

August 09, 2024

Project Number: P2267

David Schaeffer Engineering Limited
120 Iber Road, Unit 103
Stittsville, ON
K2S 1E9

Attention: Marc Pichette, P.Eng.

**Subject: Caivan Lands – Stittsville West Ltd. & Stittsville South Inc.:
Conceptual SWM Ponds Sizing and Preliminary HGL Analysis**

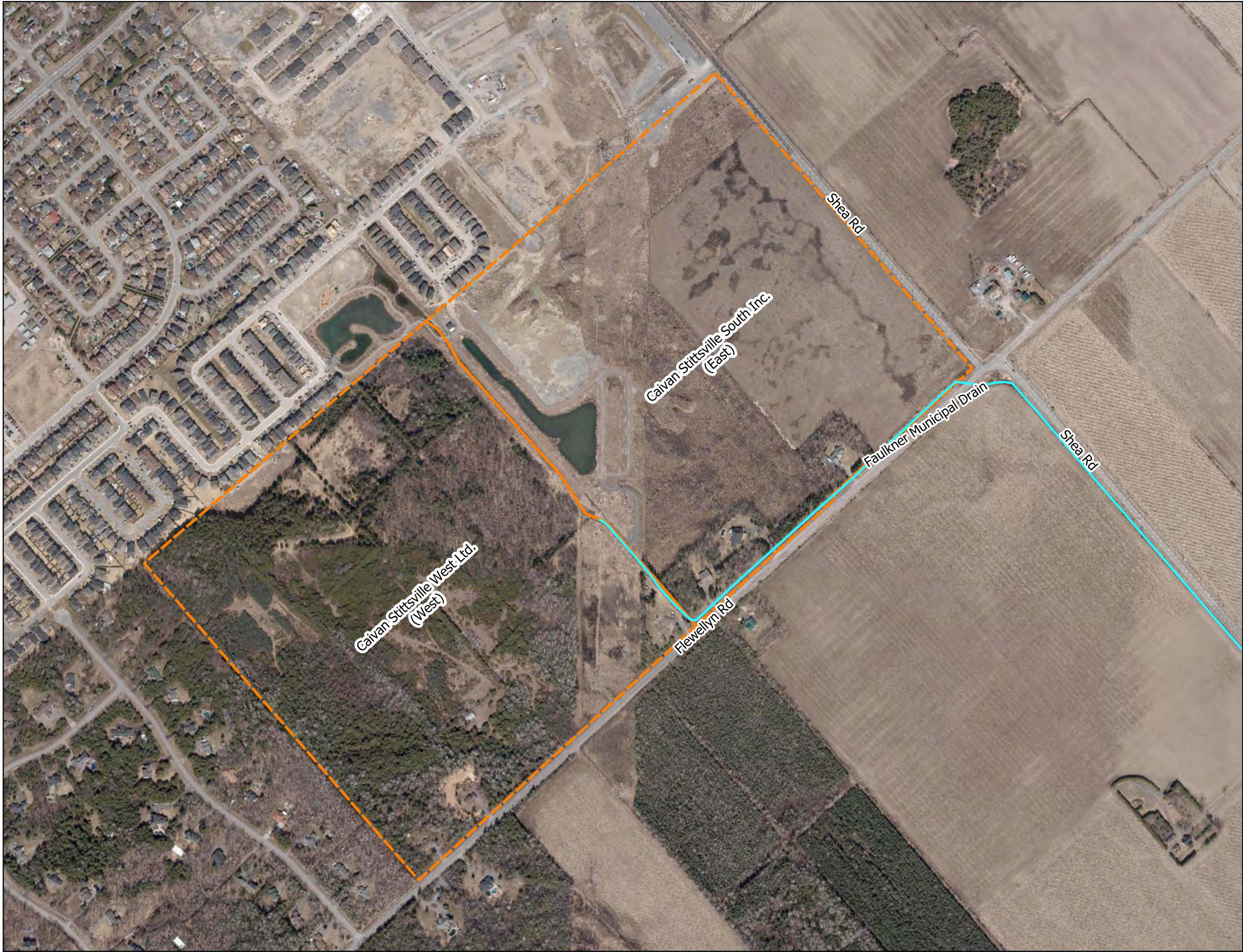
Introduction

JFSA Canada Inc. (JFSA) was retained by David Schaeffer Engineering Ltd. (DSEL) to complete a conceptual SWM ponds sizing and HGL analysis in support of their Master Servicing Study (MSS) for the proposed development of the Caivan Stittsville Lands (6030 Fernbank Road, 5993, 6070 & 6115 Flewellyn Road). This memo assesses and presents the following:

- A conceptual sizing of two SWM ponds (referred to hereon as East and West SWM Ponds) based on the existing stormwater conditions within the subject site.
- The impacts of discharging a portion of the proposed development to the existing Davidson Pond SWM facility.
- A preliminary storm HGL analysis within the proposed development based on the estimated 100-year water level in the SWM ponds and conceptual stormwater trunk sewer networks.
- A preliminary sanitary HGL analysis within the proposed development based on the estimated 100-year water level in the SWM ponds and conceptual sanitary trunk sewer networks.

Site Overview

The subject lands are bound by Flewellyn Road to the south, Shea Road to the east, an existing urban subdivision development to the north (Stittsville South – Area 6) and an estate lot subdivision to the west. The Faulkner Municipal Drain and a Hydro One power transmission corridor also bisect the area. For this study, the overall development area has been broken into two sections (referred to simply as east and west) bisected by the municipal drain and hydro corridor. The property parcel of 6030 Fernbank Road & 5993 Flewellyn Road (Caivan Stittsville South Inc.) to the east is predominantly agricultural land and grassed areas, while the west parcels (comprising 6070 & 6115 Flewellyn Road, Caivan Stittsville West Ltd.) are treed with patches of grassed areas. **Figure 1** provides an overview of the development site relative to the Faulkner drain and major roads.



Legend

-  Development Area
-  Municipal Drain

SCALE: 1:6000

0 100 200 300 m



Caivan - Stittsville Lands

Figure 1: Site Overview

PROJECT	P2267
DRAWN	PP
DATE	AUG 2024

Existing Stormwater/Pre-Development Conditions

The pre-development conditions used for this site build on the work completed by JFSA in their January 30, 2023 memo titled ***“Caivan-Stittsville Lands (5993, 6070 & 6115 Flewellyn Road) – Pre-Development Hydraulic and Hydrologic Study”***. The January 2023 memo assessed the existing major flow patterns within and around the site and outlined the findings of a detailed pre-development water budget analysis based on site-specific land use, soil and historical rainfall data. In this latest study, adjustments were made to the existing conditions/pre-development drainage areas to reflect an additional portion of the existing Hydro One power transmission corridor within the existing Davidson Lands subdivision, located northeast of the subject site that was identified to drain uncontrolled towards the Faulkner Municipal Drain after the preparation of the January 2023 memo. The existing conditions modelling was also updated to align with the Municipal Drain stationing (**5+229.82** and **4+633.10**) shown in the ***“Amendment to the Engineer’s Report for the Faulkner Municipal Drain”*** prepared by Robinson Consultants Inc. (Robinson) in December 2020.

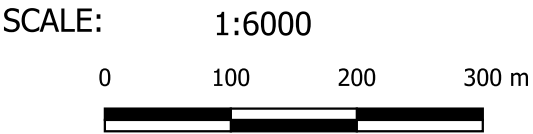
For this development, a post- to pre-development stormwater management approach was taken to size the conceptual SWM ponds and the drainage areas within the subject site were subdivided accordingly. **Figure 2** shows an overview of the existing conditions/pre-development drainage areas within the subject site. From this figure, it can be seen that for the eastern lands, the site primarily consists of **1 (one)** drainage area discharging to the Faulkner Municipal Drain, with subcatchment **Sb** corresponding to the pre-development drainage area draining to Station **4+633.10**, referred to hereon as **Node B**. For the westerly lands, the site primarily consists of **2 (two)** drainage areas discharging to the Faulkner Municipal Drain, with subcatchment **Sx** corresponding to the pre-development drainage area draining to **Node X** before reaching Station **5+229.82**, referred to hereon as **Node A** and subcatchment **Sa** corresponding to the pre-development drainage area draining to **Node A**.

A SWMHYMO model has been developed to assess the site's pre-development flows at each node and determine the allowable release rates for the conceptual SWM ponds. This model can be found in **Attachment B**, with pre-development CN and TP calculations.



Legend

- Development Area
- Drainage Areas
- Pre-Dev. Nodes
- Flow Paths
- Faulkner Municipal Drain
- LiDAR Contours
— 0.50m interval



Caivan - Stittsville Lands

Figure 2: Existing/Pre-Development Conditions Overview

PROJECT	P2267
DRAWN	PP
DATE	AUG 2024

Proposed Stormwater/Post-Development Conditions

The proposed SWM pond blocks will be located in the southeast most corners of the respective west and east blocks, to respect the existing drainage paths and topography of the site. It has been assumed that the site will have an average imperviousness of **69%** (RC=0.68) on the west, **67%** (RC=0.67) on the east and **63%** (RC=0.64) on the east portion of the development that will drain to the existing Davidson SWM Pond, based on DSEL's conceptual design and in line with the average imperviousness of a typical residential development. Approximately **35.34 ha** of the development will drain to the conceptual West SWM pond, approximately **26.25 ha** will drain to the conceptual East SWM Pond and approximately **4.1 ha** of development will drain to the existing Davidson SWM Pond. The remaining lands will remain unchanged from existing conditions and freely drain to the Faulkner Municipal Drain.

Figure 3 shows an overview of the post-development conditions and shows the location of both conceptual East and West SWM Ponds. Note that the location of the proposed conceptual SWM ponds is based on grading constraints and both ponds will outlet to the existing Faulkner Municipal Drain. The conceptual West SWM Pond, as well as post-development drainage areas **W_Und1**, **E_Und1** and **E_Und2** will outlet to **Node X**, before reaching **Node A**. Post-development drainage areas **W_Und2**, **W_Und3**, **E_Und3** and **W_UncF** outlet to **Node A**. The East SWM Pond, as well as post-development drainage areas **E_Und4** and **E_Und5**, outlet to **Node B**.

Based on a preliminary analysis, minor adjustments to the existing Davidson SWM Pond outlet structure can be made to maximize the storage capacity of the pond and accommodate the additional flows from the proposed development. Details of this preliminary analysis have also been provided in this report in the section titled "Existing Davidson Pond Updates".

SWMHYMO Post-Development Simulations

A SWMHYMO model has been developed to assess the proposed conceptual East and West SWM Pond outflows, as well as the total flows to **Nodes A** and **B** under post-development conditions to ensure that the target/pre-development release rates are not exceeded. Preliminary pond controls were set for both conceptual East and West SWM ponds and preliminary outflow-storage curves were applied to the model. Note that the simulations presented in this memo are limited to the subject site only and a detailed assessment of the impacts of the proposed development on the Faulkner Municipal Drain will be prepared at a later date by a designated party when more details regarding the development are solidified and the full external/Faulkner Municipal Drain model is updated to reflect the proposed post-development conditions. Currently, the preliminary pond controls are designed so that the post-development outflows from the proposed conceptual SWM ponds combined with the post-development flows from the uncontrolled drainage areas within the study area, do not exceed the existing/pre-development flows at **Nodes A** and **B**. Based on the information provided by DSEL during the preparation of this study, the portion of the Municipal Drain located upstream of **Node A** will be "abandoned/removed" from its status as a Municipal Drain. Consequently, construction works to improve the hydraulic capacity of that channel section can be undertaken to accommodate potential flow increases at **Node X** under post-development conditions, therefore preventing an increase in water levels in the channel.

The conceptual East and West SWM ponds have been analyzed under both free and restrictive downstream conditions according to the 100-year water levels shown in **Table 4.5** of the December 2020 **“Amendment to the Engineer’s Report for the Faulkner Municipal Drain”** prepared by Robinson. Based on that table, the 100-year water level at **Node A (Sta. 5+229.82)** and **Node B (Sta. 4+633.10)** are **102.74m** and **101.05m** respectively. Note that since the conceptual West SWM pond outlet is located at **Node X**, upstream of **Node A**, a 100-yr water level of **102.77m** was assumed in the analysis of the restrictive outfall conditions for that pond, in line with the 100-year water level used in the Davidson SWM Pond modelling presented in the DSEL/JFSA, November 2017 memo titled **“Design Brief for the Stormwater Management Pond for the Davidson Lands”**. DSEL prepared preliminary stage-storage curves for the conceptual East and West SWM ponds, which were then used in this analysis. Tables with details and calculations for both conceptual SWM ponds, including the preliminary stage-storage curves used in the analysis can be found in **Attachment C**.

Post-Development Simulation Results

Table 1 below provides a summary of the 100-year peak flows under pre- and post-development conditions at **Nodes X, A & B**. **Table 2** below provides a summary of the maximum 100-year release rates, storage volumes and preliminary water levels for the proposed conceptual SWM ponds. **Attachment C** contains the complete SWMHYMO modelling input and output files, along with a comprehensive summary of the modelling results and calculations.

Table 1: Pre- and Post-Development Flows
(100-year 24-hr SCS Type II Storm)

Node X		Node A		Node B	
100-year Target Flow ⁽¹⁾ (m ³ /s)	100-year Post-Dev. Flow (m ³ /s)	100-year Target Flow ⁽¹⁾ (m ³ /s)	100-year Post-Dev. Flow (m ³ /s)	100-year Target Flow ⁽¹⁾ (m ³ /s)	100-year Post-Dev. Flow (m ³ /s)
0.532	0.809	1.069	0.873	1.840	1.620

(1) Target flows based on peak pre-development flows.

Table 2: SWM Ponds Results Summary
(100-year 24-hr SCS Type II Storm)

SWM Pond ID	Release Rate ⁽¹⁾ (m ³ /s)	Volume Used ⁽²⁾ (m ³)	Preliminary Water Level (m)
West	0.590	20,870	103.80
East	0.899	13,990	101.95

(1) Maximum release rate between free and restrictive downstream conditions.

(2) Maximum active storage volume used based on restrictive downstream conditions.

As shown in **Table 1**, the 100-year post-development flows at **Nodes A** and **B** are less than the target flows. The 100-year post-development flows at **Node X** exceed the target flows by 277 L/s. That is mainly due to the fact that under existing/pre-development conditions the total drainage area to **Node X** is approximately **21.02 ha**, while under post-development conditions the total drainage area to the same node more than doubles, to approximately **44.85 ha**. However, as mentioned earlier in this report, the portion of the Municipal Drain located upstream of **Node A** will be “abandoned/removed” from its status as a Municipal Drain and construction works to improve the hydraulic capacity in the channel section between **Node X** and **Node A** will be undertaken to accommodate the flow increase under post-development conditions and prevent an increase in water level in the channel. As this is only a conceptual SWM analysis at this point in time, a more detailed flooding and erosion assessment will be prepared at a later date by a designated party once more information is available for the subdivision and the full external/Faulkner Municipal Drain model is updated to reflect the proposed post-development conditions to verify and mitigate any impacts the development may have on the Municipal Drain. As shown in **Table 2**, the estimated maximum 100-year storage volumes under restrictive downstream conditions for the West and East SWM ponds are **20,870 m³** and **13,990 m³** respectively. The estimated preliminary 100-year water levels under restrictive downstream conditions are **103.80 m** and **101.95 m** for the West and East SWM ponds respectively, providing a freeboard greater than 30 cm to the top of the berm for both SWM ponds.

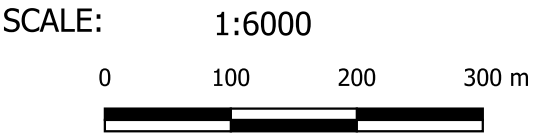
Existing Davidson Pond Updates

It is assumed that approximately **4.1 ha** of the proposed development will drain to the existing Davidson SWM Pond. This additional area was added to the Davidson Pond SWMHYMO model with minor modifications to the existing pond controls to accommodate the additional drainage area. With these modifications in place, the Davidson SWM facility has sufficient storage volume to provide quality and quantity control to accommodate the additional drainage area (refer to **Tables F-1** and **F-2** of **Attachment F**). The pond’s maximum 100-year storage volume used increased from **23,600 m³** to **25,770 m³** and the 100-year water level has increased by **11 cm** from **103.17 m** to **103.28 m**. The average freeboard between the 100-year HGL and USF elevations within the existing Davidson Lands development is approximately **0.87m** based on **Table 5-11** of the June 2020 “**Design Brief for Davidson Lands – OPA 76 AREA 6a Phase 2**” prepared by IBI Group. Additionally, based on that same table, the minimum freeboard between the 100-year HGL and USF elevations within the existing Davidson Lands development are **0.38 m** at **MH 143** and **0.39 m** at **MH 233**. Based on IBI Group’s servicing design, **MH 143** is located approximately **1,020 m** from the existing Davidson SWM Pond and **MH 233** is located approximately **617 m** from the existing Davidson SWM Pond. The 100-year HGL at **MH 143** and **MH 233** are **108.77 m** and **105.11 m** respectively according to **Table 5-11**, which result in the HGL being approximately **5.49 m** and **1.83 m** higher than the estimated maximum 100-year water level in the existing Davidson SWM Pond. Based on this, it is expected that there will be no freeboard issues within the existing development due to the increase in the pond water levels. However, a detailed analysis of the pond operation to assess the release rates, pond water levels and HGL elevations within the proposed and existing development will be completed at the detailed design stage. Refer to **Attachment F** for preliminary model results and details, including an excerpt of **Table 5-11** from IBI’s report.



Legend

- Dev_Area_v02 copy
- Drainage Areas
- Pre-Dev. Nodes
- Faulkner Municipal Drain
- Conceptual Site Plan



Caivan - Stittsville Lands

Figure 3: Proposed/Post-Development Conditions Overview

PROJECT	P2267
DRAWN	PP
DATE	AUG 2024

Preliminary Stormwater Hydraulic Grade Line Analysis (HGL)

A preliminary stormwater hydraulic grade line (HGL) analysis was conducted to ensure there will be sufficient freeboard between the HGL and the proposed top of manhole elevations within the site. Since the underside of footing (USF) elevations are not currently available, this analysis intends to verify the feasibility of gravity storm servicing connections for the units in the proposed development.

Storm Hydraulic Grade Line (HGL) Analysis Approach

Preliminary hydraulic grade line calculations for the proposed development were completed using PCSWMM modelling software. The proposed storm sewer infrastructure data was extracted from DSEL's compiled storm sewer design sheets and incorporated into a PCSWMM model, with flows derived from DSEL's Rational Method calculations applied to each Maintenance Hole (MH) in the model as steady flows (using the baseline inflow option). Exit losses were applied to all storm sewer pipes in the system based on the angle of the downstream connection. **Figure 4** provides an overview of the HGL model. The preliminary HGL analysis assumes the use of the typical City of Ottawa circular Inlet Control Devices (ICDs) throughout the proposed development, therefore, to simulate the flow in the storm sewers during the 100-year event, the Rational Method flows from DSEL's storm design sheets were increased by 14%, to account for the additional flow captured into the minor system during the 100-year event due to additional head acting on the ICDs. Refer to **Attachment A** for DSEL's storm design sheets. Additionally, the analysis assumes the highest estimated 100-year water levels in the conceptual West and East SWM Ponds (**103.80m** and **101.95m** respectively) as per **Tables C-4W** and **C-4E** of **Attachment C**. The 100-year water level in the existing Davidson SWM Pond with the adjustment of the pond controls to accommodate the additional drainage area mentioned earlier in this memo was estimated to be approximately **103.28m** and was used in the preliminary storm HGL assessment for this site.

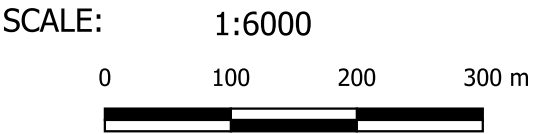
Preliminary Storm HGL Results

Table D-1 of **Attachment D** shows the maximum storm HGL elevation results and the calculated freeboard between the HGL and the top of the manhole elevation. As can be seen, the average freeboard was found to be **2.63m** (excluding **MH-1002** and **MH-314** located within the SWM pond blocks), which is considered to be sufficient to provide a minimum of 0.30m freeboard between the HGL and future USF elevations for units serviced by gravity storm connections, assuming that the typical USF elevation would be approximately 1.80m below the assumed top of manhole elevations. USF elevations may have to be slightly raised in some localized areas of the subject site due to grading constraints to maintain a minimum of 0.30m freeboard, however, this analysis shows that gravity service connections to the storm sewer are fundamentally feasible throughout the site.



Legend

- Manholes
- ▲ Outfalls
- Conduits
- Conceptual Site Plan
- Development Area



Caivan - Stittsville Lands

Figure 4: PCSWMM Storm Model Overview

PROJECT	P2267
DRAWN	PP
DATE	AUG 2024

Preliminary Sanitary Hydraulic Grade Line (HGL) Analysis

Sanitary flows from the proposed development will discharge into the existing Shea Road Pumping Station (SRPS). A sanitary hydraulic grade line (HGL) assessment has been conducted to ensure that the proposed sanitary system within the development is adequately sized to safely convey flows to the existing pumping station, even under a pump failure scenario.

Scenarios Analyzed

As per the City of Ottawa ISTB-2018-01, the site was assessed under Annual and Rare conditions. The following outlines the assumptions for both scenarios:

Rare Flows:

- Flow contributions based on Rare Event parameters set out in the City of Ottawa design guidelines and ISTB-2018-01.
- Pumping station operating at a maximum capacity of **71.5 L/s** – assumed a safety factor of 15% reduction of the firm capacity of 84 L/s as per information provided by Novatech to DSEL by email on August 18, 2023.
- Emergency overflow locations that discharge to the existing Davidson SWM Pond and proposed East SWM Pond are assumed to be flapped, with a downstream water level of **103.28m** and **101.95m** respectively based on the 100-year water level in the SWM ponds.

Annual Flows:

- Flow contributions based on Annual event parameters set out in the City of Ottawa design guidelines and ISTB-2018-01.
- Complete pumping station failure (**0 L/s**).
- Emergency overflow locations that discharge to the existing Davidson SWM Pond and proposed East SWM Pond are assumed to be flapped, with a downstream water level of **103.28m** and **101.95m** respectively based on the 100-year water level in the SWM ponds.

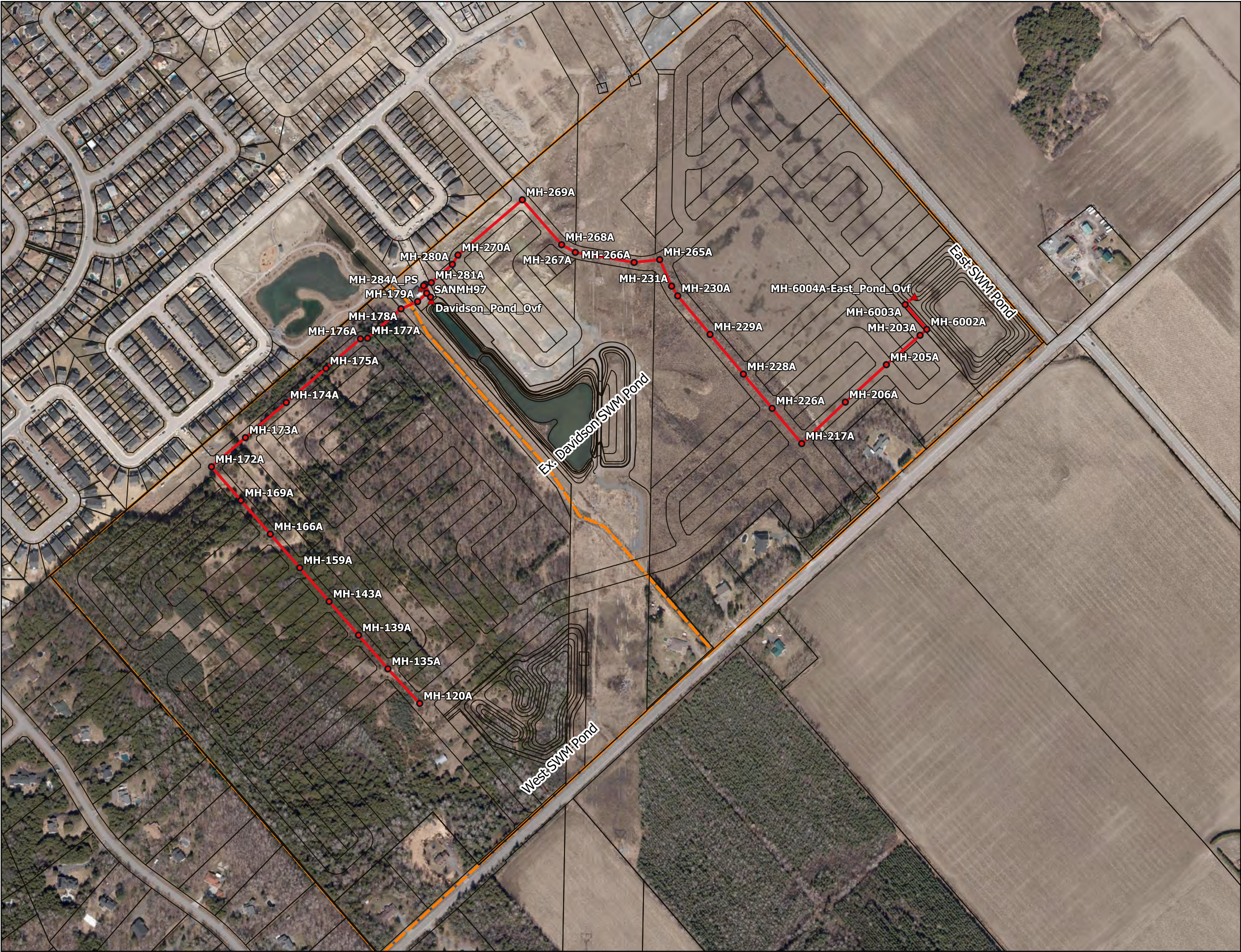
Note that a new sanitary emergency overflow at an invert of **102.344 m** is proposed to be installed and discharged to the proposed conceptual East SWM Pond. The existing sanitary overflow infrastructure to the Davidson SWM Pond will be maintained, however, modifications to the emergency overflow weir dimensions and crest/invert elevation in **SANMH 97** are proposed. The analysis assumes that the existing emergency overflow weir (sharp-crested weir) will be modified from an approximately **500mm** long by **300mm** high weir (assumed existing dimensions based on photos from the site as actual dimensions could not be obtained during the preparation of this memo) with a crest/invert elevation of **103.40 m** to a **900mm** long by **500mm** high emergency overflow weir with a crest/invert elevation of **103.05 m** (above the estimated 25-year water level in the Davidson SWM Pond). Note that no sanitary emergency overflow is proposed to discharge into the proposed conceptual West SWM Pond.

Sanitary Hydraulic Grade Line Analysis (HGL) Analysis Approach

Preliminary hydraulic grade line calculations for the proposed development were completed using PCSWMM modelling software. The proposed sanitary sewer infrastructure data was extracted from DSEL's compiled sanitary design sheets and incorporated into a PCSWMM model, with flows derived from DSEL's sanitary calculations applied to each Maintenance Hole (MH) in the model as steady flows (using the baseline inflow option). Exit losses were applied to all sanitary sewer pipes in the system based on the angle of the downstream connection. **Figure 5** provides an overview of the model.

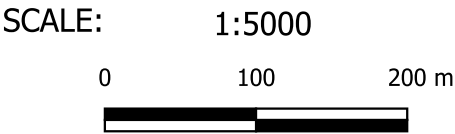
Preliminary Sanitary HGL Results

Tables E-1 and E-2 of Attachment E show the maximum sanitary HGL elevation results and the calculated freeboard between the HGL and the top of the manhole elevation. As can be seen, the minimum freeboard was found to be **3.18 m** and **2.16 m** (excluding **MH-284A_PS**, **SANMH97**, **MH-6002A** and **MH-6003A** located within the pump station and SWM pond blocks) for the Rare and Annual scenarios respectively, which is considered to be sufficient to provide a minimum of 0.30m freeboard between the HGL and future USF elevations under the Rare flows scenario and maintaining the HGL below the USF under the pumping station failure scenario (Annual flows), assuming that the typical USF elevation would be approximately 1.80m below the assumed top of manhole elevations. USF elevations may have to be slightly raised in some localized areas of the subject site due to grading constraints to maintain the minimum required freeboard, however, this analysis shows that the preliminary sanitary sewer system for the proposed development is adequately sized.



Legend

- Manholes
- ▲ Outfalls
- Conduits
- Conceptual Site Plan
- Development Area



Caivan - Stittsville Lands

Figure 5: PCSWMM Sanitary Model Overview

PROJECT	P2267
DRAWN	PP
DATE	AUG 2024

Conclusion

In summary, a post- to pre-development approach was taken to preliminarily size the conceptual West and East SWM ponds within the subject site that will outlet into the Faulkner Municipal Drain. At this time, the simulations presented in this memo are limited to the subject site only; however, a detailed assessment of the impacts of the proposed development on the Faulkner Municipal Drain will be completed at a later date by a designated party once site plan details become solidified and the full external/Faulkner Municipal Drain model is updated to reflect the proposed post-development conditions.

PCSWMM modelling has been completed to analyze the storm HGL elevations within the proposed development based on the flow details provided by DSEL. Based on this analysis, it was determined that according to the resulting freeboards between the HGL and the top of manhole elevations, it is feasible to have units serviced by gravity storm connections, assuming that the typical USF elevations would be approximately 1.80m below the assumed top of manhole elevations.

A preliminary analysis of the existing Davidson Pond has also been completed to assess the impact of draining approximately **4.1 ha** of the proposed development to this facility. It was seen that the pond outlet structure would need to be modified, but with these modifications, the pond is expected to accommodate the additional drainage area from the proposed development. A detailed analysis of the pond operation to assess the release rates, pond water levels and HGL elevations within the proposed and existing development will be completed at a later date when more details of the subdivision become solidified.

PCSWMM modelling has been completed to analyze the sanitary HGL elevations within the proposed development based on the flow details provided by DSEL. From this analysis, it was found that the proposed sanitary sewer infrastructure is sufficiently sized to safely convey sanitary flows away from the proposed development under various extreme conditions.

Yours truly,
JFSA Canada Inc.



Paulo Pickart, B.Eng., P.Eng.
Water Resources Project Engineer



Jonathon Burnett, B.Eng., P.Eng.
Senior Water Resources Engineer



cc: J.F Sabourin, M.Eng., P.Eng.
Director of Water Resources Projects

Figures

- Figure 1: Site Overview
- Figure 2: Existing/ Pre-Development Conditions Overview
- Figure 3: Proposed/ Post-Development Conditions Overview
- Figure 4: PCSWMM Storm Model Overview
- Figure 5: PCSWMM Sanitary Model Overview

Tables

- Table 1: Pre- and Post-Development (100-year 24-hr SCS Type II Storm)
- Table 2: SWM Ponds Results Summary (100-year 24-hr SCS Type II Storm)

Attachments

- Attachment A: Storm and Sanitary Design Sheets (as per DSEL)
- Attachment B: Existing/Pre-Development Conditions Simulations
- Attachment C: Proposed/Post-Development Conditions Simulations
- Attachment D: Preliminary Storm Hydraulic Grade Line Analysis
- Attachment E: Preliminary Sanitary Hydraulic Grade Line Analysis
- Attachment F: Existing Davidson SWM Pond Preliminary Analysis

Modelling Files

- SWMHYMO: STIT-Pre_v06 (refer to Attachment B)
STIT-Post_v10a-N (refer to Attachment C)
David_Lf (refer to Attachment F)
- PCSWMM: (Provided Electronically)
STIT-STM-MSS_v03.0
STIT-SAN-MSS-Rare_v03.0
STIT-SAN-MSS-Annual_v03.0



JFSA Canada Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Attachment A

Storm and Sanitary Design Sheets
(As per DSEL)

STORM SEWER CALCULATION SHEET (RATIONAL METHOD)



Local Roads Return Frequency = 2 years
Collector Roads Return Frequency = 5 years
Manning 0.013 Arterial Roads Return Frequency = 10 years

LOCATION			AREA (Ha)																FLOW							SEWER DATA									
			2 YEAR				5 YEAR				10 YEAR				100 YEAR				Time of	Intensity	Intensity	Intensity	Intensity	Peak Flow	Peak	DIA. (mm)	DIA. (mm)	TYPE	SLOPE	LENGTH	CAPACITY	VELOCITY	TIME OF	RATIO	
Location	From Node	To Node	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	AREA (Ha)	R	Indiv. 2.78 AC	Accum. 2.78 AC	Conc. (min)	2 Year (mm/h)	5 Year (mm/h)	10 Year (mm/h)	100 Year (mm/h)	Q (l/s)	Flow + 14% Q (l/s)	(actual)	(nominal)		(%)	(m)	(l/s)	(m/s)	LOW (min)	Q/Q full	
Unknown Road1 - 100																																			
	112	116	5.24	0.68	9.91	9.91	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	15.17															
					0.00	9.91	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	15.17	61.37	83.01	97.21	141.96	608	693	825	825	CONC	0.30	56.0	786.2205	1.4708	0.6346	0.773
	116	120	1.62	0.68	3.06	12.97			0.00	0.00				0.00	0.00			0.00	0.00	12.91															
					0.00	12.97	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	12.91	59.93	81.05	94.90	138.56	777	886	975	975	CONC	0.20	60.0	1002.2295	1.3424	0.7450	0.775
					0.00	12.97	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	14.26															
	120	124	1.80	0.68	3.40	16.37			0.00	0.00				0.00	0.00			0.00	0.00	16.55	58.34	78.87	92.34	134.80	955	1089	1200	1200	CONC	0.15	60.0	1509.9717	1.3351	0.7490	0.632
					0.00	16.37	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	14.23															
	124	139	1.73	0.68	3.27	19.64			0.00	0.00				0.00	0.00			0.00	0.00	17.30	56.83	76.80	89.91	131.24	1116	1272	1200	1200	CONC	0.15	64.0	1509.9717	1.3351	0.7989	0.739
					0.00	19.64	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	16.78															
	139	140	4.93	0.68	9.32	28.96			0.00	0.00				0.00	0.00			0.00	0.00	18.10	55.31	74.73	87.47	127.66	1602	1826	1350	1350	CONC	0.15	59.0	2067.1669	1.4442	0.6809	0.775
					0.00	28.96	0.08	0.68	0.15	0.15				0.00	0.00			0.00	0.00	18.78	54.08	73.05	85.50	124.78	1577	1798	1500	1500	CONC	0.15	40.0	2737.7609	1.5493	0.4303	0.576
					0.00	28.96	0.00	0.00	0.00	0.15				0.00	0.00			0.00	0.00	12.77															
					0.00	28.96	0.78	0.68	1.47	1.63				0.00	0.00			0.00	0.00																
			1.70	0.68	3.21	32.17			0.00	1.63				0.00	0.00			0.00	0.00																
	143	1002	2.70	0.80	6.00	38.18			0.00	1.63				0.00	0.00			0.00	0.00	19.21	53.34	72.04	84.31	123.03	2154	2455	1500	1500	CONC	0.15	52.0	2737.7609	1.5493	0.5594	0.787
					0.00	38.18			0.00	1.63				0.00	0.00			0.00	0.00																
	1002	HW1			0.00	38.18			0.00	1.63				0.00	0.00			0.00	0.00	19.77	52.41	70.77	82.82	120.84	2116	2412	1500	1500	CONC	0.15	17.0	2737.7609	1.5493	0.1829	0.773
Unknown Road2 - 200																																			
					0.00	0.00	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	14.82															
	231	232	4.38	0.68	8.28	8.28			0.00	0.00				0.00	0.00			0.00	0.00	14.82	62.20	84.15	98.55	143.91	515	587	975	975	CONC	0.20	54.5	1002.2295	1.3424	0.6767	0.514
					0.00	8.28			0.00	0.00				0.00	0.00			0.00	0.00	15.50	60.62	81.99	96.01	140.19	504	575	1050	1050	CONC	0.15	15.0	1057.6053	1.2214	0.2047	0.477
					0.00	8.32	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	12.53															
	235	236	0.90	0.68	1.70	10.02			0.00	0.00				0.00	0.00			0.00	0.00	15.70	60.16	81.36	95.27	139.11	603	687	1050	1050	CONC	0.15	15.5	1057.6053	1.2214	0.2115	0.570
					0.00	10.02			0.00	0.00				0.00	0.00			0.00	0.00	15.91	59.70	80.72	94.52	138.00	659	751	1050	1050	CONC	0.15	82.0	1057.6053	1.2214	1.1189	0.623
	236	237	0.54	0.68	1.02	11.04			0.00	0.00				0.00	0.00			0.00	0.00	17.03	57.36	77.52	90.76	132.49	679	774	1050	1050	CONC	0.15	86.0	1057.6053	1.2214	1.1735	0.642
					0.00	11.04			0.00	0.00				0.00	0.00			0.00	0.00	23.09															
					0.00	11.83	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00																
					0.00	11.83	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00																
					0.00	11.83	0.93	0.40	1.03	1.03				0.00	0.00			0.00	0.00																
					0.00	11.83	1.38	0.68	2.61	3.64				0.00	0.00			0.00	0.00																
	240	HW2	3.47	0.68	6.56	18.39			0.00	3.64				0.00	0.00			0.00	0.00	23.09	47.54	64.12	75.01	109.40	1108	1263	1350	1350	CONC	0.25	58.0	2668.7010	1.8644	0.5185	0.415
Unknown Road3 - 300																																			
	306	307	1.79	0.68	3.38	3.38	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	14.35															
					0.00	3.38			0.00	0.00				0.00	0.00			0.00	0.00	14.35	63.34	85.70	100.38	146.60	214	244	675	675	CONC	0.15	84.0	325.5584	0.9098	1.5389	0.658
	307	308	0.51	0.68	0.96	4.35			0.00	0.00				0.00	0.00			0.00	0.00	15.89	59.74	80.78	94.59	138.10	260	296	675	675	CONC	0.20	84.0	375.9224	1.0505	1.3327	0.691
					0.00	4.35			0.00	0.00				0.00	0.00			0.00	0.00	17.23	56.97	76.99	90.14	131.57	248	282	750	750	CONC	0.20	5.0	497.8726	1.1270	0.0739	0.498
					0.00	4.35	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00	13.71															
					0.00	4.35	0.00	0.00	0.00	0.00				0.00	0.00			0.00	0.00																
					0.00	4.35	0.73	0.40	0.81	0.81				0.00	0.00			0.00	0.00																
	313	314	1.06	0.68	2.00	6.35			0.00	0.81				0.00	0.00			0.00	0.00	17.30	56.82	76.80	89.90	131.23	423	483	825	825	CONC	0.20	37.5	641.9463	1.2009	0.5205	0.659
					0.00	6.35			0.00	0.81				0.00	0.00			0.00	0.00	17.82	55.82	75.43	88.30	128.88	416	474	900	900	CONC	0.15	25.0	701.1305	1.1021	0.3781	0.593
	314	HW3			0.00	6.35			0.00	0.81				0.00	0.00			0.00	0.00																
Unknown Road4 - 400																																			
					0.00	0.00																													

		Local Roads Return Frequency = 2 years
		Collector Roads Return Frequency = 5 years
Manning	0.013	Arterial Roads Return Frequency = 10 years

Definitions: Q = 2.78 AIR, where Q = Peak Flow in Litres per second (L/s) A = Areas in hectares (ha) I = Rainfall Intensity (mm/h) R = Runoff Coefficient	Notes: 1) Ottawa Rainfall-Intensity Curve 2) Min. Velocity = 0.80 m/s	Designed:		PROJECT:	
		Checked:		LOCATION: City of Ottawa	
		Dwg. Reference:		File Ref:	Date: 30 Jul 2024

SANITARY SEWER CALCULATION SHEET (RARE FLOWS)

Manning's $n=0.013$

LOCATION			RESIDENTIAL AREA AND POPULATION					COMM		INSTIT		PARK		C+H+I	INFILTRATION			PIPE											
STREET		FROM M.H.	TO M.H.	AREA	UNITS	POP.	CUMULATIVE	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	TOTAL FLOW	DIST	DIA	SLOPE	CAP. (FULL)	RATIO Q act/Q cap	VEL.			
				(ha)			(ha)		(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)	(%)	(l/s)		(FULL) (m/s)	(ACT.) (m/s)		
Sanitary Trunk 1																													
				0.10		0	0.10				0.00		0.00	0.93	0.93		1.03	1.03											
				0.85		98	0.95				0.00		0.00		0.93		0.85	1.88											
				1.84		214	2.79				0.00		0.00		0.93		1.84	3.72											
				2.68		770	5.47				0.00		0.00		0.93		2.68	6.40											
		120A	135A	2.96		221	8.43	1303	2.6	7.94		0.00	0.00		0.93	0.10	2.96	9.36	5.15	13.19	63.0	300	0.20	43.25	0.31	0.61	0.53		
				0.20		23	8.63	1326				0.00	0.00		0.93		0.20	9.56											
				1.10		127	9.73	1453				0.00	0.00		0.93		1.10	10.66											
				1.30		152	11.03	1605				0.00	0.00		0.93		1.30	11.96											
				1.70		196	12.73	1801				0.00	0.00		0.93		1.70	13.66											
		135A	139A	2.43		184	15.16	1985	2.6	11.73		0.00	0.00		0.93	0.10	2.43	16.09	8.85	20.68	60.0	300	0.20	43.25	0.48	0.61	0.60		
				0.23		27	15.39	2012				0.00	0.00		0.93		0.23	16.32											
				0.24		18	15.63	2030				0.00	0.00		0.93		0.24	16.56											
		139A	143A	1.28		148	16.91	2178	2.5	12.78		0.00	0.00		0.93	0.10	1.28	17.84	9.81	22.69	60.0	300	0.20	43.25	0.52	0.61	0.62		
				0.20		23	17.11	2201				0.00	0.00		0.93		0.20	18.04											
				0.29		22	17.40	2223				0.00	0.00		0.93		0.29	18.33											
		143A	159A	1.28		148	18.68	2371	2.5	13.81		0.00	0.00		0.93	0.10	1.28	19.61	10.79	24.70	60.0	300	0.20	43.25	0.57	0.61	0.63		
				0.20		23	18.88	2394				0.00	0.00		0.93		0.20	19.81											
				0.65		51	19.53	2445				0.00	0.00		0.93		0.65	20.46											
				1.36		101	20.89	2546				0.00	0.00		0.93		1.36	21.82											
		159A	166A	4.27		483	25.16	3029	2.5	17.27		0.00	0.00		0.93	0.10	4.27	26.09	14.35	31.72	60.0	300	0.20	43.25	0.73	0.61	0.67		
				0.23		27	25.39	3056				0.00	0.00		0.93		0.23	26.32											
		166A	169A	2.26		171	27.65	3227	2.4	18.30		0.00	0.00		0.93	0.10	2.26	28.58	15.72	34.11	60.0	300	0.20	43.25	0.79	0.61	0.68		
				0.20		23	27.85	3250				0.00	0.00		0.93		0.20	28.78											
		169A	172A	0.96		73	28.81	3323	2.4	18.79		0.00	0.00		0.93	0.10	0.96	29.74	16.36	35.25	60.0	300	0.20	43.25	0.82	0.61	0.68		
				0.05		0	28.86	3323				0.00	0.00		0.93		0.05	29.79											
				0.20		15	29.06	3338				0.00	0.00		0.93		0.20	29.99											
		172A	173A	1.31		99	30.37	3437	2.4	19.37		0.00	0.00		0.93	0.10	1.31	31.30	17.22	36.69	60.0	375	0.20	78.41	0.47	0.71	0.70		
		173A	174A	0.37		28	30.74	3465	2.4	19.52		0.00	0.00		0.93	0.10	0.37	31.67	17.42	37.03	72.5	375	0.20	78.41	0.47	0.71	0.70		
		174A	175A	0.42		32	31.16	3497	2.4	19.68		0.00	0.00		0.93	0.10	0.42	32.09	17.65	37.43	70.5	375	0.20	78.41	0.48	0.71	0.70		
		175A	176A	0.36		27	31.52	3524	2.4	19.82		0.00	0.00		0.93	0.10	0.36	32.45	17.85	37.76	61.0	375	0.20	78.41	0.48	0.71	0.70		
		176A	177A	0.12		9	31.64	3533	2.4	19.86		0.00	0.00		0.93	0.10	0.12	32.57	17.91	37.88	9.5	375	0.20	78.41	0.48	0.71	0.70		
		177A	178A	0.02		0	31.66	3533	2.4	19.86		0.00	0.00		0.93	0.10	0.02	32.59	17.92	37.89	60.0	375	0.20	78.41	0.48	0.71	0.70		
		178A	179A				31.66	3533	2.4	19.86		0.00	0.00		0.93	0.10	0.00	32.59	17.92	37.89	24.5	375	0.20	78.41	0.48	0.71	0.70		
		179A	180A				31.66	3533	2.4	19.86		0.00	0.00		0.93	0.10	0.00	32.59	17.92	37.89	16.5	375	0.20	78.41	0.48	0.71	0.70		
		180A	283A				31.66	3533	2.4	19.86		0.00	0.00		0.93	0.10	0.00	32.59	17.92	37.89	11.0	375	0.20	78.41	0.48	0.71	0.70		
To Sanitary Trunk 2, Pipe 283A - 284A							31.66	3533				0.00	0.00		0.93			32.59											
Sanitary Trunk 2																													
				0.04		0	0.04				0.00		0.00		0.00		0.04	0.04											
				0.28		33	0.32	33				0.00	0.00		0.00		0.28	0.32											
		203A	205A	0.43		50	0.75	83	3.0	0.57		0.00	0.00		0.00	0.00	0.43	0.75	0.41	0.98	60.0	200	0.35	19.40	0.05	0.62	0.32		
				0.40		46	1.15	129				0.00	0.00		0.00		0.40	1.15											
		205A	206A	0.70		82	1.85	211	2.9	1.41		0.00	0.00		0.00	0.00	0.70	1.85	1.02	2.43	74.5	200	0.35	19.40	0.13	0.62	0.42		
				0.38		44	2.23	255				0.00	0.00		0.00		0.38	2.23											
		206A	217A	0.68		79	2.91	334	2.8	2.19		0.00	0.00		0.00	0.00	0.68	2.91	1.60	3.79	81.0	200	0.35	19.40	0.20	0.62	0.47		
DESIGN PARAMETERS														Designed:				PROJECT:											
Park Flow =		9300	L/ha/da	0.10764		l/s/ha		Industrial Peak Factor = as per MOE Graph																					
Average Daily Flow =		200	l/p/day																										
Comm/Inst Flow =		17000	L/ha/da	0.1968		l/s/ha		Extraneous Flow =						0.550		L/s/ha													
Industrial Flow =		10000	L/ha/da	0.11574		l/s/ha		Minimum Velocity =						0.600		m/s													
Max Res. Peak Factor =		4.00				Manning's n =						(Conc)		0.013		(Pvc)		0.013											
Commercial/Inst./Park Peak Factor =						Townhouse coeff=						2.7																	
Institutional =		0.20	l/s/ha		Single house coeff=						3.4																		
Dwg. Reference:		Sanitary Drainage Plan, Dwgs. No.												File Ref:				Date:				Sheet No				1			
																		30 Jul 2024				of				2			

SANITARY SEWER CALCULATION SHEET (RARE FLOWS)																													
Manning's n=0.013																													
LOCATION				RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION					PIPE						
STREET		FROM M.H.	TO M.H.	AREA (ha)	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.		
							AREA (ha)	POP.																			(FULL) (m/s)	(ACT.) (m/s)	
				0.12		0	3.03	334				0.00		0.00		0.00		0.12	3.03										
				0.58		67	3.61	401				0.00		0.00		0.00		0.58	3.61										
				1.17		135	4.78	536				0.00		0.00		0.00		1.17	4.78										
		217A	226A	2.13		248	6.91	784	2.7	4.94		0.00		0.00	0.00	0.00	0.00	2.13	6.91	3.80	8.74	61.5	250	0.25	29.73	0.29	0.61	0.53	
				0.12		0	7.03	784				0.00		0.00		0.00		0.12	7.03										
				0.72		83	7.75	867				0.00		0.00		0.00		0.72	7.75										
				1.15		134	8.90	1001				0.00		0.00		0.00		1.15	8.90										
		226A	228A	1.30		98	10.20	1099	2.7	6.78		0.00		0.00	0.00	0.00	0.00	1.30	10.20	5.61	12.39	60.0	250	0.25	29.73	0.42	0.61	0.58	
		228A	229A	0.16		0	10.36	1099	2.7	6.78		0.00		0.00	1.85	1.85	0.20	2.01	12.21	6.72	13.69	69.5	250	0.30	32.57	0.42	0.66	0.63	
		229A	230A	0.16		0	10.52	1099	2.7	6.78		0.00		0.00	1.85	0.20	0.16	12.37	6.80	13.78	67.5	300	0.20	43.25	0.32	0.61	0.54		
		230A	231A	0.04		0	10.56	1099	2.7	6.78		0.00		0.00	1.85	0.20	0.04	12.41	6.83	13.80	15.5	300	0.20	43.25	0.32	0.61	0.54		
				0.08		0	10.64	1099				0.00		0.00	1.85			0.08	12.49										
				0.81		61	11.45	1160				0.00		0.00	1.85			0.81	13.30										
				2.74		787	14.19	1947				0.00		0.00	1.85			2.74	16.04										
				3.34		244	17.53	2191				0.00		0.00	1.85			3.34	19.38										
		231A	265A	3.90		452	21.43	2643	2.5	15.25		0.00		0.00	1.85	0.20	3.90	23.28	12.80	28.26	39.0	300	0.20	43.25	0.65	0.61	0.65		
		265A	266A	0.06		0	21.49	2643	2.5	15.25		0.00		0.00	1.85	0.20	0.06	23.34	12.84	28.29	34.5	300	0.20	43.25	0.65	0.61	0.65		
		266A	267A	0.14		0	21.63	2643	2.5	15.25		0.00		0.00	1.85	0.20	0.14	23.48	12.										

