PERFORMED. FAILURE TO COMPLY WITH THE ABOVE IS AT CONTRACTOR'S OWN RISK.
1.13. SITE SERVICING CONTRACTOR TO TERMINATE ALL SERVICES 1 METRE FROM FOUNDATION WALL.
1.14. FILTER FABRIC TO BE TERRAFIX 270R OR APPROVED EQUAL.
1.15. MAXIMUM GRASSED SLOPE TO BE 3:1. SLOPES GREATER THAN 3:1 TO BE LANDSCAPED WITH LOW MAINTENANCE GROUND COVER.
1.16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNALS, DELINEATORS, MARKERS, AND BARRIERS, ALL SIGNS, ETC. SHALL CONFORM TO THE STANDARDS OF THE TOWN OF ST. MARYS AND THE MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
1.17. THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
1.18. CONTRACTOR TO MAINTAIN A "CONFINED TRENCH CONDITION" IN ALL SEWER AND SERVICE TRENCHES.
1.19. FOLLOWING COMPLETION OF PROPOSED WORKS AND PRIOR TO OCCUPANCY INSPECTION, ALL STORM AND SANITARY SEWERS ARE TO BE FLUSHED AND ALL CATCHBASIN AND CATCHBASIN MANHOLE SUMPS ARE TO BE CLEANED OF DEBRIS AND SILT.
2. STORM SEWERS
2.1. PIPE BEDDING FOR RIGID PIPE TO BE CLASS "B" AS PER OPSD 802.030, 802.031, OR 802.032. PIPE BEDDING FOR FLEXIBLE PIPE TO BE AS PER OPSD 802.010. BEDDING MATERIAL AND COVER MATERIAL TO BE GRANULAR "A". TRENCH BACKFILL TO BE NATIVE MATERIAL REPLACED IN 300mm LIFTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
2.2. STORM SEWERS, 150mm# AND SMALLER, SHALL BE POLYVINYL CHLORIDE (PVC) PIPE DR35 ASTM-D3034 WITH INTEGRAL BELL AND SPIGOT UTILIZING FLEXIBLE ELASTOMERIC SEALS.
2.3. UNLESS OTHERWISE NOTED, STORM SEWERS 200mm# TO 375mm# SHALL BE POLYVINYL CHLORIDE (PVC) PIPE DR35 ASTM-D3034 OR RIBBED PVC SEWER PIPE CSA B182.4-M90 ASTM-F794 WITH INTEGRAL BELL AND SPIGOT UTILIZING FLEXIBLE ELASTOMERIC SEALS. RIBBED PVC NOT TO BE USED WITHIN RIGHT-OF-WAY.
2.4. STORM SEWERS, 450mm# AND LARGER, SHALL BE CONCRETE PIPE, CSA-A257.2 65-8 WITH RUBBER GASKET JOINT OR RIBBED PVC SEWER PIPE CSA B182.4-M90 ASTM-F794 WITH INTEGRAL BELL AND SPIGOT UTILIZING FLEXIBLE ELASTOMERIC RIBBED PVC NOT TO BE USED WITHIN RIGHT-OF-WAY.
2.5. STORM SEWERS AND SERVICES TO HAVE MINIMUM 1.4m COVER TO TOP OF PIPE. WHERE COVER TO TOP OF PIPE IS DEFICIENT, CONTRACTOR SHALL INSTALL SHALLOW BURIED SEWER PIPE IN ACCORDANCE WITH APPLICABLE "SEWER PIPE INSULATION DETAIL" INDICATED IN DRAWING DETAILS. INSULATION SHALL BE RIGID EXTRUDED POLYSTYRENE (EPS) BOARD, WITH A THICKNESS SUFFICIENT TO PROVIDE AN RSI-1.76 (R10) INSULATING FACTOR (TYPICALLY 50-65mm). INSULATION BOARD WIDTH SHALL BE 1.8m FOR UP TO 200mm NOMINAL PIPE DIAMETER AND 2.4m FOR 200mm-800mm DIAMETER. ALL JOINTS SHALL BE TIGHTLY BUTTED TOGETHER (TAPE OR OTHERWISE SECURE JOINTS TO RESIST MOVEMENT DURING BACKFILL PLACEMENT). RIGID EPS BOARD SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 140kPa (20psi), AND A MAXIMUM WATER ABSORPTION RATE OF 2.0% BY VOLUME. ACCEPTABLE PRODUCTS ARE DOW STYROFOAM-SM OR -HI (FULL LINE), OWENS CORNING FOAMULAR (200, 250, OR HIGHER), PLASTISPAN HD-M28 OR OTHER ENGINEER-APPROVED EQUIVALENT.
2.6. FACTORY FABRICATED WYES SHALL BE USED FOR ALL SERVICE CONNECTIONS.
2.7. MANHOLES AND CATCHBASIN, FRAMES, GRATES, CASTINGS AND LIDS TO BE 1200mm# PRECAST WITH ALUMINIUM STEPS AT 300mm CENTRES AS PER OPSD 701.010 UNLESS OTHERWISE SPECIFIED.
2.8. MANHOLES TO BE BENCHED PER OPSD 701.021.
2.9. CATCHBASINS TO BE 600mm SQUARE PRECAST AS PER OPSD 705.010.
2.10. CATCHBASIN MANHOLES AND CATCHBASINS TO HAVE A MINIMUM 600mm DEEP SUMP.
2.11. MANHOLE AND CATCHBASIN, FRAMES, GRATES, CASTINGS AND LIDS TO BE QUALITY GREY IRON ASTM A48 CLASS 30B.

