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STORMWATER MANAGEMENT REPORT

12506 & 12698 Heart Lake Road

Project #: 24-0825

Prepared for: Tribal Partners Canada Inc. and its management arm TDMSI

Date: October 16, 2025

Report Version: 01



October 16, 2025

Tribal Partners Canada Inc. and its management arm TDMSI
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Vaughan, Ontario L4K 3C8

Attention: Carleigh Oude-Reimerink, Vice President, Development

SUBJECT: STORMWATER MANAGEMENT REPORT, 12506 & 12698 HEART LAKE ROAD

EnVision Consultants Ltd. is pleased to present the enclosed Stormwater Management Report in support of the Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) application for the above-noted property. This report provides the stormwater management strategies for this development.

We thank you for utilizing EnVision for this assignment. If there are any questions regarding the enclosed report, please do not hesitate to contact us.

Yours sincerely,

Alex Williams, P.Eng.
Director – Land Development
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QUALITY MANAGEMENT

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PREPARED BY	Michelle Mbai, P.Eng., Michael Basciano, P.Eng.		
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DATE	October 16, 2025		

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1. INTRODUCTION

EnVision Consultants Ltd. (EnVision) was retained to act on behalf of Tribal Partners Canada Inc. and its management arm TDMSI (the 'Client') for the properties municipally known as 12506 & 12698 Heart Lake Road (the 'Site'), in the Town of Caledon and Region of Peel, to conduct a stormwater management design for the Site. It is our understanding that this assessment has been requested in support of an Official Plan Amendment (OPA) and Zoning By-Law Amendment (ZBA) application.

1.1. SITE LOCATION

The Site is a 50.9 ha parcel of land located in the Town of Caledon in Ontario. The property is currently composed of natural heritage and agricultural lands. The Site is bounded by Heart Lake Road to the east, Dougall Avenue, Larson Peak Road and existing single family residential dwellings to the west, a proposed industrial development (12304 Heart Lake Road) to the south, and agricultural lands to the north. An existing woodlot and Kilmanagh Creek are situated along the northern boundary of the Site. The Site location is illustrated in **Figure 1**.

The Site is located within the Humber River Watershed to the north and Etobicoke Creek Watershed to the south, which are both under the jurisdiction of the Toronto and Region Conservation Authority (TRCA).

1.2. SITE DESCRIPTION

The proposed development consists of four (4) industrial warehouse buildings with loading dock areas, associated truck and car parking areas as well as landscaped areas. There are 179 truck parking spaces and 1421 at-grade car parking spaces proposed including 64 barrier free/accessible car parking spaces. There will be a total of 247 loading dock facilities provided. The development plan also includes a stormwater management pond in the northwest portion of the Site.

It is our understanding that the proposed development of the Site includes the demolition of the existing on-site buildings.

The SWM design is based on the Site Plan prepared by the Architect (Powers Brown, September 2025).

1.3. STORMWATER MANAGEMENT OBJECTIVES

The objectives of the Stormwater Management Report are to:

- Determine the stormwater management needs specific to the site to ensure compliance with the Town of Caledon and TRCA SWM guidelines.
- Assess different stormwater management methods that align with both the Town/Regional regulations and the requirements of the conservation authority and propose a preferred approach.
- Outline the selected strategy, including technical details for the justification and sizing of the proposed stormwater management facilities.



- Demonstrate the suitability of the proposed stormwater management practices in the post development condition.

1.4. DESIGN CRITERIA

Stormwater management methods for the Site are in compliance with design criteria outlined by the Town of Caledon and the Region of Peel. The Stormwater Management Criteria (August 2012) issued by TRCA and WSP Humber River SWM Water Quantity Control Criteria Updates (November 2020) prepared by WSP are referenced in stormwater management analysis and design. Finally, guidelines from the Ministry of the Environment, Conservation and Parks (MECP) Stormwater Management Planning and Design Manual (SWMPD) (March 2003) are utilized for stormwater management planning. Furthermore, the Design Brief for Stormwater Management Pond E3 & Pond E4 in the South Fields Community Report (March 2008) prepared by David Schaeffer Engineering Ltd. was reviewed; this SWM Report was prepared considering the design brief.

1.4.1. QUANTITY CONTROL

As outlined in the TRCA SWM Guidelines, the proposed development shall provide post-development to pre-development quantity control for all storms (2-year through 100-year storm events). The peak flows shall be controlled using Humber River SWM Water Quantity Control Criteria Updates (WSP, 2020) unit flow rates for the West Humber River Watershed for all storms up to and including the 100-year storm. In addition, the proposed water quantity control SWM facilities should have the capacity to convey the Regional storm event (Hurricane Hazel). For flows discharging to Pond E3, flows shall not exceed the receiving capacity of the respective storm sewers, or peak flows from the portion of the Site used in the original design of Pond E3.

1.4.2. QUALITY CONTROL

The MECP SWMPD requires 80% total suspended solids (TSS) removal to provide enhanced (Level 1) protection for this Site.

1.4.3. EROSION CONTROL

According to TRCA SWM Criteria, the extended detention of the 25 mm event for a period of 48 hours is required for SWM ponds.

1.4.4. WATER BALANCE

The proposed development shall maintain pre-development hydrologic conditions by infiltrating clean stormwater to ensure the long-term sustainability of surrounding natural features and wetlands.



1.5. REFERENCE DOCUMENTS

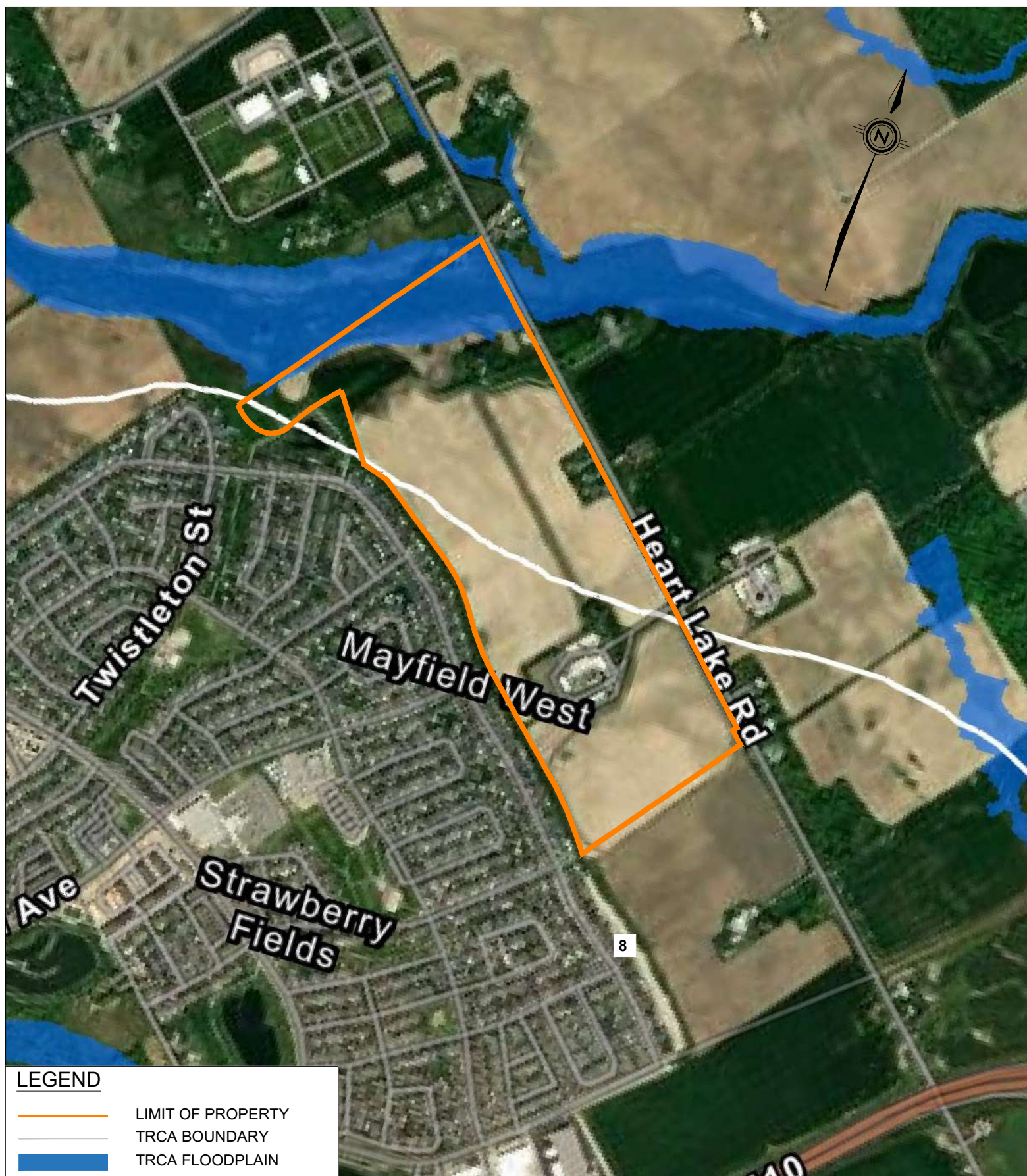
The following policies, guidelines and design documents were reviewed in preparing this SWM report:

- Stormwater Management Planning and Design (SWMPD) Manual, Ontario Ministry of Environment, Conservation and Parks (MECP), March 2003
- Stormwater Management Criteria, Toronto and Region Conservation Authority (TRCA), August 2012
- Public Works Stormwater Design Criteria and Procedural Manual, Region of Peel, June 2019
- Scoped Subwatershed Study, Region of Peel, Wood, November 2022
- Development Standards Manual, Town of Caledon, 2019
- Humber River SWM Water Quantity Control Criteria Updates, WSP, November 2020
- Final Report Humber River Hydrology Update, Civica, June 2015
- Low Impact Development Stormwater Management Planning and Design Guide, Version 1.0, Credit Valley Conservation (CVC) and Toronto and Region Conservation Authority (TRCA), 2010
- Guidance for Development Activities in Redside Dace Protected Habitat, Ministry of Natural Resources and Forestry, March 2016

The following reports and memos were reviewed in preparing this SWM report:

- Comprehensive Environmental Impact Study And Management Plan For The Mayfield West Community Development Plan Area, Dillon Consulting Ltd., David Schaeffer Engineering Ltd., and Shaheen and Peaker Ltd., November 2007
- Design Brief for South Fields Community Stormwater Management Pond E3 & Pond E4, J.F. Sabourin and Associates Inc., and David Schaeffer Engineering Ltd., August 2008
- 12506 & 12698 Heart Lake Road, Scoped Local Subwatershed Study, EnVision Consultants, October 2025
- Site Plan, 12506 Heart Lake Road, Powers Brown Architecture, October 2025
- Addendum – Supplemental Hydrogeological Information, MTE Consultants, October 2025
- 12506 & 12698 Heart Lake Road, Functional Servicing Report, EnVision Consultants, October 2025

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LEGEND

-  LIMIT OF PROPERTY
-  TRCA BOUNDARY
-  TRCA FLOODPLAIN

CLIENT	TPI ACQUISITIONS INC
TITLE	12506 HEART LAKE ROAD LOCATION PLAN



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2. EXISTING CONDITIONS

2.1. GENERAL

The existing 50.9 ha Site comprises primarily agricultural land with cultivated cover, including a woodlot and a wetland associated with Kilmanagh Creek, located along the Site's northern boundary. The area surrounding the woodlot and the Creek falls within the Greenbelt Plan and will be excluded from the proposed development. The watercourse and woodlot area will remain undisturbed and unchanged following development. As such, only 41.7 ha will be developed and will be considered in the stormwater management strategy discussed in this report.

The drainage areas within the Site have been delineated using the Topographic survey completed by J.D. Barnes Ltd. (2024). A review of elevation data from Ontario GeoHub mapping indicates no evidence of significant external drainage from adjacent existing properties onto the Site. Existing conditions and drainage patterns are illustrated in [Figure 2](#).

The existing Site is divided into four internal catchments (101, 102, 103, and 104) within the proposed development area. Catchments 102, 103, and 104 drain southward along ditched swales located along the Site's boundary, while Catchment 101 drains northward toward Kilmanagh Creek.

As part of the Stormwater Management Plan for the Mayfield West Subdivision (2008), Stormwater Management Ponds E3 and E4 were identified as required facilities within the South Fields Community, located in the Etobicoke Creek Watershed. As outlined in the Functional Servicing and Stormwater Management Report for the Moscorp 1A Subdivision, these multi-function ponds are designed to provide water quality treatment, erosion, and water quantity control based on unit flow equations. Treated runoff from both ponds will ultimately discharge to the main branch of Etobicoke Creek. The drainage areas are generally bounded by Kennedy Road to the west and future development to the north, south, and east. According to the drainage area mapping provided in the SWM report, Catchment 102 is part of the drainage area for Pond E3, while Catchment 103 contributes to the drainage area for Pond E4. The Stormwater Management Report for the South Fields Community ponds can be found in [Appendix C](#).

The Hydrogeological Investigation carried out by MTE (2025) identified the Site's soils as a combination of clay and loam, which have relatively low infiltration rates and higher runoff rates.

2.2. PRE-DEVELOPMENT RATES

A SWMHYMO Model was developed to simulate runoff from the portion of the Site (Catchment 102) draining to Pond E3 in the South Fields Community ponds. The 6-hour AES storms with 2-year through 100-year return periods were used to determine the pre-development flow rates in accordance with TRCA guidelines for the Etobicoke Creek Watershed. [Table 2.1](#) presents a summary of the existing flow rates for the Site's catchment draining to Pond E3. Furthermore, model output for pre-development flows discharging to the creek are included in [Appendix A](#).



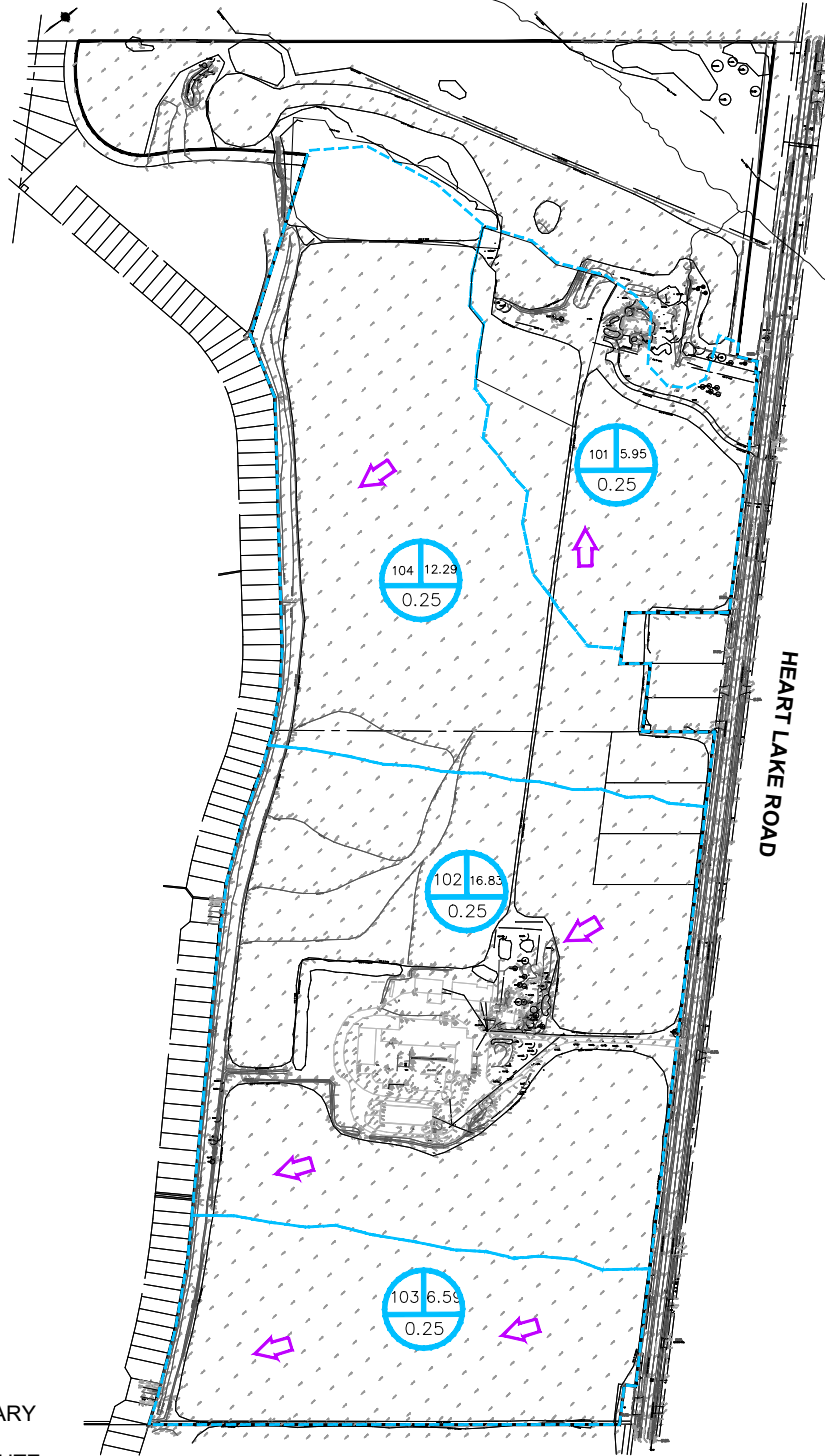
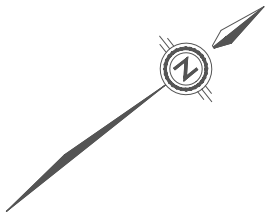
Table 2.1 Pre-development Flow Rates to Pond E3

RETURN PERIOD	6 HOUR AES PEAK FLOWS (m ³ /s) ¹
2-Year	1.019
5-Year	1.422
10-Year	1.719
25-Year	2.079
50-Year	2.355
100-Year	2.678

Notes:

- (1) As per Ultimate Catchment "E3-2B" peak flows found in the Design Brief for South Fields Community Stormwater Management Pond E3 & Pond E4, Appendix J, Attachment 1 SWMHYMO Input and Output Files.

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LEGEND

- LIMIT OF PROPERTY
- CATCHMENT BOUNDARY
- OVERLAND FLOW ROUTE
- ID — DRAINAGE AREA (ha)
RUNOFF COEFFICIENT

CLIENT

TRIBAL PARTNERS CANADA INC. AND
ITS MANAGEMENT ARM TDMSI

TITLE

12506 & 12698 HEART LAKE ROAD
CALEDON, ONTARIO
PRE-DEVELOPMENT PLAN



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3. PROPOSED CONDITIONS

3.1. GENERAL

The proposed development will be divided into four (4) catchments. Three of these catchments are controlled areas, while one catchment is uncontrolled. The delineation of post-development catchment areas is illustrated in **Figure 3**.

Catchment 201 will be serviced by a wet pond and Catchments 202A and 202B will discharge into separate end-of-pipe underground storm chambers. Ultimately, the SWM pond will discharge to Kilmanagh Creek, while the underground storage chambers will discharge to the storm sewer systems beneath Dougall Avenue and Larson Peak Road, which ultimately discharge to Pond E3. All SWM facilities will manage quantity control, and the wet pond will also provide water quality treatment and erosion control in accordance with regulatory criteria.

The following presents an overview of how each catchment will be serviced:

- Catchment 201: Stormwater collected on the roofs of Building A and B will be conveyed to an infiltration chamber for water balance purposes. The overflow from the infiltration chamber, Building C roof runoff, and the remaining at-grade stormwater runoff will be directed to the SWM Pond. Controlled flow from the pond will discharge to Kilmanagh Creek.
- Catchment 202A: The at-grade stormwater runoff will be directed to the underground storage chamber. Controlled flow from the underground storage chamber will discharge to the storm sewer system beneath Dougall Avenue which discharges to Pond E3.
- Catchment 202B: Stormwater collected on the roof of Building D will be conveyed to an infiltration chamber for water balance purposes. The overflow from the infiltration chamber and the remaining at-grade stormwater runoff will be directed to the underground storage chamber. Controlled flow from the underground storage chamber will discharge to the storm sewer system beneath Larson Peak Road which discharges to Pond E3.

Stormwater runoff from the uncontrolled area along the northeastern boundary of the Site will be captured by ditch swales located adjacent to Heart Lake Road.

A Visual OTTHYMO Model (VO) was utilized to estimate the required storage volumes for both erosion and quantity control, as well as to verify the design performance of the proposed SWM facilities. In accordance with TRCA guidelines, the 6-hour and 12-hour AES storms were used for the pond design, which drains to the Humber River watershed. The 6-hour AES storm was used for the underground storage chambers, which discharge to Pond E3 in the Etobicoke Creek watershed. Both storm distributions are simulated using 2-year through 100-year return periods.

Additionally, for the pond design, the 25 mm, 4-hour Chicago rainfall event is used to evaluate the erosion control performance (extended detention) of the pond. The 12-hour Hurricane Hazel is used in the hydrologic modelling for the Regional Storm.

To accommodate for uncontrolled flow discharging to Heart Lake Road, the stormwater management facilities are designed to overcontrol runoff to offset uncontrolled flows.



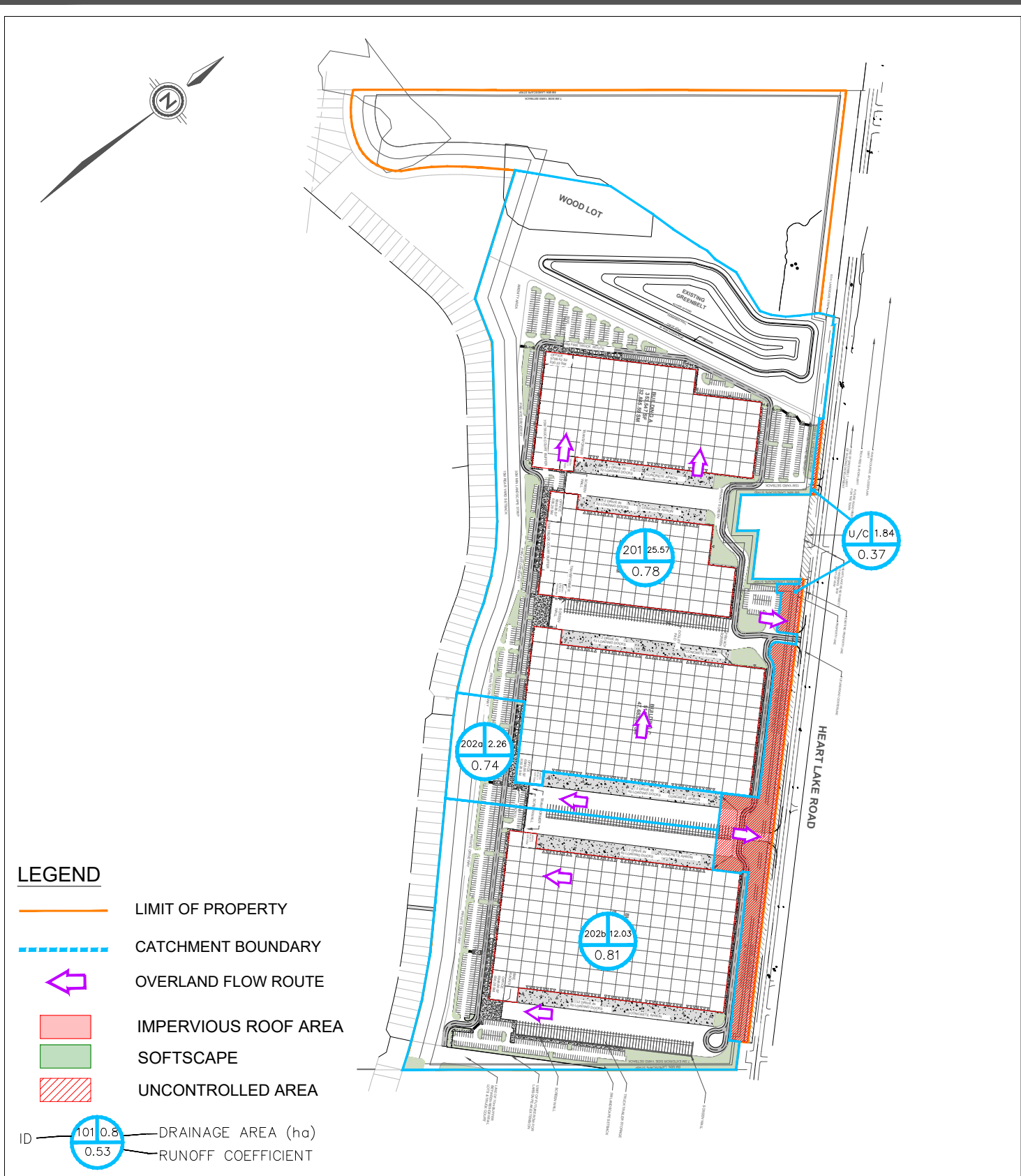
The VO model parameters for the post-development catchments are summarized in **Table 3.1**. Refer to **Appendix A** for detailed calculations.

Table 3.1: Post-Development Catchment Parameters

CATCHMENT	AREA (ha)	IMP (%)	COMMAND	OUTLET
201	19.74	74	StandHyd	SWM pond
202A	2.26	76	StandHyd	Underground Storage Chamber
202B	6.82	75	StandHyd	Underground Storage Chamber

The Site will be serviced by a storm sewer system designed in accordance with the Town's standards. The storm sewers will be sized using a 5-year return frequency and the current Town's IDF curves. All major storm runoff from the development areas will be conveyed to the proposed SWM pond and the Heart Lake Road right-of-way through overland flow routes. For areas within the catchments where an overland flow route to the respective SWM facilities is not feasible, the minor storm system will be designed to capture runoff from storm events up to and including the 100-year storm event.

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CLIENT

TRIBAL PARTNERS CANADA INC. AND
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TITLE

12506 & 12698 HEART LAKE ROAD
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3.2. ALLOWABLE FLOW RATES

Catchment 201 discharges to the SWM pond situated within the Humber River Watershed under the jurisdiction of TRCA. Accordingly, post-development peak flows are to be controlled to pre-development levels for all storm events up to and including the 100-year storm, in accordance with the unit flow rates outlined in the Humber River SWM Water Quantity Control Criteria Updates (WSP, 2020). The proposed SWM pond should be designed to safely convey post-development flows generated by the Regional storm event.

The unit flow rates for the proposed development for each catchment are shown in Table 3.2.

Table 3.2: Allowable Peak Flow Rates – Humber River Watershed

RETURN PERIOD	UNIT FLOW RATES FOR AREA <35 HA, UFR 6 (L/s/ha)	CATCHMENT 201 (19.74 HA) (m ³ /s)
2-Year	1.193	0.007
5-Year	2.329	0.014
10-Year	13.076	0.078
25-Year	16.449	0.098
50-Year	19.164	0.114
100-Year	21.678	0.129
Regional (Hurricane Hazel)	93.518	0.556

Catchments 202A and 202B are delineated to drain to Pond E3, as the existing infrastructure includes storm sewers only along Dougall Avenue and Larson Peak Road, which will convey stormwater from the Site to Pond E3. As a result, the post development peak flow rates shall not exceed the receiving capacity of the respective storm sewers, or peak flows from the portion of the Site used in the original design of Pond E3, provided in Section 2.2, whichever is less. The receiving capacity of the Dougall Avenue and Larson Peak storm sewers were calculated using Mannings equation. Calculations are included in Appendix A; results are presented in Table 3.3.



Table 3.3: Receiving Capacity of Storm Sewers

CATCHMENT	DISCHARGE POINT	STORM SEWER RECEIVING CAPACITY (m ³ /s)
202A	Dougall Avenue Sewer	0.116
202B	Larson Peak Road Sewer	0.071

As the combined storm sewer receiving capacity is lower than the peak flows from the portion of the Site used in the original design of Pond E3, the full flow capacity of the storm sewers shall govern when sizing underground cisterns for Catchments 202A and 202B.

3.3. WATER QUANTITY

The VO model includes the SWM components of the development for quantity control storage and all storm events are analyzed in this model; erosion (25 mm), 2-year through 100-year and Regional Storm. For further details on the hydrologic analysis, refer to the VO model schematic in [Appendix B](#).

3.3.1. SWM POND DESIGN (CATCHMENT 201)

Active Storage And End-of-Pipe Facilities

Wet Pond

Catchment 201 is serviced by a wet pond that discharges to the creek via a designed outlet structure. The pond outlet structure includes a 37 mm Hydro-Brake Optimum positioned at the outlet of the reverse slope pipe to convey the low-flow event into the outlet chamber. The orifice invert is set at the permanent pool water level, ensuring it effectively controls the 25 mm storm event. A 100 mm orifice plate is proposed as an additional inlet into the outlet chamber for high-flow events, with the orifice invert set at 267.35 m. The orifice is designed to manage flows from the 2-year storm up to the 100-year storm event. Detailed calculations for orifice controls and Hydro-Brake sizing details are provided in [Appendix A](#).

The results from the VO model, including the release rates and maximum storage volumes for all storm events with the use of the orifices are provided in [Appendix B](#).

The combined flows from the orifices discharge through a 750 mm culvert directed towards the channel downstream, ensuring sufficient capacity for high-flow events while maintaining effective stormwater management during regular conditions. The release rates and storage requirements for the 25 mm and 2-year through 100-year, and Regional storm events generated by VO are listed in [Table 3.4](#) below and further detailed in the SWM Pond Calculations in [Appendix A](#).



Table 3.4: SWM Pond Release Rates and Storage Volumes

RETURN PERIOD	ALLOWABLE RELEASE RATES (m ³ /s)	RELEASE RATE (m ³ /s)		STORAGE VOLUME (m ³)	
25 mm (4-hour Chicago storm)	0.003*	0.000		3919	
		6-hr AES Storm	12-hr AES Storm	6-hr AES Storm	12-hr AES Storm
2-Year	0.007	0.002	0.004	5865	6890
5-Year	0.014	0.007	0.010	7966	9053
10-Year	0.078	0.010	0.013	9387	10524
25-Year	0.098	0.015	0.016	11190	12398
50-Year	0.114	0.016	0.017	12564	13828
100-Year	0.129	0.017	0.018	13935	15268
Regional	0.556	0.246		38488	

Note: *The 25 mm storm allowable release rate is the pre-development peak flow rate for the catchment.

A summary of required storage volumes and provided storage for water quality, erosion control and quantity control are provided in Table 3.5.

Table 3.5: SWM Pond Storage Summary

EVENT	STORAGE VOLUME (m ³)	
	Provided	Required
Erosion Control*	5126	5077
Extended Detention*	5126	5073
100-Year	36151	15268
Regional**	42144	38488

Note:

* Extended detention storage for water quality and erosion control will be combined.

**A 0.30 m freeboard is provided above the pond's design high water level (top of pond).



The storage volumes provided by the proposed pond grading and the post-development release rates provided meet the requirements for the 25 mm and 2-yr to 100-yr storm events based on the required storage volumes identified in the VO modelling results and the allowable release rates. Although TRCA criteria do not require quantity control for the Regional storm event at this location, the pond has been designed to safely convey the Regional storm event. Please refer to [Appendix B](#) for VO modeling results for the proposed SWM Pond.

An emergency spillway is proposed and designed to manage flows exceeding the pond capacity. The emergency spillway consists of a trapezoidal broad-crested weir with a bottom width of 2 m and side slopes of 4:1 and riprap lining consisting of Riverstone with a median size of 150 mm and 300 mm layer thickness to prevent erosion during high-flow conditions. This design helps dissipate the energy of the water as it moves through the spillway to the channel downstream. Therefore, the Regional storm event will be safely conveyed off-site via the emergency spillway. Detailed calculations for the emergency spillway design are provided in [Appendix A](#).

3.3.2. UNDERGROUND STORAGE CHAMBERS (CATCHMENTS 202A AND 202B)

Two underground cisterns are proposed to provide quantity control for Catchment 202A and 202B for the 2- through 100-year events as per the pre-development flow rates. The cisterns are modelled in VO using the 6-hour AES Storm to determine the release rates and storage volumes. Both cisterns discharge to municipal storm sewers systems that convey stormwater to the existing Pond E3.

Underground Cistern 1 in Catchment 202A will have a minimum footprint of 1,200 m² and a chamber height of 1.32 m, providing a minimum storage volume of 1,584 m³. The chamber outlet structure includes a 210 mm orifice plate positioned at the chamber bottom.

Underground Cistern 2 in Catchment 202B will have a minimum footprint of 2,000 m² and a chamber height of 3.0 m, providing a minimum storage volume of 6,000 m³. The chamber outlet structure includes a 140 mm orifice plate positioned at the chamber bottom.

Detailed results from the VO model, including release rates and storage volumes, are available in [Appendix B](#).

The release rates for the underground cisterns are summarized in [Table 3.6](#), below.



Table 3.6: Underground Cisterns Summary

RETURN PERIOD		CISTERN 1 (C 202A)		CISTERN 2 (C 202B)		
	Peak Flow Rate (m ³ /s)	Dougall Ave. Receiving Capacity (m ³ /s)	Active Storage (m ³)	Peak Flow Rate (m ³ /s)	Larson Peak Rd Receiving Capacity (m ³ /s)	Active Storage (m ³)
2-Year	0.050	0.116	353	0.037	0.071	1,650
5-Year	0.060		510	0.044		2,307
10-Year	0.066		623	0.048		2,756
25-Year	0.074		767	0.053		3,333
50-Year	0.079		877	0.056		3,768
100-Year	0.083		988	0.059		4,203

As shown in the table above, the post-development flow rates provided by the underground cisterns meet the requirements for the 2-yr to 100-yr storm events based on the receiving capacity of the respective storm sewers.



4. WATER QUALITY

4.1. SWM POND (CATCHMENT 201)

Water quality measures for runoff conveyed to the SWM Pond will be accomplished by means of the forebays, permanent pool and extended detention elements of the proposed stormwater management pond.

4.1.1. PERMANENT POOL VOLUME

Based on Table 2.3 of the MOE SWM Planning and Design Manual (SWMPDM) (2003), the permanent pool volume required to meet Enhanced 80% long-term TSS removal is 241.74 m³/ha. Detailed calculations of required permanent pool volume can be found in [Appendix A](#). A summary is tabulated in [Table 3.8](#)

Table 4.1: Required Permanent Pool Volume

TOTAL DRAINAGE AREA (ha)	IMPERVIOUS (%)	REQUIRED PP VOLUME (m ³ /ha)	REQUIRED PP VOLUME (m ³)	PROVIDED PP VOLUME (m ³)
24.99	80	241.74	5,041	14,435

Further to permanent pool sizing, the quality control of the SWM Pond is also facilitated by the extended detention feature of the system detailed below.

4.1.2. EXTENDED DETENTION

Per the MOE SWMPDM (2003) water quality ponds require a minimum extended detention time of 24 hours for a volume of 40 m³/ha to allow for settling of suspended solids. The effectiveness of wet ponds for providing quality control can be further enhanced by providing extended detention of 48 hours.

The extended detention time for the SWM Pond was calculated using the MOE SWMPDM (2003) Equation 4.11 (drawdown time). The detention time was achieved with a 75 mm diameter orifice set at the permanent pool elevation at 266.85 m. This configuration ensures the required detention and release rates are achieved. [Table 3.9](#) presents a comparison between the extended detention volume and time recommended by the MOE and the volume and time provided. Detailed calculations can be found in [Appendix A](#).

Table 4.2: Extended Detention Volume and Time

DRAINAGE AREA (ha)	MOE RECOMMENDATIONS		PROVIDED EXTENDED DETENTION	
	ED VOLUME (m ³)	ED TIME (hrs)	ED VOLUME (m ³)	ED TIME (hrs)
24.99	1000	48	5126	320

Note: The orifice is sized to control flow in both interim and ultimate conditions, resulting in the same detention time for both phases.



As indicated above, the extended detention volume required to meet the erosion control criteria for the SWM Pond exceed those specified by the MOE. The extended detention time is relatively long due to the small orifice size required to achieve the unitary flow rate target. The reduced orifice diameter limits outflow, resulting in slower release and prolonged storage within the facility.

4.2. UNDERGROUND STORAGE CHAMBERS (CATCHMENT 202A AND 202B)

Based on our review of the South Fields Community SWM Report, Pond E3 is designed to provide water quality control in accordance with MECP guidelines. Specifically, the pond was sized to achieve 80% TSS removal from runoff generated by up to 16.83 hectares of the proposed development, which was estimated to be approximately 79% impervious. As Pond E3 is intended to provide quality control for the contributing catchments, no pre-treatment is proposed for flows entering the underground storage tank. Regular operations and maintenance (O&M) will be required to ensure the tank remains free of sediment and continues to perform effectively.

5. WATER BALANCE

The Hydrogeological Investigation (MTE, 2025) indicates that the post-development infiltration deficit is 25,543 m³/year.

Infiltration volumes generated from the 10 mm storm runoff from Buildings A, B, and D were estimated using the average annual number of days with rainfall of 10 mm or more, based on Environment Canada's 1981–2010 climate normals. The analysis determined that 26,405 m³ of roof runoff is available for infiltration, mitigating the infiltration deficit. A summary of the pre-development and post-development water balance within the Site is shown in Table 3.1.

Table 5.1: Water Balance Summary

HYDROLOGIC COMPONENT	PRE-DEVELOPMENT CONDITIONS (m ³ /year)	POST-DEVELOPMENT CONDITIONS (m ³ /year)	DIFFERENCE (m ³ /year)
Infiltration	315,921	315,921	0
Evaporation	386	25,929	25,543
Evapotranspiration	241,061	43,748	-197,312
Runoff	28,402	5,154	-23,247
Precipitation	46,073	241,089	195,017

As per Hydrogeological Addendum (October 2025) prepared by MTE Consultants Inc.

The hydrogeological information states that the native soil is a combination of silty clay to clayey silt and sandy silt. This finding indicates that the native soils have limited infiltration capacity, with an estimated infiltration rate of 3.3 mm/hr. Two infiltration systems are proposed for the proposed development to mitigate the infiltration deficit to accept and infiltrate rooftop runoff as it is considered clean and generally free of sediment. In-situ infiltration testing will be completed at the proposed infiltration locations at the detailed design stage to further assess infiltration characteristics.

An infiltration chamber located within Catchment 201 will infiltrate clean runoff from Buildings A and B rooftop areas. Similarly, the infiltration chamber in Catchment 202B is designed to accept and infiltrate clean runoff from Building D's rooftop area. Tables 5.1 and 5.2 show a summary of the design for the infiltration chambers. Detailed water balance calculations are provided in Appendix A.

Table 5.2: Infiltration Chamber (North) Design Summary

PARAMETER	REQUIREMENT	PROVIDED
Volume	583.6 m ³	589.6 m ³
Depth of Infiltration	Max. 0.24 m	0.24 m
Footprint	Min. 2,559 m ²	2,559 m ²
Drawdown Time	72 hrs	72 hrs

Table 5.3: Infiltration Chamber (South) Design Summary

PARAMETER	REQUIREMENT	PROVIDED
Volume	521.2 m ³	526.5 m ³
Depth of Infiltration	Max. 0.24 m	0.24 m
Footprint	Min. 2,285 m ²	2,285 m ²
Drawdown Time	72 hrs	72 hrs

6. THERMAL MITIGATION

The proposed SWM pond will discharge to Kilmanagh Creek, which is designated as Redside Dace Protected Habitat. Thermal mitigation is required to protect the fish species within the creek reach.

The thermal mitigation strategies incorporated into the SWM design include:

- A bottom draw outlet positioned at least 2.5 m below the SWM Pond's permanent pool surface elevation.
- Strategic plantings along the SWM pond banks provide shade, helping to maintain lower water temperatures. The shape of the pond will enhance shading, as the trees planted along the banks will cast shade over much of the open water.
- Flows discharged from the underground storage system are generally cooler than surface runoff, helping to preserve more natural thermal conditions in downstream aquatic environments.

7. EROSION PROTECTION MEASURES

Erosion concerns may arise due to high flow velocities at critical points like storm sewer outlets, overland flow routes, and emergency spillways. Generally, Riverstone is proposed where the maximum velocity is less than 3.0 m/s.

Appropriate erosion protection measures at key locations will be sized during the next stage of design.



8. CLOSING

8.1. CONCLUSIONS

Based on the information obtained through the stormwater management analysis, EnVision presents the following conclusions and recommendations.

8.1.1. *QUANTITY CONTROL*

Quantity control for the Site is achieved through a combination of a SWM pond and underground storage chambers. Catchment 201 is serviced by a wet pond with a total active storage volume of 36,151 m³ and a multi-level outlet structure designed to control both low- and high-flow events. Catchments 202A and 202B utilize underground cisterns with minimum volumes of 1,584 m³ and 6,000 m³, respectively, to provide quantity control. Each facility incorporates outlet controls to ensure compliance with the required storage volumes and allowable release rates established through VO modelling.

8.1.2. *QUALITY CONTROL*

The permanent pool and extended detention design for the SWM pond in Catchment 201 exceeds the MECP requirements, providing both sufficient volume and detention time for erosion control and settling of suspended solids. This design ensures the pond effectively meets water quality treatment objectives while also addressing erosion control needs. Furthermore, Pond E3 is intended to provide quality control from Catchments 202A and 202B, thus no pre-treatment is proposed for flows entering the underground storage tanks are necessary.

8.1.3. *WATER BALANCE*

Required water balance volumes will be met using underground infiltration chambers that will accept, and infiltrate clean runoff from building rooftops.

8.1.4. *THERMAL MITIGATION*

Thermal mitigation strategies for the SWM design include a bottom draw outlet positioned 2.5 m below the pond's permanent pool, pond bank plantings to enhance shading, and the use of an underground storage system that provides cooler outflows to protect downstream aquatic habitats.

9. CERTIFICATION AND SIGNATURES

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APPENDIX A:

Stormwater Management Calculations

Stormwater Management Calculations

VO Input Parameters

Proposed Conditions

STANDHYD Summary

Catchment	Area (ha)	DT (min)	TIMP (Fraction)	XIMP (Fraction)	Slope (%)	DPSI (mm)
201	19.74	5.00	0.74	0.74	1.00	1.00
202a	2.26	5.00	0.76	0.76	2.00	1.00
202b	6.82	5.00	0.75	0.75	2.00	1.00

Stormwater Management Calculations

Pond Outlet Configurations

Orifice Sizing

$$Q = CA\sqrt{2gh}$$

Low Flow Orifice

Orifice Discharge Equation is used to calculate the release rate from a 75 mm orifice plate with the invert at 266.85 m

Q	Orifice release rate @ 267.85	0.001	m ³ /s
C	Discharge coefficient	0.80	
d	Diameter of orifice	0.075	m
A	Cross-sectional area of orifice plate	0.004	m ²
g	Gravity acceleration	9.81	m/s ²
h	Water head above orifice centerline	1.96	m

High Flow Orifice

Orifice Discharge Equation is used to calculate the release rate from a 150 mm orifice plate with the invert at 267.35 m

Q	Orifice release rate @ 268.85	0.026	m ³ /s
C	Discharge coefficient	0.80	
d	Diameter of orifice	0.100	m
A	Cross-sectional area of orifice plate	0.008	m ²
g	Gravity acceleration	9.81	m/s ²
h	Water head above orifice centerline	0.25	m

ENVISION CONSULTANTS LTD	Project:	12506 & 12698 Heart Lake Road	No.:	24-0825
	By:	MM	Date:	2025-10-16
	Checked:	AW	Page:	3
Stormwater Management Calculations	Emergency Spillway Configurations			
Trapezoidal Sharp Crested Weir				
$Q = CL\Delta h^{1.5}$				
SWM POND EMERGENCY SPILLWAY				
	Q	Peak flow rate from pond during 100-yr storm event	0.56	m ³ /s
	C	Discharge coefficient	1.7	
	Δh	flow depth	0.30	m
Calculated:	L	Length of weir (bottom length + side slope * Δh)	2.0	m
Using L:				
	Side slope	4	:1	
	Minimum Bottom width	0	m	
	Design Bottom width	2	m	
	Cross-section Area	0.60	m ²	
	Flow Velocity	0.93	m/s	

Stormwater Management Calculations

Extended Detention

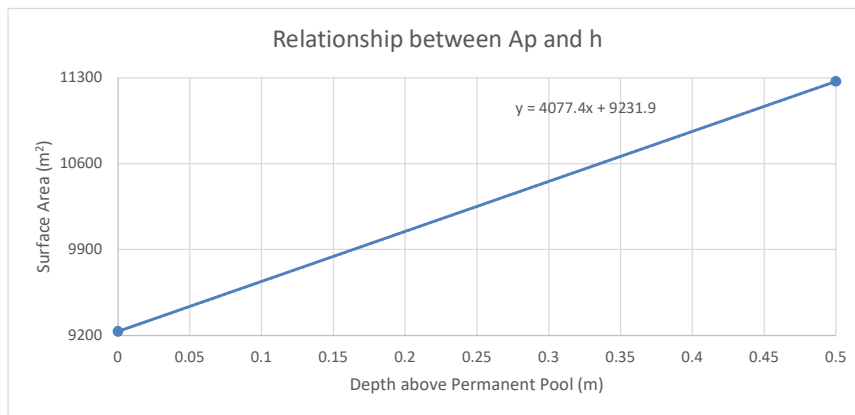
Per MOE SWM Planning & Design Manual (2003):

Equation 4.11: Drawdown Time

$$t = \frac{0.66C_2h^{1.5} + 2C_3h^{1.5}}{2.75A_o}$$

A ₀	Cross sectional area of the orifice	0.004	m ²
C ₂	Slope coefficient for the area-depth linear regression	4077.4	
C ₃	Intercept for the area-depth linear regression	9232	
h	Maximum water elevation above the orifice	0.5	m
t	Drawdown time	1152950	s
		320	hrs

Elev (m)	Depth above PP (m)	Surface Area (m ²)
266.85	0	9232
267.85	0.5	11271



Stormwater Management Calculations

Pond Grading

Pond Grading Table

Description	Elevation (m)	Depth above PP (m)	Total Volume (m3)	Active Volume (m3)
Bottom of Pond	264.35	-	0	-
Contour	266.35	-	10328	-
Permanent Pool	266.85	0.00	14435	0
Extended Detention	267.35	0.50	19561	5126
Contour	267.85	1.00	25725	11290
Contour	268.85	2.00	41343	26907
Top of Pond	269.35	2.50	50586	36151
Freeboard	269.65	2.80	56579	42144

Stormwater Management Calculations

Pond Design

Required Storage

Quality Control

Total drainage area to pond: 25.58 ha
 Imperviousness for area flowing to pond: 80%

Per Table 3.2 in MOE SWMPD Manual:

Enhanced Level Protection:	80	% TSS Removal				
Required Storage per ha:	241.97	m ³ /ha	=	6189	m ³	(Interpolated from Table 3.2)
Extended Detention Volume:	40	m ³ /ha	=	1023	m ³	
Permanent Pool Storage:	201.97	m ³ /ha	=	5166	m ³	

Erosion Control

Surface runoff for 25 mm event: 19.9 mm (Refer to Hydrologic model output)
 Extended detention (Erosion control): 5077 m³

Quantity Control

Storm Event	Return Period (Years)	Target Flow Rates* (m ³ /s)	Provided Flow Rates (VO) (m ³ /s)	Required Storage Volumes (VO) (m ³)
6 HR AES	2	0.007	0.002	5865
	5	0.014	0.007	7966
	10	0.078	0.010	9387
	25	0.098	0.015	11190
	50	0.114	0.016	12564
	100	0.129	0.017	13935
12 HR AES	2	0.007	0.004	6890
	5	0.014	0.010	9053
	10	0.078	0.013	10524
	25	0.098	0.016	12398
	50	0.114	0.017	13828
	100	0.129	0.018	15268
25 mm**	-	0.003	0	3919
Regional***	-	0.556	0.246	38488

Return Period (Years)	Min. Design Storage Requirement (VO) (m ³)	Provided Design Storage (m ³)
25 mm	5077	5126
2	6890	36151
5	9053	
10	10524	
25	12398	
50	13828	
100	15268	
Regional	38488	42144

*Target flow rates are calculated using the Humber River SWM Water Quantity Control Criteria Updates, 2020

** The 25 mm storm target flow is the pre-development peak flow for catchment 101

***The Regional flow rate and storage volumes are provided for informational purposes only, as the pond is not required to control the Regional storm event.

Stormwater Management Calculations

Pond Stage-Storage-Discharge Relationship

SWM Pond SSD Table

Elevation (m)	Hydro Brake Optimum D =37 mm Invert =266.85 m		High Flow Orifice Plate C = 0.63 D = 100 mm Invert = 267.35 m		Emergency Spillway Weir C = 1.7 L= 2 m Invert = 269.35 m		Total Flow	Active Storage
	Depth (m)	Flow (m ³ /s)	Depth (m)	Flow (m ³ /s)	Depth (m)	Flow (m ³ /s)	(m ³ /s)	(m ³)
266.85	0	0	0	0	0	0	0.000	0
267.35	0.50	0.000	0	0	0	0	0.000	5126
267.85	1.00	0.001	0.50	0.015	0	0	0.015	11290
268.85	2.00	0.001	1.50	0.026	0	0	0.027	26907
269.35	2.50	0.001	1.50	0.026	0	0	0.027	36151
269.65	2.80	0.001	1.80	0.029	0.30	0.559	0.589	42144

Stormwater Management Calculations

Pond Performance

4-Hour Chicago Storm

Storm Event	Q _{out} (m ³ /s)	V (m ³)	WSE (m)
25 mm	0	3919	267.23

6-hour AES Storm

Storm Event	Q _{out} (m ³ /s)	V (m ³)	WSE (m)
2-Year	0.002	5865	267.43
5-Year	0.007	7966	267.58
10-Year	0.01	9387	267.67
25-Year	0.015	11190	267.80
50-Year	0.016	12564	267.89
100-Year	0.017	13935	267.98

12-hour AES Storm

Storm Event	Q _{out} (m ³ /s)	V (m ³)	WSE (m)
2-Year	0.004	6890	267.50
5-Year	0.01	9053	267.65
10-Year	0.013	10524	267.75
25-Year	0.016	12398	267.88
50-Year	0.017	13828	267.98
100-Year	0.018	15268	268.07

Stormwater Management Calculations

Underground Cistern - Stage-Storage-Discharge Relationship

Underground Cistern 1 (Catchment 202a)

Description	Elevation	Water Level	Orifice Plate C = 0.60 D = 210 mm Invert = 0.00 m		Total Storage (m ³)	Active Storage (m ³)
			Head (m)	Flow (m ³ /s)		
Cistern Bottom / Invert	274.24	0.00	0.00	0.0000	0	0
	274.34	0.10	0.10	0.0291	120	120
	274.44	0.20	0.20	0.0412	240	240
	274.54	0.30	0.30	0.0504	360	360
	274.64	0.40	0.40	0.0582	480	480
	274.74	0.50	0.50	0.0651	600	600
	274.84	0.60	0.60	0.0713	720	720
	274.94	0.70	0.70	0.0770	840	840
	275.04	0.80	0.80	0.0823	960	960
	275.14	0.90	0.90	0.0873	1080	1080
	275.24	1.00	1.00	0.0921	1200	1200
	275.34	1.10	1.10	0.0965	1320	1320
	275.44	1.20	1.20	0.1008	1440	1440
	275.54	1.30	1.30	0.1050	1560	1560
Top of Cistern	275.56	1.32	1.32	0.1058	1584	1584

Underground Cistern 2 (Catchment 202b)

Description	Elevation	Water Level	Orifice Plate C = 0.60 D = 140 mm Invert = 0.00 m		Total Storage (m ³)	Active Storage (m ³)
			Head (m)	Flow (m ³ /s)		
Cistern Bottom / Invert	272.94	0.00	0.00	0.0000	0	0
	273.14	0.20	0.20	0.0183	400	400
	273.34	0.40	0.40	0.0259	800	800
	273.54	0.60	0.60	0.0317	1200	1200
	273.74	0.80	0.80	0.0366	1600	1600
	273.94	1.00	1.00	0.0409	2000	2000
	274.14	1.20	1.20	0.0448	2400	2400
	274.34	1.40	1.40	0.0484	2800	2800
	274.54	1.60	1.60	0.0517	3200	3200
	274.74	1.80	1.80	0.0549	3600	3600
	274.94	2.00	2.00	0.0579	4000	4000
	275.14	2.20	2.20	0.0607	4400	4400
	275.34	2.40	2.40	0.0634	4800	4800
	275.54	2.60	2.60	0.0660	5200	5200
	275.74	2.80	2.80	0.0685	5600	5600
Top of Cistern	275.94	3.00	3.00	0.0709	6000	6000

Stormwater Management Calculations

Receiving Sewer Capacity

Dougall Avenue Sewer Receiving Capacity

The receiving capacity of the Dougall Avenue 300 mm storm sewer is calculated with Manning's Equation:

$$Q = \frac{1}{n} AR^{2/3} S^{1/2}$$

Where,	n = Manning's roughness coefficient	0.013	
	A = Cross-sectional area of flow	0.0707	m
	R = Hydraulic radius (assuming full flow)	0.0750	m
	S = Slope	0.0144	m/m
	Q = Flow rate at full capacity	0.116	m³/s

Larson Peak Road Sewer Receiving Capacity

The receiving capacity of the Larson Peak Road 300 mm storm sewer is calculated with Manning's Equation:

$$Q = \frac{1}{n} AR^{2/3} S^{1/2}$$

Where,	n = Manning's roughness coefficient	0.013	
	A = Cross-sectional area of flow	0.0707	m
	R = Hydraulic radius (assuming full flow)	0.0750	m
	S = Slope	0.0054	m/m
	Q = Flow rate at full capacity	0.071	m³/s

Stormwater Management Calculations

Underground Cistern - Design

Underground Cistern 1 (Catchment 202a)

Quantity Control (to existing Pond E3)

Storm Event	Return Period (Years)	Allowable Flow Rate to Ex. Pond E3* (m ³ /s)	Receiving Capacity of Dougall Avenue Sewer (m ³ /s)	Provided Flow Rate (VO) (m ³ /s)	Required Storage Volume (VO) (m ³)
6-Hr AES	2	1.019	0.116	0.050	353
	5	1.422		0.060	510
	10	1.719		0.066	623
	25	2.079		0.074	767
	50	2.355		0.079	877
	100	2.678		0.083	988

*Target Flow Rate per "Ultimate E3-2B" peak flows found in the Design Brief for Stormwater Management Pond E3 & Pond E4 prepared by David Schaeffer Engineering Ltd. dated March 2008 (Attachment 1 SWMHYMO Input and Output Files)

Underground Cistern 2 (Catchment 202b)

Quantity Control (to existing Pond E3)

Storm Event	Return Period (Years)	Allowable Flow Rate to Ex. Pond E3* (m ³ /s)	Receiving Capacity of Larson Peak Rd Sewer (m ³ /s)	Provided Flow Rate (VO) (m ³ /s)	Required Storage Volume (VO) (m ³)
6-Hr AES	2	1.019	0.071	0.037	1,650
	5	1.422		0.044	2,307
	10	1.719		0.048	2,756
	25	2.079		0.053	3,333
	50	2.355		0.056	3,768
	100	2.678		0.059	4,203

*Target Flow Rate per "Ultimate E3-2B" peak flows found in the Design Brief for Stormwater Management Pond E3 & Pond E4 prepared by David Schaeffer Engineering Ltd. dated March 2008 (Attachment 1 SWMHYMO Input and Output Files)

Total Site Peak Flow Rate to Existing Pond E3

Storm Event	Return Period (Years)	Cistern 1 Peak Flow Rate (m ³ /s)	Cistern 2 Peak Flow Rate (m ³ /s)	Total Peak Flow Rate to Ex. Pond E3 (m ³ /s)	Allowable Flow Rate to Ex. Pond E3* (m ³ /s)
6-Hr AES	2			0.000	1.019
	5			0.000	1.422
	10			0.000	1.719
	25			0.000	2.079
	50			0.000	2.355
	100			0.000	2.678

*Target Flow Rate per "Ultimate E3-2B" peak flows found in the Design Brief for Stormwater Management Pond E3 & Pond E4 prepared by David Schaeffer Engineering Ltd. dated March 2008 (Attachment 1 SWMHYMO Input and Output Files)

Therefore, for storm events up to the 100-year return period, discharge to existing Pond E3 is below the allowable.

Stormwater Management Calculations

Underground Cistern - Performance

Underground Chamber 1 (Catchment 202a)

6-Hour AES Storm

Storm Event	Q _{out} (m ³ /s)	Active Storage (m ³)	WSE (m)
2-Yr	0.050	353	0.29
5-Yr	0.060	510	0.43
10-Yr	0.066	623	0.52
25-Yr	0.074	767	0.64
50-Yr	0.079	877	0.73
100-Yr	0.083	988	0.82

Note: Storage volumes are modeled including a full sump volume

12-Hour AES Storm

Storm Event	Q _{out} (m ³ /s)	Active Storage (m ³)	WSE (m)
2-Yr	0.047	317	0.26
5-Yr	0.056	447	0.37
10-Yr	0.062	539	0.45
25-Yr	0.068	660	0.55
50-Yr	0.073	752	0.63
100-Yr	0.077	848	0.71

Note: Storage volumes are modeled including a full sump volume

Underground Chamber 2 (Catchment 202b)

6-Hour AES Storm

Storm Event	Q _{out} (m ³ /s)	Active Storage (m ³)	WSE (m)
2-Yr	0.037	1,650	0.83
5-Yr	0.044	2,307	1.15
10-Yr	0.048	2,756	1.38
25-Yr	0.053	3,333	1.67
50-Yr	0.056	3,768	1.88
100-Yr	0.059	4,203	2.10

Note: Storage volumes are modeled including a full sump volume

12-Hour AES Storm

Storm Event	Q _{out} (m ³ /s)	Active Storage (m ³)	WSE (m)
2-Yr	0.038	1746	0.87
5-Yr	0.045	2383	1.19
10-Yr	0.049	2827	1.41
25-Yr	0.053	3393	1.70
50-Yr	0.057	3822	1.91
100-Yr	0.060	4255	2.13

Note: Storage volumes are modeled including a full sump volume

Stormwater Management Calculations

Water Balance Calculations

MTE provided Supplemental Hydrogeological Information dated October 9, 2025 which concluded the post-development infiltration deficit is 25,543 m³/year. Clean roof runoff produced on Buildings 'A', 'B', and 'D' will be infiltrated to mitigate this deficit.

Roof areas to be infiltrated:

Building	Area (m ²)	10 mm Rainfall Volume (m ³)	Days with >= 10 mm Rainfall*	Avg. Annual Infiltration Volume (m ³)
Building 'A'	32,846	328.5	23.9	7,850
Building 'B'	25,517	255.2	23.9	6,099
Building 'D'	52,120	521.2	23.9	12,457
Total:	110,483	1,105	-	26,405

**Based on the precipitation and climate normal values (from year 1981-2010) obtained from the Environment Canada climate station in Sandhill, Ontario*

Therefore, infiltration of the 10 mm storm runoff produced on Buildings 'A', 'B', and 'D' will mitigate the infiltration deficit.