SANITARY SEWER CALCULATION SHEET (ANNUAL FLOWS)

Manning's $n=0.013$

LOCATION			RESIDENTIAL AREA AND POPULATION					COMM		INSTT		PARK		C+H	INFILTRATION					PIPE												
STREET		FROM M.H.	TO M.H.	AREA	UNITS	POP.	CUMULATIVE	PEAK FACT.	PEAK FLOW	AREA	ACCU. AREA	AREA	ACCU. AREA	AREA	ACCU. AREA	PEAK FLOW	TOTAL AREA	ACCU. AREA	INFILT. FLOW	TOTAL FLOW	DIST	DIA	SLOPE	CAP. (FULL)	RATIO Q act/Q cap	VEL.						
				(ha)			(ha)		(l/s)	(ha)	(ha)	(ha)	(ha)	(ha)	(ha)	(l/s)	(ha)	(ha)	(l/s)	(l/s)	(m)	(mm)	(%)	(l/s)		(FULL) (m/s)	(ACT.) (m/s)					
Sanitary Trunk 1																																
				0.10		0	0.10	0			0.00		0.00	0.93	0.93		1.03	1.03														
				0.85		98	0.95	98			0.00		0.00		0.93		0.85	1.88														
				1.84		214	2.79	312			0.00		0.00		0.93		1.84	3.72														
				2.68		770	5.47	1082			0.00		0.00		0.93		2.68	6.40														
		120A	135A	2.96		221	8.43	1303	2.6	7.94	0.00	0.00		0.93	0.10	2.96	9.36	2.81	10.85	63.0	300	0.20	43.25	0.25	0.61	0.51						
				0.20		23	8.63	1326			0.00	0.00		0.93		0.20	9.56															
				1.10		127	9.73	1453			0.00	0.00		0.93		1.10	10.66															
				1.30		152	11.03	1605			0.00	0.00		0.93		1.30	11.96															
				1.70		196	12.73	1801			0.00	0.00		0.93		1.70	13.66															
		135A	139A	2.43		184	15.16	1985	2.6	11.73	0.00	0.00		0.93	0.10	2.43	16.09	4.83	16.66	60.0	300	0.20	43.25	0.39	0.61	0.57						
				0.23		27	15.39	2012			0.00	0.00		0.93		0.23	16.32															
				0.24		18	15.63	2030			0.00	0.00		0.93		0.24	16.56															
	Sanitary Trunk 1	139A	143A	1.28		148	16.91	2178	2.5	12.78	0.00	0.00		0.93	0.10	1.28	17.84	5.35	18.23	60.0	300	0.20	43.25	0.42	0.61	0.58						
				0.20		23	17.11	2201			0.00	0.00		0.93		0.20	18.04															
				0.29		22	17.40	2223			0.00	0.00		0.93		0.29	18.33															
		143A	159A	1.28		148	18.68	2371	2.5	13.81	0.00	0.00		0.93	0.10	1.28	19.61	5.88	19.79	60.0	300	0.20	43.25	0.46	0.61	0.60						
				0.20		23	18.88	2394			0.00	0.00		0.93		0.20	19.81															
				0.65		51	19.53	2445			0.00	0.00		0.93		0.65	20.46															
				1.36		101	20.89	2546			0.00	0.00		0.93		1.36	21.82															
		159A	166A	4.27		483	25.16	3029	2.5	17.27	0.00	0.00		0.93	0.10	4.27	26.09	7.83	25.20	60.0	300	0.20	43.25	0.58	0.61	0.63						
				0.23		27	25.39	3056			0.00	0.00		0.93		0.23	26.32															
		166A	169A	2.26		171	27.65	3227	2.4	18.30	0.00	0.00		0.93	0.10	2.26	28.58	8.57	26.97	60.0	300	0.20	43.25	0.62	0.61	0.64						
				0.20		23	27.85	3250			0.00	0.00		0.93		0.20	28.78															
		169A	172A	0.96		73	28.81	3323	2.4	18.79	0.00	0.00		0.93	0.10	0.96	29.74	8.92	27.81	60.0	300	0.20	43.25	0.64	0.61	0.65						
				0.05		0	28.86	3323			0.00	0.00		0.93		0.05	29.79															
				0.20		15	29.06	3338			0.00	0.00		0.93		0.20	29.99															
		172A	173A	1.31		99	30.37	3437	2.4	19.37	0.00	0.00		0.93	0.10	1.31	31.30	9.39	28.86	60.0	375	0.20	78.41	0.37	0.71	0.65						
		173A	174A	0.37		28	30.74	3465	2.4	19.52	0.00	0.00		0.93	0.10	0.37	31.67	9.50	29.12	72.5	375	0.20	78.41	0.37	0.71	0.66						
		174A	175A	0.42		32	31.16	3497	2.4	19.68	0.00	0.00		0.93	0.10	0.42	32.09	9.63	29.41	70.5	375	0.20	78.41	0.38	0.71	0.66						
		175A	176A	0.36		27	31.52	3524	2.4	19.82	0.00	0.00		0.93	0.10	0.36	32.45	9.74	29.65	61.0	375	0.20	78.41	0.38	0.71	0.66						
		176A	177A	0.12		9	31.64	3533	2.4	19.86	0.00	0.00		0.93	0.10	0.12	32.57	9.77	29.73	9.5	375	0.20	78.41	0.38	0.71	0.66						
		177A	178A	0.02		0	31.66	3533	2.4	19.86	0.00	0.00		0.93	0.10	0.02	32.59	9.78	29.74	60.0	375	0.20	78.41	0.38	0.71	0.66						
		178A	179A				31.66	3533	2.4	19.86	0.00	0.00		0.93	0.10	0.00	32.59	9.78	29.74	24.5	375	0.20	78.41	0.38	0.71	0.66						
		179A	180A				31.66	3533	2.4	19.86	0.00	0.00		0.93	0.10	0.00	32.59	9.78	29.74	16.5	375	0.20	78.41	0.38	0.71	0.66						
		180A	283A				31.66	3533	2.4	19.86	0.00	0.00		0.93	0.10	0.00	32.59	9.78	29.74	11.0	375	0.20	78.41	0.38	0.71	0.66						
To Sanitary Trunk 2, Pipe 283A - 284A							31.66	3533			0.00	0.00		0.93			32.59															
Sanitary Trunk 2																																
				0.04		0	0.04	0			0.00		0.00		0.00		0.04	0.04														
				0.28		33	0.32	33			0.00	0.00		0.00		0.28	0.32															
		203A	205A	0.43		50	0.75	83	3.0	0.57	0.00	0.00		0.00	0.00	0.43	0.75	0.23	0.79	60.0	200	0.35	19.40	0.04	0.62	0.30						
				0.40		46	1.15	129			0.00	0.00		0.00		0.40	1.15															
		205A	206A	0.70		82	1.85	211	2.9	1.41	0.00	0.00		0.00	0.00	0.70	1.85	0.56	1.96	74.5	200	0.35	19.40	0.10	0.62	0.39						
				0.38		44	2.23	255			0.00	0.00		0.00		0.38	2.23															
		206A	217A	0.68		79	2.91	334	2.8	2.19	0.00		0.00		0.00	0.00	0.68	2.91	0.87	3.06	81.0	200	0.35	19.40	0.16	0.62	0.45					
DESIGN PARAMETERS													Designed:				PROJECT:															
Park Flow =				9300	L/ha/da	0.10764		l/s/Ha																								
Average Daily Flow =				200	l/p/day																											
Comm/Inst Flow =				17000	L/ha/da	0.1968		l/s/Ha		Industrial Peak Factor = as per MOE Graph																						
Industrial Flow =				10000	L/ha/da	0.11574		l/s/Ha		Extraneous Flow =				0.300		L/s/ha																
Max Res. Peak Factor =				4.00					Minimum Velocity =				0.600		m/s																	
Commercial/Inst./Park Peak Factor =				1.00					Manning's n =				(Conc)		0.013		(Pvc)		0.013													
Institutional =				0.20	l/s/Ha						Townhouse coeff=				2.7				Dwg. Reference:				File Ref:				Date:		Sheet No		1	
											Single house coeff=				3.4				Sanitary Drainage Plan, Dwg. No.								30 Jul 2024		of		2	

SANITARY SEWER CALCULATION SHEET (ANNUAL FLOWS)																													
Manning's n=0.013																													
LOCATION				RESIDENTIAL AREA AND POPULATION							COMM		INSTIT		PARK		C+I+I	INFILTRATION					PIPE						
STREET		FROM M.H.	TO M.H.	AREA	UNITS	POP.	CUMULATIVE		PEAK FACT.	PEAK FLOW (l/s)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	AREA (ha)	ACCU. AREA (ha)	PEAK FLOW (l/s)	TOTAL AREA (ha)	ACCU. AREA (ha)	INFILT. FLOW (l/s)	TOTAL FLOW (l/s)	DIST (m)	DIA (mm)	SLOPE (%)	CAP. (FULL) (l/s)	RATIO Q act/Q cap	VEL.		
							AREA (ha)	POP.																			(FULL) (m/s)	(ACT.) (m/s)	
				0.12		0	3.03	334				0.00		0.00		0.00		0.12	3.03										
				0.58		67	3.61	401				0.00		0.00		0.00		0.58	3.61										
				1.17		135	4.78	536				0.00		0.00		0.00		1.17	4.78										
		217A	226A	2.13		248	6.91	784	2.7	4.94		0.00		0.00	0.00	0.00	2.13	6.91	2.07	7.01	61.5	250	0.25	29.73	0.24	0.61	0.50		
				0.12		0	7.03	784				0.00		0.00		0.00	0.12	7.03											
				0.72		83	7.75	867				0.00		0.00		0.00	0.72	7.75											
				1.15		134	8.90	1001				0.00		0.00		0.00	1.15	8.90											
		226A	228A	1.30		98	10.20	1099	2.7	6.78		0.00		0.00	0.00	0.00	1.30	10.20	3.06	9.84	60.0	250	0.25	29.73	0.33	0.61	0.54		
		228A	229A	0.16		0	10.36	1099	2.7	6.78		0.00		0.00	1.85	1.85	0.20	2.01	12.21	3.66	10.64	69.5	250	0.30	32.57	0.33	0.66	0.59	
		229A	230A	0.16		0	10.52	1099	2.7	6.78		0.00		0.00	1.85	0.20	0.16	12.37	3.71	10.69	67.5	300	0.20	43.25	0.25	0.61	0.50		
		230A	231A	0.04		0	10.56	1099	2.7	6.78		0.00		0.00	1.85	0.20	0.04	12.41	3.72	10.70	15.5	300	0.20	43.25	0.25	0.61	0.50		
				0.08		0	10.64	1099				0.00		0.00	1.85		0.08	12.49											
				0.81		61	11.45	1160				0.00		0.00	1.85		0.81	13.30											
				2.74		787	14.19	1947				0.00		0.00	1.85		2.74	16.04											
				3.34		244	17.53	2191				0.00		0.00	1.85		3.34	19.38											
		231A	265A	3.90		452	21.43	2643	2.5	15.25		0.00		0.00	1.85	0.20	3.90	23.28	6.98	22.44	39.0	300	0.20	43.25	0.52	0.61	0.62		
		265A	266A	0.06		0	21.49	2643	2.5	15.25		0.00		0.00	1.85	0.20	0.06	23.34	7.00	22.45	34.5	300	0.20	43.25	0.52	0.61	0.62		
		266A	267A	0.14		0	21.63	2643	2.5	15.25		0.00		0.00	1.85	0.20	0.14	23.48	7.04	22.50	80.0	300	0.20	43.25	0.52	0.61	0.62		

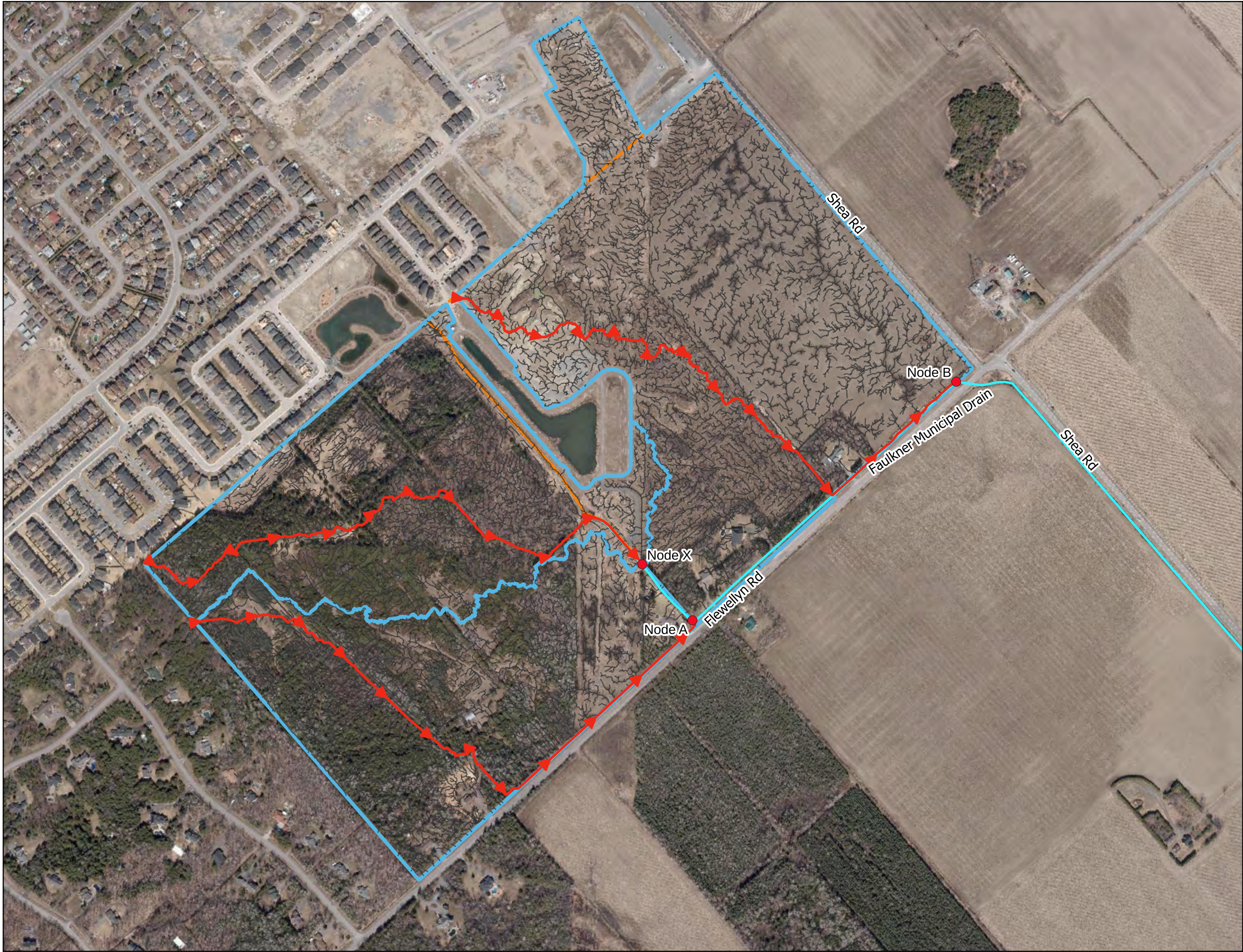


JFSA Canada Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

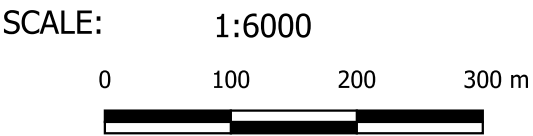
Attachment B

Existing/Pre-Development Conditions Simulations



Legend

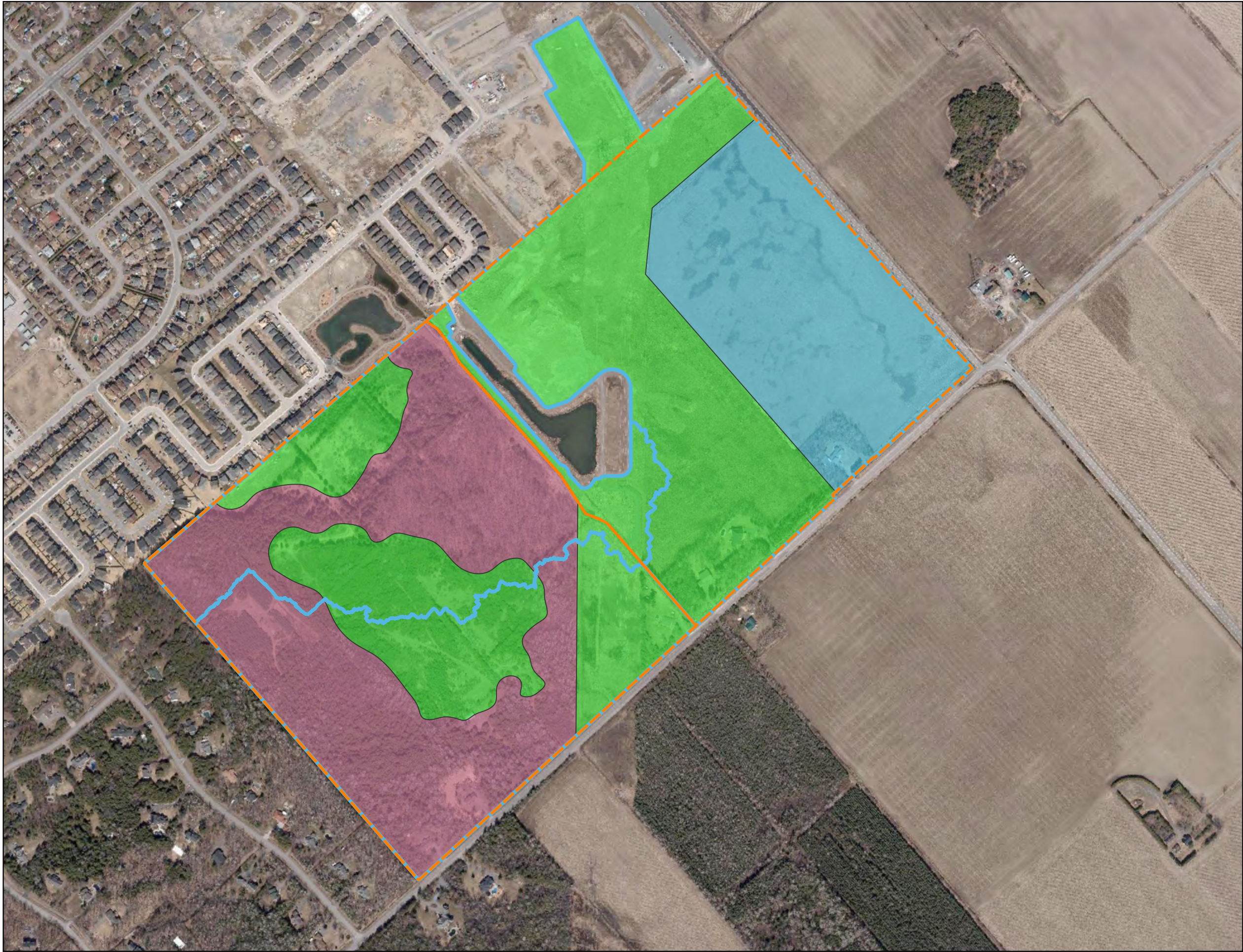
- Drainage Areas
- Development Area
- Pre-Development Nodes
- Flow Paths
- Faulkner Municipal Drain
- Drainage Pattern



Caivan - Stittsville Lands

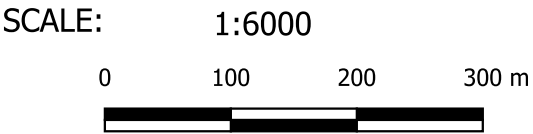
Figure B1: Existing/Pre-Development Drainage Patterns

PROJECT	P2267
DRAWN	PP
DATE	AUG 2024



Legend

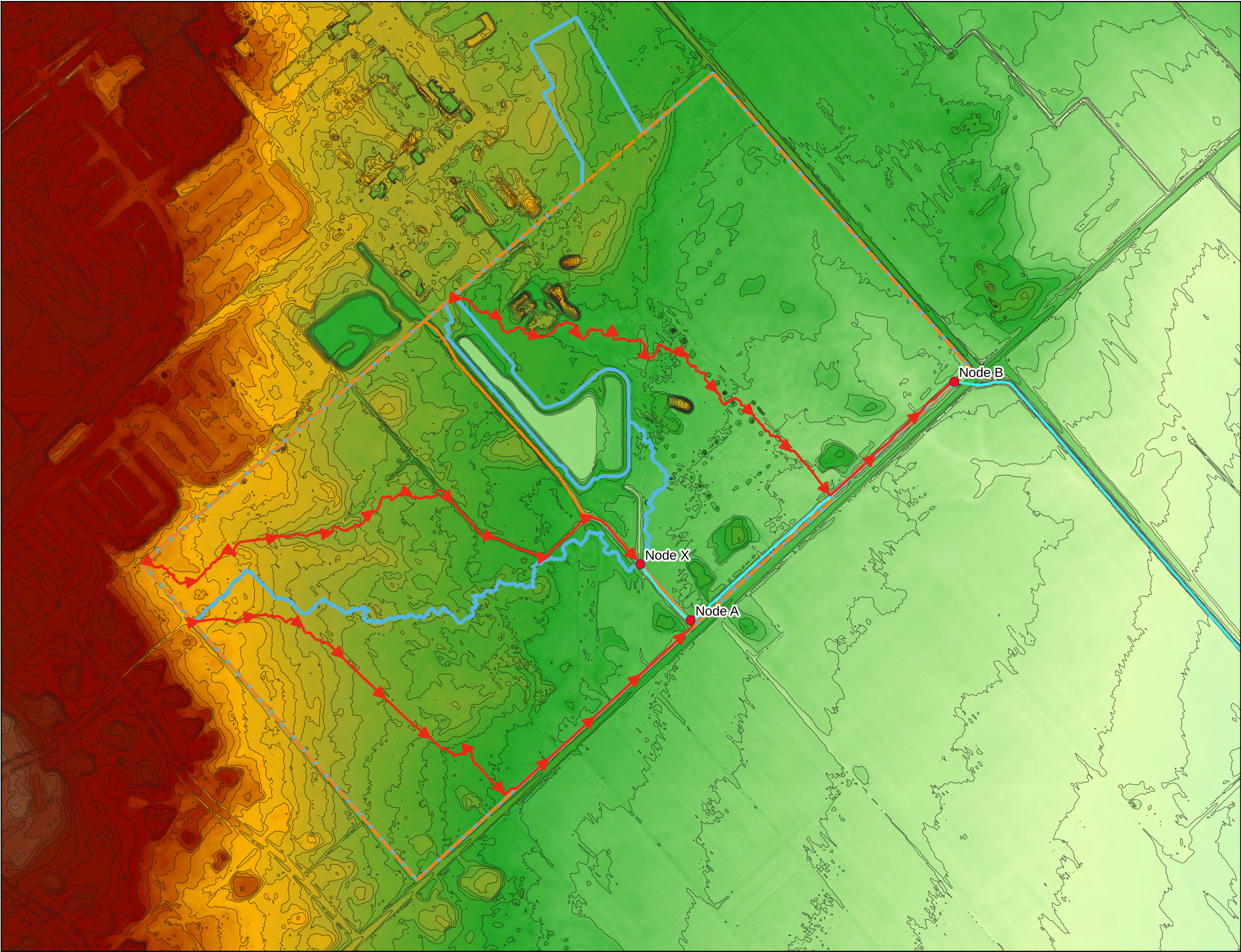
-  Development Area
-  Drainage Areas
-  Mature Forest
-  Pasture and Shrubs
-  Urban Lawn/
Shallow Rooted Crops



Caivan - Stittsville Lands

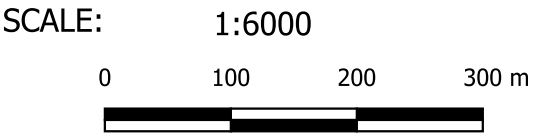
Figure B2: Land Use

PROJECT	P2267
DRAWN	PP
DATE	AUG 2024



Legend

- Development Area
- Drainage Areas
- Pre-Development Nodes
- Flow Lengths
- Faulkner Municipal Drain
- Terrain (m)
- 98
- 100
- 103
- 106
- 109
- 112
- 115
- 118
- 121
- 124



Caivan - Stittsville Lands

Figure B3: Flow Lengths

PROJECT	P2267
DRAWN	PP
DATE	AUG 2024

Table B1: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

Sb (36.62 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
15.660	Urban Lawn/Shallow Rooted Crops	Fine Sandy Loam	C	Fair	79	42.8%	33.8
20.960	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	57.2%	40.1
						CN	73.8
						CN*	64

Sx (21.02 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
11.760	Mature Forest	Fine Sandy Loam	C	Fair	73	55.9%	40.8
9.260	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	44.1%	30.8
						CN	71.7
						CN*	61

Sa (20.87 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
13.230	Mature Forest	Fine Sandy Loam	C	Fair	73	63.4%	46.3
7.640	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	36.6%	25.6
						CN	71.9
						CN*	61

Table B2: Time to Peak Calculations

Parameter	Units	Sb	Sx	Sa
Area	ha	36.62	21.02	20.87
CN*	-	64	61	61
Ptotal to calc C from CN, use 2 yr 3 hr Chicago stom	P(mm)	33.2	33.2	33.2
	Ia(mm)	4.67	4.67	4.67
	RV(mm)	4.7	4.2	4.3
Ptotal to calc C from CN, use 2 yr 24 hr SCS stom	P(mm)	52.77	52.77	52.77
	RV(mm)	12.0	10.9	11.0
C (From Chicago storm)	-	0.14	0.13	0.13
C (From SCS storm)	-	0.23	0.21	0.21
Length of Channel	m	1285	1119	1127
	ft	4214	3671	3697
Elevation of Head Water	m	104.35	109.56	109.66
	ft	342	359	360
Elevation of Outlet	m	99.68	101.46	100.83
	ft	327	333	331
Average Slope	m/m	0.0036	0.0072	0.0078
	ft/ft	0.36%	0.72%	0.78%
Kirpich				
Time of Concentration	mins	42	29	28
Time to Peak	min	28	19	19
Time to Peak	Hours	0.47	0.32	0.31
FAA (From Chicago storm)				
Time of Concentration	mins	157	118	115
Time to Peak	mins	105	79	77
Time to Peak	Hours	1.74	1.31	1.28
FAA (From SCS storm)				
Time of Concentration	mins	143	109	106
Time to Peak	mins	95	72	71
Time to Peak	Hours	1.59	1.21	1.18
Bransby Williams				
Time of Concentration	mins	63	51	50
Time to Peak	mins	42	34	33
Time to Peak	Hours	0.70	0.56	0.56
SCS				
Time of Concentration	mins	262	180	172
Time to Peak	mins	175	120	115
Time to Peak	Hours	2.91	1.99	1.91
Selected Method				
FAA (From Chicago storm)				
Time to Peak	min	105	79	77
Time to Peak	Hours	1.74	1.31	1.28

Note:

All methods calculated as per Appendix A of the SWMHYMO manual

Time to Peak calculated as 2/3 Time of concentration

Table B3: Pre-Development Peak Flows & Runoff Volumes

Event	Node X		Node A		Node B	
	Peak Flows ⁽¹⁾ (m ³ /s)	Runoff Volume (m ³)	Peak Flows ⁽¹⁾ (m ³ /s)	Runoff Volume (m ³)	Peak Flows ⁽¹⁾ (m ³ /s)	Runoff Volume (m ³)
25mm CHI 3Hr	0.044	475	0.089	947	0.152	1,876
2-Year CHI 3Hr	0.077	820	0.154	1,634	0.266	3,227
5-Year CHI 3Hr	0.142	1,503	0.284	2,995	0.492	5,896
10-Year CHI 3Hr	0.193	2,039	0.387	4,063	0.671	7,984
25-Year CHI 3Hr	0.265	2,791	0.532	5,563	0.920	10,913
50-Year CHI 3Hr	0.325	3,416	0.652	6,807	1.128	13,331
100-Year CHI 3Hr	0.392	4,114	0.787	8,198	1.362	16,032
2-Year SCS 24 Hr	0.121	1,955	0.242	3,896	0.415	7,655
5-Year SCS 24 Hr	0.210	3,346	0.422	6,669	0.726	13,064
10-Year SCS 24 Hr	0.278	4,397	0.558	8,763	0.960	17,131
25-Year SCS 24 Hr	0.370	5,808	0.743	11,574	1.279	22,572
50-Year SCS 24 Hr	0.446	6,977	0.896	13,903	1.543	27,062
100-Year SCS 24 Hr	0.532	8,280	1.069	16,500	1.840	32,071
2-year 12-hr SCS	0.114	1,553	0.228	3,096	0.390	6,092
5-year 12-hr SCS	0.203	2,735	0.407	5,450	0.700	10,693
10-year 12-hr SCS	0.273	3,653	0.548	7,280	0.941	14,250
25-year 12-hr SCS	0.366	4,866	0.734	9,698	1.262	18,937
50-year 12-hr SCS	0.445	5,892	0.893	11,742	1.535	22,894
100-year 12-hr SCS	0.523	6,909	1.051	13,769	1.806	26,811

⁽¹⁾ Target flows based on peak pre-development flows

```
00001: 20 Metric units / ID Numbers OFF
00002: #####
00003: # SWMHYMO Ver:5.500/Feb 2015 / INPUT DATA FILE
00004: #####
00005: # Project Name : [Calvan Brittville West properties]
00006: # Project Number: [2267]
00007: # Date : [2024/08/02]
00008: # Modeller : [JPF]
00009: # Company : J.F. Sabourin and Associates
00010: # License # : 254837
00011: #####
00012: # 25 mm Storm based on 3-Year, 3-Hour Chicago Storm
00013: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[001]
00014: # "25MMCH.stm" <--storm filename, one per line for NSTORM time
00015: #
00016: READ STORM STORM_FILENAME="storm.001"
00017: #
00018: DEFAULT VALUES ICAESdef=[1], read and print values
00019: DEFVAL_FILENAME="Ottawa.val"
00020: #
00021: #####
00022: # For Development Condition
00023: #####
00024: # Node X
00025: DESIGN NASHVD NHYD="*x", DT=[1]min, AREA=[21.02] (ha),
00026: DWF=[0] (cms), CN/C=[61], TP=[1.31]hrs,
00027: RAINFALL=[ , , , ] (mm/hr), END=1
00028: #
00029: #####
00030: # Total Flow at Node X (NodeA = B)
00031: #####
00032: ADD HYD NHYDsum="NodeA", NHYDs to add="B"
00033: #
00034: #####
00035: # Channel Routing from Node X to Node A
00036: #####
00037: # Faulkner Drain Cross Section 5260 from HEC-RAS model
00038: ROUTE CHANNEL NHYDout="NodeA-x", NHYDin="NodeA",
00039: RDT=[1] (min),
00040: CHLGR=[120] (m), CHSLOPE=[0.38] (%),
00041: SECNUM=[1.0], FFSLOPE=[0.38] (%),
00042: ( BEGRCROSS,BEGDIST(m)=[0.1,347.22 0.035,364.32 0.03,381.27] NSEG times
00043: ( DISTANCE (m), ELEVATION (m))=
00044: [168.62 , 102.94]
00045: [344.23 , 102.57]
00046: [347.22 , 102.52]
00047: [350.21 , 102.52]
00048: [351.21 , 102.5]
00049: [352.21 , 102.44]
00050: [355.58 , 101.35]
00051: [357.94 , 101.02]
00052: [360.74 , 101.39]
00053: [363.41 , 102.35]
00054: [364.08 , 102.43]
00055: [364.32 , 102.46]
00056: [365.32 , 102.54]
00057: [368.31 , 102.68]
00058: [376.28 , 102.88]
00059: [381.27 , 102.9]
00060: #
00061: #####
00062: # Node A
00063: #####
00064: DESIGN NASHVD NHYD="*a", DT=[1]min, AREA=[20.87] (ha),
00065: DWF=[0] (cms), CN/C=[61], TP=[1.28]hrs,
00066: RAINFALL=[ , , , ] (mm/hr), END=1
00067: #
00068: #####
00069: # Total Flow at Node A (NodeA = NodeA + B)
00070: #####
00071: ADD HYD NHYDsum="NodeA", NHYDs to add="NodeA-x" + "B"
00072: #
00073: #####
00074: # Channel Routing from Node A to Node B
00075: #####
00076: # Faulkner Drain Cross Section 4840 from HEC-RAS model
00077: ROUTE CHANNEL NHYDout="NodeA-x", NHYDin="NodeA",
00078: RDT=[1] (min),
00079: CHLGR=[173] (m), CHSLOPE=[0.20] (%),
00080: FFSLOPE=[0.20] (%),
00081: SECNUM=[1.0], NSEG=[4]
00082: ( BEGRCROSS,BEGDIST(m)=[0.1,274.44 0.03,279.44 0.035,293.89 0.02,305.08] NSEG times
00083: ( DISTANCE (m), ELEVATION (m))=
00084: [4.88 , 102.77]
00085: [274.44 , 102.03]
00086: [274.45 , 102.03]
00087: [275.45 , 101.96]
00088: [278.44 , 101.84]
00089: [279.44 , 101.74]
00090: [282.07 , 103.7]
00091: [283.33 , 101.49]
00092: [284.93 , 100.46]
00093: [286.58 , 100.25]
00094: [288.33 , 99.89]
00095: [291.06 , 100.35]
00096: [293.89 , 101.82]
00097: [296.37 , 101.82]
00098: [297.18 , 102.01]
00099: [301.12 , 102.39]
00100: [302.1 , 102.44]
00101: [305.08 , 102.46]
00102: #
00103: #####
00104: # Node B
00105: DESIGN NASHVD NHYD="*b", DT=[1]min, AREA=[36.62] (ha),
00106: DWF=[0] (cms), CN/C=[64], TP=[1.74]hrs,
00107: RAINFALL=[ , , , ] (mm/hr), END=1
00108: #
00109: #####
00110: # Total Flow at Node B (NodeB = NodeA + B)
00111: #####
00112: ADD HYD NHYDsum="NodeB", NHYDs to add="NodeA-x" + "B"
00113: #
00114: #####
00115: # STORM
00116: #####
00117: # 25 mm Storm based on 3-Year, 3-Hour Chicago Storm
00118: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[001]
00119: # "25MMCH.stm" <--storm filename, one per line for NSTORM time
00120: #
00121: # 2-Year, 3-Hour Chicago Storm
00122: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[002]
00123: # "002YCH.stm" <--storm filename, one per line for NSTORM time
00124: #
00125: # 5-Year, 3-Hour Chicago Storm
00126: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[005]
00127: # "005YCH.stm" <--storm filename, one per line for NSTORM time
00128: #
00129: # 10-Year, 3-Hour Chicago Storm
00130: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[010]
00131: # "010YCH.stm" <--storm filename, one per line for NSTORM time
00132: #
00133: # 25-Year, 3-Hour Chicago Storm
00134: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[025]
00135: # "025YCH.stm" <--storm filename, one per line for NSTORM time
00136: #
00137: # 50-Year, 3-Hour Chicago Storm
00138: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[050]
00139: # "050YCH.stm" <--storm filename, one per line for NSTORM time
00140: #
00141: # 100-Year, 3-Hour Chicago Storm
00142: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[099]
00143: # "100YCH.stm" <--storm filename, one per line for NSTORM time
00144: #
00145: # 2-Year, 24-Hour SCS Storm
00146: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[102]
00147: # "SC24002x.stm" <--storm filename, one per line for NSTORM time
00148: #
00149: # 5-Year, 24-Hour SCS Storm
00150: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[105]
00151: # "SC24005x.stm" <--storm filename, one per line for NSTORM time
00152: #
00153: # 10-Year, 24-Hour SCS Storm
00154: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[110]
00155: # "SC24010x.stm" <--storm filename, one per line for NSTORM time
00156: #
00157: # 25-Year, 24-Hour SCS Storm
00158: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[125]
00159: # "SC24025x.stm" <--storm filename, one per line for NSTORM time
00160: #
00161: # 50-Year, 24-Hour SCS Storm
00162: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[150]
00163: # "SC24050x.stm" <--storm filename, one per line for NSTORM time
00164: #
00165: # 100-Year, 24-Hour SCS Storm
00166: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[199]
00167: # "SC24100x.stm" <--storm filename, one per line for NSTORM time
00168: #
00169: # 2-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00170: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[202]
00171: # "SC12002c.stm" <--storm filename, one per line for NSTORM time
00172: #
00173: # 5-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00174: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[205]
00175: # "SC12005c.stm" <--storm filename, one per line for NSTORM time
00176: #
00177: # 10-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00178: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[210]
00179: # "SC12010c.stm" <--storm filename, one per line for NSTORM time
00180: #
00181: # 25-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00182: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[225]
00183: # "SC12025c.stm" <--storm filename, one per line for NSTORM time
00184: #
00185: # 50-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00186: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[250]
00187: # "SC12050c.stm" <--storm filename, one per line for NSTORM time
00188: #
00189: # 100-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00190: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[299]
00191: # "SC12100c.stm" <--storm filename, one per line for NSTORM time
00192: #
00193: # July 1st, 1979 Storm - Ottawa International Airport
00194: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[979]
00195: # "19790701.stm" <--storm filename, one per line for NSTORM time
00196: #
00197: # August 4th, 1988 Storm - Ottawa International Airport
00198: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[988]
00199: # "19880804.stm" <--storm filename, one per line for NSTORM time
00200: #
00201: # August 8th, 1996 Storm - Ottawa International Airport
00202: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[996]
00203: # "19960808.stm" <--storm filename, one per line for NSTORM time
00204: #
00205: # 100-Year, 3-Hour Chicago Storm + 20%
00206: *START TIER0=[0.0], METOUT=[2], NSTORM=[1], NRUN=[999]
00207: # "100YCH.stm" <--storm filename, one per line for NSTORM time
00208: #
00209: FINISH
```

Page 0

Page 1

Page 2

```
01081> R0110:CO0006-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01082> ROUTE CHANNEL -> 1.0 01:NodeA-r 21.02 .278 Mo_date 13:24 20.92 n/a .000
01083> [R/s= 120./380/030]
01084> (Vmax=.461;Dmax=.458)
01085> #####
01086> #####
01087> # Node A
01088> R0110:CO0007-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01089> DESIGN NASHDY 1.0 01:8s 20.87 .281 Mo_date 13:22 20.92 .281 .000
01090> [Cm= 61.0; H= 3.00; Tpe= 1.28]
01091> #####
01092> # Total Flow at Node A (NodeA = NodeA-r + Sb)
01093> #####
01094> R0110:CO0008-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01095> ADD HYD + 1.0 02:NodeA-r 21.02 .278 Mo_date 13:26 20.92 n/a .000
01096> SUM= 1.0 02:NodeA 20.87 .281 Mo_date 13:22 20.92 n/a .000
01097> [L/s= 573./200/020]
01098> #####
01099> # Channel Routing from Node A to Node B
01100> #####
01101> # Faulkner Drain Cross Section 4840 from HEC-RAS model
01102> R0110:CO0009-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01103> ROUTE CHANNEL -> 1.0 02:NodeA 41.89 .532 Mo_date 13:24 20.92 n/a .000
01104> [R/s= 1.00] out<- 1.0 01:NodeA-r 41.89 .532 Mo_date 13:44 20.92 n/a .000
01105> [L/s= 573./200/020]
01106> (Vmax=.461;Dmax=.458)
01107> #####
01108> # Node B
01109> R0110:CO0010-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01110> DESIGN NASHDY 1.0 01:8s 36.42 .430 Mo_date 13:55 22.44 .307 .000
01111> [Cm= 61.0; H= 3.00; Tpe= 1.74]
01112> #####
01113> # Total Flow at Node B (NodeB = NodeA-r + Sb)
01114> #####
01115> R0110:CO0011-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01116> ADD HYD + 1.0 02:NodeA-r 41.89 .532 Mo_date 13:44 20.92 n/a .000
01117> SUM= 1.0 01:NodeB 78.51 .860 Mo_date 13:48 21.82 n/a .000
01118> #####
01119> #####
01120> # STORMS
01121> #####
01122> ** END OF RUN : 124
01123> #####
01124> #####
01125> #####
01126> #####
01127> #####
01128> #####
01129> #####
01130> RUN#<COMMAND#
01131> R0125:CO0001-----
01132> START
01133> [TZERO = .00 hrs on 0]
01134> [METOPT= 2] ([Imperial, 2-metric output])
01135> [NFORM= 1]
01136> [NRUN = 0125]
01137> #####
01138> # SWMHYMO Ver:5.500/Feb 2015 / INPUT DATA FILE
01139> #####
01140> # Project Name : [Calvan Stittville West properties]
01141> # Project Number : [2267]
01142> # Date : [2024/08/02]
01143> # Modeller : [PF]
01144> # Company : J.F. Sabourin and Associates
01145> # License # : 2549237
01146> #####
01147> R0125:CO0002-----
01148> READ STORM
01149> Filename = storm.001
01150> Comment = 25 years SCS Type 2 Storm 24 Hours step 10 min, City of Ottawa
01151> [SDT=10.00;SDUR= 24.00;PTOT= 86.89]
01152> R0125:CO0003-----
01153> DEFAULT VALUES
01154> Filename = C:\Temp\SWMHYMO\Pre-Dev\Ottawa.val
01155> ICASEDY = 1 (read and print data)
01156> FileTitle= File comment: [Parameters for City of Ottawa Projects]
01157> THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARDY COM
01158> Horton's infiltration equation parameters:
01159> [F= 76.20 mm/hr] [F=13.20 mm/hr] [ICAE= 4.14 /hr] [F= .00 mm]
01160> Parameters for IMPERVIOUS surfaces in STANDYD:
01161> [Iape= 4.67 mm] [LDP=40.00 m] [MNI= .250]
01162> Parameters for IMPERVIOUS surfaces in STANDYD:
01163> [IaIm= 1.57 mm] [CL=1.50] [MNI= .013]
01164> Parameters used in NASHDY:
01165> [Ia= 4.67 mm] [H= 3.00]
01166> Average monthly Pan Evaporation data in (mm)
01167> JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01168> .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01169> Average monthly Potential Evapotranspiration in (mm)
01170> JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01171> .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01172> #####
01173> # Free Development Condition
01174> #####
01175> # Node X
01176> R0125:CO0004-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01177> DESIGN NASHDY 1.0 01:8s 21.02 .370 Mo_date 13:23 27.63 .318 .000
01178> [Cm= 61.0; H= 3.00; Tpe= 1.31]
01179> #####
01180> # Total Flow at Node X (NodeX = Sb)
01181> #####
01182> R0125:CO0005-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01183> ADD HYD SUM= 1.0 02:NodeX 21.02 .370 Mo_date 13:23 27.63 n/a .000
01184> SUM= 1.0 01:NodeA 21.02 .370 Mo_date 13:23 27.63 n/a .000
01185> #####
01186> # Channel Routing from Node X to Node A
01187> #####
01188> # Faulkner Drain Cross Section 5280 from HEC-RAS model
01189> R0125:CO0006-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01190> ROUTE CHANNEL -> 1.0 02:NodeA 41.89 .896 Mo_date 13:23 33.19 n/a .000
01191> [R/s= 1.00] out<- 1.0 01:NodeA-r 41.89 .896 Mo_date 13:40 33.19 n/a .000
01192> [L/s= 573./200/020]
01193> (Vmax=.503;Dmax=.309)
01194> #####
01195> # Node A
01196> R0125:CO0007-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01197> DESIGN NASHDY 1.0 01:8s 20.87 .374 Mo_date 13:21 27.63 .318 .000
01198> [Cm= 61.0; H= 3.00; Tpe= 1.28]
01199> #####
01200> # Total Flow at Node A (NodeA = NodeA-r + Sb)
01201> #####
01202> R0125:CO0008-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01203> ADD HYD + 1.0 02:NodeA-r 21.02 .370 Mo_date 13:26 27.63 n/a .000
01204> SUM= 1.0 02:NodeA 20.87 .374 Mo_date 13:21 27.63 n/a .000
01205> [L/s= 573./380/030]
01206> (Vmax=.503;Dmax=.309)
01207> #####
01208> # Channel Routing from Node A to Node B
01209> #####
01210> # Faulkner Drain Cross Section 4840 from HEC-RAS model
01211> R0125:CO0009-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01212> ROUTE CHANNEL -> 1.0 02:NodeA 41.89 .743 Mo_date 13:24 27.63 n/a .000
01213> [R/s= 1.00] out<- 1.0 01:NodeA-r 41.89 .743 Mo_date 13:40 27.63 n/a .000
01214> [L/s= 573./200/020]
01215> (Vmax=.505;Dmax=.316)
01216> #####
01217> # Node B
01218> R0125:CO0010-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01219> DESIGN NASHDY 1.0 01:8s 36.62 .569 Mo_date 13:54 30.03 .346 .000
01220> [Cm= 61.0; H= 3.00; Tpe= 1.74]
01221> #####
01222> # Total Flow at Node B (NodeB = NodeA-r + Sb)
01223> #####
01224> R0125:CO0011-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01225> ADD HYD + 1.0 02:NodeA-r 41.89 .743 Mo_date 13:40 27.63 n/a .000
01226> SUM= 1.0 02:NodeA 36.62 .569 Mo_date 13:54 30.03 n/a .000
01227> [L/s= 573./200/020]
01228> (Vmax=.553;Dmax=.353)
01229> #####
01230> # STORMS
01231> #####
01232> ** END OF RUN
01233> #####
01234> #####
01235> #####
01236> #####
01237> #####
01238> RUN#<COMMAND#
01239> R0150:CO0001-----
01240> START
01241> [TZERO = .00 hrs on 0]
01242> [METOPT= 2] ([Imperial, 2-metric output])
01243> [NFORM= 1]
01244> [NRUN = 0150]
01245> #####
01246> # SWMHYMO Ver:5.500/Feb 2015 / INPUT DATA FILE
01247> #####
01248> # Project Name : [Calvan Stittville West properties]
01249> # Project Number : [2267]
01250> # Date : [2024/08/02]
01251> # Modeller : [PF]
01252> # Company : J.F. Sabourin and Associates
01253> # License # : 2549237
01254> #####
01255> R0150:CO0002-----
01256> READ STORM
01257> Filename = storm.001
01258> Comment = 50 years SCS Type 2 Storm 24 Hours step 10 min, City of Ottawa
01259> [SDT=10.00;SDUR= 24.00;PTOT= 96.53]
01260> R0150:CO0003-----UtnIn-ID:INHYD-----AREAhA-QFEARcns-TpeakDate_hh:mm-----RvMm-R.C-----DWfms
01261> #####
01262> #####
01263> #####
01264> #####
01265> #####
01266> #####
01267> #####
01268> #####
01269> #####
01270> #####
01271> #####
01272> #####
01273> #####
01274> #####
01275> #####
01276> #####
01277> #####
01278> #####
01279> #####
01280> #####
01281> #####
01282> #####
01283> #####
01284> #####
01285> #####
01286> #####
01287> #####
01288> #####
01289> #####
01290> #####
01291> #####
01292> #####
01293> #####
01294> #####
01295> #####
01296> #####
01297> #####
01298> #####
01299> #####
01300> #####
01301> #####
01302> #####
01303> #####
01304> #####
01305> #####
01306> #####
01307> #####
01308> #####
01309> #####
01310> #####
01311> #####
01312> #####
01313> #####
01314> #####
01315> #####
01316> #####
01317> #####
01318> #####
01319> #####
01320> #####
01321> #####
01322> #####
01323> #####
01324> #####
01325> #####
01326> #####
01327> #####
01328> #####
01329> #####
01330> #####
01331> #####
01332> #####
01333> #####
01334> #####
01335> #####
01336> #####
01337> #####
01338> #####
01339> #####
01340> #####
01341> #####
01342> #####
01343> #####
01344> #####
01345> #####
01346> #####
01347> #####
01348> #####
01349> #####
01350> #####
01351> #####
01352> #####
01353> #####
01354> #####
01355> #####
01356> #####
01357> #####
01358> #####
01359> #####
01360> #####
01361> #####
01362> #####
01363> #####
01364> #####
01365> #####
01366> #####
01367> #####
01368> #####
01369> #####
01370> #####
01371> #####
01372> #####
01373> #####
01374> #####
01375> #####
01376> #####
01377> #####
01378> #####
01379> #####
01380> #####
01381> #####
01382> #####
01383> #####
01384> #####
01385> #####
01386> #####
01387> #####
01388> #####
01389> #####
01390> #####
01391> #####
01392> #####
01393> #####
01394> #####
01395> #####
01396> #####
01397> #####
01398> #####
01399> #####
01400> #####
01401> #####
01402> #####
01403> #####
01404> #####
01405> #####
01406> #####
01407> #####
01408> #####
01409> #####
01410> #####
01411> #####
01412> #####
01413> #####
01414> #####
01415> #####
01416> #####
01417> #####
01418> #####
01419> #####
01420> #####
01421> #####
01422> #####
01423> #####
01424> #####
01425> #####
01426> #####
01427> #####
01428> #####
01429> #####
01430> #####
01431> #####
01432> #####
01433> #####
01434> #####
01435> #####
01436> #####
01437> #####
01438> #####
01439> #####
01440> #####
```