- 2.12. STORM MANHOLE LIDS TO BE PER OPSD 401.010 - TYPE 'B' CATCHBASIN AND CATCHBASIN MANHOLE GRATES TO BE PER OPSD 400.100.
2.13. UNDER NO CIRCUMSTANCES SHALL THE BUILDING FOUNDATION DRAINS BE CONNECTED DIRECTLY TO THE STORM SEWER SYSTEM.
2.14. ALL WEEPING TIE DRAINAGE TO BE PUMPED TO THE STORM SEWER SYSTEM.
3. SANITARY SEWERS
3.1. PIPE BEDDING FOR RIGID PIPE TO BE CLASS "B" AS PER OPSD 802.030. PIPE BEDDING FOR FLEXIBLE PIPE TO BE AS PER OPSD 802.010. BEDDING MATERIAL AND COVER MATERIAL TO BE GRANULAR "A". TRENCH BACKFILL TO BE NATIVE MATERIAL REPLACED IN 300mm LIFTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
3.2. SANITARY SEWERS 150mm# AND SMALLER SHALL BE POLYVINYL CHLORIDE (PVC) PIPE DR35 ASTM-D3034 WITH INTEGRAL BELL AND SPIGOT UTILIZING FLEXIBLE ELASTOMERIC SEALS.
3.3. MANHOLES TO BE 1200mm# PRECAST WITH ALUMINIUM STEPS AT 300mm CENTRES AS PER OPSD 701.010 UNLESS OTHERWISE SPECIFIED.
3.4. MANHOLES TO BE BENCHED PER OPSD 701.021.
3.5. SANITARY MANHOLE LIDS TO BE PER OPSD 401.010 -TYPE 'A'.
3.6. MANHOLE FRAMES, CASTINGS AND LIDS TO BE QUALITY GREY IRON ASTM A48 CLASS 30B.
3.7. ADJUSTMENT UNITS FOR SANITARY STRUCTURES TO BE IN ACCORDANCE WITH OPSD 704.010 OR 704.011.
3.8. FACTORY FABRICATED WYES SHALL BE USED FOR ALL SERVICE CONNECTIONS.
3.9. SANITARY SEWERS AND SERVICES TO HAVE MINIMUM 1.4m COVER ON TOP OF PIPE. WHERE COVER TO TOP OF PIPE IS DEFICIENT, CONTRACTOR SHALL INSTALL SHALLOW BURIED PIPE IN ACCORDANCE WITH APPLICABLE "SEWER PIPE INSULATION DETAIL" INDICATED IN DRAWING DETAILS. INSULATION SHALL BE RIGID EXTRUDED POLYSTYRENE (EPS) BOARD, WITH A THICKNESS SUFFICIENT TO PROVIDE AN RSI-1.76 (R10) INSULATING FACTOR (TYPICALLY 50-65mm). INSULATION BOARD WIDTH SHALL BE 1.8m FOR UP TO 200mm NOMINAL PIPE DIAMETER. ALL JOINTS SHALL BE TIGHTLY BUTTED TOGETHER (TAPE OR OTHERWISE SECURE JOINTS TO RESIST MOVEMENT DURING BACKFILL PLACEMENT). RIGID EPS BOARD SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 140kPa (20psi), AND A MAXIMUM WATER ABSORPTION RATE OF 2.0% BY VOLUME. ACCEPTABLE PRODUCTS ARE DOW STYROFOAM-SM OR -HI (FULL LINE), OWENS CORNING FOAMULAR (200, 250, OR HIGHER), PLASTISPAN HD-M28 OR OTHER ENGINEER-APPROVED EQUIVALENT.
3.10. CONTRACTOR RESPONSIBLE FOR TESTING OF SANITARY SEWERS IN ACCORDANCE WITH OPSD 410.
4. EROSION AND SEDIMENT CONTROL