Stormwater Management Calculations

Infiltration Calculations - North Infiltration Gallery

Required Volume

Required Infiltration Volume	583.6	m ³	(10 mm rainfall volume for Buildinga 'A' and 'B' roof areas)
Target Drawdown Time	72.0	hrs	
Percolation Rate	3.3	mm/hr	(Mean infiltration rate for the native soil - silty clay to clayey silt and sandy silt)

Maximum Infiltration Depth

$$d = \frac{PT}{1000}$$

Equation 4.2 of MOE SWMP Manual

Where,	P = Percolation rate	3.3	mm/hr
	T = Drawdown time	72.0	hours
	d = Maximum depth of infiltration	0.24	m

Minimum Footprint Surface Area

$$A = \frac{1000V}{PnT}$$

Equation 4.3 of MOE SWMP Manual

Where,	P = Percolation rate	3.3	mm/hr
	n = Porosity of storage media	0.96	
	T = Drawdown time	72.0	hours
	V = Runoff volume to be infiltrated	583.6	m ³
	A = Minimum footprint area	2,559	m²

Design Drawdown Time

$$A = \frac{1000V}{PnT}$$

Equation 4.3 of MOE SWMP Manual

Using design (provided) parameters for A, and V

V = Runoff volume to be infiltrated	583.6	m ³
P = Percolation rate	3.3	mm/hr
n = Porosity of storage media	0.96	
A = Footprint area	2559.0	m ²
T = Drawdown time	72.0	hours

Design Summary

Parameter	Requirement	Provided
Volume	583.6 m ³	589.6 m ³
Depth of Infiltration	Max. 0.24 m	0.24 m
Footprint	Min. 2,559 m ²	2,559 m ²
Drawdown Time	72.0 hrs	72.0 hrs

Stormwater Management Calculations

Infiltration Calculations - South Infiltration Gallery

Required Volume

Required Infiltration Volume	521.2	m ³	(10 mm rainfall volume for Building 'D' roof area)
Target Drawdown Time	72.0	hrs	
Percolation Rate	3.3	mm/hr	(Mean infiltration rate for the native soil - silty clay to clayey silt and sandy silt)

Maximum Infiltration Depth

$$d = \frac{PT}{1000}$$

Equation 4.2 of MOE SWMP Manual

Where,	P = Percolation rate	3.3	mm/hr
	T = Drawdown time	72.0	hours
	d = Maximum depth of infiltration	0.24	m

Minimum Footprint Surface Area

$$A = \frac{1000V}{PnT}$$

Equation 4.3 of MOE SWMP Manual

Where,	P = Percolation rate	3.3	mm/hr
	n = Porosity of storage media	0.96	
	T = Drawdown time	72.0	hours
	V = Runoff volume to be infiltrated	521.2	m ³
	A = Minimum footprint area	2,285	m²

Design Drawdown Time

$$A = \frac{1000V}{PnT}$$

Equation 4.3 of MOE SWMP Manual

Using design (provided) parameters for A, and V

V = Runoff volume to be infiltrated	521.2	m ³
P = Percolation rate	3.3	mm/hr
n = Porosity of storage media	0.96	
A = Footprint area	2285.0	m ²
T = Drawdown time	72.0	hours

Design Summary

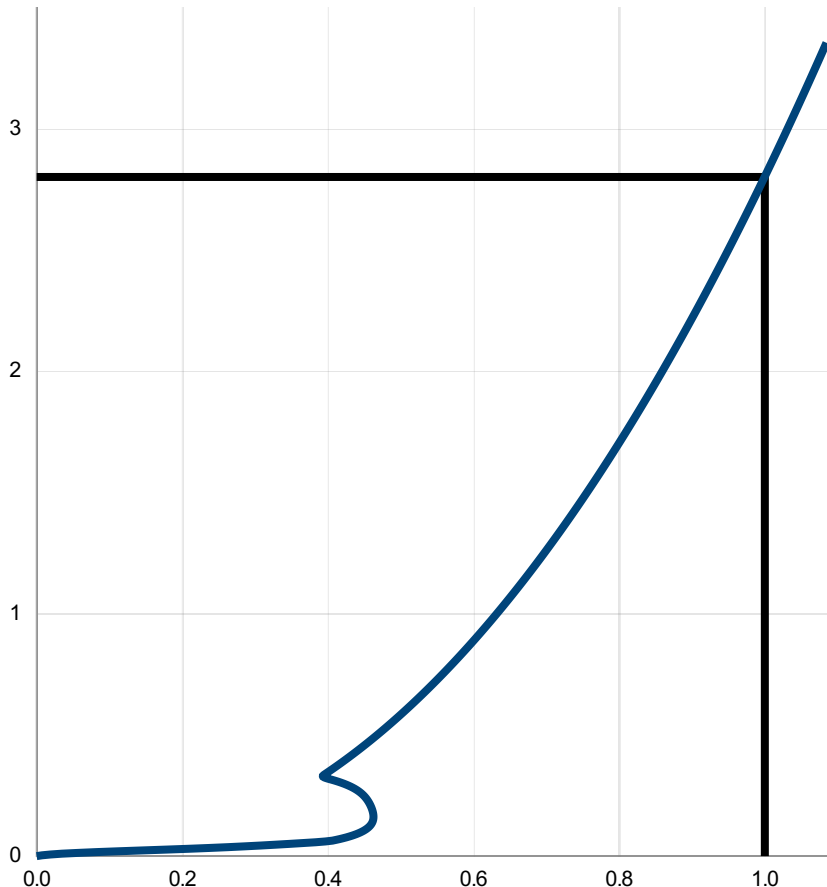
Parameter	Requirement	Provided
Volume	521.2 m ³	526.5 m ³
Depth of Infiltration	Max. 0.24 m	0.24 m
Footprint	Min. 2,285 m ²	2,285 m ²
Drawdown Time	72.0 hrs	72.0 hrs

Technical Specification

Control Point	Head (m)	Flow (l/s)
Primary Design	2.800	1.000
Flush-Flo™	0.162	0.463
Kick-Flo®	0.326	0.390
Mean Flow		0.708



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Head (m)	Flow (l/s)
0.000	0.000
0.097	0.444
0.193	0.461
0.290	0.429
0.386	0.419
0.483	0.461
0.579	0.498
0.676	0.533
0.772	0.565
0.869	0.594
0.966	0.622
1.062	0.649
1.159	0.674
1.255	0.699
1.352	0.722
1.448	0.744
1.545	0.766
1.641	0.787
1.738	0.807
1.834	0.827
1.931	0.846
2.028	0.865
2.124	0.883
2.221	0.901
2.317	0.918
2.414	0.935
2.510	0.952
2.607	0.968
2.703	0.984
2.800	1.000

DESIGN ADVICE



The head/flow characteristics of this SHE-0037-1000-2800-1000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modeling evaluates the full head/flow characteristic curve.

The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

Hydro
International
A CRH COMPANY

DATE	10/15/2025 11:16 PM
Site	12506 & 12698 Heart Lake Road
DESIGNER	Michelle Mbai
Ref	1

SHE-0037-1000-2800-1000
Hydro-Brake® Optimum

Technical Specification

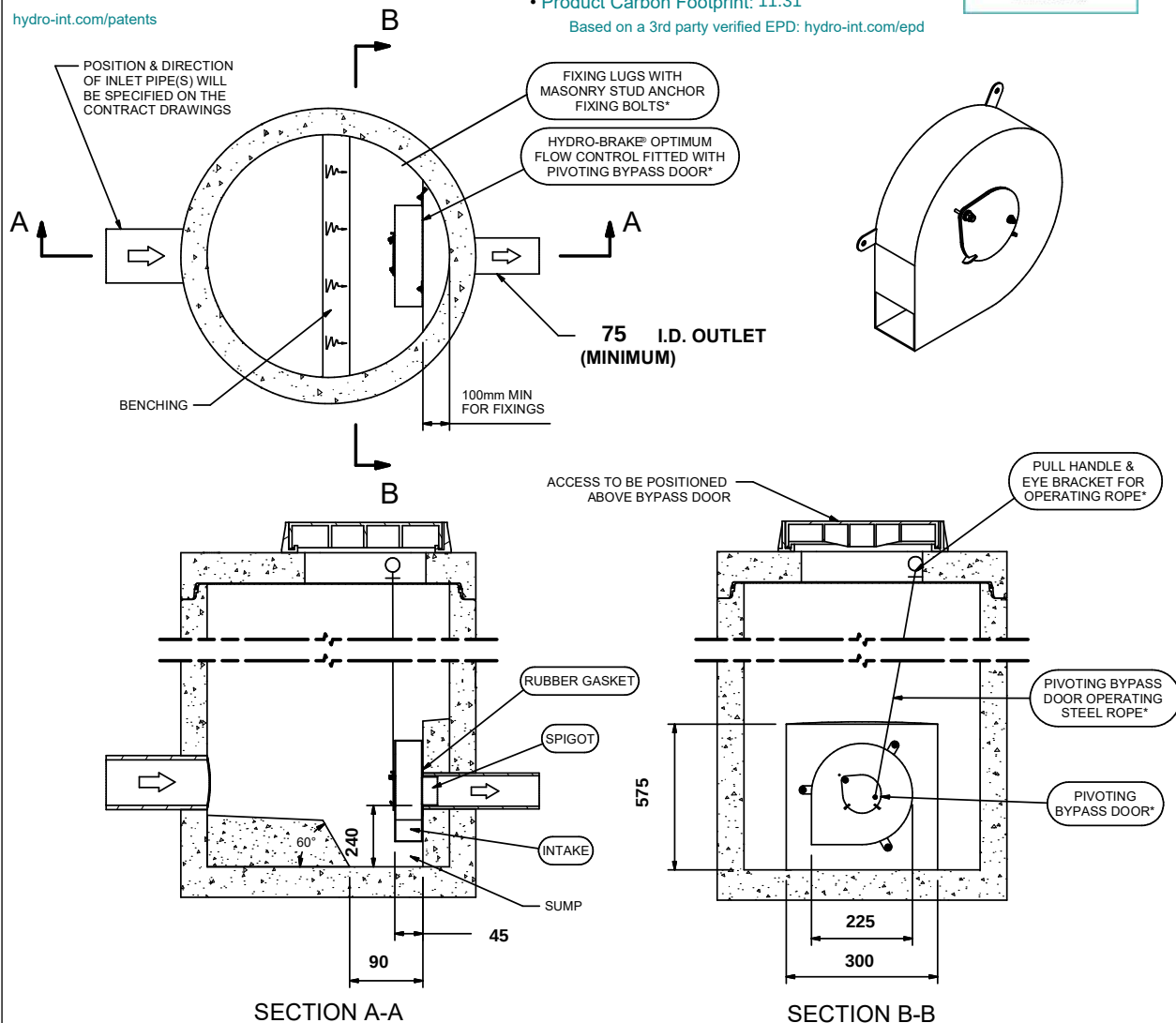
Control Point	Head (m)	Flow (l/s)
Primary Design	2.800	1.000
Flush-Flo™	0.162	0.463
Kick-Flo®	0.326	0.390
Mean Flow		0.708

hydro-int.com/patents

This Hydro-Brake® Optimum includes:

- All in 3 mm Grade 304L stainless steel
- Integral pivoting by-pass door allowing clear line of sight through to outlet, c/w operating rope
- Media blasted for corrosion resistance
- Variable flow rate post installation via adjustable inlet (if necessary)
- Indicative Weight: 5 kg
- Product Carbon Footprint: 11.31

Based on a 3rd party verified EPD: hydro-int.com/epd



IMPORTANT: ○ LIMIT OF HYDRO INTERNATIONAL SUPPLY
 THE DEVICE WILL BE HANDED TO SUIT SITE CONDITIONS
 FOR SITE SPECIFIC DETAILS AND MINIMUM CHAMBER SIZE REFER TO HYDRO INTERNATIONAL
 ALL CIVIL AND INSTALLATION WORK BY OTHERS
 * WHERE SUPPLIED
 HYDRO-BRAKE® IS A REGISTERED TRADEMARK FOR FLOW CONTROLS DESIGNED AND MANUFACTURED EXCLUSIVELY BY
 HYDRO INTERNATIONAL

THIS DESIGN LAYOUT IS FOR ILLUSTRATIVE PURPOSES ONLY. NOT TO SCALE.

**DESIGN
ADVICE**
!

The head/flow characteristics of this SHE-0037-1000-2800-1000 Hydro-Brake® Optimum Flow Control are unique. Dynamic hydraulic modelling evaluates the full head/flow characteristic curve.
The use of any other flow control will invalidate any design based on this data and could constitute a flood risk.

**Hydro
International**
A CRH COMPANY

DATE	10/15/2025 11:16 PM	SHE-0037-1000-2800-1000 Hydro-Brake® Optimum
SITE	12506 & 12698 Heart Lake Road	
DESIGNER	Michelle Mbai	
REF	1	

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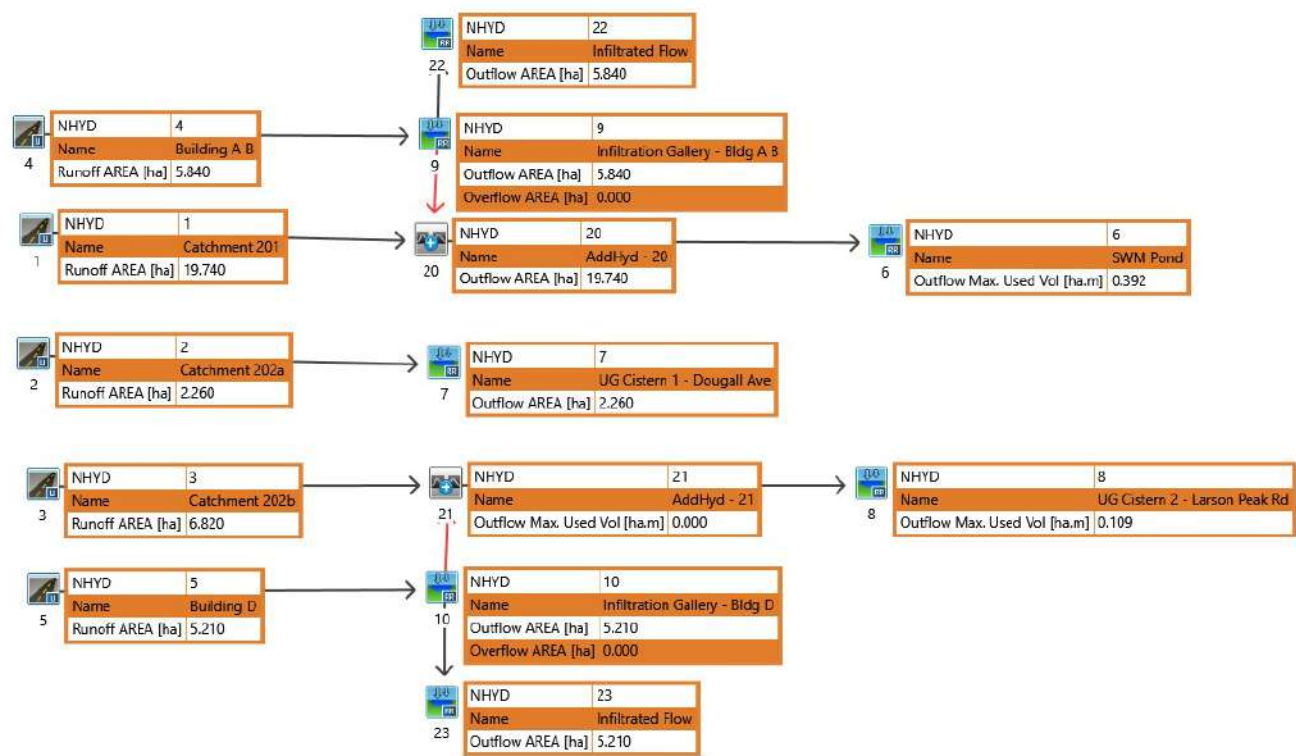
mmbai@envisionconsultants.ca



APPENDIX B:

Hydrologic Model Output

POST-DEVELOPMENT MODEL



```

=====
V   V   I   SSSSS U   U   A   L   (v 6.2.2022)
V   V   I   SS   U   U   A A   L
V   V   I   SS   U   U   AAAAA L
V   V   I   SS   U   U   A   A L
VV    I   SSSSS UUUUU A   A LLLLL

```

```

    000   TTTTT TTTTT H   H   Y   Y   M   M   000   TM
O   O   T   T   H   H   Y   Y   MM MM O   O
O   O   T   T   H   H   Y   M   M   O   O
    000   T   T   H   H   Y   M   M   000

```

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
 Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\60c
 Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\60c

DATE: 10-16-2025 TIME: 09:08:44

USER:

COMMENTS: _____

 ** SIMULATION : 0 - 25mm - 4 hr Chicago Desig **

```

-----
| CHICAGO STORM | IDF curve parameters: A= 722.949
| Ptotal= 24.99 mm | B= 7.503
| | C= 0.862
| | used in: INTENSITY = A / (t + B)^C
| |
| | Duration of storm = 4.00 hrs
| | Storm time step = 10.00 min
| | Time to peak ratio = 0.33
| |

```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.20	1.00	14.13	2.00	3.38	3.00	1.48
0.17	1.41	1.17	61.31	2.17	2.77	3.17	1.35
0.33	1.72	1.33	19.06	2.33	2.36	3.33	1.25
0.50	2.20	1.50	9.21	2.50	2.05	3.50	1.16
0.67	3.07	1.67	5.90	2.67	1.81	3.67	1.08
0.83	5.10	1.83	4.30	2.83	1.63	3.83	1.02

```

-----
| CALIB |
| STANDHYD ( 0001) | Area (ha)= 19.74
| ID= 1 DT= 5.0 min | Total Imp(%)= 74.00 Dir. Conn.(%)= 74.00
| |

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN
hrs mm/hr | hrs mm/hr | hrs mm/hr | hrs mm/hr
0.083 1.20 | 1.083 14.13 | 2.083 3.38 | 3.08 1.48
0.167 1.20 | 1.167 14.13 | 2.167 3.38 | 3.17 1.48
0.250 1.41 | 1.250 61.31 | 2.250 2.77 | 3.25 1.35
0.333 1.41 | 1.333 61.31 | 2.333 2.77 | 3.33 1.35
0.417 1.72 | 1.417 19.06 | 2.417 2.36 | 3.42 1.25
0.500 1.72 | 1.500 19.06 | 2.500 2.36 | 3.50 1.25

```

0.583	2.20	1.583	9.21	2.583	2.05	3.58	1.16
0.667	2.20	1.667	9.21	2.667	2.05	3.67	1.16
0.750	3.07	1.750	5.90	2.750	1.81	3.75	1.08
0.833	3.07	1.833	5.90	2.833	1.81	3.83	1.08
0.917	5.10	1.917	4.30	2.917	1.63	3.92	1.02
1.000	5.10	2.000	4.30	3.000	1.63	4.00	1.02

Max.Eff.Inten.(mm/hr)=	61.31	12.92	
over (min)	5.00	25.00	
Storage Coeff. (min)=	6.73 (ii)	22.73 (ii)	
Unit Hyd. Tpeak (min)=	5.00	25.00	
Unit Hyd. peak (cms)=	0.18	0.05	
TOTALS			
PEAK FLOW (cms)=	2.03	0.10	2.058 (iii)
TIME TO PEAK (hrs)=	1.33	1.67	1.33
RUNOFF VOLUME (mm)=	23.99	8.08	19.85
TOTAL RAINFALL (mm)=	24.99	24.99	24.99
RUNOFF COEFFICIENT =	0.96	0.32	0.79

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	
STANDHYD (0004)	Area (ha)= 5.84
ID= 1 DT= 5.0 min	Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.84	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	197.32	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.20	1.083	14.13	2.083	3.38	3.08	1.48
0.167	1.20	1.167	14.13	2.167	3.38	3.17	1.48
0.250	1.41	1.250	61.31	2.250	2.77	3.25	1.35
0.333	1.41	1.333	61.31	2.333	2.77	3.33	1.35
0.417	1.72	1.417	19.06	2.417	2.36	3.42	1.25
0.500	1.72	1.500	19.06	2.500	2.36	3.50	1.25
0.583	2.20	1.583	9.21	2.583	2.05	3.58	1.16
0.667	2.20	1.667	9.21	2.667	2.05	3.67	1.16
0.750	3.07	1.750	5.90	2.750	1.81	3.75	1.08
0.833	3.07	1.833	5.90	2.833	1.81	3.83	1.08
0.917	5.10	1.917	4.30	2.917	1.63	3.92	1.02
1.000	5.10	2.000	4.30	3.000	1.63	4.00	1.02

Max.Eff.Inten.(mm/hr)=	61.31	NaN	
over (min)	5.00	5.00	
Storage Coeff. (min)=	4.67 (ii)	4.67 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.22	0.25	
TOTALS			
PEAK FLOW (cms)=	0.90	0.00	0.000 (iii)
TIME TO PEAK (hrs)=	1.33	0.00	0.00
RUNOFF VOLUME (mm)=	23.99	NaN	NaN
TOTAL RAINFALL (mm)=	24.99	24.99	24.99
RUNOFF COEFFICIENT =	0.96	NaN	NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0009)	OVERFLOW IS ON
IN= 2---> OUT= 1	
DT= 5.0 min	OUTFLOW STORAGE OUTFLOW STORAGE

(cms)	(ha.m.)		(cms)	(ha.m.)
0.0000	0.0000		0.0020	0.0590
0.0020	0.0010		0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0004)	5.840	0.000	0.00	NaN
OUTFLOW: ID= 1 (0009)	5.840	0.002	0.08	20.54
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0020)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				

*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
 *** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
 ID1= 1 (0001): 19.74 2.058 1.33 19.85
 + ID2= 2 (0009): 0.00 0.000 0.00 0.00
 =====
 ID = 3 (0020): 19.74 2.058 1.33 19.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006)	OVERFLOW IS OFF
IN= 2---> OUT= 1	
DT= 5.0 min	

OUTFLOW (cms)	STORAGE (ha.m.)		OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000		0.0270	2.6907
0.0000	0.5126		0.0270	3.6151
0.0150	1.1290		0.5890	4.2144

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0020)	19.740	2.058	1.33	19.85
OUTFLOW: ID= 1 (0006)	19.740	0.000	0.00	0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= 0.00
 TIME SHIFT OF PEAK FLOW (min)=-80.00
 MAXIMUM STORAGE USED (ha.m.)= 0.3919

CALIB	Area (ha)= 6.82	
STANDHYD (0003)	Total Imp(%)= 75.00	Dir. Conn.(%)= 75.00
ID= 1 DT= 5.0 min		

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.12	1.71
Dep. Storage (mm)=	1.00	1.50
Average slope (%)=	1.00	2.00
Length (m)=	213.23	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.20	1.083	14.13	2.083	3.38	3.08	1.48
0.167	1.20	1.167	14.13	2.167	3.38	3.17	1.48
0.250	1.41	1.250	61.31	2.250	2.77	3.25	1.35
0.333	1.41	1.333	61.31	2.333	2.77	3.33	1.35
0.417	1.72	1.417	19.06	2.417	2.36	3.42	1.25
0.500	1.72	1.500	19.06	2.500	2.36	3.50	1.25
0.583	2.20	1.583	9.21	2.583	2.05	3.58	1.16
0.667	2.20	1.667	9.21	2.667	2.05	3.67	1.16
0.750	3.07	1.750	5.90	2.750	1.81	3.75	1.08
0.833	3.07	1.833	5.90	2.833	1.81	3.83	1.08
0.917	5.10	1.917	4.30	2.917	1.63	3.92	1.02

1.000 5.10 | 2.000 4.30 | 3.000 1.63 | 4.00 1.02

Max.Eff.Inten.(mm/hr)= 61.31 12.92
over (min) 5.00 25.00
Storage Coeff. (min)= 4.89 (ii) 20.90 (ii)
Unit Hyd. Tpeak (min)= 5.00 25.00
Unit Hyd. peak (cms)= 0.22 0.05

PEAK FLOW (cms)= 0.78 0.03 0.790 (iii)
TIME TO PEAK (hrs)= 1.33 1.67 1.33
RUNOFF VOLUME (mm)= 23.99 8.08 20.01
TOTAL RAINFALL (mm)= 24.99 24.99 24.99
RUNOFF COEFFICIENT = 0.96 0.32 0.80

TOTALS

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0005)
ID= 1 DT= 5.0 min
Area (ha)= 5.21
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 5.21 0.00
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 1.00
Length (m)= 186.37 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 1.20 1.083 14.13 2.083 3.38 3.08 1.48
0.167 1.20 1.167 14.13 2.167 3.38 3.17 1.48
0.250 1.41 1.250 61.31 2.250 2.77 3.25 1.35
0.333 1.41 1.333 61.31 2.333 2.77 3.33 1.35
0.417 1.72 1.417 19.06 2.417 2.36 3.42 1.25
0.500 1.72 1.500 19.06 2.500 2.36 3.50 1.25
0.583 2.20 1.583 9.21 2.583 2.05 3.58 1.16
0.667 2.20 1.667 9.21 2.667 2.05 3.67 1.16
0.750 3.07 1.750 5.90 2.750 1.81 3.75 1.08
0.833 3.07 1.833 5.90 2.833 1.81 3.83 1.08
0.917 5.10 1.917 4.30 2.917 1.63 3.92 1.02
1.000 5.10 2.000 4.30 3.000 1.63 4.00 1.02

Max.Eff.Inten.(mm/hr)= 61.31 NaN
over (min) 5.00 5.00
Storage Coeff. (min)= 4.51 (ii) 4.51 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.23 0.26

PEAK FLOW (cms)= 0.81 0.00 0.000 (iii)
TIME TO PEAK (hrs)= 1.33 0.00 0.00
RUNOFF VOLUME (mm)= 23.99 NaN NaN
TOTAL RAINFALL (mm)= 24.99 24.99 24.99
RUNOFF COEFFICIENT = 0.96 NaN NaN

TOTALS

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)
IN= 2---> OUT= 1
DT= 5.0 min
OVERFLOW IS ON
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) (cms) (ha.m.)
0.0000 0.0000 | 0.0020 0.0520
0.0020 0.0010 | 0.0000 0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0005)	5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)	5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0021)
 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003				
ID1= 1 (0010):	0.00	0.000	0.00	0.00
+ ID2= 2 (0003):	6.82	0.790	1.33	20.01
=====				
ID = 3 (0021):	6.82	0.790	1.33	20.01

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)
 IN= 2---> OUT= 1
 DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0517	0.3200
0.0183	0.0400	0.0549	0.3600
0.0259	0.0800	0.0579	0.4000
0.0317	0.1200	0.0607	0.4400
0.0366	0.1600	0.0634	0.4800
0.0409	0.2000	0.0660	0.5200
0.0448	0.2400	0.0685	0.5600
0.0484	0.2800	0.0709	0.6000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0021)	6.820	0.790	1.33	20.01
OUTFLOW: ID= 1 (0008)	6.820	0.030	3.00	20.01

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.81
 TIME SHIFT OF PEAK FLOW (min)=100.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1090

CALIB
 STANDHYD (0002)
 ID= 1 DT= 5.0 min

Area (ha)= 2.26
 Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.72	0.54
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	122.75	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.20	1.083	14.13	2.083	3.38	3.08	1.48
0.167	1.20	1.167	14.13	2.167	3.38	3.17	1.48
0.250	1.41	1.250	61.31	2.250	2.77	3.25	1.35
0.333	1.41	1.333	61.31	2.333	2.77	3.33	1.35
0.417	1.72	1.417	19.06	2.417	2.36	3.42	1.25
0.500	1.72	1.500	19.06	2.500	2.36	3.50	1.25
0.583	2.20	1.583	9.21	2.583	2.05	3.58	1.16
0.667	2.20	1.667	9.21	2.667	2.05	3.67	1.16
0.750	3.07	1.750	5.90	2.750	1.81	3.75	1.08
0.833	3.07	1.833	5.90	2.833	1.81	3.83	1.08

0.917	5.10	1.917	4.30	2.917	1.63	3.92	1.02
1.000	5.10	2.000	4.30	3.000	1.63	4.00	1.02

Max.Eff.Inten.(mm/hr)= 61.31 12.92
over (min) 5.00 20.00
Storage Coeff. (min)= 3.51 (ii) 19.52 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.26 0.06

TOTALS

PEAK FLOW (cms)= 0.28 0.01 0.283 (iii)
TIME TO PEAK (hrs)= 1.33 1.58 1.33
RUNOFF VOLUME (mm)= 23.99 8.08 20.17
TOTAL RAINFALL (mm)= 24.99 24.99 24.99
RUNOFF COEFFICIENT = 0.96 0.32 0.81

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min				
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0823	0.0960
	0.0291	0.0120	0.0873	0.1080
	0.0412	0.0240	0.0921	0.1200
	0.0504	0.0360	0.0965	0.1320
	0.0582	0.0480	0.1008	0.1440
	0.0651	0.0600	0.1050	0.1560
	0.0713	0.0720	0.1058	0.1584
	0.0770	0.0840	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0002)	2.260	0.283	1.33	20.17
OUTFLOW: ID= 1 (0007)	2.260	0.043	1.75	20.12

PEAK FLOW REDUCTION [Qout/Qin](%)= 15.05
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 0.0258

RESERVOIR(0022)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min				
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.5300	0.0100
	0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min				
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.5300	0.0100
	0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW: ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00

MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

V V I SSSSS U U A L (v 6.2.2022)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\5\607eef9b-75da-4975-ac97-f2ad024480a2\035
Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\5\607eef9b-75da-4975-ac97-f2ad024480a2\035

DATE: 10-16-2025 TIME: 09:08:43

USER:

COMMENTS: _____

** SIMULATION : 1 - 2 Year 12 Hour AES (Bloor **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\fileae783
Ptotal= 42.00 mm	Comments: 2 Year 12 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	3.25	7.14	6.50	2.94	9.75	0.42
0.25	0.42	3.50	7.14	6.75	2.94	10.00	0.42
0.50	0.42	3.75	7.14	7.00	2.94	10.25	0.42
0.75	0.42	4.00	7.14	7.25	1.68	10.50	0.42
1.00	0.42	4.25	19.32	7.50	1.68	10.75	0.42
1.25	0.42	4.50	19.32	7.75	1.68	11.00	0.42
1.50	0.42	4.75	19.32	8.00	1.68	11.25	0.42
1.75	0.42	5.00	19.32	8.25	0.84	11.50	0.42
2.00	0.42	5.25	5.46	8.50	0.84	11.75	0.42
2.25	2.52	5.50	5.46	8.75	0.84	12.00	0.42
2.50	2.52	5.75	5.46	9.00	0.84		
2.75	2.52	6.00	5.46	9.25	0.42		
3.00	2.52	6.25	2.94	9.50	0.42		

CALIB
STANDHYD (0001)
ID= 1 DT= 5.0 min

Area (ha)= 19.74
Total Imp(%)= 74.00 Dir. Conn.(%)= 74.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 14.61 5.13
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 362.77 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 10.00 30.00
Storage Coeff. (min)= 10.68 (ii) 27.53 (ii)
Unit Hyd. Tpeak (min)= 10.00 30.00
Unit Hyd. peak (cms)= 0.11 0.04

TOTALS

PEAK FLOW (cms)= 0.78 0.12 0.894 (iii)
TIME TO PEAK (hrs)= 5.25 5.42 5.25
RUNOFF VOLUME (mm)= 41.00 19.22 35.34
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.98 0.46 0.84

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 5.84	
STANDHYD (0004)	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00
ID= 1 DT= 5.0 min		

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.84	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	197.32	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42

0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 NaN
over (min) 5.00 10.00
Storage Coeff. (min)= 7.41 (ii) 7.41 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.17 0.17

TOTALS

PEAK FLOW (cms)= 0.31 0.00 0.000 (iii)
TIME TO PEAK (hrs)= 5.25 0.00 0.00
RUNOFF VOLUME (mm)= 41.00 NaN NaN
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.98 NaN NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0009)		OVERFLOW IS ON			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0020	0.0590
		0.0020	0.0010	0.0000	0.0000
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0004)		5.840	0.000	0.00	NaN
OUTFLOW: ID= 1 (0009)		5.840	0.002	0.08	20.54
OVERFLOW: ID= 3 (0003)		0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

| ADD HYD (0020) |

```

| 1 + 2 = 3 |
-----
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
ID1= 1 ( 0001): 19.74 0.894 5.25 35.34
+ ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
=====
ID = 3 ( 0020): 19.74 0.894 5.25 35.34

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0270 2.6907
0.0000 0.5126 | 0.0270 3.6151
0.0150 1.1290 | 0.5890 4.2144

```

```

INFLOW : ID= 2 ( 0020) 19.740 0.894 5.25 35.34
OUTFLOW: ID= 1 ( 0006) 19.740 0.004 12.75 7.04

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 0.48
TIME SHIFT OF PEAK FLOW (min)=450.00
MAXIMUM STORAGE USED (ha.m.)= 0.6890

```

```

| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 6.82
Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

```

```

Surface Area (ha)= IMPERVIOUS 5.12 PERVIOUS (i) 1.71
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 213.23 40.00
Mannings n = 0.013 0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 3.167 2.52 6.250 5.46 9.33 0.42
0.167 0.00 3.250 2.52 6.333 2.94 9.42 0.42
0.250 0.00 3.333 7.14 6.417 2.94 9.50 0.42
0.333 0.42 3.417 7.14 6.500 2.94 9.58 0.42
0.417 0.42 3.500 7.14 6.583 2.94 9.67 0.42
0.500 0.42 3.583 7.14 6.667 2.94 9.75 0.42
0.583 0.42 3.667 7.14 6.750 2.94 9.83 0.42
0.667 0.42 3.750 7.14 6.833 2.94 9.92 0.42
0.750 0.42 3.833 7.14 6.917 2.94 10.00 0.42
0.833 0.42 3.917 7.14 7.000 2.94 10.08 0.42
0.917 0.42 4.000 7.14 7.083 2.94 10.17 0.42
1.000 0.42 4.083 7.14 7.167 2.94 10.25 0.42
1.083 0.42 4.167 7.14 7.250 2.94 10.33 0.42
1.167 0.42 4.250 7.14 7.333 1.68 10.42 0.42
1.250 0.42 4.333 19.32 7.417 1.68 10.50 0.42
1.333 0.42 4.417 19.32 7.500 1.68 10.58 0.42
1.417 0.42 4.500 19.32 7.583 1.68 10.67 0.42
1.500 0.42 4.583 19.32 7.667 1.68 10.75 0.42
1.583 0.42 4.667 19.32 7.750 1.68 10.83 0.42
1.667 0.42 4.750 19.32 7.833 1.68 10.92 0.42
1.750 0.42 4.833 19.32 7.917 1.68 11.00 0.42
1.833 0.42 4.917 19.32 8.000 1.68 11.08 0.42
1.917 0.42 5.000 19.32 8.083 1.68 11.17 0.42
2.000 0.42 5.083 19.32 8.167 1.68 11.25 0.42
2.083 0.42 5.167 19.32 8.250 1.68 11.33 0.42
2.167 0.42 5.250 19.32 8.333 0.84 11.42 0.42
2.250 0.42 5.333 5.46 8.417 0.84 11.50 0.42
2.333 2.52 5.417 5.46 8.500 0.84 11.58 0.42
2.417 2.52 5.500 5.46 8.583 0.84 11.67 0.42
2.500 2.52 5.583 5.46 8.667 0.84 11.75 0.42
2.583 2.52 5.667 5.46 8.750 0.84 11.83 0.42
2.667 2.52 5.750 5.46 8.833 0.84 11.92 0.42
2.750 2.52 5.833 5.46 8.917 0.84 12.00 0.42
2.833 2.52 5.917 5.46 9.000 0.84 12.08 0.42
2.917 2.52 6.000 5.46 9.083 0.84 12.17 0.42
3.000 2.52 6.083 5.46 9.167 0.84 12.25 0.42

```

3.083 2.52 | 6.167 5.46 | 9.250 0.84 |

Max.Eff.Inten.(mm/hr)= 19.32 11.36
over (min) 10.00 25.00
Storage Coeff. (min)= 7.77 (ii) 24.61 (ii)
Unit Hyd. Tpeak (min)= 10.00 25.00
Unit Hyd. peak (cms)= 0.13 0.05

PEAK FLOW (cms)= 0.27 0.04 0.315 (iii)
TIME TO PEAK (hrs)= 5.25 5.42 5.25
RUNOFF VOLUME (mm)= 41.00 19.22 35.55
TOTAL RAINFALL (mm)= 42.00 42.00 42.00
RUNOFF COEFFICIENT = 0.98 0.46 0.85

TOTALS

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0005)
ID= 1 DT= 5.0 min Area (ha)= 5.21
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 5.21 0.00
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 1.00
Length (m)= 186.37 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)= 19.32 NaN
over (min) 5.00 10.00
Storage Coeff. (min)= 7.16 (ii) 7.16 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.17 0.17

TOTALS

PEAK FLOW	(cms)=	0.28	0.00	0.000 (iii)
TIME TO PEAK	(hrs)=	5.25	0.00	0.00
RUNOFF VOLUME	(mm)=	41.00	NaN	NaN
TOTAL RAINFALL	(mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT	=	0.98	NaN	NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)					
IN= 2---> OUT= 1					
DT= 5.0 min					
OVERFLOW IS ON					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0020	0.0520
		0.0020	0.0010	0.0000	0.0000
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0005)		5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)		5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)		0.000	0.000	0.00	0.00
TOTAL NUMBER OF SIMULATION OVERFLOW = 0					
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00					
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00					
PEAK FLOW REDUCTION [Qout/Qin](%)= Inf					
TIME SHIFT OF PEAK FLOW (min)= 5.00					
MAXIMUM STORAGE USED (ha.m.)= 0.0000					
MAXIMUM STORAGE USED (cu.m.)= 0.000000					
**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.					
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.					

ADD HYD (0021)					
1 + 2 = 3					
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
*** WARNING : HYDROGRAPH 0010 <ID= 1> IS DRY.					
*** WARNING : HYDROGRAPH 0021 = HYDROGRAPH 0003					
ID1= 1 (0010):		0.00	0.000	0.00	0.00
+ ID2= 2 (0003):		6.82	0.315	5.25	35.55
=====					
ID = 3 (0021):		6.82	0.315	5.25	35.55

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)					
IN= 2---> OUT= 1					
DT= 5.0 min					
OVERFLOW IS OFF					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0517	0.3200
		0.0183	0.0400	0.0549	0.3600
		0.0259	0.0800	0.0579	0.4000
		0.0317	0.1200	0.0607	0.4400
		0.0366	0.1600	0.0634	0.4800
		0.0409	0.2000	0.0660	0.5200
		0.0448	0.2400	0.0685	0.5600
		0.0484	0.2800	0.0709	0.6000
		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0021)		6.820	0.315	5.25	35.55
OUTFLOW: ID= 1 (0008)		6.820	0.038	7.50	35.55
PEAK FLOW REDUCTION [Qout/Qin](%)= 12.12					
TIME SHIFT OF PEAK FLOW (min)=135.00					
MAXIMUM STORAGE USED (ha.m.)= 0.1746					

CALIB					
STANDHYD (0002)					
ID= 1 DT= 5.0 min					
		Area	(ha)=	2.26	
		Total Imp(%)=	76.00	Dir. Conn.(%)=	76.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.72	0.54
Dep. Storage	(mm)=	1.00	1.50
Average slope	(%)=	1.00	2.00
Length	(m)=	122.75	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	2.52	6.250	5.46	9.33	0.42
0.167	0.00	3.250	2.52	6.333	2.94	9.42	0.42
0.250	0.00	3.333	7.14	6.417	2.94	9.50	0.42
0.333	0.42	3.417	7.14	6.500	2.94	9.58	0.42
0.417	0.42	3.500	7.14	6.583	2.94	9.67	0.42
0.500	0.42	3.583	7.14	6.667	2.94	9.75	0.42
0.583	0.42	3.667	7.14	6.750	2.94	9.83	0.42
0.667	0.42	3.750	7.14	6.833	2.94	9.92	0.42
0.750	0.42	3.833	7.14	6.917	2.94	10.00	0.42
0.833	0.42	3.917	7.14	7.000	2.94	10.08	0.42
0.917	0.42	4.000	7.14	7.083	2.94	10.17	0.42
1.000	0.42	4.083	7.14	7.167	2.94	10.25	0.42
1.083	0.42	4.167	7.14	7.250	2.94	10.33	0.42
1.167	0.42	4.250	7.14	7.333	1.68	10.42	0.42
1.250	0.42	4.333	19.32	7.417	1.68	10.50	0.42
1.333	0.42	4.417	19.32	7.500	1.68	10.58	0.42
1.417	0.42	4.500	19.32	7.583	1.68	10.67	0.42
1.500	0.42	4.583	19.32	7.667	1.68	10.75	0.42
1.583	0.42	4.667	19.32	7.750	1.68	10.83	0.42
1.667	0.42	4.750	19.32	7.833	1.68	10.92	0.42
1.750	0.42	4.833	19.32	7.917	1.68	11.00	0.42
1.833	0.42	4.917	19.32	8.000	1.68	11.08	0.42
1.917	0.42	5.000	19.32	8.083	1.68	11.17	0.42
2.000	0.42	5.083	19.32	8.167	1.68	11.25	0.42
2.083	0.42	5.167	19.32	8.250	1.68	11.33	0.42
2.167	0.42	5.250	19.32	8.333	0.84	11.42	0.42
2.250	0.42	5.333	5.46	8.417	0.84	11.50	0.42
2.333	2.52	5.417	5.46	8.500	0.84	11.58	0.42
2.417	2.52	5.500	5.46	8.583	0.84	11.67	0.42
2.500	2.52	5.583	5.46	8.667	0.84	11.75	0.42
2.583	2.52	5.667	5.46	8.750	0.84	11.83	0.42
2.667	2.52	5.750	5.46	8.833	0.84	11.92	0.42
2.750	2.52	5.833	5.46	8.917	0.84	12.00	0.42
2.833	2.52	5.917	5.46	9.000	0.84	12.08	0.42
2.917	2.52	6.000	5.46	9.083	0.84	12.17	0.42
3.000	2.52	6.083	5.46	9.167	0.84	12.25	0.42
3.083	2.52	6.167	5.46	9.250	0.84		

Max.Eff.Inten.(mm/hr)=	19.32	11.36
over (min)	5.00	25.00
Storage Coeff. (min)=	5.58 (ii)	22.42 (ii)
Unit Hyd. Tpeak (min)=	5.00	25.00
Unit Hyd. peak (cms)=	0.20	0.05

TOTALS

PEAK FLOW (cms)=	0.09	0.01	0.105 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	41.00	19.22	35.77
TOTAL RAINFALL (mm)=	42.00	42.00	42.00
RUNOFF COEFFICIENT =	0.98	0.46	0.85

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)
 IN= 2---> OUT= 1
 DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0823	0.0960
0.0291	0.0120	0.0873	0.1080
0.0412	0.0240	0.0921	0.1200
0.0504	0.0360	0.0965	0.1320
0.0582	0.0480	0.1008	0.1440
0.0651	0.0600	0.1050	0.1560
0.0713	0.0720	0.1058	0.1584
0.0770	0.0840	0.0000	0.0000

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW :	ID= 2 (0002)	2.260	0.105	5.25	35.77
OUTFLOW:	ID= 1 (0007)	2.260	0.047	5.50	35.72

PEAK FLOW REDUCTION [Qout/Qin](%)= 44.60
 TIME SHIFT OF PEAK FLOW (min)= 15.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0317

```

-----
| RESERVOIR( 0022) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OUTFLOW  STORAGE | OUTFLOW  STORAGE
| (cms)    (ha.m.) | (cms)    (ha.m.)
|-----|
| 0.0000   0.0000  | 1.5300   0.0100
| 0.5000   0.0050  | 1.5400   3.0000
  
```

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW :	ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW:	ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| RESERVOIR( 0023) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OUTFLOW  STORAGE | OUTFLOW  STORAGE
| (cms)    (ha.m.) | (cms)    (ha.m.)
|-----|
| 0.0000   0.0000  | 1.5300   0.0100
| 0.5000   0.0050  | 1.5400   3.0000
  
```

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW :	ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW:	ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

=====

```

V  V  I  SSSSS  U  U  A  L          (v 6.2.2022)
V  V  I  SS    U  U  A  A  L
V  V  I  SS    U  U  AAAAA  L
V  V  I  SS    U  U  A  A  L
VV   I  SSSSS  UUUUU  A  A  LLLLL
  
```

```

  OOO  TTTTT  TTTTT  H  H  Y  Y  M  M  OOO  TM
O  O  T  T  H  H  Y  Y  MM MM  O  O
O  O  T  T  H  H  Y  M  M  O  O
  OOO  T  T  H  H  Y  M  M  OOO
  
```

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
 Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\54b
 Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\54b

DATE: 10-16-2025

TIME: 09:08:41

USER:

COMMENTS: _____

 ** SIMULATION : 1 - 2 Year 6 Hour AES (Bloor, **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData ata\Local\Temp\ 744288f0-56d2-411c-a96e-a823a5116deb\e6fe40ab
Ptotal= 36.00 mm	Comments: 2 Year 6 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	1.75	12.24	3.50	5.04	5.25	0.72
0.25	0.72	2.00	12.24	3.75	2.88	5.50	0.72
0.50	0.72	2.25	33.12	4.00	2.88	5.75	0.72
0.75	0.72	2.50	33.12	4.25	1.44	6.00	0.72
1.00	0.72	2.75	9.36	4.50	1.44		
1.25	4.32	3.00	9.36	4.75	0.72		
1.50	4.32	3.25	5.04	5.00	0.72		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00	Dir. Conn.(%)= 74.00
--	---	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	4.32	3.250	9.36	4.83	0.72
0.167	0.00	1.750	4.32	3.333	5.04	4.92	0.72
0.250	0.00	1.833	12.24	3.417	5.04	5.00	0.72
0.333	0.72	1.917	12.24	3.500	5.04	5.08	0.72
0.417	0.72	2.000	12.24	3.583	5.04	5.17	0.72
0.500	0.72	2.083	12.24	3.667	5.04	5.25	0.72
0.583	0.72	2.167	12.24	3.750	5.04	5.33	0.72
0.667	0.72	2.250	12.24	3.833	2.88	5.42	0.72
0.750	0.72	2.333	33.12	3.917	2.88	5.50	0.72
0.833	0.72	2.417	33.12	4.000	2.88	5.58	0.72
0.917	0.72	2.500	33.12	4.083	2.88	5.67	0.72
1.000	0.72	2.583	33.12	4.167	2.88	5.75	0.72
1.083	0.72	2.667	33.12	4.250	2.88	5.83	0.72
1.167	0.72	2.750	33.12	4.333	1.44	5.92	0.72
1.250	0.72	2.833	9.36	4.417	1.44	6.00	0.72
1.333	4.32	2.917	9.36	4.500	1.44	6.08	0.72
1.417	4.32	3.000	9.36	4.583	1.44	6.17	0.72
1.500	4.32	3.083	9.36	4.667	1.44	6.25	0.72
1.583	4.32	3.167	9.36	4.750	1.44		

Max.Eff.Inten.(mm/hr)=	33.12	17.18
over (min)	10.00	25.00
Storage Coeff. (min)=	8.61 (ii)	22.89 (ii)
Unit Hyd. Tpeak (min)=	10.00	25.00
Unit Hyd. peak (cms)=	0.12	0.05

			TOTALS
PEAK FLOW (cms)=	1.31	0.15	1.421 (iii)
TIME TO PEAK (hrs)=	2.75	3.00	2.75
RUNOFF VOLUME (mm)=	35.00	15.00	29.80
TOTAL RAINFALL (mm)=	36.00	36.00	36.00
RUNOFF COEFFICIENT =	0.97	0.42	0.83

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

CALIB
STANDHYD ( 0004)
ID= 1 DT= 5.0 min

```

```

Area (ha)= 5.84
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

```

```

IMPERVIOUS      PERVIOUS (i)
Surface Area    (ha)= 5.84      0.00
Dep. Storage    (mm)= 1.00      1.50
Average Slope    (%)= 1.00      1.00
Length          (m)= 197.32     40.00
Mannings n      = 0.013        0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 1.667 4.32 3.250 9.36 4.83 0.72
0.167 0.00 1.750 4.32 3.333 5.04 4.92 0.72
0.250 0.00 1.833 12.24 3.417 5.04 5.00 0.72
0.333 0.72 1.917 12.24 3.500 5.04 5.08 0.72
0.417 0.72 2.000 12.24 3.583 5.04 5.17 0.72
0.500 0.72 2.083 12.24 3.667 5.04 5.25 0.72
0.583 0.72 2.167 12.24 3.750 5.04 5.33 0.72
0.667 0.72 2.250 12.24 3.833 2.88 5.42 0.72
0.750 0.72 2.333 33.12 3.917 2.88 5.50 0.72
0.833 0.72 2.417 33.12 4.000 2.88 5.58 0.72
0.917 0.72 2.500 33.12 4.083 2.88 5.67 0.72
1.000 0.72 2.583 33.12 4.167 2.88 5.75 0.72
1.083 0.72 2.667 33.12 4.250 2.88 5.83 0.72
1.167 0.72 2.750 33.12 4.333 1.44 5.92 0.72
1.250 0.72 2.833 9.36 4.417 1.44 6.00 0.72
1.333 4.32 2.917 9.36 4.500 1.44 6.08 0.72
1.417 4.32 3.000 9.36 4.583 1.44 6.17 0.72
1.500 4.32 3.083 9.36 4.667 1.44 6.25 0.72
1.583 4.32 3.167 9.36 4.750 1.44

```

```

Max.Eff.Inten.(mm/hr)= 33.12      NaN
over (min)            5.00      10.00
Storage Coeff. (min)= 5.98 (ii)    5.98 (ii)
Unit Hyd. Tpeak (min)= 5.00      10.00
Unit Hyd. peak (cms)= 0.19        0.18

```

TOTALS

```

PEAK FLOW (cms)= 0.54      0.00      0.000 (iii)
TIME TO PEAK (hrs)= 2.75    0.00      0.00
RUNOFF VOLUME (mm)= 35.00    NaN
TOTAL RAINFALL (mm)= 36.00    36.00    36.00
RUNOFF COEFFICIENT = 0.97      NaN      NaN

```

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

RESERVOIR( 0009)
IN= 2---> OUT= 1
DT= 5.0 min

```

OVERFLOW IS ON

```

OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0020 0.0590
0.0020 0.0010 | 0.0000 0.0000

```

```

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0004) 5.840 0.000 0.00 NaN
OUTFLOW: ID= 1 ( 0009) 5.840 0.002 0.08 20.54
OVERFLOW:ID= 3 ( 0003) 0.000 0.000 0.00 0.00

```

```

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

```

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.

```

-----
| ADD HYD ( 0020) |
| 1 + 2 = 3 |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
      ID1= 1 ( 0001): 19.74 1.421 2.75 29.80
      + ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
      =====
      ID = 3 ( 0020): 19.74 1.421 2.75 29.80

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
      OVERFLOW IS OFF

      OUTFLOW      STORAGE      OUTFLOW      STORAGE
      (cms)      (ha.m.)      (cms)      (ha.m.)
      0.0000      0.0000      0.0270      2.6907
      0.0000      0.5126      0.0270      3.6151
      0.0150      1.1290      0.5890      4.2144

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0020) 19.740 1.421 2.75 29.80
OUTFLOW: ID= 1 ( 0006) 19.740 0.002 7.00 2.91

      PEAK FLOW REDUCTION [Qout/Qin](%)= 0.13
      TIME SHIFT OF PEAK FLOW (min)=255.00
      MAXIMUM STORAGE USED (ha.m.)= 0.5865

```

```

-----
| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
      Area (ha)= 6.82
      Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

      IMPERVIOUS      PERVIOUS (i)
      Surface Area (ha)= 5.12 1.71
      Dep. Storage (mm)= 1.00 1.50
      Average slope (%)= 1.00 2.00
      Length (m)= 213.23 40.00
      Mannings n = 0.013 0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

-----
      TIME RAIN      TIME RAIN      TIME RAIN      TIME RAIN
      hrs mm/hr      hrs mm/hr      hrs mm/hr      hrs mm/hr
0.083 0.00 1.667 4.32 3.250 9.36 4.83 0.72
0.167 0.00 1.750 4.32 3.333 5.04 4.92 0.72
0.250 0.00 1.833 12.24 3.417 5.04 5.00 0.72
0.333 0.72 1.917 12.24 3.500 5.04 5.08 0.72
0.417 0.72 2.000 12.24 3.583 5.04 5.17 0.72
0.500 0.72 2.083 12.24 3.667 5.04 5.25 0.72
0.583 0.72 2.167 12.24 3.750 5.04 5.33 0.72
0.667 0.72 2.250 12.24 3.833 2.88 5.42 0.72
0.750 0.72 2.333 33.12 3.917 2.88 5.50 0.72
0.833 0.72 2.417 33.12 4.000 2.88 5.58 0.72
0.917 0.72 2.500 33.12 4.083 2.88 5.67 0.72
1.000 0.72 2.583 33.12 4.167 2.88 5.75 0.72
1.083 0.72 2.667 33.12 4.250 2.88 5.83 0.72
1.167 0.72 2.750 33.12 4.333 1.44 5.92 0.72
1.250 0.72 2.833 9.36 4.417 1.44 6.00 0.72
1.333 4.32 2.917 9.36 4.500 1.44 6.08 0.72
1.417 4.32 3.000 9.36 4.583 1.44 6.17 0.72
1.500 4.32 3.083 9.36 4.667 1.44 6.25 0.72
1.583 4.32 3.167 9.36 4.750 1.44

Max.Eff.Inten.(mm/hr)= 33.12 17.18
over (min) 5.00 25.00
Storage Coeff. (min)= 6.26 (ii) 20.54 (ii)
Unit Hyd. Tpeak (min)= 5.00 25.00
Unit Hyd. peak (cms)= 0.19 0.05

*TOTALS*
PEAK FLOW (cms)= 0.47 0.05 0.509 (iii)
TIME TO PEAK (hrs)= 2.75 3.00 2.75
RUNOFF VOLUME (mm)= 35.00 15.01 30.00
TOTAL RAINFALL (mm)= 36.00 36.00 36.00
RUNOFF COEFFICIENT = 0.97 0.42 0.83

```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| STANDHYD ( 0005) |
| ID= 1 DT= 5.0 min |
|-----|
Area      (ha)= 5.21
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

```

```

          IMPERVIOUS      PERVIOUS (i)
Surface Area  (ha)= 5.21      0.00
Dep. Storage  (mm)= 1.00      1.50
Average Slope (%)= 1.00      1.00
Length        (m)= 186.37    40.00
Mannings n    = 0.013      0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

          ----- TRANSFORMED HYETOGRAPH -----
TIME    RAIN    TIME    RAIN    TIME    RAIN    TIME    RAIN
hrs     mm/hr  hrs     mm/hr  hrs     mm/hr  hrs     mm/hr
0.083   0.00   1.667   4.32   3.250   9.36   4.83   0.72
0.167   0.00   1.750   4.32   3.333   5.04   4.92   0.72
0.250   0.00   1.833  12.24   3.417   5.04   5.00   0.72
0.333   0.72   1.917  12.24   3.500   5.04   5.08   0.72
0.417   0.72   2.000  12.24   3.583   5.04   5.17   0.72
0.500   0.72   2.083  12.24   3.667   5.04   5.25   0.72
0.583   0.72   2.167  12.24   3.750   5.04   5.33   0.72
0.667   0.72   2.250  12.24   3.833   2.88   5.42   0.72
0.750   0.72   2.333  33.12   3.917   2.88   5.50   0.72
0.833   0.72   2.417  33.12   4.000   2.88   5.58   0.72
0.917   0.72   2.500  33.12   4.083   2.88   5.67   0.72
1.000   0.72   2.583  33.12   4.167   2.88   5.75   0.72
1.083   0.72   2.667  33.12   4.250   2.88   5.83   0.72
1.167   0.72   2.750  33.12   4.333   1.44   5.92   0.72
1.250   0.72   2.833   9.36   4.417   1.44   6.00   0.72
1.333   4.32   2.917   9.36   4.500   1.44   6.08   0.72
1.417   4.32   3.000   9.36   4.583   1.44   6.17   0.72
1.500   4.32   3.083   9.36   4.667   1.44   6.25   0.72
1.583   4.32   3.167   9.36   4.750   1.44

```

```

Max.Eff.Inten.(mm/hr)= 33.12      NaN
over (min)           5.00      10.00
Storage Coeff. (min)= 5.77 (ii)   5.77 (ii)
Unit Hyd. Tpeak (min)= 5.00      10.00
Unit Hyd. peak (cms)= 0.20      0.18

```

```

          *TOTALS*
PEAK FLOW      (cms)= 0.48      0.00      0.000 (iii)
TIME TO PEAK   (hrs)= 2.75      0.00      0.00
RUNOFF VOLUME  (mm)= 35.00      NaN
TOTAL RAINFALL (mm)= 36.00      36.00      36.00
RUNOFF COEFFICIENT = 0.97      NaN      NaN

```

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0010) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
          OVERFLOW IS ON
OUTFLOW    STORAGE    | OUTFLOW    STORAGE
(cms)      (ha.m.)    | (cms)      (ha.m.)
0.0000     0.0000    | 0.0020     0.0520
0.0020     0.0010    | 0.0000     0.0000

```

```

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0005) 5.210      0.000      0.00      NaN
OUTFLOW: ID= 1 ( 0010) 5.210      0.002      0.08      23.02
OVERFLOW:ID= 3 ( 0003) 0.000      0.000      0.00      0.00

```

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00

PERCENTAGE OF TIME OVERFLOWING (%)= 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```
-----
| ADD HYD ( 0021) |
| 1 + 2 = 3 |
-----
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003
ID1= 1 ( 0010): 0.00 0.000 0.00 0.00
+ ID2= 2 ( 0003): 6.82 0.509 2.75 30.00
=====
ID = 3 ( 0021): 6.82 0.509 2.75 30.00
=====
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| RESERVOIR( 0008) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
OVERFLOW IS OFF

OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0517 0.3200
0.0183 0.0400 | 0.0549 0.3600
0.0259 0.0800 | 0.0579 0.4000
0.0317 0.1200 | 0.0607 0.4400
0.0366 0.1600 | 0.0634 0.4800
0.0409 0.2000 | 0.0660 0.5200
0.0448 0.2400 | 0.0685 0.5600
0.0484 0.2800 | 0.0709 0.6000

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0021) 6.820 0.509 2.75 30.00
OUTFLOW: ID= 1 ( 0008) 6.820 0.037 4.42 30.00
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.30
TIME SHIFT OF PEAK FLOW (min)=100.00
MAXIMUM STORAGE USED (ha.m.)= 0.1650