Page 4

Page 5



JFSA Canada Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Attachment C

Proposed/Post-Development Conditions Simulations

Table C1: Calculation of SCS Curve Number (CN) and Modified Curve Number (CN*)

Area W_Und1 (1.88 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
1.43	Mature Forest	Fine Sandy Loam	C	Fair	73	76.1%	55.5
0.45	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	23.9%	16.8
						CN	72
						CN*	62

Area W_Und2 (1.77 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
1.77	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	100.0%	70.0
						CN	70
						CN*	59

Area W_Und3 (0.14 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.14	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	100.0%	70.0
						CN	70
						CN*	59

Area E_Und1 (6.75 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
6.75	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	100.0%	70.0
						CN	70
						CN*	59

Area E_Und2 (0.88 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.88	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	100.0%	70.0
						CN	70
						CN*	59

Area E_Und3 (0.06 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.06	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	100.0%	70.0
						CN	70
						CN*	59

Area E_Und4 (0.43 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.43	Pasture and Shrubs	Fine Sandy Loam	C	Fair	70	100.0%	70.0
						CN	70
						CN*	59

Area E_Und5 (0.44 ha)							
Area (ha)	Land Type	Soil Name	Soil Condition	Soil Group	CN	% of Catchment	Weighted CN
0.44	Urban Lawn/Shallow Rooted Crops	Fine Sandy Loam	C	Fair	79	100.0%	79.0
						CN	79
						CN*	71

Table C2: Time to Peak Calculations

Parameter	Units	Area W_Und1	Area W_Und2	Area W_Und3	Area E_Und1	Area E_Und2	Area E_Und3	Area E_Und4	Area E_Und5
Area	ha	1.88	1.77	0.14	6.75	0.88	0.06	0.43	0.44
CN or CN*	-	62	59	59	59	59	59	59	71
Ptotal to calc C from CN, use 2 yr 3 hr Chicago stom	P(mm)	33.2	33.2	33.2	33.2	33.2	33.2	33.2	33.2
	Ia(mm)	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67
	RV(mm)	4.4	3.9	3.9	3.9	3.9	3.9	3.9	6.1
Ptotal to calc C from CN, use 2 yr 24 hr SCS stom	P(mm)	52.77	52.77	52.77	52.77	52.77	52.77	52.77	52.77
	RV(mm)	11.2	10.1	10.1	10.1	10.1	10.1	10.1	15.2
	-	0.13	0.12	0.12	0.12	0.12	0.12	0.12	0.19
C (From Chicago storm)	-	0.21	0.19	0.19	0.19	0.19	0.19	0.19	0.29
C (From SCS storm)	-	0.21	0.19	0.19	0.19	0.19	0.19	0.19	0.29
Length of Channel	m	493	339	120	870	486	120	570	270
	ft	1617	1112	394	2854	1594	394	1870	886
Elevation of Head Water	m	103.18	102.98	101.46	104.70	103.18	101.46	100.83	100.22
	ft	339	338	333	344	339	333	331	329
Elevation of Outlet	m	101.46	100.83	100.83	101.46	101.46	100.83	99.68	99.68
	ft	333	331	331	333	333	331	327	327
Average Slope	m/m	0.0035	0.0063	0.0052	0.0037	0.0035	0.0052	0.0020	0.0020
	ft/ft	0.0035	0.0063	0.0052	0.0037	0.0035	0.0052	0.0020	0.0020
Kirpich									
Time of Concentration	mins	20	12	6	31	20	6	28	16
Time to Peak	min	14	8	4	21	13	4	19	11
Time to Peak	Hours	0.23	0.13	0.07	0.34	0.22	0.07	0.31	0.18
FAA (From Chicago storm)									
Time of Concentration	mins	100	69	43	131	100	43	130	84
Time to Peak	mins	66	46	29	88	67	29	87	56
Time to Peak	Hours	1.11	0.76	0.48	1.46	1.11	0.48	1.45	0.93
FAA (From SCS storm)									
Time of Concentration	mins	91	63	40	121	92	40	120	74
Time to Peak	mins	61	42	27	81	62	27	80	50
Time to Peak	Hours	1.01	0.71	0.45	1.35	1.03	0.45	1.34	0.83
Bransby Williams									
Time of Concentration	mins	33	20	10	50	35	10	49	23
Time to Peak	mins	22	13	6	34	23	7	33	16
Time to Peak	Hours	0.37	0.22	0.11	0.56	0.39	0.12	0.55	0.26
SCS									
Time of Concentration	mins	131	78	37	217	139	37	210	84
Time to Peak	mins	88	52	25	144	93	25	140	56
Time to Peak	Hours	1.46	0.87	0.42	2.41	1.55	0.42	2.33	0.93
Selected Method									
FAA (From Chicago storm)									
Time to Peak	min	66	46	29	88	67	29	87	56
Time to Peak	Hours	1.11	0.76	0.48	1.46	1.11	0.48	1.45	0.93

Note:

All methods calculated as per Appendix A of the SWMHYMO manual

Time to Peak calculated as 2/3 Time of concentration

West SWM Pond Preliminary Stage Storage

Elevation (m)	Volume (m ³)	Volume above PP @ 90% (m ³)	Area (m ²)	Demarcation
99.80	0.000		3027.68	Pond Bottom
99.85	152.984		3091.69	
99.90	309.180		3156.14	
99.95	468.616		3221.31	
100.00	631.321		3286.87	
100.05	797.318		3353.01	
100.10	966.634		3419.62	
100.15	1139.300		3487.03	
100.20	1315.346		3554.8	
100.25	1494.794		3623.14	
100.30	1677.673		3692.01	
100.35	1864.011		3761.51	
100.40	2053.838		3831.56	
100.45	2247.177		3902.01	
100.50	2444.053		3973.03	
100.55	2644.498		4044.76	
100.60	2848.543		4117.03	
100.65	3056.213		4189.77	
100.70	3267.533		4263.01	
100.75	3482.530		4336.86	
100.80	3701.287		4413.42	
100.85	3965.021		5334.17	
100.90	4234.743		5454.73	
100.95	4510.527		5576.61	
101.00	4792.433		5699.62	
101.05	5080.520		5823.88	
101.10	5374.852		5949.39	
101.15	5675.490		6076.16	
101.20	5982.495		6204.04	
101.25	6295.928		6333.29	
101.30	6615.854		6463.75	
101.35	6942.333		6595.41	
101.40	7275.423		6728.19	
101.45	7615.186		6862.31	
101.50	7961.683		6997.59	
101.55	8314.975		7134.08	
101.60	8675.125		7271.92	
101.65	9042.195		7410.87	
101.70	9416.244		7551.08	
101.75	9797.334		7692.52	

West SWM Pond Preliminary Stage Storage

Elevation (m)	Volume (m ³)	Volume above PP @ 90% (m ³)	Area (m ²)	Demarcation
101.80	10185.695	0.000	7841.94	Permanent Pool
101.85	10581.456	356.185	7988.49	
101.90	10984.578	718.995	8136.37	
101.95	11395.153	1088.512	8286.65	
102.00	11813.299	1464.844	8439.2	
102.05	12239.131	1848.092	8594.09	
102.10	12672.764	2238.362	8751.24	
102.15	13114.314	2635.757	8910.76	
102.20	13563.895	3040.380	9072.49	
102.25	14021.623	3452.335	9236.6	
102.30	14487.613	3871.726	9403.02	
102.35	14961.981	4298.657	9571.67	
102.40	15444.842	4733.232	9742.77	
102.45	15936.316	5175.559	9916.22	
102.50	16436.515	5625.738	10091.74	
102.55	16945.553	6083.872	10269.74	
102.60	17463.547	6550.067	10450.02	
102.65	17990.611	7024.424	10632.56	
102.70	18526.862	7507.050	10817.47	
102.75	19072.416	7998.049	11004.7	
102.80	19650.686	8518.492	12126.11	
102.85	20291.822	9095.514	13519.33	
102.90	20970.528	9706.350	13628.9	
102.95	21654.725	10322.127	13738.97	
103.00	22344.430	10942.861	13849.23	
103.05	23039.656	11568.565	13959.8	
103.10	23740.415	12199.248	14070.58	
103.15	24446.724	12834.926	14181.79	
103.20	25158.598	13475.613	14293.16	
103.25	25876.050	14121.319	14404.93	
103.30	26599.098	14772.063	14516.99	
103.35	27327.756	15427.855	14629.32	
103.40	28062.035	16088.706	14741.83	
103.45	28801.952	16754.631	14854.85	
103.50	29547.523	17425.645	14967.98	
103.55	30298.758	18101.757	15081.46	
103.60	31055.674	18782.981	15195.17	
103.65	31818.284	19469.330	15309.23	
103.70	32586.605	20160.819	15423.6	
103.75	33360.649	20857.459	15538.16	

West SWM Pond Preliminary Stage Storage

Elevation (m)	Volume (m ³)	Volume above PP @ 90% (m ³)	Area (m ²)	Demarcation
103.80	34140.431	21559.262	15653.15	
103.85	34925.970	22266.247	15768.38	
103.90	35717.276	22978.423	15883.89	
103.95	36514.368	23695.806	15999.77	
104.00	37317.258	24418.407	16115.83	
104.05	38125.959	25146.238	16232.22	
104.10	38940.485	25879.311	16348.8	
104.15	39760.849	26617.639	16465.76	
104.20	40587.069	27361.237	16583.06	
104.25	41419.164	28110.122	16700.71	
104.30	42257.197	28864.352	16820.63	
104.35	43132.558	29652.177	18193.78	
104.40	44077.837	30502.928	19617.38	Top of Pond

Table C-1W: West Pond Criteria for Required Storage Volumes

Pond	Area ⁽¹⁾ (ha)	Imperviousness (%)	Storage Volume for Impervious Level ⁽²⁾ (m ³ /ha)
N/A	N/A	55	190
West SWM Pond	35.34	69	223
N/A	N/A	70	225

(1) Refer to Post-Development Figure for drainage areas to the SWM facility.

(2) Protection Level for Wet Pond: Enhanced 80% long-term S.S. removal.

SWM Planning & Design Manual, Table 3.2, p.3-10 (March 2003).

Table C-2W: Required Storage Volumes for West SWM Facility

Pond Component	Required Volume (m ³)	Volume Provided ⁽³⁾ (m ³)	Volume Ratio
Permanent Pool (PP) ⁽¹⁾	6,467	9,167	1.42
Quality Control ⁽²⁾	1,414	1,848	1.31
Forebay (20% PP)	1,293	N/A	N/A
PP - Forebay	5,174	N/A	N/A

(1) Required PP volume based on Table C-1W (223 - 40).

(2) Required quality control volume based on 40 m³/ha; Quality control release rate based on 48 hour drawdown time.

(3) Provided volume based on stage-storage curve.

(4) No erosion control requirement assumed at this time.

**Table C-3W: Summary of West SWM - Pond Operating Characteristics
(Free Downstream Conditions)**

Pond Components	Node X		Node A		SWM Pond		
	Target Flows ⁽¹⁾ (m ³ /s)	Post-Dev Flows (m ³ /s)	Target Flows ⁽¹⁾ (m ³ /s)	Post-Dev Flows (m ³ /s)	Release Rate (m ³ /s)	Volume (m ³)	Preliminary Water Level (m)
Permanent Pool	-	-	-	-	-	9,167	101.80
Quality Control	-	-	-	-	0.017	1,848	102.05
25mm 3-hr Chicago	0.044	0.080	0.089	0.085	0.061	5,084	102.45
2-year 3-hr Chicago	0.077	0.134	0.154	0.142	0.102	6,839	102.65
5-year 3-hr Chicago	0.142	0.212	0.284	0.228	0.153	9,651	102.90
10-year 3-hr Chicago	0.193	0.255	0.387	0.277	0.175	11,660	103.10
25-year 3-hr Chicago	0.265	0.323	0.532	0.350	0.214	14,240	103.30
50-year 3-hr Chicago	0.325	0.430	0.652	0.465	0.294	15,930	103.40
100-year 3-hr Chicago	0.392	0.560	0.787	0.604	0.395	17,640	103.55
2-year 24-hr SCS	0.121	0.190	0.242	0.204	0.140	8,577	102.85
5-year 24-hr SCS	0.210	0.264	0.422	0.288	0.177	11,840	103.10
10-year 24-hr SCS	0.278	0.322	0.558	0.352	0.206	14,020	103.25
25-year 24-hr SCS	0.370	0.477	0.743	0.518	0.321	16,410	103.45
50-year 24-hr SCS	0.446	0.616	0.896	0.668	0.430	18,180	103.60
100-year 24-hr SCS	0.532	0.809	1.069	0.873	0.590	19,940	103.70
2-year 12-hr SCS	0.114	0.181	0.228	0.194	0.135	8,271	102.80
5-year 12-hr SCS	0.203	0.259	0.407	0.282	0.175	11,660	103.10
10-year 12-hr SCS	0.273	0.318	0.548	0.347	0.207	14,030	103.25
25-year 12-hr SCS	0.366	0.478	0.734	0.519	0.325	16,470	103.45
50-year 12-hr SCS	0.445	0.633	0.893	0.685	0.448	18,460	103.60
100-year 12-hr SCS	0.523	0.815	1.051	0.879	0.601	20,160	103.70

* Note: Elevations reported have been rounded up to the nearest 5cm

(1) Target flows based on pre-development flows.

(2) Total post-dev flows/release rates based on SWMHYMO model which takes into account the timing of peak.

(3) No erosion control requirement assumed at this time.

**Table C-4W: Summary of West SWM - Pond Operating Characteristics
(Restrictive Downstream Conditions)**

Pond Components	SWM Pond		Preliminary Water Level (m)
	Release Rate (m ³ /s)	Volume (m ³)	
Permanent Pool	-	9,167	101.80
Quality Control	0.017	1,848	102.05
25mm 3-hr Chicago	0.000	5,545	102.50
2-year 3-hr Chicago	0.000	7,510	102.75
5-year 3-hr Chicago	0.061	10,450	103.00
10-year 3-hr Chicago	0.104	12,310	103.15
25-year 3-hr Chicago	0.169	14,750	103.30
50-year 3-hr Chicago	0.258	16,360	103.45
100-year 3-hr Chicago	0.360	17,990	103.55
2-year 24-hr SCS	0.051	10,130	102.95
5-year 24-hr SCS	0.114	12,950	103.20
10-year 24-hr SCS	0.179	14,950	103.35
25-year 24-hr SCS	0.313	17,250	103.50
50-year 24-hr SCS	0.448	19,020	103.65
100-year 24-hr SCS	0.583	20,870	103.80
2-year 12-hr SCS	0.043	9,828	102.95
5-year 12-hr SCS	0.109	12,660	103.15
10-year 12-hr SCS	0.170	14,760	103.30
25-year 12-hr SCS	0.300	17,040	103.50
50-year 12-hr SCS	0.442	18,980	103.65
100-year 12-hr SCS	0.575	20,700	103.75

* Note: Elevations reported have been rounded up to the nearest 5cm

(1) Target flows based on pre-development flows.

(2) Total post-dev flows/release rates based on SWMHYMO model which takes into account the timing of peak.

(3) No erosion control requirement assumed at this time.

Table C-5W: Extended Detention Parameters for West SWM Facility

Permanent Pool Parameters		Quality Orifice Parameters	
Area (C3)	7057.75 m ²	Diameter 0.135	m
Volume	10185.70 m ³		
PP Elev	101.800 m	Area 0.014	m ²
QC Elev	102.050 m	Invert 101.80	m
h (m)	0.250 m	C _o 0.62	

Notes:

- C3 is the intercept from the area-depth linear regression.
- PP Elev indicates the elevation of the permanent pool.
- QC Elev indicates the elevation of the storage volume required by MOE for quality control.
- h is the maximum water elevation above the orifice (m).

Table C-6W: Extended Detention Drawdown Time for West SWM Facility

Elev. (m)	Active Storage			C2 (m ² /m)	Drawdown Time (h)	Drawdown Time (days)	Flow (m ³ /s)	Demarkation Point
	V (m ³)	A (m ²)	depth (m)					
101.80	0.00	7057.75	0.00				0.000	PP Elev
101.85	356.18	7189.64	0.05	2638	22.41	0.93	0.004	
101.90	718.99	7322.73	0.10	2650	31.89	1.33	0.008	
101.95	1088.51	7457.99	0.15	2668	39.30	1.64	0.011	
102.00	1464.84	7595.28	0.20	2688	45.67	1.90	0.014	
102.05	1848.09	7734.68	0.25	2708	51.38	2.14	0.017	QC Elev
102.10	2238.36	7876.12	0.30	2728	56.65	2.36	0.023	
102.15	2635.76	8019.68	0.35	2748	61.58	2.57	0.033	
102.20	3040.38	8165.24	0.40	2769	66.26	2.76	0.040	
102.25	3452.34	8312.94	0.45	2789	70.74	2.95	0.046	
102.30	3871.73	8462.72	0.50	2810	75.06	3.13	0.050	
102.35	4298.66	8614.50	0.55	2830	79.25	3.30	0.055	
102.40	4733.23	8768.49	0.60	2851	83.33	3.47	0.059	
102.45	5175.56	8924.60	0.65	2872	87.32	3.64	0.062	
102.50	5625.74	9082.57	0.70	2893	89.21	3.72	0.070	
102.55	6083.87	9242.77	0.75	2913	90.91	3.79	0.080	
102.60	6550.07	9405.02	0.80	2934	92.44	3.85	0.090	
102.65	7024.42	9569.30	0.85	2955	93.75	3.91	0.110	
102.70	7507.05	9735.72	0.90	2976	94.91	3.95	0.121	
102.75	7998.05	9904.23	0.95	2996	96.00	4.00	0.130	
102.80	8518.49	10913.50	1.00	3856	97.07	4.04	0.139	
102.85	9095.51	12167.40	1.05	4866	98.19	4.09	0.147	
102.90	9706.35	12266.01	1.10	4735	99.32	4.14	0.154	
102.95	10322.13	12365.07	1.15	4615	100.41	4.18	0.161	
103.00	10942.86	12464.31	1.20	4505	101.46	4.23	0.168	
103.05	11568.56	12563.82	1.25	4405	102.47	4.27	0.174	
103.10	12199.25	12663.52	1.30	4312	103.46	4.31	0.180	

Notes:

- C2 is the slope coefficient from the area-depth linear regression.
- PP Elev indicates the elevation of the permanent pool.
- QC Elev indicates the elevation of the storage volume required by MOE for quality control.
- Drawdown time calculated based on MOE Equation 4.11 up to the Ext Det elevation, then based on incremental volume and average outflow.

Table C-7W: Stage-Storage-Outflow Curve for West SWM Facility (Free Outfall Conditions)

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Emergency Overflow			
			Vertical Orifice		Vertical Rect. Orifice		Vertical Rect. Orifice		Vertical Rect. Orifice		Broad Crested Weir			
			Dia (m)	0.135	Width (m)	0.200	Width (m)	0.200	Width (m)	0.600	L (m)	15.000		
			Area (m ²)	0.014	Area (m ²)	0.020	Area (m2)	0.040	Area (m2)	0.240				
			Invert (m)	101.80	Invert (m)	102.05	Invert (m)	102.45	Invert (m)	103.20	C _w	1.580		
			C _o	0.62	C _o	0.62	Co	0.62	Co	0.62	Invert (m)	103.85		
			Q @ D	0.010	C _w	1.800	Cw	1.800	Cw	1.800	n contr.	2		
Elevation	Active Sto.	Demarkation	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Outflow	Storage
(m)	(m ³)	Points	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m ³ /s)	(ha·m)
101.80	0	PP Elev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
101.85	356	QC Elev	0.050	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.036
101.90	719		0.100	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.072
101.95	1089		0.150	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.109
102.00	1465		0.200	0.014	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.146
102.05	1848		0.250	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.185
102.10	2238		0.300	0.019	0.050	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.224
102.15	2636		0.350	0.021	0.100	0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.264
102.20	3040		0.400	0.023	0.150	0.017	0.000	0.000	0.000	0.000	0.000	0.000	0.040	0.304
102.25	3452		0.450	0.024	0.200	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.345
102.30	3872		0.500	0.026	0.250	0.025	0.000	0.000	0.000	0.000	0.000	0.000	0.050	0.387
102.35	4299		0.550	0.027	0.300	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.055	0.430
102.40	4733		0.600	0.029	0.350	0.030	0.000	0.000	0.000	0.000	0.000	0.000	0.059	0.473
102.45	5176		0.650	0.030	0.400	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.062	0.518
102.50	5626		0.700	0.031	0.450	0.035	0.050	0.004	0.000	0.000	0.000	0.000	0.070	0.563
102.55	6084		0.750	0.032	0.500	0.037	0.100	0.010	0.000	0.000	0.000	0.000	0.080	0.608
102.60	6550		0.800	0.034	0.550	0.039	0.150	0.018	0.000	0.000	0.000	0.000	0.090	0.655
102.65	7024		0.850	0.035	0.600	0.041	0.200	0.035	0.000	0.000	0.000	0.000	0.110	0.702
102.70	7507		0.900	0.036	0.650	0.043	0.250	0.043	0.000	0.000	0.000	0.000	0.121	0.751
102.75	7998		0.950	0.037	0.700	0.044	0.300	0.049	0.000	0.000	0.000	0.000	0.130	0.800
102.80	8518		1.000	0.038	0.750	0.046	0.350	0.055	0.000	0.000	0.000	0.000	0.139	0.852
102.85	9096		1.050	0.039	0.800	0.048	0.400	0.060	0.000	0.000	0.000	0.000	0.147	0.910
102.90	9706		1.100	0.040	0.850	0.049	0.450	0.065	0.000	0.000	0.000	0.000	0.154	0.971
102.95	10322		1.150	0.041	0.900	0.051	0.500	0.069	0.000	0.000	0.000	0.000	0.161	1.032
103.00	10943		1.200	0.042	0.950	0.052	0.550	0.074	0.000	0.000	0.000	0.000	0.168	1.094
103.05	11569		1.250	0.043	1.000	0.054	0.600	0.078	0.000	0.000	0.000	0.000	0.174	1.157
103.10	12199		1.300	0.044	1.050	0.055	0.650	0.081	0.000	0.000	0.000	0.000	0.180	1.220
103.15	12835		1.350	0.045	1.100	0.056	0.700	0.085	0.000	0.000	0.000	0.000	0.186	1.283
103.20	13476		1.400	0.045	1.150	0.058	0.750	0.089	0.000	0.000	0.000	0.000	0.192	1.348
103.25	14121		1.450	0.046	1.200	0.059	0.800	0.092	0.050	0.012	0.000	0.000	0.209	1.412
103.30	14772		1.500	0.047	1.250	0.060	0.850	0.095	0.100	0.033	0.000	0.000	0.235	1.477
103.35	15428		1.550	0.048	1.300	0.061	0.900	0.098	0.150	0.060	0.000	0.000	0.267	1.543
103.40	16089		1.600	0.049	1.350	0.063	0.950	0.101	0.200	0.090	0.000	0.000	0.303	1.609
103.45	16755		1.650	0.049	1.400	0.064	1.000	0.104	0.250	0.124	0.000	0.000	0.341	1.675
103.50	17426		1.700	0.050	1.450	0.065	1.050	0.107	0.300	0.160	0.000	0.000	0.382	1.743
103.55	18102		1.750	0.051	1.500	0.066	1.100	0.110	0.350	0.198	0.000	0.000	0.425	1.810
103.60	18783		1.800	0.052	1.550	0.067	1.150	0.113	0.400	0.237	0.000	0.000	0.468	1.878
103.65	19469		1.850	0.052	1.600	0.068	1.200	0.115	0.450	0.330	0.000	0.000	0.566	1.947
103.70	20161		1.900	0.053	1.650	0.069	1.250	0.118	0.500	0.361	0.000	0.000	0.601	2.016
103.75	20857		1.950	0.054	1.700	0.071	1.300	0.120	0.550	0.390	0.000	0.000	0.635	2.086
103.80	21559		2.000	0.055	1.750	0.072	1.350	0.123	0.600	0.417	0.000	0.000	0.666	2.156
103.85	22266		2.050	0.055	1.800	0.073	1.400	0.125	0.650	0.442	0.000	0.000	0.695	2.227
103.90	22978		2.100	0.056	1.850	0.074	1.450	0.128	0.700	0.466	0.050	0.265	0.988	2.298
103.95	23696		2.150	0.057	1.900	0.075	1.500	0.130	0.750	0.489	0.100	0.748	1.499	2.370
104.00	24418		2.200	0.057	1.950	0.076	1.550	0.132	0.800	0.511	0.150	1.374	2.150	2.442
104.05	25146		2.250	0.058	2.000	0.077	1.600	0.135	0.850	0.531	0.200	2.114	2.915	2.515
104.10	25879		2.300	0.059	2.050	0.078	1.650	0.137	0.900	0.551	0.250	2.953	3.777	2.588
104.15	26618		2.350	0.059	2.100	0.079	1.700	0.139	0.950	0.571	0.300	3.879	4.727	2.662
104.20	27361		2.400	0.060	2.150	0.080	1.750	0.141	1.000	0.590	0.350	4.884	5.755	2.736
104.25	28110		2.450	0.061	2.200	0.081	1.800	0.143	1.050	0.608	0.400	5.964	6.856	2.811
104.30	28864		2.500	0.061	2.250	0.081	1.850	0.145	1.100	0.625	0.450	7.111	8.025	2.886
104.35	29652		2.550	0.062	2.300	0.082	1.900	0.147	1.150	0.642	0.500	8.323	9.257	2.965
104.40	30503	Top of Berm	2.600	0.063	2.350	0.083	1.950	0.149	1.200	0.659	0.550	9.596	10.550	3.050

Table C-8W: Stage-Storage-Outflow Curve for West SWM Facility (Restrictive Outfall Conditions)

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Emergency Overflow			
			Vertical Orifice		Vertical Rect. Orifice		Vertical Rect. Orifice		Vertical Rect. Orifice		Broad Crested Weir			
			Dia (m)	0.135	Width (m)	0.200	Width (m)	0.200	Width (m)	0.600	L (m)	15.000		
			Height (m)		Height (m)	0.100	Height (m)	0.200	Height (m)	0.400				
			Area (m ²)	0.014	Area (m ²)	0.020	Area (m2)	0.040	Area (m2)	0.240				
			Invert (m)	102.77	Invert (m)	102.77	Invert (m)	102.77	Invert (m)	103.20	C _w	1.580		
			C _o	0.62	C _o	0.62	Co	0.62	Co	0.62	Invert (m)	103.85		
			Q @ D	0.010	C _w	1.800	Cw	1.800	Cw	1.800	n contr.	2		
Elevation	Active Sto.	Demarkation	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Outflow	Storage
(m)	(m ³)	Points	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m ³ /s)	(ha·m)
101.80	0	PP Elev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
101.85	356	QC Elev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.036
101.90	719		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.072
101.95	1089		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.109
102.00	1465		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.146
102.05	1848		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.185
102.10	2238		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.224
102.15	2636		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.264
102.20	3040		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.304
102.25	3452		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.345
102.30	3872		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.387
102.35	4299		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.430
102.40	4733		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.473
102.45	5176		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.518
102.50	5626		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.563
102.55	6084		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.608
102.60	6550		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.655
102.65	7024		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.702
102.70	7507		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.751
102.75	7998		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.800
102.80	8518		0.030	0.002	0.030	0.002	0.030	0.002	0.000	0.000	0.000	0.000	0.006	0.852
102.85	9096		0.080	0.006	0.080	0.007	0.080	0.007	0.000	0.000	0.000	0.000	0.021	0.910
102.90	9706		0.130	0.010	0.130	0.016	0.130	0.015	0.000	0.000	0.000	0.000	0.040	0.971
102.95	10322		0.180	0.013	0.180	0.020	0.180	0.023	0.000	0.000	0.000	0.000	0.056	1.032
103.00	10943		0.230	0.016	0.230	0.023	0.230	0.040	0.000	0.000	0.000	0.000	0.079	1.094
103.05	11569		0.280	0.018	0.280	0.026	0.280	0.047	0.000	0.000	0.000	0.000	0.091	1.157
103.10	12199		0.330	0.020	0.330	0.029	0.330	0.053	0.000	0.000	0.000	0.000	0.102	1.220
103.15	12835		0.380	0.022	0.380	0.032	0.380	0.058	0.000	0.000	0.000	0.000	0.112	1.283
103.20	13476		0.430	0.024	0.430	0.034	0.430	0.063	0.000	0.000	0.000	0.000	0.121	1.348
103.25	14121		0.480	0.025	0.480	0.036	0.480	0.068	0.050	0.012	0.000	0.000	0.141	1.412
103.30	14772		0.530	0.027	0.530	0.038	0.530	0.072	0.100	0.033	0.000	0.000	0.170	1.477
103.35	15428		0.580	0.028	0.580	0.040	0.580	0.076	0.150	0.060	0.000	0.000	0.204	1.543
103.40	16089		0.630	0.029	0.630	0.042	0.630	0.080	0.200	0.090	0.000	0.000	0.241	1.609
103.45	16755		0.680	0.031	0.680	0.044	0.680	0.084	0.250	0.124	0.000	0.000	0.282	1.675
103.50	17426		0.730	0.032	0.730	0.045	0.730	0.087	0.300	0.160	0.000	0.000	0.324	1.743
103.55	18102		0.780	0.033	0.780	0.047	0.780	0.091	0.350	0.198	0.000	0.000	0.368	1.810
103.60	18783		0.830	0.034	0.830	0.049	0.830	0.094	0.400	0.237	0.000	0.000	0.413	1.878
103.65	19469		0.880	0.035	0.880	0.050	0.880	0.097	0.450	0.330	0.000	0.000	0.512	1.947
103.70	20161		0.930	0.037	0.930	0.052	0.930	0.100	0.500	0.361	0.000	0.000	0.549	2.016
103.75	20857		0.980	0.038	0.980	0.053	0.980	0.103	0.550	0.390	0.000	0.000	0.583	2.086
103.80	21559		1.030	0.039	1.030	0.054	1.030	0.106	0.600	0.417	0.000	0.000	0.616	2.156
103.85	22266		1.080	0.040	1.080	0.056	1.080	0.109	0.650	0.442	0.000	0.000	0.646	2.227
103.90	22978		1.130	0.041	1.130	0.057	1.130	0.111	0.700	0.466	0.050	0.265	0.940	2.298
103.95	23696		1.180	0.041	1.180	0.058	1.180	0.114	0.750	0.489	0.100	0.748	1.451	2.370
104.00	24418		1.230	0.042	1.230	0.060	1.230	0.117	0.800	0.511	0.150	1.374	2.103	2.442
104.05	25146		1.280	0.043	1.280	0.061	1.280	0.119	0.850	0.531	0.200	2.114	2.869	2.515
104.10	25879		1.330	0.044	1.330	0.062	1.330	0.122	0.900	0.551	0.250	2.953	3.732	2.588
104.15	26618		1.380	0.045	1.380	0.063	1.380	0.124	0.950	0.571	0.300	3.879	4.682	2.662
104.20	27361		1.430	0.046	1.430	0.065	1.430	0.127	1.000	0.590	0.350	4.884	5.711	2.736
104.25	28110		1.480	0.047	1.480	0.066	1.480	0.129	1.050	0.608	0.400	5.964	6.813	2.811
104.30	28864		1.530	0.048	1.530	0.067	1.530	0.131	1.100	0.625	0.450	7.111	7.982	2.886
104.35	29652		1.580	0.048	1.580	0.068	1.580	0.134	1.150	0.642	0.500	8.323	9.216	2.965
104.40	30503	Top of Berm	1.630	0.049	1.630	0.069	1.630	0.136	1.200	0.659	0.550	9.596	10.509	3.050

East SWM Pond Preliminary Stage Storage

				Demarcation
Elevation (m)	Volume (m ³)	Volume above PP @ 90% (m ³)	Area (m ²)	
98.50	0.000		5177.35	Pond Bottom
98.55	260.364		5237.22	
98.60	523.743		5297.95	
98.65	790.170		5359.1	
98.70	1059.663		5420.64	
98.75	1332.246		5482.65	
98.80	1607.938		5545.03	
98.85	1886.759		5607.8	
98.90	2168.731		5671.1	
98.95	2453.875		5734.64	
99.00	2742.208		5798.69	
99.05	3033.757		5863.27	
99.10	3328.540		5928.05	
99.15	3626.576		5993.4	
99.20	3927.889		6059.11	
99.25	4232.497		6125.21	
99.30	4540.420		6191.74	
99.35	4851.682		6258.74	
99.40	5166.303		6326.08	
99.45	5484.302		6393.88	
99.50	5805.757		6464.31	
99.55	6155.033		7032.63	
99.60	6509.062		7128.53	
99.65	6867.905		7225.19	
99.70	7231.606		7322.84	
99.75	7600.209		7421.3	
99.80	7973.758		7520.62	
99.85	8352.292		7620.75	
99.90	8735.856		7721.81	
99.95	9124.494		7823.72	
100.00	9518.252		7926.58	
100.05	9917.170		8030.15	
100.10	10321.294		8134.79	
100.15	10730.668		8240.16	
100.20	11145.334		8346.49	
100.25	11565.336		8453.58	
100.30	11990.715		8561.58	
100.35	12421.517		8670.48	
100.40	12857.784		8780.22	
100.45	13299.560		8890.83	

East SWM Pond Preliminary Stage Storage

Elevation (m)	Volume (m ³)	Volume above PP @ 90% (m ³)	Area (m ²)	Demarcation
100.50	13746.993	0.000	9006.47	Permanent Pool
100.55	14199.992	407.699	9113.5	
100.60	14658.382	820.250	9222.12	
100.65	15122.219	1237.703	9331.34	
100.70	15591.534	1660.087	9441.26	
100.75	16066.362	2087.432	9551.84	
100.80	16546.735	2519.768	9663.12	
100.85	17032.685	2957.123	9774.88	
100.90	17524.243	3399.525	9887.42	
100.95	18021.443	3847.005	10000.6	
101.00	18524.318	4299.592	10114.38	
101.05	19032.898	4757.314	10228.82	
101.10	19547.215	5220.200	10343.9	
101.15	20067.305	5688.281	10459.71	
101.20	20593.201	6161.587	10576.09	
101.25	21124.932	6640.145	10693.17	
101.30	21662.534	7123.987	10810.9	
101.35	22206.038	7613.140	10929.25	
101.40	22755.475	8107.634	11048.24	
101.45	23310.876	8607.495	11167.81	
101.50	23872.388	9112.855	11292.64	
101.55	24449.754	9632.485	11802.03	
101.60	25042.222	10165.706	11896.71	
101.65	25639.429	10703.192	11991.57	
101.70	26241.390	11244.957	12086.85	
101.75	26848.124	11791.018	12182.53	
101.80	27459.649	12341.390	12278.49	
101.85	28075.980	12896.088	12374.76	
101.90	28697.138	13455.131	12471.55	
101.95	29323.140	14018.532	12568.53	
102.00	29954.002	14586.308	12665.95	
102.05	30589.744	15158.476	12763.74	
102.10	31230.384	15735.052	12861.82	
102.15	31875.935	16316.048	12960.24	
102.20	32526.419	16901.483	13059.12	
102.25	33181.855	17491.376	13158.3	
102.30	33842.256	18085.737	13257.76	
102.35	34507.642	18684.584	13357.68	
102.40	35178.031	19287.934	13457.87	
102.45	35853.439	19895.801	13558.45	
102.50	36533.883	20508.201	13659.3	

East SWM Pond Preliminary Stage Storage

Elevation (m)	Volume (m ³)	Volume above PP @ 90% (m ³)	Area (m ²)	Demarcation
102.55	37219.383	21125.151	13760.68	
102.60	37909.957	21746.668	13862.3	
102.65	38605.622	22372.766	13964.32	
102.70	39306.396	23003.463	14066.62	
102.75	40012.294	23638.771	14169.31	
102.80	40723.337	24278.710	14272.38	
102.85	41439.537	24923.290	14375.63	
102.90	42160.916	25572.531	14479.51	
102.95	42887.494	26226.451	14583.63	
103.00	43619.335	26885.108	14690.02	
103.05	44386.289	27575.366	15988.11	
103.08	44878.075	28017.974	16797.66	
				Top of Pond

Table C-1E: East Pond Criteria for Required Storage Volumes

Pond	Area ⁽¹⁾ (ha)	Imperviousness (%)	Storage Volume for Impervious Level ⁽²⁾ (m ³ /ha)
N/A	N/A	55	190
East SWM Pond	26.25	67	218
N/A	N/A	70	225

(1) Refer to Post-Development Figure for drainage areas to the SWM facility.

(2) Protection Level for Wet Pond: Enhanced 80% long-term S.S. removal.

SWM Planning & Design Manual, Table 3.2, p.3-10 (March 2003).

Table C-2E: Required Storage Volumes for West SWM Facility

Pond Component	Required Volume (m ³)	Volume Provided ⁽³⁾ (m ³)	Volume Ratio
Permanent Pool (PP) ⁽¹⁾	4,673	12,372	2.65
Quality Control ⁽²⁾	1,050	1,660	1.58
Forebay (20% PP)	935	N/A	N/A
PP - Forebay	3,738	N/A	N/A

(1) Required PP volume based on Table C-1E (218 - 40).

(2) Required quality control volume based on 40 m³/ha; Quality control release rate based on 48 hour drawdown time.

(3) Provided volume based on stage-storage curve.

(4) No erosion control requirement assumed at this time.

**Table C-3E: Summary of East SWM - Pond Operating Characteristics
(Free Downstream Conditions)**

Pond Components	Node B		SWM Pond		
	Target Flows ⁽¹⁾ (m ³ /s)	Post-Dev Flows (m ³ /s)	Release Rate (m ³ /s)	Volume (m ³)	Preliminary Water Level (m)
Permanent Pool	-	-	-	12,372	100.50
Quality Control	-	-	0.013	1,660	100.70
25mm 3-hr Chicago	0.152	0.143	0.060	3,608	100.95
2-year 3-hr Chicago	0.266	0.221	0.082	4,875	101.10
5-year 3-hr Chicago	0.492	0.398	0.171	6,743	101.30
10-year 3-hr Chicago	0.671	0.543	0.276	7,875	101.40
25-year 3-hr Chicago	0.920	0.728	0.395	9,376	101.55
50-year 3-hr Chicago	1.128	0.923	0.501	10,540	101.65
100-year 3-hr Chicago	1.362	1.173	0.626	11,740	101.75
2-year 24-hr SCS	0.415	0.332	0.131	6,141	101.20
5-year 24-hr SCS	0.726	0.579	0.306	8,084	101.40
10-year 24-hr SCS	0.960	0.733	0.398	9,413	101.55
25-year 24-hr SCS	1.279	1.020	0.553	11,050	101.70
50-year 24-hr SCS	1.543	1.286	0.682	12,260	101.80
100-year 24-hr SCS	1.840	1.620	0.877	13,480	101.95
2-year 12-hr SCS	0.390	0.310	0.117	5,897	101.20
5-year 12-hr SCS	0.700	0.550	0.284	7,926	101.40
10-year 12-hr SCS	0.941	0.723	0.393	9,355	101.55
25-year 12-hr SCS	1.262	1.022	0.556	11,080	101.70
50-year 12-hr SCS	1.535	1.320	0.703	12,440	101.85
100-year 12-hr SCS	1.806	1.655	0.892	13,630	101.95

* Note: Elevations reported have been rounded up to the nearest 5cm

(1) Target flows based on pre-development flows.

(2) Total post-dev flows/release rates based on SWMHYMO model which takes into account the timing of peak.

(3) No erosion control requirement assumed at this time.

**Table C-4E: Summary of East SWM - Pond Operating Characteristics
(Restrictive Downstream Conditions)**

Pond Components	SWM Pond		Preliminary Water Level (m)
	Release Rate (m ³ /s)	Volume (m ³)	
Permanent Pool	-	12,372	100.50
Quality Control	0.013	1,660	100.70
25mm 3-hr Chicago	0.000	4,000	101.00
2-year 3-hr Chicago	0.015	5,393	101.15
5-year 3-hr Chicago	0.142	7,049	101.30
10-year 3-hr Chicago	0.258	8,059	101.40
25-year 3-hr Chicago	0.370	9,538	101.55
50-year 3-hr Chicago	0.480	10,680	101.65
100-year 3-hr Chicago	0.607	11,860	101.80
2-year 24-hr SCS	0.105	6,607	101.25
5-year 24-hr SCS	0.291	8,451	101.45
10-year 24-hr SCS	0.395	9,821	101.60
25-year 24-hr SCS	0.566	11,490	101.75
50-year 24-hr SCS	0.704	12,740	101.85
100-year 24-hr SCS	0.899	13,990	101.95
2-year 12-hr SCS	0.084	6,391	101.25
5-year 12-hr SCS	0.271	8,173	101.45
10-year 12-hr SCS	0.376	9,617	101.55
25-year 12-hr SCS	0.550	11,340	101.75
50-year 12-hr SCS	0.702	12,720	101.85
100-year 12-hr SCS	0.891	13,910	101.95

* Note: Elevations reported have been rounded up to the nearest 5cm

(1) Target flows based on pre-development flows.

(2) Total post-dev flows/release rates based on SWMHYMO model which takes into account the timing of peak.

(3) No erosion control requirement assumed at this time.

Table C-5E: Extended Detention Parameters for East SWM Facility

Permanent Pool Parameters		Quality Orifice Parameters	
Area (C3)	8105.82 m ²	Diameter 0.130	m
Volume	13746.99 m ³		
PP Elev	100.500 m	Area 0.013	m ²
QC Elev	100.700 m	Invert 100.50	m
h (m)	0.200 m	C _o 0.62	

Notes:

- C3 is the intercept from the area-depth linear regression.
- PP Elev indicates the elevation of the permanent pool.
- QC Elev indicates the elevation of the storage volume required by MOE for quality control.
- h is the maximum water elevation above the orifice (m).