4.1. CONTRACTOR TO INSTALL EROSION CONTROL MEASURES AS SHOWN PRIOR TO CONSTRUCTION AND MAINTAIN IN GOOD CONDITION UNTIL CONSTRUCTION IS COMPLETED AND ALL DISTURBED GROUND SURFACES HAVE BEEN RESTABILIZED EITHER BY PAVING OR RESTORATION OF VEGETATIVE COVER.
4.2. ALL SEDIMENT CONTROL FENCING TO BE INSTALLED PRIOR TO ANY AREA GRADING, EXCAVATING OR DEMOLITION COMMENCING.
4.3. EROSION CONTROL FENCING TO BE INSTALLED AROUND BASE OF ALL STOCKPILES. ALL STOCKPILES TO BE KEPT 2.5m MINIMUM FROM PROPERTY LINE.
4.4. EROSION PROTECTION TO BE PROVIDED AROUND ALL STORM AND SANITARY MHS AND CBS.
4.5. CONSTRUCTION ACCESS (STONE PAD) TO BE PROVIDED ON-SITE AT ALL LOCATIONS WHERE CONSTRUCTION VEHICLES EXIT THE SITE. CONSTRUCTION ACCESS (STONE PAD) SHALL BE A MINIMUM OF 5.0m WIDE, 15.0m LONG AND 0.45m MIN. DEEP AND SHALL CONSIST OF 50mm CLEAR STONE MATERIAL FOR THE FIRST 7.5m AND 150mm RIP-RAP MATERIAL FOR THE REMAINING 7.5m. CONTRACTOR TO ENSURE ALL VEHICLES LEAVE THE SITE VIA THE MUD MAT AND THAT THE MAT IS MAINTAINED IN A MANNER TO MAXIMIZE EFFECTIVENESS AT ALL TIMES.
4.6. ADDITIONAL EROSION CONTROL MEASURES MAY BE REQUIRED AS SITE DEVELOPMENT PROGRESSES. CONTRACTOR TO PROVIDE ALL ADDITIONAL EROSION CONTROL STRUCTURES.
4.7. EROSION CONTROL STRUCTURES TO REMAIN IN PLACE UNTIL ALL DISTURBED GROUND SURFACES HAVE BEEN RESTABILIZED.
4.8. NO ALTERNATE METHODS OF EROSION PROTECTION SHALL BE PERMITTED UNLESS APPROVED BY THE ENGINEER AND THE TOWN OF ST. MARYS' DEPARTMENT OF PUBLIC WORKS.
4.9. CONTRACTOR TO CLEAN ROADWAY AND SIDEWALKS OF SEDIMENTS RESULTING FROM CONSTRUCTION TRAFFIC FROM THE SITE EACH DAY.
4.10. CONTRACTOR MUST REMOVE EROSION AND SEDIMENTATION FENCING PRIOR TO COMPLETION OF PROJECT. CONTRACTOR TO HAVE EROSION AND SEDIMENTATION FENCE INSPECTED WHEN VEGETATION HAS ESTABLISHED, BUT PRIOR TO FENCE BECOMING OVERGROWN. ENGINEER'S REPRESENTATIVE TO DETERMINE IF VEGETATION HAS REACHED THE CRITICAL POINT AND WILL THEN INSTRUCT CONTRACTOR TO REMOVE FENCE.
5. MAINTENANCE RECOMMENDATIONS
5.1. REMOVE SEDIMENT AND CONTAMINANTS AND REINSTATE STORMWATER MANAGEMENT FACILITY ACCORDING TO THE DESIGN OUTLINED ON THIS PLAN.
5.2. OWNER'S REPRESENTATIVE TO MONITOR EROSION CONTROL STRUCTURES TO ENSURE FENCING IS INSTALLED AND MAINTENANCE IS PERFORMED TO CITY REQUIREMENTS.