```
-----
| CALIB |
| STANDHYD ( 0002) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 2.26
Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.72 0.54
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 122.75 40.00
Mannings n = 0.013 0.250
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 1.667 4.32 3.250 9.36 4.83 0.72
0.167 0.00 1.750 4.32 3.333 5.04 4.92 0.72
0.250 0.00 1.833 12.24 3.417 5.04 5.00 0.72
0.333 0.72 1.917 12.24 3.500 5.04 5.08 0.72
0.417 0.72 2.000 12.24 3.583 5.04 5.17 0.72
0.500 0.72 2.083 12.24 3.667 5.04 5.25 0.72
0.583 0.72 2.167 12.24 3.750 5.04 5.33 0.72
0.667 0.72 2.250 12.24 3.833 2.88 5.42 0.72
0.750 0.72 2.333 33.12 3.917 2.88 5.50 0.72
0.833 0.72 2.417 33.12 4.000 2.88 5.58 0.72
0.917 0.72 2.500 33.12 4.083 2.88 5.67 0.72
1.000 0.72 2.583 33.12 4.167 2.88 5.75 0.72
1.083 0.72 2.667 33.12 4.250 2.88 5.83 0.72
1.167 0.72 2.750 33.12 4.333 1.44 5.92 0.72
1.250 0.72 2.833 9.36 4.417 1.44 6.00 0.72
1.333 4.32 2.917 9.36 4.500 1.44 6.08 0.72
1.417 4.32 3.000 9.36 4.583 1.44 6.17 0.72
1.500 4.32 3.083 9.36 4.667 1.44 6.25 0.72
```

1.583 4.32 | 3.167 9.36 | 4.750 1.44 |

Max.Eff.Inten.(mm/hr)=	33.12	17.18	
over (min)	5.00	20.00	
Storage Coeff. (min)=	4.49 (ii)	18.77 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.23	0.06	
			TOTALS
PEAK FLOW (cms)=	0.16	0.02	0.173 (iii)
TIME TO PEAK (hrs)=	2.75	2.92	2.75
RUNOFF VOLUME (mm)=	35.00	15.01	30.20
TOTAL RAINFALL (mm)=	36.00	36.00	36.00
RUNOFF COEFFICIENT =	0.97	0.42	0.84

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)		OVERFLOW IS OFF			
IN= 2---> OUT= 1		DT= 5.0 min			
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	0.0823	0.0960
		0.0291	0.0120	0.0873	0.1080
		0.0412	0.0240	0.0921	0.1200
		0.0504	0.0360	0.0965	0.1320
		0.0582	0.0480	0.1008	0.1440
		0.0651	0.0600	0.1050	0.1560
		0.0713	0.0720	0.1058	0.1584
		0.0770	0.0840	0.0000	0.0000
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0002)		2.260	0.173	2.75	30.20
OUTFLOW: ID= 1 (0007)		2.260	0.050	3.25	30.15
		PEAK FLOW REDUCTION [Qout/Qin](%)= 28.77			
		TIME SHIFT OF PEAK FLOW (min)= 30.00			
		MAXIMUM STORAGE USED (ha.m.)= 0.0353			

RESERVOIR(0022)		OVERFLOW IS OFF			
IN= 2---> OUT= 1		DT= 5.0 min			
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	1.5300	0.0100
		0.5000	0.0050	1.5400	3.0000
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)		5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)		5.840	0.002	0.17	20.53
		PEAK FLOW REDUCTION [Qout/Qin](%)=108.00			
		TIME SHIFT OF PEAK FLOW (min)= 5.00			
		MAXIMUM STORAGE USED (ha.m.)= 0.0000			
		MAXIMUM STORAGE USED (cu.m.)= 0.255783			

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)		OVERFLOW IS OFF			
IN= 2---> OUT= 1		DT= 5.0 min			
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	1.5300	0.0100
		0.5000	0.0050	1.5400	3.0000
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)		5.210	0.002	0.08	23.02
OUTFLOW: ID= 1 (0023)		5.210	0.002	0.17	23.02
		PEAK FLOW REDUCTION [Qout/Qin](%)=108.00			
		TIME SHIFT OF PEAK FLOW (min)= 5.00			
		MAXIMUM STORAGE USED (ha.m.)= 0.0000			

MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

V V I SSSSS U U A L (v 6.2.2022)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
000 T T H H Y M M 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\177
Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\177

DATE: 10-16-2025

TIME: 09:08:44

USER:

COMMENTS: _____

** SIMULATION : 2 - 5 Year 12 Hour AES (Bloor) **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\c1600484
Ptotal= 54.38 mm	Comments: 5 Year 12 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	3.25	9.25	6.50	3.81	9.75	0.54
0.25	0.54	3.50	9.25	6.75	3.81	10.00	0.54
0.50	0.54	3.75	9.25	7.00	3.81	10.25	0.54
0.75	0.54	4.00	9.25	7.25	2.18	10.50	0.54
1.00	0.54	4.25	25.02	7.50	2.18	10.75	0.54
1.25	0.54	4.50	25.02	7.75	2.18	11.00	0.54
1.50	0.54	4.75	25.02	8.00	2.18	11.25	0.54
1.75	0.54	5.00	25.02	8.25	1.09	11.50	0.54
2.00	0.54	5.25	7.07	8.50	1.09	11.75	0.54
2.25	3.26	5.50	7.07	8.75	1.09	12.00	0.54
2.50	3.26	5.75	7.07	9.00	1.09		
2.75	3.26	6.00	7.07	9.25	0.54		
3.00	3.26	6.25	3.81	9.50	0.54		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00	Dir. Conn.(%)= 74.00
--	---	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 16.91
 over (min) 10.00 25.00
 Storage Coeff. (min)= 9.63 (ii) 24.00 (ii)
 Unit Hyd. Tpeak (min)= 10.00 25.00
 Unit Hyd. peak (cms)= 0.11 0.05

PEAK FLOW (cms)= 1.01 0.19 *TOTALS*
 TIME TO PEAK (hrs)= 5.25 5.33 1.199 (iii)
 RUNOFF VOLUME (mm)= 53.38 28.62 46.94
 TOTAL RAINFALL (mm)= 54.38 54.38 54.38
 RUNOFF COEFFICIENT = 0.98 0.53 0.86

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 5.84	
STANDHYD (0004)	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00
ID= 1 DT= 5.0 min		

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.84	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	197.32	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54

0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)= 25.02 NaN
over (min) 5.00 10.00
Storage Coeff. (min)= 6.69 (ii) 6.69 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.18 0.17

TOTALS

PEAK FLOW (cms)= 0.41 0.00 0.000 (iii)
TIME TO PEAK (hrs)= 5.25 0.00 0.00
RUNOFF VOLUME (mm)= 53.38 NaN NaN
TOTAL RAINFALL (mm)= 54.38 54.38 54.38
RUNOFF COEFFICIENT = 0.98 NaN NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0009) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OVERFLOW IS ON |
|-----|
| OUTFLOW          | STORAGE          | OUTFLOW          | STORAGE          |
| (cms)            | (ha.m.)          | (cms)            | (ha.m.)          |
| 0.0000           | 0.0000           | 0.0020           | 0.0590           |
| 0.0020           | 0.0010           | 0.0000           | 0.0000           |
|-----|
| AREA             | QPEAK            | TPEAK            | R.V.             |
| (ha)             | (cms)            | (hrs)            | (mm)             |
| INFLOW : ID= 2 ( 0004) | 5.840           | 0.000           | 0.00             |
| OUTFLOW: ID= 1 ( 0009) | 5.840           | 0.002           | 20.54            |
| OVERFLOW:ID= 3 ( 0003) | 0.000           | 0.000           | 0.00             |

```

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| ADD HYD ( 0020) |
| 1 + 2 = 3       |
|-----|
| AREA             | QPEAK            | TPEAK            | R.V.             |

```

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-----
*** W A R N I N G : (ha) (cms) (hrs) (mm)
HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
ID1= 1 ( 0001): 19.74 1.199 5.25 46.94
+ ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
=====
ID = 3 ( 0020): 19.74 1.199 5.25 46.94

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0006) | OVERFLOW IS OFF
| IN= 2----> OUT= 1 |
| DT= 5.0 min |
=====
| OUTFLOW | STORAGE | OUTFLOW | STORAGE
| (cms) | (ha.m.) | (cms) | (ha.m.)
|-----|
| 0.0000 | 0.0000 | 0.0270 | 2.6907
| 0.0000 | 0.5126 | 0.0270 | 3.6151
| 0.0150 | 1.1290 | 0.5890 | 4.2144
=====
| AREA | QPEAK | TPEAK | R.V.
| (ha) | (cms) | (hrs) | (mm)
|-----|
| INFLOW : ID= 2 ( 0020) | 19.740 | 1.199 | 5.25 | 46.94
| OUTFLOW: ID= 1 ( 0006) | 19.740 | 0.010 | 12.58 | 15.81
=====
| PEAK FLOW REDUCTION [Qout/Qin](%)= 0.80
| TIME SHIFT OF PEAK FLOW (min)=440.00
| MAXIMUM STORAGE USED (ha.m.)= 0.9053

```

```

-----
| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
=====
| Area (ha)= 6.82
| Total Imp(%)= 75.00 | Dir. Conn.(%)= 75.00
=====
| IMPERVIOUS | PERVIOUS (i)
| Surface Area (ha)= 5.12 | 1.71
| Dep. Storage (mm)= 1.00 | 1.50
| Average Slope (%)= 1.00 | 2.00
| Length (m)= 213.23 | 40.00
| Mannings n = 0.013 | 0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
| TIME | RAIN | TIME | RAIN | TIME | RAIN | TIME | RAIN |
| hrs | mm/hr | hrs | mm/hr | hrs | mm/hr | hrs | mm/hr |
|-----|-----|-----|-----|-----|-----|-----|-----|
| 0.083 | 0.00 | 3.167 | 3.26 | 6.250 | 7.07 | 9.33 | 0.54 |
| 0.167 | 0.00 | 3.250 | 3.26 | 6.333 | 3.81 | 9.42 | 0.54 |
| 0.250 | 0.00 | 3.333 | 9.25 | 6.417 | 3.81 | 9.50 | 0.54 |
| 0.333 | 0.54 | 3.417 | 9.25 | 6.500 | 3.81 | 9.58 | 0.54 |
| 0.417 | 0.54 | 3.500 | 9.25 | 6.583 | 3.81 | 9.67 | 0.54 |
| 0.500 | 0.54 | 3.583 | 9.25 | 6.667 | 3.81 | 9.75 | 0.54 |
| 0.583 | 0.54 | 3.667 | 9.25 | 6.750 | 3.81 | 9.83 | 0.54 |
| 0.667 | 0.54 | 3.750 | 9.25 | 6.833 | 3.81 | 9.92 | 0.54 |
| 0.750 | 0.54 | 3.833 | 9.25 | 6.917 | 3.81 | 10.00 | 0.54 |
| 0.833 | 0.54 | 3.917 | 9.25 | 7.000 | 3.81 | 10.08 | 0.54 |
| 0.917 | 0.54 | 4.000 | 9.25 | 7.083 | 3.81 | 10.17 | 0.54 |
| 1.000 | 0.54 | 4.083 | 9.25 | 7.167 | 3.81 | 10.25 | 0.54 |
| 1.083 | 0.54 | 4.167 | 9.25 | 7.250 | 3.81 | 10.33 | 0.54 |
| 1.167 | 0.54 | 4.250 | 9.25 | 7.333 | 2.18 | 10.42 | 0.54 |
| 1.250 | 0.54 | 4.333 | 25.02 | 7.417 | 2.18 | 10.50 | 0.54 |
| 1.333 | 0.54 | 4.417 | 25.02 | 7.500 | 2.18 | 10.58 | 0.54 |
| 1.417 | 0.54 | 4.500 | 25.02 | 7.583 | 2.18 | 10.67 | 0.54 |
| 1.500 | 0.54 | 4.583 | 25.02 | 7.667 | 2.18 | 10.75 | 0.54 |
| 1.583 | 0.54 | 4.667 | 25.02 | 7.750 | 2.18 | 10.83 | 0.54 |
| 1.667 | 0.54 | 4.750 | 25.02 | 7.833 | 2.18 | 10.92 | 0.54 |
| 1.750 | 0.54 | 4.833 | 25.02 | 7.917 | 2.18 | 11.00 | 0.54 |
| 1.833 | 0.54 | 4.917 | 25.02 | 8.000 | 2.18 | 11.08 | 0.54 |
| 1.917 | 0.54 | 5.000 | 25.02 | 8.083 | 2.18 | 11.17 | 0.54 |
| 2.000 | 0.54 | 5.083 | 25.02 | 8.167 | 2.18 | 11.25 | 0.54 |
| 2.083 | 0.54 | 5.167 | 25.02 | 8.250 | 2.18 | 11.33 | 0.54 |
| 2.167 | 0.54 | 5.250 | 25.02 | 8.333 | 1.09 | 11.42 | 0.54 |
| 2.250 | 0.54 | 5.333 | 7.07 | 8.417 | 1.09 | 11.50 | 0.54 |
| 2.333 | 3.26 | 5.417 | 7.07 | 8.500 | 1.09 | 11.58 | 0.54 |
| 2.417 | 3.26 | 5.500 | 7.07 | 8.583 | 1.09 | 11.67 | 0.54 |
| 2.500 | 3.26 | 5.583 | 7.07 | 8.667 | 1.09 | 11.75 | 0.54 |
| 2.583 | 3.26 | 5.667 | 7.07 | 8.750 | 1.09 | 11.83 | 0.54 |
| 2.667 | 3.26 | 5.750 | 7.07 | 8.833 | 1.09 | 11.92 | 0.54 |
| 2.750 | 3.26 | 5.833 | 7.07 | 8.917 | 1.09 | 12.00 | 0.54 |
| 2.833 | 3.26 | 5.917 | 7.07 | 9.000 | 1.09 | 12.08 | 0.54 |
| 2.917 | 3.26 | 6.000 | 7.07 | 9.083 | 1.09 | 12.17 | 0.54 |
| 3.000 | 3.26 | 6.083 | 7.07 | 9.167 | 1.09 | 12.25 | 0.54 |
| 3.083 | 3.26 | 6.167 | 7.07 | 9.250 | 1.09 | 12.33 | 0.54 |

```

Max.Eff.Inten.(mm/hr)=	25.02	16.91	
over (min)	5.00	25.00	
Storage Coeff. (min)=	7.00 (ii)	21.37 (ii)	
Unit Hyd. Tpeak (min)=	5.00	25.00	
Unit Hyd. peak (cms)=	0.17	0.05	
			TOTALS
PEAK FLOW (cms)=	0.36	0.07	0.419 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	53.38	28.62	47.19
TOTAL RAINFALL (mm)=	54.38	54.38	54.38
RUNOFF COEFFICIENT =	0.98	0.53	0.87

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0005)	Area (ha)= 5.21		
ID= 1 DT= 5.0 min	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	186.37	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)=	25.02	NaN	
over (min)	5.00	10.00	
Storage Coeff. (min)=	6.46 (ii)	6.46 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.18	0.17	
			TOTALS
PEAK FLOW (cms)=	0.36	0.00	0.000 (iii)

TIME TO PEAK	(hrs)=	5.25	0.00	0.00
RUNOFF VOLUME	(mm)=	53.38	NaN	NaN
TOTAL RAINFALL	(mm)=	54.38	54.38	54.38
RUNOFF COEFFICIENT	=	0.98	NaN	NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)		OVERFLOW IS ON			
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	0.0020	0.0520	
	0.0020	0.0010	0.0000	0.0000	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0005)		5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)		5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)		0.000	0.000	0.00	0.00
TOTAL NUMBER OF SIMULATION OVERFLOW = 0					
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00					
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00					
PEAK FLOW REDUCTION [Qout/Qin](%)= Inf					
TIME SHIFT OF PEAK FLOW (min)= 5.00					
MAXIMUM STORAGE USED (ha.m.)= 0.0000					
MAXIMUM STORAGE USED (cu.m.)= 0.000000					

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0021)					
1 + 2 = 3					
*** W A R N I N G :	HYDROGRAPH	0010	<ID= 1>	IS DRY.	
*** W A R N I N G :	HYDROGRAPH	0021	= HYDROGRAPH	0003	
	ID1= 1 (0010):	0.00	0.000	0.00	0.00
	+ ID2= 2 (0003):	6.82	0.419	5.25	47.19
	ID = 3 (0021):	6.82	0.419	5.25	47.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	0.0517	0.3200	
	0.0183	0.0400	0.0549	0.3600	
	0.0259	0.0800	0.0579	0.4000	
	0.0317	0.1200	0.0607	0.4400	
	0.0366	0.1600	0.0634	0.4800	
	0.0409	0.2000	0.0660	0.5200	
	0.0448	0.2400	0.0685	0.5600	
	0.0484	0.2800	0.0709	0.6000	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0021)		6.820	0.419	5.25	47.19
OUTFLOW: ID= 1 (0008)		6.820	0.045	7.58	47.19
PEAK FLOW REDUCTION [Qout/Qin](%)= 10.65					
TIME SHIFT OF PEAK FLOW (min)=140.00					
MAXIMUM STORAGE USED (ha.m.)= 0.2383					

CALIB				
STANDHYD (0002)		Area (ha)=	2.26	
ID= 1 DT= 5.0 min		Total Imp(%)=	76.00	Dir. Conn.(%)= 76.00
IMPERVIOUS PERVIOUS (i)				

Surface Area	(ha)=	1.72	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	122.75	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.26	6.250	7.07	9.33	0.54
0.167	0.00	3.250	3.26	6.333	3.81	9.42	0.54
0.250	0.00	3.333	9.25	6.417	3.81	9.50	0.54
0.333	0.54	3.417	9.25	6.500	3.81	9.58	0.54
0.417	0.54	3.500	9.25	6.583	3.81	9.67	0.54
0.500	0.54	3.583	9.25	6.667	3.81	9.75	0.54
0.583	0.54	3.667	9.25	6.750	3.81	9.83	0.54
0.667	0.54	3.750	9.25	6.833	3.81	9.92	0.54
0.750	0.54	3.833	9.25	6.917	3.81	10.00	0.54
0.833	0.54	3.917	9.25	7.000	3.81	10.08	0.54
0.917	0.54	4.000	9.25	7.083	3.81	10.17	0.54
1.000	0.54	4.083	9.25	7.167	3.81	10.25	0.54
1.083	0.54	4.167	9.25	7.250	3.81	10.33	0.54
1.167	0.54	4.250	9.25	7.333	2.18	10.42	0.54
1.250	0.54	4.333	25.02	7.417	2.18	10.50	0.54
1.333	0.54	4.417	25.02	7.500	2.18	10.58	0.54
1.417	0.54	4.500	25.02	7.583	2.18	10.67	0.54
1.500	0.54	4.583	25.02	7.667	2.18	10.75	0.54
1.583	0.54	4.667	25.02	7.750	2.18	10.83	0.54
1.667	0.54	4.750	25.02	7.833	2.18	10.92	0.54
1.750	0.54	4.833	25.02	7.917	2.18	11.00	0.54
1.833	0.54	4.917	25.02	8.000	2.18	11.08	0.54
1.917	0.54	5.000	25.02	8.083	2.18	11.17	0.54
2.000	0.54	5.083	25.02	8.167	2.18	11.25	0.54
2.083	0.54	5.167	25.02	8.250	2.18	11.33	0.54
2.167	0.54	5.250	25.02	8.333	1.09	11.42	0.54
2.250	0.54	5.333	7.07	8.417	1.09	11.50	0.54
2.333	3.26	5.417	7.07	8.500	1.09	11.58	0.54
2.417	3.26	5.500	7.07	8.583	1.09	11.67	0.54
2.500	3.26	5.583	7.07	8.667	1.09	11.75	0.54
2.583	3.26	5.667	7.07	8.750	1.09	11.83	0.54
2.667	3.26	5.750	7.07	8.833	1.09	11.92	0.54
2.750	3.26	5.833	7.07	8.917	1.09	12.00	0.54
2.833	3.26	5.917	7.07	9.000	1.09	12.08	0.54
2.917	3.26	6.000	7.07	9.083	1.09	12.17	0.54
3.000	3.26	6.083	7.07	9.167	1.09	12.25	0.54
3.083	3.26	6.167	7.07	9.250	1.09		

Max.Eff.Inten.(mm/hr)=	25.02	16.91
over (min)	5.00	20.00
Storage Coeff. (min)=	5.03 (ii)	19.40 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.21	0.06

TOTALS

PEAK FLOW (cms)=	0.12	0.02	0.141 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	53.38	28.62	47.43
TOTAL RAINFALL (mm)=	54.38	54.38	54.38
RUNOFF COEFFICIENT =	0.98	0.53	0.87

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)	OVERFLOW IS OFF			
IN= 2----> OUT= 1				
DT= 5.0 min				
	OUTFLOW	STORAGE	OUTFLOW	STORAGE
	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.0823	0.0960
	0.0291	0.0120	0.0873	0.1080
	0.0412	0.0240	0.0921	0.1200
	0.0504	0.0360	0.0965	0.1320
	0.0582	0.0480	0.1008	0.1440
	0.0651	0.0600	0.1050	0.1560
	0.0713	0.0720	0.1058	0.1584
	0.0770	0.0840	0.0000	0.0000

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW :	ID= 2 (0002)	2.260	0.141	5.25	47.43
OUTFLOW:	ID= 1 (0007)	2.260	0.056	5.50	47.39

PEAK FLOW REDUCTION [Qout/Qin](%)= 39.80
 TIME SHIFT OF PEAK FLOW (min)= 15.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0447

```

-----
| RESERVOIR( 0022) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OUTFLOW  STORAGE | OUTFLOW  STORAGE
| (cms)    (ha.m.) | (cms)    (ha.m.)
|-----|
| 0.0000   0.0000  | 1.5300   0.0100
| 0.5000   0.0050  | 1.5400   3.0000
  
```

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW :	ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW:	ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| RESERVOIR( 0023) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OUTFLOW  STORAGE | OUTFLOW  STORAGE
| (cms)    (ha.m.) | (cms)    (ha.m.)
|-----|
| 0.0000   0.0000  | 1.5300   0.0100
| 0.5000   0.0050  | 1.5400   3.0000
  
```

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW :	ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW:	ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

=====
V  V  I  SSSSS  U  U  A  L  (v 6.2.2022)
V  V  I  SS    U  U  A  A  L
V  V  I  SS    U  U  AAAAA L
V  V  I  SS    U  U  A  A  L
VV   I  SSSSS  UUUUU  A  A  LLLLL
  
```

```

    000  TTTTT  TTTTT  H  H  Y  Y  M  M  000  TM
    O  O  T    T    H  H  Y  Y  MM MM  O  O
    O  O  T    T    H  H  Y  M  M  O  O
    000  T    T    H  H  Y  M  M  000
  
```

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
 Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\419
 Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\419

DATE: 10-16-2025

TIME: 09:08:41

USER:

COMMENTS: _____

 ** SIMULATION : 2 - 5 Year 6 Hour AES (Bloor, **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\c5addc7c
Ptotal= 47.81 mm	Comments: 5 Year 6 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	1.75	16.25	3.50	6.69	5.25	0.96
0.25	0.96	2.00	16.25	3.75	3.82	5.50	0.96
0.50	0.96	2.25	43.98	4.00	3.82	5.75	0.96
0.75	0.96	2.50	43.98	4.25	1.91	6.00	0.96
1.00	0.96	2.75	12.43	4.50	1.91		
1.25	5.74	3.00	12.43	4.75	0.96		
1.50	5.74	3.25	6.69	5.00	0.96		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00	Dir. Conn.(%)= 74.00
--	---	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	5.74	3.250	12.43	4.83	0.96
0.167	0.00	1.750	5.74	3.333	6.69	4.92	0.96
0.250	0.00	1.833	16.25	3.417	6.69	5.00	0.96
0.333	0.96	1.917	16.25	3.500	6.69	5.08	0.96
0.417	0.96	2.000	16.25	3.583	6.69	5.17	0.96
0.500	0.96	2.083	16.25	3.667	6.69	5.25	0.96
0.583	0.96	2.167	16.25	3.750	6.69	5.33	0.96
0.667	0.96	2.250	16.25	3.833	3.82	5.42	0.96
0.750	0.96	2.333	43.98	3.917	3.82	5.50	0.96
0.833	0.96	2.417	43.98	4.000	3.82	5.58	0.96
0.917	0.96	2.500	43.98	4.083	3.82	5.67	0.96
1.000	0.96	2.583	43.98	4.167	3.82	5.75	0.96
1.083	0.96	2.667	43.98	4.250	3.82	5.83	0.96
1.167	0.96	2.750	43.98	4.333	1.91	5.92	0.96
1.250	0.96	2.833	12.43	4.417	1.91	6.00	0.96
1.333	5.74	2.917	12.43	4.500	1.91	6.08	0.96
1.417	5.74	3.000	12.43	4.583	1.91	6.17	0.96
1.500	5.74	3.083	12.43	4.667	1.91	6.25	0.96
1.583	5.74	3.167	12.43	4.750	1.91		

Max.Eff.Inten.(mm/hr)=	43.98	26.72
over (min)	10.00	20.00
Storage Coeff. (min)=	7.69 (ii)	19.65 (ii)
Unit Hyd. Tpeak (min)=	10.00	20.00
Unit Hyd. peak (cms)=	0.13	0.06

PEAK FLOW (cms)=	1.75	0.26	*TOTALS*
TIME TO PEAK (hrs)=	2.75	2.92	1.975 (iii)
RUNOFF VOLUME (mm)=	46.81	23.53	2.75
TOTAL RAINFALL (mm)=	47.81	47.81	40.76
RUNOFF COEFFICIENT =	0.98	0.49	47.81
			0.85

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
CALIB
STANDHYD ( 0004)
ID= 1 DT= 5.0 min
Area (ha)= 5.84
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00
-----

```

```

IMPERVIOUS      PERVIOUS (i)
Surface Area (ha)= 5.84      0.00
Dep. Storage (mm)= 1.00      1.50
Average Slope (%)= 1.00      1.00
Length (m)= 197.32      40.00
Mannings n = 0.013      0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 1.667 5.74 3.250 12.43 4.83 0.96
0.167 0.00 1.750 5.74 3.333 6.69 4.92 0.96
0.250 0.00 1.833 16.25 3.417 6.69 5.00 0.96
0.333 0.96 1.917 16.25 3.500 6.69 5.08 0.96
0.417 0.96 2.000 16.25 3.583 6.69 5.17 0.96
0.500 0.96 2.083 16.25 3.667 6.69 5.25 0.96
0.583 0.96 2.167 16.25 3.750 6.69 5.33 0.96
0.667 0.96 2.250 16.25 3.833 3.82 5.42 0.96
0.750 0.96 2.333 43.98 3.917 3.82 5.50 0.96
0.833 0.96 2.417 43.98 4.000 3.82 5.58 0.96
0.917 0.96 2.500 43.98 4.083 3.82 5.67 0.96
1.000 0.96 2.583 43.98 4.167 3.82 5.75 0.96
1.083 0.96 2.667 43.98 4.250 3.82 5.83 0.96
1.167 0.96 2.750 43.98 4.333 1.91 5.92 0.96
1.250 0.96 2.833 12.43 4.417 1.91 6.00 0.96
1.333 5.74 2.917 12.43 4.500 1.91 6.08 0.96
1.417 5.74 3.000 12.43 4.583 1.91 6.17 0.96
1.500 5.74 3.083 12.43 4.667 1.91 6.25 0.96
1.583 5.74 3.167 12.43 4.750 1.91

```

```

Max.Eff.Inten.(mm/hr)= 43.98      NaN
over (min) = 5.00      10.00
Storage Coeff. (min)= 5.34 (ii) 5.34 (ii)
Unit Hyd. Tpeak (min)= 5.00      10.00
Unit Hyd. peak (cms)= 0.21      0.18

```

```

*TOTALS*
PEAK FLOW (cms)= 0.71      0.00      0.000 (iii)
TIME TO PEAK (hrs)= 2.75      0.00      0.00
RUNOFF VOLUME (mm)= 46.81      NaN      NaN
TOTAL RAINFALL (mm)= 47.81      47.81
RUNOFF COEFFICIENT = 0.98      NaN      NaN

```

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
RESERVOIR( 0009)
IN= 2---> OUT= 1
DT= 5.0 min
-----
OVERFLOW IS ON
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0020 0.0590
0.0020 0.0010 | 0.0000 0.0000

```

```

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0004) 5.840 0.000 0.00 NaN
OUTFLOW: ID= 1 ( 0009) 5.840 0.002 0.08 20.54
OVERFLOW: ID= 3 ( 0003) 0.000 0.000 0.00 0.00

```

```

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

```

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| ADD HYD ( 0020) |
| 1 + 2 = 3 |
-----
AREA      QPEAK      TPEAK      R.V.
(ha)      (cms)      (hrs)      (mm)
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
ID1= 1 ( 0001): 19.74 1.975 2.75 40.76
+ ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
=====
ID = 3 ( 0020): 19.74 1.975 2.75 40.76

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
OVERFLOW IS OFF

OUTFLOW      STORAGE      |      OUTFLOW      STORAGE
(cms)         (ha.m.)      |      (cms)         (ha.m.)
0.0000        0.0000      |      0.0270        2.6907
0.0000        0.5126      |      0.0270        3.6151
0.0150        1.1290      |      0.5890        4.2144

AREA      QPEAK      TPEAK      R.V.
(ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0020) 19.740 1.975 2.75 40.76
OUTFLOW: ID= 1 ( 0006) 19.740 0.007 6.67 11.24

PEAK FLOW REDUCTION [Qout/Qin](%)= 0.35
TIME SHIFT OF PEAK FLOW (min)=235.00
MAXIMUM STORAGE USED (ha.m.)= 0.7966

```

```

-----
| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 6.82
Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

IMPERVIOUS      PERVIOUS (i)
Surface Area (ha)= 5.12 1.71
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 213.23 40.00
Mannings n = 0.013 0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME      RAIN      TIME      RAIN      TIME      RAIN      TIME      RAIN
hrs      mm/hr      hrs      mm/hr      hrs      mm/hr      hrs      mm/hr
0.083      0.00      1.667      5.74      3.250     12.43      4.83      0.96
0.167      0.00      1.750      5.74      3.333      6.69      4.92      0.96
0.250      0.00      1.833     16.25      3.417      6.69      5.00      0.96
0.333      0.96      1.917     16.25      3.500      6.69      5.08      0.96
0.417      0.96      2.000     16.25      3.583      6.69      5.17      0.96
0.500      0.96      2.083     16.25      3.667      6.69      5.25      0.96
0.583      0.96      2.167     16.25      3.750      6.69      5.33      0.96
0.667      0.96      2.250     16.25      3.833      3.82      5.42      0.96
0.750      0.96      2.333     43.98      3.917      3.82      5.50      0.96
0.833      0.96      2.417     43.98      4.000      3.82      5.58      0.96
0.917      0.96      2.500     43.98      4.083      3.82      5.67      0.96
1.000      0.96      2.583     43.98      4.167      3.82      5.75      0.96
1.083      0.96      2.667     43.98      4.250      3.82      5.83      0.96
1.167      0.96      2.750     43.98      4.333      1.91      5.92      0.96
1.250      0.96      2.833     12.43      4.417      1.91      6.00      0.96
1.333      5.74      2.917     12.43      4.500      1.91      6.08      0.96
1.417      5.74      3.000     12.43      4.583      1.91      6.17      0.96
1.500      5.74      3.083     12.43      4.667      1.91      6.25      0.96
1.583      5.74      3.167     12.43      4.750      1.91

Max.Eff.Inten.(mm/hr)= 43.98 26.72
over (min) 5.00 20.00
Storage Coeff. (min)= 5.59 (ii) 17.55 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.20 0.06

*TOTALS*
PEAK FLOW (cms)= 0.62 0.09 0.702 (iii)
TIME TO PEAK (hrs)= 2.75 2.92 2.75
RUNOFF VOLUME (mm)= 46.81 23.53 40.99
TOTAL RAINFALL (mm)= 47.81 47.81 47.81
RUNOFF COEFFICIENT = 0.98 0.49 0.86

```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0005)
ID= 1 DT= 5.0 min

Area (ha)= 5.21
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	186.37	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	5.74	3.250	12.43	4.83	0.96
0.167	0.00	1.750	5.74	3.333	6.69	4.92	0.96
0.250	0.00	1.833	16.25	3.417	6.69	5.00	0.96
0.333	0.96	1.917	16.25	3.500	6.69	5.08	0.96
0.417	0.96	2.000	16.25	3.583	6.69	5.17	0.96
0.500	0.96	2.083	16.25	3.667	6.69	5.25	0.96
0.583	0.96	2.167	16.25	3.750	6.69	5.33	0.96
0.667	0.96	2.250	16.25	3.833	3.82	5.42	0.96
0.750	0.96	2.333	43.98	3.917	3.82	5.50	0.96
0.833	0.96	2.417	43.98	4.000	3.82	5.58	0.96
0.917	0.96	2.500	43.98	4.083	3.82	5.67	0.96
1.000	0.96	2.583	43.98	4.167	3.82	5.75	0.96
1.083	0.96	2.667	43.98	4.250	3.82	5.83	0.96
1.167	0.96	2.750	43.98	4.333	1.91	5.92	0.96
1.250	0.96	2.833	12.43	4.417	1.91	6.00	0.96
1.333	5.74	2.917	12.43	4.500	1.91	6.08	0.96
1.417	5.74	3.000	12.43	4.583	1.91	6.17	0.96
1.500	5.74	3.083	12.43	4.667	1.91	6.25	0.96
1.583	5.74	3.167	12.43	4.750	1.91		

Max.Eff.Inten.(mm/hr)= 43.98 NaN
over (min) 5.00 10.00
Storage Coeff. (min)= 5.16 (ii) 5.16 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.21 0.18

TOTALS
PEAK FLOW (cms)= 0.64 0.00 0.000 (iii)
TIME TO PEAK (hrs)= 2.75 0.00 0.00
RUNOFF VOLUME (mm)= 46.81 NaN
TOTAL RAINFALL (mm)= 47.81 47.81
RUNOFF COEFFICIENT = 0.98 NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS ON

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0020	0.0520
0.0020	0.0010	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0005)	5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)	5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| ADD HYD ( 0021) |
| 1 + 2 = 3 |
-----
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003
ID1= 1 ( 0010): 0.00 0.000 0.00 0.00
+ ID2= 2 ( 0003): 6.82 0.702 2.75 40.99
=====
ID = 3 ( 0021): 6.82 0.702 2.75 40.99
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0008) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
OVERFLOW IS OFF

OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0517 0.3200
0.0183 0.0400 | 0.0549 0.3600
0.0259 0.0800 | 0.0579 0.4000
0.0317 0.1200 | 0.0607 0.4400
0.0366 0.1600 | 0.0634 0.4800
0.0409 0.2000 | 0.0660 0.5200
0.0448 0.2400 | 0.0685 0.5600
0.0484 0.2800 | 0.0709 0.6000

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0021) 6.820 0.702 2.75 40.99
OUTFLOW: ID= 1 ( 0008) 6.820 0.044 4.50 40.99
  
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.25
 TIME SHIFT OF PEAK FLOW (min)=105.00
 MAXIMUM STORAGE USED (ha.m.)= 0.2307

```

-----
| CALIB |
| STANDHYD ( 0002) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 2.26
Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.72 0.54
Dep. Storage (mm)= 1.00 1.50
Average slope (%)= 1.00 2.00
Length (m)= 122.75 40.00
Mannings n = 0.013 0.250
  
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 1.667 5.74 3.250 12.43 4.83 0.96
0.167 0.00 1.750 5.74 3.333 6.69 4.92 0.96
0.250 0.00 1.833 16.25 3.417 6.69 5.00 0.96
0.333 0.96 1.917 16.25 3.500 6.69 5.08 0.96
0.417 0.96 2.000 16.25 3.583 6.69 5.17 0.96
0.500 0.96 2.083 16.25 3.667 6.69 5.25 0.96
0.583 0.96 2.167 16.25 3.750 6.69 5.33 0.96
0.667 0.96 2.250 16.25 3.833 3.82 5.42 0.96
0.750 0.96 2.333 43.98 3.917 3.82 5.50 0.96
0.833 0.96 2.417 43.98 4.000 3.82 5.58 0.96
0.917 0.96 2.500 43.98 4.083 3.82 5.67 0.96
1.000 0.96 2.583 43.98 4.167 3.82 5.75 0.96
1.083 0.96 2.667 43.98 4.250 3.82 5.83 0.96
1.167 0.96 2.750 43.98 4.333 1.91 5.92 0.96
1.250 0.96 2.833 12.43 4.417 1.91 6.00 0.96
1.333 5.74 2.917 12.43 4.500 1.91 6.08 0.96
1.417 5.74 3.000 12.43 4.583 1.91 6.17 0.96
1.500 5.74 3.083 12.43 4.667 1.91 6.25 0.96
1.583 5.74 3.167 12.43 4.750 1.91
  
```

Max.Eff.Inten.(mm/hr)=	43.98	26.72	
over (min)	5.00	20.00	
Storage Coeff. (min)=	4.01 (ii)	15.98 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.24	0.07	
			TOTALS
PEAK FLOW (cms)=	0.21	0.03	0.236 (iii)
TIME TO PEAK (hrs)=	2.75	2.92	2.75
RUNOFF VOLUME (mm)=	46.81	23.53	41.22
TOTAL RAINFALL (mm)=	47.81	47.81	47.81
RUNOFF COEFFICIENT =	0.98	0.49	0.86

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)	OVERFLOW IS OFF				
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	0.0823	0.0960	
	0.0291	0.0120	0.0873	0.1080	
	0.0412	0.0240	0.0921	0.1200	
	0.0504	0.0360	0.0965	0.1320	
	0.0582	0.0480	0.1008	0.1440	
	0.0651	0.0600	0.1050	0.1560	
	0.0713	0.0720	0.1058	0.1584	
	0.0770	0.0840	0.0000	0.0000	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0002)		2.260	0.236	2.75	41.22
OUTFLOW: ID= 1 (0007)		2.260	0.060	3.33	41.17

PEAK FLOW REDUCTION [Qout/Qin](%)= 25.38
 TIME SHIFT OF PEAK FLOW (min)= 35.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0510

RESERVOIR(0022)	OVERFLOW IS OFF				
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	1.5300	0.0100	
	0.5000	0.0050	1.5400	3.0000	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)		5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)		5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)	OVERFLOW IS OFF				
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	1.5300	0.0100	
	0.5000	0.0050	1.5400	3.0000	
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)		5.210	0.002	0.08	23.02
OUTFLOW: ID= 1 (0023)		5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

V   V   I   SSSSS U   U   A   L   (v 6.2.2022)
V   V   I   SS   U   U   A A   L
V   V   I   SS   U   U   AAAAA L
V   V   I   SS   U   U   A   A L
VV    I   SSSSS UUUUU A   A LLLLL

```

```

    000   TTTTT TTTTT H   H   Y   Y   M   M   000   TM
O   O   T   T   H   H   Y Y   MM MM O   O
O   O   T   T   H   H   Y   M   M   O   O
    000   T   T   H   H   Y   M   M   000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\3b
Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\3b

DATE: 10-16-2025 TIME: 09:08:45

USER:

COMMENTS: _____

** SIMULATION : 3 - 10 Year 12 Hour AES (Bloo **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\7c8c69e9
Ptotal= 62.71 mm	Comments: 10 Year 12 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	3.25	10.66	6.50	4.39	9.75	0.63
0.25	0.63	3.50	10.66	6.75	4.39	10.00	0.63
0.50	0.63	3.75	10.66	7.00	4.39	10.25	0.63
0.75	0.63	4.00	10.66	7.25	2.51	10.50	0.63
1.00	0.63	4.25	28.84	7.50	2.51	10.75	0.63
1.25	0.63	4.50	28.84	7.75	2.51	11.00	0.63
1.50	0.63	4.75	28.84	8.00	2.51	11.25	0.63
1.75	0.63	5.00	28.84	8.25	1.25	11.50	0.63
2.00	0.63	5.25	8.15	8.50	1.25	11.75	0.63
2.25	3.76	5.50	8.15	8.75	1.25	12.00	0.63
2.50	3.76	5.75	8.15	9.00	1.25		
2.75	3.76	6.00	8.15	9.25	0.63		
3.00	3.76	6.25	4.39	9.50	0.63		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00	Dir. Conn.(%)= 74.00
--	---	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)= 28.84 20.66
over (min) 10.00 25.00
Storage Coeff. (min)= 9.10 (ii) 22.36 (ii)
Unit Hyd. Tpeak (min)= 10.00 25.00
Unit Hyd. peak (cms)= 0.12 0.05

TOTALS

PEAK FLOW (cms)= 1.17 0.24 1.403 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 61.71 35.33 54.85
TOTAL RAINFALL (mm)= 62.71 62.71 62.71
RUNOFF COEFFICIENT = 0.98 0.56 0.87

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 5.84	
STANDHYD (0004)	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00
ID= 1 DT= 5.0 min		

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.84	0.00
Dep. Storage (mm)=	1.00	1.50
Average slope (%)=	1.00	1.00
Length (m)=	197.32	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63

0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)=	28.84	NaN
over (min)	5.00	10.00
Storage Coeff. (min)=	6.32 (ii)	6.32 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.19	0.17

PEAK FLOW (cms)=	0.47	0.00	*TOTALS*
TIME TO PEAK (hrs)=	5.25	0.00	0.000 (iii)
RUNOFF VOLUME (mm)=	61.71	NaN	NaN
TOTAL RAINFALL (mm)=	62.71	62.71	62.71
RUNOFF COEFFICIENT =	0.98	NaN	NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0009)		OVERFLOW IS ON			
IN= 2---> OUT= 1		OUTFLOW (cms)		STORAGE (ha.m.)	
DT= 5.0 min		OUTFLOW (cms)		STORAGE (ha.m.)	
		0.0000	0.0000	0.0020	0.0590
		0.0020	0.0010	0.0000	0.0000
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0004)		5.840	0.000	0.00	NaN
OUTFLOW: ID= 1 (0009)		5.840	0.002	0.08	20.54
OVERFLOW: ID= 3 (0003)		0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW =	0
CUMULATIVE TIME OF OVERFLOW (HOURS) =	0.00
PERCENTAGE OF TIME OVERFLOWING (%) =	0.00

PEAK FLOW REDUCTION [Qout/Qin](%)=	Inf
TIME SHIFT OF PEAK FLOW (min)=	5.00
MAXIMUM STORAGE USED (ha.m.)=	0.0000
MAXIMUM STORAGE USED (cu.m.)=	0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0020)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				

*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
ID1= 1 (0001): 19.74 1.403 5.25 54.85
+ ID2= 2 (0009): 0.00 0.000 0.00 0.00
=====

ID = 3 (0020): 19.74 1.403 5.25 54.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	0.0270	2.6907
		0.0000	0.5126	0.0270	3.6151
		0.0150	1.1290	0.5890	4.2144
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0020)		19.740	1.403	5.25	54.85
OUTFLOW: ID= 1 (0006)		19.740	0.013	12.50	21.78
		PEAK FLOW REDUCTION [Qout/Qin](%)= 0.94			
		TIME SHIFT OF PEAK FLOW (min)=435.00			
		MAXIMUM STORAGE USED (ha.m.)= 1.0524			

CALIB					
STANDHYD (0003)					
ID= 1 DT= 5.0 min					
		Area (ha)=	6.82		
		Total Imp(%)=	75.00	Dir. Conn.(%)= 75.00	
		IMPERVIOUS	PERVIOUS (i)		
Surface Area (ha)=		5.12	1.71		
Dep. Storage (mm)=		1.00	1.50		
Average Slope (%)=		1.00	2.00		
Length (m)=		213.23	40.00		
Mannings n =		0.013	0.250		

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)=	28.84	20.66	
over (min)	5.00	20.00	
Storage Coeff. (min)=	6.62 (ii)	19.88 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.18	0.06	
			TOTALS
PEAK FLOW (cms)=	0.41	0.08	0.492 (iii)
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	61.71	35.33	55.11
TOTAL RAINFALL (mm)=	62.71	62.71	62.71
RUNOFF COEFFICIENT =	0.98	0.56	0.88

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0005)	Area (ha)= 5.21		
ID= 1 DT= 5.0 min	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	1.00	1.00	
Length (m)=	186.37	40.00	
Mannings n =	0.013	0.250	

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)=	28.84	NaN	
over (min)	5.00	10.00	
Storage Coeff. (min)=	6.10 (ii)	6.10 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.19	0.18	
			TOTALS
PEAK FLOW (cms)=	0.42	0.00	0.000 (iii)
TIME TO PEAK (hrs)=	5.25	0.00	0.00

RUNOFF VOLUME	(mm)=	61.71	NaN	NaN
TOTAL RAINFALL	(mm)=	62.71	62.71	62.71
RUNOFF COEFFICIENT	=	0.98	NaN	NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0010) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OVERFLOW IS ON |
|-----|
| OUTFLOW | STORAGE | OUTFLOW | STORAGE |
| (cms)   | (ha.m.) | (cms)   | (ha.m.) | |
|---|---|---|---|---|
| 0.0000  | 0.0000  | 0.0020  | 0.0520  |
| 0.0020  | 0.0010  | 0.0000  | 0.0000  |
|-----|-----|-----|-----|
| AREA    | QPEAK   | TPEAK   | R.V.    |
| (ha)    | (cms)   | (hrs)   | (mm)    |
|-----|-----|-----|-----|
| INFLOW : ID= 2 ( 0005) | 5.210 | 0.000 | 0.00 | NaN |
| OUTFLOW: ID= 1 ( 0010) | 5.210 | 0.002 | 0.08 | 23.02 |
| OVERFLOW: ID= 3 ( 0003) | 0.000 | 0.000 | 0.00 | 0.00 |
|-----|-----|-----|-----|
| TOTAL NUMBER OF SIMULATION OVERFLOW = 0 |
| CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00 |
| PERCENTAGE OF TIME OVERFLOWING (%) = 0.00 |
|-----|-----|-----|-----|
| PEAK FLOW REDUCTION [Qout/Qin](%)= Inf |
| TIME SHIFT OF PEAK FLOW (min)= 5.00 |
| MAXIMUM STORAGE USED (ha.m.)= 0.0000 |
| MAXIMUM STORAGE USED (cu.m.)= 0.000000 |
|-----|-----|-----|-----|

```

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| ADD HYD ( 0021) |
| 1 + 2 = 3       |
|-----|
| AREA    | QPEAK   | TPEAK   | R.V.    |
| (ha)    | (cms)   | (hrs)   | (mm)    |
|-----|-----|-----|-----|
| *** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY. |
| *** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003 |
| ID1= 1 ( 0010): 0.00 0.000 0.00 0.00 |
| + ID2= 2 ( 0003): 6.82 0.492 5.25 55.11 |
|=====|
| ID = 3 ( 0021): 6.82 0.492 5.25 55.11 |
|=====|

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0008) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OVERFLOW IS OFF |
|-----|
| OUTFLOW | STORAGE | OUTFLOW | STORAGE |
| (cms)   | (ha.m.) | (cms)   | (ha.m.) | |
|---|---|---|---|---|
| 0.0000  | 0.0000  | 0.0517  | 0.3200  |
| 0.0183  | 0.0400  | 0.0549  | 0.3600  |
| 0.0259  | 0.0800  | 0.0579  | 0.4000  |
| 0.0317  | 0.1200  | 0.0607  | 0.4400  |
| 0.0366  | 0.1600  | 0.0634  | 0.4800  |
| 0.0409  | 0.2000  | 0.0660  | 0.5200  |
| 0.0448  | 0.2400  | 0.0685  | 0.5600  |
| 0.0484  | 0.2800  | 0.0709  | 0.6000  |
|-----|-----|-----|-----|
| AREA    | QPEAK   | TPEAK   | R.V.    |
| (ha)    | (cms)   | (hrs)   | (mm)    |
|-----|-----|-----|-----|
| INFLOW : ID= 2 ( 0021) | 6.820 | 0.492 | 5.25 | 55.11 |
| OUTFLOW: ID= 1 ( 0008) | 6.820 | 0.049 | 7.75 | 55.11 |
|-----|-----|-----|-----|
| PEAK FLOW REDUCTION [Qout/Qin](%)= 9.87 |
| TIME SHIFT OF PEAK FLOW (min)=150.00 |
| MAXIMUM STORAGE USED (ha.m.)= 0.2827 |
|-----|-----|-----|-----|

```

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-----
| CALIB |
| STANDHYD ( 0002) |
| ID= 1 DT= 5.0 min |
|-----|
| Area (ha)= 2.26 |
| Total Imp(%)= 76.00 | Dir. Conn.(%)= 76.00 |
|-----|
| IMPERVIOUS | PERVIOUS (i) |
| Surface Area (ha)= 1.72 | 0.54 |
|-----|

```

Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	122.75	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	3.76	6.250	8.15	9.33	0.63
0.167	0.00	3.250	3.76	6.333	4.39	9.42	0.63
0.250	0.00	3.333	10.66	6.417	4.39	9.50	0.63
0.333	0.63	3.417	10.66	6.500	4.39	9.58	0.63
0.417	0.63	3.500	10.66	6.583	4.39	9.67	0.63
0.500	0.63	3.583	10.66	6.667	4.39	9.75	0.63
0.583	0.63	3.667	10.66	6.750	4.39	9.83	0.63
0.667	0.63	3.750	10.66	6.833	4.39	9.92	0.63
0.750	0.63	3.833	10.66	6.917	4.39	10.00	0.63
0.833	0.63	3.917	10.66	7.000	4.39	10.08	0.63
0.917	0.63	4.000	10.66	7.083	4.39	10.17	0.63
1.000	0.63	4.083	10.66	7.167	4.39	10.25	0.63
1.083	0.63	4.167	10.66	7.250	4.39	10.33	0.63
1.167	0.63	4.250	10.66	7.333	2.51	10.42	0.63
1.250	0.63	4.333	28.84	7.417	2.51	10.50	0.63
1.333	0.63	4.417	28.84	7.500	2.51	10.58	0.63
1.417	0.63	4.500	28.84	7.583	2.51	10.67	0.63
1.500	0.63	4.583	28.84	7.667	2.51	10.75	0.63
1.583	0.63	4.667	28.84	7.750	2.51	10.83	0.63
1.667	0.63	4.750	28.84	7.833	2.51	10.92	0.63
1.750	0.63	4.833	28.84	7.917	2.51	11.00	0.63
1.833	0.63	4.917	28.84	8.000	2.51	11.08	0.63
1.917	0.63	5.000	28.84	8.083	2.51	11.17	0.63
2.000	0.63	5.083	28.84	8.167	2.51	11.25	0.63
2.083	0.63	5.167	28.84	8.250	2.51	11.33	0.63
2.167	0.63	5.250	28.84	8.333	1.25	11.42	0.63
2.250	0.63	5.333	8.15	8.417	1.25	11.50	0.63
2.333	3.76	5.417	8.15	8.500	1.25	11.58	0.63
2.417	3.76	5.500	8.15	8.583	1.25	11.67	0.63
2.500	3.76	5.583	8.15	8.667	1.25	11.75	0.63
2.583	3.76	5.667	8.15	8.750	1.25	11.83	0.63
2.667	3.76	5.750	8.15	8.833	1.25	11.92	0.63
2.750	3.76	5.833	8.15	8.917	1.25	12.00	0.63
2.833	3.76	5.917	8.15	9.000	1.25	12.08	0.63
2.917	3.76	6.000	8.15	9.083	1.25	12.17	0.63
3.000	3.76	6.083	8.15	9.167	1.25	12.25	0.63
3.083	3.76	6.167	8.15	9.250	1.25		

Max.Eff.Inten.(mm/hr)=	28.84	20.66
over (min)	5.00	20.00
Storage Coeff. (min)=	4.75 (ii)	18.01 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.22	0.06

TOTALS
0.164 (iii)

PEAK FLOW (cms)=	0.14	0.03	
TIME TO PEAK (hrs)=	5.25	5.33	5.25
RUNOFF VOLUME (mm)=	61.71	35.33	55.38
TOTAL RAINFALL (mm)=	62.71	62.71	62.71
RUNOFF COEFFICIENT =	0.98	0.56	0.88

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)	OVERFLOW IS OFF			
IN= 2----> OUT= 1				
DT= 5.0 min				
OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
0.0000	0.0000	0.0823	0.0960	
0.0291	0.0120	0.0873	0.1080	
0.0412	0.0240	0.0921	0.1200	
0.0504	0.0360	0.0965	0.1320	
0.0582	0.0480	0.1008	0.1440	
0.0651	0.0600	0.1050	0.1560	
0.0713	0.0720	0.1058	0.1584	
0.0770	0.0840	0.0000	0.0000	

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW :	ID= 2 (0002)	2.260	0.164	5.25	55.38
OUTFLOW:	ID= 1 (0007)	2.260	0.062	5.58	55.33

PEAK FLOW REDUCTION [Qout/Qin](%)= 37.44
 TIME SHIFT OF PEAK FLOW (min)= 20.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0539

```

-----
| RESERVOIR( 0022) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OUTFLOW  STORAGE | OUTFLOW  STORAGE
| (cms)    (ha.m.) | (cms)    (ha.m.)
|-----|-----|
| 0.0000   0.0000  | 1.5300   0.0100
| 0.5000   0.0050  | 1.5400   3.0000
  
```

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW :	ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW:	ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| RESERVOIR( 0023) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
| OUTFLOW  STORAGE | OUTFLOW  STORAGE
| (cms)    (ha.m.) | (cms)    (ha.m.)
|-----|-----|
| 0.0000   0.0000  | 1.5300   0.0100
| 0.5000   0.0050  | 1.5400   3.0000
  
```

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW :	ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW:	ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

=====
V  V  I  SSSSS  U  U  A  L          (v 6.2.2022)
V  V  I  SS    U  U  A  A  L
V  V  I  SS    U  U  AAAAA  L
V  V  I  SS    U  U  A  A  L
VV   I  SSSSS  UUUUU  A  A  LLLLL
  
```

```

    000  TTTTT  TTTTT  H  H  Y  Y  M  M  000  TM
    O  O  T    T    H  H  Y  Y  MM MM  O  O
    O  O  T    T    H  H  Y  M  M  O  O
    000  T    T    H  H  Y  M  M  000
  
```

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
 Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\d0b
 Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\d0b

DATE: 10-16-2025

TIME: 09:08:42

USER:

COMMENTS: _____

 ** SIMULATION : 3 - 10 Year 6 Hour AES (Bloor) **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\738f3c96
Ptotal= 55.69 mm	Comments: 10 Year 6 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	1.75	18.94	3.50	7.80	5.25	1.11
0.25	1.11	2.00	18.94	3.75	4.46	5.50	1.11
0.50	1.11	2.25	51.24	4.00	4.46	5.75	1.11
0.75	1.11	2.50	51.24	4.25	2.23	6.00	1.11
1.00	1.11	2.75	14.48	4.50	2.23		
1.25	6.68	3.00	14.48	4.75	1.11		
1.50	6.68	3.25	7.80	5.00	1.11		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00	Dir. Conn.(%)= 74.00
--	---	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	6.68	3.250	14.48	4.83	1.11
0.167	0.00	1.750	6.68	3.333	7.80	4.92	1.11
0.250	0.00	1.833	18.94	3.417	7.80	5.00	1.11
0.333	1.11	1.917	18.94	3.500	7.80	5.08	1.11
0.417	1.11	2.000	18.94	3.583	7.80	5.17	1.11
0.500	1.11	2.083	18.94	3.667	7.80	5.25	1.11
0.583	1.11	2.167	18.94	3.750	7.80	5.33	1.11
0.667	1.11	2.250	18.94	3.833	4.46	5.42	1.11
0.750	1.11	2.333	51.24	3.917	4.46	5.50	1.11
0.833	1.11	2.417	51.24	4.000	4.46	5.58	1.11
0.917	1.11	2.500	51.24	4.083	4.46	5.67	1.11
1.000	1.11	2.583	51.24	4.167	4.46	5.75	1.11
1.083	1.11	2.667	51.24	4.250	4.46	5.83	1.11
1.167	1.11	2.750	51.24	4.333	2.23	5.92	1.11
1.250	1.11	2.833	14.48	4.417	2.23	6.00	1.11
1.333	6.68	2.917	14.48	4.500	2.23	6.08	1.11
1.417	6.68	3.000	14.48	4.583	2.23	6.17	1.11
1.500	6.68	3.083	14.48	4.667	2.23	6.25	1.11
1.583	6.68	3.167	14.48	4.750	2.23		

Max.Eff.Inten.(mm/hr)=	51.24	33.51
over (min)	5.00	20.00
Storage Coeff. (min)=	7.23 (ii)	18.16 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.17	0.06

PEAK FLOW (cms)=	2.06	0.33	*TOTALS*
TIME TO PEAK (hrs)=	2.75	2.92	2.358 (iii)
RUNOFF VOLUME (mm)=	54.69	29.66	48.18
TOTAL RAINFALL (mm)=	55.69	55.69	55.69
RUNOFF COEFFICIENT =	0.98	0.53	0.87

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
CALIB
STANDHYD ( 0004)
ID= 1 DT= 5.0 min
-----
Area (ha)= 5.84
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

```

```

IMPERVIOUS      PERVIOUS (i)
Surface Area (ha)= 5.84      0.00
Dep. Storage (mm)= 1.00      1.50
Average Slope (%)= 1.00      1.00
Length (m)= 197.32      40.00
Mannings n = 0.013      0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 1.667 6.68 3.250 14.48 4.83 1.11
0.167 0.00 1.750 6.68 3.333 7.80 4.92 1.11
0.250 0.00 1.833 18.94 3.417 7.80 5.00 1.11
0.333 1.11 1.917 18.94 3.500 7.80 5.08 1.11
0.417 1.11 2.000 18.94 3.583 7.80 5.17 1.11
0.500 1.11 2.083 18.94 3.667 7.80 5.25 1.11
0.583 1.11 2.167 18.94 3.750 7.80 5.33 1.11
0.667 1.11 2.250 18.94 3.833 4.46 5.42 1.11
0.750 1.11 2.333 51.24 3.917 4.46 5.50 1.11
0.833 1.11 2.417 51.24 4.000 4.46 5.58 1.11
0.917 1.11 2.500 51.24 4.083 4.46 5.67 1.11
1.000 1.11 2.583 51.24 4.167 4.46 5.75 1.11
1.083 1.11 2.667 51.24 4.250 4.46 5.83 1.11
1.167 1.11 2.750 51.24 4.333 2.23 5.92 1.11
1.250 1.11 2.833 14.48 4.417 2.23 6.00 1.11
1.333 6.68 2.917 14.48 4.500 2.23 6.08 1.11
1.417 6.68 3.000 14.48 4.583 2.23 6.17 1.11
1.500 6.68 3.083 14.48 4.667 2.23 6.25 1.11
1.583 6.68 3.167 14.48 4.750 2.23

```

```

Max.Eff.Inten.(mm/hr)= 51.24      NaN
over (min) = 5.00      10.00
Storage Coeff. (min)= 5.02 (ii) 5.02 (ii)
Unit Hyd. Tpeak (min)= 5.00      10.00
Unit Hyd. peak (cms)= 0.21      0.18

```

```

*TOTALS*
PEAK FLOW (cms)= 0.83      0.00      0.000 (iii)
TIME TO PEAK (hrs)= 2.75      0.00      0.00
RUNOFF VOLUME (mm)= 54.69      NaN      NaN
TOTAL RAINFALL (mm)= 55.69      55.69      55.69
RUNOFF COEFFICIENT = 0.98      NaN      NaN

```

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
RESERVOIR( 0009)
IN= 2---> OUT= 1
DT= 5.0 min
-----
OVERFLOW IS ON
OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0020 0.0590
0.0020 0.0010 | 0.0000 0.0000

```

```

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0004) 5.840 0.000 0.00 NaN
OUTFLOW: ID= 1 ( 0009) 5.840 0.002 0.08 20.54
OVERFLOW: ID= 3 ( 0003) 0.000 0.000 0.00 0.00

```

```

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

```

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| ADD HYD ( 0020) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
      ID1= 1 ( 0001): 19.74 2.358 2.75 48.18
      + ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
      =====
      ID = 3 ( 0020): 19.74 2.358 2.75 48.18

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
          OVERFLOW IS OFF

          OUTFLOW      STORAGE      OUTFLOW      STORAGE
          (cms)      (ha.m.)      (cms)      (ha.m.)
          0.0000      0.0000      |      0.0270      2.6907
          0.0000      0.5126      |      0.0270      3.6151
          0.0150      1.1290      |      0.5890      4.2144