Table C-6E: Extended Detention Drawdown Time for East SWM Facility (Free Downstream Conditions)

Elev. (m)	Active Storage			C2 (m ² /m)	Drawdown Time (h)	Drawdown Time (days)	Flow (m ³ /s)	Demarkation Point
	V (m ³)	A (m ²)	depth (m)					
100.50	0.00	8105.82	0.00				0.000	PP Elev
100.55	407.70	8202.15	0.05	1927	27.69	1.15	0.004	
100.60	820.25	8299.91	0.10	1941	39.32	1.64	0.007	
100.65	1237.70	8398.21	0.15	1949	48.35	2.01	0.011	
100.70	1660.09	8497.13	0.20	1957	56.05	2.34	0.013	QC Elev
100.75	2087.43	8596.66	0.25	1963	62.92	2.62	0.020	
100.80	2519.77	8696.81	0.30	1970	69.20	2.88	0.028	
100.85	2957.12	8797.39	0.35	1976	75.04	3.13	0.037	
100.90	3399.52	8898.68	0.40	1982	80.55	3.36	0.056	
100.95	3847.00	9000.54	0.45	1988	85.77	3.57	0.065	
101.00	4299.59	9102.94	0.50	1994	90.78	3.78	0.073	
101.05	4757.31	9205.94	0.55	2000	95.59	3.98	0.080	
101.10	5220.20	9309.51	0.60	2006	100.25	4.18	0.087	
101.15	5688.28	9413.74	0.65	2012	104.76	4.37	0.105	
101.20	6161.59	9518.48	0.70	2018	105.87	4.41	0.132	
101.25	6640.15	9623.85	0.75	2024	106.78	4.45	0.163	
101.30	7123.99	9729.81	0.80	2030	107.52	4.48	0.199	
101.35	7613.14	9836.33	0.85	2036	108.14	4.51	0.238	
101.40	8107.63	9943.42	0.90	2042	108.64	4.53	0.310	
101.45	8607.49	10051.03	0.95	2048	109.07	4.54	0.344	
101.50	9112.86	10163.38	1.00	2058	109.46	4.56	0.374	
101.55	9632.48	10621.83	1.05	2396	109.82	4.58	0.415	
101.60	10165.71	10707.04	1.10	2365	110.16	4.59	0.464	
101.65	10703.19	10792.41	1.15	2336	110.46	4.60	0.517	
101.70	11244.96	10878.17	1.20	2310	110.74	4.61	0.573	
101.75	11791.02	10964.28	1.25	2287	110.99	4.62	0.631	
101.80	12341.39	11050.64	1.30	2265	111.22	4.63	0.691	

Notes:

- C2 is the slope coefficient from the area-depth linear regression.
- PP Elev indicates the elevation of the permanent pool.
- QC Elev indicates the elevation of the storage volume required by MOE for quality control.
- Drawdown time calculated based on MOE Equation 4.11 up to the Ext Det elevation, then based on incremental volume and average outflow.

Table C-7E: Stage-Storage-Outflow Curve for East SWM Facility (Free Outfall Conditions)

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Emergency Overflow			
			Vertical Orifice		Vertical Rect. Orifice		Vertical Rect. Orifice		Vertical Rect. Orifice		Broad Crested Weir			
			Dia (m)	0.130	Width (m)	0.200	Width (m)	0.600	Width (m)	0.650	L (m)	15.000		
			Height (m)		Height (m)	0.200	Height (m)	0.300	Height (m)	0.400				
			Area (m ²)	0.013	Area (m ²)	0.040	Area (m2)	0.180	Area (m2)	0.260				
			Invert (m)	100.50	Invert (m)	100.70	Invert (m)	101.10	Invert (m)	101.50	C _w	1.580		
			C _o	0.62	C _o	0.62	Co	0.62	Co	0.62	Invert (m)	102.10		
			Q @ D	0.009	C _w	1.800	Cw	1.800	Cw	1.800	n contr.	2		
Elevation	Active Sto.	Demarkation	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Outflow	Storage
(m)	(m ³)	Points	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m ³ /s)	(ha·m)
100.50	0	PP Elev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100.55	408	QC Elev	0.050	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.041
100.60	820		0.100	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.082
100.65	1238		0.150	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.124
100.70	1660		0.200	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.166
100.75	2087		0.250	0.016	0.050	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.209
100.80	2520		0.300	0.018	0.100	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.252
100.85	2957		0.350	0.019	0.150	0.018	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.296
100.90	3400		0.400	0.021	0.200	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.056	0.340
100.95	3847		0.450	0.023	0.250	0.043	0.000	0.000	0.000	0.000	0.000	0.000	0.065	0.385
101.00	4300		0.500	0.024	0.300	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.073	0.430
101.05	4757		0.550	0.025	0.350	0.055	0.000	0.000	0.000	0.000	0.000	0.000	0.080	0.476
101.10	5220		0.600	0.027	0.400	0.060	0.000	0.000	0.000	0.000	0.000	0.000	0.087	0.522
101.15	5688		0.650	0.028	0.450	0.065	0.050	0.012	0.000	0.000	0.000	0.000	0.105	0.569
101.20	6162		0.700	0.029	0.500	0.069	0.100	0.033	0.000	0.000	0.000	0.000	0.132	0.616
101.25	6640		0.750	0.030	0.550	0.074	0.150	0.060	0.000	0.000	0.000	0.000	0.163	0.664
101.30	7124		0.800	0.031	0.600	0.078	0.200	0.090	0.000	0.000	0.000	0.000	0.199	0.712
101.35	7613		0.850	0.032	0.650	0.081	0.250	0.124	0.000	0.000	0.000	0.000	0.238	0.761
101.40	8108		0.900	0.033	0.700	0.085	0.300	0.191	0.000	0.000	0.000	0.000	0.310	0.811
101.45	8607		0.950	0.034	0.750	0.089	0.350	0.221	0.000	0.000	0.000	0.000	0.344	0.861
101.50	9113		1.000	0.035	0.800	0.092	0.400	0.247	0.000	0.000	0.000	0.000	0.374	0.911
101.55	9632		1.050	0.036	0.850	0.095	0.450	0.271	0.050	0.013	0.000	0.000	0.415	0.963
101.60	10166		1.100	0.037	0.900	0.098	0.500	0.292	0.100	0.036	0.000	0.000	0.464	1.017
101.65	10703		1.150	0.038	0.950	0.101	0.550	0.313	0.150	0.065	0.000	0.000	0.517	1.070
101.70	11245		1.200	0.039	1.000	0.104	0.600	0.332	0.200	0.098	0.000	0.000	0.573	1.124
101.75	11791		1.250	0.040	1.050	0.107	0.650	0.350	0.250	0.135	0.000	0.000	0.631	1.179
101.80	12341		1.300	0.041	1.100	0.110	0.700	0.367	0.300	0.175	0.000	0.000	0.691	1.234
101.85	12896		1.350	0.041	1.150	0.113	0.750	0.383	0.350	0.216	0.000	0.000	0.753	1.290
101.90	13455		1.400	0.042	1.200	0.115	0.800	0.399	0.400	0.319	0.000	0.000	0.875	1.346
101.95	14019		1.450	0.043	1.250	0.118	0.850	0.414	0.450	0.357	0.000	0.000	0.931	1.402
102.00	14586		1.500	0.044	1.300	0.120	0.900	0.428	0.500	0.391	0.000	0.000	0.983	1.459
102.05	15158		1.550	0.044	1.350	0.123	0.950	0.442	0.550	0.422	0.000	0.000	1.032	1.516
102.10	15735		1.600	0.045	1.400	0.125	1.000	0.456	0.600	0.452	0.000	0.000	1.078	1.574
102.15	16316		1.650	0.046	1.450	0.128	1.050	0.469	0.650	0.479	0.050	0.265	1.386	1.632
102.20	16901		1.700	0.047	1.500	0.130	1.100	0.482	0.700	0.505	0.100	0.748	1.912	1.690
102.25	17491		1.750	0.047	1.550	0.132	1.150	0.494	0.750	0.530	0.150	1.374	2.578	1.749
102.30	18086		1.800	0.048	1.600	0.135	1.200	0.507	0.800	0.553	0.200	2.114	3.356	1.809
102.35	18685		1.850	0.049	1.650	0.137	1.250	0.518	0.850	0.576	0.250	2.953	4.232	1.868
102.40	19288		1.900	0.049	1.700	0.139	1.300	0.530	0.900	0.597	0.300	3.879	5.195	1.929
102.45	19896		1.950	0.050	1.750	0.141	1.350	0.542	0.950	0.618	0.350	4.884	6.236	1.990
102.50	20508		2.000	0.051	1.800	0.143	1.400	0.553	1.000	0.639	0.400	5.964	7.349	2.051
102.55	21125		2.050	0.051	1.850	0.145	1.450	0.564	1.050	0.658	0.450	7.111	8.530	2.113
102.60	21747		2.100	0.052	1.900	0.147	1.500	0.574	1.100	0.677	0.500	8.323	9.774	2.175
102.65	22373		2.150	0.053	1.950	0.149	1.550	0.585	1.150	0.696	0.550	9.596	11.079	2.237
102.70	23003		2.200	0.053	2.000	0.151	1.600	0.595	1.200	0.714	0.600	10.927	12.441	2.300
102.75	23639		2.250	0.054	2.050	0.153	1.650	0.605	1.250	0.732	0.650	12.312	13.857	2.364
102.80	24279		2.300	0.054	2.100	0.155	1.700	0.615	1.300	0.749	0.700	13.751	15.325	2.428
102.85	24923		2.350	0.055	2.150	0.157	1.750	0.625	1.350	0.766	0.750	15.240	16.843	2.492
102.90	25573		2.400	0.056	2.200	0.159	1.800	0.635	1.400	0.782	0.800	16.777	18.409	2.557
102.95	26226		2.450	0.056	2.250	0.161	1.850	0.645	1.450	0.798	0.850	18.362	20.022	2.623
103.00	26885		2.500	0.057	2.300	0.163	1.900	0.654	1.500	0.814	0.900	19.993	21.680	2.689
103.05	27575		2.550	0.057	2.350	0.165	1.950	0.663	1.550	0.830	0.950	21.667	23.382	2.758
103.08	28018	Top of Berm	2.580	0.058	2.380	0.166	1.980	0.669	1.580	0.839	0.980	22.692	24.423	2.802

Table C-8E: Stage-Storage-Outflow Curve for East SWM Facility (Restrictive Outfall Conditions)

			Quality Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Emergency Overflow			
			Vertical Orifice		Vertical Rect. Orifice		Vertical Rect. Orifice		Vertical Rect. Orifice		Broad Crested Weir			
			Dia (m)	0.130	Width (m)	0.200	Width (m)	0.600	Width (m)	0.650	L (m)	15.000		
			Height (m)		Height (m)	0.200	Height (m)	0.300	Height (m)	0.400				
			Area (m ²)	0.013	Area (m ²)	0.040	Area (m2)	0.180	Area (m2)	0.260				
			Invert (m)	101.05	Invert (m)	101.05	Invert (m)	101.10	Invert (m)	101.50	C _w	1.580	Invert (m)	102.10
			C _o	0.62	C _o	0.62	Co	0.62	Co	0.62	n	contr.		
			Q @ D	0.009	C _w	1.800	Cw	1.800	Cw	1.800				
Elevation	Active Sto.	Demarkation	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Depth	Outflow	Outflow	Storage
(m)	(m ³)	Points	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m)	(m ³ /s)	(m ³ /s)	(ha·m)
100.50	0	PP Elev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100.55	408	QC Elev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041
100.60	820		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.082
100.65	1238		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.124
100.70	1660		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.166
100.75	2087		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.209
100.80	2520		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.252
100.85	2957		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.296
100.90	3400		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.340
100.95	3847		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.385
101.00	4300		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.430
101.05	4757	QC Elev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.476
101.10	5220		0.050	0.004	0.050	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.522
101.15	5688		0.100	0.007	0.100	0.010	0.050	0.012	0.000	0.000	0.000	0.000	0.029	0.569
101.20	6162		0.150	0.011	0.150	0.018	0.100	0.033	0.000	0.000	0.000	0.000	0.061	0.616
101.25	6640		0.200	0.013	0.200	0.035	0.150	0.060	0.000	0.000	0.000	0.000	0.108	0.664
101.30	7124		0.250	0.016	0.250	0.043	0.200	0.090	0.000	0.000	0.000	0.000	0.148	0.712
101.35	7613		0.300	0.018	0.300	0.049	0.250	0.124	0.000	0.000	0.000	0.000	0.191	0.761
101.40	8108		0.350	0.019	0.350	0.055	0.300	0.191	0.000	0.000	0.000	0.000	0.266	0.811
101.45	8607		0.400	0.021	0.400	0.060	0.350	0.221	0.000	0.000	0.000	0.000	0.302	0.861
101.50	9113		0.450	0.023	0.450	0.065	0.400	0.247	0.000	0.000	0.000	0.000	0.335	0.911
101.55	9632	QC Elev	0.500	0.024	0.500	0.069	0.450	0.271	0.050	0.013	0.000	0.000	0.377	0.963
101.60	10166		0.550	0.025	0.550	0.074	0.500	0.292	0.100	0.036	0.000	0.000	0.427	1.017
101.65	10703		0.600	0.027	0.600	0.078	0.550	0.313	0.150	0.065	0.000	0.000	0.482	1.070
101.70	11245		0.650	0.028	0.650	0.081	0.600	0.332	0.200	0.098	0.000	0.000	0.539	1.124
101.75	11791		0.700	0.029	0.700	0.085	0.650	0.350	0.250	0.135	0.000	0.000	0.599	1.179
101.80	12341		0.750	0.030	0.750	0.089	0.700	0.367	0.300	0.175	0.000	0.000	0.660	1.234
101.85	12896		0.800	0.031	0.800	0.092	0.750	0.383	0.350	0.216	0.000	0.000	0.722	1.290
101.90	13455		0.850	0.032	0.850	0.095	0.800	0.399	0.400	0.319	0.000	0.000	0.845	1.346
101.95	14019		0.900	0.033	0.900	0.098	0.850	0.414	0.450	0.357	0.000	0.000	0.902	1.402
102.00	14586		0.950	0.034	0.950	0.101	0.900	0.428	0.500	0.391	0.000	0.000	0.955	1.459
102.05	15158	QC Elev	1.000	0.035	1.000	0.104	0.950	0.442	0.550	0.422	0.000	0.000	1.004	1.516
102.10	15735		1.050	0.036	1.050	0.107	1.000	0.456	0.600	0.452	0.000	0.000	1.051	1.574
102.15	16316		1.100	0.037	1.100	0.110	1.050	0.469	0.650	0.479	0.050	0.265	1.360	1.632
102.20	16901		1.150	0.038	1.150	0.113	1.100	0.482	0.700	0.505	0.100	0.748	1.886	1.690
102.25	17491		1.200	0.039	1.200	0.115	1.150	0.494	0.750	0.530	0.150	1.374	2.552	1.749
102.30	18086		1.250	0.040	1.250	0.118	1.200	0.507	0.800	0.553	0.200	2.114	3.331	1.809
102.35	18685		1.300	0.041	1.300	0.120	1.250	0.518	0.850	0.576	0.250	2.953	4.208	1.868
102.40	19288		1.350	0.041	1.350	0.123	1.300	0.530	0.900	0.597	0.300	3.879	5.170	1.929
102.45	19896		1.400	0.042	1.400	0.125	1.350	0.542	0.950	0.618	0.350	4.884	6.212	1.990
102.50	20508		1.450	0.043	1.450	0.128	1.400	0.553	1.000	0.639	0.400	5.964	7.326	2.051
102.55	21125	QC Elev	1.500	0.044	1.500	0.130	1.450	0.564	1.050	0.658	0.450	7.111	8.507	2.113
102.60	21747		1.550	0.044	1.550	0.132	1.500	0.574	1.100	0.677	0.500	8.323	9.752	2.175
102.65	22373		1.600	0.045	1.600	0.135	1.550	0.585	1.150	0.696	0.550	9.596	11.057	2.237
102.70	23003		1.650	0.046	1.650	0.137	1.600	0.595	1.200	0.714	0.600	10.927	12.419	2.300
102.75	23639		1.700	0.047	1.700	0.139	1.650	0.605	1.250	0.732	0.650	12.312	13.835	2.364
102.80	24279		1.750	0.047	1.750	0.141	1.700	0.615	1.300	0.749	0.700	13.751	15.303	2.428
102.85	24923		1.800	0.048	1.800	0.143	1.750	0.625	1.350	0.766	0.750	15.240	16.822	2.492
102.90	25573		1.850	0.049	1.850	0.145	1.800	0.635	1.400	0.782	0.800	16.777	18.389	2.557
102.95	26226		1.900	0.049	1.900	0.147	1.850	0.645	1.450	0.798	0.850	18.362	20.002	2.623
103.00	26885		1.950	0.050	1.950	0.149	1.900	0.654	1.500	0.814	0.900	19.993	21.660	2.689
103.05	27575	Top of Berm	2.000	0.051	2.000	0.151	1.950	0.663	1.550	0.830	0.950	21.667	23.362	2.758
103.08	28018		2.030	0.051	2.030	0.153	1.980	0.669	1.580	0.839	0.980	22.692	24.403	2.802

```

00001: 20 Metric units / ID Numbers OFF
00002: *
00003: * SWMHYMO Ver:5.500/Feb 2015 / INPUT DATA FILE
00004: *
00005: * Project Name : [Calvan Brittville West properties]
00006: * Project Number: [2267]
00007: * Date : [2/24/08/02]
00008: * Modeller : [JP]
00009: * Company : J.F. Sabourin and Associates
00010: * License # : 254937
00011: *
00012: * 25 mm Storm based on 2-Year, 4-hour Chicago Storm
00013: START TZERO=[0.0], NETOUT=[2], NETONE=[1], NRUN=[001]
00014: * ["25mmCIN.sta"] <-storm filename, one per line for NETONE time
00015: *
00016: READ STORM STORM_FILENAME="storm.001"
00017: *
00018: DEFAULT VALUES ICAESDef=[1], read and print values
00019: DEFVAL_FILENAME="Ottawa.val"
00020: *
00021: *
00022: *
00023: *
00024: * Node X - West SWM Pond Outlet
00025: *
00026: * Post-development drainage area to West SWM Pond
00027: CALIB STANHYD NHYD="W_Fond", DT=[1]min, AREA=[35.34] (ha), XINP=[0.64], TIMP=[0.69], DWF=[0.1] (cms),
LOSS=[1] Horton Eqt: Fc=[76.2] (mm/hr), Fc=[13.2] (mm/hr), DCAV=[4.14] (hr), Fc=[0.00] (mm),
Previous areas: IArea=[4.67] (mm), SLRP=[2.0] (4), LGP=[40] (m), MRP=[0.25], BCP=[0] (min),
Impervious areas: IALnp=[1.57] (mm), SLRP=[0.5] (4), LGP=[40] (m), MRP=[0.25], BCP=[0] (min),
RAINFALL=[ , , -1] (mm/hr)
00028: *
00029: *
00030: *
00031: *
00032: *
00033: *
00034: * West SWM Pond Routing (Free Outfall Conditions)
00035: * Quality control and permanent pool requirements based on MOE guidelines
00036: * for enhanced quality control for wet ponds.
00037: *
00038: ROUTE RESERVOIR NHYDout="W_Fond-Out", NHYDin="W_Fond", RDT=[1] (min),
TABLE of (OUTFLOW-STORE) values
00039: (cms) - (ha-m)
00040: [ 0 , 0 ]
00041: [ 0.004 , 0.036 ]
00042: [ 0.008 , 0.072 ]
00043: [ 0.011 , 0.109 ]
00044: [ 0.014 , 0.146 ]
00045: [ 0.017 , 0.185 ]
00046: [ 0.023 , 0.224 ]
00047: [ 0.033 , 0.264 ]
00048: [ 0.04 , 0.304 ]
00049: [ 0.046 , 0.345 ]
00050: [ 0.05 , 0.387 ]
00051: [ 0.055 , 0.43 ]
00052: [ 0.059 , 0.473 ]
00053: [ 0.062 , 0.518 ]
00054: [ 0.07 , 0.563 ]
00055: [ 0.08 , 0.608 ]
00056: [ 0.09 , 0.652 ]
00057: [ 0.11 , 0.702 ]
00058: [ 0.121 , 0.751 ]
00059: [ 0.13 , 0.8 ]
00060: [ 0.139 , 0.852 ]
00061: [ 0.147 , 0.912 ]
00062: [ 0.154 , 0.971 ]
00063: [ 0.161 , 1.032 ]
00064: [ 0.168 , 1.094 ]
00065: [ 0.174 , 1.157 ]
00066: [ 0.18 , 1.22 ]
00067: [ 0.186 , 1.283 ]
00068: [ 0.192 , 1.348 ]
00069: [ 0.209 , 1.412 ]
00070: [ 0.235 , 1.477 ]
00071: [ 0.267 , 1.543 ]
00072: [ 0.303 , 1.609 ]
00073: [ 0.341 , 1.675 ]
00074: [ 0.382 , 1.743 ]
00075: [ 0.425 , 1.81 ]
00076: [ 0.468 , 1.878 ]
00077: [ 0.566 , 1.947 ]
00078: [ 0.601 , 2.016 ]
00079: [ 0.635 , 2.086 ]
00080: [ 0.666 , 2.156 ]
00081: [ 0.695 , 2.227 ]
00082: [ 0.988 , 2.298 ]
00083: [ 1.499 , 2.37 ]
00084: [ 2.15 , 2.442 ]
00085: [ 2.915 , 2.515 ]
00086: [ 3.777 , 2.588 ]
00087: [ 4.727 , 2.662 ]
00088: [ 5.755 , 2.736 ]
00089: [ 6.856 , 2.811 ]
00090: [ 8.025 , 2.886 ]
00091: [ 9.257 , 2.965 ]
00092: [ 10.55 , 3.05 ]
00093: *
00094: *
00095: *
00096: *
00097: *
00098: *
00099: *
00100: *
00101: *
00102: *
00103: *
00104: *
00105: *
00106: ROUTE RESERVOIR NHYDout="Wfond-Rout", NHYDin="W_Fond", RDT=[1] (min),
TABLE of (OUTFLOW-STORE) Values
00107: (cms) - (ha-m)
00108: [ 0 , 0 ]
00109: [ 0.004 , 0.036 ]
00110: [ 0.008 , 0.072 ]
00111: [ 0.011 , 0.109 ]
00112: [ 0.014 , 0.146 ]
00113: [ 0.017 , 0.185 ]
00114: [ 0.023 , 0.224 ]
00115: [ 0.033 , 0.264 ]
00116: [ 0.04 , 0.304 ]
00117: [ 0.046 , 0.345 ]
00118: [ 0.05 , 0.387 ]
00119: [ 0.055 , 0.43 ]
00120: [ 0.059 , 0.473 ]
00121: [ 0.062 , 0.518 ]
00122: [ 0.07 , 0.563 ]
00123: [ 0.08 , 0.608 ]
00124: [ 0.09 , 0.652 ]
00125: [ 0.11 , 0.702 ]
00126: [ 0.121 , 0.751 ]
00127: [ 0.13 , 0.8 ]
00128: [ 0.139 , 0.852 ]
00129: [ 0.147 , 0.912 ]
00130: [ 0.154 , 0.971 ]
00131: [ 0.161 , 1.032 ]
00132: [ 0.168 , 1.094 ]
00133: [ 0.174 , 1.157 ]
00134: [ 0.18 , 1.22 ]
00135: [ 0.186 , 1.283 ]
00136: [ 0.192 , 1.348 ]
00137: [ 0.209 , 1.412 ]
00138: [ 0.235 , 1.477 ]
00139: [ 0.267 , 1.543 ]
00140: [ 0.303 , 1.609 ]
00141: [ 0.341 , 1.675 ]
00142: [ 0.382 , 1.743 ]
00143: [ 0.425 , 1.81 ]
00144: [ 0.468 , 1.878 ]
00145: [ 0.566 , 1.947 ]
00146: [ 0.601 , 2.016 ]
00147: [ 0.635 , 2.086 ]
00148: [ 0.666 , 2.156 ]
00149: [ 0.695 , 2.227 ]
00150: [ 0.988 , 2.298 ]
00151: [ 1.499 , 2.37 ]
00152: [ 2.15 , 2.442 ]
00153: [ 2.915 , 2.515 ]
00154: [ 3.777 , 2.588 ]
00155: [ 4.727 , 2.662 ]
00156: [ 5.755 , 2.736 ]
00157: [ 6.856 , 2.811 ]
00158: [ 8.025 , 2.886 ]
00159: [ 9.257 , 2.965 ]
00160: [ 10.509 , 3.05 ]
00161: *
00162: *
00163: *
00164: *
00165: *
00166: *
00167: *
00168: *
00169: *
00170: *
00171: *
00172: *
00173: *
00174: *
00175: *
00176: *
00177: *
00178: *
00179: *
00180: *
00181: *
00182: *
00183: *
00184: *
00185: *
00186: *
00187: *
00188: *
00189: *
00190: *
00191: *
00192: *
00193: *
00194: *
00195: *
00196: *
00197: *
00198: *
00199: *
00200: *
00201: *
00202: *
00203: *
00204: *
00205: *
00206: *
00207: *
00208: *
00209: *
00210: *
00211: *
00212: *
00213: *
00214: *
00215: *
00216: *
00217: *
00218: *
00219: *
00220: *
00221: *
00222: *
00223: *
00224: *
00225: *
00226: *
00227: *
00228: *
00229: *
00230: *
00231: *
00232: *
00233: *
00234: *
00235: *
00236: *
00237: *
00238: *
00239: *
00240: *
00241: *
00242: *
00243: *
00244: *
00245: *
00246: *
00247: *
00248: *
00249: *
00250: *
00251: *
00252: *
00253: *
00254: *
00255: *
00256: *
00257: *
00258: *
00259: *
00260: *
00261: *
00262: *
00263: *
00264: *
00265: *
00266: *
00267: *
00268: *
00269: *
00270: *
00271: *
00272: *
00273: *
00274: *
00275: *
00276: *
00277: *
00278: *
00279: *
00280: *
00281: *
00282: *
00283: *
00284: *
00285: *
00286: *
00287: *
00288: *
00289: *
00290: *
00291: *
00292: *
00293: *
00294: *
00295: *
00296: *
00297: *
00298: *
00299: *
00300: *
00301: *
00302: *
00303: *
00304: *
00305: *
00306: *
00307: *
00308: *
00309: *
00310: *
00311: *
00312: *
00313: *
00314: *
00315: *
00316: *
00317: *
00318: *
00319: *
00320: *
00321: *
00322: *
00323: *
00324: *
00325: *
00326: *
00327: *
00328: *
00329: *
00330: *
00331: *
00332: *
00333: *
00334: *
00335: *
00336: *
00337: *
00338: *
00339: *
00340: *
00341: *
00342: *
00343: *
00344: *
00345: *
00346: *
00347: *
00348: *
00349: *
00350: *
00351: *
00352: *
00353: *
00354: *
00355: *
00356: *
00357: *
00358: *
00359: *
00360: *

```

```

00361: [ 0 , 0 ]
00362: [ 0 , 0.041 ]
00363: [ 0 , 0.082 ]
00364: [ 0 , 0.124 ]
00365: [ 0 , 0.166 ]
00366: [ 0 , 0.209 ]
00367: [ 0 , 0.252 ]
00368: [ 0 , 0.296 ]
00369: [ 0 , 0.34 ]
00370: [ 0 , 0.385 ]
00371: [ 0 , 0.43 ]
00372: [ 0 , 0.476 ]
00373: [ 0.007 , 0.522 ]
00374: [ 0.029 , 0.569 ]
00375: [ 0.061 , 0.616 ]
00376: [ 0.108 , 0.664 ]
00377: [ 0.148 , 0.712 ]
00378: [ 0.191 , 0.761 ]
00379: [ 0.266 , 0.811 ]
00380: [ 0.302 , 0.861 ]
00381: [ 0.335 , 0.911 ]
00382: [ 0.377 , 0.963 ]
00383: [ 0.427 , 1.017 ]
00384: [ 0.482 , 1.07 ]
00385: [ 0.538 , 1.124 ]
00386: [ 0.599 , 1.179 ]
00387: [ 0.66 , 1.234 ]
00388: [ 0.722 , 1.29 ]
00389: [ 0.845 , 1.346 ]
00390: [ 0.902 , 1.402 ]
00391: [ 0.955 , 1.459 ]
00392: [ 1.004 , 1.516 ]
00393: [ 1.051 , 1.574 ]
00394: [ 1.136 , 1.632 ]
00395: [ 1.486 , 1.69 ]
00396: [ 2.552 , 1.749 ]
00397: [ 3.331 , 1.809 ]
00398: [ 4.208 , 1.868 ]
00399: [ 5.17 , 1.929 ]
00400: [ 6.212 , 1.99 ]
00401: [ 7.326 , 2.051 ]
00402: [ 8.507 , 2.113 ]
00403: [ 9.752 , 2.175 ]
00404: [ 11.057 , 2.237 ]
00405: [ 12.419 , 2.3 ]
00406: [ 13.835 , 2.364 ]
00407: [ 15.303 , 2.428 ]
00408: [ 16.822 , 2.492 ]
00409: [ 18.389 , 2.557 ]
00410: [ 20.002 , 2.623 ]
00411: [ 21.66 , 2.689 ]
00412: [ 23.362 , 2.758 ]
00413: [ 24.403 , 2.802 ]
00414: [ -1 , -1 ] (max twenty pts)
00415: NYDOUT["EFond-Drv"]
00416: *-----*
00417: *#####*
00418: *# Area E_Und4 to Node B
00419: DESIGN NASHVD NYD=[ "E_Und4" ], DT=[1]min, AREA=[0.43] (ha),
00420: DWF=[0] (gms), CM/C=[59], TP=[11.43]hrs,
00421: RAINFALL=[ , , , ] (mm/hr), END=-1
00422: *-----*
00423: *#####*
00424: *# Area E_Und5 to Node B
00425: DESIGN NASHVD NYD=[ "E_Und5" ], DT=[1]min, AREA=[0.44] (ha),
00426: DWF=[0] (gms), CM/C=[71], TP=[10.93]hrs,
00427: RAINFALL=[ , , , ] (mm/hr), END=-1
00428: *-----*
00429: *#####*
00430: *# Total Flow at Node B (NodeB = NodeA + E_Pond-Out + E_Pond-Of + E_Und4 + E_Und5)
00431: ADD HYD NYDsum=["NodeB"], NYDts to add=["NodeA-r" + "E_Pond-Out" + "E_Pond-Of" + "E_Und4" + "E_Und5"]
00432: *-----*
00433: *#####*
00434: *# STORMS
00435: *#####*
00436: *# 25 mm Storm based on 2-Year, 3-Hour Chicago Storm
00437: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[001]
00438: *# ["25MMCH3.stm"] <--storm filename, one per line for NSTORM time
00439: *-----*
00440: *# 2-Year, 3-Hour Chicago Storm
00441: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[002]
00442: *# ["002YCH3.stm"] <--storm filename, one per line for NSTORM time
00443: *-----*
00444: *# 5-Year, 3-Hour Chicago Storm
00445: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[005]
00446: *# ["005YCH3.stm"] <--storm filename, one per line for NSTORM time
00447: *-----*
00448: *# 10-Year, 3-Hour Chicago Storm
00449: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[010]
00450: *# ["010YCH3.stm"] <--storm filename, one per line for NSTORM time
00451: *-----*
00452: *# 25-Year, 3-Hour Chicago Storm
00453: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[025]
00454: *# ["025YCH3.stm"] <--storm filename, one per line for NSTORM time
00455: *-----*
00456: *# 50-Year, 3-Hour Chicago Storm
00457: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[050]
00458: *# ["050YCH3.stm"] <--storm filename, one per line for NSTORM time
00459: *-----*
00460: *# 100-Year, 3-Hour Chicago Storm
00461: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[099]
00462: *# ["100YCH3.stm"] <--storm filename, one per line for NSTORM time
00463: *-----*
00464: *# 2-Year, 24-Hour SCS Storm
00465: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[102]
00466: *# ["SC2402x.stm"] <--storm filename, one per line for NSTORM time
00467: *-----*
00468: *# 5-Year, 24-Hour SCS Storm
00469: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[105]
00470: *# ["SC2405x.stm"] <--storm filename, one per line for NSTORM time
00471: *-----*
00472: *# 10-Year, 24-Hour SCS Storm
00473: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[110]
00474: *# ["SC2410x.stm"] <--storm filename, one per line for NSTORM time
00475: *-----*
00476: *# 25-Year, 24-Hour SCS Storm
00477: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[125]
00478: *# ["SC24025x.stm"] <--storm filename, one per line for NSTORM time
00479: *-----*
00480: *# 50-Year, 24-Hour SCS Storm
00481: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[150]
00482: *# ["SC24050x.stm"] <--storm filename, one per line for NSTORM time
00483: *-----*
00484: *# 100-Year, 24-Hour SCS Storm
00485: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[199]
00486: *# ["SC24100x.stm"] <--storm filename, one per line for NSTORM time
00487: *-----*
00488: *# 2-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00489: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[202]
00490: *# ["SC1205c.stm"] <--storm filename, one per line for NSTORM time
00491: *-----*
00492: *# 5-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00493: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[205]
00494: *# ["SC1205c.stm"] <--storm filename, one per line for NSTORM time
00495: *-----*
00496: *# 10-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00497: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[210]
00498: *# ["SC1205c.stm"] <--storm filename, one per line for NSTORM time
00499: *-----*
00500: *# 25-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00501: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[225]
00502: *# ["SC1205c.stm"] <--storm filename, one per line for NSTORM time
00503: *-----*
00504: *# 50-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00505: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[250]
00506: *# ["SC1205c.stm"] <--storm filename, one per line for NSTORM time
00507: *-----*
00508: *# 100-Year, 12-Hour SCS Storm (per City of Ottawa Carp River PCNMM model)
00509: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[299]
00510: *# ["SC1205c.stm"] <--storm filename, one per line for NSTORM time
00511: *-----*
00512: *# July 1st, 1979 Storm - Ottawa International Airport
00513: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[979]
00514: *# ["1979071.stm"] <--storm filename, one per line for NSTORM time
00515: *-----*
00516: *# August 4th, 1988 Storm - Ottawa International Airport
00517: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[988]
00518: *# ["19880804.stm"] <--storm filename, one per line for NSTORM time
00519: *-----*
00520: *# August 8th, 1996 Storm - Ottawa International Airport
00521: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[996]
00522: *# ["19960808.stm"] <--storm filename, one per line for NSTORM time
00523: *-----*
00524: *# 100-Year, 3-Hour Chicago Storm + 20x
00525: *START TZERO=[0.0], METOUT=[2], NSTORM=[1], NRUN=[999]
00526: *# ["100YCH3.stm"] <--storm filename, one per line for NSTORM time
00527: *-----*
00528: FINISH

```

```
00001 =====
00002 CALIB STANWHD 1.0 01E Undr 35.34 2.357 No date 1:06 15.69 628 .000
00003 ##### [XINF=64;TIMP=69]
00004 [Horton parameters: Fw=76.20;Fcp=13.20;DCAV=4.14; Fw=.00]
00005 [Impervious area: IAlp=4.67;ISLIP=2.50;LGR= 48; MNH= .013;ICR= .0]
00006 [Impervious area: IAlp=1.57;ISLIP= .50;LGR= 48; MNH= .013;ICR= .0]
00007 #####
00008 # Total Flow at Node A (NodeA = NodeA-r + W Undr + W Undr + E Undr + E Undr)
00009 #####
00010 StormWater Management Hydrologic Model 222 000 11 555 #####
00011 #####
00012 ##### SWMHDV Ver 5.500 #####
00013 A single event and continuous hydrologic simulation model
00014 based on the principles of HMM and its successors
00015 #####
00016 #####
00017 #####
00018 #####
00019 #####
00020 #####
00021 #####
00022 #####
00023 #####
00024 #####
00025 #####
00026 #####
00027 #####
00028 #####
00029 #####
00030 #####
00031 #####
00032 #####
00033 #####
00034 #####
00035 #####
00036 #####
00037 #####
00038 #####
00039 #####
00040 #####
00041 #####
00042 #####
00043 #####
00044 #####
00045 #####
00046 #####
00047 #####
00048 #####
00049 #####
00050 #####
00051 #####
00052 #####
00053 #####
00054 #####
00055 #####
00056 #####
00057 #####
00058 #####
00059 #####
00060 #####
00061 #####
00062 #####
00063 #####
00064 #####
00065 #####
00066 #####
00067 #####
00068 #####
00069 #####
00070 #####
00071 #####
00072 #####
00073 #####
00074 #####
00075 #####
00076 #####
00077 #####
00078 #####
00079 #####
00080 #####
00081 #####
00082 #####
00083 #####
00084 #####
00085 #####
00086 #####
00087 #####
00088 #####
00089 #####
00090 #####
00091 #####
00092 #####
00093 #####
00094 #####
00095 #####
00096 #####
00097 #####
00098 #####
00099 #####
00100 #####
00101 #####
00102 #####
00103 #####
00104 #####
00105 #####
00106 #####
00107 #####
00108 #####
00109 #####
00110 #####
00111 #####
00112 #####
00113 #####
00114 #####
00115 #####
00116 #####
00117 #####
00118 #####
00119 #####
00120 #####
00121 #####
00122 #####
00123 #####
00124 #####
00125 #####
00126 #####
00127 #####
00128 #####
00129 #####
00130 #####
00131 #####
00132 #####
00133 #####
00134 #####
00135 #####
00136 #####
00137 #####
00138 #####
00139 #####
00140 #####
00141 #####
00142 #####
00143 #####
00144 #####
00145 #####
00146 #####
00147 #####
00148 #####
00149 #####
00150 #####
00151 #####
00152 #####
00153 #####
00154 #####
00155 #####
00156 #####
00157 #####
00158 #####
00159 #####
00160 #####
00161 #####
00162 #####
00163 #####
00164 #####
00165 #####
00166 #####
00167 #####
00168 #####
00169 #####
00170 #####
00171 #####
00172 #####
00173 #####
00174 #####
00175 #####
00176 #####
00177 #####
00178 #####
00179 #####
00180 #####
00181 #####
00182 #####
00183 #####
00184 #####
00185 #####
00186 #####
00187 #####
00188 #####
00189 #####
00190 #####
00191 #####
00192 #####
00193 #####
00194 #####
00195 #####
00196 #####
00197 #####
00198 #####
00199 #####
00200 #####
00201 #####
00202 #####
00203 #####
00204 #####
00205 #####
00206 #####
00207 #####
00208 #####
00209 #####
00210 #####
00211 #####
00212 #####
00213 #####
00214 #####
00215 #####
00216 #####
00217 #####
00218 #####
00219 #####
00220 #####
00221 #####
00222 #####
00223 #####
00224 #####
00225 #####
00226 #####
00227 #####
00228 #####
00229 #####
00230 #####
00231 #####
00232 #####
00233 #####
00234 #####
00235 #####
00236 #####
00237 #####
00238 #####
00239 #####
00240 #####
00241 #####
00242 #####
00243 #####
00244 #####
00245 #####
00246 #####
00247 #####
00248 #####
00249 #####
00250 #####
00251 #####
00252 #####
00253 #####
00254 #####
00255 #####
00256 #####
00257 #####
00258 #####
00259 #####
00260 #####
00261 #####
00262 #####
00263 #####
00264 #####
00265 #####
00266 #####
00267 #####
00268 #####
00269 #####
00270 #####
00271 #####
00272 #####
00273 #####
00274 #####
00275 #####
00276 #####
00277 #####
00278 #####
00279 #####
00280 #####
00281 #####
00282 #####
00283 #####
00284 #####
00285 #####
00286 #####
00287 #####
00288 #####
00289 #####
00290 #####
00291 #####
00292 #####
00293 #####
00294 #####
00295 #####
00296 #####
00297 #####
00298 #####
00299 #####
00300 #####
00301 #####
00302 #####
00303 #####
00304 #####
00305 #####
00306 #####
00307 #####
00308 #####
00309 #####
00310 #####
00311 #####
00312 #####
00313 #####
00314 #####
00315 #####
00316 #####
00317 #####
00318 #####
00319 #####
00320 #####
00321 #####
00322 #####
00323 #####
00324 #####
00325 #####
00326 #####
00327 #####
00328 #####
00329 #####
00330 #####
00331 #####
00332 #####
00333 #####
00334 #####
00335 #####
00336 #####
00337 #####
00338 #####
00339 #####
00340 #####
00341 #####
00342 #####
00343 #####
00344 #####
00345 #####
00346 #####
00347 #####
00348 #####
00349 #####
00350 #####
00351 #####
00352 #####
00353 #####
00354 #####
00355 #####
00356 #####
00357 #####
00358 #####
00359 #####
00360 #####
```

```
00361) # Total Flow at Node X (NodeX = W Pond-Out + W Pond-Of + W Und1 + E Und1 + E Und2)
00362) R0002-C00018-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00363) ADD HYD + 1.0 02W_Pond-Out 35.34 .102 No date 3:09 21.25 n/a .000
00364) + 1.0 02W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00365) + 1.0 02W_Und1 1.88 .008 No date 2:32 4.04 n/a .000
00366) + 1.0 02W_Und1 6.75 .021 No date 3:02 6.63 n/a .000
00367) + 1.0 02W_Und2 1.88 .008 No date 2:32 4.04 n/a .000
00368) SUM= 1.0 01W_Und2 44.85 .134 No date 3:06 17.53 n/a .000
00369) #####
00370) # Channel Routing from Node A to Node B
00371) #####
00372) # Faulkner Drain Cross Section 5280 from HEC-RAS model
00373) R0002-C0001-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00374) ROUTE CHANNEL -> 1.0 02W_Und2 44.85 .134 No date 3:06 17.53 n/a .000
00375) RDSF 1.001 out<= 1.0 01W_Pond-Of 44.85 .134 No date 3:09 17.53 n/a .000
00376) [L/S/ft= 120./ 380./030]
00377) (Wbas= 363.23mm= 323)
00378) #####
00379) # Node A (Sta. 5+229.82 from the December 2020 Amendment to the Engineer's Report
00380) # for the Faulkner Municipal Drain by Robinson Consultants Inc.)
00381) #####
00382) # Area W Und2 to Node A
00383) R0002-C00012-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00384) DESIGN NASHRO 1.0 01W_Und2 1.77 .009 No date 2:03 3.63 .114 .000
00385) [Cm= 59.0; B= 3.00; Tpe= 1.45]
00386) #####
00387) # Area W Und2 to Node A
00388) R0002-C00013-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00389) DESIGN NASHRO 1.0 01W_Und3 .14 .001 No date 1:39 3.62 .114 .000
00390) [Cm= 59.0; B= 3.00; Tpe= 1.45]
00391) #####
00392) # Area E Und2 to Node A
00393) R0002-C00014-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00394) DESIGN NASHRO 1.0 01W_Und3 .06 .000 No date 1:39 3.61 .113 .000
00395) [Cm= 59.0; B= 3.00; Tpe= 1.45]
00396) #####
00397) # Area W Und2 to Node A
00398) R0002-C00015-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00399) CALIS STANHYD 1.0 01W_UndF .63 .086 No date 1:00 21.25 .667 .000
00400) [XIMP= 62.1TIMP= 69]
00401) (Horton parameters: Fm= 76.20; Fc= 13.20; DCAV= 4.14; F= .00)
00402) [Previous area: IApex= 4.67; ISLPF= 2.00; LGS= 40.0MMF= 250; SCF= .0]
00403) [Impervious area: IAlmp= 1.57; SLIP= .50; LGS= 65.0MMF= 0.13; SCF= .0]
00404) #####
00405) # Total Flow at Node A (NodeA = W Pond-Out + W Pond-Of + W Und1 + E Und1 + W UndF)
00406) R0002-C0001-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00407) ADD HYD + 1.0 02W_Und2 1.77 .009 No date 2:03 3.63 n/a .000
00408) + 1.0 02W_Und3 .14 .001 No date 1:39 3.61 n/a .000
00409) + 1.0 02W_Und3 .06 .000 No date 1:39 3.61 n/a .000
00410) + 1.0 02W_UndF 6.75 .021 No date 3:02 6.63 n/a .000
00411) SUM= 1.0 01W_Und2 44.85 .134 No date 3:06 17.53 n/a .000
00412) [L/S/ft= 120./ 380./030]
00413) #####
00414) # Channel Routing from Node A to Node B
00415) #####
00416) # Faulkner Drain Cross Section 4840 from HEC-RAS model
00417) R0002-C00017-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00418) ROUTE CHANNEL -> 1.0 02W_Und2 47.45 .142 No date 3:00 17.00 n/a .000
00419) RDSF 1.001 out<= 1.0 01W_Pond-Of 47.45 .136 No date 3:21 17.00 n/a .000
00420) [L/S/ft= 120./ 380./030]
00421) (Wbas= 331.23mm= 273)
00422) #####
00423) # Node B - East SWM Pond Outlet (Sta. 4+633.10 from the December 2020 Amendment to the
00424) # Engineer's Report for the Faulkner Municipal Drain by Robinson Consultants Inc.)
00425) #####
00426) # Post-development drainage area to East SWM Pond
00427) R0002-C00018-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00428) CALIS STANHYD 1.0 01W_Pond 26.25 2.462 No date 1:04 20.72 .650 .000
00429) [XIMP= 62.1TIMP= 67]
00430) (Horton parameters: Fm= 76.20; Fc= 13.20; DCAV= 4.14; F= .00)
00431) [Previous area: IApex= 4.67; ISLPF= 2.00; LGS= 40.0MMF= 250; SCF= .0]
00432) [Impervious area: IAlmp= 1.57; SLIP= .50; LGS= 65.0MMF= 0.13; SCF= .0]
00433) #####
00434) # East SWM Pond Routing (Free Outfall Conditions)
00435) # Quality control and permanent pool requirements based on MCK guidelines
00436) # for enhanced quality control for wet ponds.
00437) #####
00438) R0002-C00019-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00439) ROUTE RESERVOIR -> 1.0 02W_Pond 26.25 2.462 No date 1:04 20.72 n/a .000
00440) overflow <= 1.0 02W_Pond-Of 26.25 2.462 No date 1:04 20.72 n/a .000
00441) overflow <= 1.0 03W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00442) (MstCoosed= 4.074E+01 m3, TotDrVVol= 0.000E+00 m3, N-Of= 0, TotDrVOf= 0.hrs)
00443) #####
00444) # East SWM Pond Routing (Restrictive Outfall Conditions)
00445) # 100-year Water Level of 101.0m at XS 4+633.10 according to the
00446) # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
00447) # Dated December 2020, Prepared by Robinson Consultants Inc.
00448) #####
00449) R0002-C00020-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00450) ROUTE RESERVOIR -> 1.0 02W_Pond 26.25 2.462 No date 1:04 20.72 n/a .000
00451) out <= 1.0 01W_Pond-Of 26.25 .015 No date 3:21 6.67 n/a .000
00452) overflow <= 1.0 03W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00453) (MstCoosed= 5.393E+00 m3, TotDrVVol= 0.000E+00 m3, N-Of= 0, TotDrVOf= 0.hrs)
00454) #####
00455) # Area E Und2 to Node B
00456) R0002-C00021-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00457) DESIGN NASHRO 1.0 01W_Und4 .43 .001 No date 3:01 3.63 .114 .000
00458) [Cm= 59.0; B= 3.00; Tpe= 1.45]
00459) #####
00460) # Area E Und2 to Node B
00461) R0002-C00022-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00462) DESIGN NASHRO 1.0 01W_Und5 .14 .002 No date 1:38 6.68 .157 .000
00463) [Cm= 71.0; B= 3.00; Tpe= .93]
00464) #####
00465) # Total Flow at Node B (NodeB = W Pond-Out + E Pond-Of + E Und1 + E Und2)
00466) R0002-C00023-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00467) ADD HYD + 1.0 02W_Pond-Out 26.25 .082 No date 3:07 20.72 n/a .000
00468) + 1.0 02W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00469) + 1.0 02W_Und3 .63 .003 No date 3:01 3.63 n/a .000
00470) + 1.0 02W_Und5 .44 .003 No date 2:16 5.64 n/a .000
00471) SUM= 1.0 01W_Und2 44.85 .134 No date 3:06 17.53 n/a .000
00472) [L/S/ft= 120./ 380./030]
00473) #####
00474) # STORMS
00475) #####
00476) ** END OF RUN : 4
00477) #####
00478) #####
00479) #####
00480) #####
00481) #####
00482) #####
00483) #####
00484) RUN# COMMANDS
00485) R0005-C00001-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00486) START (TZERO = .00 hrs on 0)
00487) (METCO= 2 (Imperial, 2-metric output))
00488) (NFORM= 1)
00489) (RNUM = 0001)
00490) #####
00491) # SWMHYMO Ver.5.00/Jan 2015 / INPUT DATA FILE
00492) #####
00493) # Project Name : [Calvin Stittville West properties]
00494) # Date : [2024/08/02]
00495) # Modeler : [J]
00496) # Company : J.F. Babourin and Associates
00497) # License # : 2549237
00498) #####
00499) # Project Number : [2287]
00500) #####
00501) R0005-C00002-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00502) READ STORM
00503) # File name = storm.001
00504) # Comment = callCAG STORM 5 Year, 3 Hours
00505) [SFP=1.00 STORM= 3.00/PROT= 42.51]
00506) #####
00507) # DEFAULT VALUES
00508) # File name = C:\Temp\SWMHYMO\Post-Dev\Ottawa.val
00509) # ICAESD = 1 (read and print data)
00510) # Flatfile File comment: Parameters for City of Ottawa Projects]
00511) # The FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARDY COM
00512) # Horton's infiltration equation parameters:
00513) [Fm= 76.20 mm/hr] [Fc=13.20 mm/hr] [DCAV= 4.14 /hr] [F= .00 mm]
00514) # Parameters for PERVIOUS surfaces in STANHYD:
00515) [IApex= 4.67 mm] [ISLPF= 2.00] [LGS= 40.0] [MMF= .250]
00516) # Parameters for IMPERVIOUS surfaces in STANHYD:
00517) [IAlmp= 1.57 mm] [SLIP= 1.50] [LGS= .013]
00518) # Parameters used in NASHRO:
00519) [Cm= 4.67 mm] [B= 3.00]
00520) # Average monthly Pan Evaporation data in (mm)
00521) JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
00522) .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
00523) # Average monthly Potential Evapotranspiration in (mm)
00524) JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
00525) .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
00526) #####
00527) # Post Development Conditions
00528) #####
00529) # Node X - West SWM Pond Outlet
00530) #####
00531) # Post-development drainage area to West SWM Pond
00532) R0005-C00004-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00533) CALIS STANHYD 1.0 01W_Pond 35.34 4.937 No date 1:04 30.36 .714 .000
00534) [XIMP= 64.1TIMP= 69]
00535) (Horton parameters: Fm= 76.20; Fc= 13.20; DCAV= 4.14; F= .00)
00536) [Previous area: IApex= 4.67; ISLPF= 2.00; LGS= 40.0MMF= 250; SCF= .0]
00537) [Impervious area: IAlmp= 1.57; SLIP= .50; LGS= 65.0MMF= 0.13; SCF= .0]
00538) #####
00539) # West SWM Pond Routing (Free Outfall Conditions)
00540) # Quality control and permanent pool requirements based on MCK guidelines
```

```
00541) # for enhanced quality control for wet ponds.
00542) #####
00543) R0005-C00005-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00544) ROUTE RESERVOIR -> 1.0 02W_Pond 35.34 4.937 No date 1:04 30.36 n/a .000
00545) overflow <= 1.0 03W_Pond-Of 35.34 .004 No date 3:10 30.36 n/a .000
00546) overflow <= 1.0 03W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00547) (MstCoosed= 1.043E+01 m3, TotDrVVol= 0.000E+00 m3, N-Of= 0, TotDrVOf= 0.hrs)
00548) #####
00549) # West SWM Pond Routing (Restrictive Outfall Conditions)
00550) # 100-year Water Level of 102.7m at XS 5+229.82 according to the
00551) # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
00552) # Dated December 2020, Prepared by Robinson Consultants Inc.
00553) # However, the existing Davidson SWM Facility assumes a 100-year Water
00554) # Level of 102.7m under restrictive downstream conditions and therefore,
00555) # the latter water level has conservatively been assumed for this study.
00556) #####
00557) R0005-C00006-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00558) ROUTE RESERVOIR -> 1.0 02W_Pond 35.34 4.937 No date 1:04 30.36 n/a .000
00559) out <= 1.0 01W_Pond-Of 35.34 .061 No date 3:14 7.63 n/a .000
00560) overflow <= 1.0 03W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00561) (MstCoosed= 1.043E+01 m3, TotDrVVol= 0.000E+00 m3, N-Of= 0, TotDrVOf= 0.hrs)
00562) #####
00563) # Area W Und1 to Node X
00564) R0005-C00007-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00565) DESIGN NASHRO 1.0 01W_Und1 1.48 .015 No date 2:29 7.40 .174 .000
00566) [Cm= 62.0; B= 3.00; Tpe= 1.11]
00567) #####
00568) # Area E Und1 to Node X
00569) R0005-C00008-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00570) DESIGN NASHRO 1.0 01W_Und1 1.75 .039 No date 2:59 6.68 .157 .000
00571) [Cm= 59.0; B= 3.00; Tpe= 1.46]
00572) #####
00573) # Area E Und2 to Node X
00574) R0005-C00009-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00575) DESIGN NASHRO 1.0 01W_Und1 .48 .006 No date 1:23 2.66 n/a .000
00576) [Cm= 59.0; B= 3.00; Tpe= 1.11]
00577) #####
00578) # Total Flow at Node X (NodeX = W Pond-Out + W Pond-Of + W Und1 + E Und1 + E Und2)
00579) R0005-C00010-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00580) ADD HYD + 1.0 02W_Pond-Out .00 .000 No date 0:00 .00 n/a .000
00581) + 1.0 02W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00582) + 1.0 02W_Und1 1.88 .008 No date 2:32 4.04 n/a .000
00583) + 1.0 02W_Und1 6.75 .039 No date 2:58 6.68 n/a .000
00584) + 1.0 02W_Und2 .88 .006 No date 2:29 6.68 n/a .000
00585) SUM= 1.0 01W_Und2 44.85 .134 No date 3:06 17.53 n/a .000
00586) #####
00587) # Channel Routing from Node X to Node A
00588) #####
00589) # Faulkner Drain Cross Section 5280 from HEC-RAS model
00590) R0005-C00011-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00591) ROUTE CHANNEL -> 1.0 02W_Und2 44.85 .212 No date 2:52 25.37 n/a .000
00592) [Wbas= 331.23mm= 273]
00593) [L/S/ft= 120./ 380./030]
00594) (Wbas= 425.23mm= 249)
00595) #####
00596) # Node A (Sta. 5+229.82 from the December 2020 Amendment to the Engineer's Report
00597) # for the Faulkner Municipal Drain by Robinson Consultants Inc.)
00598) #####
00599) # Area W Und2 to Node A
00600) R0005-C00012-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00601) DESIGN NASHRO 1.0 01W_Und2 1.77 .016 No date 2:01 6.68 .157 .000
00602) [Cm= 59.0; B= 3.00; Tpe= 1.47]
00603) #####
00604) # Area W Und3 to Node A
00605) R0005-C00013-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00606) DESIGN NASHRO 1.0 01W_Und3 .14 .002 No date 1:38 6.68 .157 .000
00607) [Cm= 59.0; B= 3.00; Tpe= 1.47]
00608) #####
00609) # Area E Und3 to Node A
00610) R0005-C00014-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00611) DESIGN NASHRO 1.0 01W_Und3 .06 .001 No date 1:38 6.66 .157 .000
00612) [Cm= 59.0; B= 3.00; Tpe= 1.47]
00613) #####
00614) # Area W UndF to Node A
00615) R0005-C00015-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00616) CALIS STANHYD 1.0 01W_UndF .63 .127 No date 1:00 30.36 .714 .000
00617) [XIMP= 64.1TIMP= 69]
00618) (Horton parameters: Fm= 76.20; Fc= 13.20; DCAV= 4.14; F= .00)
00619) [Previous area: IApex= 4.67; ISLPF= 2.00; LGS= 40.0MMF= 250; SCF= .0]
00620) [Impervious area: IAlmp= 1.57; SLIP= .50; LGS= 65.0MMF= 0.13; SCF= .0]
00621) #####
00622) # Total Flow at Node X (NodeX = W Pond-Out + W Pond-Of + W Und1 + E Und1 + E Und2)
00623) R0005-C00016-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00624) ADD HYD + 1.0 02W_Pond-Out 44.85 .212 No date 2:55 25.37 n/a .000
00625) + 1.0 02W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00626) + 1.0 02W_Und3 .14 .002 No date 1:38 6.68 n/a .000
00627) + 1.0 02W_Und3 .06 .001 No date 1:38 6.66 n/a .000
00628) + 1.0 02W_UndF .63 .127 No date 1:00 30.36 n/a .000
00629) SUM= 1.0 01W_Und2 44.85 .228 No date 2:41 24.66 n/a .000
00630) #####
00631) # Channel Routing from Node A to Node B
00632) #####
00633) # Faulkner Drain Cross Section 4840 from HEC-RAS model
00634) R0005-C00017-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00635) ROUTE CHANNEL -> 1.0 02W_Und2 47.45 .228 No date 2:41 24.66 n/a .000
00636) [L/S/ft= 120./ 380./030]
00637) (Wbas= 363.23mm= 323)
00638) #####
00639) # Node B - East SWM Pond Outlet (Sta. 4+633.10 from the December 2020 Amendment to the
00640) # Engineer's Report for the Faulkner Municipal Drain by Robinson Consultants Inc.)
00641) #####
00642) # Post-development drainage area to East SWM Pond
00643) R0005-C00018-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00644) CALIS STANHYD 1.0 01W_Pond 26.25 3.734 No date 1:04 29.73 .699 .000
00645) [XIMP= 62.1TIMP= 67]
00646) (Horton parameters: Fm= 76.20; Fc= 13.20; DCAV= 4.14; F= .00)
00647) [Previous area: IApex= 4.67; ISLPF= 2.00; LGS= 40.0MMF= 250; SCF= .0]
00648) [Impervious area: IAlmp= 1.57; SLIP= .50; LGS= 65.0MMF= 0.13; SCF= .0]
00649) #####
00650) # East SWM Pond Routing (Free Outfall Conditions)
00651) # Quality control and permanent pool requirements based on MCK guidelines
00652) # for enhanced quality control for wet ponds.
00653) #####
00654) R0005-C00019-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00655) ROUTE RESERVOIR -> 1.0 02W_Pond 26.25 3.734 No date 1:04 29.73 n/a .000
00656) overflow <= 1.0 02W_Pond-Of 26.25 3.734 No date 1:04 29.73 n/a .000
00657) overflow <= 1.0 03W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00658) (MstCoosed= 4.743E+00 m3, TotDrVVol= 0.000E+00 m3, N-Of= 0, TotDrVOf= 0.hrs)
00659) #####
00660) # East SWM Pond Routing (Restrictive Outfall Conditions)
00661) # 100-year Water Level of 101.0m at XS 4+633.10 according to the
00662) # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
00663) # Dated December 2020, Prepared by Robinson Consultants Inc.
00664) #####
00665) R0005-C00020-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00666) ROUTE RESERVOIR -> 1.0 02W_Pond 26.25 3.734 No date 1:04 29.73 n/a .000
00667) out <= 1.0 01W_Pond-Of 26.25 .142 No date 3:00 11.68 n/a .000
00668) overflow <= 1.0 03W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00669) (MstCoosed= 7.043E+00 m3, TotDrVVol= 0.000E+00 m3, N-Of= 0, TotDrVOf= 0.hrs)
00670) #####
00671) # Area E Und4 to Node B
00672) R0005-C00021-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00673) DESIGN NASHRO 1.0 01W_Und4 .43 .003 No date 2:57 6.68 .157 .000
00674) [Cm= 59.0; B= 3.00; Tpe= 1.45]
00675) #####
00676) # Area E Und5 to Node B
00677) R0005-C00022-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00678) DESIGN NASHRO 1.0 01W_Und5 .44 .005 No date 2:13 10.11 .238 .000
00679) [Cm= 71.0; B= 3.00; Tpe= .93]
00680) #####
00681) # Total Flow at Node B (NodeB = W Pond-Out + E Pond-Of + E Und1 + E Und2 + E UndF)
00682) R0005-C00023-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00683) ADD HYD + 1.0 02W_Pond-Out 47.45 .222 No date 3:01 24.66 n/a .000
00684) + 1.0 02W_Pond-Of .00 .000 No date 0:00 .00 n/a .000
00685) + 1.0 02W_Und4 .43 .003 No date 2:57 6.68 n/a .000
00686) + 1.0 02W_Und5 .44 .005 No date 2:13 10.11 n/a .000
00687) SUM= 1.0 01W_Und2 44.85 .228 No date 2:55 25.37 n/a .000
00688) #####
00689) # STORMS
00690) #####
00691) #####
00692) #####
00693) ** END OF RUN : 9
00694) #####
00695) #####
00696) #####
00697) #####
00698) #####
00699) #####
00700) #####
00701) RUN# COMMANDS
00702) R0005-C00001-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00703) START (TZERO = .00 hrs on 0)
00704) (METCO= 2 (Imperial, 2-metric output))
00705) (NFORM= 1)
00706) (RNUM = 0001)
00707) #####
00708) # SWMHYMO Ver.5.00/Jan 2015 / INPUT DATA FILE
00709) #####
00710) # Project Name : [Calvin Stittville West properties]
00711) # Date : [2024/08/02]
00712) # Modeler : [J.F. Babourin and Associates]
00713) # License # : 2549237
00714) # Project Number : [2287]
00715) # Company : J.F. Babourin and Associates
00716) # License # : 2549237
00717) #####
00718) R0005-C00002-----Dtlm=ID-INHYD-----AREAh-QFEARms-TpeakDate_hh:mm-----Rvm-R-C-----DNFms
00719) READ STORM
00720) # File name = storm.001
```