- 19. CONTRACTOR IS RESPONSIBLE FOR CONTACTING ENGINEER 48 HRS PRIOR TO COMMENCING WORK TO ARRANGE FOR INSPECTION ENGINEER TO DETERMINE DEGREE OF INSPECTION AND TESTING REQUIRED FOR CERTIFICATION OF UNDERGROUND SERVICE INSTALLATION AS MANDATED BY ONTARIO BUILDING CODE, DIVISION C, PART 1, SECTION 1.2.2, GENERAL REVIEW. FAILURE TO NOTIFY ENGINEER WILL RESULT IN EXTENSIVE POST CONSTRUCTION INSPECTION AT CONTRACTORS EXPENSE.
1.10. PLAN TO BE READ IN CONJUNCTION WITH SWM REPORT AND DRAWING C2.1 PREPARED BY MTE CONSULTANTS INC.
1.11. EXISTING TOPOGRAPHIC INFORMATION TAKEN FROM SURVEY CONDUCTED BY MTE CONSULTANTS INC, ON FEBRUARY 9, 2022.
1.12. CONTRACTOR TO OBTAIN WRITTEN PERMISSION FROM ADJACENT PROPERTY OWNER PRIOR TO ENTERING UPON NEIGHBOURING LANDS TO UNDERTAKE ANY WORK. COPIES OF THESE LETTERS OF CONSENT SHALL BE SUBMITTED TO THE DEPARTMENT OF PUBLIC WORKS FOR APPROVAL PRIOR TO ANY WORK BEING PERFORMED. FAILURE TO COMPLY WITH THE ABOVE IS AT CONTRACTOR'S OWN RISK.
1.13. SITE SERVICING CONTRACTOR TO TERMINATE ALL SERVICES 1 METRE FROM FOUNDATION WALL.
1.14. FILTER FABRIC TO BE TERRAFIX 270R OR APPROVED EQUAL.
1.15. MAXIMUM GRASSED SLOPE TO BE 3:1. SLOPES GREATER THAN 3:1 TO BE LANDSCAPED WITH LOW MAINTENANCE GROUND COVER.
1.16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNALS, DELINEATORS, MARKERS, AND BARRIERS, ALL SIGNS, ETC. SHALL CONFORM TO THE STANDARDS OF THE TOWN OF ST. MARYS AND THE MTO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
1.17. THE POSITION OF POLE LINES, CONDUITS, WATERMANS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
1.18. CONTRACTOR TO MAINTAIN A "CONFINED TRENCH CONDITION" IN ALL SEWER AND SERVICE TRENCHES.
1.19. FOLLOWING COMPLETION OF PROPOSED WORKS AND PRIOR TO OCCUPANCY INSPECTION, ALL STORM AND SANITARY SEWERS ARE TO BE FLUSHED AND ALL CATCHBASIN AND CATCHBASIN MANHOLE SUMPS ARE TO BE CLEANED OF DEBRIS AND SILT.
2. STORM SEWERS
2.1. PIPE BEDDING FOR RIGID PIPE TO BE CLASS "B" AS PER OPSD 802.030, 802.031, OR 802.032. PIPE BEDDING FOR FLEXIBLE PIPE TO BE AS PER OPSD 802.010. BEDDING MATERIAL AND COVER MATERIAL TO BE GRANULAR "A". TRENCH BACKFILL TO BE NATIVE MATERIAL REPLACED IN 300mm LIFTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY.
2.2. STORM SEWERS, 150mm# AND SMALLER, SHALL BE POLYVINYL CHLORIDE (PVC) PIPE DR35 ASTM-D3034 WITH INTEGRAL BELL AND SPIGOT UTILIZING FLEXIBLE ELASTOMERIC SEALS.
2.3. UNLESS OTHERWISE NOTED, STORM SEWERS 200mm# TO 375mm# SHALL BE POLYVINYL CHLORIDE (PVC) PIPE DR35 ASTM-D3034 OR RIBBED PVC SEWER PIPE CSA B182.4-M90 ASTM-F794 WITH INTEGRAL BELL AND SPIGOT UTILIZING FLEXIBLE ELASTOMERIC SEALS. RIBBED PVC NOT TO BE USED WITHIN RIGHT-OF-WAY.
2.4. STORM SEWERS, 450mm# AND LARGER, SHALL BE CONCRETE PIPE, CSA-A257.2 65-8 WITH RUBBER GASKET JOINT OR RIBBED PVC SEWER PIPE CSA B182.4-M90 ASTM-F794 WITH INTEGRAL BELL AND SPIGOT UTILIZING FLEXIBLE ELASTOMERIC RIBBED PVC NOT TO BE USED WITHIN RIGHT-OF-WAY.
2.5. STORM SEWERS AND SERVICES TO HAVE MINIMUM 1.4m COVER TO TOP OF PIPE. WHERE COVER TO TOP OF PIPE IS DEFICIENT, CONTRACTOR SHALL INSTALL SHALLOW BURIED SEWER PIPE IN ACCORDANCE WITH APPLICABLE "SEWER PIPE INSULATION DETAIL" INDICATED IN DRAWING DETAILS. INSULATION SHALL BE RIGID EXTRUDED POLYSTYRENE (EPS) BOARD, WITH A THICKNESS SUFFICIENT TO PROVIDE AN RSI-1.76 (R10) INSULATING FACTOR (TYPICALLY 50-65mm). INSULATION BOARD WIDTH SHALL BE 1.8m FOR UP TO 200mm NOMINAL PIPE DIAMETER AND 2.4m FOR 200mm-800mm DIAMETER. ALL JOINTS SHALL BE TIGHTLY BUTTED TOGETHER (TAPE OR OTHERWISE SECURE JOINTS TO RESIST MOVEMENT DURING BACKFILL PLACEMENT). RIGID EPS BOARD SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 140kPa (20psi), AND A MAXIMUM WATER ABSORPTION RATE OF 2.0% BY VOLUME. ACCEPTABLE PRODUCTS ARE DOW STYROFOAM-SM OR -HI (FULL LINE), OWENS CORNING FOAMULAR (200, 250, OR HIGHER), PLASTISPAN HD-M28 OR OTHER ENGINEER-APPROVED EQUIVALENT.
2.6. FACTORY FABRICATED WYES SHALL BE USED FOR ALL SERVICE CONNECTIONS.
2.7. MANHOLES AND CATCHBASIN, FRAMES, GRATES, CASTINGS AND LIDS TO BE 1200mm# PRECAST WITH ALUMINIUM STEPS AT 300mm CENTRES AS PER OPSD 701.010 UNLESS OTHERWISE SPECIFIED.
2.8. MANHOLES TO BE BENCHED PER OPSD 701.021.
2.9. CATCHBASINS TO BE 600mm SQUARE PRECAST AS PER OPSD 705.010.
2.10. CATCHBASIN MANHOLES AND CATCHBASINS TO HAVE A MINIMUM 600mm DEEP SUMP.
2.11. MANHOLE AND CATCHBASIN, FRAMES, GRATES, CASTINGS AND LIDS TO BE QUALITY GREY IRON ASTM A48 CLASS 30B.