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0020) 19.740 2.358 2.75 48.18
OUTFLOW: ID= 1 ( 0006) 19.740 0.010 6.58 16.89

          PEAK FLOW REDUCTION [Qout/Qin](%)= 0.44
          TIME SHIFT OF PEAK FLOW (min)=230.00
          MAXIMUM STORAGE USED (ha.m.)= 0.9387

```

```

-----
| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
          Area (ha)= 6.82
          Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

          IMPERVIOUS      PERVIOUS (i)
          Surface Area (ha)= 5.12 1.71
          Dep. Storage (mm)= 1.00 1.50
          Average Slope (%)= 1.00 2.00
          Length (m)= 213.23 40.00
          Mannings n = 0.013 0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

          ----- TRANSFORMED HYETOGRAPH -----
          TIME      RAIN      TIME      RAIN      TIME      RAIN      TIME      RAIN
          hrs      mm/hr      hrs      mm/hr      hrs      mm/hr      hrs      mm/hr
          0.083      0.00      1.667      6.68      3.250      14.48      4.83      1.11
          0.167      0.00      1.750      6.68      3.333      7.80      4.92      1.11
          0.250      0.00      1.833      18.94      3.417      7.80      5.00      1.11
          0.333      1.11      1.917      18.94      3.500      7.80      5.08      1.11
          0.417      1.11      2.000      18.94      3.583      7.80      5.17      1.11
          0.500      1.11      2.083      18.94      3.667      7.80      5.25      1.11
          0.583      1.11      2.167      18.94      3.750      7.80      5.33      1.11
          0.667      1.11      2.250      18.94      3.833      4.46      5.42      1.11
          0.750      1.11      2.333      51.24      3.917      4.46      5.50      1.11
          0.833      1.11      2.417      51.24      4.000      4.46      5.58      1.11
          0.917      1.11      2.500      51.24      4.083      4.46      5.67      1.11
          1.000      1.11      2.583      51.24      4.167      4.46      5.75      1.11
          1.083      1.11      2.667      51.24      4.250      4.46      5.83      1.11
          1.167      1.11      2.750      51.24      4.333      2.23      5.92      1.11
          1.250      1.11      2.833      14.48      4.417      2.23      6.00      1.11
          1.333      6.68      2.917      14.48      4.500      2.23      6.08      1.11
          1.417      6.68      3.000      14.48      4.583      2.23      6.17      1.11
          1.500      6.68      3.083      14.48      4.667      2.23      6.25      1.11
          1.583      6.68      3.167      14.48      4.750      2.23      6.33      1.11

          Max.Eff.Inten.(mm/hr)= 51.24 33.51
          over (min) 5.00 20.00
          Storage Coeff. (min)= 5.26 (ii) 16.19 (ii)
          Unit Hyd. Tpeak (min)= 5.00 20.00
          Unit Hyd. peak (cms)= 0.21 0.06

          *TOTALS*
          PEAK FLOW (cms)= 0.73 0.11 0.831 (iii)
          TIME TO PEAK (hrs)= 2.75 2.92 2.75
          RUNOFF VOLUME (mm)= 54.69 29.66 48.43
          TOTAL RAINFALL (mm)= 55.69 55.69 55.69
          RUNOFF COEFFICIENT = 0.98 0.53 0.87

```

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0005)
ID= 1 DT= 5.0 min

Area (ha)= 5.21
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	186.37	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	6.68	3.250	14.48	4.83	1.11
0.167	0.00	1.750	6.68	3.333	7.80	4.92	1.11
0.250	0.00	1.833	18.94	3.417	7.80	5.00	1.11
0.333	1.11	1.917	18.94	3.500	7.80	5.08	1.11
0.417	1.11	2.000	18.94	3.583	7.80	5.17	1.11
0.500	1.11	2.083	18.94	3.667	7.80	5.25	1.11
0.583	1.11	2.167	18.94	3.750	7.80	5.33	1.11
0.667	1.11	2.250	18.94	3.833	4.46	5.42	1.11
0.750	1.11	2.333	51.24	3.917	4.46	5.50	1.11
0.833	1.11	2.417	51.24	4.000	4.46	5.58	1.11
0.917	1.11	2.500	51.24	4.083	4.46	5.67	1.11
1.000	1.11	2.583	51.24	4.167	4.46	5.75	1.11
1.083	1.11	2.667	51.24	4.250	4.46	5.83	1.11
1.167	1.11	2.750	51.24	4.333	2.23	5.92	1.11
1.250	1.11	2.833	14.48	4.417	2.23	6.00	1.11
1.333	6.68	2.917	14.48	4.500	2.23	6.08	1.11
1.417	6.68	3.000	14.48	4.583	2.23	6.17	1.11
1.500	6.68	3.083	14.48	4.667	2.23	6.25	1.11
1.583	6.68	3.167	14.48	4.750	2.23		

Max.Eff.Inten.(mm/hr)= 51.24 NaN
over (min) 5.00 5.00
Storage Coeff. (min)= 4.85 (ii) 4.85 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.22 0.25

PEAK FLOW (cms)= 0.74 0.00 0.000 (iii)
TIME TO PEAK (hrs)= 2.75 0.00 0.00
RUNOFF VOLUME (mm)= 54.69 NaN NaN
TOTAL RAINFALL (mm)= 55.69 55.69
RUNOFF COEFFICIENT = 0.98 NaN NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS ON

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0020	0.0520
0.0020	0.0010	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0005)	5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)	5.210	0.002	0.08	23.02
OVERFLOW:ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00

PERCENTAGE OF TIME OVERFLOWING (%)= 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```
-----
| ADD HYD ( 0021) |
| 1 + 2 = 3 |
-----
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003
ID1= 1 ( 0010): 0.00 0.000 0.00 0.00
+ ID2= 2 ( 0003): 6.82 0.831 2.75 48.43
=====
ID = 3 ( 0021): 6.82 0.831 2.75 48.43
=====
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| RESERVOIR( 0008) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
OVERFLOW IS OFF

OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0517 0.3200
0.0183 0.0400 | 0.0549 0.3600
0.0259 0.0800 | 0.0579 0.4000
0.0317 0.1200 | 0.0607 0.4400
0.0366 0.1600 | 0.0634 0.4800
0.0409 0.2000 | 0.0660 0.5200
0.0448 0.2400 | 0.0685 0.5600
0.0484 0.2800 | 0.0709 0.6000

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0021) 6.820 0.831 2.75 48.43
OUTFLOW: ID= 1 ( 0008) 6.820 0.048 4.50 48.43
```

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.78
TIME SHIFT OF PEAK FLOW (min)=105.00
MAXIMUM STORAGE USED (ha.m.)= 0.2756

```
-----
| CALIB |
| STANDHYD ( 0002) |
| ID= 1 DT= 5.0 min |
-----
Area (ha)= 2.26
Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 1.72 0.54
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 122.75 40.00
Mannings n = 0.013 0.250
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```
----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 1.667 6.68 3.250 14.48 4.83 1.11
0.167 0.00 1.750 6.68 3.333 7.80 4.92 1.11
0.250 0.00 1.833 18.94 3.417 7.80 5.00 1.11
0.333 1.11 1.917 18.94 3.500 7.80 5.08 1.11
0.417 1.11 2.000 18.94 3.583 7.80 5.17 1.11
0.500 1.11 2.083 18.94 3.667 7.80 5.25 1.11
0.583 1.11 2.167 18.94 3.750 7.80 5.33 1.11
0.667 1.11 2.250 18.94 3.833 4.46 5.42 1.11
0.750 1.11 2.333 51.24 3.917 4.46 5.50 1.11
0.833 1.11 2.417 51.24 4.000 4.46 5.58 1.11
0.917 1.11 2.500 51.24 4.083 4.46 5.67 1.11
1.000 1.11 2.583 51.24 4.167 4.46 5.75 1.11
1.083 1.11 2.667 51.24 4.250 4.46 5.83 1.11
1.167 1.11 2.750 51.24 4.333 2.23 5.92 1.11
1.250 1.11 2.833 14.48 4.417 2.23 6.00 1.11
1.333 6.68 2.917 14.48 4.500 2.23 6.08 1.11
1.417 6.68 3.000 14.48 4.583 2.23 6.17 1.11
1.500 6.68 3.083 14.48 4.667 2.23 6.25 1.11
```

1.583 6.68 | 3.167 14.48 | 4.750 2.23 |

Max.Eff.Inten.(mm/hr)=	51.24	33.51	
over (min)	5.00	15.00	
Storage Coeff. (min)=	3.77 (ii)	14.70 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.25	0.08	
			TOTALS
PEAK FLOW (cms)=	0.24	0.04	0.282 (iii)
TIME TO PEAK (hrs)=	2.75	2.83	2.75
RUNOFF VOLUME (mm)=	54.69	29.66	48.68
TOTAL RAINFALL (mm)=	55.69	55.69	55.69
RUNOFF COEFFICIENT =	0.98	0.53	0.87

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	0.0823	0.0960	
	0.0291	0.0120	0.0873	0.1080	
	0.0412	0.0240	0.0921	0.1200	
	0.0504	0.0360	0.0965	0.1320	
	0.0582	0.0480	0.1008	0.1440	
	0.0651	0.0600	0.1050	0.1560	
	0.0713	0.0720	0.1058	0.1584	
	0.0770	0.0840	0.0000	0.0000	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
INFLOW : ID= 2 (0002)	2.260	0.282	2.75	48.68	
OUTFLOW: ID= 1 (0007)	2.260	0.066	3.33	48.63	
	PEAK FLOW REDUCTION [Qout/Qin](%)= 23.49				
	TIME SHIFT OF PEAK FLOW (min)= 35.00				
	MAXIMUM STORAGE USED (ha.m.)= 0.0623				

RESERVOIR(0022)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	1.5300	0.0100	
	0.5000	0.0050	1.5400	3.0000	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
INFLOW : ID= 2 (0009)	5.840	0.002	0.08	20.54	
OUTFLOW: ID= 1 (0022)	5.840	0.002	0.17	20.53	
	PEAK FLOW REDUCTION [Qout/Qin](%)=108.00				
	TIME SHIFT OF PEAK FLOW (min)= 5.00				
	MAXIMUM STORAGE USED (ha.m.)= 0.0000				
	MAXIMUM STORAGE USED (cu.m.)= 0.255783				

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	1.5300	0.0100	
	0.5000	0.0050	1.5400	3.0000	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
INFLOW : ID= 2 (0010)	5.210	0.002	0.08	23.02	
OUTFLOW: ID= 1 (0023)	5.210	0.002	0.17	23.02	
	PEAK FLOW REDUCTION [Qout/Qin](%)=108.00				
	TIME SHIFT OF PEAK FLOW (min)= 5.00				
	MAXIMUM STORAGE USED (ha.m.)= 0.0000				

MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

V V I SSSSS U U A L (v 6.2.2022)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTT TTTT H H Y Y M M 000 TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
000 T T H H Y M M 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\225
Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\225

DATE: 10-16-2025

TIME: 09:08:44

USER:

COMMENTS: _____

** SIMULATION : 4 - 25 Year 12 Hour AES (Bloo **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\5624082f
Ptotal= 73.10 mm	Comments: 25 Year 12 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	3.25	12.43	6.50	5.12	9.75	0.73
0.25	0.73	3.50	12.43	6.75	5.12	10.00	0.73
0.50	0.73	3.75	12.43	7.00	5.12	10.25	0.73
0.75	0.73	4.00	12.43	7.25	2.92	10.50	0.73
1.00	0.73	4.25	33.63	7.50	2.92	10.75	0.73
1.25	0.73	4.50	33.63	7.75	2.92	11.00	0.73
1.50	0.73	4.75	33.63	8.00	2.92	11.25	0.73
1.75	0.73	5.00	33.63	8.25	1.46	11.50	0.73
2.00	0.73	5.25	9.50	8.50	1.46	11.75	0.73
2.25	4.39	5.50	9.50	8.75	1.46	12.00	0.73
2.50	4.39	5.75	9.50	9.00	1.46		
2.75	4.39	6.00	9.50	9.25	0.73		
3.00	4.39	6.25	5.12	9.50	0.73		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00	Dir. Conn.(%)= 74.00
--	---	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 25.46
 over (min) 10.00 25.00
 Storage Coeff. (min)= 8.56 (ii) 20.76 (ii)
 Unit Hyd. Tpeak (min)= 10.00 25.00
 Unit Hyd. peak (cms)= 0.12 0.05

PEAK FLOW (cms)= 1.36 0.30 *TOTALS*
 TIME TO PEAK (hrs)= 5.25 5.33 1.662 (iii)
 RUNOFF VOLUME (mm)= 72.10 44.03 64.80
 TOTAL RAINFALL (mm)= 73.10 73.10 73.10
 RUNOFF COEFFICIENT = 0.99 0.60 0.89

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 5.84	
STANDHYD (0004)	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00
ID= 1 DT= 5.0 min		

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.84	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	197.32	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73

0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)= 33.63 NaN
over (min) 5.00 10.00
Storage Coeff. (min)= 5.94 (ii) 5.94 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.19 0.18

TOTALS
0.000 (iii)

PEAK FLOW (cms)= 0.55 0.00
TIME TO PEAK (hrs)= 5.25 0.00
RUNOFF VOLUME (mm)= 72.10 NaN
TOTAL RAINFALL (mm)= 73.10 73.10
RUNOFF COEFFICIENT = 0.99 NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0009)	OVERFLOW IS ON			
IN= 2---> OUT= 1	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
DT= 5.0 min	0.0000	0.0000	0.0020	0.0590
	0.0020	0.0010	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0004)	5.840	0.000	0.00	NaN
OUTFLOW: ID= 1 (0009)	5.840	0.002	0.08	20.54
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0020)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3				

```

-----
(ha)      (cms)      (hrs)      (mm)
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
      ID1= 1 ( 0001): 19.74 1.662 5.25 64.80
+      ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
=====
      ID = 3 ( 0020): 19.74 1.662 5.25 64.80

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0006) | OVERFLOW IS OFF
| IN= 2----> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW      STORAGE      OUTFLOW      STORAGE
      (cms)        (ha.m.)      (cms)        (ha.m.)
      0.0000      0.0000      0.0270      2.6907
      0.0000      0.5126      0.0270      3.6151
      0.0150      1.1290      0.5890      4.2144

```

```

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0020) 19.740 1.662 5.25 64.80
OUTFLOW: ID= 1 ( 0006) 19.740 0.016 12.50 29.18

```

```

      PEAK FLOW REDUCTION [Qout/Qin](%)= 0.95
      TIME SHIFT OF PEAK FLOW (min)=435.00
      MAXIMUM STORAGE USED (ha.m.)= 1.2398

```

```

-----
| CALIB          |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
      Area (ha)= 6.82
      Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

```

```

      IMPERVIOUS      PERVIOUS (i)
      Surface Area (ha)= 5.12 1.71
      Dep. Storage (mm)= 1.00 1.50
      Average Slope (%)= 1.00 2.00
      Length (m)= 213.23 40.00
      Mannings n = 0.013 0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
      TIME      RAIN      TIME      RAIN      TIME      RAIN      TIME      RAIN
      hrs      mm/hr      hrs      mm/hr      hrs      mm/hr      hrs      mm/hr
0.083 0.00 3.167 4.39 6.250 9.50 9.33 0.73
0.167 0.00 3.250 4.39 6.333 5.12 9.42 0.73
0.250 0.00 3.333 12.43 6.417 5.12 9.50 0.73
0.333 0.73 3.417 12.43 6.500 5.12 9.58 0.73
0.417 0.73 3.500 12.43 6.583 5.12 9.67 0.73
0.500 0.73 3.583 12.43 6.667 5.12 9.75 0.73
0.583 0.73 3.667 12.43 6.750 5.12 9.83 0.73
0.667 0.73 3.750 12.43 6.833 5.12 9.92 0.73
0.750 0.73 3.833 12.43 6.917 5.12 10.00 0.73
0.833 0.73 3.917 12.43 7.000 5.12 10.08 0.73
0.917 0.73 4.000 12.43 7.083 5.12 10.17 0.73
1.000 0.73 4.083 12.43 7.167 5.12 10.25 0.73
1.083 0.73 4.167 12.43 7.250 5.12 10.33 0.73
1.167 0.73 4.250 12.43 7.333 2.92 10.42 0.73
1.250 0.73 4.333 33.63 7.417 2.92 10.50 0.73
1.333 0.73 4.417 33.63 7.500 2.92 10.58 0.73
1.417 0.73 4.500 33.63 7.583 2.92 10.67 0.73
1.500 0.73 4.583 33.63 7.667 2.92 10.75 0.73
1.583 0.73 4.667 33.63 7.750 2.92 10.83 0.73
1.667 0.73 4.750 33.63 7.833 2.92 10.92 0.73
1.750 0.73 4.833 33.63 7.917 2.92 11.00 0.73
1.833 0.73 4.917 33.63 8.000 2.92 11.08 0.73
1.917 0.73 5.000 33.63 8.083 2.92 11.17 0.73
2.000 0.73 5.083 33.63 8.167 2.92 11.25 0.73
2.083 0.73 5.167 33.63 8.250 2.92 11.33 0.73
2.167 0.73 5.250 33.63 8.333 1.46 11.42 0.73
2.250 0.73 5.333 9.50 8.417 1.46 11.50 0.73
2.333 4.39 5.417 9.50 8.500 1.46 11.58 0.73
2.417 4.39 5.500 9.50 8.583 1.46 11.67 0.73
2.500 4.39 5.583 9.50 8.667 1.46 11.75 0.73
2.583 4.39 5.667 9.50 8.750 1.46 11.83 0.73
2.667 4.39 5.750 9.50 8.833 1.46 11.92 0.73
2.750 4.39 5.833 9.50 8.917 1.46 12.00 0.73
2.833 4.39 5.917 9.50 9.000 1.46 12.08 0.73
2.917 4.39 6.000 9.50 9.083 1.46 12.17 0.73
3.000 4.39 6.083 9.50 9.167 1.46 12.25 0.73
3.083 4.39 6.167 9.50 9.250 1.46

```

Max.Eff.Inten.(mm/hr)=	33.63	25.46	
over (min)	5.00	20.00	
Storage Coeff. (min)=	6.22 (ii)	18.42 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.19	0.06	
			TOTALS
PEAK FLOW (cms)=	0.48	0.10	0.583 (iii)
TIME TO PEAK (hrs)=	5.25	5.25	5.25
RUNOFF VOLUME (mm)=	72.10	44.03	65.08
TOTAL RAINFALL (mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT =	0.99	0.60	0.89

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
STANDHYD (0005)	Area (ha)= 5.21		
ID= 1 DT= 5.0 min	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	186.37	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)=	33.63	NaN	
over (min)	5.00	10.00	
Storage Coeff. (min)=	5.74 (ii)	5.74 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.20	0.18	
			TOTALS
PEAK FLOW (cms)=	0.49	0.00	0.000 (iii)

TIME TO PEAK	(hrs)=	5.25	0.00	0.00
RUNOFF VOLUME	(mm)=	72.10	NaN	NaN
TOTAL RAINFALL	(mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT	=	0.99	NaN	NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)		OVERFLOW IS ON			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	0.0020	0.0520
		0.0020	0.0010	0.0000	0.0000
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0005)		5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)		5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)		0.000	0.000	0.00	0.00
TOTAL NUMBER OF SIMULATION OVERFLOW = 0					
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00					
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00					
PEAK FLOW REDUCTION [Qout/Qin](%)= Inf					
TIME SHIFT OF PEAK FLOW (min)= 5.00					
MAXIMUM STORAGE USED (ha.m.)= 0.0000					
MAXIMUM STORAGE USED (cu.m.)= 0.000000					

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0021)					
1 + 2 = 3					
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.					
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003					
ID1= 1 (0010):		0.00	0.000	0.00	0.00
+ ID2= 2 (0003):		6.82	0.583	5.25	65.08
ID = 3 (0021):		6.82	0.583	5.25	65.08

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	0.0517	0.3200
		0.0183	0.0400	0.0549	0.3600
		0.0259	0.0800	0.0579	0.4000
		0.0317	0.1200	0.0607	0.4400
		0.0366	0.1600	0.0634	0.4800
		0.0409	0.2000	0.0660	0.5200
		0.0448	0.2400	0.0685	0.5600
		0.0484	0.2800	0.0709	0.6000
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0021)		6.820	0.583	5.25	65.08
OUTFLOW: ID= 1 (0008)		6.820	0.053	8.25	65.08
PEAK FLOW REDUCTION [Qout/Qin](%)= 9.14					
TIME SHIFT OF PEAK FLOW (min)=180.00					
MAXIMUM STORAGE USED (ha.m.)= 0.3393					

CALIB			
STANDHYD (0002)			
ID= 1 DT= 5.0 min	Area (ha)= 2.26	Total Imp(%)= 76.00	Dir. Conn.(%)= 76.00
IMPERVIOUS PERVIOUS (i)			

Surface Area	(ha)=	1.72	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	122.75	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.39	6.250	9.50	9.33	0.73
0.167	0.00	3.250	4.39	6.333	5.12	9.42	0.73
0.250	0.00	3.333	12.43	6.417	5.12	9.50	0.73
0.333	0.73	3.417	12.43	6.500	5.12	9.58	0.73
0.417	0.73	3.500	12.43	6.583	5.12	9.67	0.73
0.500	0.73	3.583	12.43	6.667	5.12	9.75	0.73
0.583	0.73	3.667	12.43	6.750	5.12	9.83	0.73
0.667	0.73	3.750	12.43	6.833	5.12	9.92	0.73
0.750	0.73	3.833	12.43	6.917	5.12	10.00	0.73
0.833	0.73	3.917	12.43	7.000	5.12	10.08	0.73
0.917	0.73	4.000	12.43	7.083	5.12	10.17	0.73
1.000	0.73	4.083	12.43	7.167	5.12	10.25	0.73
1.083	0.73	4.167	12.43	7.250	5.12	10.33	0.73
1.167	0.73	4.250	12.43	7.333	2.92	10.42	0.73
1.250	0.73	4.333	33.63	7.417	2.92	10.50	0.73
1.333	0.73	4.417	33.63	7.500	2.92	10.58	0.73
1.417	0.73	4.500	33.63	7.583	2.92	10.67	0.73
1.500	0.73	4.583	33.63	7.667	2.92	10.75	0.73
1.583	0.73	4.667	33.63	7.750	2.92	10.83	0.73
1.667	0.73	4.750	33.63	7.833	2.92	10.92	0.73
1.750	0.73	4.833	33.63	7.917	2.92	11.00	0.73
1.833	0.73	4.917	33.63	8.000	2.92	11.08	0.73
1.917	0.73	5.000	33.63	8.083	2.92	11.17	0.73
2.000	0.73	5.083	33.63	8.167	2.92	11.25	0.73
2.083	0.73	5.167	33.63	8.250	2.92	11.33	0.73
2.167	0.73	5.250	33.63	8.333	1.46	11.42	0.73
2.250	0.73	5.333	9.50	8.417	1.46	11.50	0.73
2.333	4.39	5.417	9.50	8.500	1.46	11.58	0.73
2.417	4.39	5.500	9.50	8.583	1.46	11.67	0.73
2.500	4.39	5.583	9.50	8.667	1.46	11.75	0.73
2.583	4.39	5.667	9.50	8.750	1.46	11.83	0.73
2.667	4.39	5.750	9.50	8.833	1.46	11.92	0.73
2.750	4.39	5.833	9.50	8.917	1.46	12.00	0.73
2.833	4.39	5.917	9.50	9.000	1.46	12.08	0.73
2.917	4.39	6.000	9.50	9.083	1.46	12.17	0.73
3.000	4.39	6.083	9.50	9.167	1.46	12.25	0.73
3.083	4.39	6.167	9.50	9.250	1.46		

Max.Eff.Inten.(mm/hr)=	33.63	25.46
over (min)	5.00	20.00
Storage Coeff. (min)=	4.47 (ii)	16.67 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.23	0.06

TOTALS

PEAK FLOW (cms)=	0.16	0.03	0.194 (iii)
TIME TO PEAK (hrs)=	5.25	5.25	5.25
RUNOFF VOLUME (mm)=	72.10	44.03	65.36
TOTAL RAINFALL (mm)=	73.10	73.10	73.10
RUNOFF COEFFICIENT =	0.99	0.60	0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0823	0.0960
		0.0291	0.0120	0.0873	0.1080
		0.0412	0.0240	0.0921	0.1200
		0.0504	0.0360	0.0965	0.1320
		0.0582	0.0480	0.1008	0.1440
		0.0651	0.0600	0.1050	0.1560
		0.0713	0.0720	0.1058	0.1584
		0.0770	0.0840	0.0000	0.0000

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW :	ID= 2 (0002)	2.260	0.194	5.25	65.36
OUTFLOW:	ID= 1 (0007)	2.260	0.068	5.67	65.32

PEAK FLOW REDUCTION [Qout/Qin](%)= 35.07
 TIME SHIFT OF PEAK FLOW (min)= 25.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0660

```

-----
| RESERVOIR( 0022) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
| OUTFLOW  STORAGE | OUTFLOW  STORAGE
| (cms)    (ha.m.) | (cms)    (ha.m.)
|-----|
| 0.0000   0.0000  | 1.5300   0.0100
| 0.5000   0.0050  | 1.5400   3.0000
  
```

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW :	ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW:	ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| RESERVOIR( 0023) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
| OUTFLOW  STORAGE | OUTFLOW  STORAGE
| (cms)    (ha.m.) | (cms)    (ha.m.)
|-----|
| 0.0000   0.0000  | 1.5300   0.0100
| 0.5000   0.0050  | 1.5400   3.0000
  
```

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW :	ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW:	ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

=====
V  V  I  SSSSS  U  U  A  L                      (v 6.2.2022)
V  V  I  SS    U  U  A  A  L
V  V  I  SS    U  U  AAAAA  L
V  V  I  SS    U  U  A  A  L
VV   I  SSSSS  UUUUU  A  A  LLLLL
  
```

```

    000  TTTTT  TTTTT  H  H  Y  Y  M  M  000  TM
O  O  T  T  H  H  Y  Y  MM MM  O  O
O  O  T  T  H  H  Y  M  M  O  O
    000  T  T  H  H  Y  M  M  000
  
```

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
 Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\66d
 Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\66d

DATE: 10-16-2025

TIME: 09:08:42

USER:

 ** SIMULATION : 4 - 25 Year 6 Hour AES (Bloor) **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\43322df
Ptotal= 65.59 mm	Comments: 25 Year 6 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	1.75	22.30	3.50	9.18	5.25	1.31
0.25	1.31	2.00	22.30	3.75	5.25	5.50	1.31
0.50	1.31	2.25	60.35	4.00	5.25	5.75	1.31
0.75	1.31	2.50	60.35	4.25	2.62	6.00	1.31
1.00	1.31	2.75	17.06	4.50	2.62		
1.25	7.87	3.00	17.06	4.75	1.31		
1.50	7.87	3.25	9.18	5.00	1.31		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00	Dir. Conn.(%)= 74.00
--	---	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	7.87	3.250	17.06	4.83	1.31
0.167	0.00	1.750	7.87	3.333	9.18	4.92	1.31
0.250	0.00	1.833	22.30	3.417	9.18	5.00	1.31
0.333	1.31	1.917	22.30	3.500	9.18	5.08	1.31
0.417	1.31	2.000	22.30	3.583	9.18	5.17	1.31
0.500	1.31	2.083	22.30	3.667	9.18	5.25	1.31
0.583	1.31	2.167	22.30	3.750	9.18	5.33	1.31
0.667	1.31	2.250	22.30	3.833	5.25	5.42	1.31
0.750	1.31	2.333	60.35	3.917	5.25	5.50	1.31
0.833	1.31	2.417	60.35	4.000	5.25	5.58	1.31
0.917	1.31	2.500	60.35	4.083	5.25	5.67	1.31
1.000	1.31	2.583	60.35	4.167	5.25	5.75	1.31
1.083	1.31	2.667	60.35	4.250	5.25	5.83	1.31
1.167	1.31	2.750	60.35	4.333	2.62	5.92	1.31
1.250	1.31	2.833	17.06	4.417	2.62	6.00	1.31
1.333	7.87	2.917	17.06	4.500	2.62	6.08	1.31
1.417	7.87	3.000	17.06	4.583	2.62	6.17	1.31
1.500	7.87	3.083	17.06	4.667	2.62	6.25	1.31
1.583	7.87	3.167	17.06	4.750	2.62		

Max.Eff.Inten.(mm/hr)=	60.35	43.45
over (min)	5.00	20.00
Storage Coeff. (min)=	6.77 (ii)	16.62 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.18	0.06

PEAK FLOW (cms)=	2.43	0.44	*TOTALS*
TIME TO PEAK (hrs)=	2.75	2.92	2.831 (iii)
RUNOFF VOLUME (mm)=	64.59	37.71	57.60
TOTAL RAINFALL (mm)=	65.59	65.59	65.59
RUNOFF COEFFICIENT =	0.98	0.57	0.88

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

CALIB
STANDHYD ( 0004)
ID= 1 DT= 5.0 min

```

```

Area      (ha)=    5.84
Total Imp(%)= 100.00  Dir. Conn.(%)= 100.00

```

```

                IMPERVIOUS      PERVIOUS (i)
Surface Area    (ha)=    5.84      0.00
Dep. Storage    (mm)=    1.00      1.50
Average Slope   (%)=    1.00      1.00
Length         (m)=   197.32     40.00
Mannings n      =    0.013     0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
      TIME    RAIN      TIME    RAIN      TIME    RAIN      TIME    RAIN
      hrs    mm/hr     hrs    mm/hr     hrs    mm/hr     hrs    mm/hr
0.083    0.00    1.667    7.87    3.250   17.06    4.83    1.31
0.167    0.00    1.750    7.87    3.333    9.18    4.92    1.31
0.250    0.00    1.833   22.30    3.417    9.18    5.00    1.31
0.333    1.31    1.917   22.30    3.500    9.18    5.08    1.31
0.417    1.31    2.000   22.30    3.583    9.18    5.17    1.31
0.500    1.31    2.083   22.30    3.667    9.18    5.25    1.31
0.583    1.31    2.167   22.30    3.750    9.18    5.33    1.31
0.667    1.31    2.250   22.30    3.833    5.25    5.42    1.31
0.750    1.31    2.333   60.35    3.917    5.25    5.50    1.31
0.833    1.31    2.417   60.35    4.000    5.25    5.58    1.31
0.917    1.31    2.500   60.35    4.083    5.25    5.67    1.31
1.000    1.31    2.583   60.35    4.167    5.25    5.75    1.31
1.083    1.31    2.667   60.35    4.250    5.25    5.83    1.31
1.167    1.31    2.750   60.35    4.333    2.62    5.92    1.31
1.250    1.31    2.833   17.06    4.417    2.62    6.00    1.31
1.333    7.87    2.917   17.06    4.500    2.62    6.08    1.31
1.417    7.87    3.000   17.06    4.583    2.62    6.17    1.31
1.500    7.87    3.083   17.06    4.667    2.62    6.25    1.31
1.583    7.87    3.167   17.06    4.750    2.62

```

```

Max.Eff.Inten.(mm/hr)=    60.35      NaN
over (min)           =    5.00      5.00
Storage Coeff. (min)=    4.70 (ii)   4.70 (ii)
Unit Hyd. Tpeak (min)=    5.00      5.00
Unit Hyd. peak (cms)=    0.22      0.25

```

```

*TOTALS*
PEAK FLOW      (cms)=    0.98      0.00      0.000 (iii)
TIME TO PEAK   (hrs)=    2.75      0.00      0.00
RUNOFF VOLUME  (mm)=    64.59      NaN
TOTAL RAINFALL (mm)=    65.59     65.59     65.59
RUNOFF COEFFICIENT =    0.98      NaN

```

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

```

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
    CN* = 85.0  Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
    THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

```

RESERVOIR( 0009)
IN= 2---> OUT= 1
DT= 5.0 min

```

OVERFLOW IS ON

```

      OUTFLOW      STORAGE      OUTFLOW      STORAGE
      (cms)        (ha.m.)      (cms)        (ha.m.)
      0.0000      0.0000      0.0020      0.0590
      0.0020      0.0010      0.0000      0.0000

```

```

                AREA      QPEAK      TPEAK      R.V.
                (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0004)   5.840      0.000      0.00      NaN
OUTFLOW: ID= 1 ( 0009)   5.840      0.002      0.08     20.54
OVERFLOW: ID= 3 ( 0003)   0.000      0.000      0.00      0.00

```

```

TOTAL NUMBER OF SIMULATION OVERFLOW =    0
CUMULATIVE TIME OF OVERFLOW (HOURS) =    0.00
PERCENTAGE OF TIME OVERFLOWING (%) =    0.00

```

```

PEAK FLOW REDUCTION [Qout/Qin](%)=    Inf
TIME SHIFT OF PEAK FLOW (min)=    5.00
MAXIMUM STORAGE USED (ha.m.)=    0.0000
MAXIMUM STORAGE USED (cu.m.)=    0.000000

```

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| ADD HYD ( 0020) |
| 1 + 2 = 3       |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
    ID1= 1 ( 0001): 19.74  2.831  2.75  57.60
    + ID2= 2 ( 0009):  0.00  0.000  0.00  0.00
=====
    ID = 3 ( 0020): 19.74  2.831  2.75  57.60

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
          OVERFLOW IS OFF

          OUTFLOW      STORAGE      OUTFLOW      STORAGE
          (cms)        (ha.m.)      (cms)        (ha.m.)
          0.0000      0.0000      0.0270      2.6907
          0.0000      0.5126      0.0270      3.6151
          0.0150      1.1290      0.5890      4.2144

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0020) 19.740  2.831  2.75  57.60
OUTFLOW: ID= 1 ( 0006) 19.740  0.015  6.50  24.06

          PEAK FLOW REDUCTION [Qout/Qin](%)= 0.52
          TIME SHIFT OF PEAK FLOW (min)=225.00
          MAXIMUM STORAGE USED (ha.m.)= 1.1190

```

```

-----
| CALIB      |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
          Area (ha)= 6.82
          Total Imp(%)= 75.00  Dir. Conn.(%)= 75.00

          IMPERVIOUS      PERVIOUS (i)
Surface Area (ha)= 5.12  1.71
Dep. Storage (mm)= 1.00  1.50
Average Slope (%)= 1.00  2.00
Length (m)= 213.23  40.00
Mannings n = 0.013  0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
      TIME    RAIN      TIME    RAIN      TIME    RAIN      TIME    RAIN
      hrs    mm/hr     hrs    mm/hr     hrs    mm/hr     hrs    mm/hr
0.083    0.00    1.667    7.87    3.250   17.06    4.83    1.31
0.167    0.00    1.750    7.87    3.333    9.18    4.92    1.31
0.250    0.00    1.833   22.30    3.417    9.18    5.00    1.31
0.333    1.31    1.917   22.30    3.500    9.18    5.08    1.31
0.417    1.31    2.000   22.30    3.583    9.18    5.17    1.31
0.500    1.31    2.083   22.30    3.667    9.18    5.25    1.31
0.583    1.31    2.167   22.30    3.750    9.18    5.33    1.31
0.667    1.31    2.250   22.30    3.833    5.25    5.42    1.31
0.750    1.31    2.333   60.35    3.917    5.25    5.50    1.31
0.833    1.31    2.417   60.35    4.000    5.25    5.58    1.31
0.917    1.31    2.500   60.35    4.083    5.25    5.67    1.31
1.000    1.31    2.583   60.35    4.167    5.25    5.75    1.31
1.083    1.31    2.667   60.35    4.250    5.25    5.83    1.31
1.167    1.31    2.750   60.35    4.333    2.62    5.92    1.31
1.250    1.31    2.833   17.06    4.417    2.62    6.00    1.31
1.333    7.87    2.917   17.06    4.500    2.62    6.08    1.31
1.417    7.87    3.000   17.06    4.583    2.62    6.17    1.31
1.500    7.87    3.083   17.06    4.667    2.62    6.25    1.31
1.583    7.87    3.167   17.06    4.750    2.62

```

```

Max.Eff.Inten.(mm/hr)= 60.35  43.45
over (min)           5.00  15.00
Storage Coeff. (min)= 4.92 (ii) 14.78 (ii)
Unit Hyd. Tpeak (min)= 5.00  15.00
Unit Hyd. peak (cms)= 0.22  0.08

```

TOTALS

```

PEAK FLOW (cms)= 0.86  0.16  1.008 (iii)
TIME TO PEAK (hrs)= 2.75  2.83  2.75
RUNOFF VOLUME (mm)= 64.59  37.71  57.87
TOTAL RAINFALL (mm)= 65.59  65.59  65.59

```

RUNOFF COEFFICIENT = 0.98 0.57 0.88

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0005)
ID= 1 DT= 5.0 min

Area (ha)= 5.21
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 5.21 0.00
Dep. Storage (mm)= 1.00 1.50
Average slope (%)= 1.00 1.00
Length (m)= 186.37 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	7.87	3.250	17.06	4.83	1.31
0.167	0.00	1.750	7.87	3.333	9.18	4.92	1.31
0.250	0.00	1.833	22.30	3.417	9.18	5.00	1.31
0.333	1.31	1.917	22.30	3.500	9.18	5.08	1.31
0.417	1.31	2.000	22.30	3.583	9.18	5.17	1.31
0.500	1.31	2.083	22.30	3.667	9.18	5.25	1.31
0.583	1.31	2.167	22.30	3.750	9.18	5.33	1.31
0.667	1.31	2.250	22.30	3.833	5.25	5.42	1.31
0.750	1.31	2.333	60.35	3.917	5.25	5.50	1.31
0.833	1.31	2.417	60.35	4.000	5.25	5.58	1.31
0.917	1.31	2.500	60.35	4.083	5.25	5.67	1.31
1.000	1.31	2.583	60.35	4.167	5.25	5.75	1.31
1.083	1.31	2.667	60.35	4.250	5.25	5.83	1.31
1.167	1.31	2.750	60.35	4.333	2.62	5.92	1.31
1.250	1.31	2.833	17.06	4.417	2.62	6.00	1.31
1.333	7.87	2.917	17.06	4.500	2.62	6.08	1.31
1.417	7.87	3.000	17.06	4.583	2.62	6.17	1.31
1.500	7.87	3.083	17.06	4.667	2.62	6.25	1.31
1.583	7.87	3.167	17.06	4.750	2.62		

Max.Eff.Inten.(mm/hr)= 60.35 NaN
over (min)= 5.00 5.00
Storage Coeff. (min)= 4.54 (ii) 4.54 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.23 0.25

PEAK FLOW (cms)= 0.87 0.00 *TOTALS*
TIME TO PEAK (hrs)= 2.75 0.00 0.000 (iii)
RUNOFF VOLUME (mm)= 64.59 NaN NaN
TOTAL RAINFALL (mm)= 65.59 65.59 65.59
RUNOFF COEFFICIENT = 0.98 NaN NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS ON

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0020	0.0520
0.0020	0.0010	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0005)	5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)	5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

 | ADD HYD (0021) |
1 + 2 = 3
 *** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.
 *** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003
 ID1= 1 (0010): 0.00 0.000 0.00 0.00
 + ID2= 2 (0003): 6.82 1.008 2.75 57.87
 =====
 ID = 3 (0021): 6.82 1.008 2.75 57.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | RESERVOIR(0008) |
 | IN= 2---> OUT= 1 |
DT= 5.0 min
 OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0517	0.3200
0.0183	0.0400	0.0549	0.3600
0.0259	0.0800	0.0579	0.4000
0.0317	0.1200	0.0607	0.4400
0.0366	0.1600	0.0634	0.4800
0.0409	0.2000	0.0660	0.5200
0.0448	0.2400	0.0685	0.5600
0.0484	0.2800	0.0709	0.6000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0021)	6.820	1.008	2.75	57.87
OUTFLOW: ID= 1 (0008)	6.820	0.053	4.58	57.87

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.24
 TIME SHIFT OF PEAK FLOW (min)=110.00
 MAXIMUM STORAGE USED (ha.m.)= 0.3333

 | CALIB
 | STANDHYD (0002) |
ID= 1 DT= 5.0 min
 Area (ha)= 2.26
 Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.72	0.54
Dep. Storage (mm)=	1.00	1.50
Average slope (%)=	1.00	2.00
Length (m)=	122.75	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	7.87	3.250	17.06	4.83	1.31
0.167	0.00	1.750	7.87	3.333	9.18	4.92	1.31
0.250	0.00	1.833	22.30	3.417	9.18	5.00	1.31
0.333	1.31	1.917	22.30	3.500	9.18	5.08	1.31
0.417	1.31	2.000	22.30	3.583	9.18	5.17	1.31
0.500	1.31	2.083	22.30	3.667	9.18	5.25	1.31
0.583	1.31	2.167	22.30	3.750	9.18	5.33	1.31
0.667	1.31	2.250	22.30	3.833	5.25	5.42	1.31
0.750	1.31	2.333	60.35	3.917	5.25	5.50	1.31
0.833	1.31	2.417	60.35	4.000	5.25	5.58	1.31
0.917	1.31	2.500	60.35	4.083	5.25	5.67	1.31
1.000	1.31	2.583	60.35	4.167	5.25	5.75	1.31
1.083	1.31	2.667	60.35	4.250	5.25	5.83	1.31
1.167	1.31	2.750	60.35	4.333	2.62	5.92	1.31
1.250	1.31	2.833	17.06	4.417	2.62	6.00	1.31

1.333	7.87	2.917	17.06	4.500	2.62	6.08	1.31
1.417	7.87	3.000	17.06	4.583	2.62	6.17	1.31
1.500	7.87	3.083	17.06	4.667	2.62	6.25	1.31
1.583	7.87	3.167	17.06	4.750	2.62		

Max.Eff.Inten.(mm/hr)= 60.35 43.45
over (min) 5.00 15.00
Storage Coeff. (min)= 3.54 (ii) 13.39 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.26 0.08

TOTALS
PEAK FLOW (cms)= 0.29 0.05 0.338 (iii)
TIME TO PEAK (hrs)= 2.75 2.83 2.75
RUNOFF VOLUME (mm)= 64.59 37.71 58.14
TOTAL RAINFALL (mm)= 65.59 65.59 65.59
RUNOFF COEFFICIENT = 0.98 0.57 0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0823	0.0960
0.0291	0.0120	0.0873	0.1080
0.0412	0.0240	0.0921	0.1200
0.0504	0.0360	0.0965	0.1320
0.0582	0.0480	0.1008	0.1440
0.0651	0.0600	0.1050	0.1560
0.0713	0.0720	0.1058	0.1584
0.0770	0.0840	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0002)	2.260	0.338	2.75	58.14
OUTFLOW: ID= 1 (0007)	2.260	0.074	3.33	58.09

PEAK FLOW REDUCTION [Qout/Qin](%)= 21.76
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.0767

RESERVOIR(0022)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.5300	0.0100
0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.5300	0.0100
0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW: ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

V V I SSSSS U U A L (v 6.2.2022)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTTT TTTTT H H Y Y M M 000 TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
000 T T H H Y M M 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\eed
Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\eed

DATE: 10-16-2025 TIME: 09:08:46

USER:

COMMENTS: _____

** SIMULATION : 5 - 50 Year 12 Hour AES (Bloo **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\81d7e0e4
Ptotal= 80.82 mm	Comments: 50 Year 12 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	3.25	13.74	6.50	5.66	9.75	0.81
0.25	0.81	3.50	13.74	6.75	5.66	10.00	0.81
0.50	0.81	3.75	13.74	7.00	5.66	10.25	0.81
0.75	0.81	4.00	13.74	7.25	3.23	10.50	0.81
1.00	0.81	4.25	37.17	7.50	3.23	10.75	0.81
1.25	0.81	4.50	37.17	7.75	3.23	11.00	0.81
1.50	0.81	4.75	37.17	8.00	3.23	11.25	0.81
1.75	0.81	5.00	37.17	8.25	1.62	11.50	0.81
2.00	0.81	5.25	10.50	8.50	1.62	11.75	0.81
2.25	4.85	5.50	10.50	8.75	1.62	12.00	0.81
2.50	4.85	5.75	10.50	9.00	1.62		
2.75	4.85	6.00	10.50	9.25	0.81		
3.00	4.85	6.25	5.66	9.50	0.81		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00 Dir. Conn.(%)= 74.00
--	---

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 10.00 20.00
Storage Coeff. (min)= 8.22 (ii) 19.79 (ii)
Unit Hyd. Tpeak (min)= 10.00 20.00
Unit Hyd. peak (cms)= 0.13 0.06

TOTALS

PEAK FLOW (cms)= 1.51 0.36 1.865 (iii)
TIME TO PEAK (hrs)= 5.25 5.33 5.25
RUNOFF VOLUME (mm)= 79.82 50.68 72.24
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.99 0.63 0.89

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0004) ID= 1 DT= 5.0 min	Area (ha)= 5.84 Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00
--	---	-----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.84	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	197.32	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81

0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 NaN
over (min) 5.00 10.00
Storage Coeff. (min)= 5.71 (ii) 5.71 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.20 0.18

TOTALS
PEAK FLOW (cms)= 0.60 0.00 0.000 (iii)
TIME TO PEAK (hrs)= 5.25 0.00 0.00
RUNOFF VOLUME (mm)= 79.82 NaN NaN
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.99 NaN NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0009)					OVERFLOW IS ON				
IN= 2---> OUT= 1									
DT= 5.0 min									
					OUTFLOW	STORAGE	OUTFLOW	STORAGE	
					(cms)	(ha.m.)	(cms)	(ha.m.)	
					0.0000	0.0000	0.0020	0.0590	
					0.0020	0.0010	0.0000	0.0000	
					AREA	QPEAK	TPEAK	R.V.	
					(ha)	(cms)	(hrs)	(mm)	
INFLOW : ID= 2 (0004)					5.840	0.000	0.00	NaN	
OUTFLOW: ID= 1 (0009)					5.840	0.002	0.08	20.54	
OVERFLOW: ID= 3 (0003)					0.000	0.000	0.00	0.00	

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| ADD HYD ( 0020) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
*** W A R N I N G :  HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G :  HYDROGRAPH 0003 = HYDROGRAPH 0001
      ID1= 1 ( 0001):  19.74   1.865   5.25   72.24
      + ID2= 2 ( 0009):   0.00   0.000   0.00   0.00
      =====
      ID = 3 ( 0020):  19.74   1.865   5.25   72.24

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
          OVERFLOW IS OFF
          OUTFLOW      STORAGE      OUTFLOW      STORAGE
          (cms)      (ha.m.)      (cms)      (ha.m.)
          0.0000      0.0000      0.0270      2.6907
          0.0000      0.5126      0.0270      3.6151
          0.0150      1.1290      0.5890      4.2144
          =====
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0020)  19.740   1.865   5.25   72.24
OUTFLOW: ID= 1 ( 0006)  19.740   0.017  12.50  34.34
          =====
          PEAK FLOW REDUCTION [Qout/Qin](%)= 0.91
          TIME SHIFT OF PEAK FLOW (min)=435.00
          MAXIMUM STORAGE USED (ha.m.)= 1.3828

```

```

-----
| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
          Area (ha)= 6.82
          Total Imp(%)= 75.00  Dir. Conn.(%)= 75.00
          =====
          IMPERVIOUS      PERVIOUS (i)
          Surface Area (ha)= 5.12      1.71
          Dep. Storage (mm)= 1.00      1.50
          Average Slope (%)= 1.00      2.00
          Length (m)= 213.23      40.00
          Mannings n = 0.013      0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
      TIME      RAIN      TIME      RAIN      TIME      RAIN      TIME      RAIN
      hrs      mm/hr      hrs      mm/hr      hrs      mm/hr      hrs      mm/hr
0.083      0.00      3.167      4.85      6.250     10.50      9.33      0.81
0.167      0.00      3.250      4.85      6.333      5.66      9.42      0.81
0.250      0.00      3.333     13.74      6.417      5.66      9.50      0.81
0.333      0.81      3.417     13.74      6.500      5.66      9.58      0.81
0.417      0.81      3.500     13.74      6.583      5.66      9.67      0.81
0.500      0.81      3.583     13.74      6.667      5.66      9.75      0.81
0.583      0.81      3.667     13.74      6.750      5.66      9.83      0.81
0.667      0.81      3.750     13.74      6.833      5.66      9.92      0.81
0.750      0.81      3.833     13.74      6.917      5.66     10.00      0.81
0.833      0.81      3.917     13.74      7.000      5.66     10.08      0.81
0.917      0.81      4.000     13.74      7.083      5.66     10.17      0.81
1.000      0.81      4.083     13.74      7.167      5.66     10.25      0.81
1.083      0.81      4.167     13.74      7.250      5.66     10.33      0.81
1.167      0.81      4.250     13.74      7.333      3.23     10.42      0.81
1.250      0.81      4.333     37.17      7.417      3.23     10.50      0.81
1.333      0.81      4.417     37.17      7.500      3.23     10.58      0.81
1.417      0.81      4.500     37.17      7.583      3.23     10.67      0.81
1.500      0.81      4.583     37.17      7.667      3.23     10.75      0.81
1.583      0.81      4.667     37.17      7.750      3.23     10.83      0.81
1.667      0.81      4.750     37.17      7.833      3.23     10.92      0.81
1.750      0.81      4.833     37.17      7.917      3.23     11.00      0.81
1.833      0.81      4.917     37.17      8.000      3.23     11.08      0.81
1.917      0.81      5.000     37.17      8.083      3.23     11.17      0.81
2.000      0.81      5.083     37.17      8.167      3.23     11.25      0.81
2.083      0.81      5.167     37.17      8.250      3.23     11.33      0.81
2.167      0.81      5.250     37.17      8.333      1.62     11.42      0.81
2.250      0.81      5.333     10.50      8.417      1.62     11.50      0.81
2.333      4.85      5.417     10.50      8.500      1.62     11.58      0.81
2.417      4.85      5.500     10.50      8.583      1.62     11.67      0.81
2.500      4.85      5.583     10.50      8.667      1.62     11.75      0.81
2.583      4.85      5.667     10.50      8.750      1.62     11.83      0.81
2.667      4.85      5.750     10.50      8.833      1.62     11.92      0.81
2.750      4.85      5.833     10.50      8.917      1.62     12.00      0.81
2.833      4.85      5.917     10.50      9.000      1.62     12.08      0.81

```

2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 29.06
over (min) 5.00 20.00
Storage Coeff. (min)= 5.98 (ii) 17.55 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.19 0.06

PEAK FLOW (cms)= 0.53 0.12 *TOTALS*
TIME TO PEAK (hrs)= 5.25 5.25 0.650 (iii)
RUNOFF VOLUME (mm)= 79.82 50.68 72.53
TOTAL RAINFALL (mm)= 80.82 80.82 80.82
RUNOFF COEFFICIENT = 0.99 0.63 0.90

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)= 5.21	
STANDHYD (0005)	Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00
ID= 1 DT= 5.0 min		

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	186.37	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)= 37.17 NaN
over (min) 5.00 10.00
Storage Coeff. (min)= 5.51 (ii) 5.51 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00

Unit Hyd. peak (cms)=	0.20	0.18	
PEAK FLOW (cms)=	0.54	0.00	*TOTALS*
TIME TO PEAK (hrs)=	5.25	0.00	0.000 (iii)
RUNOFF VOLUME (mm)=	79.82	NaN	0.00
TOTAL RAINFALL (mm)=	80.82	80.82	NaN
RUNOFF COEFFICIENT =	0.99	NaN	80.82
			NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)					
IN= 2---> OUT= 1					
DT= 5.0 min					

OVERFLOW IS ON					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0020	0.0520
		0.0020	0.0010	0.0000	0.0000

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0005)		5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)		5.210	0.002	0.08	23.02
OVERFLOW:ID= 3 (0003)		0.000	0.000	0.00	0.00
TOTAL NUMBER OF SIMULATION OVERFLOW = 0					
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00					
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00					
PEAK FLOW REDUCTION [Qout/Qin](%)= Inf					
TIME SHIFT OF PEAK FLOW (min)= 5.00					
MAXIMUM STORAGE USED (ha.m.)= 0.0000					
MAXIMUM STORAGE USED (cu.m.)= 0.000000					
**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.					
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.					