Page 2

```
01081 [Horton parameters: Fw=76.20;Fw=13.20;DCAY=4.14; Fw=.00]
01082 [Previous area: IApex=4.67;ISLP=2.00;ISLP=40.0;MNP=250;SCF=.0]
01083 [Impervious area: IApex=1.57;ISLP=50.0;ISLP=418.0;MNP=0.0;ISLP=.0]
01084 #####
01085 # East SWM Pond Routing (Free Outfall Conditions)
01086 # Quality control and permanent pool requirements based on MOE guidelines
01087 # for enhanced quality control for wet ponds.
01088 #####
01089 ROUTE RESERVOIR -> -----DtnID=IDHYND-----AREAA=GFARCS=PeakDate_hh:mm-----RvM=R.C-----DWfms
01090 out <= 1.0 01E-Pond-Out 26.25 .592 No date 1.03 43.76 n/a .000
01091 over <= 1.0 01E-Pond-Out 26.25 .395 No date 2.04 43.76 n/a .000
01092 over <= 1.0 01E-Pond-Out 26.25 .000 No date 0.00 .00 n/a .000
01093 [MetSto=1936E+00 m3, TotDvVol=0.000E+00 m3, N-Over= 0, TotDvOvr= 0.hrs]
01094 #####
01095 # East SWM Pond Routing (Restrictive Outfall Conditions)
01096 # 100-year Water Level of 101.05m at XS #4633.10 according to the
01097 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
01098 # Dated December 2020, Prepared by Robinson Consultants Inc.
01099 #####
01100 ROUTE RESERVOIR -> -----DtnID=IDHYND-----AREAA=GFARCS=PeakDate_hh:mm-----RvM=R.C-----DWfms
01101 out <= 1.0 01E-Pond 26.25 .592 No date 1.03 43.76 n/a .000
01102 over <= 1.0 01E-Pond-Out 26.25 .000 No date 2.06 25.62 n/a .000
01103 over <= 1.0 03E-Pond-Rovt 0.00 .000 No date 0.00 .00 n/a .000
01104 [MetSto=1936E+00 m3, TotDvVol=0.000E+00 m3, N-Over= 0, TotDvOvr= 0.hrs]
01105 #####
01106 # Area E Und4 to Node B
01107 ROUTE CHANNEL -> -----DtnID=IDHYND-----AREAA=GFARCS=PeakDate_hh:mm-----RvM=R.C-----DWfms
01108 [RDT=1.00] out<= 1.0 01E-Und4 .43 .005 No date 2.154 12.47 .214 .000
01109 [L/S= 120 / 389 / 0.30]
01110 #####
01111 # Area E Und5 to Node B
01112 ROUTE CHANNEL -> -----DtnID=IDHYND-----AREAA=GFARCS=PeakDate_hh:mm-----RvM=R.C-----DWfms
01113 [RDT=1.00] out<= 1.0 01E-Und5 .44 .010 No date 2.111 18.23 .313 .000
01114 [L/S= 71.0 / 300 / .76]
01115 #####
01116 # Total Flow at Node B (NodeB = F_Pond-Out + F_Pond-Ovr + E_Und4 + E_Und5)
01117 ADD HYD + 1.0 02E-Node-B 47.45 .344 No date 3.01 36.81 n/a .000
01118 + 1.0 02E-Pond-Out 26.25 .395 No date 2.04 43.76 n/a .000
01119 + 1.0 02E-Pond-Out 26.25 .000 No date 0.00 .00 n/a .000
01120 + 1.0 02E-Und4 .43 .005 No date 2.154 12.47 n/a .000
01121 + 1.0 02E-Und5 .44 .010 No date 2.111 18.23 n/a .000
01122 SUM= 1.0 01E-NodeB 74.57 .728 No date 2.138 39.00 n/a .000
01123 #####
01124 #####
01125 ** END OF RUN : 49
01126 #####
01127 #####
01128 #####
01129 #####
01130 #####
01131 #####
01132 #####
01133 #####
01134 #####
01135 #####
01136 #####
01137 #####
01138 #####
01139 #####
01140 #####
01141 #####
01142 #####
01143 #####
01144 #####
01145 #####
01146 #####
01147 #####
01148 #####
01149 #####
01150 #####
01151 #####
01152 #####
01153 #####
01154 #####
01155 #####
01156 #####
01157 #####
01158 #####
01159 #####
01160 #####
01161 #####
01162 #####
01163 #####
01164 #####
01165 #####
01166 #####
01167 #####
01168 #####
01169 #####
01170 #####
01171 #####
01172 #####
01173 #####
01174 #####
01175 #####
01176 #####
01177 #####
01178 #####
01179 #####
01180 #####
01181 #####
01182 #####
01183 #####
01184 #####
01185 #####
01186 #####
01187 #####
01188 #####
01189 #####
01190 #####
01191 #####
01192 #####
01193 #####
01194 #####
01195 #####
01196 #####
01197 #####
01198 #####
01199 #####
01200 #####
01201 #####
01202 #####
01203 #####
01204 #####
01205 #####
01206 #####
01207 #####
01208 #####
01209 #####
01210 #####
01211 #####
01212 #####
01213 #####
01214 #####
01215 #####
01216 #####
01217 #####
01218 #####
01219 #####
01220 #####
01221 #####
01222 #####
01223 #####
01224 #####
01225 #####
01226 #####
01227 #####
01228 #####
01229 #####
01230 #####
01231 #####
01232 #####
01233 #####
01234 #####
01235 #####
01236 #####
01237 #####
01238 #####
01239 #####
01240 #####
01241 #####
01242 #####
01243 #####
01244 #####
01245 #####
01246 #####
01247 #####
01248 #####
01249 #####
01250 #####
01251 #####
01252 #####
01253 #####
01254 #####
01255 #####
01256 #####
01257 #####
01258 #####
01259 #####
01260 #####
```

Page 4

```
01801# # License # : 2549237
01802# *****
01803# R0105:CO000-----
01804# READ STORM
01805# Filename = storm.001
01806# Comment = 5 years SCS Type 2 Storm 24 Hours step 10 min, City of Ottawa
01807# (SOT=10.00;SDOM= 24.00;PTOT= 64.11)
01808# R0105:CO003-----
01809# DEFAULT VALUES
01810# Filename = C:\Temp\SWMHYMO\Post-Dev\Ottawa.val
01811# ICASEV# = 1 (read and print data)
01812# FileTitle= File comment: (Parameters for City of Ottawa Projects)
01813# *****
01814# THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDYD COM
01815# Horton's infiltration equation parameters:
01816# [Fw 76.20 mm/hr] [Fw1:20 mm/hr] [ICAWY 4.14 /hr] [Fw .00 mm]
01817# Parameters for Pervious surfaces in STANDYD:
01818# [Iapex= 4.67 mm] [LDP=40.00 m] [MHW =250]
01819# Parameters for IMPERVIOUS surfaces in STANDYD:
01820# [Ialmp= 1.57 mm] [CLIR=1.50] [MNI= .013]
01821# Parameters used in NASHYD:
01822# [Ia= 4.67 mm] [N= 3.00]
01823# Average monthly Pan Evaporation data in (mm)
01824# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01825# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01826# Average monthly Potential Evaporation in (mm)
01827# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01828# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01829# # Post Development Conditions
01830# *****
01831# # Node X - West SWM Pond Outlet
01832# *****
01833# # Post-development drainage area to West SWM Pond
01834# R0105:CO0004-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01835# CALIS STANDYD 1.0 0.01W Und4 35.34 4.489 No date 12:04 45.95 717 .000
01836# [XIMP= 64.71MP= 69]
01837# [Horton parameters: Fw 76.20;Fw= 13.20;ICAWY=14; Fw .00]
01838# [Previous area: Iapex= 4.67;SLPF=2.00;LGP= 40.0;MHW=250;SCF= .0]
01839# [Impervious area: Ialmp= 1.57;SLPF= .50;LGP= 485.0;MNI=.013;SCF= .0]
01840# *****
01841# # West SWM Pond Routing (Free outfall Conditions)
01842# *****
01843# # Quality control and permanent pool requirements based on MCE guidelines
01844# # for enhanced quality control for wet ponds.
01845# *****
01846# R0105:CO0005-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01847# ROUTE RESERVOIR -> 1.0 0.02W Pond 35.34 4.489 No date 12:04 45.95 n/a .000
01848# out <= 1.0 0.01W Pond-Out 26.25 .308 No date 12:55 44.98 n/a .000
01849# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
01850# [MdtotSeed= 1.84E+01 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
01851# *****
01852# # 100-year Water Level of 102.7m at XS 5+229.82 according to the
01853# # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
01854# # dated December 2020, Prepared by Robinson Consultants Inc.,
01855# # However, the existing Davidson SWM Facility assumes a 100-year Water
01856# # level of 102.7m under restrictive downstream conditions and therefore,
01857# # the latter water level has conservatively been assumed for this study.
01858# *****
01859# # Area E Und3 to Node X
01860# *****
01861# R0105:CO0006-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01862# ROUTE RESERVOIR -> 1.0 0.01W Und4 35.34 4.489 No date 12:04 45.95 n/a .000
01863# out <= 1.0 0.01W Pond-Out 35.34 .114 No date 16:05 23.31 n/a .000
01864# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
01865# [MdtotSeed= 1.29E+01 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
01866# *****
01867# # Area W Und3 to Node X
01868# *****
01869# R0105:CO0007-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01870# DESIGN NASHYD 1.0 0.01W Und4 1.88 .022 No date 13:10 16.42 .256 .000
01871# [CN= 62.0; N= 3.00; Typ= 1.1]
01872# *****
01873# # Area E Und3 to Node X
01874# *****
01875# R0105:CO0008-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01876# DESIGN NASHYD 1.0 0.01W Und4 6.75 .058 No date 13:36 14.97 .234 .000
01877# [CN= 59.0; N= 3.00; Typ= 1.46]
01878# *****
01879# # Area E Und3 to Node X
01880# *****
01881# R0105:CO0009-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01882# DESIGN NASHYD 1.0 0.01W Und4 1.88 .022 No date 13:10 16.42 .256 .000
01883# [CN= 59.0; N= 3.00; Typ= 1.1]
01884# *****
01885# # Total Flow from Node X Under Node X
01886# *****
01887# R0105:CO0010-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01888# ADD HYD 1.0 0.01W Und4 35.34 4.489 No date 12:04 45.95 n/a .000
01889# out <= 1.0 0.02W Pond-Out 35.34 .114 No date 16:05 23.31 n/a .000
01890# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
01891# [MdtotSeed= 1.29E+01 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
01892# *****
01893# # Channel Routing from Node X to Node A
01894# *****
01895# R0105:CO0011-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01896# ROUTE CHANNEL -> 1.0 0.01W Und4 44.85 .264 No date 13:28 39.44 n/a .000
01897# [RDT= 1.00] out<= 1.0 0.01W Und4-r 44.85 .264 No date 13:30 39.44 n/a .000
01898# [L/S= 122.7 / 380.0]
01899# [Vmax= 489;Dmax= .296]
01900# *****
01901# # Node A (Sta. 5+229.82 from the December 2020 Amendment to the Engineer's Report
01902# # for the Faulkner Municipal Drain by Robinson Consultants Inc.)
01903# *****
01904# R0105:CO0012-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01905# AREA W Und3 to Node A 1.0 0.01W Und4 1.77 .025 No date 12:45 14.97 .234 .000
01906# *****
01907# # Area W Und3 to Node A
01908# *****
01909# R0105:CO0013-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01910# AREA W Und3 to Node A 1.0 0.01W Und4 1.4 .003 No date 12:25 14.96 .233 .000
01911# [CN= 59.0; N= 3.00; Typ= .48]
01912# *****
01913# # Area E Und3 to Node A
01914# *****
01915# R0105:CO0014-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01916# DESIGN NASHYD 1.0 0.01W Und4 .06 .001 No date 12:25 14.95 .233 .000
01917# [CN= 59.0; N= 3.00; Typ= .48]
01918# *****
01919# # Area W Und3 to Node A
01920# *****
01921# R0105:CO0015-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01922# CALIS STANDYD 1.0 0.01W Und4 .63 .108 No date 12:00 45.95 .717 .000
01923# [XIMP= 64.71MP= 69]
01924# [Horton parameters: Fw 76.20;Fw= 13.20;ICAWY=14; Fw .00]
01925# [Previous area: Iapex= 4.67;SLPF=2.00;LGP= 40.0;MHW=250;SCF= .0]
01926# [Impervious area: Ialmp= 1.57;SLPF= .50;LGP= 485.0;MNI=.013;SCF= .0]
01927# *****
01928# # Post-development drainage area to East SWM Pond
01929# *****
01930# R0105:CO0016-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01931# ROUTE RESERVOIR -> 1.0 0.02W Pond 26.25 3.407 No date 12:03 44.98 n/a .000
01932# out <= 1.0 0.01W Pond-Out 26.25 .308 No date 12:55 44.98 n/a .000
01933# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
01934# [MdtotSeed= 8.04E+00 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
01935# *****
01936# # East SWM Pond Routing (Free outfall Conditions)
01937# *****
01938# # Quality control and permanent pool requirements based on MCE guidelines
01939# # for enhanced quality control for wet ponds.
01940# *****
01941# R0105:CO0017-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01942# ROUTE RESERVOIR -> 1.0 0.02W Pond 26.25 3.407 No date 12:03 44.98 n/a .000
01943# out <= 1.0 0.01W Pond-Out 26.25 .308 No date 12:55 44.98 n/a .000
01944# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
01945# [MdtotSeed= 8.04E+00 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
01946# *****
01947# # 100-year Water Level of 101.9m at XS 4+633.10 according to the
01948# # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
01949# # dated December 2020, Prepared by Robinson Consultants Inc.,
01950# # However, the existing Davidson SWM Facility assumes a 100-year Water
01951# # level of 102.7m under restrictive downstream conditions and therefore,
01952# # the latter water level has conservatively been assumed for this study.
01953# *****
01954# # Area E Und3 to Node B
01955# *****
01956# R0105:CO0018-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01957# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
01958# [CN= 59.0; N= 3.00; Typ= 1.46]
01959# *****
01960# # Area E Und3 to Node B
01961# *****
01962# R0105:CO0019-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01963# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
01964# [CN= 59.0; N= 3.00; Typ= 1.46]
01965# *****
01966# # Area E Und3 to Node B
01967# *****
01968# R0105:CO0020-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01969# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
01970# [CN= 59.0; N= 3.00; Typ= 1.46]
01971# *****
01972# # Area E Und3 to Node B
01973# *****
01974# R0105:CO0021-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01975# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
01976# [CN= 59.0; N= 3.00; Typ= 1.46]
01977# *****
01978# # Area E Und3 to Node B
01979# *****
01980# R0105:CO0022-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01981# DESIGN NASHYD 1.0 0.01W Und4 .44 .008 No date 12:56 21.64 .338 .000
01982# [CN= 71.0; N= 3.00; Typ= 1.07]
01983# *****
01984# # Total Flow at Node B (NodeA = NodeA-r + E_Pond-Out + E_Pond-Ofv + E_Und3 + E_Und4)
01985# *****
01986# R0105:CO0023-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01987# ADD HYD 1.0 0.02W Pond-Out 47.45 .280 No date 13:41 38.51 n/a .000
01988# out <= 1.0 0.02W Pond-Out 26.25 .308 No date 12:55 44.98 n/a .000
01989# overflow <= 1.0 0.02W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
01990# [MdtotSeed= 1.02E+01 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
01991# *****
01992# # Channel Routing from Node B to Node B
01993# *****
01994# R0105:CO0024-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
01995# ROUTE CHANNEL -> 1.0 0.02W Und4 44.85 .322 No date 13:20 46.95 n/a .000
01996# [L/S= 122.7 / 380.0]
01997# [Vmax= 489;Dmax= .296]
01998# *****
01999# # Node A (Sta. 5+229.82 from the December 2020 Amendment to the Engineer's Report
02000# # for the Faulkner Municipal Drain by Robinson Consultants Inc.)
02001# *****
02002# R0105:CO0025-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02003# AREA W Und3 to Node A 1.0 0.01W Und4 1.88 .022 No date 13:10 16.42 .256 .000
02004# [CN= 62.0; N= 3.00; Typ= 1.1]
02005# *****
02006# # Area E Und3 to Node X
02007# *****
02008# R0105:CO0026-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02009# DESIGN NASHYD 1.0 0.01W Und4 6.75 .058 No date 13:36 14.97 .234 .000
02010# [CN= 59.0; N= 3.00; Typ= 1.46]
02011# *****
02012# # Area E Und3 to Node X
02013# *****
02014# R0105:CO0027-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02015# DESIGN NASHYD 1.0 0.01W Und4 1.88 .022 No date 13:10 16.42 .256 .000
02016# [CN= 59.0; N= 3.00; Typ= 1.1]
02017# *****
02018# # Total Flow from Node X Under Node X
02019# *****
02020# R0105:CO0028-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02021# ADD HYD 1.0 0.01W Und4 35.34 4.489 No date 12:04 45.95 n/a .000
02022# out <= 1.0 0.02W Pond-Out 35.34 .114 No date 16:05 23.31 n/a .000
02023# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
02024# [MdtotSeed= 1.29E+01 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
02025# *****
02026# # Channel Routing from Node X to Node A
02027# *****
02028# R0105:CO0029-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02029# ROUTE CHANNEL -> 1.0 0.01W Und4 44.85 .264 No date 13:28 39.44 n/a .000
02030# [RDT= 1.00] out<= 1.0 0.01W Und4-r 44.85 .264 No date 13:30 39.44 n/a .000
02031# [L/S= 122.7 / 380.0]
02032# [Vmax= 489;Dmax= .296]
02033# *****
02034# # Node A (Sta. 5+229.82 from the December 2020 Amendment to the Engineer's Report
02035# # for the Faulkner Municipal Drain by Robinson Consultants Inc.)
02036# *****
02037# R0105:CO0030-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02038# AREA W Und3 to Node A 1.0 0.01W Und4 1.77 .025 No date 12:45 14.97 .234 .000
02039# *****
02040# # Area W Und3 to Node A
02041# *****
02042# R0105:CO0031-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02043# AREA W Und3 to Node A 1.0 0.01W Und4 1.4 .003 No date 12:25 14.96 .233 .000
02044# [CN= 59.0; N= 3.00; Typ= .48]
02045# *****
02046# # Area E Und3 to Node A
02047# *****
02048# R0105:CO0032-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02049# DESIGN NASHYD 1.0 0.01W Und4 .06 .001 No date 12:25 14.95 .233 .000
02050# [CN= 59.0; N= 3.00; Typ= .48]
02051# *****
02052# # Area W Und3 to Node A
02053# *****
02054# R0105:CO0033-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02055# CALIS STANDYD 1.0 0.01W Und4 .63 .108 No date 12:00 45.95 .717 .000
02056# [XIMP= 64.71MP= 69]
02057# [Horton parameters: Fw 76.20;Fw= 13.20;ICAWY=14; Fw .00]
02058# [Previous area: Iapex= 4.67;SLPF=2.00;LGP= 40.0;MHW=250;SCF= .0]
02059# [Impervious area: Ialmp= 1.57;SLPF= .50;LGP= 485.0;MNI=.013;SCF= .0]
02060# *****
02061# # Post-development drainage area to East SWM Pond
02062# *****
02063# R0105:CO0034-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02064# ROUTE RESERVOIR -> 1.0 0.02W Pond 26.25 3.407 No date 12:03 44.98 n/a .000
02065# out <= 1.0 0.01W Pond-Out 26.25 .308 No date 12:55 44.98 n/a .000
02066# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
02067# [MdtotSeed= 8.04E+00 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
02068# *****
02069# # East SWM Pond Routing (Free outfall Conditions)
02070# *****
02071# # Quality control and permanent pool requirements based on MCE guidelines
02072# # for enhanced quality control for wet ponds.
02073# *****
02074# R0105:CO0035-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02075# ROUTE RESERVOIR -> 1.0 0.02W Pond 26.25 3.407 No date 12:03 44.98 n/a .000
02076# out <= 1.0 0.01W Pond-Out 26.25 .308 No date 12:55 44.98 n/a .000
02077# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
02078# [MdtotSeed= 8.04E+00 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
02079# *****
02080# # 100-year Water Level of 102.7m at XS 5+229.82 according to the
02081# # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
02082# # dated December 2020, Prepared by Robinson Consultants Inc.,
02083# # However, the existing Davidson SWM Facility assumes a 100-year Water
02084# # level of 102.7m under restrictive downstream conditions and therefore,
02085# # the latter water level has conservatively been assumed for this study.
02086# *****
02087# # Area E Und3 to Node X
02088# *****
02089# R0105:CO0036-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02090# DESIGN NASHYD 1.0 0.01W Und4 6.75 .058 No date 13:36 14.97 .234 .000
02091# [CN= 59.0; N= 3.00; Typ= 1.46]
02092# *****
02093# # Area E Und3 to Node X
02094# *****
02095# R0105:CO0037-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02096# DESIGN NASHYD 1.0 0.01W Und4 1.88 .022 No date 13:10 16.42 .256 .000
02097# [CN= 59.0; N= 3.00; Typ= 1.1]
02098# *****
02099# # Total Flow from Node X Under Node X
02100# *****
02101# R0105:CO0038-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02102# ADD HYD 1.0 0.02W Pond-Out 35.34 .114 No date 16:05 23.31 n/a .000
02103# out <= 1.0 0.02W Pond-Out 35.34 .114 No date 16:05 23.31 n/a .000
02104# overflow <= 1.0 0.02W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
02105# [MdtotSeed= 1.29E+01 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
02106# *****
02107# # Channel Routing from Node X to Node A
02108# *****
02109# R0105:CO0039-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02110# ROUTE CHANNEL -> 1.0 0.02W Und4 44.85 .264 No date 13:28 39.44 n/a .000
02111# [RDT= 1.00] out<= 1.0 0.02W Und4-r 44.85 .264 No date 13:30 39.44 n/a .000
02112# [L/S= 122.7 / 380.0]
02113# [Vmax= 489;Dmax= .296]
02114# *****
02115# # Node A (Sta. 5+229.82 from the December 2020 Amendment to the Engineer's Report
02116# # for the Faulkner Municipal Drain by Robinson Consultants Inc.)
02117# *****
02118# R0105:CO0040-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02119# AREA W Und3 to Node A 1.0 0.01W Und4 1.77 .025 No date 12:45 14.97 .234 .000
02120# *****
02121# # Area W Und3 to Node A
02122# *****
02123# R0105:CO0041-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02124# AREA W Und3 to Node A 1.0 0.01W Und4 1.4 .003 No date 12:25 14.96 .233 .000
02125# [CN= 59.0; N= 3.00; Typ= .48]
02126# *****
02127# # Area E Und3 to Node A
02128# *****
02129# R0105:CO0042-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02130# DESIGN NASHYD 1.0 0.01W Und4 .06 .001 No date 12:25 14.95 .233 .000
02131# [CN= 59.0; N= 3.00; Typ= .48]
02132# *****
02133# # Area W Und3 to Node A
02134# *****
02135# R0105:CO0043-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02136# CALIS STANDYD 1.0 0.01W Und4 .63 .108 No date 12:00 45.95 .717 .000
02137# [XIMP= 64.71MP= 69]
02138# [Horton parameters: Fw 76.20;Fw= 13.20;ICAWY=14; Fw .00]
02139# [Previous area: Iapex= 4.67;SLPF=2.00;LGP= 40.0;MHW=250;SCF= .0]
02140# [Impervious area: Ialmp= 1.57;SLPF= .50;LGP= 485.0;MNI=.013;SCF= .0]
02141# *****
02142# # Post-development drainage area to East SWM Pond
02143# *****
02144# R0105:CO0044-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02145# ROUTE RESERVOIR -> 1.0 0.02W Pond 26.25 3.407 No date 12:03 44.98 n/a .000
02146# out <= 1.0 0.01W Pond-Out 26.25 .308 No date 12:55 44.98 n/a .000
02147# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
02148# [MdtotSeed= 8.04E+00 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
02149# *****
02150# # East SWM Pond Routing (Free outfall Conditions)
02151# *****
02152# # Quality control and permanent pool requirements based on MCE guidelines
02153# # for enhanced quality control for wet ponds.
02154# *****
02155# R0105:CO0045-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02156# ROUTE RESERVOIR -> 1.0 0.02W Pond 26.25 3.407 No date 12:03 44.98 n/a .000
02157# out <= 1.0 0.01W Pond-Out 26.25 .308 No date 12:55 44.98 n/a .000
02158# overflow <= 1.0 0.01W Pond-Ofv .00 .000 No date 0:00 .00 n/a .000
02159# [MdtotSeed= 8.04E+00 m3, TotDrVVol= 0.000E+00 m3, N-Ofv= 0, TotDrVOfv= 0.hrs]
02160# *****
02161# # 100-year Water Level of 101.9m at XS 4+633.10 according to the
02162# # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
02163# # dated December 2020, Prepared by Robinson Consultants Inc.,
02164# # However, the existing Davidson SWM Facility assumes a 100-year Water
02165# # level of 102.7m under restrictive downstream conditions and therefore,
02166# # the latter water level has conservatively been assumed for this study.
02167# *****
02168# # Area E Und3 to Node B
02169# *****
02170# R0105:CO0046-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02171# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
02172# [CN= 59.0; N= 3.00; Typ= 1.46]
02173# *****
02174# # Area E Und3 to Node B
02175# *****
02176# R0105:CO0047-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02177# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
02178# [CN= 59.0; N= 3.00; Typ= 1.46]
02179# *****
02180# # Area E Und3 to Node B
02181# *****
02182# R0105:CO0048-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02183# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
02184# [CN= 59.0; N= 3.00; Typ= 1.46]
02185# *****
02186# # Area E Und3 to Node B
02187# *****
02188# R0105:CO0049-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02189# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
02190# [CN= 59.0; N= 3.00; Typ= 1.46]
02191# *****
02192# # Area E Und3 to Node B
02193# *****
02194# R0105:CO0050-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02195# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
02196# [CN= 59.0; N= 3.00; Typ= 1.46]
02197# *****
02198# # Area E Und3 to Node B
02199# *****
02200# R0105:CO0051-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02201# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
02202# [CN= 59.0; N= 3.00; Typ= 1.46]
02203# *****
02204# # Area E Und3 to Node B
02205# *****
02206# R0105:CO0052-----DtnIn-ID:INHYD-----AREAAh-QFEARCS-TpeakDate_hh:mm-----Rvmm-R.C-----DWfms
02207# DESIGN NASHYD 1.0 0.01W Und4 .43 .004 No date 13:35 14.97 .233 .000
02208# [CN= 59.0; N= 3.00; Typ= 1.46]

```

```
02161) #####
02162) # Post-development drainage area to East SMM Pond
02163) ROUTE RESERVOIR -> 1.0 01E Pond 26.25 4.156 No date 12:03 53.12 .714 .000
02164) CALIB STANDVND [XMPF=64;TIME=69]
02165) [Horton parameters: Fw=76.20;Fw=13.20;DCAV=4.14; P= .00]
02166) [Previous area: IApex=4.67;ISLIPF=50.10;LGP= 40.0MHP=250;ISCP= .0]
02167) [Impervious area: IAlpex=1.57;ISLIPF=50.10;LGP= 485.0MHP=0.13;ISCP= .0]
02168) #####
02169) # East SMM Pond Routing (Free Outfall Conditions)
02170) # Quality control and permanent pool requirements based on MOE guidelines
02171) # for enhanced quality control wet ponds.
02172) #####
02173) ROUTE RESERVOIR -> 1.0 01E Pond-Out 26.25 .398 No date 12:49 53.12 n/a .000
02174) overflow <= 1.0 01E Pond-Out 26.25 .398 No date 12:49 53.12 n/a .000
02175) (Mottosed=9413E+00 m3, TotDrVVol=0.000E+00 m3, N-DrV= 0, TotDrVDrV= 0.hrs)
02176) #####
02177) # 100-year Water Level of 101.05m at XS +4633.10 according to the
02178) # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
02179) # Dated December 2020, Prepared by Robinson Consultants Inc.
02180) #####
02181) ROUTE RESERVOIR -> 1.0 01E Pond-Out 26.25 4.156 No date 12:03 53.12 n/a .000
02182) overflow <= 1.0 01E Pond-Out 26.25 .398 No date 12:49 53.12 n/a .000
02183) (Mottosed=9413E+00 m3, TotDrVVol=0.000E+00 m3, N-DrV= 0, TotDrVDrV= 0.hrs)
02184) #####
02185) # East SMM Pond Routing (Free Outfall Conditions)
02186) # Quality control and permanent pool requirements based on MOE guidelines
02187) # for enhanced quality control wet ponds.
02188) #####
02189) ROUTE RESERVOIR -> 1.0 01E Pond-Out 26.25 5.167 No date 12:02 63.20 n/a .000
02190) overflow <= 1.0 01E Pond-Out 26.25 .553 No date 12:43 63.19 n/a .000
02191) (Mottosed=1105E+01 m3, TotDrVVol=0.000E+00 m3, N-DrV= 0, TotDrVDrV= 0.hrs)
02192) #####
02193) # 100-year Water Level of 101.05m at XS +4633.10 according to the
02194) # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
02195) # Dated December 2020, Prepared by Robinson Consultants Inc.
02196) #####
02197) ROUTE RESERVOIR -> 1.0 01E Pond-Out 26.25 5.167 No date 12:02 63.20 n/a .000
02198) overflow <= 1.0 01E Pond-Out 26.25 .553 No date 12:43 63.19 n/a .000
02199) (Mottosed=1105E+01 m3, TotDrVVol=0.000E+00 m3, N-DrV= 0, TotDrVDrV= 0.hrs)
02200) #####
02201) # Total Flow at Node B (NodeB = NodeB-R + E_Pond-Out + E_Pond-DrV + E_Undr + E_Undr)
02202) #####
02203) ADD HYD + 1.0 02E Node-B 47.45 .344 No date 13:42 45.92 n/a .000
02204) + 1.0 02E Pond-Out 26.25 .398 No date 12:49 53.12 n/a .000
02205) + 1.0 02E Pond-Out 26.25 .398 No date 12:49 53.12 n/a .000
02206) + 1.0 02E Pond-Out 26.25 .398 No date 12:49 53.12 n/a .000
02207) + 1.0 02E Pond-Out 26.25 .398 No date 12:49 53.12 n/a .000
02208) SUM= 74.57 .733 No date 13:19 48.19 n/a .000
02209) #####
02210) ** END OF RUN : 124
02211) #####
02212) #####
02213) #####
02214) #####
02215) #####
02216) #####
02217) #####
02218) #####
02219) #####
02220) #####
02221) #####
02222) #####
02223) #####
02224) #####
02225) #####
02226) #####
02227) #####
02228) #####
02229) #####
02230) #####
02231) #####
02232) #####
02233) #####
02234) #####
02235) #####
02236) #####
02237) #####
02238) #####
02239) #####
02240) #####
02241) #####
02242) #####
02243) #####
02244) #####
02245) #####
02246) #####
02247) #####
02248) #####
02249) #####
02250) #####
02251) #####
02252) #####
02253) #####
02254) #####
02255) #####
02256) #####
02257) #####
02258) #####
02259) #####
02260) #####
02261) #####
02262) #####
02263) #####
02264) #####
02265) #####
02266) #####
02267) #####
02268) #####
02269) #####
02270) #####
02271) #####
02272) #####
02273) #####
02274) #####
02275) #####
02276) #####
02277) #####
02278) #####
02279) #####
02280) #####
02281) #####
02282) #####
02283) #####
02284) #####
02285) #####
02286) #####
02287) #####
02288) #####
02289) #####
02290) #####
02291) #####
02292) #####
02293) #####
02294) #####
02295) #####
02296) #####
02297) #####
02298) #####
02299) #####
02300) #####
02301) #####
02302) #####
02303) #####
02304) #####
02305) #####
02306) #####
02307) #####
02308) #####
02309) #####
02310) #####
02311) #####
02312) #####
02313) #####
02314) #####
02315) #####
02316) #####
02317) #####
02318) #####
02319) #####
02320) #####
02321) #####
02322) #####
02323) #####
02324) #####
02325) #####
02326) #####
02327) #####
02328) #####
02329) #####
02330) #####
02331) #####
02332) #####
02333) #####
02334) #####
02335) #####
02336) #####
02337) #####
02338) #####
02339) #####
02340) #####
02341) #####
02342) #####
02343) #####
02344) #####
02345) #####
02346) #####
02347) #####
02348) #####
02349) #####
02350) #####
02351) #####
02352) #####
02353) #####
02354) #####
02355) #####
02356) #####
02357) #####
02358) #####
02359) #####
02360) #####
02361) #####
02362) #####
02363) #####
02364) #####
02365) #####
02366) #####
02367) #####
02368) #####
02369) #####
02370) #####
02371) #####
02372) #####
02373) #####
02374) #####
02375) #####
02376) #####
02377) #####
02378) #####
02379) #####
02380) #####
02381) #####
02382) #####
02383) #####
02384) #####
02385) #####
02386) #####
02387) #####
02388) #####
02389) #####
02390) #####
02391) #####
02392) #####
02393) #####
02394) #####
02395) #####
02396) #####
02397) #####
02398) #####
02399) #####
02400) #####
02401) #####
02402) #####
02403) #####
02404) #####
02405) #####
02406) #####
02407) #####
02408) #####
02409) #####
02410) #####
02411) #####
02412) #####
02413) #####
02414) #####
02415) #####
02416) #####
02417) #####
02418) #####
02419) #####
02420) #####
02421) #####
02422) #####
02423) #####
02424) #####
02425) #####
02426) #####
02427) #####
02428) #####
02429) #####
02430) #####
02431) #####
02432) #####
02433) #####
02434) #####
02435) #####
02436) #####
02437) #####
02438) #####
02439) #####
02440) #####
02441) #####
02442) #####
02443) #####
02444) #####
02445) #####
02446) #####
02447) #####
02448) #####
02449) #####
02450) #####
02451) #####
02452) #####
02453) #####
02454) #####
02455) #####
02456) #####
02457) #####
02458) #####
02459) #####
02460) #####
02461) #####
02462) #####
02463) #####
02464) #####
02465) #####
02466) #####
02467) #####
02468) #####
02469) #####
02470) #####
02471) #####
02472) #####
02473) #####
02474) #####
02475) #####
02476) #####
02477) #####
02478) #####
02479) #####
02480) #####
02481) #####
02482) #####
02483) #####
02484) #####
02485) #####
02486) #####
02487) #####
02488) #####
02489) #####
02490) #####
02491) #####
02492) #####
02493) #####
02494) #####
02495) #####
02496) #####
02497) #####
02498) #####
02499) #####
02500) #####
02501) #####
02502) #####
02503) #####
02504) #####
02505) #####
02506) #####
02507) #####
02508) #####
02509) #####
02510) #####
02511) #####
02512) #####
02513) #####
02514) #####
02515) #####
02516) #####
02517) #####
02518) #####
02519) #####
02520) #####
```