STORMWATER MANAGEMENT (SWM) SUMMARY FOR THE CONTROLLED PART OF THE SITE

Table with 2 columns: SITE DRAINAGE SYSTEM - CB2 (TYPE: SURFACE STORAGE), SITE DRAINAGE SYSTEM - CBM4 (TYPE: SURFACE STORAGE), SITE DRAINAGE SYSTEM - CBM6 (TYPE: SURFACE STORAGE), SITE DRAINAGE SYSTEM - MH4 (TYPE: SURFACE STORAGE). Rows include Orifice Size, Orifice Invert, Max. Storage Depth, Max. Ponding Elevation, Max. Used Site Storage, and Available Site Storage.



GEODETIC BM ELEV. = 321.731m
SITE BENCHMARK ELEV. = 323.007m

NOTE TO CONTRACTOR: DO NOT SCALE DRAWINGS. CONTRACTORS MUST CHECK AND VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

Revision table with columns: No., REVISION, and BY. Includes dates for issued for approval and issued for client review.

MTE Engineers, Scientists, Surveyors
519-271-7952

Professional Engineer License information for S. Anthoulakis, 100516499, 2023-01-12.

OWNER: PERTH COUNTY INGREDIENTS
PROJECT: 2022 BUILDING ADDITIONS

CONSTRUCTION NOTES AND DETAILS table with columns: Project Manager, Design By, Drawn By, Surveyed By, Date, Scale, Project No., Checked By, Drawing No., Sheet 5 of 5.

January 12, 2023 4:31:26 PM Plotted by: Shiroa Anthoulakis