ADD HYD (0021)					
1 + 2 = 3					

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.					
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003					
ID1= 1 (0010):		0.00	0.000	0.00	0.00
+ ID2= 2 (0003):		6.82	0.650	5.25	72.53
=====					
ID = 3 (0021):		6.82	0.650	5.25	72.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)					
IN= 2---> OUT= 1					
DT= 5.0 min					

OVERFLOW IS OFF					
		OUTFLOW	STORAGE	OUTFLOW	STORAGE
		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0517	0.3200
		0.0183	0.0400	0.0549	0.3600
		0.0259	0.0800	0.0579	0.4000
		0.0317	0.1200	0.0607	0.4400
		0.0366	0.1600	0.0634	0.4800
		0.0409	0.2000	0.0660	0.5200
		0.0448	0.2400	0.0685	0.5600
		0.0484	0.2800	0.0709	0.6000

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0021)		6.820	0.650	5.25	72.53
OUTFLOW: ID= 1 (0008)		6.820	0.057	8.25	72.53
PEAK FLOW REDUCTION [Qout/Qin](%)= 8.71					
TIME SHIFT OF PEAK FLOW (min)=180.00					
MAXIMUM STORAGE USED (ha.m.)= 0.3822					

CALIB	
STANDHYD (0002)	Area (ha)= 2.26

ID= 1 DT= 5.0 min | Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.72	0.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	122.75	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	4.85	6.250	10.50	9.33	0.81
0.167	0.00	3.250	4.85	6.333	5.66	9.42	0.81
0.250	0.00	3.333	13.74	6.417	5.66	9.50	0.81
0.333	0.81	3.417	13.74	6.500	5.66	9.58	0.81
0.417	0.81	3.500	13.74	6.583	5.66	9.67	0.81
0.500	0.81	3.583	13.74	6.667	5.66	9.75	0.81
0.583	0.81	3.667	13.74	6.750	5.66	9.83	0.81
0.667	0.81	3.750	13.74	6.833	5.66	9.92	0.81
0.750	0.81	3.833	13.74	6.917	5.66	10.00	0.81
0.833	0.81	3.917	13.74	7.000	5.66	10.08	0.81
0.917	0.81	4.000	13.74	7.083	5.66	10.17	0.81
1.000	0.81	4.083	13.74	7.167	5.66	10.25	0.81
1.083	0.81	4.167	13.74	7.250	5.66	10.33	0.81
1.167	0.81	4.250	13.74	7.333	3.23	10.42	0.81
1.250	0.81	4.333	37.17	7.417	3.23	10.50	0.81
1.333	0.81	4.417	37.17	7.500	3.23	10.58	0.81
1.417	0.81	4.500	37.17	7.583	3.23	10.67	0.81
1.500	0.81	4.583	37.17	7.667	3.23	10.75	0.81
1.583	0.81	4.667	37.17	7.750	3.23	10.83	0.81
1.667	0.81	4.750	37.17	7.833	3.23	10.92	0.81
1.750	0.81	4.833	37.17	7.917	3.23	11.00	0.81
1.833	0.81	4.917	37.17	8.000	3.23	11.08	0.81
1.917	0.81	5.000	37.17	8.083	3.23	11.17	0.81
2.000	0.81	5.083	37.17	8.167	3.23	11.25	0.81
2.083	0.81	5.167	37.17	8.250	3.23	11.33	0.81
2.167	0.81	5.250	37.17	8.333	1.62	11.42	0.81
2.250	0.81	5.333	10.50	8.417	1.62	11.50	0.81
2.333	4.85	5.417	10.50	8.500	1.62	11.58	0.81
2.417	4.85	5.500	10.50	8.583	1.62	11.67	0.81
2.500	4.85	5.583	10.50	8.667	1.62	11.75	0.81
2.583	4.85	5.667	10.50	8.750	1.62	11.83	0.81
2.667	4.85	5.750	10.50	8.833	1.62	11.92	0.81
2.750	4.85	5.833	10.50	8.917	1.62	12.00	0.81
2.833	4.85	5.917	10.50	9.000	1.62	12.08	0.81
2.917	4.85	6.000	10.50	9.083	1.62	12.17	0.81
3.000	4.85	6.083	10.50	9.167	1.62	12.25	0.81
3.083	4.85	6.167	10.50	9.250	1.62		

Max.Eff.Inten.(mm/hr)=	37.17	29.06
over (min)	5.00	20.00
Storage Coeff. (min)=	4.29 (ii)	15.86 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.23	0.07

PEAK FLOW (cms)=	0.18	0.04	*TOTALS*
TIME TO PEAK (hrs)=	5.17	5.25	0.217 (iii)
RUNOFF VOLUME (mm)=	79.82	50.68	72.82
TOTAL RAINFALL (mm)=	80.82	80.82	80.82
RUNOFF COEFFICIENT =	0.99	0.63	0.90

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0823	0.0960
0.0291	0.0120	0.0873	0.1080
0.0412	0.0240	0.0921	0.1200
0.0504	0.0360	0.0965	0.1320
0.0582	0.0480	0.1008	0.1440

0.0651	0.0600		0.1050	0.1560
0.0713	0.0720		0.1058	0.1584
0.0770	0.0840		0.0000	0.0000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0002)	2.260	0.217	5.25	72.82
OUTFLOW: ID= 1 (0007)	2.260	0.073	5.67	72.78

PEAK FLOW REDUCTION [Qout/Qin](%)= 33.61
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 0.0752

RESERVOIR(0022)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW	STORAGE		OUTFLOW	STORAGE
(cms)	(ha.m.)		(cms)	(ha.m.)
0.0000	0.0000		1.5300	0.0100
0.5000	0.0050		1.5400	3.0000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW	STORAGE		OUTFLOW	STORAGE
(cms)	(ha.m.)		(cms)	(ha.m.)
0.0000	0.0000		1.5300	0.0100
0.5000	0.0050		1.5400	3.0000

	AREA	QPEAK	TPEAK	R.V.
	(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW: ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

V V I SSSSS U U A L (v 6.2.2022)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\vo2\voin.dat
Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\b3a
Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\b3a

DATE: 10-16-2025

TIME: 09:08:42

USER:

COMMENTS: _____

 ** SIMULATION : 5 - 50 Year 6 Hour AES (Bloor) **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\81e392cf
Ptotal= 73.00 mm	Comments: 50 Year 6 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	1.75	24.82	3.50	10.22	5.25	1.46
0.25	1.46	2.00	24.82	3.75	5.84	5.50	1.46
0.50	1.46	2.25	67.16	4.00	5.84	5.75	1.46
0.75	1.46	2.50	67.16	4.25	2.92	6.00	1.46
1.00	1.46	2.75	18.98	4.50	2.92		
1.25	8.76	3.00	18.98	4.75	1.46		
1.50	8.76	3.25	10.22	5.00	1.46		

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 19.74 Total Imp(%)= 74.00	Dir. Conn.(%)= 74.00
--	---	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	8.76	3.250	18.98	4.83	1.46
0.167	0.00	1.750	8.76	3.333	10.22	4.92	1.46
0.250	0.00	1.833	24.82	3.417	10.22	5.00	1.46
0.333	1.46	1.917	24.82	3.500	10.22	5.08	1.46
0.417	1.46	2.000	24.82	3.583	10.22	5.17	1.46
0.500	1.46	2.083	24.82	3.667	10.22	5.25	1.46
0.583	1.46	2.167	24.82	3.750	10.22	5.33	1.46
0.667	1.46	2.250	24.82	3.833	5.84	5.42	1.46
0.750	1.46	2.333	67.16	3.917	5.84	5.50	1.46
0.833	1.46	2.417	67.16	4.000	5.84	5.58	1.46
0.917	1.46	2.500	67.16	4.083	5.84	5.67	1.46
1.000	1.46	2.583	67.16	4.167	5.84	5.75	1.46
1.083	1.46	2.667	67.16	4.250	5.84	5.83	1.46
1.167	1.46	2.750	67.16	4.333	2.92	5.92	1.46
1.250	1.46	2.833	18.98	4.417	2.92	6.00	1.46
1.333	8.76	2.917	18.98	4.500	2.92	6.08	1.46
1.417	8.76	3.000	18.98	4.583	2.92	6.17	1.46
1.500	8.76	3.083	18.98	4.667	2.92	6.25	1.46
1.583	8.76	3.167	18.98	4.750	2.92		

Max.Eff.Inten.(mm/hr)=	67.16	50.27
over (min)	5.00	20.00
Storage Coeff. (min)=	6.49 (ii)	15.78 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.18	0.07

PEAK FLOW (cms)=	2.71	0.52	*TOTALS*
TIME TO PEAK (hrs)=	2.75	2.83	3.189 (iii)
RUNOFF VOLUME (mm)=	72.00	43.95	2.75
TOTAL RAINFALL (mm)=	73.00	73.00	64.71
RUNOFF COEFFICIENT =	0.99	0.60	73.00
			0.89

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL

THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0004) ID= 1 DT= 5.0 min	Area (ha)= 5.84 Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00
--	--

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.84	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	197.32	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	8.76	3.250	18.98	4.83	1.46
0.167	0.00	1.750	8.76	3.333	10.22	4.92	1.46
0.250	0.00	1.833	24.82	3.417	10.22	5.00	1.46
0.333	1.46	1.917	24.82	3.500	10.22	5.08	1.46
0.417	1.46	2.000	24.82	3.583	10.22	5.17	1.46
0.500	1.46	2.083	24.82	3.667	10.22	5.25	1.46
0.583	1.46	2.167	24.82	3.750	10.22	5.33	1.46
0.667	1.46	2.250	24.82	3.833	5.84	5.42	1.46
0.750	1.46	2.333	67.16	3.917	5.84	5.50	1.46
0.833	1.46	2.417	67.16	4.000	5.84	5.58	1.46
0.917	1.46	2.500	67.16	4.083	5.84	5.67	1.46
1.000	1.46	2.583	67.16	4.167	5.84	5.75	1.46
1.083	1.46	2.667	67.16	4.250	5.84	5.83	1.46
1.167	1.46	2.750	67.16	4.333	2.92	5.92	1.46
1.250	1.46	2.833	18.98	4.417	2.92	6.00	1.46
1.333	8.76	2.917	18.98	4.500	2.92	6.08	1.46
1.417	8.76	3.000	18.98	4.583	2.92	6.17	1.46
1.500	8.76	3.083	18.98	4.667	2.92	6.25	1.46
1.583	8.76	3.167	18.98	4.750	2.92		

Max.Eff.Inten.(mm/hr)=	67.16	NaN
over (min)	5.00	5.00
Storage Coeff. (min)=	4.50 (ii)	4.50 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.23	0.26
		TOTALS
PEAK FLOW (cms)=	1.09	0.00 0.000 (iii)
TIME TO PEAK (hrs)=	2.75	0.00 0.00
RUNOFF VOLUME (mm)=	72.00	NaN NaN
TOTAL RAINFALL (mm)=	73.00	73.00
RUNOFF COEFFICIENT =	0.99	NaN NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0009) IN= 2---> OUT= 1 DT= 5.0 min	OVERFLOW IS ON			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0020	0.0590
	0.0020	0.0010	0.0000	0.0000
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0004)	5.840	0.000	0.00	NaN
OUTFLOW: ID= 1 (0009)	5.840	0.002	0.08	20.54
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
 TIME SHIFT OF PEAK FLOW (min)= 5.00

MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```
-----
| ADD HYD ( 0020) |
| 1 + 2 = 3       |
|-----|
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
  ID1= 1 ( 0001): 19.74 3.189 2.75 64.71
+ ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
=====
  ID = 3 ( 0020): 19.74 3.189 2.75 64.71
=====
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-----
| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----|
OVERFLOW IS OFF

OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0270 2.6907
0.0000 0.5126 | 0.0270 3.6151
0.0150 1.1290 | 0.5890 4.2144
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0020)	19.740	3.189	2.75	64.71
OUTFLOW: ID= 1 (0006)	19.740	0.016	6.50	29.34

PEAK FLOW REDUCTION [Qout/Qin](%)= 0.50
TIME SHIFT OF PEAK FLOW (min)=225.00
MAXIMUM STORAGE USED (ha.m.)= 1.2564

```
-----
| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
|-----|
Area (ha)= 6.82
Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 5.12 1.71
Dep. Storage (mm)= 1.00 1.50
Average slope (%)= 1.00 2.00
Length (m)= 213.23 40.00
Mannings n = 0.013 0.250
```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	8.76	3.250	18.98	4.83	1.46
0.167	0.00	1.750	8.76	3.333	10.22	4.92	1.46
0.250	0.00	1.833	24.82	3.417	10.22	5.00	1.46
0.333	1.46	1.917	24.82	3.500	10.22	5.08	1.46
0.417	1.46	2.000	24.82	3.583	10.22	5.17	1.46
0.500	1.46	2.083	24.82	3.667	10.22	5.25	1.46
0.583	1.46	2.167	24.82	3.750	10.22	5.33	1.46
0.667	1.46	2.250	24.82	3.833	5.84	5.42	1.46
0.750	1.46	2.333	67.16	3.917	5.84	5.50	1.46
0.833	1.46	2.417	67.16	4.000	5.84	5.58	1.46
0.917	1.46	2.500	67.16	4.083	5.84	5.67	1.46
1.000	1.46	2.583	67.16	4.167	5.84	5.75	1.46
1.083	1.46	2.667	67.16	4.250	5.84	5.83	1.46
1.167	1.46	2.750	67.16	4.333	2.92	5.92	1.46
1.250	1.46	2.833	18.98	4.417	2.92	6.00	1.46
1.333	8.76	2.917	18.98	4.500	2.92	6.08	1.46
1.417	8.76	3.000	18.98	4.583	2.92	6.17	1.46
1.500	8.76	3.083	18.98	4.667	2.92	6.25	1.46
1.583	8.76	3.167	18.98	4.750	2.92		

Max.Eff.Inten.(mm/hr)=	67.16	50.27
over (min)	5.00	15.00
Storage Coeff. (min)=	4.72 (ii)	14.01 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.22	0.08

PEAK FLOW (cms)= 0.95 0.18

TOTALS
1.134 (iii)

TIME TO PEAK	(hrs)=	2.75	2.83	2.75
RUNOFF VOLUME	(mm)=	72.00	43.95	64.99
TOTAL RAINFALL	(mm)=	73.00	73.00	73.00
RUNOFF COEFFICIENT	=	0.99	0.60	0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area (ha)= 5.21 Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00
--	---

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	186.37	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	1.667	8.76	3.250	18.98	4.83	1.46
0.167	0.00	1.750	8.76	3.333	10.22	4.92	1.46
0.250	0.00	1.833	24.82	3.417	10.22	5.00	1.46
0.333	1.46	1.917	24.82	3.500	10.22	5.08	1.46
0.417	1.46	2.000	24.82	3.583	10.22	5.17	1.46
0.500	1.46	2.083	24.82	3.667	10.22	5.25	1.46
0.583	1.46	2.167	24.82	3.750	10.22	5.33	1.46
0.667	1.46	2.250	24.82	3.833	5.84	5.42	1.46
0.750	1.46	2.333	67.16	3.917	5.84	5.50	1.46
0.833	1.46	2.417	67.16	4.000	5.84	5.58	1.46
0.917	1.46	2.500	67.16	4.083	5.84	5.67	1.46
1.000	1.46	2.583	67.16	4.167	5.84	5.75	1.46
1.083	1.46	2.667	67.16	4.250	5.84	5.83	1.46
1.167	1.46	2.750	67.16	4.333	2.92	5.92	1.46
1.250	1.46	2.833	18.98	4.417	2.92	6.00	1.46
1.333	8.76	2.917	18.98	4.500	2.92	6.08	1.46
1.417	8.76	3.000	18.98	4.583	2.92	6.17	1.46
1.500	8.76	3.083	18.98	4.667	2.92	6.25	1.46
1.583	8.76	3.167	18.98	4.750	2.92		

Max.Eff.Inten.(mm/hr)=	67.16	NaN	
over (min)	5.00	5.00	
Storage Coeff. (min)=	4.35 (ii)	4.35 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.23	0.26	
			TOTALS
PEAK FLOW (cms)=	0.97	0.00	0.000 (iii)
TIME TO PEAK (hrs)=	2.75	0.00	0.00
RUNOFF VOLUME (mm)=	72.00	NaN	NaN
TOTAL RAINFALL (mm)=	73.00	73.00	73.00
RUNOFF COEFFICIENT =	0.99	NaN	NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010) IN= 2---> OUT= 1 DT= 5.0 min	OVERFLOW IS ON			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0020	0.0520
	0.0020	0.0010	0.0000	0.0000
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

INFLOW : ID= 2 (0005)	5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)	5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0021)				
1 + 2 = 3				

*** W A R N I N G :	HYDROGRAPH	0010 <ID= 1> IS DRY.
*** W A R N I N G :	HYDROGRAPH	0021 = HYDROGRAPH 0003
ID1= 1 (0010):	0.00	0.000 0.00 0.00
+ ID2= 2 (0003):	6.82	1.134 2.75 64.99
=====		
ID = 3 (0021):	6.82	1.134 2.75 64.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min				

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0517	0.3200
0.0183	0.0400	0.0549	0.3600
0.0259	0.0800	0.0579	0.4000
0.0317	0.1200	0.0607	0.4400
0.0366	0.1600	0.0634	0.4800
0.0409	0.2000	0.0660	0.5200
0.0448	0.2400	0.0685	0.5600
0.0484	0.2800	0.0709	0.6000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0021)	6.820	1.134	2.75	64.99
OUTFLOW: ID= 1 (0008)	6.820	0.056	4.75	64.99

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.95
 TIME SHIFT OF PEAK FLOW (min)=120.00
 MAXIMUM STORAGE USED (ha.m.)= 0.3768

CALIB			
STANDHYD (0002)	Area (ha)= 2.26		
ID= 1 DT= 5.0 min	Total Imp(%)= 76.00	Dir. Conn.(%)= 76.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.72	0.54
Dep. Storage (mm)=	1.00	1.50
Average slope (%)=	1.00	2.00
Length (m)=	122.75	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	8.76	3.250	18.98	4.83	1.46
0.167	0.00	1.750	8.76	3.333	10.22	4.92	1.46
0.250	0.00	1.833	24.82	3.417	10.22	5.00	1.46
0.333	1.46	1.917	24.82	3.500	10.22	5.08	1.46
0.417	1.46	2.000	24.82	3.583	10.22	5.17	1.46
0.500	1.46	2.083	24.82	3.667	10.22	5.25	1.46
0.583	1.46	2.167	24.82	3.750	10.22	5.33	1.46
0.667	1.46	2.250	24.82	3.833	5.84	5.42	1.46
0.750	1.46	2.333	67.16	3.917	5.84	5.50	1.46
0.833	1.46	2.417	67.16	4.000	5.84	5.58	1.46
0.917	1.46	2.500	67.16	4.083	5.84	5.67	1.46
1.000	1.46	2.583	67.16	4.167	5.84	5.75	1.46

1.083	1.46	2.667	67.16	4.250	5.84	5.83	1.46
1.167	1.46	2.750	67.16	4.333	2.92	5.92	1.46
1.250	1.46	2.833	18.98	4.417	2.92	6.00	1.46
1.333	8.76	2.917	18.98	4.500	2.92	6.08	1.46
1.417	8.76	3.000	18.98	4.583	2.92	6.17	1.46
1.500	8.76	3.083	18.98	4.667	2.92	6.25	1.46
1.583	8.76	3.167	18.98	4.750	2.92		

Max.Eff.Inten.(mm/hr)= 67.16 50.27
over (min) 5.00 15.00
Storage Coeff. (min)= 3.39 (ii) 12.68 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.26 0.08

TOTALS

PEAK FLOW (cms)= 0.32 0.06 0.380 (iii)
TIME TO PEAK (hrs)= 2.75 2.83 2.75
RUNOFF VOLUME (mm)= 72.00 43.95 65.26
TOTAL RAINFALL (mm)= 73.00 73.00 73.00
RUNOFF COEFFICIENT = 0.99 0.60 0.89

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0823	0.0960
0.0291	0.0120	0.0873	0.1080
0.0412	0.0240	0.0921	0.1200
0.0504	0.0360	0.0965	0.1320
0.0582	0.0480	0.1008	0.1440
0.0651	0.0600	0.1050	0.1560
0.0713	0.0720	0.1058	0.1584
0.0770	0.0840	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0002)	2.260	0.380	2.75	65.26
OUTFLOW: ID= 1 (0007)	2.260	0.079	3.42	65.22

PEAK FLOW REDUCTION [Qout/Qin](%)= 20.71
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.0877

RESERVOIR(0022)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.5300	0.0100
0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.5300	0.0100
0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0023)	5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0023)	5.840	0.002	0.17	20.53

INFLOW : ID= 2 (0010) 5.210 0.002 0.08 23.02
OUTFLOW: ID= 1 (0023) 5.210 0.002 0.17 23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

V V I SSSSS U U A L (v 6.2.2022)
V V I SS U U A A L
V V I SS U U A A A L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL

000 TTTTT TTTTT H H Y Y M M 000 TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
000 T T H H Y M M 000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\649
Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\649

DATE: 10-16-2025 TIME: 09:08:45

USER:

COMMENTS: _____

** SIMULATION : 6 - 100 Year 12 Hour AES (Bloor) **

READ STORM
Ptotal= 88.54 mm
Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\9962e5f2
Comments: 100 Year 12 Hour AES (Bloor, TRCA)

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.00	3.25	15.05	6.50	6.20	9.75	0.89
0.25	0.89	3.50	15.05	6.75	6.20	10.00	0.89
0.50	0.89	3.75	15.05	7.00	6.20	10.25	0.89
0.75	0.89	4.00	15.05	7.25	3.54	10.50	0.89
1.00	0.89	4.25	40.71	7.50	3.54	10.75	0.89
1.25	0.89	4.50	40.71	7.75	3.54	11.00	0.89
1.50	0.89	4.75	40.71	8.00	3.54	11.25	0.89
1.75	0.89	5.00	40.71	8.25	1.77	11.50	0.89
2.00	0.89	5.25	11.51	8.50	1.77	11.75	0.89
2.25	5.31	5.50	11.51	8.75	1.77	12.00	0.89
2.50	5.31	5.75	11.51	9.00	1.77		
2.75	5.31	6.00	11.51	9.25	0.89		
3.00	5.31	6.25	6.20	9.50	0.89		

CALIB
STANDHYD (0001)
ID= 1 DT= 5.0 min
Area (ha)= 19.74
Total Imp(%)= 74.00 Dir. Conn.(%)= 74.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 14.61 5.13
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00

Length (m)= 362.77 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 10.00 20.00
Storage Coeff. (min)= 7.93 (ii) 18.97 (ii)
Unit Hyd. Tpeak (min)= 10.00 20.00
Unit Hyd. peak (cms)= 0.13 0.06

TOTALS

PEAK FLOW (cms)= 1.65 0.41 2.059 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 87.54 57.45 79.72
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.99 0.65 0.90

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT= 5.0 min
Area (ha)= 5.84
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 5.84 0.00
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 1.00
Length (m)= 197.32 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----
TIME RAIN | TIME RAIN | TIME RAIN | TIME RAIN

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 NaN
over (min) 5.00 10.00
Storage Coeff. (min)= 5.50 (ii) 5.50 (ii)
Unit Hyd. Tpeak (min)= 5.00 10.00
Unit Hyd. peak (cms)= 0.20 0.18

TOTALS

PEAK FLOW (cms)= 0.66 0.00 0.000 (iii)
TIME TO PEAK (hrs)= 5.25 0.00 0.00
RUNOFF VOLUME (mm)= 87.54 NaN NaN
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.99 NaN NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0009)	OVERFLOW IS ON				
IN= 2---> OUT= 1					
DT= 5.0 min					
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	0.0020	0.0590	
	0.0020	0.0010	0.0000	0.0000	
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
INFLOW : ID= 2 (0004)	5.840	0.000	0.00	NaN	
OUTFLOW: ID= 1 (0009)	5.840	0.002	0.08	20.54	
OVERFLOW:ID= 3 (0003)	0.000	0.000	0.00	0.00	

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.

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-----
| ADD HYD ( 0020) |
| 1 + 2 = 3 |
-----
          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
      ID1= 1 ( 0001): 19.74 2.059 5.25 79.72
      + ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
      =====
      ID = 3 ( 0020): 19.74 2.059 5.25 79.72

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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-----
| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
-----
          OVERFLOW IS OFF

          OUTFLOW      STORAGE      OUTFLOW      STORAGE
          (cms)      (ha.m.)      (cms)      (ha.m.)
          0.0000      0.0000      0.0270      2.6907
          0.0000      0.5126      0.0270      3.6151
          0.0150      1.1290      0.5890      4.2144

          AREA      QPEAK      TPEAK      R.V.
          (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0020) 19.740 2.059 5.25 79.72
OUTFLOW: ID= 1 ( 0006) 19.740 0.018 12.50 39.16

          PEAK FLOW REDUCTION [Qout/Qin](%)= 0.88
          TIME SHIFT OF PEAK FLOW (min)=435.00
          MAXIMUM STORAGE USED (ha.m.)= 1.5268

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-----
| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
-----
          Area (ha)= 6.82
          Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

          IMPERVIOUS      PERVIOUS (i)
          Surface Area (ha)= 5.12 1.71
          Dep. Storage (mm)= 1.00 1.50
          Average slope (%)= 1.00 2.00
          Length (m)= 213.23 40.00
          Mannings n = 0.013 0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
      TIME RAIN      TIME RAIN      TIME RAIN      TIME RAIN
      hrs mm/hr      hrs mm/hr      hrs mm/hr      hrs mm/hr
0.083 0.00 3.167 5.31 6.250 11.51 9.33 0.89
0.167 0.00 3.250 5.31 6.333 6.20 9.42 0.89
0.250 0.00 3.333 15.05 6.417 6.20 9.50 0.89
0.333 0.89 3.417 15.05 6.500 6.20 9.58 0.89
0.417 0.89 3.500 15.05 6.583 6.20 9.67 0.89
0.500 0.89 3.583 15.05 6.667 6.20 9.75 0.89
0.583 0.89 3.667 15.05 6.750 6.20 9.83 0.89
0.667 0.89 3.750 15.05 6.833 6.20 9.92 0.89
0.750 0.89 3.833 15.05 6.917 6.20 10.00 0.89
0.833 0.89 3.917 15.05 7.000 6.20 10.08 0.89
0.917 0.89 4.000 15.05 7.083 6.20 10.17 0.89
1.000 0.89 4.083 15.05 7.167 6.20 10.25 0.89
1.083 0.89 4.167 15.05 7.250 6.20 10.33 0.89
1.167 0.89 4.250 15.05 7.333 3.54 10.42 0.89
1.250 0.89 4.333 40.71 7.417 3.54 10.50 0.89
1.333 0.89 4.417 40.71 7.500 3.54 10.58 0.89
1.417 0.89 4.500 40.71 7.583 3.54 10.67 0.89
1.500 0.89 4.583 40.71 7.667 3.54 10.75 0.89
1.583 0.89 4.667 40.71 7.750 3.54 10.83 0.89
1.667 0.89 4.750 40.71 7.833 3.54 10.92 0.89
1.750 0.89 4.833 40.71 7.917 3.54 11.00 0.89
1.833 0.89 4.917 40.71 8.000 3.54 11.08 0.89
1.917 0.89 5.000 40.71 8.083 3.54 11.17 0.89
2.000 0.89 5.083 40.71 8.167 3.54 11.25 0.89
2.083 0.89 5.167 40.71 8.250 3.54 11.33 0.89
2.167 0.89 5.250 40.71 8.333 1.77 11.42 0.89
2.250 0.89 5.333 11.51 8.417 1.77 11.50 0.89
2.333 5.31 5.417 11.51 8.500 1.77 11.58 0.89
2.417 5.31 5.500 11.51 8.583 1.77 11.67 0.89
2.500 5.31 5.583 11.51 8.667 1.77 11.75 0.89
2.583 5.31 5.667 11.51 8.750 1.77 11.83 0.89

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2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 5.76 (ii) 16.80 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.20 0.06

TOTALS

PEAK FLOW (cms)= 0.58 0.14 0.717 (iii)
TIME TO PEAK (hrs)= 5.25 5.25 5.25
RUNOFF VOLUME (mm)= 87.54 57.45 80.02
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.99 0.65 0.90

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0005)
ID= 1 DT= 5.0 min
Area (ha)= 5.21
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	5.21	0.00
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	1.00
Length	(m)=	186.37	40.00
Mannings n	=	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 NaN

over (min)	5.00	10.00	
Storage Coeff. (min)=	5.32 (ii)	5.32 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.21	0.18	
			TOTALS
PEAK FLOW (cms)=	0.59	0.00	0.000 (iii)
TIME TO PEAK (hrs)=	5.25	0.00	0.00
RUNOFF VOLUME (mm)=	87.54	NaN	NaN
TOTAL RAINFALL (mm)=	88.54	88.54	88.54
RUNOFF COEFFICIENT =	0.99	NaN	NaN

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)	OVERFLOW IS ON			
IN= 2---> OUT= 1				
DT= 5.0 min				
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0020	0.0520
	0.0020	0.0010	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0005)	5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)	5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0021)				
1 + 2 = 3				
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003				
ID1= 1 (0010):	0.00	0.000	0.00	0.00
+ ID2= 2 (0003):	6.82	0.717	5.25	80.02
ID = 3 (0021):	6.82	0.717	5.25	80.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min				
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0517	0.3200
	0.0183	0.0400	0.0549	0.3600
	0.0259	0.0800	0.0579	0.4000
	0.0317	0.1200	0.0607	0.4400
	0.0366	0.1600	0.0634	0.4800
	0.0409	0.2000	0.0660	0.5200
	0.0448	0.2400	0.0685	0.5600
	0.0484	0.2800	0.0709	0.6000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0021)	6.820	0.717	5.25	80.02
OUTFLOW: ID= 1 (0008)	6.820	0.060	8.25	80.02

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.32
TIME SHIFT OF PEAK FLOW (min)=180.00
MAXIMUM STORAGE USED (ha.m.)= 0.4255

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-----
| CALIB          |
| STANDHYD ( 0002) |
| ID= 1 DT= 5.0 min |
|-----

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Area (ha)= 2.26
Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.72	0.54
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	122.75	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

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----- TRANSFORMED HYETOGRAPH -----

```

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	3.167	5.31	6.250	11.51	9.33	0.89
0.167	0.00	3.250	5.31	6.333	6.20	9.42	0.89
0.250	0.00	3.333	15.05	6.417	6.20	9.50	0.89
0.333	0.89	3.417	15.05	6.500	6.20	9.58	0.89
0.417	0.89	3.500	15.05	6.583	6.20	9.67	0.89
0.500	0.89	3.583	15.05	6.667	6.20	9.75	0.89
0.583	0.89	3.667	15.05	6.750	6.20	9.83	0.89
0.667	0.89	3.750	15.05	6.833	6.20	9.92	0.89
0.750	0.89	3.833	15.05	6.917	6.20	10.00	0.89
0.833	0.89	3.917	15.05	7.000	6.20	10.08	0.89
0.917	0.89	4.000	15.05	7.083	6.20	10.17	0.89
1.000	0.89	4.083	15.05	7.167	6.20	10.25	0.89
1.083	0.89	4.167	15.05	7.250	6.20	10.33	0.89
1.167	0.89	4.250	15.05	7.333	3.54	10.42	0.89
1.250	0.89	4.333	40.71	7.417	3.54	10.50	0.89
1.333	0.89	4.417	40.71	7.500	3.54	10.58	0.89
1.417	0.89	4.500	40.71	7.583	3.54	10.67	0.89
1.500	0.89	4.583	40.71	7.667	3.54	10.75	0.89
1.583	0.89	4.667	40.71	7.750	3.54	10.83	0.89
1.667	0.89	4.750	40.71	7.833	3.54	10.92	0.89
1.750	0.89	4.833	40.71	7.917	3.54	11.00	0.89
1.833	0.89	4.917	40.71	8.000	3.54	11.08	0.89
1.917	0.89	5.000	40.71	8.083	3.54	11.17	0.89
2.000	0.89	5.083	40.71	8.167	3.54	11.25	0.89
2.083	0.89	5.167	40.71	8.250	3.54	11.33	0.89
2.167	0.89	5.250	40.71	8.333	1.77	11.42	0.89
2.250	0.89	5.333	11.51	8.417	1.77	11.50	0.89
2.333	5.31	5.417	11.51	8.500	1.77	11.58	0.89
2.417	5.31	5.500	11.51	8.583	1.77	11.67	0.89
2.500	5.31	5.583	11.51	8.667	1.77	11.75	0.89
2.583	5.31	5.667	11.51	8.750	1.77	11.83	0.89
2.667	5.31	5.750	11.51	8.833	1.77	11.92	0.89
2.750	5.31	5.833	11.51	8.917	1.77	12.00	0.89
2.833	5.31	5.917	11.51	9.000	1.77	12.08	0.89
2.917	5.31	6.000	11.51	9.083	1.77	12.17	0.89
3.000	5.31	6.083	11.51	9.167	1.77	12.25	0.89
3.083	5.31	6.167	11.51	9.250	1.77		

Max.Eff.Inten.(mm/hr)= 40.71 32.69
over (min) 5.00 20.00
Storage Coeff. (min)= 4.14 (ii) 15.18 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.24 0.07

TOTALS
PEAK FLOW (cms)= 0.19 0.04 0.239 (iii)
TIME TO PEAK (hrs)= 5.17 5.25 5.25
RUNOFF VOLUME (mm)= 87.54 57.45 80.32
TOTAL RAINFALL (mm)= 88.54 88.54 88.54
RUNOFF COEFFICIENT = 0.99 0.65 0.91

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0007) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
|-----

```

OVERFLOW IS OFF

OUTFLOW	STORAGE	OUTFLOW	STORAGE
(cms)	(ha.m.)	(cms)	(ha.m.)
0.0000	0.0000	0.0823	0.0960
0.0291	0.0120	0.0873	0.1080

0.0412	0.0240	0.0921	0.1200
0.0504	0.0360	0.0965	0.1320
0.0582	0.0480	0.1008	0.1440
0.0651	0.0600	0.1050	0.1560
0.0713	0.0720	0.1058	0.1584
0.0770	0.0840	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0002)	2.260	0.239	5.25	80.32
OUTFLOW: ID= 1 (0007)	2.260	0.077	5.75	80.27

PEAK FLOW REDUCTION [Qout/Qin](%)= 32.36
 TIME SHIFT OF PEAK FLOW (min)= 30.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0848

```

RESERVOIR( 0022)
IN= 2---> OUT= 1
DT= 5.0 min
  
```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.5300	0.0100
0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

RESERVOIR( 0023)
IN= 2---> OUT= 1
DT= 5.0 min
  
```

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.5300	0.0100
0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW: ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

V V I SSSSS U U A L (v 6.2.2022)
V V I SS U U A A L
V V I SS U U AAAAA L
V V I SS U U A A L
VV I SSSSS UUUUU A A LLLLL
  
```

```

OOO TTTT TTTT H H Y Y M M OOO TM
O O T T H H Y Y MM MM O O
O O T T H H Y M M O O
OOO T T H H Y M M OOO
  
```

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\visual OTTHYMO 6.2\VO2\voin.dat
 Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\222
 Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\222

USER:

COMMENTS: _____

** SIMULATION : 6 - 100 Year 6 Hour AES (Bloo **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData
	Local\Temp\
	744288f0-56d2-411c-a96e-a823a5116deb\46697090
Ptotal= 80.31 mm	Comments: 100 Year 6 Hour AES (Bloor, TRCA)

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.00	1.75	27.30	3.50	11.24	5.25	1.61
0.25	1.61	2.00	27.30	3.75	6.42	5.50	1.61
0.50	1.61	2.25	73.88	4.00	6.42	5.75	1.61
0.75	1.61	2.50	73.88	4.25	3.21	6.00	1.61
1.00	1.61	2.75	20.88	4.50	3.21		
1.25	9.64	3.00	20.88	4.75	1.61		
1.50	9.64	3.25	11.24	5.00	1.61		

CALIB	Area (ha)= 19.74
STANDHYD (0001)	Total Imp(%)= 74.00 Dir. Conn.(%)= 74.00
ID= 1 DT= 5.0 min	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	1.667	9.64	3.250	20.88	4.83	1.61
0.167	0.00	1.750	9.64	3.333	11.24	4.92	1.61
0.250	0.00	1.833	27.30	3.417	11.24	5.00	1.61
0.333	1.61	1.917	27.30	3.500	11.24	5.08	1.61
0.417	1.61	2.000	27.30	3.583	11.24	5.17	1.61
0.500	1.61	2.083	27.30	3.667	11.24	5.25	1.61
0.583	1.61	2.167	27.30	3.750	11.24	5.33	1.61
0.667	1.61	2.250	27.30	3.833	6.42	5.42	1.61
0.750	1.61	2.333	73.88	3.917	6.42	5.50	1.61
0.833	1.61	2.417	73.88	4.000	6.42	5.58	1.61
0.917	1.61	2.500	73.88	4.083	6.42	5.67	1.61
1.000	1.61	2.583	73.88	4.167	6.42	5.75	1.61
1.083	1.61	2.667	73.88	4.250	6.42	5.83	1.61
1.167	1.61	2.750	73.88	4.333	3.21	5.92	1.61
1.250	1.61	2.833	20.88	4.417	3.21	6.00	1.61
1.333	9.64	2.917	20.88	4.500	3.21	6.08	1.61
1.417	9.64	3.000	20.88	4.583	3.21	6.17	1.61
1.500	9.64	3.083	20.88	4.667	3.21	6.25	1.61
1.583	9.64	3.167	20.88	4.750	3.21		

Max.Eff.Inten.(mm/hr)=	73.88	57.08
over (min)	5.00	20.00
Storage Coeff. (min)=	6.25 (ii)	15.08 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.19	0.07
PEAK FLOW (cms)=	2.98	0.60
TIME TO PEAK (hrs)=	2.75	2.75
RUNOFF VOLUME (mm)=	79.31	50.24
TOTAL RAINFALL (mm)=	80.31	80.31
RUNOFF COEFFICIENT =	0.99	0.63
TOTALS		
		3.544 (iii)

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| STANDHYD ( 0004) |
| ID= 1 DT= 5.0 min |
-----

```

Area (ha)= 5.84
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.84	0.00
Dep. Storage (mm)=	1.00	1.50
Average slope (%)=	1.00	1.00
Length (m)=	197.32	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----

```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	9.64	3.250	20.88	4.83	1.61
0.167	0.00	1.750	9.64	3.333	11.24	4.92	1.61
0.250	0.00	1.833	27.30	3.417	11.24	5.00	1.61
0.333	1.61	1.917	27.30	3.500	11.24	5.08	1.61
0.417	1.61	2.000	27.30	3.583	11.24	5.17	1.61
0.500	1.61	2.083	27.30	3.667	11.24	5.25	1.61
0.583	1.61	2.167	27.30	3.750	11.24	5.33	1.61
0.667	1.61	2.250	27.30	3.833	6.42	5.42	1.61
0.750	1.61	2.333	73.88	3.917	6.42	5.50	1.61
0.833	1.61	2.417	73.88	4.000	6.42	5.58	1.61
0.917	1.61	2.500	73.88	4.083	6.42	5.67	1.61
1.000	1.61	2.583	73.88	4.167	6.42	5.75	1.61
1.083	1.61	2.667	73.88	4.250	6.42	5.83	1.61
1.167	1.61	2.750	73.88	4.333	3.21	5.92	1.61
1.250	1.61	2.833	20.88	4.417	3.21	6.00	1.61
1.333	9.64	2.917	20.88	4.500	3.21	6.08	1.61
1.417	9.64	3.000	20.88	4.583	3.21	6.17	1.61
1.500	9.64	3.083	20.88	4.667	3.21	6.25	1.61
1.583	9.64	3.167	20.88	4.750	3.21		

Max.Eff.Inten.(mm/hr)=	73.88	NaN
over (min)	5.00	5.00
Storage Coeff. (min)=	4.34 (ii)	4.34 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.23	0.26

			TOTALS
PEAK FLOW (cms)=	1.20	0.00	0.000 (iii)
TIME TO PEAK (hrs)=	2.75	0.00	0.00
RUNOFF VOLUME (mm)=	79.31	NaN	NaN
TOTAL RAINFALL (mm)=	80.31	80.31	80.31
RUNOFF COEFFICIENT =	0.99	NaN	NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0009) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----

```

OVERFLOW IS ON

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0020	0.0590
0.0020	0.0010	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0004)	5.840	0.000	0.00	NaN
OUTFLOW: ID= 1 (0009)	5.840	0.002	0.08	20.54
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

| ADD HYD ( 0020) |
| 1 + 2 = 3 |
|-----|
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.
*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
  ID1= 1 ( 0001): 19.74 3.544 2.75 71.75
+ ID2= 2 ( 0009): 0.00 0.000 0.00 0.00
=====
  ID = 3 ( 0020): 19.74 3.544 2.75 71.75

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

| RESERVOIR( 0006) |
| IN= 2---> OUT= 1 |
| DT= 5.0 min |
|-----|
OVERFLOW IS OFF

OUTFLOW STORAGE | OUTFLOW STORAGE
(cms) (ha.m.) | (cms) (ha.m.)
0.0000 0.0000 | 0.0270 2.6907
0.0000 0.5126 | 0.0270 3.6151
0.0150 1.1290 | 0.5890 4.2144

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 ( 0020) 19.740 3.544 2.75 71.75
OUTFLOW: ID= 1 ( 0006) 19.740 0.017 6.50 34.28

```

PEAK FLOW REDUCTION [Qout/Qin](%)= 0.48
 TIME SHIFT OF PEAK FLOW (min)=225.00
 MAXIMUM STORAGE USED (ha.m.)= 1.3935

```

| CALIB |
| STANDHYD ( 0003) |
| ID= 1 DT= 5.0 min |
|-----|
Area (ha)= 6.82
Total Imp(%)= 75.00 Dir. Conn.(%)= 75.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 5.12 1.71
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 213.23 40.00
Mannings n = 0.013 0.250

```

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

```

----- TRANSFORMED HYETOGRAPH -----
TIME RAIN TIME RAIN TIME RAIN TIME RAIN
hrs mm/hr hrs mm/hr hrs mm/hr hrs mm/hr
0.083 0.00 1.667 9.64 3.250 20.88 4.83 1.61
0.167 0.00 1.750 9.64 3.333 11.24 4.92 1.61
0.250 0.00 1.833 27.30 3.417 11.24 5.00 1.61
0.333 1.61 1.917 27.30 3.500 11.24 5.08 1.61
0.417 1.61 2.000 27.30 3.583 11.24 5.17 1.61
0.500 1.61 2.083 27.30 3.667 11.24 5.25 1.61
0.583 1.61 2.167 27.30 3.750 11.24 5.33 1.61
0.667 1.61 2.250 27.30 3.833 6.42 5.42 1.61
0.750 1.61 2.333 73.88 3.917 6.42 5.50 1.61
0.833 1.61 2.417 73.88 4.000 6.42 5.58 1.61
0.917 1.61 2.500 73.88 4.083 6.42 5.67 1.61
1.000 1.61 2.583 73.88 4.167 6.42 5.75 1.61
1.083 1.61 2.667 73.88 4.250 6.42 5.83 1.61
1.167 1.61 2.750 73.88 4.333 3.21 5.92 1.61
1.250 1.61 2.833 20.88 4.417 3.21 6.00 1.61
1.333 9.64 2.917 20.88 4.500 3.21 6.08 1.61
1.417 9.64 3.000 20.88 4.583 3.21 6.17 1.61
1.500 9.64 3.083 20.88 4.667 3.21 6.25 1.61
1.583 9.64 3.167 20.88 4.750 3.21

Max.Eff.Inten.(mm/hr)= 73.88 57.08
over (min) 5.00 15.00
Storage Coeff. (min)= 4.54 (ii) 13.37 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00

```

Unit Hyd. peak (cms)=	0.23	0.08	
			TOTALS
PEAK FLOW (cms)=	1.05	0.21	1.259 (iii)
TIME TO PEAK (hrs)=	2.75	2.83	2.75
RUNOFF VOLUME (mm)=	79.31	50.24	72.04
TOTAL RAINFALL (mm)=	80.31	80.31	80.31
RUNOFF COEFFICIENT =	0.99	0.63	0.90

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area (ha)= 5.21 Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00
--	---	-----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	186.37	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.00	1.667	9.64	3.250	20.88	4.83	1.61
0.167	0.00	1.750	9.64	3.333	11.24	4.92	1.61
0.250	0.00	1.833	27.30	3.417	11.24	5.00	1.61
0.333	1.61	1.917	27.30	3.500	11.24	5.08	1.61
0.417	1.61	2.000	27.30	3.583	11.24	5.17	1.61
0.500	1.61	2.083	27.30	3.667	11.24	5.25	1.61
0.583	1.61	2.167	27.30	3.750	11.24	5.33	1.61
0.667	1.61	2.250	27.30	3.833	6.42	5.42	1.61
0.750	1.61	2.333	73.88	3.917	6.42	5.50	1.61
0.833	1.61	2.417	73.88	4.000	6.42	5.58	1.61
0.917	1.61	2.500	73.88	4.083	6.42	5.67	1.61
1.000	1.61	2.583	73.88	4.167	6.42	5.75	1.61
1.083	1.61	2.667	73.88	4.250	6.42	5.83	1.61
1.167	1.61	2.750	73.88	4.333	3.21	5.92	1.61
1.250	1.61	2.833	20.88	4.417	3.21	6.00	1.61
1.333	9.64	2.917	20.88	4.500	3.21	6.08	1.61
1.417	9.64	3.000	20.88	4.583	3.21	6.17	1.61
1.500	9.64	3.083	20.88	4.667	3.21	6.25	1.61
1.583	9.64	3.167	20.88	4.750	3.21		

Max.Eff.Inten.(mm/hr)=	73.88	NaN	
over (min)	5.00	5.00	
Storage Coeff. (min)=	4.19 (ii)	4.19 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.24	0.26	
			TOTALS
PEAK FLOW (cms)=	1.07	0.00	0.000 (iii)
TIME TO PEAK (hrs)=	2.75	0.00	0.00
RUNOFF VOLUME (mm)=	79.31	NaN	NaN
TOTAL RAINFALL (mm)=	80.31	80.31	80.31
RUNOFF COEFFICIENT =	0.99	NaN	NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010) IN= 2---> OUT= 1 DT= 5.0 min	OVERFLOW IS ON	
	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000
	0.0020	0.0010
	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0020	0.0520
	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0005)	5.210	0.000	0.00	NaN
OUTFLOW: ID= 1 (0010)	5.210	0.002	0.08	23.02
OVERFLOW: ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
 CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
 PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
 TIME SHIFT OF PEAK FLOW (min)= 5.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0000
 MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0021)
 1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.				
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003				
ID1= 1 (0010):	0.00	0.000	0.00	0.00
+ ID2= 2 (0003):	6.82	1.259	2.75	72.04
=====				
ID = 3 (0021):	6.82	1.259	2.75	72.04

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0008)
 IN= 2---> OUT= 1
 DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0517	0.3200
0.0183	0.0400	0.0549	0.3600
0.0259	0.0800	0.0579	0.4000
0.0317	0.1200	0.0607	0.4400
0.0366	0.1600	0.0634	0.4800
0.0409	0.2000	0.0660	0.5200
0.0448	0.2400	0.0685	0.5600
0.0484	0.2800	0.0709	0.6000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0021)	6.820	1.259	2.75	72.04
OUTFLOW: ID= 1 (0008)	6.820	0.059	4.75	72.04

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.71
 TIME SHIFT OF PEAK FLOW (min)=120.00
 MAXIMUM STORAGE USED (ha.m.)= 0.4203

CALIB
 STANDHYD (0002)
 ID= 1 DT= 5.0 min

Area (ha)= 2.26
 Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.72	0.54
Dep. Storage (mm)=	1.00	1.50
Average slope (%)=	1.00	2.00
Length (m)=	122.75	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.00	1.667	9.64	3.250	20.88	4.83	1.61
0.167	0.00	1.750	9.64	3.333	11.24	4.92	1.61
0.250	0.00	1.833	27.30	3.417	11.24	5.00	1.61
0.333	1.61	1.917	27.30	3.500	11.24	5.08	1.61
0.417	1.61	2.000	27.30	3.583	11.24	5.17	1.61
0.500	1.61	2.083	27.30	3.667	11.24	5.25	1.61
0.583	1.61	2.167	27.30	3.750	11.24	5.33	1.61
0.667	1.61	2.250	27.30	3.833	6.42	5.42	1.61
0.750	1.61	2.333	73.88	3.917	6.42	5.50	1.61

0.833	1.61	2.417	73.88	4.000	6.42	5.58	1.61
0.917	1.61	2.500	73.88	4.083	6.42	5.67	1.61
1.000	1.61	2.583	73.88	4.167	6.42	5.75	1.61
1.083	1.61	2.667	73.88	4.250	6.42	5.83	1.61
1.167	1.61	2.750	73.88	4.333	3.21	5.92	1.61
1.250	1.61	2.833	20.88	4.417	3.21	6.00	1.61
1.333	9.64	2.917	20.88	4.500	3.21	6.08	1.61
1.417	9.64	3.000	20.88	4.583	3.21	6.17	1.61
1.500	9.64	3.083	20.88	4.667	3.21	6.25	1.61
1.583	9.64	3.167	20.88	4.750	3.21		

Max.Eff.Inten.(mm/hr)= 73.88 57.08
over (min) 5.00 15.00
Storage Coeff. (min)= 3.26 (ii) 12.09 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.27 0.09

TOTALS

PEAK FLOW (cms)= 0.35 0.07 0.421 (iii)
TIME TO PEAK (hrs)= 2.75 2.83 2.75
RUNOFF VOLUME (mm)= 79.31 50.24 72.33
TOTAL RAINFALL (mm)= 80.31 80.31 80.31
RUNOFF COEFFICIENT = 0.99 0.63 0.90

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0007)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	0.0823	0.0960
		0.0291	0.0120	0.0873	0.1080
		0.0412	0.0240	0.0921	0.1200
		0.0504	0.0360	0.0965	0.1320
		0.0582	0.0480	0.1008	0.1440
		0.0651	0.0600	0.1050	0.1560
		0.0713	0.0720	0.1058	0.1584
		0.0770	0.0840	0.0000	0.0000
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0002)		2.260	0.421	2.75	72.33
OUTFLOW: ID= 1 (0007)		2.260	0.083	3.42	72.29
		PEAK FLOW REDUCTION [Qout/Qin](%)= 19.81			
		TIME SHIFT OF PEAK FLOW (min)= 40.00			
		MAXIMUM STORAGE USED (ha.m.)= 0.0988			

RESERVOIR(0022)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	1.5300	0.0100
		0.5000	0.0050	1.5400	3.0000
		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)		5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)		5.840	0.002	0.17	20.53
		PEAK FLOW REDUCTION [Qout/Qin](%)=108.00			
		TIME SHIFT OF PEAK FLOW (min)= 5.00			
		MAXIMUM STORAGE USED (ha.m.)= 0.0000			
		MAXIMUM STORAGE USED (cu.m.)= 0.255783			

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)		OVERFLOW IS OFF			
IN= 2---> OUT= 1					
DT= 5.0 min					
		OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
		0.0000	0.0000	1.5300	0.0100
		0.5000	0.0050	1.5400	3.0000

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW :	ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW:	ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW	REDUCTION	[Qout/Qin] (%)=108.00
TIME SHIFT OF PEAK FLOW		(min)= 5.00
MAXIMUM STORAGE USED		(ha.m.)= 0.0000
MAXIMUM STORAGE USED		(cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

V   V   I   SSSSS U   U   A   L           (v 6.2.2022)
V   V   I   SS   U   U   A A   L
V   V   I   SS   U   U   AAAAA L
V   V   I   SS   U   U   A   A   L
VV      I   SSSSS UUUUU A   A   LLLLL

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000   TTTTT TTTTT H   H   Y   Y   M   M   000   TM
O   O   T   T   H   H   Y   Y   MM  MM  O   O
O   O   T   T   H   H   Y   M   M   O   O
000   T   T   H   H   Y   M   M   000

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\vo2\voin.dat
Output filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\c8b
Summary filename: C:\Users\MichaelBasciano\AppData\Local\Civica\XH5\607eef9b-75da-4975-ac97-f2ad024480a2\c8b

DATE: 10-16-2025 TIME: 09:08:46

USER:

COMMENTS: _____

** SIMULATION : Hazel **

READ STORM	Filename: C:\Users\MichaelBasciano\AppData\Local\Temp\744288f0-56d2-411c-a96e-a823a5116deb\d924e210
Ptotal=212.00 mm	Comments: Hazel

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	6.00	3.00	13.00	6.00	23.00	9.00	53.00
1.00	4.00	4.00	17.00	7.00	13.00	10.00	38.00
2.00	6.00	5.00	13.00	8.00	13.00	11.00	13.00

CALIB	Area (ha)= 19.74
STANDHYD (0001)	Total Imp(%)= 74.00
ID= 1 DT= 5.0 min	Dir. Conn.(%)= 74.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	14.61	5.13
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	362.77	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 20.00
Storage Coeff. (min)= 7.14 (ii) 16.42 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.17 0.06

TOTALS

PEAK FLOW (cms)= 2.15 0.69 2.835 (iii)
TIME TO PEAK (hrs)= 10.00 10.00 10.00
RUNOFF VOLUME (mm)= 211.00 173.55 201.26
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 1.00 0.82 0.95

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB
STANDHYD (0004)
ID= 1 DT= 5.0 min
Area (ha)= 5.84
Total Imp(%)= 100.00 Dir. Conn.(%)= 100.00

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 5.84 0.00
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 1.00
Length (m)= 197.32 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00

0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 NaN
over (min) 5.00 5.00
Storage Coeff. (min)= 4.95 (ii) 4.95 (ii)
Unit Hyd. Tpeak (min)= 5.00 5.00
Unit Hyd. peak (cms)= 0.22 0.25

TOTALS

PEAK FLOW (cms)= 0.86 0.00 0.000 (iii)
TIME TO PEAK (hrs)= 10.00 0.00 0.00
RUNOFF VOLUME (mm)= 211.00 NaN NaN
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 1.00 NaN NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0009) IN= 2---> OUT= 1 DT= 5.0 min	OVERFLOW IS ON			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0020	0.0590
	0.0020	0.0010	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0004)	5.840	0.000	0.00	NaN
OUTFLOW: ID= 1 (0009)	5.840	0.002	0.08	20.54
OVERFLOW:ID= 3 (0003)	0.000	0.000	0.00	0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

ADD HYD (0020) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
*** W A R N I N G : HYDROGRAPH 0009 <ID= 2> IS DRY.				

*** W A R N I N G : HYDROGRAPH 0003 = HYDROGRAPH 0001
 ID1= 1 (0001): 19.74 2.835 10.00 201.26
 + ID2= 2 (0009): 0.00 0.000 0.00 0.00
 =====
 ID = 3 (0020): 19.74 2.835 10.00 201.26

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0006)		OVERFLOW IS OFF			
IN= 2---> OUT= 1		OUTFLOW		STORAGE	
DT= 5.0 min		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0270	2.6907
		0.0000	0.5126	0.0270	3.6151
		0.0150	1.1290	0.5890	4.2144

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0020)	19.740	2.835	10.00	201.26
OUTFLOW: ID= 1 (0006)	19.740	0.246	12.25	89.04

PEAK FLOW REDUCTION [Qout/Qin](%)= 8.66
 TIME SHIFT OF PEAK FLOW (min)=135.00
 MAXIMUM STORAGE USED (ha.m.)= 3.8488

CALIB STANDHYD (0003)		Area (ha)= 6.82		Total Imp(%)= 75.00		Dir. Conn.(%)= 75.00	
ID= 1 DT= 5.0 min							
Surface Area	(ha)=	5.12		1.71			
Dep. Storage	(mm)=	1.00		1.50			
Average slope	(%)=	1.00		2.00			
Length	(m)=	213.23		40.00			
Mannings n	=	0.013		0.250			

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.33
over (min)	5.00	15.00

Storage Coeff. (min)=	5.19 (ii)	14.48 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.21	0.08	
			TOTALS
PEAK FLOW (cms)=	0.75	0.23	0.985 (iii)
TIME TO PEAK (hrs)=	10.00	10.00	10.00
RUNOFF VOLUME (mm)=	211.00	173.55	201.64
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.82	0.95

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB STANDHYD (0005) ID= 1 DT= 5.0 min	Area (ha)= 5.21 Total Imp(%)= 100.00	Dir. Conn.(%)= 100.00
--	---	-----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	5.21	0.00
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	1.00
Length (m)=	186.37	40.00
Mannings n =	0.013	0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	NaN	
over (min)	5.00	5.00	
Storage Coeff. (min)=	4.78 (ii)	4.78 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.22	0.25	
			TOTALS
PEAK FLOW (cms)=	0.77	0.00	0.000 (iii)
TIME TO PEAK (hrs)=	10.00	0.00	0.00
RUNOFF VOLUME (mm)=	211.00	NaN	NaN
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	NaN	NaN

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: THE PERVIOUS AREA HAS NO FLOW .

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 85.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR( 0010) | OVERFLOW IS ON
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE    |    OUTFLOW    STORAGE
      (cms)      (ha.m.)    |    (cms)      (ha.m.)
      0.0000      0.0000    |    0.0020      0.0520
      0.0020      0.0010    |    0.0000      0.0000

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0005)  5.210      0.000      0.00      NaN
OUTFLOW: ID= 1 ( 0010)  5.210      0.002      0.08      23.02
OVERFLOW:ID= 3 ( 0003)  0.000      0.000      0.00      0.00

TOTAL NUMBER OF SIMULATION OVERFLOW = 0
CUMULATIVE TIME OF OVERFLOW (HOURS) = 0.00
PERCENTAGE OF TIME OVERFLOWING (%) = 0.00

PEAK FLOW REDUCTION [Qout/Qin](%)= Inf
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.000000
  
```

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
 CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

```

-----
| ADD HYD ( 0021) |
| 1 + 2 = 3       |
-----
      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
*** W A R N I N G : HYDROGRAPH 0010 <ID= 1> IS DRY.
*** W A R N I N G : HYDROGRAPH 0021 = HYDROGRAPH 0003
      ID1= 1 ( 0010):  0.00      0.000      0.00      0.00
      + ID2= 2 ( 0003):  6.82      0.985      10.00      201.64
      =====
      ID = 3 ( 0021):  6.82      0.985      10.00      201.64
  
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| RESERVOIR( 0008) | OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT= 5.0 min      |
-----
      OUTFLOW    STORAGE    |    OUTFLOW    STORAGE
      (cms)      (ha.m.)    |    (cms)      (ha.m.)
      0.0000      0.0000    |    0.0517      0.3200
      0.0183      0.0400    |    0.0549      0.3600
      0.0259      0.0800    |    0.0579      0.4000
      0.0317      0.1200    |    0.0607      0.4400
      0.0366      0.1600    |    0.0634      0.4800
      0.0409      0.2000    |    0.0660      0.5200
      0.0448      0.2400    |    0.0685      0.5600
      0.0484      0.2800    |    0.0709      0.6000

      AREA      QPEAK      TPEAK      R.V.
      (ha)      (cms)      (hrs)      (mm)
INFLOW : ID= 2 ( 0021)  6.820      0.985      10.00      201.64
OUTFLOW: ID= 1 ( 0008)  6.820      0.104      12.08      201.63

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.54
TIME SHIFT OF PEAK FLOW (min)=125.00
MAXIMUM STORAGE USED (ha.m.)= 1.1486
  
```

```

-----
| CALIB          |
| STANDHYD ( 0002) |
| ID= 1 DT= 5.0 min |
-----
      Area (ha)= 2.26
      Total Imp(%)= 76.00 Dir. Conn.(%)= 76.00