Page 7

Page 8

```
032411 [L/S/m= 573.0 /200.0/200]
032420 *****
032421 *****
032422 *****
032423 *****
032424 *****
032425 *****
032426 *****
032427 *****
032428 *****
032429 *****
032430 *****
032431 *****
032432 *****
032433 *****
032434 *****
032435 *****
032436 *****
032437 *****
032438 *****
032439 *****
032440 *****
032441 *****
032442 *****
032443 *****
032444 *****
032445 *****
032446 *****
032447 *****
032448 *****
032449 *****
032450 *****
032451 *****
032452 *****
032453 *****
032454 *****
032455 *****
032456 *****
032457 *****
032458 *****
032459 *****
032460 *****
032461 *****
032462 *****
032463 *****
032464 *****
032465 *****
032466 *****
032467 *****
032468 *****
032469 *****
032470 *****
032471 *****
032472 *****
032473 *****
032474 *****
032475 *****
032476 *****
032477 *****
032478 *****
032479 *****
032480 *****
032481 *****
032482 *****
032483 *****
032484 *****
032485 *****
032486 *****
032487 *****
032488 *****
032489 *****
032490 *****
032491 *****
032492 *****
032493 *****
032494 *****
032495 *****
032496 *****
032497 *****
032498 *****
032499 *****
032500 *****
032501 *****
032502 *****
032503 *****
032504 *****
032505 *****
032506 *****
032507 *****
032508 *****
032509 *****
032510 *****
032511 *****
032512 *****
032513 *****
032514 *****
032515 *****
032516 *****
032517 *****
032518 *****
032519 *****
032520 *****
032521 *****
032522 *****
032523 *****
032524 *****
032525 *****
032526 *****
032527 *****
032528 *****
032529 *****
032530 *****
032531 *****
032532 *****
032533 *****
032534 *****
032535 *****
032536 *****
032537 *****
032538 *****
032539 *****
032540 *****
032541 *****
032542 *****
032543 *****
032544 *****
032545 *****
032546 *****
032547 *****
032548 *****
032549 *****
032550 *****
032551 *****
032552 *****
032553 *****
032554 *****
032555 *****
032556 *****
032557 *****
032558 *****
032559 *****
032560 *****
032561 *****
032562 *****
032563 *****
032564 *****
032565 *****
032566 *****
032567 *****
032568 *****
032569 *****
032570 *****
032571 *****
032572 *****
032573 *****
032574 *****
032575 *****
032576 *****
032577 *****
032578 *****
032579 *****
032580 *****
032581 *****
032582 *****
032583 *****
032584 *****
032585 *****
032586 *****
032587 *****
032588 *****
032589 *****
032590 *****
032591 *****
032592 *****
032593 *****
032594 *****
032595 *****
032596 *****
032597 *****
032598 *****
032599 *****
032600 *****
```

Page 10

```
039611 [INFO] = 1]
03962 [UNID = 3.0]
03963 *****
03964 # SWMMHYMO Ver:3.00/Feb 2015 / INPUT DATA FILE
03965 # *****
03966 # Project Name : [Calvin Stittville West properties]
03967 # Project Number : [2247]
03968 # Date : [2024/08/02]
03969 # Modeler : [JF]
03970 # Company : J.F. Sabourin and Associates
03971 # License # : 2549237
03972 *****
03973 R0299:C00002-----
03974 HEAD STORM
03975 Filename = storm.001
03976 Comment = 100 years IBC Type 2 Storm 12 hours steep 15 min, as per Carp River
03977 [SFT=15.00 No date 12.50/Tp= 56.00]
03978 R0299:C00003-----
03979 DEFAULT VALUES
03980 Filename = C:\Temp\SWMMHYMO\Post-Dev\Ottawa.val
03981 ICASEV = 1 (read and print data)
03982 FileTitle: File comment: [Parameters for City of Ottawa Projects]
03983 *****
03984 THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
03985 Horton's infiltration equation parameters:
03986 [F= 76.20 mm/hr] [F=01: 2.0 mm/hr] [DCAV= 4.14 /hr] [F= .00 mm]
03987 Parameters for PERVIOUS surfaces in STANDHYD:
03988 [Iapex= 4.67 mm] [Iap=40.00 n] [DIMP= .250]
03989 Parameters for IMPERVIOUS surfaces in STANDHYD:
03990 [Ialmp= 1.57 mm] [CLIV= 1.50] [DIMP= .013]
03991 Parameters used in NASHYD:
03992 [Iaw= 4.67 mm] [N= 3.00]
03993 *****
03994 Average monthly Pan Evaporation data in (mm)
03995 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
03996 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
03997 Average monthly Potential Evapotranspiration (mm)
03998 JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
03999 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
04000 *****
04001 # Post Development Conditions
04002 *****
04003 # Node X - West SWM Pond Outlet
04004 *****
04005 # Post-development drainage area to West SWM Pond
04006 R0299:C00004-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04007 CALIB STANDHYD
04008 [XIMP= 64.71IMP= 69]
04009 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04010 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04011 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04012 *****
04013 # East SWM Pond Routing (Free Outfall Conditions)
04014 *****
04015 # Quality control and permanent pool requirements based on MCE guidelines
04016 *****
04017 # for enhanced quality control for wet ponds.
04018 *****
04019 # Post-development drainage area to West SWM Pond
04020 R0299:C00005-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04021 ROUTE RESERVOIR -> 1.0 02:01Fond 35.34 9.147 No date 6:02 74.69 n/a .000
04022 out <= 1.0 01:01Fond-Out 35.34 .603 No date 7:00 74.69 n/a .000
04023 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04024 [MetStoDev= 2016E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04025 *****
04026 # 100-year Water Level of 102.74m at XS S+229.82 according to the
04027 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04028 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04029 # However, the existing Davidson SWM Facility assumes a 100-year Water
04030 # Level of 102.77m under restrictive downstream conditions and therefore,
04031 # the latter water level has conservatively been used for this study.
04032 *****
04033 # Area W Und2 to Node X
04034 R0299:C00007-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04035 [C= 62.0; N= 3.00; Tp= 1.11]
04036 1.88 .095 No date 7:09 33.77 .352 .000
04037 *****
04038 # Area E Und2 to Node X
04039 R0299:C00008-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04040 [C= 59.0; N= 3.00; Tp= 1.46]
04041 6.75 .146 No date 7:34 31.14 .324 .000
04042 *****
04043 # Area E Und2 to Node X
04044 R0299:C00009-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04045 [C= 59.0; N= 3.00; Tp= 1.11]
04046 .023 No date 7:09 31.14 .324 .000
04047 *****
04048 # Total Flow at Node X (NodeA = W Pond Und2 + E Und2 + E Und2)
04049 R0299:C00010-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04050 ADD HYD
04051 + 1.0 02:01Fond-Ofv 35.34 9.147 No date 6:02 74.69 n/a .000
04052 + 1.0 02:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04053 + 1.0 02:01Fond-Ofv 1.88 .095 No date 7:09 33.77 n/a .000
04054 + 1.0 02:01Fond-Ofv 6.75 .146 No date 7:34 31.14 n/a .000
04055 + 1.0 02:01Fond-Ofv .88 .023 No date 7:09 31.14 n/a .000
04056 + 1.0 02:01Fond-Ofv 44.85 .815 No date 7:14 65.57 n/a .000
04057 *****
04058 # Channel Routing from Node X to Node A
04059 *****
04060 # Faulkner Drain Cross Section 5280 from HEC-RAS model
04061 R0299:C00011-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04062 ROUTE CHANNEL -> 1.0 02:01NodeX 44.85 .815 No date 7:14 65.57 n/a .000
04063 [RDT= 1.00] out<= 1.0 01:01NodeX-r 44.85 .815 No date 7:16 65.57 n/a .000
04064 [L/S= 120 / .389]
04065 [Vmax= .636/Imax= .141]
04066 *****
04067 # Node A (Sta. S+229.82 from the December 2020 Amendment to the Engineer's Report
04068 # for the Faulkner Municipal Drain by Robinson Consultants Inc.)
04069 *****
04070 # Area W Und3 to Node A
04071 R0299:C00012-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04072 DESIGN NASHYD
04073 [C= 59.0; N= 3.00; Tp= .76]
04074 1.77 .063 No date 6:45 31.14 .324 .000
04075 *****
04076 # Area W Und3 to Node A
04077 R0299:C00013-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04078 DESIGN NASHYD
04079 [C= 59.0; N= 3.00; Tp= .48]
04080 .14 .007 No date 6:25 31.14 .324 .000
04081 *****
04082 # Area E Und3 to Node A
04083 R0299:C00014-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04084 DESIGN NASHYD
04085 [C= 59.0; N= 3.00; Tp= .48]
04086 .06 .003 No date 6:25 31.13 .324 .000
04087 *****
04088 # Area W Und3 to Node A
04089 R0299:C00015-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04090 CALIB STANDHYD
04091 [XIMP= 64.71IMP= 69]
04092 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04093 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04094 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04095 *****
04096 # Total Flow at Node A (NodeA = NodeB-r + W Und2 + W Und3 + E Und3 + W Und3)
04097 R0299:C00016-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04098 ADD HYD
04099 + 1.0 02:01NodeA-r 44.85 .815 No date 7:16 65.57 n/a .000
04100 + 1.0 02:01Fond-Ofv 1.77 .063 No date 6:45 31.14 n/a .000
04101 + 1.0 02:01Fond-Ofv .14 .007 No date 6:25 31.14 n/a .000
04102 + 1.0 02:01Fond-Ofv .06 .003 No date 6:25 31.13 n/a .000
04103 + 1.0 02:01Fond-Ofv .63 .197 No date 6:00 74.69 n/a .000
04104 + 1.0 01:01NodeA 47.45 .879 No date 7:08 64.26 n/a .000
04105 *****
04106 # Channel Routing from Node A to Node B
04107 *****
04108 # Faulkner Drain Cross Section 4840 from HEC-RAS model
04109 R0299:C00017-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04110 ROUTE CHANNEL -> 1.0 02:01NodeA 47.45 .879 No date 7:08 64.26 n/a .000
04111 [RDT= 1.00] out<= 1.0 01:01NodeA-r 47.45 .856 No date 7:30 64.26 n/a .000
04112 [L/S= 573 / .200/.020]
04113 *****
04114 # Node B - East SWM Pond Outlet (Sta. S+433.10 from the December 2020 Amendment to the
04115 # Engineer's Report for the Faulkner Municipal Drain by Robinson Consultants Inc.)
04116 *****
04117 # Post-development drainage area to East SWM Pond
04118 R0299:C00018-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04119 CALIB STANDHYD
04120 [XIMP= 62.71IMP= 67]
04121 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04122 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04123 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04124 *****
04125 # East SWM Pond Routing (Free Outfall Conditions)
04126 *****
04127 # for enhanced quality control for wet ponds.
04128 *****
04129 # Post-development drainage area to East SWM Pond
04130 R0299:C00019-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04131 ROUTE RESERVOIR -> 1.0 02:01Fond 26.25 6.918 No date 6:02 73.55 n/a .000
04132 out <= 1.0 01:01Fond-Out 26.25 .892 No date 6:39 73.54 n/a .000
04133 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04134 [MetStoDev= 1363E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04135 *****
04136 # 100-year Water Level of 101.05m at XS S+433.10 according to the
04137 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04138 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04139 # However, the existing Davidson SWM Facility assumes a 100-year Water
04140 # Level of 101.07m under restrictive downstream conditions and therefore,
04141 # the latter water level has conservatively been used for this study.
04142 *****
04143 # Area W Und3 to Node A
04144 R0299:C00020-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04145 DESIGN NASHYD
04146 [C= 59.0; N= 3.00; Tp= .48]
04147 26.25 6.918 No date 6:02 73.55 .766 .000
04148 *****
04149 # Area E Und3 to Node A
04150 R0299:C00021-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04151 DESIGN NASHYD
04152 [C= 59.0; N= 3.00; Tp= .48]
04153 .06 .003 No date 6:25 31.13 .324 .000
04154 *****
04155 # Area W Und3 to Node A
04156 R0299:C00022-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04157 CALIB STANDHYD
04158 [XIMP= 64.71IMP= 69]
04159 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04160 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04161 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04162 *****
04163 # East SWM Pond Routing (Free Outfall Conditions)
04164 *****
04165 # for enhanced quality control for wet ponds.
04166 *****
04167 # Post-development drainage area to East SWM Pond
04168 R0299:C00023-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04169 ROUTE RESERVOIR -> 1.0 02:01Fond 26.25 6.918 No date 6:02 73.55 n/a .000
04170 out <= 1.0 01:01Fond-Out 26.25 .892 No date 6:39 73.54 n/a .000
04171 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04172 [MetStoDev= 1363E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04173 *****
04174 # 100-year Water Level of 101.05m at XS S+433.10 according to the
04175 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04176 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04177 # However, the existing Davidson SWM Facility assumes a 100-year Water
04178 # Level of 101.07m under restrictive downstream conditions and therefore,
04179 # the latter water level has conservatively been used for this study.
04180 *****
04181 # Area W Und3 to Node A
04182 R0299:C00024-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04183 DESIGN NASHYD
04184 [C= 59.0; N= 3.00; Tp= .48]
04185 26.25 6.918 No date 6:02 73.55 n/a .000
04186 *****
04187 # Area E Und3 to Node A
04188 R0299:C00025-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04189 DESIGN NASHYD
04190 [C= 59.0; N= 3.00; Tp= .48]
04191 .06 .003 No date 6:25 31.13 .324 .000
04192 *****
04193 # Area W Und3 to Node A
04194 R0299:C00026-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04195 CALIB STANDHYD
04196 [XIMP= 64.71IMP= 69]
04197 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04198 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04199 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04200 *****
04201 # East SWM Pond Routing (Free Outfall Conditions)
04202 *****
04203 # for enhanced quality control for wet ponds.
04204 *****
04205 # Post-development drainage area to East SWM Pond
04206 R0299:C00027-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04207 ROUTE RESERVOIR -> 1.0 02:01Fond 26.25 6.918 No date 6:02 73.55 n/a .000
04208 out <= 1.0 01:01Fond-Out 26.25 .892 No date 6:39 73.54 n/a .000
04209 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04210 [MetStoDev= 1363E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04211 *****
04212 # 100-year Water Level of 101.05m at XS S+433.10 according to the
04213 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04214 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04215 # However, the existing Davidson SWM Facility assumes a 100-year Water
04216 # Level of 101.07m under restrictive downstream conditions and therefore,
04217 # the latter water level has conservatively been used for this study.
04218 *****
04219 # Area W Und3 to Node A
04220 R0299:C00028-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04221 DESIGN NASHYD
04222 [C= 59.0; N= 3.00; Tp= .48]
04223 26.25 6.918 No date 6:02 73.55 n/a .000
04224 *****
04225 # Area E Und3 to Node A
04226 R0299:C00029-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04227 DESIGN NASHYD
04228 [C= 59.0; N= 3.00; Tp= .48]
04229 .06 .003 No date 6:25 31.13 .324 .000
04230 *****
04231 # Area W Und3 to Node A
04232 R0299:C00030-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04233 CALIB STANDHYD
04234 [XIMP= 64.71IMP= 69]
04235 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04236 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04237 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04238 *****
04239 # East SWM Pond Routing (Free Outfall Conditions)
04240 *****
04241 # for enhanced quality control for wet ponds.
04242 *****
04243 # Post-development drainage area to East SWM Pond
04244 R0299:C00031-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04245 ROUTE RESERVOIR -> 1.0 02:01Fond 26.25 6.918 No date 6:02 73.55 n/a .000
04246 out <= 1.0 01:01Fond-Out 26.25 .892 No date 6:39 73.54 n/a .000
04247 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04248 [MetStoDev= 1363E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04249 *****
04250 # 100-year Water Level of 101.05m at XS S+433.10 according to the
04251 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04252 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04253 # However, the existing Davidson SWM Facility assumes a 100-year Water
04254 # Level of 101.07m under restrictive downstream conditions and therefore,
04255 # the latter water level has conservatively been used for this study.
04256 *****
04257 # Area W Und3 to Node A
04258 R0299:C00032-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04259 DESIGN NASHYD
04260 [C= 59.0; N= 3.00; Tp= .48]
04261 26.25 6.918 No date 6:02 73.55 n/a .000
04262 *****
04263 # Area E Und3 to Node A
04264 R0299:C00033-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04265 DESIGN NASHYD
04266 [C= 59.0; N= 3.00; Tp= .48]
04267 .06 .003 No date 6:25 31.13 .324 .000
04268 *****
04269 # Area W Und3 to Node A
04270 R0299:C00034-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04271 CALIB STANDHYD
04272 [XIMP= 64.71IMP= 69]
04273 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04274 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04275 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04276 *****
04277 # East SWM Pond Routing (Free Outfall Conditions)
04278 *****
04279 # for enhanced quality control for wet ponds.
04280 *****
04281 # Post-development drainage area to East SWM Pond
04282 R0299:C00035-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04283 ROUTE RESERVOIR -> 1.0 02:01Fond 26.25 6.918 No date 6:02 73.55 n/a .000
04284 out <= 1.0 01:01Fond-Out 26.25 .892 No date 6:39 73.54 n/a .000
04285 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04286 [MetStoDev= 1363E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04287 *****
04288 # 100-year Water Level of 101.05m at XS S+433.10 according to the
04289 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04290 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04291 # However, the existing Davidson SWM Facility assumes a 100-year Water
04292 # Level of 101.07m under restrictive downstream conditions and therefore,
04293 # the latter water level has conservatively been used for this study.
04294 *****
04295 # Area W Und3 to Node A
04296 R0299:C00036-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04297 DESIGN NASHYD
04298 [C= 59.0; N= 3.00; Tp= .48]
04299 26.25 6.918 No date 6:02 73.55 n/a .000
04300 *****
04301 # Area E Und3 to Node A
04302 R0299:C00037-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04303 DESIGN NASHYD
04304 [C= 59.0; N= 3.00; Tp= .48]
04305 .06 .003 No date 6:25 31.13 .324 .000
04306 *****
04307 # Area W Und3 to Node A
04308 R0299:C00038-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04309 CALIB STANDHYD
04310 [XIMP= 64.71IMP= 69]
04311 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04312 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04313 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04314 *****
04315 # East SWM Pond Routing (Free Outfall Conditions)
04316 *****
04317 # for enhanced quality control for wet ponds.
04318 *****
04319 # Post-development drainage area to East SWM Pond
04320 R0299:C00039-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04321 ROUTE RESERVOIR -> 1.0 02:01Fond 26.25 6.918 No date 6:02 73.55 n/a .000
04322 out <= 1.0 01:01Fond-Out 26.25 .892 No date 6:39 73.54 n/a .000
04323 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04324 [MetStoDev= 1363E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04325 *****
04326 # 100-year Water Level of 101.05m at XS S+433.10 according to the
04327 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04328 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04329 # However, the existing Davidson SWM Facility assumes a 100-year Water
04330 # Level of 101.07m under restrictive downstream conditions and therefore,
04331 # the latter water level has conservatively been used for this study.
04332 *****
04333 # Area W Und3 to Node A
04334 R0299:C00040-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04335 DESIGN NASHYD
04336 [C= 59.0; N= 3.00; Tp= .48]
04337 26.25 6.918 No date 6:02 73.55 n/a .000
04338 *****
04339 # Area E Und3 to Node A
04340 R0299:C00041-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04341 DESIGN NASHYD
04342 [C= 59.0; N= 3.00; Tp= .48]
04343 .06 .003 No date 6:25 31.13 .324 .000
04344 *****
04345 # Area W Und3 to Node A
04346 R0299:C00042-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04347 CALIB STANDHYD
04348 [XIMP= 64.71IMP= 69]
04349 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04350 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04351 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04352 *****
04353 # East SWM Pond Routing (Free Outfall Conditions)
04354 *****
04355 # for enhanced quality control for wet ponds.
04356 *****
04357 # Post-development drainage area to East SWM Pond
04358 R0299:C00043-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04359 ROUTE RESERVOIR -> 1.0 02:01Fond 26.25 6.918 No date 6:02 73.55 n/a .000
04360 out <= 1.0 01:01Fond-Out 26.25 .892 No date 6:39 73.54 n/a .000
04361 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04362 [MetStoDev= 1363E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04363 *****
04364 # 100-year Water Level of 101.05m at XS S+433.10 according to the
04365 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04366 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04367 # However, the existing Davidson SWM Facility assumes a 100-year Water
04368 # Level of 101.07m under restrictive downstream conditions and therefore,
04369 # the latter water level has conservatively been used for this study.
04370 *****
04371 # Area W Und3 to Node A
04372 R0299:C00044-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04373 DESIGN NASHYD
04374 [C= 59.0; N= 3.00; Tp= .48]
04375 26.25 6.918 No date 6:02 73.55 n/a .000
04376 *****
04377 # Area E Und3 to Node A
04378 R0299:C00045-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04379 DESIGN NASHYD
04380 [C= 59.0; N= 3.00; Tp= .48]
04381 .06 .003 No date 6:25 31.13 .324 .000
04382 *****
04383 # Area W Und3 to Node A
04384 R0299:C00046-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04385 CALIB STANDHYD
04386 [XIMP= 64.71IMP= 69]
04387 [Horton parameters: F= 76.20/F= 13.20/DCAV= 4.14; F= .00]
04388 [Previous area: Iapex= 4.67/ISLFP= 2.00/IAP= .40/IMP= .250/BCF= .0]
04389 [Impervious area: Ialmp= 1.57/ISLPI= .50/ID= 485.0MM= .013/IC= .0]
04390 *****
04391 # East SWM Pond Routing (Free Outfall Conditions)
04392 *****
04393 # for enhanced quality control for wet ponds.
04394 *****
04395 # Post-development drainage area to East SWM Pond
04396 R0299:C00047-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04397 ROUTE RESERVOIR -> 1.0 02:01Fond 26.25 6.918 No date 6:02 73.55 n/a .000
04398 out <= 1.0 01:01Fond-Out 26.25 .892 No date 6:39 73.54 n/a .000
04399 overflow <= 1.0 03:01Fond-Ofv .00 .000 No date 0:00 .00 n/a .000
04400 [MetStoDev= 1363E+01 m3, TotOfvVol= 0.000E+00 m3, N-Ofv= 0, TotOfvOfv= 0 hrs]
04401 *****
04402 # 100-year Water Level of 101.05m at XS S+433.10 according to the
04403 # Amendment to the Engineer's Report for the Faulkner Municipal Drain,
04404 # Dated December 2020, Prepared by Robinson Consultants Inc.,
04405 # However, the existing Davidson SWM Facility assumes a 100-year Water
04406 # Level of 101.07m under restrictive downstream conditions and therefore,
04407 # the latter water level has conservatively been used for this study.
04408 *****
04409 # Area W Und3 to Node A
04410 R0299:C00048-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04411 DESIGN NASHYD
04412 [C= 59.0; N= 3.00; Tp= .48]
04413 26.25 6.918 No date 6:02 73.55 n/a .000
04414 *****
04415 # Area E Und3 to Node A
04416 R0299:C00049-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DWfms
04417 DESIGN NASHYD
04418 [C= 59.0; N= 3.00; Tp= .48]
04419 .06 .003 No date 6:25 31.13 .324 .000
04420 *****
04421 # Area W Und3 to Node A
04422 R0299:C00050-----DtnIn=DtNHVD-----AREAhA-QFEARCs-TpeakDate hh:mm-----RVm=R.C-----DW
```



JFSA Canada Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Attachment D

Preliminary Storm Hydraulic Grade Line Analysis

Table D-1: Caivan Stittsville Lands - MSS
Preliminary 100 Year HGL Analysis

SWM Pond	MH-ID	Invert Elevation (m)	Top of MH (m)	Max HGL (m)	Top of MH Freeboard (m)
Trunk 1 West SWM Pond	MH-112	103.58	106.93	104.49	2.44
	MH-116	103.26	106.79	104.35	2.44
	MH-120	102.88	106.64	104.27	2.38
	MH-124	102.70	106.49	104.21	2.28
	MH-139	102.32	106.33	104.14	2.19
	MH-140	102.08	106.18	104.07	2.11
	MH-143	101.96	106.00	103.97	2.03
	MH-1002	101.83	104.35	103.83	0.52
	West SWM Pond	-	-	103.80	-
Trunk 2 West SWM Pond	MH-231	102.84	106.68	104.09	2.59
	MH-232	102.65	106.42	104.03	2.39
	MH-235	102.57	106.38	104.00	2.38
	MH-236	102.52	106.34	103.98	2.36
	MH-237	102.37	106.18	103.90	2.28
	MH-240	101.95	106.01	103.84	2.18
	West SWM Pond	-	-	103.80	-
Trunk 3 Davidson SWM Pond	MH-306	102.78	106.04	103.59	2.46
	MH-307	102.63	105.88	103.51	2.37
	MH-308	102.39	105.76	103.39	2.37
	MH-313	101.69	105.82	103.38	2.44
	MH-314	101.54	103.89	103.30	0.59
	Davidson SWM Pond	-	-	103.28	-
Trunk 4 East SWM Pond	MH-405	101.94	105.43	102.70	2.73
	MH-406	101.84	105.63	102.64	2.99
	MH-412	101.42	105.68	102.47	3.21
	MH-413	101.29	105.51	102.44	3.07
	MH-414	101.12	105.37	102.40	2.97
	MH-415	101.05	105.34	102.39	2.95
	MH-430	100.83	105.25	102.32	2.94
	MH-434	100.67	104.94	102.15	2.79
	MH-435	100.54	104.85	101.98	2.87
	East SWM Pond	-	-	101.95	-

**Table D-1: Caivan Stittsville Lands - MSS
Preliminary 100 Year HGL Analysis**

SWM Pond	MH-ID	Invert Elevation (m)	Top of MH (m)	Max HGL (m)	Top of MH Freeboard (m)
Trunk 5 East SWM Pond	MH-519	102.03	105.49	102.38	3.11
	MH-522	101.53	105.36	102.30	3.06
	MH-524	101.42	105.24	102.27	2.97
	MH-528	101.31	105.12	102.25	2.88
	MH-532	100.79	104.99	102.04	2.95
	MH-5320	101.15	105.00	102.14	2.86
	MH-533	100.54	104.86	101.96	2.90
	East SWM Pond	-	-	101.95	-
				Min⁽¹⁾	2.03
				Max⁽¹⁾	3.21
				Average⁽¹⁾	2.63

Notes:

(1) Freeboard excluding MH-1002 and MH-314 within the SWM pond blocks.

(2) Analysis assumes the use of ICDs throughout the development (s), therefore the Rational Method flows as per DSEL's storm design sheets were increased by 14% to account for additional head on the ICDs during the 100-year event.

(3) Analysis assumes the following preliminary 100-year water level in the West and East SWM Ponds:

West SWM Pond: 103.80m

East SWM Pond: 101.95m

(4) Analysis assumes a preliminary 100-year water level of 103.28m in the Davidson SWM Pond as per recent analysis prepared by JFSA with the inclusion of the total proposed drainage area of 4.10 ha (~63% imperviousness) of Caivan Stittsville lands that is proposed to drain to the Davidson SWM Pond.

(5) Model Name: STIT-STM-MSS_v03.0.inp.



JFSA Canada Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Attachment E

Preliminary Sanitary Hydraulic Grade Line Analysis

Table E-1: Caivan Stittsville Lands - MSS
Preliminary Sanitary HGL Analysis
Rare Flows
(Pumping station capacity of 71.5 L/s)

Location	MH-ID	Invert Elevation (m)	Top of MH (m)	Max HGL (m)	Top of MH Freeboard (m)
Trunk 1 West Development	MH-120A	100.80	106.18	100.91	5.28
	MH-135A	100.64	106.33	100.79	5.54
	MH-139A	100.50	106.48	100.66	5.82
	MH-143A	100.36	106.63	100.52	6.11
	MH-159A	100.22	106.78	100.41	6.37
	MH-166A	100.08	106.93	100.28	6.65
	MH-169A	99.94	107.36	100.18	7.18
	MH-172A	99.74	108.64	99.92	8.72
	MH-173A	99.60	107.87	99.79	8.08
	MH-174A	99.44	107.65	99.62	8.03
	MH-175A	99.28	107.47	99.47	8.00
	MH-176A	99.13	107.36	99.31	8.05
	MH-177A	99.08	107.36	99.27	8.09
	MH-178A	98.93	107.36	99.11	8.25
	MH-179A	98.85	107.36	99.04	8.32
	MH-180A	98.76	107.36	98.97	8.40
Trunk 2 East Development	MH-203A	101.73	104.94	101.76	3.18
	MH-205A	101.49	105.25	101.54	3.71
	MH-206A	101.20	105.39	101.26	4.13
	MH-217A	100.86	105.56	100.95	4.61
	MH-226A	100.68	105.68	100.80	4.88
	MH-228A	100.51	105.42	100.63	4.79
	MH-229A	100.26	105.56	100.38	5.19
	MH-230A	100.09	105.70	100.23	5.47
	MH-231A	100.03	105.73	100.22	5.51
	MH-265A	99.89	105.81	100.07	5.74
	MH-266A	99.79	105.88	99.98	5.90
	MH-267A	99.60	106.75	99.78	6.97
	MH-268A	99.53	106.69	99.74	6.95
	MH-269A	99.31	106.71	99.51	7.20
	MH-270A	99.05	105.73	99.23	6.50
	MH-280A	98.99	105.70	99.18	6.52
	MH-281A	98.89	105.70	99.06	6.64
	MH-282A	98.72	105.74	98.81	6.93
	MH-283A	98.66	105.74	98.78	6.96

Table E-1: Caivan Stittsville Lands - MSS
Preliminary Sanitary HGL Analysis
Rare Flows
(Pumping station capacity of 71.5 L/s)

Location	MH-ID	Invert Elevation (m)	Top of MH (m)	Max HGL (m)	Top of MH Freeboard (m)
	MH-284A_PS	98.60	105.74	98.72	7.02
	SANMH97	103.01	105.34	103.01	2.33
	Davidson_Pond_Ovf	102.97	103.57	103.28	-
	MH-6002A	102.27	104.96	102.27	2.69
	MH-6003A	102.07	105.01	102.07	2.94
	MH-6004A-East_Pond_Ovf	102.02	105.01	102.02	-
				Min⁽¹⁾	3.18
				Max⁽¹⁾	8.72
				Average⁽¹⁾	6.42

Notes:

- (1) Freeboard excluding MH-284A_PS, SANMH97, MH-6002A and MH-6003A.
- (2) Analysis assumes rare event parameters/flows as per DSEL's sanitary design sheets.
- (3) Analysis assumes pumping station operating at a maximum capacity of 71.5 L/s.
- (4) Emergency sanitary overflows that discharge to the SWM ponds are assumed to be flapped.
- (5) Assumed emergency sanitary overflows (above the 25-year water level in the SWM ponds):
 - West: Existing emergency overflow to Davidson SWM Pond; 900 x 500mm sharp crested weir in SANMH97; Invert elevation = 103.05m (modified weir dimensions and invert).
 - East: Proposed emergency overflow to East SWM Pond; Reversed 375mm dia. sanitary pipe between MH-203A and MH-6002A; Invert elevation = 102.344m.
- (6) Assumed 100-year water level in the SWM Ponds:
 - Davidson SWM Pond = 103.28m
 - East SWM Pond: 101.95m
- (7) Model Name: STIT-SAN-MSS-Rare_v03.0.inp.

Table E-2: Caivan Stittsville Lands - MSS
Preliminary Sanitary HGL Analysis
Annual Flows
(Pumping Station Failure)

Location	MH-ID	Invert Elevation (m)	Top of MH (m)	Max HGL (m)	Top of MH Freeboard (m)
Trunk 1 West Development	MH-120A	100.80	106.18	103.64	2.55
	MH-135A	100.64	106.33	103.62	2.71
	MH-139A	100.50	106.48	103.61	2.87
	MH-143A	100.36	106.63	103.58	3.05
	MH-159A	100.22	106.78	103.56	3.22
	MH-166A	100.08	106.93	103.52	3.41
	MH-169A	99.94	107.36	103.47	3.89
	MH-172A	99.74	108.64	103.41	5.23
	MH-173A	99.60	107.87	103.39	4.48
	MH-174A	99.44	107.65	103.37	4.28
	MH-175A	99.28	107.47	103.36	4.11
	MH-176A	99.13	107.36	103.34	4.02
	MH-177A	99.08	107.36	103.33	4.03
	MH-178A	98.93	107.36	103.32	4.04
	MH-179A	98.85	107.36	103.31	4.05
	MH-180A	98.76	107.36	103.30	4.07
Trunk 2 East Development	MH-203A	101.73	104.94	102.49	2.45
	MH-205A	101.49	105.25	102.71	2.54
	MH-206A	101.20	105.39	102.96	2.43
	MH-217A	100.86	105.56	103.21	2.35
	MH-226A	100.68	105.68	103.24	2.44
	MH-228A	100.51	105.42	103.26	2.16
	MH-229A	100.26	105.56	103.29	2.28
	MH-230A	100.09	105.70	103.29	2.41
	MH-231A	100.03	105.73	103.29	2.44
	MH-265A	99.89	105.81	103.29	2.52
	MH-266A	99.79	105.88	103.29	2.59
	MH-267A	99.60	106.75	103.29	3.46
	MH-268A	99.53	106.69	103.29	3.40
	MH-269A	99.31	106.71	103.29	3.42
	MH-270A	99.05	105.73	103.29	2.44
	MH-280A	98.99	105.70	103.29	2.41
	MH-281A	98.89	105.70	103.29	2.41
	MH-282A	98.72	105.74	103.29	2.45
	MH-283A	98.66	105.74	103.29	2.45

**Table E-2: Caivan Stittsville Lands - MSS
Preliminary Sanitary HGL Analysis
Annual Flows
(Pumping Station Failure)**

Location	MH-ID	Invert Elevation (m)	Top of MH (m)	Max HGL (m)	Top of MH Freeboard (m)
	MH-284A_PS	98.60	105.74	103.29	2.45
	SANMH97	103.01	105.34	103.28	2.06
	Davidson_Pond_Ovf	102.97	103.57	103.28	-
	MH-6002A	102.27	104.96	102.40	2.56
	MH-6003A	102.07	105.01	102.18	2.83
	MH-6004A-East_Pond_Ovf	102.02	105.01	102.12	-
				Min⁽¹⁾	2.16
				Max⁽¹⁾	5.23
				Average⁽¹⁾	3.12

Notes:

- (1) Freeboard excluding MH-284A_PS, SANMH97, MH-6002A and MH-6003A.
- (2) Analysis assumes annual event parameters/flows as per DSEL's sanitary design sheets.
- (3) Analysis assumes complete pumping station failure (0 L/s).
- (4) Emergency sanitary overflows that discharge to the SWM ponds are assumed to be flapped.
- (5) Assumed emergency sanitary overflows (above the 25-year water level in the SWM ponds):
 - West: Existing emergency overflow to Davidson SWM Pond; 900 x 500mm sharp crested weir in SANMH97; Invert elevation = 103.05m (modified weir dimensions and invert).
 - East: Proposed emergency overflow to East SWM Pond; Reversed 375mm dia. sanitary pipe between MH-203A and MH-6002A; Invert elevation = 102.344m.
- (6) Assumed 100-year water level in the SWM Ponds:
 - Davidson SWM Pond = 103.28m
 - East SWM Pond: 101.95m
- (7) Model Name: STIT-SAN-MSS-Annual_v03.0.inp.



JFSA Canada Inc.
52 Springbrook Drive,
Ottawa, ON K2S 1B9
T 613-836-3884 F 613-836-0332

jfsa.com

Attachment F

Existing Davidson SWM Pond Preliminary Analysis

Table F-1: Criteria for Required Storage Volumes

Pond	Area ⁽¹⁾ (ha)	Imperviousness (%)	Storage Volume for Impervious Level ⁽²⁾ (m ³ /ha)
N/A	N/A	55	190
Davidson Co-Tenancy	44.721	57	194.67
N/A	N/A	70	225

(1) Includes the additional 4.1 ha to the SWM facility.

(2) Protection Level for Wet Pond: Enhanced 80% long-term S.S. removal.

SWM Planning & Design Manual, Table 3.2, p.3-10 (March 2003).

Table F-2: Required Storage Volumes for SWM Facility

Pond Component	Required Volume (m ³)	Provided Volume ⁽⁴⁾ (m ³)	Volume Ratio
Permanent Pool (PP) ⁽¹⁾	6917	9054	1.31
Quality Control ⁽²⁾	1789	1789	1.00
Extended Detention ⁽³⁾	6605	7058	1.07
Forebay (20% PP)	1383	N/A	N/A
PP - Forebay	5533	N/A	N/A

(1) Required PP volume based on Table F-1 (194.67 - 40 = 154.67 m³/ha).

(2) Required quality control volume based on 40 m³/ha.

(3) Required extended detention volume based on the detention of the 25 mm storm for a 72 hour drawdown time.

(4) Provided volume based on stage-storage curve and extended detention

(5) Based on grading plan provided by DSEL.

(6) As per MOE, Maximum Forebay Area: 33% of Total Permanent Pool.

**Table F-3: Davidson SWM Pond Level and Storage Summary
(Restrictive Downstream Conditions)**

Event	Pond Level (m)	Max Storage Used ⁽¹⁾ (m ³)
100yr/24hr Chicago	103.10	22,240
100yr/24hr SCS Type II	103.21	24,280
100yr/12hr SCS Type II	103.28	25,770

⁽¹⁾ Active storage volume only.

```
00001 20 Metric units / ID Numbers OFF
00002 *#*****
00003 *# SWMHYMO Ver.5.02(Jan 2001 <BETA> / INPUT DATA FILE
00004 *#*****
00005 *# Project Name : [Stittsville - Davidson Co-Tenancy]
00006 *# Project Number: [1123-13]
00007 *# Date : 2015/05/06
00008 *# Modeller : Laura Pipkins, P.Eng.
00009 *# Updated : 2016/09/24 [IP]
00010 *# Updated : 2017/02/13 [IP]
00011 *# Updated : 2017/03/22 [IP]
00012 *# Updated : 2017/09/13 [IP]
00013 *# Updated : 2017/09/18 [IP]
00014 *# Updated : 2023/07/04 [IP]
00015 *# Updated : 2023/07/15 [IP]
00016 *# Updated : 2023/09/25 [IP]
00017 *# Updated : 2024/08/02 [IP]
00018 *# Company : J.F. Sabourin and Associates
00019 *# License : 2582434
00020 *#*****
00021 *# 25 mm Storm based on 2-Year, 3-Hour Chicago Storm
00022 *#*****
00023 *# ["25MMCH3.stm"] <-storm filename, one per line for NSTORM time
00024 *#*****
00025 READ STORM STORM_FILENAME="storm.001"
00026 *#*****
00027 DEFAULT VALUES ICASH=0, read and print values
00028 *#*****
00029 *#*****
00030 *#*****
00031 *#*****
00032 *# PROPOSED OUTFLOW - FREE OUTFALL HYDROGRAPH
00033 *#*****
00034 *# Minor system hydrograph provided September 2017 by IBI Group
00035 READ HYD HYD_FILENAME="Min"
00036 *#*****
00037 *#*****
00038 *# Major system hydrograph provided September 2017 by IBI Group
00039 READ HYD HYD_FILENAME="Maj"
00040 *#*****
00041 *#*****
00042 *#*****
00043 *# PROPOSED POND BLOCK
00044 *#*****
00045 *# Drainage area characteristics as per base plan provided by DSEI
00046 DESIGN STANDHYD NHYD="Pond", STP[1](min), AREA=3.071(ha),
00047 XCHY=0.451, TCHY=0.01(cms), LCHS=1,
00048 SLOPE=0.5(%), RAINFALL=[. . . , 1(mm/hr), END=1]
00049 *#*****
00050 *# Proposed Additional Area Requested by DSEI, July 2024
00051 DESIGN STANDHYD NHYD="Add", STP[1](min), AREA=4.1(ha),
00052 XCHY=0.58, TCHY=0.63, DCHY=0.01(cms), LCHS=1,
00053 SLOPE=0.5(%), RAINFALL=[. . . , 1(mm/hr), END=1]
00054 *#*****
00055 *#*****
00056 *# TOTAL INFLOWS TO SWM FACILITY
00057 *#*****
00058 ADD HYD NHYDsum="Pin", NHYD to add["Min"*"Maj"*"Pond"*"Add"]
00059 *#*****
00060 *#*****
00061 *# SWM FACILITY
00062 *#*****
00063 *# Quality control and permanent pool requirements based on MGS guidelines
00064 *# for enhanced quality control for wet ponds. Extended detention of the 25 mm
00065 *# runoff volume for 72 hours estimated for uniform erosion control requirements.
00066 *# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
00067 *# "Faulkner Drain Hydrotechnical Update" by Novastra Inc.
00068 *#*****
00069 *# Free Outfall Conditions
00070 ROUTE RESERVOIR NHYDout["Pfout", NHYDin="Pin",
00071 ROT=1](min),
00072 *#*****
00073 TABLE of ( OUTFLOW-STORAGE ) values
00074 ( cms ) - ( ha-m )
00075 [ 0 , 0 ]
00076 [ 0.01 , 0.102 ]
00077 [ 0.021 , 0.206 ]
00078 [ 0.029 , 0.213 ]
00079 [ 0.035 , 0.422 ]
00080 [ 0.04 , 0.534 ]
00081 [ 0.045 , 0.648 ]
00082 [ 0.047 , 0.706 ]
00083 [ 0.05 , 0.824 ]
00084 [ 0.059 , 0.946 ]
00085 [ 0.062 , 1.009 ]
00086 [ 0.064 , 1.075 ]
00087 [ 0.074 , 1.143 ]
00088 [ 0.109 , 1.209 ]
00089 [ 0.153 , 1.474 ]
00090 [ 0.201 , 1.653 ]
00091 [ 0.25 , 1.836 ]
00092 [ 0.298 , 2.024 ]
00093 [ 0.343 , 2.216 ]
00094 [ 0.545 , 2.313 ]
00095 [ 0.609 , 2.512 ]
00096 [ 0.666 , 2.714 ]
00097 [ 0.693 , 2.818 ]
00098 [ 0.825 , 2.927 ]
00099 [ 1.318 , 3.133 ]
00100 [ 1.998 , 3.348 ]
00101 [ 3.366 , 3.568 ]
00102 [ 6.429 , 3.912 ]
00103 *#*****
00104 *#*****
00105 *# Restrictive Downstream Conditions (100-Year D/S Water Level = 102.77 m)
00106 ROUTE RESERVOIR NHYDout["Pfout", NHYDin="Pin",
00107 ROT=1](min),
00108 *#*****
00109 TABLE of ( OUTFLOW-STORAGE ) values
00110 ( cms ) - ( ha-m )
00111 [ 0 , 0 ]
00112 [ 0.037 , 1.563 ]
00113 [ 0.058 , 1.836 ]
00114 [ 0.106 , 2.024 ]
00115 [ 0.137 , 2.216 ]
00116 [ 0.52 , 2.313 ]
00117 [ 0.584 , 2.512 ]
00118 [ 0.642 , 2.714 ]
00119 [ 0.669 , 2.818 ]
00120 [ 0.801 , 2.922 ]
00121 [ 1.296 , 3.133 ]
00122 [ 1.976 , 3.348 ]
00123 [ 3.344 , 3.568 ]
00124 [ 6.408 , 3.912 ]
00125 *#*****
00126 *#*****
00127 *#*****
00128 *# Restrictive Downstream Conditions (100-Year D/S Water Level = 102.77 m)
00129 *# 100% Blockage of Drop Inlet Structure
00130 ROUTE RESERVOIR NHYDout["Pfout", NHYDin="Pin",
00131 ROT=1](min),
00132 *#*****
00133 TABLE of ( OUTFLOW-STORAGE ) values
00134 ( cms ) - ( ha-m )
00135 [ 0 , 0 ]
00136 [ 0.000 , 2.818 ]
00137 [ 0.106 , 2.922 ]
00138 [ 0.551 , 3.133 ]
00139 [ 1.185 , 3.348 ]
00140 [ 1.963 , 3.568 ]
00141 [ 3.352 , 3.912 ]
00142 *#*****
00143 *#*****
00144 *#*****
00145 *# SAVE STG
00146 *#*****
00147 *# Save Pond Inflow Hydrograph For Use In Preparing Pond Stage-Time Curves
00148 *# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
00149 *# SAVE HYD NHYD="Pin", # OF FCULLES=-1, ICASH=1
00150 *#*****
00151 *#*****
00152 *# Save Pond Outflow Hydrograph For Use in Calculating Average Velocity in the
00153 *# Forebay during the 10-Year Storm
00154 *# SAVE HYD NHYD="Pfout", # OF FCULLES=-1, ICASH=1
00155 *#*****
00156 *#*****
00157 *# Save Pond Outflow Hydrograph For Use in Preparing Pond Stage-Time Curves
00158 *# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
00159 *# SAVE HYD NHYD="Pfout", # OF FCULLES=-1, ICASH=1
00160 *#*****
00161 *#*****
00162 *#*****
00163 *# CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
00164 *#*****
00165 *# Overland Flow Route Capacity
00166 ROUTE CHANNEL NHYDout["OVL FR", NHYDin="Maj", ROT=1](min),
00167 CHLSP=10(m), CHLSP=10.71(%), FFLSP=0.77(%),
00168 SECSUM=1.0, NSEG=1]
00169 ( SECSUM, SECSUM (m)=10.03 9.2) NSEG times
00170 ( DISTANCE (m), ELEVATION (m)=
00171 [-15.8 , 105.60 ]
00172 [-15.8 , 105.45 ]
00173 [-6.0 , 105.35 ]
00174 [-0.0 , 105.16 ]
00175 [-4.20 , 105.65 ]
00176 [-9.20 , 106.23 ]
00177 *#*****
00178 *# Outlet Channel Capacity
00179 ROUTE CHANNEL NHYDout["Pfout", NHYDin="Pfout", ROT=1](min),
00180 CHLSP=10(m), CHLSP=10.10(%), FFLSP=10.10(%),
```

```
00181> SECSUM=1.0, NSEG=3]
00182 ( SECSUM, SECSUM (m)=10.08 -0.25, -0.035 0.25, 0.08 2.80) NSEG times
00183 ( DISTANCE (m), ELEVATION (m)=
00184 [-2.80 , 102.23 ]
00185 [-0.25 , 101.38 ]
00186 [ 0.00 , 101.38 ]
00187 [ 0.25 , 101.38 ]
00188 [ 2.80 , 102.23 ]
00189 *#*****
00190 *#*****
00191 *# STORMS
00192 *#*****
00193 *# 25 mm Storm based on 2-Year, 3-Hour Chicago Storm
00194 *#*****
00195 *#*****
00196 *#*****
00197 *# 2-Year, 3-Hour Chicago Storm
00198 *#*****
00199 *#*****
00200 *#*****
00201 *# 5-Year, 3-Hour Chicago Storm
00202 *#*****
00203 *#*****
00204 *#*****
00205 *# 10-Year, 3-Hour Chicago Storm
00206 *#*****
00207 *#*****
00208 *#*****
00209 *# 25-Year, 3-Hour Chicago Storm
00210 *#*****
00211 *#*****
00212 *#*****
00213 *# 50-Year, 3-Hour Chicago Storm
00214 *#*****
00215 *#*****
00216 *#*****
00217 *# 100-Year, 3-Hour Chicago Storm
00218 *#*****
00219 *#*****
00220 *#*****
00221 *# 2-Year, 24-Hour SCS Storm
00222 *#*****
00223 *#*****
00224 *#*****
00225 *# 5-Year, 24-Hour SCS Storm
00226 *#*****
00227 *#*****
00228 *#*****
00229 *# 10-Year, 24-Hour SCS Storm
00230 *#*****
00231 *#*****
00232 *#*****
00233 *# 25-Year, 24-Hour SCS Storm
00234 *#*****
00235 *#*****
00236 *#*****
00237 *# 50-Year, 24-Hour SCS Storm
00238 *#*****
00239 *#*****
00240 *#*****
00241 *# 100-Year, 24-Hour SCS Storm
00242 *#*****
00243 *#*****
00244 *#*****
00245 *# 2-Year, 12-Hour SCS Storm (per City of Ottawa Carp River FCSNM model)
00246 *#*****
00247 *#*****
00248 *#*****
00249 *# 5-Year, 12-Hour SCS Storm (per City of Ottawa Carp River FCSNM model)
00250 *#*****
00251 *#*****
00252 *#*****
00253 *# 10-Year, 12-Hour SCS Storm (per City of Ottawa Carp River FCSNM model)
00254 *#*****
00255 *#*****
00256 *#*****
00257 *# 25-Year, 12-Hour SCS Storm (per City of Ottawa Carp River FCSNM model)
00258 *#*****
00259 *#*****
00260 *#*****
00261 *# 50-Year, 12-Hour SCS Storm (per City of Ottawa Carp River FCSNM model)
00262 *#*****
00263 *#*****
00264 *#*****
00265 *# 100-Year, 12-Hour SCS Storm (per City of Ottawa Carp River FCSNM model)
00266 *#*****
00267 *#*****
00268 *#*****
00269 *# July 1st, 1979 Storm - Ottawa International Airport
00270 *#*****
00271 *#*****
00272 *#*****
00273 *# August 4th, 1988 Storm - Ottawa International Airport
00274 *#*****
00275 *#*****
00276 *#*****
00277 *# August 8th, 1996 Storm - Ottawa International Airport
00278 *#*****
00279 *#*****
00280 *#*****
00281 *# 100-Year, 3-Hour Chicago Storm + 20%
00282 *#*****
00283 *#*****
00284 *#*****
00285 *# 100-Year, 24-Hour SCS Storm + 20%
00286 *#*****
00287 *#*****
00288 *#*****
00289 *#*****
00290 FINISH
```

Page 0

```
00361#
00362#
00363#
00364# RUN#COMMAND#
00365# R0005:C0001-----
00366# START
00367# (TZERO = .00 hrs on 0)
00368# (METOUT= 2 (1=imperial, 2=metric output))
00369# (INFOFORM = 1)
00370# (NRUN = 0003)
00371# *****
00372# SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
00373#
00374# Project Name : [Stittville South - Davidson Co-Tenancy]
00375# Project Number : [1123-1]
00376# Date : 2015/05/06
00377# Modeler : Laura Pipkins, P.Eng.
00378# Updated : 2016/08/24 [LF]
00379# Updated : 2017/02/13 [LF]
00380# Updated : 2017/03/22 [LF]
00381# Updated : 2017/09/13 [LF]
00382# Updated : 2017/09/18 [LF]
00383# Updated : 2023/07/12 [LF]
00384# Updated : 2023/09/25 [LF]
00385# Updated : 2024/08/02 [JF]
00386# Updated : 2024/08/02 [JF]
00387# Company : J.F. Sabourin and Associates
00388# License # : 2582634
00389# *****
00390# R0005:C0002-----
00391# READ STORM
00392#
00393# Comment = CHICAGO STORM 5 Year, 3 Hours
00394# (SDT=10.00:SDUR= 3.00:PTOT= 42.51)
00395# R0005:C0003-----
00396# DEFAULT VALUES
00397# FileNm = C:\Temp\SWMHYMO\Davidson Post-Dev\Ottawa.val
00398# ICASDev = 1 (read and print data)
00399# FileTitle= File comment: [Parameters for City of Ottawa Projects]
00400# THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
00401# Horton's infiltration equation parameters:
00402# [P= 76.20 mm/hr] [Pc=13.20 mm/hr] [ICAc= 4.14 /hr] [P= .00 mm]
00403# Parameters for PERVIOUS surfaces in STANDBY:
00404# [Iape= 4.67 mm] [LGP=40.00 mm] [MNP= .250]
00405# Parameters for IMPERVIOUS surfaces in STANDBY:
00406# [Ialpe= 1.57 mm] [CLi= 1.50] [MNI= .013]
00407# Parameters used in NASTB:
00408# [Ia= 4.67 mm] [N= 3.00]
00409# Average monthly Pan Evaporation data in (mm)
00410# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
00411# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
00412# Average monthly Potential Evapotranspiration in (mm)
00413# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
00414# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
00415# *****
00416# PROPOSED DEVELOPMENT - FREE OUTFALL HYDROGRAPH
00417# *****
00418# MINOR SYSTEM HYDROGRAPH PROVIDED SEPTEMBER 2017 BY IBI Group
00419# R0005:C0004-----
00420# READ HYD 1.0 01:Min 37.55 4.623 No date 1:10 26.67 n/a .000
00421# FileNm= C:\Temp\SWMHYMO\Davidson Post-Dev\10n1
00422# Comment = MINOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
00423# Major system hydrograph provided September 2017 by IBI Group
00424# R0005:C0005-----
00425# READ HYD 10.0 01:Min .00 .000 No date 0:00 .00 n/a .000
00426# FileNm= C:\Temp\SWMHYMO\Davidson Post-Dev\10n1
00427# Comment = MAJOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
00428# PROPOSED BLOCK
00429# R0005:C0006-----
00430# DESIGN STANDBY 1.0 01: Pond 3.07 .379 No date 1:00 23.46 .552 .000
00431# [XIMP= .58:TIMP= .63]
00432# [SLF= .50:DT= 1.00]
00433# [LOSS= 1: HORTONS]
00434# Proposed Additional Area Requested by DESL, July 2024
00435# R0005:C0007-----
00436# DESIGN STANDBY -----
00437# [XIMP= .58:TIMP= .63]
00438# [SLF= .50:DT= 1.00]
00439# [LOSS= 1: HORTONS]
00440# *****
00441# TOTAL INFLOW TO SWM FACILITY
00442# R0005:C0008-----
00443# ADD HYD 1.0 02:Min 37.55 4.623 No date 1:10 26.67 n/a .000
00444# + 10.0 02:Min .00 .000 No date 0:00 .00 n/a .000
00445# + 1.0 02: Pond 3.07 .379 No date 1:00 23.46 n/a .000
00446# + 1.0 02:Add1 4.10 .460 No date 1:01 28.44 n/a .000
00447# + 1.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin
00448# *****
00449# SWM FACILITY
00450# *****
00451# Quality control and permanent pool requirements based on MGE guidelines
00452# For enhanced quality control for wet ponds. Extended detention of the 25 mm
00453# runoff volume for 72 hours estimated for unknown erosion control requirements.
00454# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
00455# "Finalized Drain Hydrotechnical Update" by Novotek.
00456# Free Outfall Conditions
00457# R0005:C0009-----
00458# ROUTE RESERVOIR -> 1.0 02:Pin 44.72 5.177 No date 1:09 26.61 n/a .000
00459# out <= 1.0 01:FFout 44.72 .072 No date 3:25 26.61 n/a .000
00460# over <= 1.0 03:PFout .00 .000 No date 0:00 .00 n/a .000
00461# (MstToDes= 1128E+01 m3, TotOutVol= 0.000E+00 m3, N-Over= 0, TotOutVol= 0.hrs)
00462# R0005:C0010-----
00463# ADD HYD 1.0 02:Min 37.55 4.623 No date 1:10 26.67 n/a .000
00464# + 10.0 02:Min .00 .000 No date 0:00 .00 n/a .000
00465# + 1.0 02: Pond 3.07 .379 No date 1:00 23.46 n/a .000
00466# + 1.0 02:Add1 4.10 .460 No date 1:01 28.44 n/a .000
00467# + 1.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin
00468# *****
00469# SWM FACILITY
00470# *****
00471# Quality control and permanent pool requirements based on MGE guidelines
00472# For enhanced quality control for wet ponds. Extended detention of the 25 mm
00473# runoff volume for 72 hours estimated for unknown erosion control requirements.
00474# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
00475# "Finalized Drain Hydrotechnical Update" by Novotek.
00476# Free Outfall Conditions
00477# R0005:C0011-----
00478# ROUTE RESERVOIR -> 1.0 02:Pin 44.72 5.177 No date 1:09 26.61 n/a .000
00479# out <= 1.0 01:FFout 44.72 .072 No date 3:25 26.61 n/a .000
00480# over <= 1.0 03:PFout .00 .000 No date 0:00 .00 n/a .000
00481# (MstToDes= 1190E+01 m3, TotOutVol= 0.000E+00 m3, N-Over= 0, TotOutVol= 0.hrs)
00482# R0005:C0012-----
00483# SAVE HYD
00484# *****
00485# Save Pond Inflow Hydrograph For Use In Preparing Pond Stage-Time Curves
00486# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
00487# HYD= ("Pin", # OF PCVCL= [-1], ICAS= [1])
00488# HYD COMMENT= "Pond Inflow"
00489# Save Pond Outflow Hydrograph For Use In Calculating Average Velocity in the
00490# Forebay During the 10-Year Storm
00491# HYD= ("FFout", # OF PCVCL= [-1], ICAS= [1])
00492# HYD COMMENT= "Free Outfall Conditions"
00493# Save Pond Outflow Hydrograph For Use In Preparing Pond Stage-Time Curves
00494# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
00495# HYD= ("FFout", # OF PCVCL= [-1], ICAS= [1])
00496# HYD COMMENT= "Pond Outflow - Restrictive D/ Conditions"
00497# *****
00498# CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
00499# R0005:C0013-----
00500# OVERLAND FLOW ROUTE CAPACITY
00501# ROUTE CHANNEL -> 1.0 02:Min 44.72 .072 No date 3:25 26.61 n/a .000
00502# (RDT= 1.00) out<= 1.0 01:OV FR .00 .000 No date 0:00 .00 n/a .000
00503# (L/S= 10. / 100 / 0.35)
00504# (Vmax= .000:Dmax= .000)
00505# Outlet Channel Capacity
00506# R0005:C0014-----
00507# ROUTE CHANNEL -> 1.0 02:Pin 44.72 .072 No date 3:25 26.61 n/a .000
00508# (RDT= 1.00) out<= 1.0 01:FFchan 44.72 .072 No date 3:26 26.61 n/a .000
00509# (L/S= 10. / 100 / 0.35)
00510# (Vmax= .205:Dmax= .268)
00511# *****
00512# STORMS
00513# *****
00514# END OF RUN : 98
00515# *****
00516#
00517#
00518#
00519#
00520#
00521# RUN#COMMAND#
00522# R0009:C0001-----
00523# START
00524# (TZERO = .00 hrs on 0)
00525# (METOUT= 2 (1=imperial, 2=metric output))
00526# (INFOFORM = 1)
00527# (NRUN = 0009)
00528# *****
00529# SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
00530#
00531# Project Name : [Stittville South - Davidson Co-Tenancy]
00532# Project Number : [1123-1]
00533# Date : 2015/05/06
00534# Modeler : Laura Pipkins, P.Eng.
00535# Updated : 2016/08/24 [LF]
00536# Updated : 2017/02/13 [LF]
00537# Updated : 2017/03/22 [LF]
00538# Updated : 2017/09/13 [LF]
00539# Updated : 2017/09/18 [LF]
00540# Updated : 2023/07/12 [LF]
00541# Updated : 2023/09/25 [LF]
00542# Updated : 2024/08/02 [JF]
00543# Company : J.F. Sabourin and Associates
00544# License # : 2582634
00545# *****
00546# R0009:C0002-----
00547# READ STORM
00548#
00549# FileNm = storm.001
00550# Comment = CHICAGO STORM 100 Year, 3 Hours
00551# (SDT=10.00:SDUR= 3.00:PTOT= 71.66)
00552# R0009:C0003-----
00553# DEFAULT VALUES
00554# FileNm = C:\Temp\SWMHYMO\Davidson Post-Dev\Ottawa.val
00555# ICASDev = 1 (read and print data)
00556# FileTitle= File comment: [Parameters for City of Ottawa Projects]
00557# THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
00558# Horton's infiltration equation parameters:
00559# [P= 76.20 mm/hr] [Pc=13.20 mm/hr] [ICAc= 4.14 /hr] [P= .00 mm]
00560# Parameters for PERVIOUS surfaces in STANDBY:
00561# [Iape= 4.67 mm] [LGP=40.00 mm] [MNP= .250]
00562# Parameters for IMPERVIOUS surfaces in STANDBY:
00563# [Ialpe= 1.57 mm] [CLi= 1.50] [MNI= .013]
00564# Parameters used in NASTB:
00565# [Ia= 4.67 mm] [N= 3.00]
00566# Average monthly Pan Evaporation data in (mm)
00567# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
00568# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
00569# Average monthly Potential Evapotranspiration in (mm)
00570# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
00571# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
00572# *****
00573# PROPOSED DEVELOPMENT - FREE OUTFALL HYDROGRAPH
00574# *****
00575# MINOR SYSTEM HYDROGRAPH PROVIDED SEPTEMBER 2017 BY IBI Group
00576# R0009:C0004-----
00577# READ HYD 1.0 01:Min 37.55 4.623 No date 1:10 26.67 n/a .000
00578# FileNm= C:\Temp\SWMHYMO\Davidson Post-Dev\10n1
00579# Comment = MINOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
00580# Major system hydrograph provided September 2017 by IBI Group
00581# R0009:C0005-----
00582# READ HYD 10.0 01:Min .00 .000 No date 0:00 .00 n/a .000
00583# FileNm= C:\Temp\SWMHYMO\Davidson Post-Dev\10n1
00584# Comment = MAJOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
00585# PROPOSED BLOCK
00586# R0009:C0006-----
00587# DESIGN STANDBY 1.0 01: Pond 3.07 .379 No date 1:01 23.46 .552 .000
00588# [XIMP= .58:TIMP= .63]
00589# [SLF= .50:DT= 1.00]
00590# [LOSS= 1: HORTONS]
00591# Proposed Additional Area Requested by DESL, July 2024
00592# R0009:C0007-----
00593# DESIGN STANDBY -----
00594# [XIMP= .58:TIMP= .63]
00595# [SLF= .50:DT= 1.00]
00596# [LOSS= 1: HORTONS]
00597# *****
00598# TOTAL INFLOW TO SWM FACILITY
00599# R0009:C0008-----
00600# ADD HYD 1.0 02:Min 37.55 4.623 No date 1:10 26.67 n/a .000
00601# + 10.0 02:Min .00 .000 No date 0:00 .00 n/a .000
00602# + 1.0 02: Pond 3.07 .379 No date 1:00 23.46 n/a .000
00603# + 1.0 02:Add1 4.10 .460 No date 1:01 28.44 n/a .000
00604# + 1.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin
00605# *****
00606# SWM FACILITY
00607# *****
00608# Quality control and permanent pool requirements based on MGE guidelines
00609# For enhanced quality control for wet ponds. Extended detention of the 25 mm
00610# runoff volume for 72 hours estimated for unknown erosion control requirements.
00611# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
00612# "Finalized Drain Hydrotechnical Update" by Novotek.
00613# Free Outfall Conditions
00614# R0009:C0009-----
00615# ROUTE RESERVOIR -> 1.0 02:Pin 44.72 5.177 No date 1:09 26.61 n/a .000
00616# out <= 1.0 01:FFout 44.72 .072 No date 3:25 26.61 n/a .000
00617# over <= 1.0 03:PFout .00 .000 No date 0:00 .00 n/a .000
00618# (MstToDes= 2128E+01 m3, TotOutVol= 0.000E+00 m3, N-Over= 0, TotOutVol= 0.hrs)
00619# R0009:C0010-----
00620# ADD HYD 1.0 02:Min 37.55 4.623 No date 1:10 26.67 n/a .000
00621# + 10.0 02:Min .00 .000 No date 0:00 .00 n/a .000
00622# + 1.0 02: Pond 3.07 .379 No date 1:00 23.46 n/a .000
00623# + 1.0 02:Add1 4.10 .460 No date 1:01 28.44 n/a .000
00624# + 1.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin 10.0 01:Pin
00625# *****
00626# SWM FACILITY
00627# *****
00628# Quality control and permanent pool requirements based on MGE guidelines
00629# For enhanced quality control for wet ponds. Extended detention of the 25 mm
00630# runoff volume for 72 hours estimated for unknown erosion control requirements.
00631# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
00632# "Finalized Drain Hydrotechnical Update" by Novotek.
00633# Free Outfall Conditions
00634# R0009:C0011-----
00635# ROUTE RESERVOIR -> 1.0 02:Pin 44.72 5.177 No date 1:09 26.61 n/a .000
00636# out <= 1.0 01:FFout 44.72 .072 No date 3:25 26.61 n/a .000
00637# over <= 1.0 03:PFout .00 .000 No date 0:00 .00 n/a .000
00638# (MstToDes= 2321E+01 m3, TotOutVol= 0.000E+00 m3, N-Over= 0, TotOutVol= 0.hrs)
00639# R0009:C0012-----
00640# SAVE HYD
00641# *****
00642# Save Pond Inflow Hydrograph For Use In Preparing Pond Stage-Time Curves
00643# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
00644# HYD= ("Pin", # OF PCVCL= [-1], ICAS= [1])
00645# HYD COMMENT= "Pond Inflow"
00646# Save Pond Outflow Hydrograph For Use In Calculating Average Velocity in the
00647# Forebay During the 10-Year Storm
00648# HYD= ("FFout", # OF PCVCL= [-1], ICAS= [1])
00649# HYD COMMENT= "Free Outfall Conditions"
00650# Save Pond Outflow Hydrograph For Use In Preparing Pond Stage-Time Curves
00651# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
00652# HYD= ("FFout", # OF PCVCL= [-1], ICAS= [1])
00653# HYD COMMENT= "Pond Outflow - Restrictive D/ Conditions"
00654# *****
00655# CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
00656# R0009:C0013-----
00657# OVERLAND FLOW ROUTE CAPACITY
00658# ROUTE CHANNEL -> 1.0 02:Min 44.72 .072 No date 3:25 26.61 n/a .000
00659# (RDT= 1.00) out<= 1.0 01:OV FR .00 .000 No date 0:00 .00 n/a .000
00660# (L/S= 10. / 100 / 0.35)
00661# (Vmax= .000:Dmax= .000)
00662# Outlet Channel Capacity
00663# R0009:C0014-----
00664# ROUTE CHANNEL -> 1.0 02:Pin 44.72 .072 No date 3:25 26.61 n/a .000
00665# (RDT= 1.00) out<= 1.0 01:FFchan 44.72 .072 No date 3:26 26.61 n/a .000
00666# (L/S= 10. / 100 / 0.35)
00667# (Vmax= .246:Dmax= .257)
00668# *****
00669# STORMS
00670# *****
00671# END OF RUN : 100
00672# *****
00673#
00674#
00675#
00676#
00677#
00678# RUN#COMMAND#
00679# R0102:C0001-----
00680# START
00681# (TZERO = .00 hrs on 0)
00682# (METOUT= 2 (1=imperial, 2=metric output))
00683# (INFOFORM = 1)
00684# (NRUN = 0102)
00685# *****
00686# SWMHYMO Ver:5.02/Jan 2001 <BETA> / INPUT DATA FILE
00687#
00688# Project Name : [Stittville South - Davidson Co-Tenancy]
00689# Project Number : [1123-1]
00690# Date : 2015/05/06
00691# Modeler : Laura Pipkins, P.Eng.
00692# Updated : 2016/08/24 [LF]
00693# Updated : 2017/02/13 [LF]
00694# Updated : 2017/03/22 [LF]
00695# Updated : 2017/09/13 [LF]
00696# Updated : 2017/09/18 [LF]
00697# Updated : 2023/07/12 [LF]
00698# Updated : 2023/09/25 [LF]
00699# Updated : 2024/08/02 [JF]
00700# Company : J.F. Sabourin and Associates
00701# License # : 2582634
00702# *****
00703# R0102:C0002-----
00704# READ STORM
00705#
00706# FileNm = storm.001
00707# Comment = 3 Year SCS Type 2 Storm 24 Hours step 10 min, City of Ottawa
00708# (SDT=10.00:SDUR= 24.00:PTOT= 48.46)
00709# R0102:C0003-----
00710# DEFAULT VALUES
00711# FileNm = C:\Temp\SWMHYMO\Davidson Post-Dev\Ottawa.val
00712# ICASDev = 1 (read and print data)
00713# FileTitle= File comment: [Parameters for City of Ottawa Projects]
00714# THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
00715# Horton's infiltration equation parameters:
00716# [P= 76.20 mm/hr] [Pc=13.20 mm/hr] [ICAc= 4.14 /hr] [P= .00 mm]
00717# Parameters for PERVIOUS surfaces in STANDBY:
00718# [Iape= 4.67 mm] [LGP=40.00 mm] [MNP= .250]
00719# Parameters for IMPERVIOUS surfaces in STANDBY:
00720# [Ialpe= .57 mm] [CLi= 1.50] [MNI= .013]
```

Page 2

Page 3

```
01441# R0205:C0001-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01442# ROUTE CHANNEL --> 1.0 0.01FFout 44.72 .126 No.date 10:06 36.59 n/a .000
01443# [L/S/n= 10./ 700./030]
01444# (Vmax= .000)max
01445#
01446# Outlet Channel Capacity
01447# R0205:C0001-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01448# ROUTE CHANNEL --> 1.0 0.01FFout 44.72 .126 No.date 10:06 36.59 n/a .000
01449# [L/S/n= 10./ 700./030]
01450# (Vmax= .227)max
01451# (Vmax= .227)max
01452#
01453# STORMS
01454# *****
01455# ** END OF RUN : 249
01456# *****
01457#
01458#
01459#
01460#
01461#
01462#
01463# RUN#:COMMAND#
01464# R0210:C0001-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01465# START
01466# (TZERO = .00 hrs on 0)
01467# (NETOUT= 2 (Imperial, 2metric output))
01468# (NRTM= 1)
01469# (NRUN = 0210)
01470# *****
01471# SWMHYMO Ver5.02/Jan 2001 <BETA> / INPUT DATA FILE
01472# *****
01473# Project Name : [Brittville South - Davidson Co-Tenancy]
01474# Project Number : [1123-13]
01475# Date : 2015/05/06
01476# Modeller : Laura Phipps, P.Eng.
01477# Updated : 2014/08/24 [IP]
01478# Updated : 2017/02/13 [IP]
01479# Updated : 2017/03/22 [IP]
01480# Updated : 2017/09/13 [IP]
01481# Updated : 2017/09/18 [IP]
01482# Updated : 2023/07/12 [IP]
01483# Updated : 2023/07/12 [IP]
01484# Updated : 2023/09/25 [IP]
01485# Updated : 2024/08/02 [IP]
01486# Company : J.F. Sabourin and Associates
01487# License # : 2582434
01488# *****
01489# R0210:C0002-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01490# HEAD STORM
01491# File name = storm.001
01492# Comment = 10 years RCS Type 2 Storm 12 Hours step 15 min, as per Carp River U
01493# (SDT=15.00;IDDR= 12.00;POT= 67.20)
01494# R0210:C0003-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01495# *****
01496# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Ottawa.val
01497# ICASEB= 1 (read and print data)
01498# FileTitle= File comment: [Parameters for City of Ottawa Projects]
01499# The FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
01500# Horton's infiltration equation parameters:
01501# [F= 76.20 mm/hr] [F=13.20 mm/hr] [DCAV= 4.14 /hr] [F= .00 mm]
01502# Parameters for PERVIOUS surfaces in STANHYD:
01503# [Iape= 4.67 mm] [LDP=40.00 ml] [DMP= .250]
01504# Parameters for IMPERVIOUS surfaces in STANHYD:
01505# [Iape= 1.57 mm] [CLP= 1.50] [NHI= .033]
01506# Parameters used in NASTHYD:
01507# [Iaw= 4.67 mm] [W= 3.00]
01508# Average monthly Pan Evaporation data in (mm)
01509# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01510# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01511# Average monthly Potential Evapotranspiration in (mm)
01512# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01513# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01514# *****
01515# *****
01516# PROPOSED DEVELOPMENT - FREE OUTFALL HYDROGRAPHS
01517# Minor system hydrograph provided September 2017 by IBI Group
01518# R0210:C0004-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01519# READ HYD 37.55 4.990 No.date 5:52 43.60 n/a .000
01520# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Min.0210
01521# Comment = MINOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
01522# Major system hydrograph provided September 2017 by IBI Group
01523# R0210:C0005-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01524# READ HYD 37.55 4.990 No.date 5:52 43.60 n/a .000
01525# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Min.0210
01526# Comment = MINOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
01527# Major system hydrograph provided September 2017 by IBI Group
01528# R0210:C0006-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01529# PROPOSED POND BLOCK
01530# *****
01531# Drainage area characteristics as per base plan provided by DESL
01532# R0210:C0006-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01533# DESIGN STANHYD 1.0 0.01Pond 3.07 .430 No.date 6:01 39.54 .588 .000
01534# (XIMP=.45;TIMP=.45)
01535# (SLF= .50;DTR= 1.00)
01536# (LOSS= 1 : HORTONS)
01537# *****
01538# PROPOSED Additional Area Requested by DESL, July 2024
01539# R0210:C0007-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01540# DESIGN STANHYD 1.0 0.01addl 4.10 .693 No.date 6:00 46.69 .495 .000
01541# (XIMP=.45;TIMP=.63)
01542# (SLF= .50;DTR= 1.00)
01543# (LOSS= 1 : HORTONS)
01544# *****
01545# TOTAL INFLOWS TO SWM FACILITY
01546# R0210:C0008-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01547# ADD HYD 37.55 4.990 No.date 5:52 43.60 n/a .000
01548# + 15.0 02Infl 0.00 .000 No.date 0:00 .00 n/a .000
01549# + 1.0 02Pond 3.07 .430 No.date 6:01 39.54 n/a .000
01550# + 0.0 02Addl 4.10 .693 No.date 6:00 46.69 n/a .000
01551# SOW= 1.0 0.01Pin 44.72 5.872 No.date 5:54 43.60 n/a .000
01552# *****
01553# SWM FACILITY
01554# *****
01555# Quality control requirements based on WCE guidelines
01556# For enhanced quality control for wet ponds, Extended detention of the 25 mm
01557# runoff volume for 72 hours estimated for unknown erosion control requirements.
01558# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
01559# "Faulkner Drain Hydrotechnical Update" by Novatech.
01560# Free outfall conditions
01561# R0210:C0009-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01562# ROUTE RESERVOIR --> 1.0 0.01FFout 44.72 5.872 No.date 5:54 43.60 n/a .000
01563# out <= 1.0 0.01FFout 44.72 .190 No.date 8:17 43.60 n/a .000
01564# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01565# (MetDuse=1842E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01566# Restrictive Downstream Conditions (100-year D/S Water Level = 102.77 m)
01567# R0210:C0010-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01568# ROUTE RESERVOIR --> 1.0 0.02Pin 44.72 5.872 No.date 5:54 43.60 n/a .000
01569# out <= 1.0 0.01FFout 44.72 .060 No.date 12:06 8.83 n/a .000
01570# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01571# (MetDuse=1842E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01572# Restrictive Downstream Conditions (100-year D/S Water Level = 102.77 m)
01573# 100% Blockage of Drop Inlet Structure
01574# R0210:C0011-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01575# ROUTE RESERVOIR --> 1.0 0.02Pin 44.72 5.872 No.date 5:54 43.60 n/a .000
01576# out <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01577# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01578# (MetDuse=1850E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01579# *****
01580# SAVE HYD
01581# *****
01582# Save Pond Inflow Hydrograph For Use In Preparing Pond Stage-Time Curves
01583# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
01584# SAVE HYD HYD=Pin, # OF PCYCLES=[-1], ICASEB=[1]
01585# HYD COMMENT="Fond Inflow"
01586# Save Pond Outflow Hydrograph For Use In Calculating Average Velocity in the
01587# Forebay During the 10-Year Storm
01588# SAVE HYD HYD=FFout, # OF PCYCLES=[-1], ICASEB=[1]
01589# HYD COMMENT="Fond Outflow - Free Outfall Conditions"
01590# Save Pond Outflow Hydrograph For Use In Preparing Pond Stage-Time Curves
01591# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
01592# SAVE HYD HYD=FFout, # OF PCYCLES=[-1], ICASEB=[1]
01593# HYD COMMENT="Fond Outflow - Restrictive D/S Conditions"
01594# *****
01595# CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
01596# *****
01597# Overland Flow Route Capacity
01598# R0210:C0012-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01599# ROUTE CHANNEL --> 15.0 02Infl 0.00 .000 No.date 0:00 .00 n/a .000
01600# [L/S/n= 10./ 700./030]
01601# (Vmax= .000)max
01602# (Vmax= .243)max
01603# Outlet Channel Capacity
01604# R0210:C0013-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01605# ROUTE CHANNEL --> 1.0 0.02FFout 44.72 .190 No.date 8:17 43.60 n/a .000
01606# [L/S/n= 10./ 700./030]
01607# (Vmax= .243)max
01608# *****
01609# STORMS
01610# *****
01611# ** END OF RUN : 224
01612# *****
01613#
01614#
01615#
01616#
01617#
01618#
01619#
01620# RUN#:COMMAND#
01621# R0225:C0001-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01622# START
01623# (TZERO = .00 hrs on 0)
01624# (NETOUT= 2 (Imperial, 2metric output))
01625# (NRTM= 1)
01626# (NRUN = 0225)
01627# *****
01628# SWMHYMO Ver5.02/Jan 2001 <BETA> / INPUT DATA FILE
01629# *****
01630# Project Name : [Brittville South - Davidson Co-Tenancy]
01631# Project Number : [1123-13]
01632# Date : 2015/05/06
01633# Modeller : Laura Phipps, P.Eng.
01634# Updated : 2016/08/24 [IP]
01635# Updated : 2017/02/13 [IP]
01636# Updated : 2017/03/22 [IP]
01637# Updated : 2017/09/13 [IP]
01638# Updated : 2017/09/18 [IP]
01639# Updated : 2023/07/12 [IP]
01640# Updated : 2023/07/12 [IP]
01641# Updated : 2023/09/25 [IP]
01642# Updated : 2024/08/02 [IP]
01643# Company : J.F. Sabourin and Associates
01644# License # : 2582434
01645# *****
01646# R0225:C0002-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01647# HEAD STORM
01648# File name = storm.001
01649# Comment = 25 years RCS Type 2 Storm 12 Hours step 15 min, calculated as per C
01650# (SDT=15.00;IDDR= 12.00;POT= 78.44)
01651# R0225:C0003-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01652# *****
01653# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Ottawa.val
01654# ICASEB= 1 (read and print data)
01655# FileTitle= File comment: [Parameters for City of Ottawa Projects]
01656# The FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
01657# Horton's infiltration equation parameters:
01658# [F= 76.20 mm/hr] [F=13.20 mm/hr] [DCAV= 4.14 /hr] [F= .00 mm]
01659# Parameters for PERVIOUS surfaces in STANHYD:
01660# [Iape= 4.67 mm] [LDP=40.00 ml] [DMP= .250]
01661# Parameters for IMPERVIOUS surfaces in STANHYD:
01662# [Iape= 1.57 mm] [CLP= 1.50] [NHI= .033]
01663# Parameters used in NASTHYD:
01664# [Iaw= 4.67 mm] [W= 3.00]
01665# Average monthly Pan Evaporation data in (mm)
01666# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01667# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01668# Average monthly Potential Evapotranspiration in (mm)
01669# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01670# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01671# *****
01672# *****
01673# PROPOSED DEVELOPMENT - FREE OUTFALL HYDROGRAPHS
01674# Minor system hydrograph provided September 2017 by IBI Group
01675# R0225:C0004-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01676# READ HYD 37.55 4.990 No.date 5:52 43.60 n/a .000
01677# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Min.0225
01678# Comment = MINOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
01679# Major system hydrograph provided September 2017 by IBI Group
01680# R0225:C0005-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01681# READ HYD 37.55 4.990 No.date 5:52 43.60 n/a .000
01682# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Min.0225
01683# Comment = MINOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
01684# Major system hydrograph provided September 2017 by IBI Group
01685# R0225:C0006-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01686# PROPOSED POND BLOCK
01687# *****
01688# Drainage area characteristics as per base plan provided by DESL
01689# R0225:C0006-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01690# DESIGN STANHYD 1.0 0.01Pond 3.07 .430 No.date 6:01 39.54 .588 .000
01691# (XIMP=.45;TIMP=.45)
01692# (SLF= .50;DTR= 1.00)
01693# (LOSS= 1 : HORTONS)
01694# *****
01695# PROPOSED Additional Area Requested by DESL, July 2024
01696# R0225:C0007-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01697# DESIGN STANHYD 1.0 0.01addl 4.10 .854 No.date 6:00 56.29 .716 .000
01698# (XIMP=.45;TIMP=.63)
01699# (SLF= .50;DTR= 1.00)
01700# (LOSS= 1 : HORTONS)
01701# *****
01702# TOTAL INFLOWS TO SWM FACILITY
01703# R0225:C0008-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01704# ADD HYD 37.55 5.893 No.date 5:55 49.89 n/a .000
01705# + 15.0 02Infl 0.00 .000 No.date 0:00 .00 n/a .000
01706# + 1.0 0.02Pond 3.07 .558 No.date 6:01 48.27 n/a .000
01707# + 0.0 0.02Addl 4.10 .854 No.date 6:00 .00 n/a .000
01708# SOW= 1.0 0.01Pin 44.72 7.035 No.date 5:55 50.40 n/a .000
01709# *****
01710# SWM FACILITY
01711# *****
01712# Quality control requirements based on WCE guidelines
01713# For enhanced quality control for wet ponds, Extended detention of the 25 mm
01714# runoff volume for 72 hours estimated for unknown erosion control requirements.
01715# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
01716# "Faulkner Drain Hydrotechnical Update" by Novatech.
01717# Free outfall conditions
01718# R0225:C0009-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01719# ROUTE RESERVOIR --> 1.0 0.02Pin 44.72 7.035 No.date 5:55 50.40 n/a .000
01720# out <= 1.0 0.01FFout 44.72 .270 No.date 7:16 50.40 n/a .000
01721# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01722# (MetDuse=1918E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01723# Restrictive Downstream Conditions (100-year D/S Water Level = 102.77 m)
01724# R0225:C0010-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01725# ROUTE RESERVOIR --> 1.0 0.02Pin 44.72 7.035 No.date 5:55 50.40 n/a .000
01726# out <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01727# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01728# (MetDuse=2052E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01729# Restrictive Downstream Conditions (100-year D/S Water Level = 102.77 m)
01730# 100% Blockage of Drop Inlet Structure
01731# R0225:C0011-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01732# ROUTE RESERVOIR --> 1.0 0.02Pin 44.72 7.035 No.date 5:55 50.40 n/a .000
01733# out <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01734# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01735# (MetDuse=2284E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01736# *****
01737# CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
01738# *****
01739# Overland Flow Route Capacity
01740# R0225:C0012-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01741# ROUTE CHANNEL --> 15.0 02Infl 0.00 .034 No.date 5:430399.65 n/a .000
01742# [L/S/n= 10./ 700./030]
01743# (Vmax= .243)max
01744# (Vmax= .243)max
01745# Outlet Channel Capacity
01746# R0225:C0013-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01747# ROUTE CHANNEL --> 1.0 0.02FFout 44.72 .270 No.date 7:16 50.40 n/a .000
01748# [L/S/n= 10./ 700./030]
01749# (Vmax= .243)max
01750# *****
01751# STORMS
01752# *****
01753# ** END OF RUN : 249
01754# *****
01755#
01756#
01757#
01758#
01759#
01760#
01761#
01762# RUN#:COMMAND#
01763# R0270:C0001-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01764# START
01765# (TZERO = .00 hrs on 0)
01766# (NETOUT= 2 (Imperial, 2metric output))
01767# (NRTM= 1)
01768# (NRUN = 0210)
01769# *****
01770# SWMHYMO Ver5.02/Jan 2001 <BETA> / INPUT DATA FILE
01771# *****
01772# Project Name : [Brittville South - Davidson Co-Tenancy]
01773# Project Number : [1123-13]
01774# Date : 2015/05/06
01775# Modeller : Laura Phipps, P.Eng.
01776# Updated : 2016/08/24 [IP]
01777# Updated : 2017/02/13 [IP]
01778# Updated : 2017/03/22 [IP]
01779# Updated : 2017/09/13 [IP]
01780# Updated : 2017/09/18 [IP]
01781# Updated : 2023/07/12 [IP]
01782# Updated : 2023/07/12 [IP]
01783# Updated : 2023/09/25 [IP]
01784# Updated : 2024/08/02 [IP]
01785# Company : J.F. Sabourin and Associates
01786# License # : 2582434
01787# *****
01788# R0270:C0002-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01789# HEAD STORM
01790# File name = storm.001
01791# Comment = 25 years RCS Type 2 Storm 12 Hours step 15 min, calculated as per C
01792# (SDT=15.00;IDDR= 12.00;POT= 78.44)
01793# R0270:C0003-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01794# *****
01795# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Ottawa.val
01796# ICASEB= 1 (read and print data)
01797# FileTitle= File comment: [Parameters for City of Ottawa Projects]
01798# The FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
01799# Horton's infiltration equation parameters:
01800# [F= 76.20 mm/hr] [F=13.20 mm/hr] [DCAV= 4.14 /hr] [F= .00 mm]
01801# Parameters for PERVIOUS surfaces in STANHYD:
01802# [Iape= 4.67 mm] [LDP=40.00 ml] [DMP= .250]
01803# Parameters for IMPERVIOUS surfaces in STANHYD:
01804# [Iape= 1.57 mm] [CLP= 1.50] [NHI= .033]
01805# Parameters used in NASTHYD:
01806# [Iaw= 4.67 mm] [W= 3.00]
01807# Average monthly Pan Evaporation data in (mm)
01808# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01809# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01810# Average monthly Potential Evapotranspiration in (mm)
01811# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
01812# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
01813# *****
01814# *****
01815# PROPOSED DEVELOPMENT - FREE OUTFALL HYDROGRAPHS
01816# Minor system hydrograph provided September 2017 by IBI Group
01817# R0270:C0004-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01818# READ HYD 37.55 4.990 No.date 5:52 43.60 n/a .000
01819# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Min.0210
01820# Comment = MINOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
01821# Major system hydrograph provided September 2017 by IBI Group
01822# R0270:C0005-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01823# READ HYD 37.55 4.990 No.date 5:52 43.60 n/a .000
01824# File name = C:\Temp\SWMHYMO\Davidson Post-Dev\Min.0210
01825# Comment = MINOR SYSTEM FLOW FROM DAVIDSON CO-TENANCY (SEPTEMBER 2017,
01826# Major system hydrograph provided September 2017 by IBI Group
01827# R0270:C0006-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01828# PROPOSED POND BLOCK
01829# *****
01830# Drainage area characteristics as per base plan provided by DESL
01831# R0270:C0006-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01832# DESIGN STANHYD 1.0 0.01Pond 3.07 .430 No.date 6:01 39.54 .588 .000
01833# (XIMP=.45;TIMP=.45)
01834# (SLF= .50;DTR= 1.00)
01835# (LOSS= 1 : HORTONS)
01836# *****
01837# PROPOSED Additional Area Requested by DESL, July 2024
01838# R0270:C0007-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01839# DESIGN STANHYD 1.0 0.01addl 4.10 .693 No.date 6:00 46.69 .495 .000
01840# (XIMP=.45;TIMP=.63)
01841# (SLF= .50;DTR= 1.00)
01842# (LOSS= 1 : HORTONS)
01843# *****
01844# TOTAL INFLOWS TO SWM FACILITY
01845# R0270:C0008-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01846# ADD HYD 37.55 4.990 No.date 5:52 43.60 n/a .000
01847# + 15.0 02Infl 0.00 .000 No.date 0:00 .00 n/a .000
01848# + 1.0 0.02Pond 3.07 .430 No.date 6:01 39.54 n/a .000
01849# + 0.0 0.02Addl 4.10 .693 No.date 6:00 46.69 n/a .000
01850# SOW= 1.0 0.01Pin 44.72 5.872 No.date 5:54 43.60 n/a .000
01851# *****
01852# SWM FACILITY
01853# *****
01854# Quality control requirements based on WCE guidelines
01855# For enhanced quality control for wet ponds, Extended detention of the 25 mm
01856# runoff volume for 72 hours estimated for unknown erosion control requirements.
01857# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
01858# "Faulkner Drain Hydrotechnical Update" by Novatech.
01859# Free outfall conditions
01860# R0270:C0009-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01861# ROUTE RESERVOIR --> 1.0 0.01FFout 44.72 5.872 No.date 5:54 43.60 n/a .000
01862# out <= 1.0 0.01FFout 44.72 .190 No.date 8:17 43.60 n/a .000
01863# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01864# (MetDuse=1842E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01865# Restrictive Downstream Conditions (100-year D/S Water Level = 102.77 m)
01866# R0270:C0010-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01867# ROUTE RESERVOIR --> 1.0 0.02Pin 44.72 5.872 No.date 5:54 43.60 n/a .000
01868# out <= 1.0 0.01FFout 44.72 .060 No.date 12:06 8.83 n/a .000
01869# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01870# (MetDuse=1842E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01871# Restrictive Downstream Conditions (100-year D/S Water Level = 102.77 m)
01872# 100% Blockage of Drop Inlet Structure
01873# R0270:C0011-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01874# ROUTE RESERVOIR --> 1.0 0.02Pin 44.72 5.872 No.date 5:54 43.60 n/a .000
01875# out <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01876# overflow <= 1.0 0.01FFout 44.72 .000 No.date 0:00 .00 n/a .000
01877# (MetDuse=1850E+01 m3, TotOutVol=.000E+00 m3, N-Ov= 0, TotDurOv= 0 hrs)
01878# *****
01879# SAVE HYD
01880# *****
01881# Save Pond Inflow Hydrograph For Use In Preparing Pond Stage-Time Curves
01882# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
01883# SAVE HYD HYD=Pin, # OF PCYCLES=[-1], ICASEB=[1]
01884# HYD COMMENT="Fond Inflow"
01885# Save Pond Outflow Hydrograph For Use In Calculating Average Velocity in the
01886# Forebay During the 10-Year Storm
01887# SAVE HYD HYD=FFout, # OF PCYCLES=[-1], ICASEB=[1]
01888# HYD COMMENT="Fond Outflow - Free Outfall Conditions"
01889# Save Pond Outflow Hydrograph For Use In Preparing Pond Stage-Time Curves
01890# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
01891# SAVE HYD HYD=FFout, # OF PCYCLES=[-1], ICASEB=[1]
01892# HYD COMMENT="Fond Outflow - Restrictive D/S Conditions"
01893# *****
01894# CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
01895# *****
01896# Overland Flow Route Capacity
01897# R0270:C0012-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
01898# ROUTE CHANNEL --> 15.0 02Infl 0.00 .000 No.date 0:00 .00 n/a .000
01899# [L/S/n= 10./ 700./030]
01900# (Vmax= .000)max
01901# (Vmax= .243)max
01902# Outlet Channel Capacity
01903# R0270:C0013-----DtnIn-ID:HYND-----AREAA-QFEARCS=TpeakDate hh:mm-----RvM=R-C-----DWfmsC
0190
```