      IMPERVIOUS      PERVIOUS (i)
      Surface Area (ha)= 1.72      0.54
      Dep. Storage (mm)= 1.00      1.50
      Average Slope (%)= 1.00      2.00
  
```

Length (m)= 122.75 40.00
Mannings n = 0.013 0.250

NOTE: RAINFALL WAS TRANSFORMED TO 5.0 MIN. TIME STEP.

----- TRANSFORMED HYETOGRAPH -----							
TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)= 53.00 50.33
over (min) 5.00 15.00
Storage Coeff. (min)= 3.72 (ii) 13.01 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.25 0.08

TOTALS
PEAK FLOW (cms)= 0.25 0.07 0.327 (iii)
TIME TO PEAK (hrs)= 10.00 10.00 10.00
RUNOFF VOLUME (mm)= 211.00 173.55 202.01
TOTAL RAINFALL (mm)= 212.00 212.00 212.00
RUNOFF COEFFICIENT = 1.00 0.82 0.95

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| RESERVOIR(0007) |
| IN= 2---> OUT= 1 |
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0823	0.0960
0.0291	0.0120	0.0873	0.1080
0.0412	0.0240	0.0921	0.1200
0.0504	0.0360	0.0965	0.1320
0.0582	0.0480	0.1008	0.1440
0.0651	0.0600	0.1050	0.1560
0.0713	0.0720	0.1058	0.1584
0.0770	0.0840	0.0000	0.0000

INFLOW : ID= 2 (0002) AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)
2.260 0.327 10.00 202.01

OUTFLOW: ID= 1 (0007) 2.260 0.121 11.17 201.96

PEAK FLOW REDUCTION [Qout/Qin](%)= 37.04
TIME SHIFT OF PEAK FLOW (min)= 70.00
MAXIMUM STORAGE USED (ha.m.)= 0.2046

RESERVOIR(0022)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.5300	0.0100
0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	5.840	0.002	0.08	20.54
OUTFLOW: ID= 1 (0022)	5.840	0.002	0.17	20.53

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

RESERVOIR(0023)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	1.5300	0.0100
0.5000	0.0050	1.5400	3.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0010)	5.210	0.002	0.08	23.02
OUTFLOW: ID= 1 (0023)	5.210	0.002	0.17	23.02

PEAK FLOW REDUCTION [Qout/Qin](%)=108.00
TIME SHIFT OF PEAK FLOW (min)= 5.00
MAXIMUM STORAGE USED (ha.m.)= 0.0000
MAXIMUM STORAGE USED (cu.m.)= 0.255783

**** WARNING : HYDROGRAPH PEAK WAS NOT REDUCED.
CHECK OUTFLOW/STORAGE TABLE OR REDUCE DT.

FINISH



APPENDIX C:

Supporting Documentation

DESIGN BRIEF

FOR

**STORMWATER MANAGEMENT
POND E3 & POND E4**

IN THE

SOUTH FIELDS COMMUNITY

**MOSCORP 1A AND MOSCORP 2
SUBDIVISIONS**

TOWN OF CALEDON

**PROJECT NO. 07-294
MARCH 2008
REVISED AUGUST 2008
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**DESIGN BRIEF
FOR
SOUTH FIELDS COMMUNITY
POND E3 & POND E4
IN THE
MOSCOP 1A AND MOSCOP 2 SUBDIVISIONS**

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**DESIGN BRIEF
FOR
SOUTH FIELDS COMMUNITY
POND E3 & POND E4
IN THE
MOSCOP 1A AND MOSCOP 2 SUBDIVISIONS
TOWN OF CALEDON**

**MARCH 2008
REVISED AUGUST 2008**

1.0 INTRODUCTION

Stormwater Management Ponds E3 and E4 in the South Fields Community within the Mayfield West Community are located within the Etobicoke Creek Watershed. The drainage areas for Ponds E3 and E4 are generally bound by existing Kennedy Road to the west, and future development to the north, south, and east, as shown in Figure 1.

As set out in the *Functional Servicing and Stormwater Management Report for Moscorp 1A Subdivision in the South Neighbourhood of Mayfield West Community*, two multi-function ponds are required within the subject lands. The ponds are intended to satisfy various stormwater management requirements, including the following:

- **Water Quality Control:** The permanent pool should be sized for enhanced level of protection.
- **Erosion Control:** Volume resulting from a continuous simulation to match the prescribed erosion exceedance threshold.
- **Water Quantity Control:** Control of post-development flows in accordance with Unit Flow Equations (refer to Appendix E).

Ponds E3 and E4 outflows will ultimately discharge treated runoff into the main branch of Etobicoke Creek.

The following design brief is intended to provide technical support for the detailed design of the ponds, as well as to demonstrate conformance with the overall servicing requirements of the *FSR, SWMP Design Manual* and generally accepted stormwater management practice.

2.0 PREVIOUS STUDIES AND REPORTS

2.1 General

The following material has been reviewed in order to identify the constraints, which govern development within the subject site:

- ***Development Phasing Plan for Mayfield West Community, Phase 1: South Neighbourhood in the Town of Caledon***, David Schaeffer Engineering Ltd., Dillon Consulting, and ENTRA Consultants, December 2006.
- ***Comprehensive Environmental Impact Study and Management Plan, Mayfield West Community Plan Area, Town of Caledon***, David Schaeffer Engineering Ltd., Dillon Consulting, Shaheen & Peaker Limited, and Valcoustics Canada Ltd., November 2007.
- ***Town of Caledon Draft Development Standards, Policies and Guidelines***, January 2008
- ***Etobicoke Creek Hydrology Update, Final Draft Study Report***, March 2007, Toronto and Region Conservation Authority
- ***SWM Plan Stormwater Management Planning and Design Manual, March 2003***, Ministry of Environment (SWMP Design Manual)
- ***Functional Servicing and Stormwater Management Report (FSR) for Moscorp 1A Subdivision in the South Neighbourhood of Mayfield West Community***, David Schaeffer Engineering Limited, March 2007, Revised October 2007
- ***Functional Servicing and Stormwater Management Report (FSR) for Moscorp 2 Subdivision in the South Neighbourhood of Mayfield West Community***, David Schaeffer Engineering Limited, October 2007

The above documents form the basis of this report.

3.0 DRAINAGE ANALYSIS

The pond design characteristics and requirements, based on the drainage areas as shown, are summarized in Table 1 as follows:

Table 1: SWM Pond Design Characteristics

Item	Approximated Design Criteria (E3)	Approximated Design Criteria (E4)	Comments
Drainage Area	62.221 ha	88.248 ha	(refer to Appendix F)
% Imperviousness	63.15	71.79	Measured Imperviousness (refer to Appendix F)
Permanent Pool Volume	25 700 m ³	33 916 m ³	Refer to Calculation Sheet B-1 of Appendix B
Extended Detention Volume	2489 m ³	3530 m ³	Refer to Calculation Sheet B-1 of Appendix B
Required Storage Volume for Erosion Control	9277 m ³	14 914 m ³	Based on Continuous Erosion Model. Refer to Calculation Sheet B-2 of Appendix B
Allowable Release Rate – Erosion Control	37 L/s	59 L/s	Based on Continuous Erosion Model. Refer to Calculation Sheet B-2 of Appendix B
Allowable Release Rate – 2 Year 5 Year 10-year 25 Year 50-year 100-year	269 L/s 483 L/s 648 L/s 874 L/s 1055 L/s 1241 L/s	381 L/s 684 L/s 917 L/s 1238 L/s 1493 L/s 1757 L/s	Based on TRCA's Unit Flow Equations (refer to Appendix E)

In order to simulate the runoff from the areas draining to Ponds E3 and E4, a DDSWMM/XPSWMM Model was developed. The model simulates pond inflow hydrographs for the 2- to 100-year events. The hydrographs are routed through the proposed SWM Pond and the flows generated by the model were used to design the various pond components described in Section 6.0. Refer to Appendix A for the DDSWMM/XPSWMM hydrologic and hydraulic modeling data and results (Refer to CD for DDSWMM input and output files). For more details refer to the ***Stormwater Management Plan for the Mayfield West Subdivision, Phases 1A and 2 to Pond E3***, and ***Stormwater Management Plan for the Mayfield West Subdivision, Phase 1A to Pond E4***, prepared by JFSA Inc., dated August 2008.

A SWMHYMO model was also developed to simulate the interim conditions for Pond E3 and the ultimate conditions for Ponds E3 and E4 (Refer to Appendix J).

4.0 SUBDIVISION DRAINAGE

4.1 Conveyance of Minor System Flows

MoscCorp Subdivision will be serviced by a conventional storm sewer system designed in general conformance with “Draft” Town of Caledon standards. The storm sewers will be sized using a 10-year return frequency and Town of Caledon IDF curves.

All storm flows will be directed to one of two stormwater management facilities, Pond E3 and E4, where the runoff will be treated for water quality, erosion, and quantity control.

4.1.1 Pond E3

The 6-hour AES storms have been used with the models to verify that target release rates for all return periods are achieved, and that the storage volumes are adequate. The simulated peak flows, release rates and maximum storage volumes for the 2- to 100-year storms are presented and compared in Table 2A.

Table 2A: XPSWMM Flows and Storage Summary for Pond E3

Storm Event	Pond Inflow (m ³ /s)	Pond Outflow (m ³ /s)	Pond Level (m)	Max Storage Used (m ³)
2yr/6hr AES	3.247	0.136	260.491	12611
5yr/6hr AES	4.771	0.311	260.660	15934
10yr/6hr AES	5.862	0.448	260.806	18856
25yr/6hr AES	7.269	0.663	260.998	22773
50yr/6hr AES	8.340	0.922	261.119	25285
100yr/6hr AES	9.405	1.201	261.229	27596

4.1.2 Pond E4

The 6-hour AES storms have been used with the models to verify that target release rates for all return periods are achieved, and that the storage volumes are adequate. The simulated peak flows, release rates and maximum storage volumes for the 2- to 100-year storms are presented and compared in Table 2B.

Table 2B: XPSWMM Flows and Storage Summary for Pond E4

Storm Event	Pond Inflow MH 35 (m ³ /s)	Pond Inflow MH42 (m ³ /s)	Total Pond Inflow (m ³ /s)	Pond Outflow (m ³ /s)	Pond Level (m)	Max Storage Used (m ³)
2yr/6hr AES	5.374	0.051	5.425	0.220	258.949	18978
5yr/6hr AES	7.908	0.075	7.982	0.554	259.159	24759
10yr/6hr AES	9.734	0.091	9.825	0.791	259.312	29060
25yr/6hr AES	11.910	0.122	12.032	1.063	259.505	34602
50yr/6hr AES	13.525	0.152	13.676	1.387	259.634	38367
100yr/6hr AES	15.100	0.181	15.281	1.746	259.756	41985

4.2 Conveyance of Major System

Major system runoff in excess of the minor system and up to the 100-year event will be conveyed within the road allowances via a continuous overland flow route, ultimately directed to Ponds E3 and E4. The major system flow will not exceed the width of the road allowance, and in no case will the depth of flow exceed 0.30 m above the gutter of the road. Should the major system flow exceed the conveyance capacity of any given road, the storm sewer will be sized to accommodate the flows in excess of the road capacity. For details refer to the ***Stormwater Management Plan for the Mayfield West Subdivision, Phases 1A and 2 to Pond E3***, and ***Stormwater Management Plan for the Mayfield West Subdivision, Phase 1A to Pond E4***, prepared by JFSA Inc., dated May 2008.

4.3 Employment Lands

It should be noted that the subdivision and external contributing areas include lands that are designated for employment uses. These land uses typically produce high runoff due to high imperviousness coverage, which would readily exceed the carrying capacity of the receiving road network. In accordance with standard industry practice, the employment lands will limit their total outflow to the calculated 10-year storm flow, with no major system flow permitted to leave the site. On site detention techniques will be applied to achieve the 10-year release rate as determined by the Rational Method. For more details refer to the ***Stormwater Management Plan for the Mayfield West Subdivision, Phases 1A and 2 to Pond E3***, and ***Stormwater Management Plan for the Mayfield West Subdivision, Phase 1A to Pond E4***, prepared by JFSA Inc., dated May 2008.

4.4 Pond E3 Pipe Network

Based on the combined DDSWMM/XPSWMM models, the maximum 100-year minor system flow to the SWM Pond E3 would be approximately 9.405 m³/s. This flow was simulated with a 6-hour, 100-year AES storm (refer to Table 2A).

4.5 Pond E4 Pipe Network

Based on the combined DDSWMM /XPSWMM models, the maximum 100-year minor and major system flow to the SWM Pond E4 and would be approximately 15.100 m³/s to the east forebay and 0.181 m³/s to the west forebay. These flows were simulated with a 6-hour, 100-year AES storm (refer to Table 2B).

5.0 POND OPERATING CHARACTERISTICS

The stormwater management ponds have been designed in accordance with the requirements of the Town of Caledon and the ***SWMP Design Manual***, and include the following features:

- Sediment Forebay** ➤ to improve sediment removal prior to entering the pond
- Permanent Pool** ➤ to buffer storm flows and trap pollutants
- Extended Detention Storage** ➤ to provide water quality and erosion control
- Quantity Control Storage** ➤ to attenuate post-development flows to the allowable release rates

Details of the sizing of the various pond components will follow in Section 6.0. The grading of the pond and the details are illustrated on Drawings 80 through 85.

The operating characteristics of the pond are defined in the following section, and are summarized below in Tables 3A and 3B, for Ponds E3 and E4, respectively.

Table 3A: Summary of Pond Operating Characteristics for Pond E3

Pond Component	Lower Elevation (m)	Upper Elevation (m)	Allowable Release Rate (m ³ /s)	Provided Release Rate (m ³ /s)	Volume Used (m ³)
Permanent Pool	257.800	259.800	N/A	N/A	25,700
Ext. Det. (Erosion)	259.800	260.318	0.037	0.037	9 277 *
2yr/6hr	259.800	260.491	0.269	0.136	12 611 *
5yr/6hr	260.491	260.660	0.483	0.311	15 934 *
10yr/6hr	260.660	260.806	0.648	0.448	18 856 *
25yr/6hr	260.806	260.998	0.874	0.663	22 773 *
50yr/6hr	260.998	261.119	1.055	0.922	25 285 *
100yr/6hr	261.119	261.229	1.241	1.201	27 596 *

Note: * active storage volume

Table 3B: Summary of Pond Operating Characteristics for Pond E4

Pond Component	Lower Elevation (m)	Upper Elevation (m)	Allowable Release Rate (m ³ /s)	Provided Release Rate (m ³ /s)	Volume Used (m ³)
Permanent Pool	256.200	258.200	N/A	N/A	33,916
Ext. Det.	258.200	258.798	0.059	0.059	14 914 *
2yr/6hr	258.200	258.949	0.381	0.220	18 978 *
5yr/12hr	258.949	259.159	0.684	0.554	24 759 *
10yr/12hr	259.159	259.312	0.917	0.791	29 060 *
25yr/12hr	259.312	259.505	1.238	1.060	34 602 *
50yr/6hr	259.505	259.634	1.493	1.367	38 367 *
100yr/6hr	259.634	259.756	1.757	1.746	41 985 *

Note: * active storage volume

With the proposed controls described in Section 6.0, the above DDSWMM/XPSWMM results show that the actual provided release rates do not exceed the allowable release rates. Also note that the simulated water levels for the Regional Storm (Hurricane Hazel) were 261.893 m for Pond E3 and 260.284 m for Pond E4.

6.0 POND COMPONENTS

6.1 Sediment Forebay

6.1.1 Pond E3

Pond E3 includes a sediment forebay in order to improve the pollutant removal by trapping larger particles near the inlet of the pond. The forebay is designed with a length to width ratio of approximately 2:1 and does not exceed one third of the permanent pool surface area for wet ponds, as required in the **SWMP Design Manual** (refer to Table B-3A in Calculation Sheet B-1 of Appendix B).

The forebay will have a minimum depth of 2.0 metres to minimize the potential for re-suspension. In accordance with Town of Caledon criteria, the forebay has been graded at 4:1. The forebay berm has been set 0.30 metre below the permanent pool water level.

Pond E3 obtains flows through one inlet pipe: a 3.0 m x 1.8 m box pipe having a 0.20% slope to the forebay. The forebay have been sized to meet the greater of the settling and dispersion criteria, as stated in the **SWMP Design Manual**. Calculations for the minimum dispersion length, settling length and the maximum velocity have been included in Appendix B (refer to Calculation Sheet B-3).

6.1.2 Pond E4

The proposed facility has been equipped with two sediment forebays in order to improve the pollutant removal by trapping larger particles near the inlet of the pond. The forebays have been designed with a length to width ratio of approximately 2:1 and do not exceed one third of the permanent pool surface area for wet ponds, as required in the **SWMP Design Manual** (refer to Table B-3A in Calculation Sheet B-1 of Appendix B).

The forebays will have a minimum depth of 3.0 metres to minimize the potential for re-suspension. In accordance with Town of Caledon criteria, the forebays have been graded at 4:1. The forebay berm has been set 0.30 metres below the permanent pool water level.

Pond E4 obtains flows through two inlet pipes: a 3.0 m x 2.4 m box pipe having a 0.50% slope to the eastern forebay and a 675 mm pipe having a 0.20% slope to the western forebay. The forebays have been sized to meet the greater of the settling and dispersion criteria, as stated in the **SWMP Design Manual**. Calculations for the minimum dispersion length, settling length and the maximum velocity have been included in Appendix B (refer to Calculation Sheets B-4 and B-5).

6.2 Permanent Pool

In accordance with the **SWMP Design Manual**, the pond should have an average permanent pool depth between 1.0 and 2.0 metres. The proposed facilities have been designed with a permanent pool depth of 2.0 metres.

6.2.1 Pond E3

The permanent pool for Pond E3 has been sized in accordance with the requirements of the **SWMP Design Manual**, Table 3.2, enhanced protection level for wet pond, 63.15 % imperviousness, as follows (refer to Tables B-1 and B-2 in Calculation Sheet B-1 of Appendix B):

$$(209.02 - 40) \text{ m}^3/\text{ha} \times 62.221 \text{ ha} = 10\,516 \text{ m}^3$$

The proposed facility has a permanent pool volume of 16 358 m³ (refer to Table B-3A in Calculation Sheet B-1 of Appendix B).

6.2.2 Pond E4

The permanent pool for pond E4 has been sized in accordance with the requirements of the **SWMP Design Manual**, Table 3.2, enhanced protection level for wet pond, 71.79 % imperviousness, as follows (refer to Tables B-1 and B-2 in Calculation Sheet B-1 of Appendix B):

$$(227.98 - 40) \text{ m}^3/\text{ha} \times 88.248 \text{ ha} = 16\,589 \text{ m}^3$$

The proposed facility has a permanent pool volume of 21 775 m³ (refer to Table B-3B in Calculation Sheet B-1 of Appendix B).

The slopes in the permanent pool will be graded with side slopes of 4:1 and 7:1, with minor localized variations. As per Town of Caledon design criteria the side slopes adjacent to the maintenance access road have been graded at 4:1 maximum. In accordance with the Town of Caledon criteria, the grading above and below the permanent pool elevation has been graded at 7:1 in order to address public safety concerns. The proposed pond grading for Pond E3 and E4 are shown on Drawings 80 through 85.

6.3 Extended Detention Storage

For water quality control, ponds E3 and E4 are to be sized for enhanced protection in accordance with the ***SWMP Design Manual***.

Erosion Control requires the application of the more restrictive of the detention of:

- the 25-mm storm for a minimum of 48 hours;
- the erosion threshold defined by the Headwaters Study, or;
- the erosion threshold defined by the continuous modeling.

A detailed analysis revealed that the extended detention storage for erosion control was to be based on a continuous erosion model of Etobicoke Creek, the more restrictive of the detention criteria. The result showed that a 25 mm storm should be controlled to 37 L/s and 59 L/s for Pond E3 and E4, respectively, in order to meet the erosion threshold. The 25 mm storm runoff volumes associated with these release rates are 9 277 m³ and 14 914 m³, for Pond E3 and E4 respectively, (refer to Table B-4 in Calculation Sheet B-2 of Appendix B).

The extended detention storage for quality control of 40 m³/ha was based on MOE criterion. For Pond E3, this volume is 2489 m³ and for Pond E4, this volume is 3530 m³ (refer to Table B-2 in Calculation Sheet B-1 of Appendix B).

Note that, for both Pond E3 and E4, the active volume portion for water quality control is contained within the erosion control volume.

For quantity control, the allowable release rates were based on the TRCA's Unit Flow Equations using post-development areas (refer to TRCA's table "**Estimated Unit Flow Rate Regression Relationships**"). Pre-development flows were modeled with SWMHYMO (M25-PRE.dat, M25-PRE.sum) using pre-development conditions to estimate pre-development flows (Appendix E). Table E-1 of Calculation Sheet E-1 and Figure E-2 of Appendix E, demonstrate that the post-development flows using TRCA's unit flow equation are the most critical criterion and were therefore used to design the pond outlets.

6.4 Extended Detention Outlet

The extended detention volumes within the ponds will outlet through reverse graded pipes. Orifices will be provided to discharge the extended detention volume at the allowable release rate for erosion control. The extended detention component has been provided with side slopes of 7:1 in the vicinity of the permanent pool, and 4:1 elsewhere as illustrated in Drawings 80 through 85.

Quantity control will be provided by a combination orifice / notched weir located in the outlet structure. The allowable release rates for the ponds are summarized in Table 4.

Table 4
Summary of Discharge Characteristics
Etobicoke Watershed – Allowable Release Rates

Pond I.D.	Imp. Coverage (%)	Drainage Area (ha)	Release Rates (m ³ /s) ¹						
			Extended Detention ²	2-Year	5-Year	10-Year	25-Year	50-year	100-year
E3	63.15	62.221	0.037	0.269	0.483	0.648	0.874	1.055	1.241
E4	79.79	88.248	0.059	0.381	0.684	0.917	1.238	1.493	1.757

¹ Release rates are based on unit flow equations applied to post-development drainage areas

² Release rates based on continuous erosion model

Refer to Appendix L for details of the continuous erosion model.

6.4.1 Pond E3

The extended detention volume within the pond will outlet through one (1) 375 mm perforated intake pipes, located at the west and south ends of the pond. The perforated intake pipes will be installed with a reverse grade pipe and supported by a concrete cradle. The extended detention outlet is illustrated on Drawing 72.

The extended detention release rate for pond E3 is 37 L/s (based on the erosion threshold).

A 162 mm vertical orifice plate will be installed at the control manhole (No. 425) and has been sized to discharge the extended detention volume at a peak flow of 37 L/s, during the selected 25 mm storm. Calculation of the required orifice size in order to achieve the maximum release rate is provided in Appendix D (refer to Calculation Sheet C-1 and SWMHYMO model proposed.dat).

The detention time provided is 5.0 days, which is governed by the continuous erosion control model release rate (refer to Calculation Sheet B-2).

6.4.2 Pond E4

The extended detention volume within the pond will outlet through a 375 mm perforated intake pipe, located at the south end of the pond. The perforated intake pipe will be installed with a reverse grade pipe and supported by a concrete cradle. The extended detention outlet is illustrated on Drawing 75.

The extended detention release rate for pond E4 is 59 L/s (based on the erosion threshold).

A 197 mm vertical orifice plate will be installed at the drop-inlet structure and has been sized to discharge the extended detention volume at a peak flow of 59 L/s, during the selected 25 mm storm. Calculation of the required orifice size in order to achieve the maximum release rate is provided in Appendix D (refer to Calculation Sheet C-2 and SWMHYMO model proposed.dat).

The detention time provided is 5.0 days, which is governed by the continuous erosion control model release rate (refer to Calculation Sheet B-2).

6.5 Drop Inlet Structure

6.5.1 Pond E3

Quantity control will be provided by a combination orifice / weir located in a 3.0 m by 2.4 m pre-cast box outlet structure.

Four (4) circular orifices will provide some of the quantity control. The four orifices will have a diameter of 300 mm and inverts of 260.40 m.

One(1) rectangular weir in the top portion of the outlet structure (acting as sharp-crested weirs) will also provide quantity control up to the 100-year event. The weir will have a width of 1600 mm and a height of 330 mm and will have a crest (invert) elevation of 260.90 m. The remaining portion of the box structure will be set at an elevation of 261.230 m.

The controlled flows at the outlet structure will be conveyed by a 1800 mm concrete pipe with a 0.25% slope and a capacity of 5.768 m³/s. The flows from that pipe will be directed to Tributary 18 of Etobicoke Creek. The capacity of the 1800 mm diameter pipe will be larger than the maximum Regional pond outflow of 5.452 m³/s.

Calculations in support of the quantity control orifices and weir are provided in Appendix D (refer to Calculation Sheets D-1 and D-3).

The velocity in the outflow pipe of Pond E-3 is presented in Appendix D (refer to Calculation Sheet D-5).

6.5.2 Pond E4

Quantity control will be provided by a combination orifice / weir located in a 3.0 m by 3.0 m pre-cast box outlet structure.

Four (4) circular orifice will provide some of the quantity control. The four orifices will have a diameter of 400 mm and inverts of 258.85 m.

One (1) rectangular weir in the top portion of the outlet structure (acting as sharp-crested weirs) will provide quantity control up to the 100-year event. The rectangular weirs will have a width of 1775 mm and a height of 306 mm and will have a crest (invert) elevation of 259.450 m. The remaining portion of the box structure will be set at an elevation of 259.756 m.

The controlled flows at the outlet structure will be conveyed by a 1650 mm concrete pipe with a 1.50% slope and a capacity of 11.202 m³/s. The flows from this pipe will be directed to tributary 19 of Etobicoke Creek. The capacity of the 1650 mm diameter pipe will be larger than the maximum Regional pond outflow of 10.447 m³/s.

Calculations in support of the quantity control orifices and weir are provided in Appendix D (refer to Calculation Sheets D-2 and D-4).

The velocity in the outflow pipe of Pond E-4 is presented in Appendix D (refer to Calculation Sheet D-5).

Refer to Appendix K for the results of a HEC-RAS model of Tributaries 18 and 19, from the outlets of Ponds E3 and E4 to their confluence with Etobicoke Creek, for the 2- to 100-year and Regional water levels.

6.6 Conveyance of Emergency Overflows

In the event of a blockage or a storm greater than the design horizon, a 6.0 metre wide emergency overflow channel has been provided for Pond E3. Its crest elevation has been set at an elevation of 261.893 m. This emergency overflow for Pond E3 will have a normal depth of 0.095 m with a flow capacity of 0.689 m³/s.

In the event of a blockage or a storm greater than the design horizon, a 6.0 metre wide emergency overflow channel has been provided for Pond E4. Its crest elevation has been set at an elevation of 260.284 m. This emergency overflow for Pond E4 will have normal depth of 0.180 m with a flow capacity of 1.137 m³/s. Refer to Appendix I for a detailed analysis of the emergency overflow channels for Ponds E3 and E4.

6.7 Access Road

A five (5) metre wide access roads have been provided in each facility in order to facilitate routine inspection and maintenance activities. The proposed slope on the access road varies, with a maximum slope of 8.0%.

7.0 SITE RESTORATION AND POND PLANTINGS

The stormwater management pond will be planted in accordance with the final landscape drawings and the ***SWM Design Manual***. Refer to the landscape drawings for details of the proposed plantings for the pond and storm outfall.

8.0 EROSION AND SEDIMENT CONTROL

An erosion and sediment control strategy will be implemented during the construction of services in accordance with Town of Caledon standards and the Erosion and Sediment Control Guidelines for Urban Construction, dated December 2006. The erosion and sediment control strategy will include the following:

- special measures for works in or adjacent to stream corridors, such as culvert crossings, wetland construction, etc.
- environment fencing
- stone mud mat at all construction entrances
- use of the permanent ponds as a temporary silt basins during site construction activities
- regular inspection of the erosion and sediment control devices
- removal and disposal of the erosion and sediment control devices after the site has been stabilized

9.0 POND MAINTENANCE

9.1 Inspections

As recommended in the SWMP Design Manual, inspections should be made after every significant storm (say, >10 mm) during the first two years of operation to ensure that the facility is functioning properly. It is anticipated that four inspections will be required per year. After the initial period, and proper operation has been confirmed, an inspection schedule can be established based on the observed operation of the pond. As a minimum requirement, however, the pond should be inspected annually, although four inspections per year are recommended.

9.2 Regular Operation and Maintenance Activities

Grass Cutting

Grass cutting is not recommended for the pond and surrounding open space area, as it is anticipated that the valley lands will naturalize as the riparian plantings mature.

Weed Control

Weed Control is not recommended for the pond. If weed control is required in order to remove a specific species, the weeds should be removed by hand.

Plantings

In the event that vegetation must be replaced, the plantings should be replaced in accordance with the approved Landscape Design and the recommendations of the SWMP Planning and Design Manual, or as modified by the operating authority.

Sediment Removal

In accordance with the SWMP Planning and Design Manual, it is recommended that the frequency of sediment removal be determined based on a 5% reduction in the total suspended solids (TSS) removal efficiency. We have determined the pond maintenance frequency to be approximately every 24 years for pond E3 and the pond maintenance frequency to be approximately every 26 years for pond E4. It should be noted that routine cleaning of the sediment forebay should allow for less frequent cleaning of the main cell that indicated in the SWMP design Manual, however the extension of service life prior to cleaning cannot be quantified. The required frequency of sediment removal can be monitored as outlined in Appendix G.

Vegetation should be replaced in accordance with the approved Landscape Design and the recommendations of the SWMP design Manual, or as modified by the operating authority.

Trash removal

Accumulated trash and debris within the facility should be removed by hand during the regularly scheduled inspections. As per the ***SWMP Planning and Design Manual***, a “spring cleanup” is required to remove trash from all surface SWMPs.

Winter Maintenance

There are no special operation or maintenance activities required for the winter.

Safety

The SWM facility should be provided with appropriate signage which warns the public of the presence of deep water and steep slopes.

The approved landscape drawings have been prepared with strategic plantings around the perimeter of the pond in order to discourage direct access to the facility.

Inlets, outlets, structures, and headwalls have been provided with grates and covers, where appropriate, in order to prevent public entry or tampering.

9.3 Annual Sediment Loading Rate

For pond E3, the annual sediment loading rate is based on Table 6.3 from the **SWMP Planning and Design Manual**. The annual loading rate for residential land use with 63.15% imperviousness is 2.39 m³/ha. Based on a drainage area of 62.221 ha, the expected annual sediment loading rate into the pond is 148.65 m³ per year.

For pond E4, the annual sediment loading rate is based on Table 6.3 from the SWMP Planning and Design Manual. The annual loading rate for residential land use with 71.79% imperviousness is 2.92 m³/ha. Based on a drainage area of 88.248 ha, the expected annual sediment loading rate into the pond is 257.63 m³ per year.

10.0 SOILS

Based on the geotechnical investigation reports for Moscorp 1A and 2, prepared by Shaheen and Peaker Limited, dated March 2008, the various soil types for the project include surface topsoil, clayey silt, sandy silt, silty sand, and sand/gravel. Additional details on the borehole logs and SWM Pond recommendations can be found in the detailed report, which was previously submitted under separate cover to the Town of Caledon, March 7, 2008, as part of the first engineering submission package. Excerpts for the SWM Pond geotechnical investigation prepared by Shaheen and Peaker can be found in Appendix H.

Prepared by,
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Prepared by,
David Schaeffer Engineering Ltd.



Per: Antoine Vachon, M. Eng., P. Eng.

Per: Jennifer Cappola-Logullo, P.Eng.

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Pond Design Brief E3-E4_20080815.doc

APPENDIX A

HYDROLOGIC AND HYDRAULIC MODELING

Table A-1: Pond E3 Outlet Flows

Time (hh:mm)	Flow (m ³ /s)					
	2-year	5-year	10-year	25-year	50-year	100-year
0:00	0.000	0.000	0.000	0.000	0.000	0.000
0:30	0.000	0.000	0.000	0.000	0.000	0.000
1:00	0.000	0.000	0.000	0.000	0.000	0.000
1:30	0.000	0.000	0.000	0.000	0.000	0.000
2:00	0.001	0.003	0.004	0.006	0.007	0.008
2:30	0.013	0.021	0.024	0.028	0.031	0.034
3:00	0.032	0.040	0.161	0.335	0.450	0.560
3:30	0.038	0.186	0.341	0.507	0.724	1.023
4:00	0.041	0.257	0.411	0.608	0.884	1.213
4:30	0.076	0.291	0.438	0.656	0.922	1.214
5:00	0.101	0.307	0.447	0.661	0.897	1.118
5:30	0.116	0.311	0.446	0.643	0.845	1.029
6:00	0.125	0.309	0.440	0.616	0.784	0.938
6:30	0.131	0.304	0.433	0.585	0.730	0.856
7:00	0.135	0.298	0.422	0.560	0.677	0.780
7:30	0.136	0.291	0.410	0.534	0.630	0.713
8:00	0.136	0.281	0.398	0.511	0.585	0.653
8:30	0.135	0.272	0.384	0.496	0.552	0.601
9:00	0.133	0.262	0.369	0.479	0.521	0.563
9:30	0.131	0.252	0.355	0.463	0.502	0.532
10:00	0.128	0.242	0.340	0.446	0.485	0.508
10:30	0.125	0.233	0.325	0.428	0.467	0.491
11:00	0.122	0.224	0.311	0.410	0.449	0.473
11:30	0.119	0.215	0.297	0.392	0.431	0.455
12:00	0.116	0.207	0.284	0.371	0.412	0.437
12:30	0.112	0.199	0.271	0.352	0.393	0.417
13:00	0.109	0.190	0.259	0.334	0.373	0.399
13:30	0.105	0.182	0.247	0.317	0.353	0.378
14:00	0.102	0.175	0.236	0.301	0.333	0.358
14:30	0.099	0.168	0.226	0.287	0.315	0.337
15:00	0.096	0.161	0.216	0.273	0.300	0.319
15:30	0.093	0.154	0.207	0.261	0.285	0.303
16:00	0.089	0.148	0.198	0.248	0.271	0.288
16:30	0.086	0.142	0.189	0.236	0.258	0.273
17:00	0.083	0.136	0.180	0.225	0.245	0.260
17:30	0.080	0.131	0.172	0.215	0.233	0.247
18:00	0.078	0.126	0.164	0.205	0.222	0.234
18:30	0.075	0.121	0.157	0.195	0.212	0.223
19:00	0.073	0.116	0.151	0.186	0.202	0.213
19:30	0.070	0.112	0.145	0.178	0.193	0.203
20:00	0.068	0.107	0.138	0.169	0.183	0.192
20:30	0.063	0.100	0.128	0.157	0.169	0.178
21:00	0.058	0.092	0.118	0.145	0.156	0.164
21:30	0.054	0.085	0.109	0.134	0.144	0.152
22:00	0.050	0.078	0.101	0.123	0.133	0.140
22:30	0.046	0.072	0.093	0.114	0.123	0.129
23:00	0.042	0.067	0.086	0.105	0.113	0.119
23:30	0.041	0.062	0.079	0.097	0.105	0.110

Table A-2: Pond E4 Outlet Flows

Time (hh:mm)	Flow (m ³ /s)					
	2-year	5-year	10-year	25-year	50-year	100-year
0:00	0.000	0.000	0.000	0.000	0.000	0.000
0:30	0.000	0.000	0.000	0.000	0.000	0.000
1:00	0.000	0.000	0.000	0.000	0.000	0.000
1:30	0.000	0.000	0.000	0.001	0.001	0.001
2:00	0.006	0.010	0.013	0.016	0.019	0.022
2:30	0.032	0.042	0.048	0.054	0.058	0.078
3:00	0.055	0.263	0.512	0.797	0.963	1.245
3:30	0.062	0.455	0.715	0.978	1.274	1.675
4:00	0.145	0.529	0.779	1.052	1.367	1.744
4:30	0.191	0.553	0.791	1.056	1.343	1.680
5:00	0.212	0.550	0.776	1.020	1.262	1.540
5:30	0.219	0.532	0.744	0.967	1.163	1.386
6:00	0.219	0.508	0.708	0.927	1.074	1.250
6:30	0.217	0.485	0.671	0.887	1.004	1.138
7:00	0.213	0.460	0.633	0.843	0.945	1.041
7:30	0.206	0.433	0.593	0.795	0.898	0.962
8:00	0.198	0.405	0.553	0.744	0.848	0.912
8:30	0.188	0.379	0.515	0.694	0.795	0.860
9:00	0.179	0.354	0.480	0.644	0.742	0.806
9:30	0.170	0.331	0.446	0.596	0.688	0.752
10:00	0.161	0.309	0.415	0.552	0.637	0.698
10:30	0.152	0.288	0.386	0.512	0.588	0.645
11:00	0.142	0.269	0.360	0.474	0.544	0.596
11:30	0.135	0.251	0.336	0.440	0.502	0.550
12:00	0.127	0.234	0.313	0.407	0.465	0.508
12:30	0.121	0.219	0.292	0.378	0.430	0.469
13:00	0.114	0.205	0.272	0.351	0.397	0.433
13:30	0.108	0.191	0.253	0.326	0.368	0.400
14:00	0.103	0.178	0.235	0.303	0.341	0.371
14:30	0.097	0.166	0.219	0.282	0.317	0.344
15:00	0.091	0.155	0.204	0.262	0.294	0.319
15:30	0.086	0.145	0.191	0.244	0.273	0.296
16:00	0.082	0.135	0.178	0.227	0.254	0.275
16:30	0.077	0.127	0.166	0.211	0.236	0.255
17:00	0.073	0.119	0.155	0.196	0.220	0.237
17:30	0.070	0.112	0.143	0.183	0.204	0.220
18:00	0.066	0.104	0.134	0.170	0.190	0.205
18:30	0.062	0.098	0.126	0.159	0.177	0.191
19:00	0.062	0.093	0.118	0.146	0.164	0.177
19:30	0.062	0.088	0.111	0.137	0.152	0.165
20:00	0.062	0.082	0.104	0.127	0.141	0.152
20:30	0.061	0.075	0.094	0.114	0.129	0.137
21:00	0.061	0.068	0.085	0.103	0.116	0.125
21:30	0.061	0.062	0.076	0.093	0.105	0.113
22:00	0.061	0.062	0.069	0.085	0.095	0.102
22:30	0.061	0.062	0.062	0.077	0.086	0.093
23:00	0.060	0.061	0.062	0.070	0.078	0.084
23:30	0.060	0.061	0.062	0.063	0.071	0.077

Figure A-1 XPSWMM MODEL SCHEMATIC

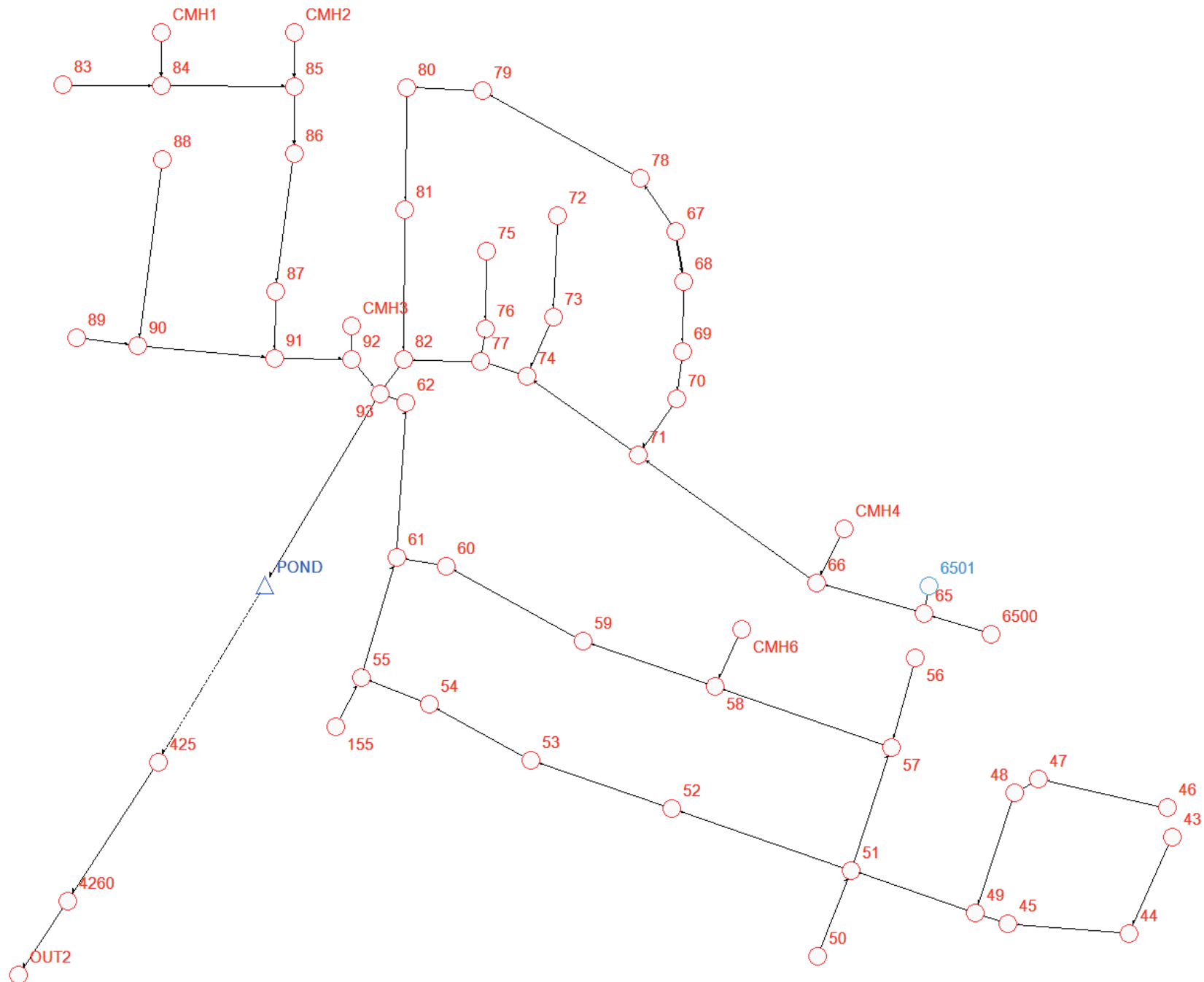
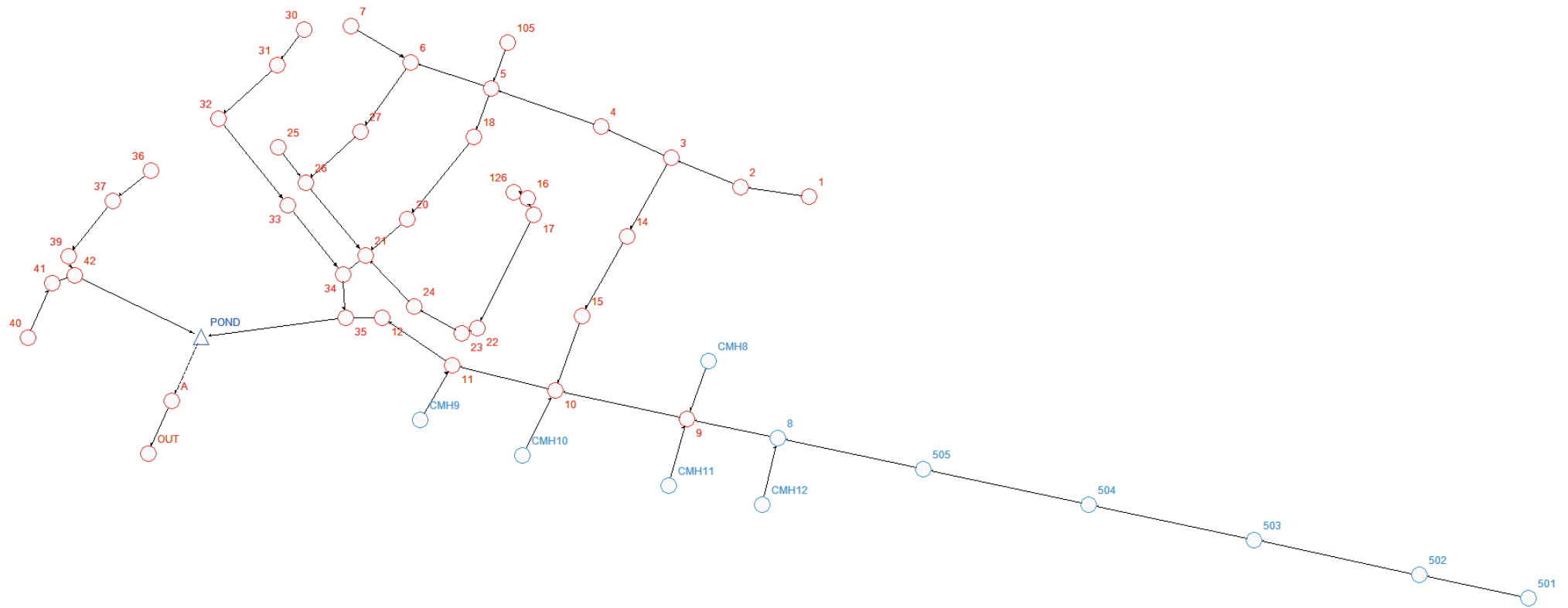


Figure A-2 XPSWMM MODEL SCHEMATIC



APPENDIX B

QUALITY AND EROSION VOLUMES AND SEDIMENT FOREBAY CALCULATIONS

CALCULATION SHEET B-1: POND QUALITY VOLUME

Table B-1: Criteria for Required Storage Volumes

Pond	Area (ha)	% Imperviousness (%)	Storage Volume for Impervious Level ⁽¹⁾ (m ³ /ha)
N/A	N/A	55	190
E3	62.221	63.15	209.02
N/A	N/A	70	225
E4	88.248	71.79	227.98
N/A	N/A	85	250

⁽¹⁾ 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 B-2: Required Storage Volumes

Pond Component	Volume (m ³)	
	Pond E3	Pond E4
Permanent Pool (PP)	10516	16589
Extended Detention (Quality) ⁽¹⁾	2489	3530
Storage Volume (PP + Quality) ⁽²⁾	13005	20119
Forebay (20% PP)	2103	3318
PP - Forebay	8413	13271

⁽¹⁾ Based on 40 m³/ha.

⁽²⁾ Based on Table B1.

Table B-3A: Summary of Pond E3 Design

Item	Required Volume (m ³)	Provided Volume ⁽¹⁾ (m ³)	Volume Ratio	Provided Area ⁽²⁾ (m ²)	Provided Elevation (m)
Storage Volume (PP + Quality)	13005	34977	2.69	N/A	260.32
Extended Detention (Quality)	2489	9277	3.73	N/A	260.32
Permanent Pool (PP)	10516	25700	2.44	16358	259.80
Forebay	2103	N/A	N/A	4092	259.80
PP - Forebay	8413	N/A	N/A	12266	259.80
Area Ratio (%) ⁽³⁾ =				25	

⁽¹⁾ Based on Stage-Storage Curve (refer to Calculation Sheet D-1) and Provided Extended Detention (refer to Calculation Sheet C-1)

⁽²⁾ Drawing 294grad2.dwg (May 5th, 2008)

⁽³⁾ As per MOE, Maximum Forebay Area: 33% of Total Permanent Pool.

Table B-3B: Summary of Pond E4 Design

Item	Required Volume (m ³)	Provided Volume ⁽¹⁾ (m ³)	Volume Ratio	Provided Area ⁽²⁾ (m ²)	Provided Elevation (m)
Storage Volume	20119	48830	2.43	N/A	258.80
Extended Detention	3530	14914	4.23	N/A	258.80
Permenant Pool	16589	33916	2.04	21775	258.20
Forebay	3318	N/A	N/A	4882	258.20
PP - Forebay	13271	N/A	N/A	16893	258.20
Area Ratio (%) ⁽³⁾ =				22	

⁽¹⁾ Based on Stage-Storage Curve (refer to Calculation Sheet D-2) and Provided Extended Detention (refer to Calculation Sheet C-2)

⁽²⁾ Provided by DSEL

⁽³⁾ As per MOE, Maximum Forebay Area: 33% of Total Permanent Pool.

CALCULATION SHEET B-2: POND EROSION VOLUME

Table B-4: Erosion Volume and Release rates

Pond	RV ⁽¹⁾	Area ⁽²⁾	% Imp. ⁽²⁾	Total Volume	Release Rate ⁽³⁾
	(mm)	(ha)	(%)	(m ³)	(L/s)
E3	14.91	62.22	63.15	9277	37
E4	16.90	88.25	65.87	14914	59

⁽¹⁾ Based on SWMHYMO model (proposed.dat) for the 25 mm storm.

⁽²⁾ Total area and average % imperviousness values based on DDSWMM input files.

⁽³⁾ Release rate determined by continuous erosion model.

```

00001> 20      Metric units
00002> *#*****
00003> *# Project Name: [Mayfield West]      Project Number: [552-05]
00004> *# Date       : 2008/07/25
00005> *# Modeller   : [SPB]
00006> *# Company    : JFSA
00007> *# License #  : 1155024
00008> *#*****
00009> * According to figure 2.3 of Etobicoke Creek Hydrology Update, Soil type for the
00010> * study area is Type CD
00011> *
00012> *% 25 mm Storm
00013> START      TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[1]
00014> *          ["25mm.stm"] <--storm filename, one per line for NSTORM time
00015> *%-----|-----|
00016> READ STORM  STORM_FILENAME=["STORM.001"]
00017> *%-----|-----|
00018> *%-----|-----|
00019> CALIB STANDHYD NHYD=["AE3"], DT=[5](min), AREA=[62.22](ha),
00020> XIMP=[.60], TIMP=[.64], DWF=[0](cms), LOSS=[2],
00021> SCS curve number CN=[74],
00022> Pervious surfaces: IAPER=[7](mm), SLPP=[0.5](%),
00023> LGP=[40](m), MNP=[0.3], SCP=[0](min),
00024> Impervious surfaces: IAimp=[2.5](mm), SLPI=[0.5](%),
00025> LGI=[644](m), MNI=[.015], SCI=[0](min),
00026> RAINFALL=[ , , , , ](mm/hr) , END=-1
00027> *%-----|-----|
00028> CALIB STANDHYD NHYD=["AE4"], DT=[5](min), AREA=[88.25](ha),
00029> XIMP=[.71], TIMP=[.72], DWF=[0](cms), LOSS=[2],
00030> SCS curve number CN=[74],
00031> Pervious surfaces: IAPER=[7](mm), SLPP=[0.5](%),
00032> LGP=[40](m), MNP=[0.3], SCP=[0](min),
00033> Impervious surfaces: IAimp=[2.5](mm), SLPI=[0.5](%),
00034> LGI=[767](m), MNI=[.015], SCI=[0](min),
00035> RAINFALL=[ , , , , ](mm/hr) , END=-1
00036> *%-----|-----|
00037> *%-----|-----|
00038> *%-----|-----|
00039> FINISH
00040>
00041>
00042>

```

```
00001> =====
00002>
00003> SSSSS W W M M H H Y Y M M 000 999 999 =====
00004> S W W W MM MM H H Y Y MM MM 0 0 9 9 9 9
00005> SSSSS W W W M M M HHHH Y M M M 0 0 ## 9 9 9 9 Ver5 Beta
00006> S W W M M H H Y M M 0 0 9999 9999 Sept 2000
00007> SSSSS W W M M H H Y M M 000 9 9 =====
00008> 9 9 9 9 # 2547402
00009> StormWater Management Hydrologic Model 999 999 =====
00010>
00011> *****
00012> ***** SWMHYMO Ver/5 Beta *****
00013> ***** A single event and continuous hydrologic simulation model *****
00014> ***** based on the principles of HYMO and its successors *****
00015> ***** OTTHYMO-83 and OTTHYMO-89. *****
00016> *****
00017> ***** Distributed by: J.F. Sabourin and Associates Inc. *****
00018> ***** Ottawa, Ontario: (613) 727-5199 *****
00019> ***** Gatineau, Quebec: (819) 243-6858 *****
00020> ***** E-Mail: swmhymo@jfsa.Com *****
00021> *****
00022>
00023> ++++++
00024> ++++++ Licensed user: JFSAlnc. ++++++
00025> ++++++ Stittsville SERIAL#:2547402 ++++++
00026> ++++++
00027>
00028> *****
00029> ***** ++++++ PROGRAM ARRAY DIMENSIONS ++++++ *****
00030> ***** Maximum value for ID numbers : 10 *****
00031> ***** Max. number of rainfall points: 52750 *****
00032> ***** Max. number of flow points : 52750 *****
00033> *****
00034>
00035> *** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) ***
00036> *** ----- ***
00037> *** ID: Hydrograph IDentification numbers, (1-10). ***
00038> *** NHYD: Hydrograph reference numbers, (6 digits or characters). ***
00039> *** AREA: Drainage area associated with hydrograph, (ac.) or (ha.). ***
00040> *** QPEAK: Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s). ***
00041> *** TpeakDate_hh:mm is the date and time of the peak flow. ***
00042> *** R.V.: Runoff Volume of simulated hydrograph, (in) or (mm). ***
00043> *** R.C.: Runoff Coefficient of simulated hydrograph, (ratio). ***
00044> *** *: see WARNING or NOTE message printed at end of run. ***
00045> *** **: see ERROR message printed at end of run. ***
00046> *****
00047> *****
00048>
00049> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00050>
00051> *****
00052>
00053> ***** SUMMARY OUTPUT *****
00054> *****
00055> * DATE: 2008-08-01 TIME: 14:38:10 RUN COUNTER: 000398 *
00056> *****
00057> * Input filename: C:\DOCUME~1\User1\Desktop\RUN\proposed.dat *
00058> * Output filename: C:\DOCUME~1\User1\Desktop\RUN\proposed.out *
00059> * Summary filename: C:\DOCUME~1\User1\Desktop\RUN\proposed.sum *
00060> * User comments: *
00061> * 1: _____ *
00062> * 2: _____ *
00063> * 3: _____ *
00064> *****
00065>
00066>
00067> #*****
00068> # Project Name: [Mayfield West] Project Number: [552-05]
00069> # Date : 2008/07/25
00070> # Modeller : [SPB]
00071> # Company : JFSA
00072> # License # : 1155024
00073> #*****
00074> RUN:COMMAND#
00075> 001:0001-----
00076> START
00077> [TZERO = .00 hrs on 0]
00078> [METOUT= 2 (1=imperial, 2=metric output)]
00079> [NSTORM= 1 ]
00080> [NRUN = 1 ]
00081> 001:0002-----
00082> READ STORM
00083> Filename = STORM.001
00084> Comment = 25 mm 4 hour based on Chicago Pearson Intl Airport
00085> [SDT= 5.00:SDUR= 4.00:PTOT= 25.00]
00086> 001:0003-----ID:NHYD-----AREA-----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00087> CALIB STANDHYD 01:AE3 62.22 3.086 No_date 1:30 14.91 .596
00088> [XIMP=.60:TIMP=.64]
00089> [LOSS= 2 :CN= 74.0]
```