Page 5

```
02161# DESIGN STANDARD 1.0 01:Pond 3.07 .572 Mo date 1:32 60.35 .719 .000
02162# [XIMP=50:DT=1.00]
02163# [LOSS=1:WORTON]
02164# [LOSS=1:WORTON]
02165# Proposed Additional Area Requested by DEEL, July 2024
02166# R0989:C00007-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02167# DESIGN STANDARD 1.0 01:Addl 4.10 .876 Mo date 1:31 67.19 .800 .000
02168# [XIMP=58:TIMP=63]
02169# [SLF=50:DT=1.00]
02170# [LOSS=1:WORTON]
02171# TOTAL INFLOWS TO SWM FACILITY-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02172# R0979:C00008-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02173# ADD HYD 37.55 7.092 Mo date 1:38 67.13 n/a .000
02174# + 5.0 02:Infl 0.0 .112 Mo date 1:30 n/a .000
02175# + 1.0 02:Infl 3.07 .572 Mo date 1:32 60.35 n/a .000
02176# + 1.0 02:Infl 4.10 .876 Mo date 1:31 67.19 n/a .000
02177# + 1.0 02:Infl 44.72 8.483 Mo date 1:33 67.07 n/a .000
02178# SOW 1.0 01:Pin 44.72 8.483 Mo date 1:33 67.07 n/a .000
02179# SOW 1.0 01:Pin 44.72 8.483 Mo date 1:33 67.07 n/a .000
02180# SOW 1.0 01:Pin 44.72 8.483 Mo date 1:33 67.07 n/a .000
02181# SWM FACILITY-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02182# #####
02183# Quality control and permanent pool requirements based on MCE guidelines
02184# For enhanced quality control for wet ponds. Extended detention of the 25 mm
02185# runoff volume for 72 hours estimated for unknown erosion control requirements.
02186# 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
02187# "Faulkner Drain Hydrotechnical Update" by Novatech.
02188# Free Outfall Conditions
02189# R0979:C00009-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02190# ROUTE RESERVOIR -> 1.0 02:Pin 44.72 8.483 Mo date 1:33 67.07 n/a .000
02191# out <= 1.0 01:PfOut 44.72 .669 Mo date 2:23 67.06 n/a .000
02192# overlow <= 1.0 03:PFout 0.0 .000 Mo date 0:00 .00 n/a .000
02193# (MstToUsed=.272E+01 m3, TotOfVol=.000E+00 m3, N-OvF= 0, TotOfDurF= 0.hrs)
02194# Restrictive Downstream Conditions (100-Year D/S Water Level = 102.77 m)
02195# R0979:C00110-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02196# ROUTE RESERVOIR -> 1.0 02:Pin 44.72 8.483 Mo date 1:33 67.07 n/a .000
02197# out <= 1.0 01:PfOut 44.72 .669 Mo date 2:23 67.11 n/a .000
02198# overlow <= 1.0 03:PFout 0.0 .000 Mo date 0:00 .00 n/a .000
02199# (MstToUsed=.273E+01 m3, TotOfVol=.000E+00 m3, N-OvF= 0, TotOfDurF= 0.hrs)
02200# Restrictive Downstream Conditions (100-Year D/S Water Level = 102.77 m)
02201# 100% Blockage of Drop Inlet Structure
02202# R0979:C00111-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02203# ROUTE RESERVOIR -> 1.0 02:Pin 44.72 8.483 Mo date 1:33 67.07 n/a .000
02204# out <= 1.0 01:PfOut 44.72 .119 Mo date 3:02 4.44 n/a .000
02205# overlow <= 1.0 03:PFout 0.0 .000 Mo date 0:00 .00 n/a .000
02206# (MstToUsed=.293E+01 m3, TotOfVol=.000E+00 m3, N-OvF= 0, TotOfDurF= 0.hrs)
02207# #####
02208# SAVE HYD
02209# #####
02210# Save Pond Inflow Hydrograph For Use In Calculating Average Velocity in the
02211# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
02212# SAVE HYD HYD COMMENT="Fond Inflow", # OF FCYCLER=[-1], ICAESAB=[1]
02213# #####
02214# Save Pond Outflow Hydrograph For Use In Calculating Average Velocity in the
02215# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
02216# SAVE HYD HYD COMMENT="Fond Outflow", # OF FCYCLER=[-1], ICAESAB=[1]
02217# #####
02218# Save Pond Outflow Hydrograph For Use In Preparing Pond Stage-Time Curves
02219# For Use in IBI Group's HGL Analysis of the Upstream Subdivision
02220# SAVE HYD HYD COMMENT="Fond Outflow - Free Outfall Conditions", # OF FCYCLER=[-1], ICAESAB=[1]
02221# #####
02222# Save Pond Outflow Hydrograph For Use In Preparing Pond Stage-Time Curves
02223# Restrictive D/S Conditions"
02224# #####
02225# CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
02226# R0979:C00112-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02227# ROUTE CHANNEL -> 1.0 02:Pin 44.72 8.483 Mo date 1:33 67.07 n/a .000
02228# (RDF=1.00) out<= 1.0 01:OV FR 0.0 .112 Mo date 1:26 n/a .000
02229# (L/S/m= 10././700./030)
02230# (Vmax= 431.0max= 114)
02231# Outlet Channel Capacity
02232# R0979:C00113-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02233# ROUTE CHANNEL -> 1.0 02:Pin 44.72 .669 Mo date 2:23 67.06 n/a .000
02234# (RDF=1.00) out<= 1.0 01:PFchan 44.72 .669 Mo date 2:25 67.06 n/a .000
02235# (L/S/m= 10././100./035)
02236# (Vmax= 302.0max= .779)
02237# #####
02238# STORMS
02239# #####
02240# END OF RUN = 995
02241# #####
02242# #####
02243# #####
02244# #####
02245# #####
02246# #####
02247# #####
02248# #####
02249# #####
02250# #####
02251# [TERR= 0.00 hrs on 0]
02252# [METOUT= 2 [Impiserial, 2metric output]]
02253# [NIN= 0986]
02254# [NIN= 0986]
02255# #####
02256# SWMHYMO Ver.5.02/Jan 2001 <BETA> / INPUT DATA FILE
02257# #####
02258# Project Name : [Stittville South - Davidson Co-Tenancy]
02259# Project Number: [1123-13]
02260# Date : 2015/03/06
02261# Modeller : Laura Pipkins, P.Eng.
02262# Updated : 2016/09/14 [IP]
02263# Updated : 2017/02/13 [IP]
02264# Updated : 2017/03/22 [IP]
02265# Updated : 2017/09/13 [IP]
02266# Updated : 2017/09/18 [IP]
02267# Updated : 2023/07/14 [IP]
02268# Updated : 2023/07/12 [IP]
02269# Updated : 2023/09/25 [IP]
02270# Updated : 2024/08/02 [IP]
02271# Company : J.F. Sabourin and Associates
02272# License # : 2582634
02273# #####
02274# R0988:C00002-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02275# READ STORM
02276# Filename = storm.001
02277# Comment = August 8th, 1988 Storm (5h) - Ottawa International Airport step 5
02278# (SDT= 5.00;SDUR= 5.98;TOT= 80.59)
02279# R0988:C00003-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02280# DEFAULT VALUES
02281# Filename = C:\Temp\SWMHYMO\Davidson Post-Dev\Ottawa.val
02282# FileTitle File comment: [Parameters for City of Ottawa Projects]
02283# The FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
02284# Horton's infiltration equation parameters:
02285# [Fw= 76.20 mm/hr [Fw=10.20 mm/hr] [DCAV= 4.14 /hr] [Fr= .00 mm]
02286# Parameters for IMPERVIOUS surfaces in STANDARD:
02287# [Iperm= 4.67 mm] [LSP=40.00 m] [IMPV=.250]
02288# Parameters for IMPERVIOUS surfaces in STANDARD:
02289# [Iimp= 1.57 mm] [Ct= 1.50] [NHI= .031]
02290# Parameters used in NASHDT:
02291# [Iw= 4.67 mm] [W= 3.00]
02292# Average monthly Pan Evaporation data in (mm)
02293# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
02294# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
02295# Average monthly Potential Evapotranspiration in (mm)
02296# JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
02297# .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
02298# #####
02299# #####
02300# #####
02301# PROPOSED DEVELOPMENT - FREE OUTFALL HYDROGRAPHS
02302# #####
02303# Minor system hydrograph provided September 2017 by IBI Group
02304# R0988:C00004-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02305# READ HYD 37.55 7.092 Mo date 1:38 67.13 n/a .000
02306# Filename = C:\Temp\SWMHYMO\Davidson Post-Dev\Min.0986
02307# Comment = MINOR SYSTEM FLOW FROM DIVISION CO-TENANCY (SEPTEMBER 2017,
02308# Major system hydrograph provided September 2017 by IBI Group
02309# R0988:C00005-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02310# READ HYD 37.55 7.092 Mo date 1:38 67.13 n/a .000
02311# Filename = C:\Temp\SWMHYMO\Davidson Post-Dev\Maj.0986
02312# Comment = MAJOR SYSTEM FLOW FROM DIVISION CO-TENANCY (SEPTEMBER 2017,
02313# #####
02314# PROPOSED POND BLOCK
02315# #####
02316# Drainage area characteristics as per base plan provided by DEEL
02317# R0988:C00006-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02318# DESIGN STANDARD 1.0 01:Pond 3.07 .686 Mo date 2:00 56.24 .698 .000
02319# [XIMP=45:TIMP=45]
02320# [SLF=50:DT=1.00]
02321# [LOSS=1:WORTON]
02322# Proposed Additional Area Requested by DEEL, July 2024
02323# R0988:C00007-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02324# DESIGN STANDARD 1.0 01:Addl 4.10 1.033 Mo date 2:01 63.25 .785 .000
02325# [XIMP=58:TIMP=63]
02326# [SLF=50:DT=1.00]
02327# [LOSS=1:WORTON]
02328# #####
02329# TOTAL INFLOWS TO SWM FACILITY
02330# #####
02331# R0988:C00008-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02332# ADD HYD 37.55 7.092 Mo date 1:38 67.13 n/a .000
02333# + 5.0 02:Infl 0.0 .118 Mo date 1:56:59.99 n/a .000
02334# + 1.0 02:Pond 3.07 .686 Mo date 2:00 56.24 n/a .000
02335# + 1.0 02:Infl 4.10 1.033 Mo date 2:01 63.25 n/a .000
02336# SOW 1.0 01:Pin 44.72 8.538 Mo date 2:01 57.37 n/a .000
02337# SOW 1.0 01:Pin 44.72 8.538 Mo date 2:01 57.37 n/a .000
02338# SWM FACILITY-----DtnIn-ID:HYND-----AREAbA-QFEARcMs-TPeakDate_hh:mm-----RvMm-R.C-----DWfCms
02339# #####
02340# Quality control and permanent pool requirements based on MCE guidelines
02341# #####
02342# #####
02343# #####
02344# #####
02345# #####
02346# #####
02347# #####
02348# #####
02349# #####
02350# #####
02351# #####
02352# #####
02353# #####
02354# #####
02355# #####
02356# #####
02357# #####
02358# #####
02359# #####
02360# #####
02361# #####
02362# #####
02363# #####
02364# #####
02365# #####
02366# #####
02367# #####
02368# #####
02369# #####
02370# #####
02371# #####
02372# #####
02373# #####
02374# #####
02375# #####
02376# #####
02377# #####
02378# #####
02379# #####
02380# #####
02381# #####
02382# #####
02383# #####
02384# #####
02385# #####
02386# #####
02387# #####
02388# #####
02389# #####
02390# #####
02391# #####
02392# #####
02393# #####
02394# #####
02395# #####
02396# #####
02397# #####
02398# #####
02399# #####
02400# #####
02401# #####
02402# #####
02403# #####
02404# #####
02405# #####
02406# #####
02407# #####
02408# #####
02409# #####
02410# #####
02411# #####
02412# #####
02413# #####
02414# #####
02415# #####
02416# #####
02417# #####
02418# #####
02419# #####
02420# #####
02421# #####
02422# #####
02423# #####
02424# #####
02425# #####
02426# #####
02427# #####
02428# #####
02429# #####
02430# #####
02431# #####
02432# #####
02433# #####
02434# #####
02435# #####
02436# #####
02437# #####
02438# #####
02439# #####
02440# #####
02441# #####
02442# #####
02443# #####
02444# #####
02445# #####
02446# #####
02447# #####
02448# #####
02449# #####
02450# #####
02451# #####
02452# #####
02453# #####
02454# #####
02455# #####
02456# #####
02457# #####
02458# #####
02459# #####
02460# #####
02461# #####
02462# #####
02463# #####
02464# #####
02465# #####
02466# #####
02467# #####
02468# #####
02469# #####
02470# #####
02471# #####
02472# #####
02473# #####
02474# #####
02475# #####
02476# #####
02477# #####
02478# #####
02479# #####
02480# #####
02481# #####
02482# #####
02483# #####
02484# #####
02485# #####
02486# #####
02487# #####
02488# #####
02489# #####
02490# #####
02491# #####
02492# #####
02493# #####
02494# #####
02495# #####
02496# #####
02497# #####
02498# #####
02499# #####
02500# #####
02501# #####
02502# #####
02503# #####
02504# #####
02505# #####
02506# #####
02507# #####
02508# #####
02509# #####
02510# #####
02511# #####
02512# #####
02513# #####
02514# #####
02515# #####
02516# #####
02517# #####
02518# #####
02519# #####
02520# #####
02521# #####
02522# #####
02523# #####
02524# #####
02525# #####
02526# #####
02527# #####
02528# #####
02529# #####
02530# #####
02531# #####
02532# #####
02533# #####
02534# #####
02535# #####
02536# #####
02537# #####
02538# #####
02539# #####
02540# #####
02541# #####
02542# #####
02543# #####
02544# #####
02545# #####
02546# #####
02547# #####
02548# #####
02549# #####
02550# #####
02551# #####
02552# #####
02553# #####
02554# #####
02555# #####
02556# #####
02557# #####
02558# #####
02559# #####
02560# #####
02561# #####
02562# #####
02563# #####
02564# #####
02565# #####
02566# #####
02567# #####
02568# #####
02569# #####
02570# #####
02571# #####
02572# #####
02573# #####
02574# #####
02575# #####
02576# #####
02577# #####
02578# #####
02579# #####
02580# #####
02581# #####
02582# #####
02583# #####
02584# #####
02585# #####
02586# #####
02587# #####
02588# #####
02589# #####
02590# #####
02591# #####
02592# #####
02593# #####
02594# #####
02595# #####
02596# #####
02597# #####
02598# #####
02599# #####
02600# #####
02601# #####
02602# #####
02603# #####
02604# #####
02605# #####
02606# #####
02607# #####
02608# #####
02609# #####
02610# #####
02611# #####
02612# #####
02613# #####
02614# #####
02615# #####
02616# #####
02617# #####
02618# #####
02619# #####
02620# #####
02621# #####
02622# #####
02623# #####
02624# #####
02625# #####
02626# #####
02627# #####
02628# #####
02629# #####
02630# #####
02631# #####
02632# #####
02633# #####
02634# #####
02635# #####
02636# #####
02637# #####
02638# #####
02639# #####
02640# #####
02641# #####
02642# #####
02643# #####
02644# #####
02645# #####
02646# #####
02647# #####
02648# #####
02649# #####
02650# #####
02651# #####
02652# #####
02653# #####
02654# #####
02655# #####
02656# #####
02657# #####
02658# #####
02659# #####
02660# #####
02661# #####
02662# #####
02663# #####
02664# #####
02665# #####
02666# #####
02667# #####
02668# #####
02669# #####
02670# #####
02671# #####
02672# #####
02673# #####
02674# #####
02675# #####
02676# #####
02677# #####
02678# #####
02679# #####
02680# #####
02681# #####
02682# #####
02683# #####
02684# #####
02685# #####
02686# #####
02687# #####
02688# #####
02689# #####
02690# #####
02691# #####
02692# #####
02693# #####
02694# #####
02695# #####
02696# #####
02697# #####
02698# #####
02699# #####
02700# #####
02701# #####
02702# #####
02703# #####
02704# #####
02705# #####
02706# #####
02707# #####
02708# #####
02709# #####
02710# #####
02711# #####
02712# #####
02713# #####
02714# #####
02715# #####
02716# #####
02717# #####
02718# #####
02719# #####
02720# #####
02721# #####
02722# #####
02723# #####
02724# #####
02725# #####
02726# #####
02727# #####
02728# #####
02729# #####
02730# #####
02731# #####
02732# #####
02733# #####
02734# #####
02735# #####
02736# #####
02737# #####
02738# #####
02739# #####
02740# #####
02741# #####
02742# #####
02743# #####
02744# #####
02745# #####
02746# #####
02747# #####
02748# #####
02749# #####
02750# #####
02751# #####
02752# #####
02753# #####
02754# #####
02755# #####
02756# #####
02757# #####
02758# #####
02759# #####
02760# #####
02761# #####
02762# #####
02763# #####
02764# #####
02765# #####
02766# #####
02767# #####
02768# #####
02769# #####
02770# #####
02771# #####
02772# #####
02773# #####
02774# #####
02775# #####
02776# #####
02777# #####
02778# #####
02779# #####
02780# #####
02781# #####
02782# #####
02783# #####
02784# #####
02785# #####
02786# #####
02787# #####
02788# #####
02789# #####
02790# #####
02791# #####
02792# #####
02793# #####
02794# #####
02795# #####
02796# #####
02797# #####
02798# #####
02799# #####
02800# #####
02801# #####
02802# #####
02803# #####
02804# #####
02805# #####
02806# #####
02807# #####
02808# #####
02809# #####
02810# #####
02811# #####
02812# #####
02813# #####
02814# #####
02815# #####
02816# #####
02817# #####
02818# #####
02819# #####
02820# #####
02821# #####
02822# #####
02823# #####
02824# #####
02825# #####
02826# #####
02827# #####
02828# #####
02829# #####
02830# #####
02831# #####
02832# #####
02833# #####
02834# #####
02835# #####
02836# #####
02837# #####
02838# #####
02839# #####
02840# #####
02841# #####
02842# #####
02843# #####
02844# #####
02845# #####
02846# #####
02847# #####
02848# #####
02849# #####
02850# #####
02851# #####
02852# #####
02853# #####
02854# #####
02855# #####
02856# #####
02857# #####
02858# #####
02859# #####
02860# #####
02861# #####
02862# #####
02863# #####
02864# #####
02865# #####
02866# #####
02867# #####
02868# #####
02869# #####
02870# #####
02871# #####
02872# #####
02873# #####
02874# #####
02875# #####
02876# #####
02877# #####
02878# #####
02879# #####
02880# #####
02881# #####
02882# #####
02883# #####
02884# #####
02885# #####
02886# #####
02887# #####
02888# #####
02889# #####
02890# #####
02891# #####
02892# #####
02893# #####
02894# #####
02895# #####
02896# #####
02897# #####
02898# #####
02899# #####
02900# #####
02901# #####
02902# #####
02903# #####
02904# #####
02905# #####
02906# #####
02907# #####
02908# #####
02909# #####
02910# #####
02911# #####
02912# #####
02913# #####
02914# #####
02915# #####
02916# #####
02917# #####
02918# #####
02919# #####
02920# #####
02921# #####
02922# #####
02923# #####
02924# #####
02925# #####
02926# #####
02927# #####
02928# #####
02929# #####
02930# #####
02931# #####
02932# #####
02933# #####
02934# #####
02935# #####
02936# #####
02937# #####
02938# #####
02939# #####
02940# #####
02941# #####
02942# #####
02943# #####
02944# #####
02945# #####
02946# #####
02947# #####
02948# #####
02949# #####
02950# #####
02951# #####
02952# #####
02953# #####
02954# #####
02955# #####
02956# #####
02957# #####
02958# #####
02959# #####
02960# #####
02961# #####
02962# #####
02963# #####
02964# #####
02965# #####
02966# #####
02967# #####
02968# #####
02969# #####
02970# #####
02971# #####
02972# #####
02973# #####
02974# #####
02975# #####
02976# #####
02977# #####
02978# #####
02979# #####
02980# #####
02981# #####
02982# #####
02983# #####
02984# #####
02985# #####
02986# #####
02987# #####
02988# #####
02989# #####
02990# #####
02991# #####
02992# #####
02993# #####
02994# #####
02995# #####
02996# #####
02997# #####
02998# #####
02999# #####
03000# #####
```

```
02521> #####
02522> # SAVE HYD
02523> #####
02524> # Save Pond Inflow Hydrograph For Use In Preparing Pond Stage-Time Curves
02525> # For Use In IRI Group's HGL Analysis of the Upstream Subdivision
02526> #SAVE HYD HYD=[PInfl], # OF PCVLEIS=[-1], ICASEsh=[1]
02527> #
02528> # Save Pond Outflow Hydrograph For Use In Calculating Average Velocity in the
02529> # Forebay During the 10-Year Storm
02530> #SAVE HYD HYD=[PFRout], # OF PCVLEIS=[-1], ICASEsh=[1]
02531> #
02532> # Save Pond Outflow Hydrograph For Use In Preparing Pond Stage-Time Curves
02533> # For Use In IRI Group's HGL Analysis of the Upstream Subdivision
02534> #SAVE HYD HYD=[PFRout], # OF PCVLEIS=[-1], ICASEsh=[1]
02535> #
02536> #####
02537> # CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
02538> #####
02539> # Overland Flow Route Capacity
02540> R0998:CO0012-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02541> ROUTE CHANNEL -> 5.0 02:ImJ .00 .052 Mo date 1:2518899.79 n/a .000
02542> [R098:1.00] out< 1.0 01:OVFL FR .00 .048 Mo date 1:2517578.54 n/a .000
02543> [L/S/m= 10.7 /100/.035]
02544> [Vmax= .385Imax=.086]
02545> # Outlet Channel Capacity
02546> R0998:CO0013-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02547> ROUTE CHANNEL -> 1.0 02:PFRout 44.72 .198 Mo date 4:00 40.36 n/a .000
02548> [R098:1.00] out< 1.0 01:PFRchan 44.72 .198 Mo date 4:02 40.58 n/a .000
02549> [L/S/m= 10.7 /100/.035]
02550> [Vmax= .245Imax=.062]
02551> #####
02552> # STORMS
02553> #####
02554> ** END OF RUN : 997
02555> #####
02556> #####
02557> #####
02558> #####
02559> #####
02560> #####
02561> #####
02562> #####
02563> R0998:CO0001-----
02564> START
02565> [TRES= .00 hrs on 0]
02566> [METOUT= 2 (1=imperial, 2=metric output)]
02567> [NETOUT= 1]
02568> [NRUN= 0998]
02569> #####
02570> # SWMHYD Ver:5.02/Jan 2001 <META> / INPUT DATA FILE
02571> #####
02572> # Project Number: 1 [Brittville South - Davidson Co-Tenancy]
02573> # Project Number: 1123-13]
02574> # Date : 2015/05/08
02575> # Modeler : Laura Fipkins, P.Eng.
02576> # Updated : 2016/08/24 [L]
02577> # Updated : 2017/02/13 [L]
02578> # Updated : 2017/03/22 [L]
02579> # Updated : 2017/09/13 [L]
02580> # Updated : 2017/09/18 [L]
02581> # Updated : 2023/07/12 [L]
02582> # Updated : 2023/07/12 [L]
02583> # Updated : 2023/09/25 [L]
02584> # Updated : 2024/08/02 [L]
02585> # Company : J.F. Sabourin & Associates
02586> # License # : 2582634
02587> #####
02588> R0998:CO0002-----
02589> READ STORM
02590> Filename = storm.001
02591> Comment = CHICAGO STORM + 20% Stress Test 100 Year, 3 Hours
02592> [STP=10.0]SDRM= 3.00[PFR= 86.00]
02593> R0998:CO0003-----
02594> #####
02595> # DEFAULT VALUES
02596> Filename = C:\Temp\SWMHYMO\Davidson Post-Dev\Ottawa.val
02597> ICASEsh = 1 (read and print data)
02598> FileTitle = File comment: [Parameters for City of Ottawa Projects]
02599> #####
02600> # THE FOLLOWING PARAMETERS ARE USED IN THE DESIGN STANDARD COM
02601> # Horton's infiltration equation parameters:
02602> [For 76.20 mm/hr] [FC=11.20 mm/hr] [ICAC= 4.14 /hr] [F= .00 mm]
02603> Parameters for PERVIOUS surfaces in STANDARD:
02604> [Iapex= 4.67 mm] [LGF=40.00 mm] [MNE= .250]
02605> Parameters for IMPERVIOUS surfaces in STANDARD:
02606> [Ialng= 1.57 mm] [CLIV= 1.50] [MNI= .013]
02607> Parameters used in MASTUD:
02608> [Ia= 4.67 mm] [SM= 3.00]
02609> Average monthly Pan Evaporation data in (mm)
02610> JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
02611> .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
02612> Average monthly Potential Evapotranspiration in (mm)
02613> JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC
02614> .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00
02615> #####
02616> # PROPOSED DEVELOPMENT - FREE OUTFLOW
02617> #####
02618> # Minor system hydrograph provided September 2017 by IRI Group
02619> R0998:CO0004-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02620> READ HYD 10.0 01:ImJ 37.55 8.192 Mo date 1:14 63.89 n/a .000
02621> [STP=10.0]SDRM= 3.00[PFR= 86.00]
02622> # Major system hydrograph provided September 2017 by IRI Group
02623> R0998:CO0005-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02624> READ HYD 10.0 01:ImJ .00 .718 Mo date 1:10***** n/a .000
02625> [STP=10.0]SDRM= 3.00[PFR= 86.00]
02626> # Major system flow from DAVIDSON CO-TENANCY (SEPTEMBER 2017,
02627> #####
02628> # PROPOSED POND BLOCK
02629> #####
02630> # Drainage area characteristics used by DSEL
02631> R0998:CO0006-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02632> DESIGN STANDARD 10.0 01:PFR 3.07 1.019 Mo date 1:01 60.48 .706 .000
02633> [XIMP= 45:TIMP= 45]
02634> [SLP= .50:DT= 1.00]
02635> [LOSS= 1 : HORTON]
02636> # Proposed Additional Area Requested by DSEL, July 2024
02637> R0998:CO0007-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02638> DESIGN STANDARD 1.0 01:AdJ 4.10 1.627 Mo date 1:00 67.81 .789 .000
02639> [XIMP= 58:TIMP= 63]
02640> [SLP= .50:DT= 1.00]
02641> [LOSS= 1 : HORTON]
02642> #####
02643> # TOTAL INFLOWS TO SWM FACILITY
02644> #####
02645> R0998:CO0008-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02646> ADD HYD 1.0 02:PFR 37.55 8.192 Mo date 1:14 63.89 n/a .000
02647> + 1.0 02:PFR .00 .718 Mo date 1:10***** n/a .000
02648> + 1.0 02:PFR 3.07 1.019 Mo date 1:01 60.48 n/a .000
02649> + 1.0 02:AdJ 4.10 1.627 Mo date 1:00 67.81 n/a .000
02650> SUM= 44.72 10.156 Mo date 1:12 66.19 n/a .000
02651> #####
02652> # SWM FACILITY
02653> #####
02654> # Quality control and permanent pool requirements based on MCE guidelines
02655> # For enhanced quality control for wet ponds, Extended detention of the 25 mm
02656> # runoff volume for 72 hours estimated for unknown erosion control requirements.
02657> # 2-, 5- and 100-year target release rates as per Table 3 of the April 2016
02658> # "Faulkner Drain Hydrotechnical Update" by Novatech.
02659> # Free Outfall Conditions
02660> R0998:CO0009-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02661> ROUTE RESERVOIR -> 1.0 02:PFR 44.72 10.156 Mo date 1:12 66.19 n/a .000
02662> out < 1.0 01:PFRout 44.72 .629 Mo date 2:27 31.24 n/a .000
02663> overflow < 1.0 03:PFRovf .00 .000 Mo date 0:00 .00 n/a .000
02664> [MdtotCsed=.2634E+01 m3, TotCovVol=.000E+00 m3, M-ovf= 0, TotDurOf= 0 hrs]
02665> # Restrictive Downstream Conditions (100-Year D/S Water Level = 102.77 m)
02666> R0998:CO0010-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02667> ROUTE RESERVOIR -> 1.0 02:PFR 44.72 10.156 Mo date 1:12 66.19 n/a .000
02668> out < 1.0 01:PFRout 44.72 .629 Mo date 2:27 31.24 n/a .000
02669> overflow < 1.0 03:PFRovf .00 .000 Mo date 0:00 .00 n/a .000
02670> [MdtotCsed=.2668E+01 m3, TotCovVol=.000E+00 m3, M-ovf= 0, TotDurOf= 0 hrs]
02671> # Restrictive Downstream Conditions (100-Year D/S Water Level = 102.77 m)
02672> # 100% Blockage of Drop Inlet Structure
02673> R0998:CO0011-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02674> ROUTE RESERVOIR -> 1.0 02:PFR 44.72 10.156 Mo date 1:12 66.19 n/a .000
02675> out < 1.0 03:PFRout 44.72 .107 Mo date 3:14 3.56 n/a .000
02676> overflow < 1.0 03:PFRovf .00 .000 Mo date 0:00 .00 n/a .000
02677> [MdtotCsed=.0928E+01 m3, TotCovVol=.000E+00 m3, M-ovf= 0, TotDurOf= 0 hrs]
02678> #####
02679> # SAVE HYD
02680> #####
02681> # Save Pond Inflow Hydrograph For Use In Preparing Pond Stage-Time Curves
02682> # For Use In IRI Group's HGL Analysis of the Upstream Subdivision
02683> #SAVE HYD HYD=[PInfl], # OF PCVLEIS=[-1], ICASEsh=[1]
02684> #
02685> # Save Pond Outflow Hydrograph For Use In Calculating Average Velocity in the
02686> # Forebay During the 10-Year Storm
02687> #SAVE HYD HYD=[PFRout], # OF PCVLEIS=[-1], ICASEsh=[1]
02688> #
02689> # Save Pond Outflow Hydrograph For Use In Preparing Pond Stage-Time Curves
02690> # For Use In IRI Group's HGL Analysis of the Upstream Subdivision
02691> #SAVE HYD HYD=[PFRout], # OF PCVLEIS=[-1], ICASEsh=[1]
02692> #
02693> #####
02694> # CHECK CAPACITIES OF OVERLAND FLOW ROUTE INTO POND AND OUTLET CHANNEL FROM POND
02695> #####
02696> # Overland Flow Route Capacity
02697> R0998:CO0012-----Dtain-ID:HYND-----AREAh-QFEARcms-TpeakDate hh:mm-----Rvm-R.C-----
02698> ROUTE CHANNEL -> 1.0 02:ImJ .00 .718 Mo date 1:10***** n/a .000
02699> [R098:1.00] out< 1.0 01:OVFL FR .00 .713 Mo date 1:10***** n/a .000
02700> [L/S/m= 10.7 /100/.035]
```

```
02881i *** WARNING: Inflow hydrograph is dry! Routing not done!
02882i R0202:C00005 READ HYD
02883i *** NOTE: The hydrograph which was read is dry.
02884i R0202:C00010 ROUTE RESERVOIR
02885i *** WARNING: Outflow volume is less than inflow volume.
02886i R0202:C00011 ROUTE RESERVOIR
02887i *** WARNING: Outflow volume is less than inflow volume.
02888i R0202:C00012 ROUTE CHANNEL ->
02889i *** WARNING: Inflow hydrograph is dry! Routing not done!
02890i R0205:C00005 READ HYD
02891i *** NOTE: The hydrograph which was read is dry.
02892i R0205:C00010 ROUTE RESERVOIR
02893i *** WARNING: Outflow volume is less than inflow volume.
02894i R0205:C00011 ROUTE RESERVOIR
02895i *** WARNING: Outflow volume is less than inflow volume.
02896i R0205:C00012 ROUTE CHANNEL ->
02897i *** WARNING: Inflow hydrograph is dry! Routing not done!
02898i R0209:C00010 ROUTE RESERVOIR
02899i *** WARNING: Outflow volume is less than inflow volume.
02900i R0209:C00011 ROUTE RESERVOIR
02901i *** WARNING: Outflow volume is less than inflow volume.
02902i R0202:C00005 READ HYD
02903i *** NOTE: The hydrograph which was read is dry.
02904i R0202:C00010 ROUTE RESERVOIR
02905i *** WARNING: Outflow volume is less than inflow volume.
02906i R0202:C00011 ROUTE RESERVOIR
02907i *** WARNING: Outflow volume is less than inflow volume.
02908i R0202:C00012 ROUTE CHANNEL ->
02909i *** WARNING: Inflow hydrograph is dry! Routing not done!
02910i R0205:C00005 READ HYD
02911i *** NOTE: The hydrograph which was read is dry.
02912i R0205:C00010 ROUTE RESERVOIR
02913i *** WARNING: Outflow volume is less than inflow volume.
02914i R0205:C00011 ROUTE RESERVOIR
02915i *** WARNING: Outflow volume is less than inflow volume.
02916i R0205:C00012 ROUTE CHANNEL ->
02917i *** WARNING: Inflow hydrograph is dry! Routing not done!
02918i R0219:C00010 ROUTE RESERVOIR
02919i *** WARNING: Outflow volume is less than inflow volume.
02920i R0219:C00011 ROUTE RESERVOIR
02921i *** WARNING: Outflow volume is less than inflow volume.
02922i R0202:C00005 READ HYD
02923i *** NOTE: The hydrograph which was read is dry.
02924i R0202:C00010 ROUTE RESERVOIR
02925i *** WARNING: Outflow volume is less than inflow volume.
02926i R0202:C00011 ROUTE RESERVOIR
02927i *** WARNING: Outflow volume is less than inflow volume.
02928i R0202:C00012 ROUTE CHANNEL ->
02929i *** WARNING: Inflow hydrograph is dry! Routing not done!
02930i R0205:C00005 READ HYD
02931i *** NOTE: The hydrograph which was read is dry.
02932i R0205:C00010 ROUTE RESERVOIR
02933i *** WARNING: Outflow volume is less than inflow volume.
02934i R0205:C00011 ROUTE RESERVOIR
02935i *** WARNING: Outflow volume is less than inflow volume.
02936i R0205:C00012 ROUTE CHANNEL ->
02937i *** WARNING: Inflow hydrograph is dry! Routing not done!
02938i R0210:C00005 READ HYD
02939i *** NOTE: The hydrograph which was read is dry.
02940i R0210:C00010 ROUTE RESERVOIR
02941i *** WARNING: Outflow volume is less than inflow volume.
02942i R0210:C00011 ROUTE RESERVOIR
02943i *** WARNING: Outflow volume is less than inflow volume.
02944i R0210:C00012 ROUTE CHANNEL ->
02945i *** WARNING: Inflow hydrograph is dry! Routing not done!
02946i R0225:C00010 ROUTE RESERVOIR
02947i *** WARNING: Outflow volume is less than inflow volume.
02948i R0225:C00011 ROUTE RESERVOIR
02949i *** WARNING: Outflow volume is less than inflow volume.
02950i R0250:C00010 ROUTE RESERVOIR
02951i *** WARNING: Outflow volume is less than inflow volume.
02952i R0250:C00011 ROUTE RESERVOIR
02953i *** WARNING: Outflow volume is less than inflow volume.
02954i R0299:C00010 ROUTE RESERVOIR
02955i *** WARNING: Outflow volume is less than inflow volume.
02956i R0299:C00011 ROUTE RESERVOIR
02957i *** WARNING: Outflow volume is less than inflow volume.
02958i R0979:C00010 ROUTE RESERVOIR
02959i *** WARNING: Outflow volume is less than inflow volume.
02960i R0979:C00011 ROUTE RESERVOIR
02961i *** WARNING: Outflow volume is less than inflow volume.
02962i R0988:C00010 ROUTE RESERVOIR
02963i *** WARNING: Outflow volume is less than inflow volume.
02964i R0988:C00011 ROUTE RESERVOIR
02965i *** WARNING: Outflow volume is less than inflow volume.
02966i R0996:C00010 ROUTE RESERVOIR
02967i *** WARNING: Outflow volume is less than inflow volume.
02968i R0996:C00011 ROUTE RESERVOIR
02969i *** WARNING: Outflow volume is less than inflow volume.
02970i R0998:C00010 ROUTE RESERVOIR
02971i *** WARNING: Outflow volume is less than inflow volume.
02972i R0998:C00011 ROUTE RESERVOIR
02973i *** WARNING: Outflow volume is less than inflow volume.
02974i R0999:C00010 ROUTE RESERVOIR
02975i *** WARNING: Outflow volume is less than inflow volume.
02976i R0999:C00011 ROUTE RESERVOIR
02977i *** WARNING: Outflow volume is less than inflow volume.
02978i Simulation ended on 2024-08-07 at 20:56:39
02979i =====
02980i
```

Table 5-9: Functioning of the Dry Pond

PARAMETER	2 YEAR CHICAGO	5 YEAR CHICAGO	100 YEAR CHICAGO	100 YEAR CHICAGO + 20%	100 YEAR 12 HOUR SCS TYPE II	100 YEAR 24 HOUR SCS TYPE II	100 YEAR 24 HOUR SCS TYPE II + 20%
Storage Utilised (cu. m)	0	0	576	1940	425	456	1138
Outflow (l/s)	58	100	492	545	484	487	515
Water Level (m)	103.46	103.54	104.55	104.73	104.52	104.52	104.63
Drawdown Time (hr)	n/a	n/a	<3	<4	<4	<4	<5

The dry pond has a freeboard of 0.45 m during the 100 year Chicago design storm and 0.27m during the stress test.

The cumulative downstream major flow hydrograph to the SWM facility was provided to the SWM facility design engineer to incorporate into the facility's design.

5.4.3 Hydraulic Evaluation

An XPSWMM hydraulic model was created for the subject site. Minor system hydrographs generated from the DDSWMM model were exported to the XPSWMM model. Minor system losses were accounted for in accordance with Appendix 6-B of the City of Ottawa Sewer Design Guidelines (October 2012).

Simulations were performed for various storms to confirm the performance of the proposed SWM facility and the hydraulic grade line (HGL) through the Davidson Lands development.

IBI Group provided SWM facility design engineer the cumulative downstream minor system hydrograph to include in the pond design. The boundary condition at the downstream MH of the Davidson Lands development (XPSWMM MH900) is a tailwater developed based on maximum water elevations for various storm events provided by SWM facility design engineer. For reference, the maximum water levels in the pond are summarized within Table 3B of the Design Brief for the Stormwater Management Pond, a copy is provided within Appendix D of this report. The below table provides summary of the tailwater elevation used for the respective design storms.

Table 5-10 Summary of Tailwater elevation at SWM facility (based on restrictive downstream conditions at pond Outlet)

DESIGN STORM	TAILWATER SURFACE ELEVATION(M)
100 year, 3 hour Chicago	103.00
100 year, 3 hour Chicago +20%	103.
100 year, 12 hour SCS	103.17
100 year, 24 hour SCS	103.12
100 year, 24 hour SCS +20%	103.24
July 1 st , 1979 (Historical)	103.25
August 4 th , 1988 (Historical)	103.08
August 8 th , 1996 (Historical)	102.76

Note: All WSEL as per DSEL Design Brief for the Stormwater Management Pond for the Davidson Lands, November 2017. See reference provided within Appendix D of this report

5.4.4 Results of Hydraulic Evaluation

The hydraulic grade line (HGL) was analyzed using the XPSWMM dynamic model for the 100 year 3 hour Chicago storm, the governing storm event for the subdivision. The corresponding stress test (100 year 3 hour Chicago storm + 20% increase in intensity) was also simulated, as were three historical storms. Both the 100 year 12 h and 24 h SCS storms were simulated for the receiving SWM facility, so they were also simulated for the subdivision. Of the two, the 100 year 24 h SCS is the more conservative within the subdivision, so the corresponding stress test was also simulated.

The HGL elevations are presented in the following **Table 5.9**, along with a comparison of under-side of footing (USF) elevations. Results for all storm events, including a simulation accounting for the emergency sanitary overflow (as discussed in **Section 6**), as well as XPSWMM model output files are provided in **Appendix D**.

Table 5-11 Storm HGL Elevations – Phase 2

POND XPSWMM NODE ⁽⁴⁾	USF ELEV. (M)	STORM EVENTS						HYDROGRAPHS CONTRIBUTING TO XPSWMM NODE
		100 YEAR 3 HOUR CHICAGO ⁽¹⁾		100 YEAR 3 HOUR CHICAGO + 20% ⁽²⁾		JULY 1, 1979 HISTORICAL ⁽³⁾		
		HGL (M)	USF [OR PG] - HGL (M)	HGL (M)	USF [OR PG] - HGL (M)	HGL (M)	USF [OR PG] - HGL (M)	
MH900 (5)	N/A	103.00	N/A	103.24	N/A	103.25	N/A	
MH115	104.30	103.00	1.30	103.24	1.06	103.26	1.04	R115A, R115B
MH114	104.45	103.00	1.45	103.25	1.20	103.28	1.17	R114
MH113	104.40	103.08	1.32	103.25	1.15	103.30	1.10	R113
MH112	104.40	103.21	1.19	103.28	1.12	103.39	1.01	S112,R112
MH111	104.55	103.41	1.14	103.49	1.06	103.56	0.99	S111
MH176	105.40	104.55	0.85	104.56	0.84	104.55	0.85	R176A,S176, R176B,S176A
MH110	104.70	103.71	0.99	103.80	0.90	103.81	0.89	R110
MH216	104.90	103.93	0.97	104.04	0.86	104.06	0.84	R216, S216
MH215	105.10	104.22	0.88	104.25	0.85	104.26	0.84	R215,S215
MH226	104.90	104.18	0.72	104.29	0.61	104.30	0.60	S226
MH225	104.90	104.30	0.60	104.41	0.49	104.41	0.49	R225
MH224	105.10	104.50	0.60	104.62	0.48	104.61	0.49	
MH234	105.36	104.84	0.52	104.96	0.40	104.95	0.41	S234
MH233	105.50	105.11	0.39	105.23	0.27	105.21	0.29	
MH232	105.70	105.12	0.58	105.24	0.46	105.21	0.49	R233, S233
MH231	106.10	105.17	0.93	105.27	0.83	105.24	0.86	S231
MH223	105.20	104.66	0.54	104.78	0.42	104.76	0.44	S223, R223
MH222	105.30	104.66	0.64	104.78	0.52	104.76	0.54	
MH221	105.79	104.68	1.11	104.79	1.00	104.77	1.02	S221
MH220	106.10	104.84	1.26	104.84	1.26	104.84	1.26	
MH109	104.95	103.89	1.06	103.99	0.96	103.97	0.98	S109
MH195	N/A	103.93	N/A	104.03	N/A	104.01	N/A	P109
MH211	105.10	104.07	1.03	104.11	0.99	104.10	1.00	S211A, S211B
MH108	104.83	104.07	0.76	104.19	0.64	104.12	0.71	S108, R108A, R108B
MH189	104.85	104.08	0.77	104.20	0.65	104.14	0.71	S189
MH188	104.85	104.12	0.73	104.26	0.59	104.18	0.67	R188A, S188B, S188A, R188B
MH187	N/A	104.15	N/A	104.31	N/A	104.21	N/A	S187A,S187B
MH186	N/A	104.19	N/A	104.36	N/A	104.25	N/A	S186
MH320	N/A	104.20	N/A	104.38	N/A	104.26	N/A	FP320

POND XPSWMM NODE ⁽⁴⁾	USF ELEV. (M)	STORM EVENTS						HYDROGRAPHS CONTRIBUTING TO XPSWMM NODE
		100 YEAR 3 HOUR CHICAGO ⁽¹⁾		100 YEAR 3 HOUR CHICAGO + 20% ⁽²⁾		JULY 1, 1979 HISTORICAL ⁽³⁾		
		HGL (M)	USF [OR PG] - HGL (M)	HGL (M)	USF [OR PG] - HGL (M)	HGL (M)	USF [OR PG] - HGL (M)	
MH185	N/A	104.25	N/A	104.44	N/A	104.31	N/A	S185,R185A,R 185B
MH305	N/A	104.26	N/A	104.43	N/A	104.31	N/A	S305
MH308	104.92	104.32	0.60	104.50	0.42	104.37	0.55	S308
MH307	105.07	104.36	0.71	104.54	0.53	104.40	0.67	
MH306	104.97	104.37	0.60	104.56	0.41	104.41	0.56	S306
MH300	105.07	104.46	0.61	104.68	0.39	104.50	0.57	S300A,S300B, R300
MH304	104.82	104.28	0.54	104.46	0.36	104.34	0.48	
MH303	104.82	104.32	0.50	104.50	0.32	104.38	0.44	S303,R303
MH302	104.87	104.34	0.53	104.52	0.35	104.39	0.48	
MH301	105.02	104.45	0.57	104.66	0.36	104.50	0.52	S301,R301A,R 301B
MH107	105.53	104.18	1.35	104.32	1.21	104.23	1.30	S107
MH205	105.50	104.25	1.25	104.38	1.12	104.28	1.22	S205
MH204	105.30	104.38	0.92	104.52	0.78	104.40	0.90	
MH203	105.00	104.55	0.45	104.70	0.30	104.57	0.43	S203A,S203B, R203
MH106	105.35	104.30	1.05	104.43	0.92	104.32	1.03	S106, R106
MH202	105.35	104.64	0.71	104.79	0.56	104.37	0.98	S202
MH201	105.25	104.70	0.55	104.85	0.40	104.43	0.82	
MH200	105.20	104.76	0.44	104.91	0.29	104.49	0.71	S200
MH105	105.49	104.32	1.17	104.46	1.03	104.34	1.15	
MH104	105.48	104.39	1.09	104.52	0.96	104.41	1.07	S104, R104
MH103	105.68	104.63	1.05	104.77	0.91	104.64	1.04	S103
MH156	107.63	105.17	2.46	105.34	2.29	105.17	2.46	R156A,R156B
MH155	106.75	105.57	1.18	105.78	0.97	105.56	1.19	S154,S155
MH145	107.28	106.39	0.89	106.42	0.86	106.39	0.89	R145
MH144	107.83	106.75	1.08	106.75	1.08	106.75	1.08	
MH143	109.15	108.77	0.38	108.77	0.38	108.77	0.38	S143
MH142	111.10	110.42	0.68	110.42	0.68	110.42	0.68	S142
MH146	110.75	110.18	0.57	110.18	0.57	110.18	0.57	S146, R146
MH141	109.52	108.61	0.91	108.62	0.90	108.61	0.91	S141A, S141B,R141
MH140	109.72	108.64	1.08	108.64	1.08	108.64	1.08	
MH139	110.75	109.88	0.87	109.88	0.87	109.88	0.87	

(1) Model file: STM_0909-100CH_2020-06-04.OUT

(2) Model file: STM_0909-120CH_2020-06-04.OUT

(3) Model file: STM_0909-19790701_2020-06-04.OUT

(4) Highlighted nodes indicate where hydrographs are imported into the XPSWMM model

(5) Boundary conditions as per approved DSEL report Table 2A in Design Brief for the Stormwater Management Pond for the Davidson Lands, November 2017.

The above tables indicate that minimum 0.3 m clearance between the USF and HGL is maintained across the subject site during the 100 year 3 hour Chicago storm event. It should be noted that the above results also indicate that there would be no severe flooding to properties during the 100 year 3 hour Chicago storm with a 20% increase in intensity, nor during the July 1 1979 historical storms. The results of the remainder of the storm events are presented in **Appendix D**.

An evaluation of the hydraulic grade line in Phase 2 was undertaken assuming that those storm sewer pipes that are partially permanently submerged have 25% accumulation of sediment. The results of the hydraulic evaluation are presented in **Appendix D**.

5.4.5 Design Criteria for Future Development Areas

The design criteria for future development areas FP135, FP320 and P109 was determined and evaluated with the 3 hour, 100 year Chicago design storm. The major flow for FP135 is contained onsite up to the 100 year Chicago, 327cu.m. of on site storage is estimated but will be confirmed at the detailed design stage. The maximum allowable minor system flow is set to the 5 year Chicago Storm and corresponds to 622 l/s. The storm HGL within the receiving MH135 during the 100 year Chicago event would be 104.95 m. The major flow for FP320 includes 10.4 cu.m. of onsite storage and outflows 344 l/s of major flow during the 100 year Chicago design storm event. The maximum allowable minor system flow is set to the 5 year Chicago Storm and corresponds to 395 l/s. The storm HGL within the receiving MH 320 during the 100 year Chicago event would be 104.20 m. The major flow for P109 is contained onsite up to the 100 year Chicago using 130 cu.m. of on site storage. The maximum allowable minor system flow is set to the 5 year Rational Method flow with an inlet time of 10 minutes as per request by the City of Ottawa and corresponds to 173 l/s. The storm HGL within the receiving MH195 would be 103.89m.

5.5 Summary of Model Output Files

The following is a reference list of the model output files including file names and storm event evaluated. The files are included on the CD enclosed in **Appendix D**.

DDSWMM:

- 5 year 3 hour Chicago: 37533-5CH.OUT, EXT37533-5CH.OUT
- 100 year 3 hour Chicago: 37533-100CH.OUT, EXT37533-100CH.OUT
- 100 year 3 hour Chicago + 20%: 37533-120CH.OUT, EXT37533-120CH.OUT
- 100 year 12 hour SCS Type II: 37533-SC12100c.OUT, EXT37533-SC12100c.OUT
- 100 year 24 hour SCS Type II: 37533-SC24100X.OUT, EXT37533-SC24100x.OUT
- 100 year 24 hour SCS Type II + 20%: 37533-SC24120x.OUT, EXT37533-SC24120x.OUT
- July 1979: 37533-19790701.OUT, EXT37533-19790701.OUT
- August 1988: 37533-19880804.OUT, EXT37533-19880804.OUT
- August 1996: 37533-19960808.OUT, EXT37533-19960808.OUT

SWMHYMO:

- 37533VXD.OUT

XPSWMM:

- 2 year 3 hour Chicago: STM_0909-2CH_2020-06-04.out
- 5 year 3 hour Chicago: STM_0909-5CH_2020-06-04.out
- 100 year 3 hour Chicago: STM_0909-100CH_2020-06-04.OUT
- 100 year 3 hour Chicago + 20%: STM_0909-120CH_2020-06-04.OUT
- 100 year 12 hour SCS Type II: STM_0912-SC12100C_2020-06-04. OUT