```
00090> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00091> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 644.:MNI=.015:SCI= .0]
00092> 001:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00093> CALIB STANDHYD 01:AE4 88.25 4.918 No_date 1:30 16.90 .676
00094> [XIMP=.71:TIMP=.72]
00095> [LOSS= 2 :CN= 74.0]
00096> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00097> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 767.:MNI=.015:SCI= .0]
00098> 001:0005-----
00099> FINISH
00100> -----
00101> *****
00102> WARNINGS / ERRORS / NOTES
00103> -----
00104> Simulation ended on 2008-08-01 at 14:38:10
00105> =====
00106>
00107>
```

CALCULATION SHEET B-3: FOREBAY SIZING FOR POND E3

South Fields Community Moscorp Phases 1A and 2 Pond E3 Town of Caledon Calculation of Forebay Size

© DSEL

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$L_{\min} = \left(\frac{r Q_p}{V_s} \right)^{0.5}$$

where: r = length to width ratio, at the invert of the inlet pipe.
 Q_p = peak outflow during design quality storm
 V_s = settling velocity

Input: r = 1.68 (94.33m/56.16m)
 Q_p = 0.055 m³/s (at elevation 260.41 m)
 V_s = 0.0003 m/s

$$L_{\min} = 17.55 \text{ m}$$

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls (Refer to Calculation Sheet D-1 of Appendix D)

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$L_{\min} = \frac{8Q}{d V_f}$$

where: Q = Inlet flowrate (10 year Storm AES 6 Hours)
 d = depth of permanent pool
 V_f = desired final velocity

Input: Q = 5.86 m³/s
 d = 2.0 m
 V_f = 0.5 m/s

$$L_{\min} = 46.90 \text{ m}$$

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required 46.90 m

Length of Forebay Provided 94.33 m (at the elevation 259.80 m)

CALCULATION SHEET B-4: FOREBAY SIZING FOR POND E4 EAST

South Fields Community Moscorp Phases 1A and 2 Pond E4 (East Inlet) Town of Caledon Calculation of East Forebay Size

© DSEL

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$L_{\min} = \left(\frac{r Q_p}{V_s} \right)^{0.5}$$

where: r = length to width ratio, at the invert of the inlet pipe.
 Q_p = peak outflow during design quality storm
 V_s = settling velocity

Input: r = 2.06 (91.08m / 44.12m)
 Q_p = 0.060 m³/s (at elevation 258.82 m)
 V_s = 0.0003 m/s

$$L_{\min} = 20.32 \text{ m}$$

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls (Refer to Calculation Sheet D-2 of Appendix D)

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$L_{\min} = \frac{8Q}{d V_f}$$

where: Q = Inlet flowrate (10 year Storm AES 6 Hours)
 d = depth of permanent pool
 V_f = desired final velocity

Input: Q = 9.73 m³/s
 d = 2.0 m
 V_f = 0.5 m/s

$$L_{\min} = 77.87 \text{ m}$$

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required 77.87 m

Length of Forebay Provided 91.08 m (at the elevation 258.20 m)

CALCULATION SHEET B-5: FOREBAY SIZING FOR POND E4 WEST

South Fields Community Moscorp Phases 1A and 2 Pond E4 (West Inlet) Town of Caledon Calculation of West Forebay Size

© DSEL

Settling Criteria

From the SWMP Manual, the required length for settling is as follows:

$$L_{\min} = \left(\frac{r Q_p}{V_s} \right)^{0.5}$$

where: r = length to width ratio, at the invert of the inlet pipe.
 Q_p = peak outflow during design quality storm
 V_s = settling velocity

Input: r = 2.01 (55.58m/27.72m)
 Q_p = 0.060 m³/s (at elevation 258.82 m)
 V_s = 0.0003 m/s

$$L_{\min} = 20.03 \text{ m}$$

The peak flow rate from the pond during the quality storm is taken as the flow that would occur just below the quantity controls (Refer to Calculation Sheet D-2 of Appendix D)

Dispersion Criteria

From the SWMP Manual, the required length for dispersion is as follows:

$$L_{\min} = \frac{8Q}{d V_f}$$

where: Q = Inlet flowrate (10 year Storm AES 6 Hours)
 d = depth of permanent pool
 V_f = desired final velocity

Input: Q = 0.10 m³/s
 d = 2.0 m
 V_f = 0.5 m/s

$$L_{\min} = 0.78 \text{ m}$$

The minimum forebay length is determined by the larger of the settling or dispersion criteria.

Minimum Length of Forebay Required 20.03 m

Length of Forebay Provided 55.58 m (at the elevation 258.20 m)

APPENDIX C

SIZING OF ORIFICE FOR EXTENDED DETENTION OUTLET

CALCULATION SHEET C-1: EXTENDED DETENTION FOR POND E3

time Drawdown time in hours
C2 slope coefficient from the area-depth linear regression
C3 intercept from the area-depth linear regression
h maximum water elevation above the orifice (m)
A0 Cross-sectional area of the orifice (m²)

Table C-1: Extended Detention Parameters for Pond E3

Permanent Pool Parameters		Orifice Parameters	
A (C3)	16101.6 m ²	Orifice 1 Dia.	0.162 m
Elev. P.P.	259.8 m		
Elev. A.S.	260.318 m	A0 (m ²)	0.021 m ²
h (m)	0.518 m		

Table C-2: Extended Detention Drawdown Time for Pond E3

Elev. (m)	Active Storage			C2 (m ² /m)	Drawdown Time (h)	Drawdown Time (days)
	V (m ³)	A (m ²)	depth (m)			
259.800	0.00	16101.60	0.00			
259.850	832.60	16683.70	0.05	11642	35.56	1.48
259.900	1686.70	17090.30	0.10	9887	50.70	2.11
259.950	2552.00	17370.50	0.15	8459	62.44	2.60
260.000	3428.50	17631.90	0.20	7652	72.48	3.02
260.050	4316.30	17868.20	0.25	7066	81.42	3.39
260.100	5215.10	18104.50	0.30	6676	89.60	3.73
260.150	6126.90	18355.10	0.35	6439	97.26	4.05
260.200	7095.10	18630.60	0.40	6323	104.54	4.36
260.250	7979.30	19043.10	0.45	6537	111.77	4.66
260.300	8931.70	19049.50	0.50	5896	117.83	4.91
260.318	9277	19049.57	0.518	5690	119.95	5.00
260.350	9884.20	19049.70	0.55	5360.2	123.58	5.15
260.400	10847.20	19259.80	0.60	5263.7	129.60	5.40
260.450	11812.40	19359.30	0.65	5011.8	135.15	5.63
260.500	12785.90	19492.30	0.70	4843.9	140.61	5.86
260.550	13763.40	19603.10	0.75	4668.7	145.85	6.08
260.600	14746.60	19714.50	0.80	4516.1	150.96	6.29
260.650	15735.20	19825.90	0.85	4381.5	155.93	6.50
260.700	16729.50	19937.40	0.90	4262.0	160.80	6.70
260.750	17729.20	20049.40	0.95	4155.6	165.55	6.90
260.800	18734.60	20161.60	1.00	4060.0	170.22	7.09
260.850	19745.60	20274.00	1.05	3973.7	174.79	7.28
260.900	20762.40	20386.90	1.10	3895.7	179.29	7.47
260.950	21785.20	20500.10	1.15	3824.8	183.71	7.65
261.000	22814.40	20613.60	1.20	3760.0	188.06	7.84
261.050	23848.70	20727.00	1.25	3700.3	192.34	8.01
261.100	24888.90	20840.60	1.30	3645.4	196.57	8.19
261.150	25931.30	20954.60	1.35	3594.8	200.74	8.36
261.200	26982.50	21068.50	1.40	3547.8	204.86	8.54
261.250	28039.50	21182.20	1.45	3503.9	208.93	8.71

Table C-2: Extended Detention Drawdown Time for Pond E3

Elev. (m)	Active Storage			C2 (m ² /m)	Drawdown Time (h)	Drawdown Time (days)
	V (m ³)	A (m ²)	depth (m)			
261.300	29102.30	21298.20	1.50	3464.4	212.95	8.87
261.350	30314.90	21431.50	1.55	3438.6	217.01	9.04
261.400	31445.20	21538.20	1.60	3397.9	220.92	9.20
261.450	32315.60	21758.50	1.65	3428.4	225.25	9.39
261.500	33399.60	21759.60	1.70	3328.2	228.65	9.53
261.550	34502.30	21985.50	1.75	3362.2	232.95	9.71
261.600	35617.10	22297.00	1.80	3441.9	237.60	9.90
261.650	36737.60	22478.80	1.85	3447.1	241.67	10.07
261.700	37871.70	22699.10	1.90	3472.4	245.89	10.25
261.750	39008.00	22909.50	1.95	3491.2	250.05	10.42
261.800	40150.50	23044.40	2.00	3471.4	253.85	10.58
261.850	41340.30	23754.60	2.05	3733.2	260.28	10.85
261.900	42540.20	24060.00	2.10	3789.7	264.86	11.04
261.950	43748.80	24303.30	2.15	3814.7	269.14	11.21
262.000	44976.30	24598.60	2.20	3862.3	273.67	11.40
262.050	46215.70	24829.40	2.25	3879.0	277.87	11.58
262.100	47463.90	25072.90	2.30	3900.6	282.13	11.76
262.150	48724.70	25314.60	2.35	3920.4	286.38	11.93
262.200	49985.40	25563.90	2.40	3942.6	290.65	12.11
262.250	51284.10	25823.10	2.45	3968.0	294.97	12.29
262.300	52585.50	26088.60	2.50	3994.8	299.32	12.47
262.350	54012.40	26406.90	2.55	4041.3	303.93	12.66
262.400	55393.70	26692.40	2.60	4073.4	308.38	12.85
262.450	56546.00	27141.60	2.65	4166.0	313.69	13.07
262.500	57901.90	27188.00	2.70	4106.1	316.88	13.20

9277 Erosion volume (for the 25 mm storm event)

5.00 Second orifice diameter selected to obtain a drawdown time of 5 days for the 25 mm storm

CALCULATION SHEET C-2: EXTENDED DETENTION FOR POND E4

time Drawdown time in hours
C2 slope coefficient from the area-depth linear regression
C3 intercept from the area-depth linear regression
h maximum water elevation above the orifice (m)
A0 Cross-sectional area of the orifice (m²)

Table C-3: Extended Detention Parameters for Pond E4

Permanent Pool Parameters		Orifice Parameters	
A (C3)	21774.6 m ²	Orifice Dia.	0.197 m
Elev. P.P.	258.2 m		
Elev. A.S.	258.798 m	A0 (m ²)	0.030 m ²
h (m)	0.598 m		

Table C-4: Extended Detention Drawdown Time for Pond E4

Elev. (m)	Active Storage			C2 (m ² /m)	Drawdown Time (h)	Drawdown Time (days)
	V (m ³)	A (m ²)	depth (m)			
258.200	0.00	21774.60	0.00			
258.250	1147.10	22946.80	0.05	23444	32.91	1.37
258.300	2325.70	23573.10	0.10	17985	46.98	1.96
258.350	3519.40	23987.80	0.15	14755	57.89	2.41
258.400	4727.30	24333.40	0.20	12794	67.18	2.80
258.450	5951.70	24672.80	0.25	11593	75.48	3.15
258.500	7191.90	25008.40	0.30	10779	83.09	3.46
258.550	8448.90	25344.60	0.35	10200	90.18	3.76
258.600	9793.50	25741.50	0.40	9917	96.96	4.04
258.650	11013.50	26319.40	0.45	10100	103.69	4.32
258.700	12329.60	26321.40	0.50	9094	109.30	4.55
258.750	13645.70	26322.10	0.55	8268	114.64	4.78
258.798	14914	26617.94	0.598	8104	120.00	5.00
258.800	14977.30	26632.70	0.60	8097	120.26	5.01
258.850	16313.90	26800.80	0.65	7733	125.47	5.23
258.900	17658.90	26971.70	0.70	7424	130.52	5.44
258.950	19005.40	27134.00	0.75	7146	135.41	5.64
259.000	20372.90	27298.80	0.80	6905	140.17	5.84
259.050	21742.40	27464.70	0.85	6694	144.82	6.03
259.100	23120.50	27631.50	0.90	6508	149.37	6.22
259.150	24507.50	27798.30	0.95	6341	153.82	6.41
259.200	25902.80	27965.80	1.00	6191	158.18	6.59
259.250	27307.20	28135.00	1.05	6058	162.47	6.77
259.300	28718.40	28303.40	1.10	5935	166.68	6.94
259.350	30139.80	28473.50	1.15	5825	170.82	7.12
259.400	31569.60	28643.80	1.20	5724	174.91	7.29
259.450	33008.60	28815.30	1.25	5633	178.93	7.46
259.500	34456.9	28987.40	1.30	5548	182.91	7.62
259.550	35910.9	29160.20	1.35	5471	186.83	7.78
259.581	36826.0	29268.19	1.38	5425	189.26	7.89
259.600	37376.9	29333.20	1.40	5399	190.71	7.95
259.650	38833.5	29507.70	1.45	5333	194.54	8.11
259.700	40315.2	29681.70	1.50	5271	198.34	8.26
259.750	41805.5	29856.00	1.55	5214	202.09	8.42
259.800	43305.5	30031.40	1.60	5160	205.81	8.58
259.850	44813.4	30206.30	1.65	5110	209.50	8.73

Table C-4: Extended Detention Drawdown Time for Pond E4

Elev. (m)	Active Storage			C2 (m ² /m)	Drawdown Time (h)	Drawdown Time (days)
	V (m ³)	A (m ²)	depth (m)			
259.900	46330.5	30381.80	1.70	5063	213.15	8.88
259.950	47856.0	30557.80	1.75	5019	216.77	9.03
260.000	49391.2	30733.20	1.80	4977	220.36	9.18
260.050	50941.3	30909.50	1.85	4938	223.92	9.33
260.100	52492.0	31085.10	1.90	4900	227.46	9.48
260.150	54057.9	31262.50	1.95	4866	230.98	9.62
260.200	55603.9	31438.90	2.00	4832	234.47	9.77
260.250	57179.7	31614.90	2.05	4800	237.93	9.91
260.300	58793.2	31794.60	2.10	4771	241.39	10.06
260.350	60794.9	31983.70	2.15	4748	244.85	10.20
260.400	62565.7	32195.40	2.20	4737	248.37	10.35
260.450	63566.8	32457.60	2.25	4748	252.04	10.50
260.500	65177.0	32465.70	2.30	4648	254.85	10.62

14914 Erosion volume (for the 25 mm storm event)

5.00 Second orifice diameter selected to obtain a drawdown time of 5 days for the 25 mm storm

APPENDIX D

SIZING OF QUANTITY CONTROL AND DROP INLET STRUCTURE

CALCULATION SHEET D-1: STAGE-STORAGE-OUTFLOW FOR POND E3

Table D-1: Stage-Storage-Outflow Curve for Pond E3

		Erosion Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Quantity Control 4		Quantity Control 5		Overflow Weir 1			
		Vertical Orifice		Vertical Orifice		Vertical Orifice		Vertical Orifice		Vertical Orifice		Sharp Crested Weir		Overflow Weir			
		Dia (m) = 0.162		Dia (m) = 0.300		Dia (m) = 0.300		Dia (m) = 0.300		Dia (m) = 0.300		L = 1.600		L = 10.800			
		C = 0.62		C = 0.62		C = 0.62		C = 0.62		C = 0.62		C _w = 1.700		C _w = 1.800			
		invert= 259.80		invert= 260.40		invert= 260.40		invert= 260.40		invert= 260.40		invert= 260.90		invert= 261.23			
Q @ D = 0.016		Q @ D = 0.075		Q @ D = 0.075		Q @ D = 0.075		Q @ D = 0.075		Q @ D = 0.075		n contr. = 2		n contr. = 0			
Elevation	Active Sto.	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Outflow	Storage
(m)	(m³)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m³/s)	(ha-m)
259.80	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
259.85	833	0.050	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.083
259.90	1687	0.100	0.010	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.169
259.95	2552	0.150	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.015	0.255
260.00	3429	0.200	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.343
260.05	4316	0.250	0.023	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.023	0.432
260.10	5215	0.300	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.026	0.522
260.15	6127	0.350	0.029	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.613
260.20	7095	0.400	0.032	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.032	0.710
260.25	7979	0.450	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.034	0.798
260.30	8932	0.500	0.037	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.893
260.35	9884	0.550	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.988
260.40	10847	0.600	0.041	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041	1.085
260.45	11812	0.650	0.043	0.050	0.013	0.050	0.013	0.050	0.013	0.050	0.013	0.000	0.000	0.000	0.000	0.093	1.181
260.50	12786	0.700	0.045	0.100	0.025	0.100	0.025	0.100	0.025	0.100	0.025	0.000	0.000	0.000	0.000	0.145	1.279
260.55	13763	0.750	0.046	0.150	0.038	0.150	0.038	0.150	0.038	0.150	0.038	0.000	0.000	0.000	0.000	0.197	1.376
260.60	14747	0.800	0.048	0.200	0.050	0.200	0.050	0.200	0.050	0.200	0.050	0.000	0.000	0.000	0.000	0.248	1.475
260.65	15735	0.850	0.050	0.250	0.063	0.250	0.063	0.250	0.063	0.250	0.063	0.000	0.000	0.000	0.000	0.300	1.574
260.70	16730	0.900	0.051	0.300	0.075	0.300	0.075	0.300	0.075	0.300	0.075	0.000	0.000	0.000	0.000	0.352	1.673
260.75	17729	0.950	0.053	0.350	0.087	0.350	0.087	0.350	0.087	0.350	0.087	0.000	0.000	0.000	0.000	0.400	1.773
260.80	18735	1.000	0.054	0.400	0.097	0.400	0.097	0.400	0.097	0.400	0.097	0.000	0.000	0.000	0.000	0.443	1.873
260.85	19746	1.050	0.056	0.450	0.106	0.450	0.106	0.450	0.106	0.450	0.106	0.000	0.000	0.000	0.000	0.481	1.975
260.90	20762	1.100	0.057	0.500	0.115	0.500	0.115	0.500	0.115	0.500	0.115	0.000	0.000	0.000	0.000	0.517	2.076
260.95	21785	1.150	0.059	0.550	0.123	0.550	0.123	0.550	0.123	0.550	0.123	0.050	0.030	0.000	0.000	0.580	2.179
261.00	22814	1.200	0.060	0.600	0.130	0.600	0.130	0.600	0.130	0.600	0.130	0.100	0.085	0.000	0.000	0.666	2.281
261.05	23849	1.250	0.061	0.650	0.137	0.650	0.137	0.650	0.137	0.650	0.137	0.150	0.155	0.000	0.000	0.765	2.385
261.10	24889	1.300	0.062	0.700	0.144	0.700	0.144	0.700	0.144	0.700	0.144	0.200	0.237	0.000	0.000	0.876	2.489
261.15	25931	1.350	0.064	0.750	0.150	0.750	0.150	0.750	0.150	0.750	0.150	0.250	0.329	0.000	0.000	0.995	2.593
261.20	26983	1.400	0.065	0.800	0.157	0.800	0.157	0.800	0.157	0.800	0.157	0.300	0.430	0.000	0.000	1.121	2.698
261.23	27617	1.430	0.066	0.830	0.160	0.830	0.160	0.830	0.160	0.830	0.160	0.330	0.494	0.003	0.003	1.204	2.762
261.25	28040	1.450	0.066	0.850	0.162	0.850	0.162	0.850	0.162	0.850	0.162	0.300	0.494	0.023	0.068	1.278	2.804
261.30	29102	1.500	0.067	0.900	0.168	0.900	0.168	0.900	0.168	0.900	0.168	0.400	0.494	0.073	0.383	1.618	2.910
261.35	30315	1.550	0.069	0.950	0.174	0.950	0.174	0.950	0.174	0.950	0.174	0.450	0.494	0.123	0.839	2.096	3.031
261.40	31445	1.600	0.070	1.000	0.179	1.000	0.179	1.000	0.179	1.000	0.179	0.500	0.494	0.173	1.399	2.679	3.145
261.45	32316	1.650	0.071	1.050	0.184	1.050	0.184	1.050	0.184	1.050	0.184	0.550	0.494	0.223	2.047	3.349	3.232
261.50	33400	1.700	0.072	1.100	0.189	1.100	0.189	1.100	0.189	1.100	0.189	0.600	0.494	0.273	2.773	4.096	3.340
261.55	34502	1.750	0.073	1.150	0.194	1.150	0.194	1.150	0.194	1.150	0.194	0.650	0.494	0.323	3.569	4.913	3.450
261.60	35617	1.800	0.074	1.200	0.199	1.200	0.199	1.200	0.199	1.200	0.199	0.700	0.494	0.373	4.429	5.793	3.562
261.65	36738	1.850	0.075	1.250	0.204	1.250	0.204	1.250	0.204	1.250	0.204	0.750	0.494	0.423	5.348	6.732	3.674
261.70	37872	1.900	0.076	1.300	0.208	1.300	0.208	1.300	0.208	1.300	0.208	0.800	0.494	0.473	6.324	7.727	3.787
261.75	39008	1.950	0.077	1.350	0.213	1.350	0.213	1.350	0.213	1.350	0.213	0.850	0.494	0.523	7.353	8.775	3.901
261.80	40151	2.000	0.078	1.400	0.217	1.400	0.217	1.400	0.217	1.400	0.217	0.900	0.494	0.573	8.432	9.873	4.015
261.85	41340	2.050	0.079	1.450	0.221	1.450	0.221	1.450	0.221	1.450	0.221	0.950	0.494	0.623	9.559	11.018	4.134
261.90	42540	2.100	0.080	1.500	0.226	1.500	0.226	1.500	0.226	1.500	0.226	1.000	0.494	0.673	10.733	12.210	4.254
261.95	43749	2.150	0.081	1.550	0.230	1.550	0.230	1.550	0.230	1.550	0.230	1.050	0.494	0.723	11.951	13.446	4.375
262.00	44976	2.200	0.082	1.600	0.234	1.600	0.234	1.600	0.234	1.600	0.234	1.100	0.494	0.773	13.212	14.724	4.498
262.05	46216	2.250	0.083	1.650	0.238	1.650	0.238	1.650	0.238	1.650	0.238	1.150	0.494	0.823	14.514	16.043	4.622
262.10	47464	2.300	0.084	1.700	0.242	1.700	0.242	1.700	0.242	1.700	0.242	1.200	0.494	0.873	15.857	17.402	4.746
262.15	48725	2.350	0.085	1.750	0.246	1.750	0.246	1.750	0.246	1.750	0.246	1.250	0.494	0.923	17.238	18.800	4.872
262.20	49985	2.400	0.086	1.800	0.249	1.800	0.249	1.800	0.249	1.800	0.249	1.300	0.494	0.973	18.658	20.236	4.999
262.25	51284	2.450	0.087	1.850	0.253	1.850	0.253	1.850	0.253	1.850	0.253	1.350	0.494	1.023	20.115	21.708	5.128
262.30	52586	2.500	0.088	1.900	0.257	1.900	0.257	1.900	0.257	1.900	0.257	1.400	0.494	1.073	21.607	23.217	5.259
262.35	54012	2.550	0.089	1.950	0.260	1.950	0.260	1.950	0.260	1.950	0.260	1.450	0.494	1.123	23.135	24.760	5.401
262.40	55394	2.600	0.090	2.000	0.264	2.000	0.264	2.000	0.264	2.000	0.264	1.500	0.494	1.173	24.697	26.337	5.539
262.45	56546	2.650	0.														

Note: Calculated outflows do not include back

CALCULATION SHEET D-2: STAGE-STORAGE-OUTFLOW FOR POND E4

Table D-2: Stage-Storage-Outflow Curve for Pond E4

		Erosion Control 1		Quantity Control 1		Quantity Control 2		Quantity Control 3		Quantity Control 4		Quantity Control 5		Overflow Weir 1			
		Vertical Orifice		Vertical Orifice		Vertical Orifice		Vertical Orifice		Vertical Orifice		Weir		Overflow Weir			
		Dia (m) = 0.197		Dia (m) = 0.400		Dia (m) = 0.400		Dia (m) = 0.400		Dia (m) = 0.400		L = 1.775		L = 12.000			
		C = 0.62		C = 0.62		C = 0.62		C = 0.62		C = 0.62		C _w = 1.700		C _w = 1.800			
		invert= 258.20		invert= 258.85		invert= 258.85		invert= 258.85		invert= 258.85		invert= 259.45		invert= 259.76			
		Q @ D = 0.026		Q @ D = 0.154		Q @ D = 0.154		Q @ D = 0.154		Q @ D = 0.154		n contr. = 2		n contr. = 0			
Elevation	Active Sto.	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Head	Outflow	Outflow	Storage
(m)	(m³)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m)	(m³/s)	(m³/s)	(ha-m)
258.20	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
258.25	1147	0.050	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.115
258.30	2326	0.100	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.233
258.35	3519	0.150	0.020	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.020	0.352
258.40	4727	0.200	0.027	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.473
258.45	5952	0.250	0.033	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.033	0.595
258.50	7192	0.300	0.038	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.719
258.55	8449	0.350	0.042	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.042	0.845
258.60	9794	0.400	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.046	0.979
258.65	11014	0.450	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.050	1.101
258.70	12330	0.500	0.053	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.053	1.233
258.75	13646	0.550	0.056	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.056	1.365
258.80	14977	0.600	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.059	1.498
258.85	16314	0.650	0.062	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.062	1.631
258.90	17659	0.700	0.065	0.050	0.019	0.050	0.019	0.050	0.019	0.050	0.019	0.000	0.000	0.000	0.000	0.142	1.766
258.95	19005	0.750	0.068	0.100	0.039	0.100	0.039	0.100	0.039	0.100	0.039	0.000	0.000	0.000	0.000	0.222	1.901
259.00	20373	0.800	0.070	0.150	0.058	0.150	0.058	0.150	0.058	0.150	0.058	0.000	0.000	0.000	0.000	0.302	2.037
259.05	21742	0.850	0.073	0.200	0.077	0.200	0.077	0.200	0.077	0.200	0.077	0.000	0.000	0.000	0.000	0.381	2.174
259.10	23121	0.900	0.075	0.250	0.096	0.250	0.096	0.250	0.096	0.250	0.096	0.000	0.000	0.000	0.000	0.461	2.312
259.15	24508	0.950	0.077	0.300	0.116	0.300	0.116	0.300	0.116	0.300	0.116	0.000	0.000	0.000	0.000	0.540	2.451
259.20	25903	1.000	0.079	0.350	0.135	0.350	0.135	0.350	0.135	0.350	0.135	0.000	0.000	0.000	0.000	0.620	2.590
259.25	27307	1.050	0.082	0.400	0.154	0.400	0.154	0.400	0.154	0.400	0.154	0.000	0.000	0.000	0.000	0.699	2.731
259.30	28718	1.100	0.084	0.450	0.173	0.450	0.173	0.450	0.173	0.450	0.173	0.000	0.000	0.000	0.000	0.774	2.872
259.35	30140	1.150	0.086	0.500	0.189	0.500	0.189	0.500	0.189	0.500	0.189	0.000	0.000	0.000	0.000	0.842	3.014
259.40	31570	1.200	0.088	0.550	0.204	0.550	0.204	0.550	0.204	0.550	0.204	0.000	0.000	0.000	0.000	0.905	3.157
259.45	33009	1.250	0.090	0.600	0.218	0.600	0.218	0.600	0.218	0.600	0.218	0.000	0.000	0.000	0.000	0.963	3.301
259.50	34457	1.300	0.092	0.650	0.232	0.650	0.232	0.650	0.232	0.650	0.232	0.050	0.034	0.000	0.000	1.051	3.446
259.55	35911	1.350	0.094	0.700	0.244	0.700	0.244	0.700	0.244	0.700	0.244	0.100	0.094	0.000	0.000	1.164	3.591
259.60	37377	1.400	0.095	0.750	0.256	0.750	0.256	0.750	0.256	0.750	0.256	0.150	0.172	0.000	0.000	1.292	3.738
259.65	38834	1.450	0.097	0.800	0.267	0.800	0.267	0.800	0.267	0.800	0.267	0.200	0.264	0.000	0.000	1.430	3.883
259.70	40315	1.500	0.099	0.850	0.278	0.850	0.278	0.850	0.278	0.850	0.278	0.250	0.367	0.000	0.000	1.579	4.032
259.75	41806	1.550	0.101	0.900	0.289	0.900	0.289	0.900	0.289	0.900	0.289	0.300	0.479	0.000	0.000	1.735	4.181
259.76	41985	1.556	0.101	0.906	0.290	0.906	0.290	0.906	0.290	0.906	0.290	0.306	0.493	0.000	0.000	1.754	4.199
259.80	43306	1.600	0.103	0.950	0.299	0.950	0.299	0.950	0.299	0.950	0.299	0.350	0.493	0.044	0.199	1.991	4.331
259.85	44813	1.650	0.104	1.000	0.309	1.000	0.309	1.000	0.309	1.000	0.309	0.400	0.493	0.094	0.623	2.455	4.481
259.90	46331	1.700	0.106	1.050	0.318	1.050	0.318	1.050	0.318	1.050	0.318	0.450	0.493	0.144	1.180	3.052	4.633
259.95	47856	1.750	0.108	1.100	0.327	1.100	0.327	1.100	0.327	1.100	0.327	0.500	0.493	0.194	1.846	3.756	4.786
260.00	49391	1.800	0.109	1.150	0.336	1.150	0.336	1.150	0.336	1.150	0.336	0.550	0.493	0.244	2.603	4.551	4.939
260.05	50941	1.850	0.111	1.200	0.345	1.200	0.345	1.200	0.345	1.200	0.345	0.600	0.493	0.294	3.443	5.428	5.094
260.10	52492	1.900	0.112	1.250	0.354	1.250	0.354	1.250	0.354	1.250	0.354	0.650	0.493	0.344	4.358	6.378	5.249
260.15	54058	1.950	0.114	1.300	0.362	1.300	0.362	1.300	0.362	1.300	0.362	0.700	0.493	0.394	5.342	7.397	5.406
260.20	55604	2.000	0.115	1.350	0.370	1.350	0.370	1.350	0.370	1.350	0.370	0.750	0.493	0.444	6.390	8.479	5.560
260.25	57180	2.050	0.117	1.400	0.378	1.400	0.378	1.400	0.378	1.400	0.378	0.800	0.493	0.494	7.500	9.622	5.718
260.30	58793	2.100	0.118	1.450	0.386	1.450	0.386	1.450	0.386	1.450	0.386	0.850	0.493	0.544	8.667	10.822	5.879
260.35	60795	2.150	0.120	1.500	0.393	1.500	0.393	1.500	0.393	1.500	0.393	0.900	0.493	0.594	9.889	12.076	6.079
260.40	62566	2.200	0.121	1.550	0.401	1.550	0.401	1.550	0.401	1.550	0.401	0.950	0.493	0.644	11.163	13.381	6.257
260.45	63567	2.250	0.123	1.600	0.408	1.600	0.408	1.600	0.408	1.600	0.408	1.000	0.493	0.694	12.488	14.737	6.357
260.50	65177	2.300	0.124	1.650	0.416	1.650	0.416	1.650	0.416	1.650	0.416	1.050	0.493	0.744	13.862	16.141	6.518

Note: Calculated outflows do not included backwater effects from downstream pipes

CALCULATION SHEET D-3 - CONTROLS FOR POND E3

Table D-3: Controls for Pond E3

Erosion Control 1			Quantity Control 1			Quantity Control 2			Quantity Control 3			Quantity Control 4			Quantity Control 5			Overflow Control 1		
Vertical Circ. Orifice			Vertical Circ. Orifice			Vertical Circ. Orifice			Vertical Circ. Orifice			Vertical Circ. Orifice			Sharp Crested Weir			Overflow Weir (Control Box)		
Diameter	(m)	0.162	Diameter	(m)	0.300	Diameter	(m)	0.300	Diameter	(m)	0.300	Diameter	(m)	0.300	L	(m)	1.600	L	(m)	10.800
A_o	(m ²)	0.02061	A_o	(m ²)	0.07069	A_o	(m ²)	0.07069	A_o	(m ²)	0.07069	A_o	(m ²)	0.07069	C_w		1.7	C_w		1.8
C_o		0.62	C_o		0.62	C_o		0.62	C_o		0.62	C_o		0.62	Crest Elev.	(m)	260.900	Crest Elev.	(m)	261.230
Invert	(m)	259.80	Invert	(m)	260.40	Invert	(m)	260.40	Invert	(m)	260.40	Invert	(m)	260.40	100-yr Level	(m)	261.229	Regional Level	(m)	261.893
100-yr Water Level	(m)	261.229	100-yr Water Level	(m)	261.229	100-yr Water Level	(m)	261.229	100-yr Water Level	(m)	261.229	100-yr Water Level	(m)	261.229	$h_{(100-yr)}$	(m)	0.329	$h_{(regional)}$	(m)	0.663
h	(m)	1.348	h	(m)	0.679	h	(m)	0.679	h	(m)	0.679	h	(m)	0.679	n		2	n		0
Q_o	(m ³ /s)	0.066	Q_o	(m ³ /s)	0.160	Q_o	(m ³ /s)	0.160	Q_o	(m ³ /s)	0.160	Q_o	(m ³ /s)	0.160	Q_w	(m ³ /s)	0.492	Q_w	(m ³ /s)	10.495
Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$ Q_o is the orifice flow C_o is the orifice coefficient A_o is the orifice flow area g is the gravitational constant h is the head of water			Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$ Q_o is the orifice flow C_o is the orifice coefficient A_o is the orifice flow area g is the gravitational constant h is the head of water			Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$ Q_o is the orifice flow C_o is the orifice coefficient A_o is the orifice flow area g is the gravitational constant h is the head of water			Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$ Q_o is the orifice flow C_o is the orifice coefficient A_o is the orifice flow area g is the gravitational constant h is the head of water			Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$ Q_o is the orifice flow C_o is the orifice coefficient A_o is the orifice flow area g is the gravitational constant h is the head of water			Weir Equation: $Q_w = C_w (L-0.1nh)(h)^{1.5}$ Q_w is the weir flow C_w is the weir coefficient L is the weir length h is the weir height n is the # of side contractions			Weir Equation: $Q_w = C_w (L-0.1nh)(h)^{1.5}$ Q_w is the weir flow C_w is the weir coefficient L is the weir length h is the weir height n is the # of side contractions		

CALCULATION SHEET D-4 - CONTROLS FOR POND E4

Table D-4: Controls for Pond E4

Erosion Control 1			Quantity Control 1			Quantity Control 2			Quantity Control 3			Quantity Control 4			Quantity Control 5			Overflow Weir 1		
Vertical Circ. Orifice			Vertical Circ. Orifice			Vertical Circ. Orifice			Vertical Circ. Orifice			Vertical Circ. Orifice			Sharp Crested Weir			Overflow Weir (Control Box)		
Diameter	(m)	0.197	Diameter	(m)	0.400	Diameter	(m)	0.400	Diameter	(m)	0.400	Diameter	(m)	0.400	L	(m)	1.775	L	(m)	12.000
A_o	(m ²)	0.03048	A_o	(m ²)	0.12566	A_o	(m ²)	0.12566	A_o	(m ²)	0.12566	A_o	(m ²)	0.12566	C_w		1.7	C_w		1.8
C_o		0.62	C_o		0.62	C_o		0.62	C_o		0.62	C_o		0.62	Crest Elev.	(m)	259.450	Crest Elev.	(m)	259.756
invert	(m)	258.20	invert	(m)	258.85	invert	(m)	258.85	invert	(m)	258.85	invert	(m)	258.85	100-yr Level	(m)	259.756	Regional Level	(m)	260.284
100-yr Water Level	(m)	259.909	100-yr Water Level	(m)	259.909	100-yr Water Level	(m)	259.909	100-yr Water Level	(m)	259.909	100-yr Water Level	(m)	259.909	$h_{(100-yr)}$	(m)	0.306	$h_{(regional)}$	(m)	0.528
h	(m)	1.611	h	(m)	0.859	h	(m)	0.859	h	(m)	0.859	h	(m)	0.859	n		2	n		0
Q_o	(m ³ /s)	0.106	Q_o	(m ³ /s)	0.320	Q_o	(m ³ /s)	0.320	Q_o	(m ³ /s)	0.320	Q_o	(m ³ /s)	0.320	Q_w	(m ³ /s)	0.493	Q_w	(m ³ /s)	8.287
Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$			Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$			Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$			Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$			Orifice Equation: $Q_o = C_o A_o (2gh)^{0.5}$			Weir Equation: $Q_w = C_w (L - 0.1nh)(h)^{1.5}$			Weir Equation: $Q_w = C_w (L - 0.1nh)(h)^{1.5}$		
Q_o is the orifice flow			Q_o is the orifice flow			Q_o is the orifice flow			Q_o is the orifice flow			Q_o is the orifice flow			Q_w is the weir flow			Q_w is the weir flow		
C_o is the orifice coefficient			C_o is the orifice coefficient			C_o is the orifice coefficient			C_o is the orifice coefficient			C_o is the orifice coefficient			C_w is the weir coefficient			C_w is the weir coefficient		
A_o is the orifice flow area			A_o is the orifice flow area			A_o is the orifice flow area			A_o is the orifice flow area			A_o is the orifice flow area			L is the weir length			L is the weir length		
g is the gravitational constant			g is the gravitational constant			g is the gravitational constant			g is the gravitational constant			g is the gravitational constant			h is the weir height			h is the weir height		
h is the head of water			h is the head of water			h is the head of water			h is the head of water			h is the head of water			n is the # of side contractions			n is the # of side contractions		

CALCULATION SHEET D-5: VELOCITIES AT OUTFLOW PIPES

Table D-5: Velocities at Outflow Pipes

Storm	Peak Velocities (m/s)	
	Pond E3	Pond E4
2-yr 6-h AES	0.94	2.07
5-yr 6-h AES	1.23	2.74
10-yr 6-h AES	1.37	3.05
25-yr 6-h AES	1.54	3.33
50-yr 6-h AES	1.70	3.59
100-yr 6-h AES	1.84	3.83

APPENDIX E

UNIT FLOW EQUATIONS AND PRE-DEVELOPMENT FLOWS

**ESTIMATED UNIT FLOW RATE REGRESSION RELATIONSHIPS
(LINEAR REGRESSION METHOD)
6 HOUR AES RAINFALL**

RETURN PERIOD	TRIBUTARY									
	Tributary 1 - Node A to E		Tributary 2 - Node N to E		Tributary 3 - Node N to G		Tributary 4 - Node W to N		Tributary 5 - Node W to O	
	Regression Equation	R ²	Regression Equation	R ²	Regression Equation	R ²	Regression Equation	R ²	Regression Equation	R ²
2 Year	y = -0.0003x + 4.3435	0.9195	y = 0.0006x - 1.7357	0.5675	y = 0.0028x - 0.0241	0.9974	y = 4E-05x + 5.4143	0.0350	y = -0.0077x + 29.71	0.4638
5 Year	y = -0.0005x + 7.7937	0.9206	y = 0.0008x - 0.5459	0.4331	y = 0.0038x + 1.4353	0.9972	y = 7E-06x + 9.1455	0.0006	y = -0.0104x + 41.966	0.4166
10 Year	y = -0.0007x + 10.453	0.9206	y = 0.0008x + 0.3602	0.3627	y = 0.0081x - 3.9654	0.9929	y = -1E-05x + 11.855	0.0011	y = -0.0129x + 52.065	0.4169
25 Year	y = -0.0009x + 14.103	0.9224	y = 0.001x + 1.3059	0.3446	y = 0.01x - 3.7307	0.9935	y = -3E-05x + 15.471	0.0049	y = -0.0189x + 70.833	0.5277
50 Year	y = -0.001x + 17.01	0.9234	y = 0.0011x + 2.3265	0.3108	y = 0.0113x - 2.6534	0.9899	y = -4E-05x + 18.157	0.0074	y = -0.0242x + 87.806	0.5650
100 Year	y = -0.0012x + 20.017	0.9231	y = 0.0014x + 2.6812	0.3453	y = 0.0128x - 1.6957	0.9777	y = -0.0001x + 22.201	0.0354	y = -0.0307x + 106.92	0.6414
Regional	y = -0.0032x + 75.779	0.9225	y = 0.001x + 46.24	0.0760	y = -0.0028x + 101.89	0.9672	y = -0.001x + 77.157	0.8984	y = -0.0379x + 159.32	0.7893
Average R ²		0.9217		0.3486		0.9880		0.1404		0.5458

RETURN PERIOD	TRIBUTARY				Notes: 1. Equations for Tributary 6 should be applied to Tributary 2 in light of the superior statistical relationship derived for this tributary (of which Tributary 2 is a subset). 2. Similarly, equation for Tributaries 3 should be used in favour of the equations for Tributary 7, due to their superior statistical significance. 3. Catchments 201, 202, 203, 205, 206, 207, 209, 210, 211, 212, 219 each have their own local tributary of Etobicoke Creek. Therefore, it is recommended that the unit flow rates for these catchments be calculated individually based on their individual peak flows divided by their individual drainage area (see Appendix F and Table 3.3). 4. y = Unit Flow Rate in l/s/ha 5. Result defined as statistically significant if R ² value greater than 0.5. Note that if R ² =1.0 all variance is
	Tributary 6 - Node W to E		Tributary 7 - Node W to G		
	Regression Equation	R ²	Regression Equation	R ²	
2 Year	y = 0.0003x + 0.2669	0.8974	y = -0.0002x + 9.9357	0.1624	
5 Year	y = 0.0005x + 1.348	0.8831	y = -0.0003x + 15.325	0.1950	
10 Year	y = 0.0006x + 2.13	0.8682	y = -0.0004x + 19.554	0.2219	
25 Year	y = 0.0007x + 3.5498	0.8542	y = -0.0006x + 25.269	0.2425	
50 Year	y = 0.0008x + 4.6604	0.8411	y = -0.0007x + 30.247	0.2774	
100 Year	y = 0.0008x + 6.1373	0.8303	y = -0.0009x + 35.552	0.2950	
Regional	y = 0.0007x + 47.282	0.5076	y = -0.0024x + 100.44	0.9789	
Average R ²		0.8117		0.3390	

Recommended Unit Flow Rate Equations

CALCULATION SHEET E-1: ALLOWABLE RELEASE RATES

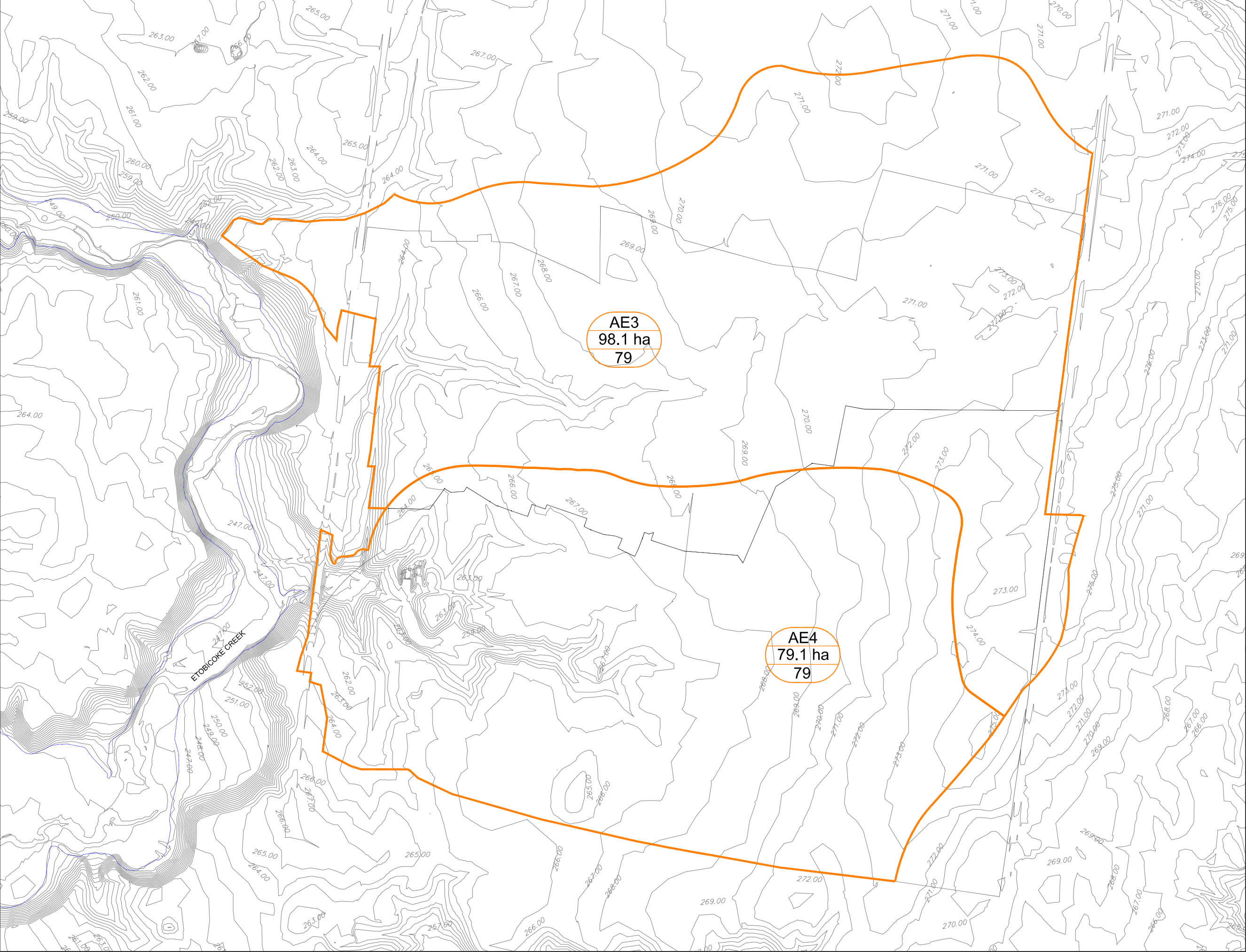
Table E-1: Pre-Development Flows vs Unit Flows

		Flows (m ³ /s)						
		Area	2-year	5-year	10-year	25-year	50-year	100-year
Pond E3	Pre-Development ⁽¹⁾	98.10	0.887	1.438	1.846	2.392	2.822	3.261
	Unit Flows ⁽²⁾	62.22	0.269	0.483	0.648	0.874	1.055	1.241
Pond E4	Pre-Development ⁽¹⁾	79.10	0.955	1.551	1.993	2.588	3.055	3.533
	Unit Flows ⁽²⁾	88.25	0.381	0.684	0.917	1.238	1.493	1.757

Notes:

⁽¹⁾ Based on SWMHYMO model M25-PRE.DAT (refer to Figure E-1 and attached SWMHYMO files).

⁽²⁾ Based on TRCA's unit flow equations (refer to Figure 2 and Table 4.3).



LEGEND :

- PRE-DEVELOPMENT DRAINAGE BOUNDARY
- POST-DEVELOPMENT DRAINAGE BOUNDARY
- WATERCOURSE

AE3

98.1 ha

79

PRE-DEVELOPMENT AREA ID
DRAINAGE AREA
CN

SCALE :

0 50 100 150 200 250 300m

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600 ALDEN ROAD., SUITE 500
MARKHAM, ONTARIO, L3R 0E7
(905) 475-3080

Phases 1a and 2 of Mayfield West Subdivision to Ponds E3 and E4

Pre-Development Drainage Areas

FIGURE E-1

DESIGNED:	
DRAWN:	SPB/LP
VERIFIED:	AV
APPROVED: AV	
DATE	PROJECT No.
Aug/08	552-05

DRAWING REF.
552-05\200807 3rd PDB SWMR\
Design\JFSA Figures.dwg



LEGEND :

POST-DEVELOPMENT DRAINAGE BOUNDARY

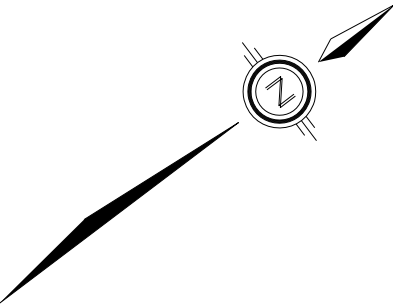
WATERCOURSE

AE3
62.156 ha
62.3%

POST-DEVELOPMENT AREA ID
DRAINAGE AREA
IMPERVIOUSNESS

SCALE :

0 25 50 75 100 125 150m



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Phases 1a and 2 of Mayfield West
Subdivision to Ponds E3 and E4

Post-Development
Drainage Areas

FIGURE E-2	DESIGNED:	
	DRAWN:	SPB/LP
	VERIFIED:	AV
	APPROVED:	AV
DRAWING REF. 552-05\200807 3rd PDB SWMR\ Design\CAD\JFSA Figures.dwg	DATE	PROJECT No.
	Aug/08	552-05

```

00001> 20      Metric units
00002> *#*****
00003> *# Project Name: [Mayfield West]      Project Number: [552-05]
00004> *# Date       : 2008/04/29
00005> *# Modeller   : [AV]
00006> *# Company    : JFSA
00007> *# License #   : 1155024
00008> *#*****
00009> *% 2 year 6 hour AES storm
00010> START      TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[2]
00011> *          ["2Y6.stm"] <--storm filename, one per line for NSTORM time
00012> *%-----|-----
00013> READ STORM  STORM_FILENAME=["STORM.001"]
00014> *%-----|-----
00015> *****|*****
00016> *# SIMULATIONS FOR PRE-DEVELOPMENT CONDITIONS *
00017> *****|*****
00018> *%-----|-----
00019> *# Drainage area A03
00020> DESIGN NASHYD NHYD=["A03"], DT=[5]min, AREA=[98.1](ha),
00021> DWF=[0](cms), CN/C=[79], TP=[1.58]hrs,
00022> RAINFALL=[ , , , , ](mm/hr), END=-1
00023> *%-----|-----
00024> *# Drainage area A04
00025> DESIGN NASHYD NHYD=["A04"], DT=[5]min, AREA=[79.1](ha),
00026> DWF=[0](cms), CN/C=[79], TP=[1.05]hrs,
00027> RAINFALL=[ , , , , ](mm/hr), END=-1
00028> *%-----|-----
00029> *%-----|-----
00030> *% 5 year 6 hour AES storm
00031> START      TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[5]
00032> *          ["5Y6.stm"] <--storm filename, one per line for NSTORM time
00033> *%-----|-----
00034> *% 10 year 6 hour AES storm
00035> START      TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[10]
00036> *          ["10Y6.stm"] <--storm filename, one per line for NSTORM time
00037> *%-----|-----
00038> *% 25 year 6 hour AES storm
00039> START      TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[25]
00040> *          ["25Y6.stm"] <--storm filename, one per line for NSTORM time
00041> *%-----|-----
00042> *% 50 year 6 hour AES storm
00043> START      TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[50]
00044> *          ["50Y6.stm"] <--storm filename, one per line for NSTORM time
00045> *%-----|-----
00046> *% 100 year 6 hour AES storm
00047> START      TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[100]
00048> *          ["100Y6.stm"] <--storm filename, one per line for NSTORM time
00049> *%-----|-----
00050> FINISH
00051>
00052>
00053>

```

```
00001> =====
00002>
00003> SSSSS W W M M H H Y Y M M 000 999 999 =====
00004> S W W W M M H H Y Y M M 0 0 9 9 9 9
00005> SSSSS W W W M M M H H H H Y M M M 0 0 ## 9 9 9 9 Ver5 Beta
00006> S W W M M H H Y M M 0 0 9999 9999 Sept 2000
00007> SSSSS W W M M H H Y M M 000 9 9 =====
00008> 9 9 9 9 # 2582634
00009> StormWater Management Hydrologic Model 999 999 =====
00010>
00011> *****
00012> ***** SWMHYMO Ver/5 Beta *****
00013> ***** A single event and continuous hydrologic simulation model *****
00014> ***** based on the principles of HYMO and its successors *****
00015> ***** OTTHYMO-83 and OTTHYMO-89. *****
00016> *****
00017> ***** Distributed by: J.F. Sabourin and Associates Inc. *****
00018> ***** Ottawa, Ontario: (613) 727-5199 *****
00019> ***** Gatineau, Quebec: (819) 243-6858 *****
00020> ***** E-Mail: swmhymo@jfsa.Com *****
00021> *****
00022>
00023> ++++++
00024> ++++++ Licensed user: JFSAlnc. ++++++
00025> ++++++ Ottawa / Gatineau SERIAL#:2582634 ++++++
00026> ++++++
00027>
00028> *****
00029> ***** ++++++ PROGRAM ARRAY DIMENSIONS ++++++ *****
00030> ***** Maximum value for ID numbers : 10 *****
00031> ***** Max. number of rainfall points: 52750 *****
00032> ***** Max. number of flow points : 52750 *****
00033> *****
00034>
00035> *** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) ***
00036> *** ----- ***
00037> *** ID: Hydrograph IDentification numbers, (1-10). ***
00038> *** NHYD: Hydrograph reference numbers, (6 digits or characters). ***
00039> *** AREA: Drainage area associated with hydrograph, (ac.) or (ha.). ***
00040> *** QPEAK: Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s). ***
00041> *** TpeakDate_hh:mm is the date and time of the peak flow. ***
00042> *** R.V.: Runoff Volume of simulated hydrograph, (in) or (mm). ***
00043> *** R.C.: Runoff Coefficient of simulated hydrograph, (ratio). ***
00044> *** *: see WARNING or NOTE message printed at end of run. ***
00045> *** **: see ERROR message printed at end of run. ***
00046> *****
00047> *****
00048>
00049> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00050>
00051> *****
00052>
00053> ***** S U M M A R Y O U T P U T *****
00054> *****
00055> * DATE: 2008-08-14 TIME: 12:04:24 RUN COUNTER: 000314 *
00056> *****
00057> * Input filename: Z:\PROJ\552-05\200807-3\PDBSWM-1\Design\SWMHYMO\M25-PR*
00058> * Output filename: Z:\PROJ\552-05\200807-3\PDBSWM-1\Design\SWMHYMO\M25-PR*
00059> * Summary filename: Z:\PROJ\552-05\200807-3\PDBSWM-1\Design\SWMHYMO\M25-PR*
00060> * User comments:
00061> * 1:
00062> * 2:
00063> * 3:
00064> *****
00065>
00066>
00067> #*****
00068> # Project Name: [Mayfield West] Project Number: [552-05]
00069> # Date : 2008/04/29
00070> # Modeller : [AV]
00071> # Company : JFSA
00072> # License # : 1155024
00073> #*****
00074> ** END OF RUN : 1
00075>
00076> *****
00077>
00078>
00079>
00080>
00081>
00082> RUN:COMMAND#
00083> 002:0001-----
00084> START
00085> [TZERO = .00 hrs on 0]
00086> [METOUT= 2 (1=imperial, 2=metric output)]
00087> [NSTORM= 1 ]
00088> [NRUN = 2 ]
00089> #*****
```

```
00090> # Project Name: [Mayfield West] Project Number: [552-05]
00091> # Date : 2008/04/29
00092> # Modeller : [AV]
00093> # Company : JFSA
00094> # License # : 1155024
00095> #*****
00096> 002:0002-----
00097> READ STORM
00098> Filename = STORM.001
00099> Comment = 2yr/6hr
00100> [SDT=15.00:SDUR= 6.25:PTOT= 36.00]
00101> # SIMULATIONS FOR PRE-DEVELOPMENT CONDITIONS *
00102> # Drainage area A03
00103> 002:0003-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00104> DESIGN NASHYD 01:A03 98.10 .887 No_date 4:30 11.67 .324
00105> [CN= 79.0: N= 3.00]
00106> [Tp= 1.58:DT= 5.00]
00107> # Drainage area A04
00108> 002:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00109> DESIGN NASHYD 01:A04 79.10 .955 No_date 3:55 11.67 .324
00110> [CN= 79.0: N= 3.00]
00111> [Tp= 1.05:DT= 5.00]
00112> ** END OF RUN : 4
00113>
00114> *****
00115>
00116>
00117>
00118>
00119>
00120> RUN:COMMAND#
00121> 005:0001-----
00122> START
00123> [TZERO = .00 hrs on 0]
00124> [METOUT= 2 (1=imperial, 2=metric output)]
00125> [NSTORM= 1 ]
00126> [NRUN = 5 ]
00127> #*****
00128> # Project Name: [Mayfield West] Project Number: [552-05]
00129> # Date : 2008/04/29
00130> # Modeller : [AV]
00131> # Company : JFSA
00132> # License # : 1155024
00133> #*****
00134> 005:0002-----
00135> READ STORM
00136> Filename = STORM.001
00137> Comment = 5yr/6hr
00138> [SDT=15.00:SDUR= 6.25:PTOT= 47.81]
00139> # SIMULATIONS FOR PRE-DEVELOPMENT CONDITIONS *
00140> # Drainage area A03
00141> 005:0003-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00142> DESIGN NASHYD 01:A03 98.10 1.438 No_date 4:30 18.84 .394
00143> [CN= 79.0: N= 3.00]
00144> [Tp= 1.58:DT= 5.00]
00145> # Drainage area A04
00146> 005:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00147> DESIGN NASHYD 01:A04 79.10 1.551 No_date 3:50 18.84 .394
00148> [CN= 79.0: N= 3.00]
00149> [Tp= 1.05:DT= 5.00]
00150> ** END OF RUN : 9
00151>
00152> *****
00153>
00154>
00155>
00156>
00157>
00158> RUN:COMMAND#
00159> 010:0001-----
00160> START
00161> [TZERO = .00 hrs on 0]
00162> [METOUT= 2 (1=imperial, 2=metric output)]
00163> [NSTORM= 1 ]
00164> [NRUN = 10 ]
00165> #*****
00166> # Project Name: [Mayfield West] Project Number: [552-05]
00167> # Date : 2008/04/29
00168> # Modeller : [AV]
00169> # Company : JFSA
00170> # License # : 1155024
00171> #*****
00172> 010:0002-----
00173> READ STORM
00174> Filename = STORM.001
00175> Comment = 10yr/6hr
00176> [SDT=15.00:SDUR= 6.25:PTOT= 55.69]
00177> # SIMULATIONS FOR PRE-DEVELOPMENT CONDITIONS *
00178> # Drainage area A03
```

```
00179> 010:0003-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00180> DESIGN NASHYD 01:A03 98.10 1.846 No_date 4:30 24.13 .433
00181> [CN= 79.0: N= 3.00]
00182> [Tp= 1.58:DT= 5.00]
00183> # Drainage area A04
00184> 010:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00185> DESIGN NASHYD 01:A04 79.10 1.993 No_date 3:50 24.13 .433
00186> [CN= 79.0: N= 3.00]
00187> [Tp= 1.05:DT= 5.00]
00188> ** END OF RUN : 24
00189>
00190> *****
00191>
00192>
00193>
00194>
00195>
00196> RUN:COMMAND#
00197> 025:0001-----
00198> START
00199> [TZERO = .00 hrs on 0]
00200> [METOUT= 2 (1=imperial, 2=metric output)]
00201> [NSTORM= 1 ]
00202> [NRUN = 25 ]
00203> #*****
00204> # Project Name: [Mayfield West] Project Number: [552-05]
00205> # Date : 2008/04/29
00206> # Modeller : [AV]
00207> # Company : JFSA
00208> # License # : 1155024
00209> #*****
00210> 025:0002-----
00211> READ STORM
00212> Filename = STORM.001
00213> Comment = 25yr/6hr
00214> [SDT=15.00:SDUR= 6.25:PTOT= 65.59]
00215> # SIMULATIONS FOR PRE-DEVELOPMENT CONDITIONS *
00216> # Drainage area A03
00217> 025:0003-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00218> DESIGN NASHYD 01:A03 98.10 2.392 No_date 4:30 31.21 .476
00219> [CN= 79.0: N= 3.00]
00220> [Tp= 1.58:DT= 5.00]
00221> # Drainage area A04
00222> 025:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00223> DESIGN NASHYD 01:A04 79.10 2.588 No_date 3:50 31.21 .476
00224> [CN= 79.0: N= 3.00]
00225> [Tp= 1.05:DT= 5.00]
00226> ** END OF RUN : 49
00227>
00228> *****
00229>
00230>
00231>
00232>
00233>
00234> RUN:COMMAND#
00235> 050:0001-----
00236> START
00237> [TZERO = .00 hrs on 0]
00238> [METOUT= 2 (1=imperial, 2=metric output)]
00239> [NSTORM= 1 ]
00240> [NRUN = 50 ]
00241> #*****
00242> # Project Name: [Mayfield West] Project Number: [552-05]
00243> # Date : 2008/04/29
00244> # Modeller : [AV]
00245> # Company : JFSA
00246> # License # : 1155024
00247> #*****
00248> 050:0002-----
00249> READ STORM
00250> Filename = STORM.001
00251> Comment = 50yr/6hr
00252> [SDT=15.00:SDUR= 6.25:PTOT= 73.00]
00253> # SIMULATIONS FOR PRE-DEVELOPMENT CONDITIONS *
00254> # Drainage area A03
00255> 050:0003-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00256> DESIGN NASHYD 01:A03 98.10 2.822 No_date 4:25 36.77 .504
00257> [CN= 79.0: N= 3.00]
00258> [Tp= 1.58:DT= 5.00]
00259> # Drainage area A04
00260> 050:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00261> DESIGN NASHYD 01:A04 79.10 3.055 No_date 3:50 36.77 .504
00262> [CN= 79.0: N= 3.00]
00263> [Tp= 1.05:DT= 5.00]
00264> ** END OF RUN : 99
00265>
00266> *****
00267>
```

```

00268>
00269>
00270>
00271>
00272> RUN:COMMAND#
00273> 100:0001-----
00274>     START
00275>     [TZERO = .00 hrs on      0]
00276>     [METOUT= 2      (1=imperial, 2=metric output)]
00277>     [NSTORM= 1 ]
00278>     [NRUN = 100 ]
00279> #*****
00280> # Project Name: [Mayfield West] Project Number: [552-05]
00281> # Date : 2008/04/29
00282> # Modeller : [AV]
00283> # Company : JFSA
00284> # License # : 1155024
00285> #*****
00286> 100:0002-----
00287>     READ STORM
00288>     Filename = STORM.001
00289>     Comment = 100yr/6hr
00290>     [SDT=15.00:SDUR= 6.25:PTOT= 80.31]
00291> # SIMULATIONS FOR PRE-DEVELOPMENT CONDITIONS *
00292> # Drainage area A03
00293> 100:0003-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00294>     DESIGN NASHYD 01:A03 98.10 3.261 No_date 4:25 42.45 .529
00295>     [CN= 79.0: N= 3.00]
00296>     [Tp= 1.58:DT= 5.00]
00297> # Drainage area A04
00298> 100:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm---R.V.-R.C.-
00299>     DESIGN NASHYD 01:A04 79.10 3.533 No_date 3:50 42.45 .529
00300>     [CN= 79.0: N= 3.00]
00301>     [Tp= 1.05:DT= 5.00]
00302> 100:0002-----
00303>     FINISH
00304> -----
00305> *****
00306>     WARNINGS / ERRORS / NOTES
00307> -----
00308>     Simulation ended on 2008-08-14 at 12:04:26
00309> =====
00310>
00311>

```

APPENDIX F

POST-DEVELOPMENT DRAINAGE AREAS AND AVERAGE IMPERVIOUSNESS

CALCULATION SHEET F-1: IMPERVIOUSNESS FOR POND E3

Table F-1 - Weighted Average Imperviousness for Pond E3

Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
43N1	0.274	71	19.454
44NE	0.348	61	21.228
44NW	0.071	61	4.331
45NE	0.088	61	5.368
46NE	0.397	61	24.217
46SE	0.097	61	5.917
48NE	0.081	56	4.536
48NW	0.201	61	12.261
48R1	0.094	25	2.350
48S1	0.019	44	0.836
48SE	0.141	75	10.575
48SW	0.149	73	10.877
49NW	0.149	47	7.003
49S1	0.019	20	0.380
49SE	0.206	61	12.566
49SW	0.124	59	7.316
50SE	0.121	72	8.712
50SW	0.044	64	2.816
51NE	0.161	65	10.465
51NW	0.144	75	10.800
51R1	0.246	10	2.460
51SE	0.080	45	3.600
52NE	0.169	75	12.675
52S1	0.038	38	1.444
52SE	0.167	74	12.358
52SW	0.076	62	4.712
53NE	0.147	65	9.555
53R1	0.169	20	3.380
53R2	0.111	23	2.553
53SE	0.151	68	10.268
54NE	0.185	71	13.135
54R1	0.173	22	3.806
54S1	0.117	66	7.722
54SE	0.161	70	11.270
54SW	0.031	53	1.643
55NE	0.114	53	6.042
55NW	0.083	71	5.893
55R1	0.116	23	2.668
55SW	0.091	75	6.825
56NE	0.098	60	5.880
56NW	0.090	51	4.590
56R1	0.257	16	4.112
57NE	0.106	70	7.420
57NW	0.077	58	4.466

CALCULATION SHEET F-1: IMPERVIOUSNESS FOR POND E3

Table F-1 - Weighted Average Imperviousness for Pond E3

Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
57R1	0.175	27	4.725
57SE	0.190	70	13.300
57SW	0.175	60	10.500
58NE	0.063	47	2.961
58NW	0.049	78	3.822
58R1	0.214	24	5.136
58SE	0.169	75	12.675
58SW	0.186	54	10.044
58WW	0.091	38	3.458
59NE	0.144	65	9.360
59R1	0.168	23	3.864
59R2	0.058	16	0.928
59R3	0.177	24	4.248
59R4	0.146	23	3.358
59SE	0.154	70	10.780
60NW	0.226	71	16.046
60S1	0.029	49	1.421
60SW	0.168	72	12.096
61NE	0.062	71	4.402
61NW	0.048	81	3.888
61S1	0.082	72	5.904
61S2	0.069	65	4.485
61SE	0.075	66	4.950
61SW	0.064	76	4.864
65NE	0.044	68	2.992
65SE	0.110	74	8.140
66NE	0.069	63	4.347
66NW	0.090	51	4.590
66R1	0.196	23	4.508
66R2	0.147	25	3.675
66SE	0.182	75	13.650
66SW	0.143	71	10.153
69NE	0.261	61	15.921
69NW	0.149	61	9.089
70NE	0.293	61	17.873
70NW	0.107	61	6.527
70SE	0.021	40	0.840
71NE	0.156	74	11.544
71R1	0.203	23	4.669
71SE	0.234	75	17.550
72NE	0.120	61	7.320
72NW	0.082	61	5.002
73NE	0.401	61	24.461
73NW	0.236	61	14.396

CALCULATION SHEET F-1: IMPERVIOUSNESS FOR POND E3

Table F-1 - Weighted Average Imperviousness for Pond E3

Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
73R1	0.176	26	4.576
73SE	0.022	70	1.540
77N1	0.179	61	10.919
75NE	0.127	61	7.747
75NW	0.154	61	9.394
76NE	0.087	61	5.307
76NW	0.081	61	4.941
76SE	0.054	67	3.618
77NE	0.027	64	1.728
77NW	0.029	37	1.073
77SE	0.197	67	13.199
78NE	0.475	61	28.975
78NW	0.264	61	16.104
78SE	0.130	61	7.930
78SW	0.127	61	7.747
79NE	0.195	61	11.895
79SE	0.073	61	4.453
80NW	0.021	69	1.449
80S1	0.098	68	6.664
80S2	0.090	71	6.390
80S3	0.152	61	9.272
80SW	0.022	76	1.672
81NE	0.105	99	10.395
81NW	0.105	99	10.395
83N	0.057	99	5.643
83S	0.180	75	13.500
84NE	0.036	99	3.564
84NW	0.013	99	1.287
84SE	0.068	76	5.168
84SW	0.093	75	6.975
85NE	0.035	99	3.465
85NW	0.035	99	3.465
85SE	0.024	72	1.728
86NE	0.053	71	3.763
86NW	0.091	39	3.549
86SE	0.055	64	3.520
86SW	0.146	70	10.220
87NE	0.054	66	3.564
87NW	0.134	71	9.514
88NE	0.146	66	9.636
88NW	0.123	51	6.273
88R1	0.123	28	3.444
88R2	0.113	25	2.825
88R3	0.033	23	0.759

CALCULATION SHEET F-1: IMPERVIOUSNESS FOR POND E3

Table F-1 - Weighted Average Imperviousness for Pond E3

Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
88R4	0.036	23	0.828
88R5	0.034	23	0.782
88R6	0.048	62	2.976
88R7	0.158	22	3.476
88S1	0.164	74	12.136
88S2	0.156	73	11.388
88SE	0.058	68	3.944
88SW	0.056	66	3.696
89N1	0.049	46	2.254
89R1	0.054	25	1.350
90N1	0.040	50	2.000
90NE	0.028	37	1.036
90NW	0.030	56	1.680
90R1	0.155	25	3.875
90SE	0.044	66	2.904
90SW	0.175	69	12.075
91NE	0.015	65	0.975
91NW	0.015	71	1.065
91SE	0.036	69	2.484
91SW	0.154	71	10.934
92NE	0.029	55	1.595
92NW	0.020	63	1.260
92SW	0.029	62	1.798
E6500NE	1.032	61	62.952
E6500NN	16.828	79	1329.412
E6500NW	0.500	61	30.500
E6500SW	1.131	61	68.991
E6501N1	1.386	61	84.546
E6501NE	4.534	61	276.574
E6501NW	2.745	79	216.855
E6501S1	0.018	61	1.098
E6501S2	2.000	61	122.000
E6501S3	1.057	61	64.477
E6501SE	2.021	61	123.281
E6501SW	0.426	61	25.986
E83	0.293	99	29.007
E84	0.222	99	21.978
E85	0.164	61	10.004
E87	0.852	79	67.308
E80W	0.066	77	5.082
E80E	0.052	99	5.148
PK01	0.244	7	1.708
PK02	2.062	57	117.534
PK03	0.072	7	0.504

CALCULATION SHEET F-1: IMPERVIOUSNESS FOR POND E3

Table F-1 - Weighted Average Imperviousness for Pond E3

Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
PK04	0.259	7	1.813
PK05	0.209	7	1.463
PK06	0.100	7	0.700
PK07	0.140	7	0.980
PK08	0.170	7	1.190
PK09	0.202	7	1.414
PK10	0.212	7	1.484
POND	4.502	44	198.088
PONDR1	0.330	20	6.600
Total	62.221		3929.380

Weighted Average = S(Area x Imp) / Total Area = 3929.38 / 62.221 = 63.15 %

CALCULATION SHEET F-2: IMPERVIOUSNESS FOR POND E4

Table F-2 - Weighted Average Imperviousness for Pond E4

Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
1N	0.129	73	9.417
1R1	0.141	18	2.538
1S	0.038	48	1.824
2N	0.147	58	8.526
2NE	0.053	74	3.922
2R1	0.204	19	3.876
2S	0.092	39	3.588
3NN	0.035	61	2.135
3NW	0.010	72	0.720
3R1	0.060	21	1.260
3SE	0.192	73	14.016
3SW	0.174	58	10.092
4NE	0.088	69	6.072
4NN	0.052	53	2.756
4NW	0.158	76	12.008
4SW	0.158	25	3.950
4R1	0.144	25	3.600
4R2	0.129	28	3.612
4SE	0.176	69	12.144
5NE	0.066	41	2.706
5NW	0.159	67	10.653
5R1	0.252	22	5.544
5SW	0.130	72	9.360
6R1	0.063	23	1.449
6R2	0.136	22	2.992
7EE	0.048	37	1.776
7NE	0.180	74	13.320
7NW	0.053	41	2.173
7SE	0.040	54	2.160
7SW	0.038	41	1.558
8N	0.079	47	3.713
8S	0.079	68	5.372
9NE	0.131	46	6.026
9NW	0.149	41	6.109
9SE	0.091	67	6.097
9SW	0.087	68	5.916
10N	0.156	39	6.084
10S	0.094	66	6.204
11N	0.132	45	5.940
11S	0.091	66	6.006
14E	0.170	76	12.920
14R1	0.114	21	2.394
14R2	0.054	22	1.188
14W	0.162	77	12.474
15E	0.182	60	10.920

CALCULATION SHEET F-2: IMPERVIOUSNESS FOR POND E4

Table F-2 - Weighted Average Imperviousness for Pond E4

Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
15R1	0.069	19	1.311
15W	0.175	76	13.300
16NE	0.066	62	4.092
16NW	0.126	49	6.174
16SE	0.057	66	3.762
16SW	0.087	41	3.567
17NE	0.096	64	6.144
17R1	0.305	11	3.355
17R3	0.178	23	4.094
17R5	0.268	23	6.164
17SE	0.154	67	10.318
17SW	0.159	68	10.812
18E	0.110	47	5.170
19R1	0.179	19	3.401
19W	0.159	55	8.745
20E	0.274	61	16.714
20R1	0.176	16	2.816
20W	0.217	69	14.973
23E	0.123	59	7.257
23W	0.121	68	8.228
24N	0.140	74	10.360
24S	0.049	59	2.891
25E	0.197	50	9.850
25W	0.182	45	8.190
26NW	0.031	40	1.240
26SW	0.030	41	1.230
27NE	0.176	50	8.800
27NW	0.171	64	10.944
27SW	0.127	71	9.017
29NE	0.058	49	2.842
29NW	0.152	76	11.552
29R1	0.178	22	3.916
29R2	0.089	25	2.225
29SE	0.049	61	2.989
29SW	0.018	47	0.846
30E	0.156	66	10.296
30W	0.087	69	6.003
31E	0.148	64	9.472
31WW	0.328	61	20.008
31W	0.099	70	6.930
32N	0.160	38	6.080
32S	0.079	78	6.162
33NE	0.152	46	6.992
33NW	0.082	43	3.526
33SE	0.110	64	7.040

CALCULATION SHEET F-2: IMPERVIOUSNESS FOR POND E4

Table F-2 - Weighted Average Imperviousness for Pond E4

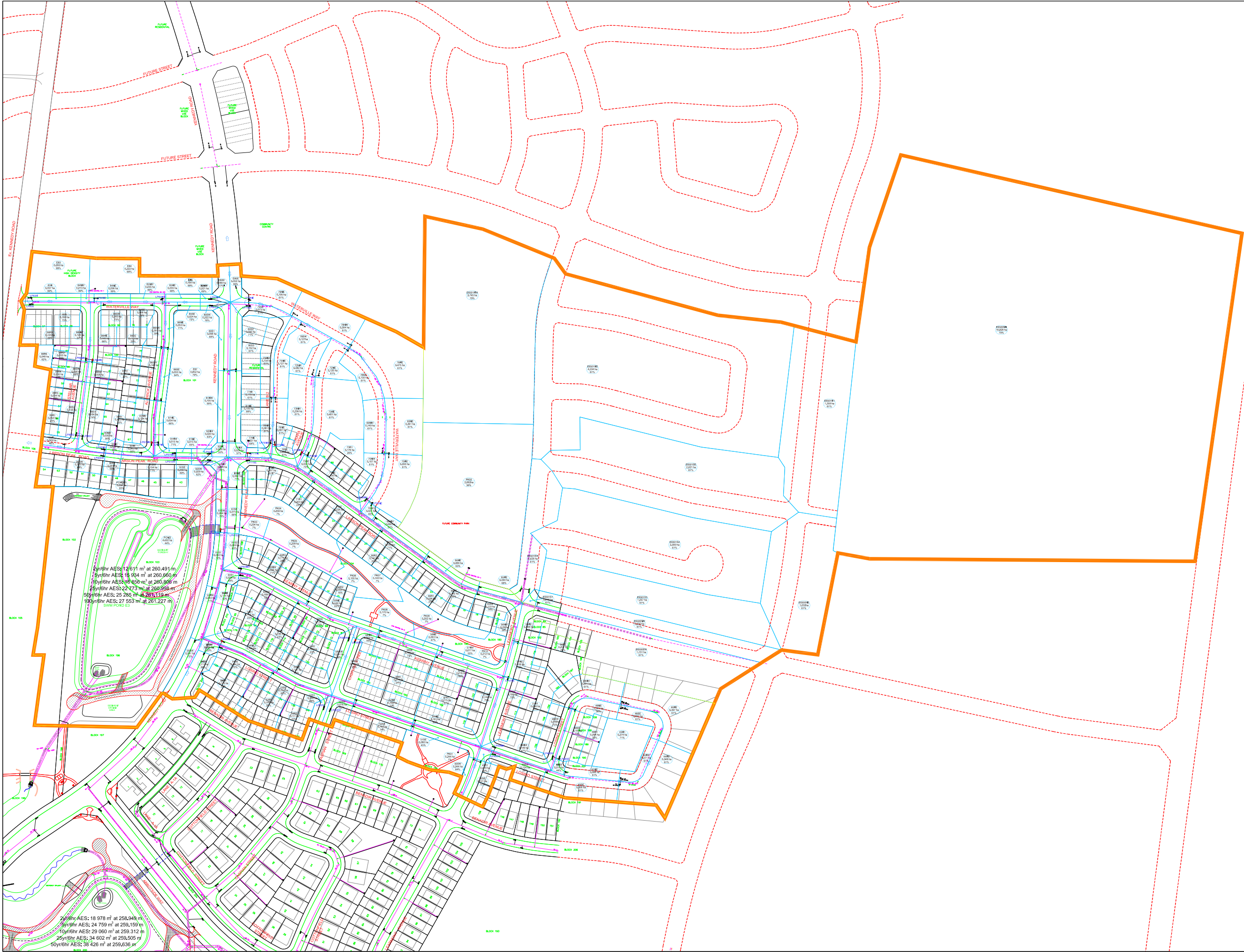
Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
33SW	0.051	67	3.417
34N	0.125	48	6.000
34S	0.120	62	7.440
36E	0.125	68	8.500
36W	0.093	41	3.813
37NE	0.074	68	5.032
37NW	0.087	69	6.003
37SE	0.088	71	6.248
37SW	0.092	68	6.256
40E	0.056	63	3.528
40W	0.058	59	3.422
41E	0.090	72	6.480
41W	0.091	63	5.733
E1	0.906	61	55.266
E10N	2.546	79	201.134
E10S	1.148	79	90.692
E11N	2.398	79	189.442
E11S	0.111	79	8.769
E501N	3.335	79	263.465
E501S	2.310	79	182.490
S01N	0.128	79	10.112
S01S	0.121	79	9.559
E502N	1.436	79	113.444
E502S	3.732	79	294.828
S02N	0.207	79	16.353
S02S	0.190	79	15.010
E503N	1.368	79	108.072
E503S	3.786	79	299.094
S03N	0.201	79	15.879
S03S	0.182	79	14.378
E504N	11.960	79	944.840
E504S	3.594	79	283.926
S04N	0.199	79	15.721
S04S	0.190	79	15.010
E505NE	10.581	79	835.899
E505NN	0.857	61	52.277
E505NW	3.092	61	188.612
E505SW	3.566	79	281.714
S05N	0.170	79	13.430
S05S	0.169	79	13.351
E8	1.959	79	154.761
E8N	1.218	79	96.222
E8S	1.262	79	99.698
E9	2.293	79	181.147
E9N	1.930	79	152.470

CALCULATION SHEET F-2: IMPERVIOUSNESS FOR POND E4

Table F-2 - Weighted Average Imperviousness for Pond E4

Segment ID	Area (ha)	Imperviousness (%)	Area x Imp.
E9S	1.272	79	100.488
E15N	1.447	79	114.313
PK1	0.247	7	1.729
POND	5.724	46	263.304
Total	88.248		6335.679

Weighted Average = $S(\text{Area} \times \text{Imp}) / \text{Total Area} = 6335.679 / 88.248 = 71.79 \%$



LEGEND :

LIMITS OF POND TRIBUTARY AREA

MAJOR SYSTEM CATCHMENT BOUNDARY

MAJOR SYSTEM FLOW DIRECTION

FIRST DIRECTION OF EXCESS MAJOR SYSTEM FLOW AT LOW POINT

LP02

LOW POINT

SUB-CATCHMENT ID

SUB-CATCHMENT AREA

TOTAL IMPERVIOUSNESS

2yr/6hr AES: 23620 m³ at 259.118 m

SURFACE ELEVATION AND ACTIVE STORAGE FOR THE INDICATED STORM

CATCHBASIN

SCALE :

0255075100125150m



J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
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GATINEAU (819) 243-6858

DSEL
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600 ALDEN ROAD., SUITE 500
MARKHAM, ONTARIO., L3R 0E7
(905) 475-3080

Phases 1a and 2 of Mayfield
West Subdivision to Pond E3

Proposed Major System

FIGURE F-1	DESIGNED:	
	DRAWN:	SPB/LP
	VERIFIED:	AV
	APPROVED:	AV
DRAWING REF. 552-05\200807 3rd PDB SWMR\ Design\CAD\JFSA Figures.dwg	DATE	PROJECT No.
	Aug/08	552-05

APPENDIX G

SEDIMENT REMOVAL CALCULATIONS

APPENDIX H

GEOTECHNICAL INVESTIGATIONS

APPENDIX I

EMERGENCY SPILLWAY / WEIR FOR PONDS E3 AND E4



J.F. Sabourin and Associates Inc.

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August 15, 2008

David Schaeffer Engineering Limited

600 Alden Road, Suite 500
Markham, Ontario L3R 0E7

Attention: Jennifer Cappola-Logullo, P.Eng.

Subject: Mayfield West - Emergency Spillway / Weir for Ponds E3 and E4 *our file: 552/05*

As described in the Pond Design Briefs and SWM Plan Reports for both Ponds E3 and E4, the control outlet structures of the ponds are designed to convey the 2 year to 100 year design flows as well as the Regional flow. Based on this, the emergency spillway / weir elevations in both ponds have been set to their respective Regional water levels of 261.893 m for Pond E3 and 260.284 m for Pond E4.

It follows that, under normal operation (ie. without any blocking) the outlet structures of both Ponds E3 and E4 could capture and convey the Regional storm flows. The purpose of the emergency spillway / weir is to; i) convey flows and runoff volumes that would result from an event that exceeds the Regional storm, and ii) provide a secondary pond outlet if part of the outlet structures were to be blocked.

To size the width of the emergency weir, a 50% blockage of the outlet structures were considered. As such, and with the Regional storm event the capacity of the outlet structure was reduced by 50% over the full range of pond levels. This compromised stage-outflow curve was then entered in the XPSWMM model to determine the potential pond levels and flows over the emergency spillway / weir.

In order to limit the increase in pond water level, the Spillway / Weir for Pond E3 has a width of 6 m and has a trapezoidal shape with 3H:1V side slopes. The channel downstream from the weir has a slope of 2%. Similarly, the Spillway / Weir for Pond E4 has a width of 6 m and has a trapezoidal shape with 12.5H:1V side slopes. The channel downstream from this weir has a slope of 0.5%.

The Spillway / Weir characteristics and resulting pond conditions for a 50% blockage of the outlet structure, and downstream channel flow velocities are summarized in Table 1.

Table 1: Spillway / Weir Characteristics and Hydraulic Conditions for a 50% Blockage of Outlet Structure
(Regional Event)

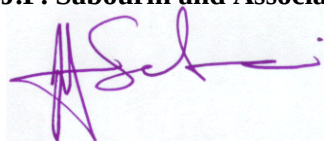
Characteristics	Pond E3	Pond E4
Spillway / Weir Elevation (m)	261.893	260.284
Width of Spillway / Weir (m)	6.000	6.000
Weir Coefficient	1.700	1.700
Side Slopes of Spillway / Weir (m)*	3H:1V	12.5H:1V
Slope of Spillway / Weir Channel (%)	2.000	0.500
Spillway / Weir Channel Manning's Roughness Coefficient	0.025	0.025
Regional Pond Water Level with 50% Blockage (m)	262.059	260.550
Minimum Protection Elevation with 0.3 m Freeboard (m)	262.359	260.850
Depth of Flow over Spillway / Weir (m)	0.166	0.266
Flow Through Outlet Structure (m ³ /s)**	5.018	8.071
Flow Over Spillway / Weir (m ³ /s)	0.689	1.137
Normal Flow Depth Over Spillway / Weir Channel (m)	0.095	0.180
Flow Velocity in Spillway / Weir Channel (m/s)	0.990	0.767

*) The Spillway / Weir for both Pond E3 and E4 were conservatively simulated as rectangular weirs in XPSWMM.

**) It is noted that even with a 50% blockage factor, the outlet structure of both ponds still convey the majority of the Regional flow. This can be explained by the fact that under Regional flow conditions, the downstream drainage pipes from the ponds, flow practically full and, as a consequence, significantly reduce (by almost 50%) the hydraulic efficient of the outlet structures.

Yours truly,

J.F. Sabourin and Associates Inc.



J.F. Sabourin, M.Eng, P.Eng.

Director of Water Resources Projects

APPENDIX J

***MAYFIELD WEST PHASES 1A AND 2 TO POND E3
INTERIM CONDITIONS***



J.F. Sabourin and Associates Inc.

WATER RESOURCES AND ENVIRONMENTAL
CONSULTANTS

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August 12, 2008

David Schaeffer Engineering Limited

600 Alden Road, Suite 500
Markham, Ontario L3R 0E7

Attention: Jennifer Cappola-Logullo, P.Eng.

Subject: Mayfield West Phases 1A and 2 to Pond E3 (Interim Conditions) *our file: 552/05*

As requested by your office, we have evaluated, for the interim conditions described below, the 2- to 100-year AES design storm outflows from Pond E3 to Etobicoke Creek.

Under existing conditions, the approximate total drainage area to the location of Pond E3 is 98.12 ha, while under ultimate conditions, the total drainage area to Pond E3 will be reduced to 62.22 ha. The difference of 35.9 ha will be directed to other future SWM Ponds. However, under interim conditions, when only Phases 1A and 2 (26.48 ha) are developed, Pond E3 will also collect the drainage from some 78.21 ha of undeveloped land, for a total drainage area of 104.69 ha. The difference of 6.57 ha between the existing drainage area of 98.12 ha and the interim total drainage area of 104.69 ha represents land that currently drain towards Pond E4 that will be diverted to Pond E3.

In order to confirm that Pond E3 can provide the required level of control during interim conditions, a lumped SWMHYMO model was developed for both interim and ultimate conditions. The results from the latter can also be used to further provide a comparison with the detailed DDSWMM / XPSWMM model results that were obtained and described in the Pond Design Briefs and SWM Plan Reports for both Ponds E3 and E4. A lumped model for the ultimate drainage conditions of Pond E4 was also developed. It is noted that lumped models make use of the same stage-storage-outflow curves as described in the Pond Design Brief and SWM Reports.

The main input data for the Interim and Ultimate drainage conditions for Pond E3 and Pond E4 are presented in Table 1. Refer to Figures 1 and 2 for delineations of interim and ultimate drainage conditions, respectively.

Table 1: Comparison of Input Parameters for Pond E3 and Pond E4

	Scenario	Post-Development				Remaining Existing	
		Area (ha)	TIMP (%)	XIMP (%)	On-Site Storage ⁽¹⁾ (m ³)	Area (ha)	CN
Pond E3	1 (Interim)	26.481	56	49	0	78.21	72
	2 (Ultimate)	62.221	62	50	948	0	N/A
Pond E4	1 (Ultimate)	88.168	72	59	7527	0	N/A

⁽¹⁾ On-site storage for employment lands

Based on the above information, design storm outflows for Pond E3 and Pond E4 were determined using SWMHYMO (see Attachment 1 for input and output files) for AES design storms. The results are summarized in Tables 2 and 3 and indicate that both SWM Ponds will provide the required level of control for either interim or ultimate conditions.

Table 2: Pond E3 Outflow Summary

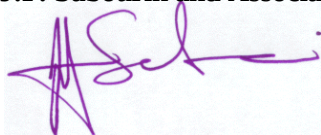
Storm Event	Target Flow Rate (m ³ /s)	DDSWMM / XPSWMM Outflow (m ³ /s)	SWMHYMO Scenario 1 (Interim) Outflow (m ³ /s)	SWMHYMO Scenario 2 (Ultimate) Outflow (m ³ /s)
2-year AES	0.269	0.136	0.038	0.106
5-year AES	0.483	0.311	0.227	0.314
10-year AES	0.648	0.448	0.382	0.446
25-year AES	0.874	0.663	0.566	0.650
50-year AES	1.055	0.922	0.821	0.899
100-year AES	1.241	1.201	1.110	1.178

Table 3: Pond E4 Outflow Summary

Storm Event	Target Flow Rate (m ³ /s)	DDSWMM / XPSWMM Outflow (m ³ /s)	SWMHYMO Scenario 1 (Ultimate) Outflow (m ³ /s)
2-year AES	0.381	0.220	0.213
5-year AES	0.684	0.554	0.558
10-year AES	0.917	0.791	0.784
25-year AES	1.238	1.060	1.062
50-year AES	1.493	1.367	1.386
100-year AES	1.757	1.752	1.746

Yours truly,

J.F. Sabourin and Associates Inc.



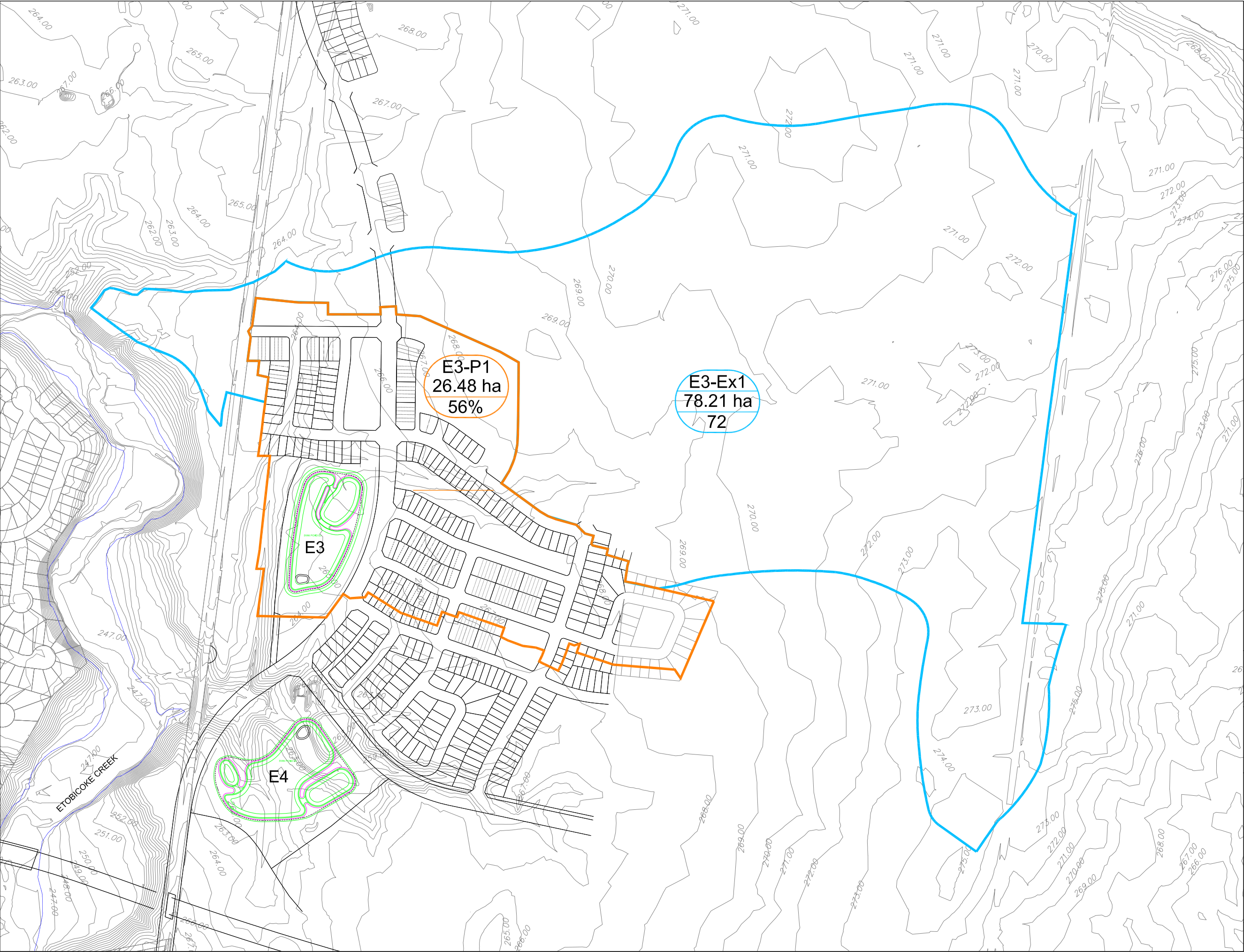
J.F. Sabourin, M.Eng, P.Eng.

Director of Water Resources Projects

Figure 1: Interim Drainage Conditions

Figure 2: Ultimate Drainage Conditions

Attachment 1: SWMHYMO Input and Output Files



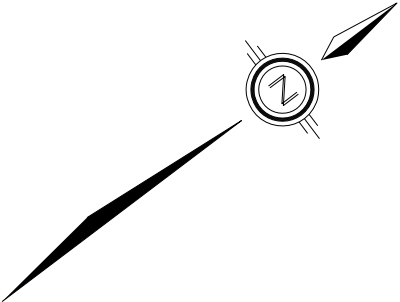
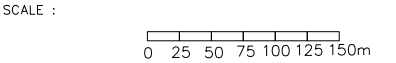
- LEGEND :
- POST-DEVELOPMENT DRAINAGE BOUNDARY
 - PRE-DEVELOPMENT DRAINAGE BOUNDARY
 - WATERCOURSE

E3-P1
26.48 ha
56%

POST-DEVELOPMENT AREA ID
DRAINAGE AREA
TOTAL IMPERVIOUSNESS

E3-Ex1
78.21 ha
72

PRE-DEVELOPMENT AREA ID
DRAINAGE AREA
CN



J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

DSEL
david schaeffer engineering ltd
600 ALDEN ROAD., SUITE 500
MARKHAM, ONTARIO, L3R 0E7
(905) 475-3080

Phases 1a and 2 of Mayfield West
Subdivision to Ponds E3 and E4

Interim Drainage Conditions

FIGURE 1

DRAWING REF.
552-05\200807 3rd PDB SWMR\
Design\CAD\JFSA Figures.dwg

DESIGNED:	
DRAWN:	SPB/LP
VERIFIED:	AV
APPROVED: AV	
DATE	PROJECT No.
Aug/08	552-05



LEGEND :

POST-DEVELOPMENT DRAINAGE BOUNDARY

WATERCOURSE

E3-2

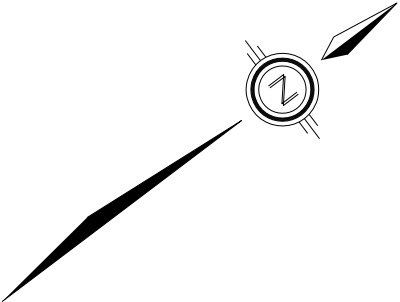
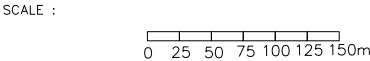
62.22 ha

62%

POST-DEVELOPMENT AREA ID

DRAINAGE AREA

TOTAL IMPERVIOUSNESS



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Phases 1a and 2 of Mayfield West Subdivision to Ponds E3 and E4

Ultimate Drainage Conditions

FIGURE 2	DESIGNED:	
	DRAWN:	SPB/LP
	VERIFIED:	AV
	APPROVED: AV	
DRAWING REF. 552-05\200807 3rd PDB SWMR\Design\CAD\JFSA Figures.dwg	DATE	PROJECT No.
	Aug/08	552-05

Attachment 1

SWMHYMO Input and Output files

InterimA.dat
InterimA.sum



```

00001> 20      Metric units
00002> *#*****
00003> *# Project Name: [Mayfield West]      Project Number: [552-05]
00004> *# Date      : 2008/04/29
00005> *# Modeller   : [AV]
00006> *# Company    : JFSA
00007> *# License #   : 1155024
00008> *#*****
00009> *# The purpose of this lumped model of areas to Pond E3 and Pond E4 is to:
00010> *# 1) Demonstrate the compatibility between SWMHYMO and DDSWMM / XPSWMM used
00011> *#    in the SWM Plan analyses of both areas and ponds.
00012> *# 2) To confirm that the proposed Pond E3 will satisfy the SWM requirements
00013> *#    under interim and ultimate conditions. Under interim conditions, only
00014> *#    26.48 ha will be developed and 78.21 ha of existing undevelopped lands
00015> *#    will be serviced by Pond E3 while under ultimate conditions, Pond E3
00016> *#    will collect the drainage from a total area of 62.2 ha.
00017> *
00018> *% 2 year 6 hour AES storm
00019> START      TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[2]
00020> *          ["2Y6.stm"] <--storm filename, one per line for NSTORM time
00021> *#-----|-----
00022> READ STORM  STORM_FILENAME=["STORM.001"]
00023> *#-----|-----
00024> *#*****
00025> *# SIMULATIONS FOR POST-DEVELOPMENT CONDITIONS *
00026> *#*****
00027> *#-----|-----
00028> *# Drainage area for POND E3
00029> *#-----|-----
00030> * Scenario 1: Phase 1a & 2 + Exterior (interim)
00031> *#-----|-----
00032> *# Phase 1a and 2
00033> CALIB STANDHYD      NHYD=["E3-P1"], DT=[5](min), AREA=[26.481](ha),
00034>                     XIMP=[.49], TIMP=[.56], DWF=[0](cms), LOSS=[2],
00035>                     SCS curve number CN=[72],
00036>                     Pervious surfaces: IAPer=[7](mm), SLPP=[0.5](%),
00037>                     LGP=[40](m), MNP=[0.3], SCP=[0](min),
00038>                     Impervious surfaces: IAimp=[2.5](mm), SLPI=[0.5](%),
00039>                     LGI=[420](m), MNI=[.015], SCI=[0](min),
00040>                     RAINFALL=[ , , , , ](mm/hr), END=-1
00041> *#-----|-----
00042> *# Remaining undevelopped lands
00043> CALIB NASHYD      NHYD=["E3-Ex1"], DT=[5]min, AREA=[78.21](ha),
00044>                     DWF=[0](cms), CN/C=[72], IA=[7](mm),
00045>                     N=[3], TP=[1.38]hrs,
00046>                     RAINFALL=[ , , , , ](mm/hr), END=-1
00047> *#-----|-----
00048> ADD HYD      NHYDsum=["E3-S1"], NHYDs to add=["E3-P1"+"E3-Ex1"]
00049> *#-----|-----
00050> *# Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00051> *# E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00052> *# Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00053> *# Engineering Ltd.
00054> ROUTE RESERVOIR      NHYDout=["PE3-1"], NHYDin=["E3-S1"],
00055>                     RDT=[1](min),
00056>                     TABLE of ( OUTFLOW-STORAGE ) values
00057>                     (cms) - (ha-m)
00058>                     [ 0.000 , 0.000 ]
00059>                     0.0149 0.255
00060>                     0.0233 0.432
00061>                     0.0294 0.613
00062>                     0.0344 0.798
00063>                     0.0388 0.988
00064>                     0.0928 1.181
00065>                     0.1967 1.376
00066>                     0.3002 1.574
00067>                     0.4 1.773
00068>                     0.481 1.975
00069>                     0.5798 2.179
00070>                     0.7653 2.385
00071>                     0.9946 2.593
00072>                     1.2036 2.762
00073>                     1.6177 2.91
00074>                     2.6788 3.145
00075>                     4.0962 3.34
00076>                     [ -1 , -1 ] (max twenty pts)
00077>                     NHYDovf=["OVFP3-1"],
00078> *#-----|-----
00079> * Scenario 2: Ultimate Development with Storage on Site for Employment Lands
00080> *#-----|-----
00081> *# Portion of ultimate development as residential lands
00082> CALIB STANDHYD      NHYD=["E3-2A"], DT=[5](min), AREA=[45.393](ha),
00083>                     XIMP=[.44], TIMP=[.56], DWF=[0](cms), LOSS=[2],
00084>                     SCS curve number CN=[72],
00085>                     Pervious surfaces: IAPer=[7](mm), SLPP=[0.5](%),
00086>                     LGP=[40](m), MNP=[0.3], SCP=[0](min),
00087>                     Impervious surfaces: IAimp=[2.5](mm), SLPI=[0.5](%),
00088>                     LGI=[550](m), MNI=[.015], SCI=[0](min),
00089>                     RAINFALL=[ , , , , ](mm/hr), END=-1

```

```

00090> *%-----|-----
00091> *# Portion of ultimate development as employment lands
00092> CALIB STANDHYD NHYD=["E3-2B"], DT=[5](min), AREA=[16.828](ha),
00093> XIMP=[.67], TIMP=[.79], DWF=[0](cms), LOSS=[2],
00094> SCS curve number CN=[72],
00095> Pervious surfaces: IAPer=[7](mm), SLPP=[0.5](%),
00096> LGP=[40](m), MNP=[0.3], SCP=[0](min),
00097> Impervious surfaces: IAimp=[2.5](mm), SLPI=[0.5](%),
00098> LGI=[335](m), MNI=[.015], SCI=[0](min),
00099> RAINFALL=[ , , , ](mm/hr), END=-1
00100> *%-----|-----
00101> *# Route reservoir to simulate effects of on-site storage within Development
00102> *# Lands as per DDSWM analysis documented in "Design Brief for SWM Ponds E3 and
00103> *# E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00104> *# Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00105> *# Engineering Ltd.
00106> ROUTE RESERVOIR NHYDout=["MiE3-2"], NHYDin=["E3-2B"],
00107> RDT=[5](min),
00108> TABLE of ( OUTFLOW-STORAGE ) values
00109> (cms) - (ha-m)
00110> [ 0.0 , 0.0 ]
00111> 4.703 0.0948
00112> [ -1 , -1 ] (max twenty pts)
00113> NHYDovf=["MaE3-2"],
00114> *%-----|-----
00115> ADD HYD NHYDsum=["E3-2C"], NHYDs to add=["E3-2A"+"MiE3-2"]
00116> *%-----|-----
00117> *# Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00118> *# E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00119> *# Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00120> *# Engineering Ltd.
00121> ROUTE RESERVOIR NHYDout=["PE3-2"], NHYDin=["E3-2C"],
00122> RDT=[1](min),
00123> TABLE of ( OUTFLOW-STORAGE ) values
00124> (cms) - (ha-m)
00125> [ 0.000 , 0.000 ]
00126> 0.0149 0.255
00127> 0.0233 0.432
00128> 0.0294 0.613
00129> 0.0344 0.798
00130> 0.0388 0.988
00131> 0.0928 1.181
00132> 0.1967 1.376
00133> 0.3002 1.574
00134> 0.4 1.773
00135> 0.481 1.975
00136> 0.5798 2.179
00137> 0.7653 2.385
00138> 0.9946 2.593
00139> 1.2036 2.762
00140> 1.6177 2.91
00141> 2.6788 3.145
00142> 4.0962 3.34
00143> [ -1 , -1 ] (max twenty pts)
00144> NHYDovf=["OVFP3-2"],
00145> *%-----|-----
00146> *%-----|-----
00147> *# Drainage area for POND E4
00148> *%-----|-----
00149> * Scenario 1: Ultimate Development
00150> *%-----|-----
00151> *# Portion of ultimate development as residential lands
00152> CALIB STANDHYD NHYD=["E4-1A"], DT=[5](min), AREA=[31.199](ha),
00153> XIMP=[.44], TIMP=[.59], DWF=[0](cms), LOSS=[2],
00154> SCS curve number CN=[72],
00155> Pervious surfaces: IAPer=[7](mm), SLPP=[0.5](%),
00156> LGP=[40](m), MNP=[0.3], SCP=[0](min),
00157> Impervious surfaces: IAimp=[2.5](mm), SLPI=[0.5](%),
00158> LGI=[456](m), MNI=[.015], SCI=[0](min),
00159> RAINFALL=[ , , , ](mm/hr), END=-1
00160> *%-----|-----
00161> *# Portion of ultimate development as residential employment lands
00162> CALIB STANDHYD NHYD=["E4-1B"], DT=[5](min), AREA=[57.049](ha),
00163> XIMP=[.67], TIMP=[.79], DWF=[0](cms), LOSS=[2],
00164> SCS curve number CN=[72],
00165> Pervious surfaces: IAPer=[7](mm), SLPP=[0.5](%),
00166> LGP=[40](m), MNP=[0.3], SCP=[0](min),
00167> Impervious surfaces: IAimp=[2.5](mm), SLPI=[0.5](%),
00168> LGI=[617](m), MNI=[.015], SCI=[0](min),
00169> RAINFALL=[ , , , ](mm/hr), END=-1
00170> *%-----|-----
00171> *# Route reservoir to simulate effects of on-site storage within Development
00172> *# Lands as per DDSWM analysis documented in "Design Brief for SWM Ponds E3 and
00173> *# E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00174> *# Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00175> *# Engineering Ltd.
00176> ROUTE RESERVOIR NHYDout=["MiE4-1"], NHYDin=["E4-1B"],
00177> RDT=[5](min),
00178> TABLE of ( OUTFLOW-STORAGE ) values

```

```

00179>                                (cms) - (ha-m)
00180>                                [ 0.0 , 0.0 ]
00181>                                11.347 0.7527
00182>                                [ -1 , -1 ] (max twenty pts)
00183>                                NHYDovf=["MaE4-1"] ,
00184> *%-----|-----|
00185> *%-----|-----|
00186> ADD HYD                      NHYDsum=["E4-1C"], NHYDs to add=["E4-1A"+"MiE4-1"]
00187> *%-----|-----|
00188> *%-----|-----|
00189> *# Pond E4 as designed and described in the "Design Brief for SWM Ponds E3 and
00190> *# E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00191> *# Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00192> *# Engineering Ltd.
00193> ROUTE RESERVOIR              NHYDout=["PE4-1"] , NHYDin=["E4-1C"] ,
00194>                                RDT=[1](min),
00195>                                TABLE of ( OUTFLOW-STORAGE ) values
00196>                                (cms) - (ha-m)
00197>                                [ 0.000 , 0.000 ]
00198>                                0.0133 0.233
00199>                                0.0326 0.595
00200>                                0.042 0.845
00201>                                0.0496 1.101
00202>                                0.0562 1.365
00203>                                0.0622 1.631
00204>                                0.2219 1.901
00205>                                0.3812 2.174
00206>                                0.5402 2.451
00207>                                0.699 2.731
00208>                                0.8419 3.014
00209>                                0.9629 3.301
00210>                                1.1641 3.591
00211>                                1.2916 3.738
00212>                                1.4304 3.883
00213>                                1.5786 4.032
00214>                                1.7349 4.181
00215>                                1.7541 4.199
00216>                                1.9906 4.331
00217>                                [ -1 , -1 ] (max twenty pts)
00218>                                NHYDovf=["OVFP4-1"] ,
00219> *%-----|-----|
00220> *%-----|-----|
00221> *%-----|-----|
00222> *% 5 year 6 hour AES storm
00223> START                        TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[5]
00224> *                            ["5Y6.stm"] <--storm filename, one per line for NSTORM time
00225> *%-----|-----|
00226> *% 10 year 6 hour AES storm
00227> START                        TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[10]
00228> *                            ["10Y6.stm"] <--storm filename, one per line for NSTORM time
00229> *%-----|-----|
00230> *% 25 year 6 hour AES storm
00231> START                        TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[25]
00232> *                            ["25Y6.stm"] <--storm filename, one per line for NSTORM time
00233> *%-----|-----|
00234> *% 50 year 6 hour AES storm
00235> START                        TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[50]
00236> *                            ["50Y6.stm"] <--storm filename, one per line for NSTORM time
00237> *%-----|-----|
00238> *% 100 year 6 hour AES storm
00239> START                        TZERO=[0.0]hrs or date, METOUT=[2], NSTORM=[1], NRUN=[100]
00240> *                            ["100Y6.stm"] <--storm filename, one per line for NSTORM time
00241> *%-----|-----|
00242> FINISH
00243>
00244>
00245>

```

```
00001> =====
00002>
00003> SSSSS W W M M H H Y Y M M 000 999 999 =====
00004> S W W W M M H H Y Y M M 0 0 9 9 9 9
00005> SSSSS W W W M M M H H H H Y M M M 0 0 ## 9 9 9 9 Ver5 Beta
00006> S W W M M H H Y M M 0 0 9999 9999 Sept 2000
00007> SSSSS W W M M H H Y M M 000 9 9 =====
00008> 9 9 9 9 # 2547402
00009> StormWater Management Hydrologic Model 999 999 =====
00010>
00011> *****
00012> ***** SWMHYMO Ver/5 Beta *****
00013> ***** A single event and continuous hydrologic simulation model *****
00014> ***** based on the principles of HYMO and its successors *****
00015> ***** OTTHYMO-83 and OTTHYMO-89. *****
00016> *****
00017> ***** Distributed by: J.F. Sabourin and Associates Inc. *****
00018> ***** Ottawa, Ontario: (613) 727-5199 *****
00019> ***** Gatineau, Quebec: (819) 243-6858 *****
00020> ***** E-Mail: swmhymo@jfsa.Com *****
00021> *****
00022>
00023> ++++++
00024> ++++++ Licensed user: JFSaInc. ++++++
00025> ++++++ Stittsville SERIAL#:2547402 ++++++
00026> ++++++
00027>
00028> *****
00029> ***** ++++++ PROGRAM ARRAY DIMENSIONS ++++++ *****
00030> ***** Maximum value for ID numbers : 10 *****
00031> ***** Max. number of rainfall points: 52750 *****
00032> ***** Max. number of flow points : 52750 *****
00033> *****
00034>
00035> *** DESCRIPTION SUMMARY TABLE HEADERS (units depend on METOUT in START) ***
00036> *** ----- ***
00037> *** ID: Hydrograph IDentification numbers, (1-10). ***
00038> *** NHYD: Hydrograph reference numbers, (6 digits or characters). ***
00039> *** AREA: Drainage area associated with hydrograph, (ac.) or (ha.). ***
00040> *** QPEAK: Peak flow of simulated hydrograph, (ft^3/s) or (m^3/s). ***
00041> *** TpeakDate_hh:mm is the date and time of the peak flow. ***
00042> *** R.V.: Runoff Volume of simulated hydrograph, (in) or (mm). ***
00043> *** R.C.: Runoff Coefficient of simulated hydrograph, (ratio). ***
00044> *** *: see WARNING or NOTE message printed at end of run. ***
00045> *** **: see ERROR message printed at end of run. ***
00046> *****
00047> *****
00048>
00049> ::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::::
00050>
00051> *****
00052>
00053> ***** SUMMARY OUTPUT *****
00054> *****
00055> * DATE: 2008-08-12 TIME: 21:22:24 RUN COUNTER: 000462 *
00056> *****
00057> * Input filename: Z:\PROJ\552-05\200807-3\PDBSWM-1\Design\SWMHYMO\Interi*
00058> * Output filename: Z:\PROJ\552-05\200807-3\PDBSWM-1\Design\SWMHYMO\Interi*
00059> * Summary filename: Z:\PROJ\552-05\200807-3\PDBSWM-1\Design\SWMHYMO\Interi*
00060> * User comments:
00061> * 1:
00062> * 2:
00063> * 3:
00064> *****
00065>
00066>
00067> #*****
00068> # Project Name: [Mayfield West] Project Number: [552-05]
00069> # Date : 2008/04/29
00070> # Modeller : [AV]
00071> # Company : JFSA
00072> # License # : 1155024
00073> #*****
00074> # The purpose of this lumped model of areas to Pond E3 and Pond E4 is to:
00075> # 1) Demonstrate the compatibility between SWMHYMO and DDSWMM / XPSWMM used
00076> # in the SWM Plan analyses of both areas and ponds.
00077> # 2) To confirm that the proposed Pond E3 will satisfy the SWM requirements
00078> # under interim and ultimate conditions. Under interim conditions, only
00079> # 26.48 ha will be developed and 78.21 ha of existing undevelopped lands
00080> # will be serviced by Pond E3 while under ultimate conditions, Pond E3
00081> # will collect the drainage from a total area of 62.2 ha.
00082> ** END OF RUN : 1
00083>
00084> *****
00085>
00086>
00087>
00088>
00089>
```

```

00090> RUN:COMMAND#
00091> 002:0001-----
00092> START
00093> [TZERO = .00 hrs on 0]
00094> [METOUT= 2 (1=imperial, 2=metric output)]
00095> [NSTORM= 1 ]
00096> [NRUN = 2 ]
00097> #*****
00098> # Project Name: [Mayfield West] Project Number: [552-05]
00099> # Date : 2008/04/29
00100> # Modeller : [AV]
00101> # Company : JFSA
00102> # License # : 1155024
00103> #*****
00104> # The purpose of this lumped model of areas to Pond E3 and Pond E4 is to:
00105> # 1) Demonstrate the compatibility between SWMHYMO and DDSWMM / XPSWMM used
00106> # in the SWM Plan analyses of both areas and ponds.
00107> # 2) To confirm that the proposed Pond E3 will satisfy the SWM requirements
00108> # under interim and ultimate conditions. Under interim conditions, only
00109> # 26.48 ha will be developed and 78.21 ha of existing undevelopped lands
00110> # will be serviced by Pond E3 while under ultimate conditions, Pond E3
00111> # will collect the drainage from a total area of 62.2 ha.
00112> 002:0002-----
00113> READ STORM
00114> Filename = STORM.001
00115> Comment = 2yr/6hr
00116> [SDT=15.00:SDUR= 6.25:PTOT= 36.00]
00117> # SIMULATIONS FOR POST-DEVELOPMENT CONDITIONS
00118> # Drainage area for POND E3
00119> # Phase 1a and 2
00120> 002:0003-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00121> CALIB STANDHYD 01:E3-P1 26.48 1.106 No_date 2:45 20.39 .566
00122> [XIMP=.49:TIMP=.56]
00123> [LOSS= 2 :CN= 72.0]
00124> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00125> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 420.:MNI=.015:SCI= .0]
00126> # Remaining undevelopped lands
00127> 002:0004-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00128> CALIB NASHYD 01:E3-Ex1 78.21 .435 No_date 4:25 6.58 .183
00129> [CN= 72.0: N= 3.00]
00130> [Tp= 1.38:DT= 5.00]
00131> 002:0005-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00132> ADD HYD 02:E3-P1 26.48 1.106 No_date 2:45 20.39 n/a
00133> + 03:E3-Ex1 78.21 .435 No_date 4:25 6.58 n/a
00134> [DT= 5.00] SUM= 01:E3-S1 104.69 1.152 No_date 2:50 10.07 n/a
00135> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00136> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00137> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00138> # Engineering Ltd.
00139> 002:0006-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00140> ROUTE RESERVOIR -> 02:E3-S1 104.69 1.152 No_date 2:50 10.07 n/a
00141> [RDT= 1.00] out<- 01:PE3-1 104.69 .038 No_date 8:39 10.07 n/a
00142> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00143> {MxStoUsed=.9721E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00144> # Portion of ultimate development as residential lands
00145> 002:0007-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00146> CALIB STANDHYD 01:E3-2A 45.39 1.677 No_date 2:50 19.56 .543
00147> [XIMP=.44:TIMP=.56]
00148> [LOSS= 2 :CN= 72.0]
00149> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00150> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 550.:MNI=.015:SCI= .0]
00151> # Portion of ultimate development as employment lands
00152> 002:0008-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00153> CALIB STANDHYD 01:E3-2B 16.83 1.019 No_date 2:45 25.92 .720
00154> [XIMP=.67:TIMP=.79]
00155> [LOSS= 2 :CN= 72.0]
00156> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00157> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 335.:MNI=.015:SCI= .0]
00158> # Route reservoir to simulate effects of on-site storage within Development
00159> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00160> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00161> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00162> # Engineering Ltd.
00163> 002:0009-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00164> ROUTE RESERVOIR -> 02:E3-2B 16.83 1.019 No_date 2:45 25.92 n/a
00165> [RDT= 5.00] out<- 01:MiE3-2 16.83 .986 No_date 2:45 25.92 n/a
00166> overflow <= 03:MaE3-2 .00 .000 No_date 0:00 .00 n/a
00167> {MxStoUsed=.2038E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00168> 002:0010-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00169> ADD HYD 02:E3-2A 45.39 1.677 No_date 2:50 19.56 n/a
00170> + 03:MiE3-2 16.83 .986 No_date 2:45 25.92 n/a
00171> [DT= 5.00] SUM= 01:E3-2C 62.22 2.660 No_date 2:45 21.28 n/a
00172> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00173> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00174> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00175> # Engineering Ltd.
00176> 002:0011-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00177> ROUTE RESERVOIR -> 02:E3-2C 62.22 2.660 No_date 2:45 21.28 n/a
00178> [RDT= 1.00] out<- 01:PE3-2 62.22 .106 No_date 6:21 21.28 n/a

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00179>          overflow <= 03:OVFP3-      .00      .000 No_date      0:00      .00 n/a
00180> {MxStoUsed=.1206E+01, TotOvfVol=.0000E+00, N-Ovf=      0, TotDurOvf=      0.hrs}
00181> # Drainage area for POND E4
00182> # Portion of ultimate development as residential lands
00183> 002:0012-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00184> CALIB STANDHYD      01:E4-1A      31.20      1.191 No_date      2:45      19.91 .553
00185> [XIMP=.44:TIMP=.59]
00186> [LOSS= 2 :CN= 72.0]
00187> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00188> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 456.:MNI=.015:SCI= .0]
00189> # Portion of ultimate development as residential employment lands
00190> 002:0013-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00191> CALIB STANDHYD      01:E4-1B      57.05      3.074 No_date      2:45      25.92 .720
00192> [XIMP=.67:TIMP=.79]
00193> [LOSS= 2 :CN= 72.0]
00194> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00195> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 617.:MNI=.015:SCI= .0]
00196> # Route reservoir to simulate effects of on-site storage within Development
00197> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00198> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00199> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00200> # Engineering Ltd.
00201> 002:0014-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00202> ROUTE RESERVOIR -> 02:E4-1B      57.05      3.074 No_date      2:45      25.92 n/a
00203> [RDT= 5.00] out<- 01:MiE4-1      57.05      2.770 No_date      2:55      25.92 n/a
00204> overflow <= 03:MaE4-1      .00      .000 No_date      0:00      .00 n/a
00205> {MxStoUsed=.1849E+00, TotOvfVol=.0000E+00, N-Ovf=      0, TotDurOvf=      0.hrs}
00206> 002:0015-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00207> ADD HYD      02:E4-1A      31.20      1.191 No_date      2:45      19.91 n/a
00208> + 03:MiE4-1      57.05      2.770 No_date      2:55      25.92 n/a
00209> [DT= 5.00] SUM= 01:E4-1C      88.25      3.866 No_date      2:55      23.80 n/a
00210> # Pond E4 as designed and described in the "Design Brief for SWM Ponds E3 and
00211> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00212> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00213> # Engineering Ltd.
00214> 002:0016-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00215> ROUTE RESERVOIR -> 02:E4-1C      88.25      3.866 No_date      2:55      23.80 n/a
00216> [RDT= 1.00] out<- 01:PE4-1      88.25      .213 No_date      5:48      23.80 n/a
00217> overflow <= 03:OVFP4-      .00      .000 No_date      0:00      .00 n/a
00218> {MxStoUsed=.1886E+01, TotOvfVol=.0000E+00, N-Ovf=      0, TotDurOvf=      0.hrs}
00219> ** END OF RUN :      4
00220>
00221> *****
00222>
00223>
00224>
00225>
00226>
00227> RUN:COMMAND#
00228> 005:0001-----
00229> START
00230> [TZERO =      .00 hrs on      0]
00231> [METOUT= 2 (1=imperial, 2=metric output)]
00232> [NSTORM= 1 ]
00233> [NRUN = 5 ]
00234> #*****
00235> # Project Name: [Mayfield West] Project Number: [552-05]
00236> # Date : 2008/04/29
00237> # Modeller : [AV]
00238> # Company : JFSA
00239> # License # : 1155024
00240> #*****
00241> # The purpose of this lumped model of areas to Pond E3 and Pond E4 is to:
00242> # 1) Demonstrate the compatibility between SWMHYMO and DDSWMM / XPSWMM used
00243> # in the SWM Plan analyses of both areas and ponds.
00244> # 2) To confirm that the proposed Pond E3 will satisfy the SWM requirements
00245> # under interim and ultimate conditions. Under interim conditions, only
00246> # 26.48 ha will be developed and 78.21 ha of existing undevelopped lands
00247> # will be serviced by Pond E3 while under ultimate conditions, Pond E3
00248> # will collect the drainage from a total area of 62.2 ha.
00249> 005:0002-----
00250> READ STORM
00251> Filename = STORM.001
00252> Comment = 5yr/6hr
00253> [SDT=15.00:SDUR= 6.25:PTOT= 47.81]
00254> # SIMULATIONS FOR POST-DEVELOPMENT CONDITIONS
00255> # Drainage area for POND E3
00256> # Phase 1a and 2
00257> 005:0003-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00258> CALIB STANDHYD      01:E3-P1      26.48      1.598 No_date      2:45      29.21 .611
00259> [XIMP=.49:TIMP=.56]
00260> [LOSS= 2 :CN= 72.0]
00261> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00262> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 420.:MNI=.015:SCI= .0]
00263> # Remaining undevelopped lands
00264> 005:0004-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00265> CALIB NASHYD      01:E3-Ex1      78.21      .794 No_date      4:25      11.93 .250
00266> [CN= 72.0: N= 3.00]
00267> [Tp= 1.38:DT= 5.00]
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00268> 005:0005-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00269> ADD HYD 02:E3-P1 26.48 1.598 No_date 2:45 29.21 n/a
00270> + 03:E3-Ex1 78.21 .794 No_date 4:25 11.93 n/a
00271> [DT= 5.00] SUM= 01:E3-S1 104.69 1.695 No_date 2:45 16.30 n/a
00272> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00273> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00274> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00275> # Engineering Ltd.
00276> 005:0006-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00277> ROUTE RESERVOIR -> 02:E3-S1 104.69 1.695 No_date 2:45 16.30 n/a
00278> [RDT= 1.00] out<- 01:PE3-1 104.69 .227 No_date 7:11 16.30 n/a
00279> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00280> {MxStoUsed=.1435E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00281> # Portion of ultimate development as residential lands
00282> 005:0007-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00283> CALIB STANDHYD 01:E3-2A 45.39 2.411 No_date 2:50 28.30 .592
00284> [XIMP=.44:TIMP=.56]
00285> [LOSS= 2 :CN= 72.0]
00286> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00287> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 550.:MNI=.015:SCI= .0]
00288> # Portion of ultimate development as employment lands
00289> 005:0008-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00290> CALIB STANDHYD 01:E3-2B 16.83 1.422 No_date 2:45 36.20 .757
00291> [XIMP=.67:TIMP=.79]
00292> [LOSS= 2 :CN= 72.0]
00293> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00294> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 335.:MNI=.015:SCI= .0]
00295> # Route reservoir to simulate effects of on-site storage within Development
00296> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00297> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00298> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00299> # Engineering Ltd.
00300> 005:0009-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00301> ROUTE RESERVOIR -> 02:E3-2B 16.83 1.422 No_date 2:45 36.20 n/a
00302> [RDT= 5.00] out<- 01:ME3-2 16.83 1.375 No_date 2:45 36.20 n/a
00303> overflow <= 03:MaE3-2 .00 .000 No_date 0:00 .00 n/a
00304> {MxStoUsed=.2842E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00305> 005:0010-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00306> ADD HYD 02:E3-2A 45.39 2.411 No_date 2:50 28.30 n/a
00307> + 03:ME3-2 16.83 1.375 No_date 2:45 36.20 n/a
00308> [DT= 5.00] SUM= 01:E3-2C 62.22 3.776 No_date 2:50 30.43 n/a
00309> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00310> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00311> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00312> # Engineering Ltd.
00313> 005:0011-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00314> ROUTE RESERVOIR -> 02:E3-2C 62.22 3.776 No_date 2:50 30.43 n/a
00315> [RDT= 1.00] out<- 01:PE3-2 62.22 .314 No_date 5:03 30.43 n/a
00316> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00317> {MxStoUsed=.1602E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00318> # Drainage area for POND E4
00319> # Portion of ultimate development as residential lands
00320> 005:0012-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00321> CALIB STANDHYD 01:E4-1A 31.20 1.776 No_date 2:45 28.81 .603
00322> [XIMP=.44:TIMP=.59]
00323> [LOSS= 2 :CN= 72.0]
00324> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00325> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 456.:MNI=.015:SCI= .0]
00326> # Portion of ultimate development as residential employment lands
00327> 005:0013-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00328> CALIB STANDHYD 01:E4-1B 57.05 4.351 No_date 2:45 36.20 .757
00329> [XIMP=.67:TIMP=.79]
00330> [LOSS= 2 :CN= 72.0]
00331> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00332> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 617.:MNI=.015:SCI= .0]
00333> # Route reservoir to simulate effects of on-site storage within Development
00334> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00335> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00336> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00337> # Engineering Ltd.
00338> 005:0014-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00339> ROUTE RESERVOIR -> 02:E4-1B 57.05 4.351 No_date 2:45 36.20 n/a
00340> [RDT= 5.00] out<- 01:ME4-1 57.05 3.921 No_date 2:55 36.20 n/a
00341> overflow <= 03:MaE4-1 .00 .000 No_date 0:00 .00 n/a
00342> {MxStoUsed=.2615E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00343> 005:0015-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00344> ADD HYD 02:E4-1A 31.20 1.776 No_date 2:45 28.81 n/a
00345> + 03:ME4-1 57.05 3.921 No_date 2:55 36.20 n/a
00346> [DT= 5.00] SUM= 01:E4-1C 88.25 5.468 No_date 2:50 33.59 n/a
00347> # Pond E4 as designed and described in the "Design Brief for SWM Ponds E3 and
00348> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00349> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00350> # Engineering Ltd.
00351> 005:0016-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00352> ROUTE RESERVOIR -> 02:E4-1C 88.25 5.468 No_date 2:50 33.59 n/a
00353> [RDT= 1.00] out<- 01:PE4-1 88.25 .558 No_date 5:00 33.58 n/a
00354> overflow <= 03:OVFP4- .00 .000 No_date 0:00 .00 n/a
00355> {MxStoUsed=.2482E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00356> ** END OF RUN : 9

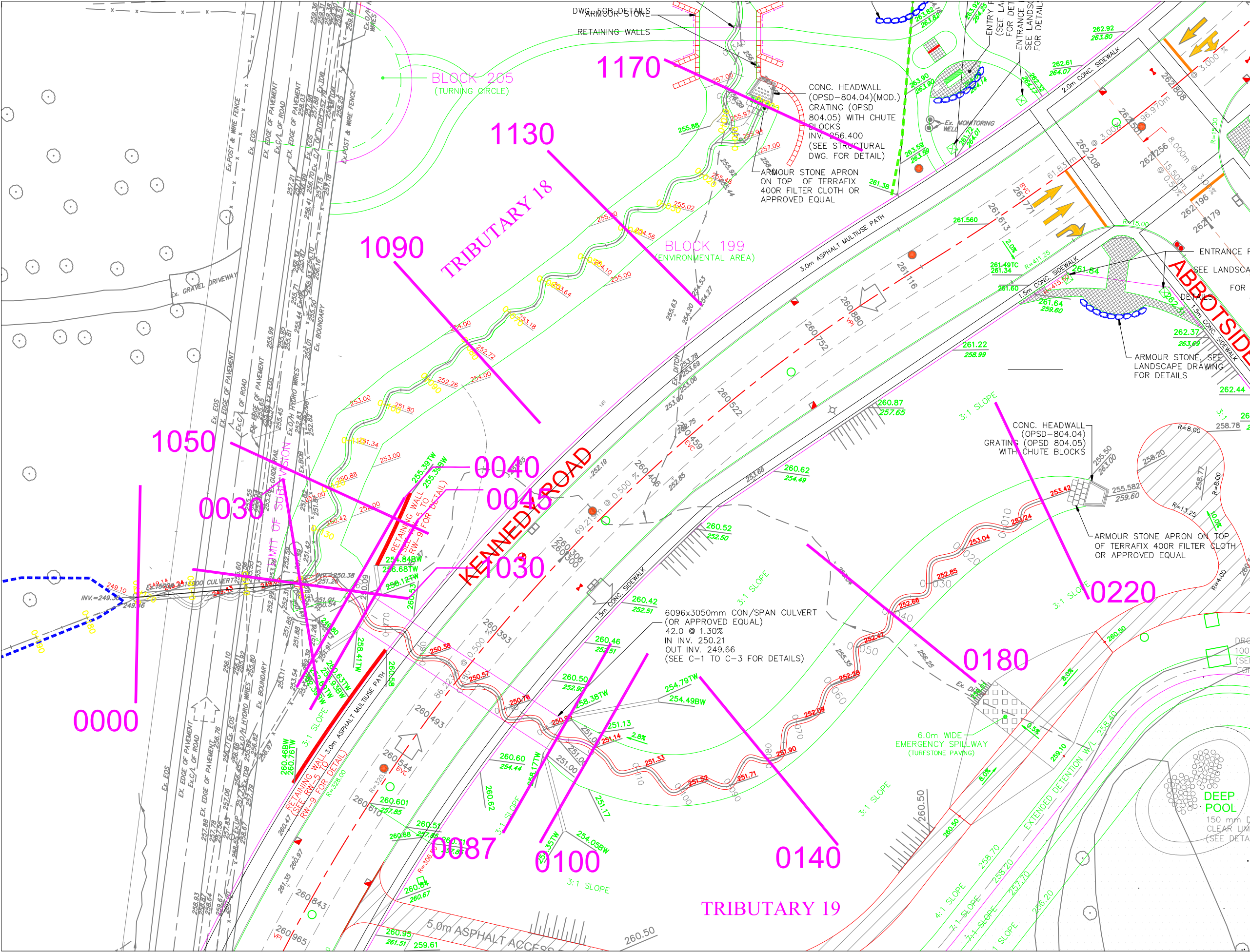
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00357>
00358> *****
00359>
00360>
00361>
00362>
00363>
00364> RUN:COMMAND#
00365> 010:0001-----
00366> START
00367> [TZERO = .00 hrs on 0]
00368> [METOUT= 2 (1=imperial, 2=metric output)]
00369> [NSTORM= 1]
00370> [NRUN = 10]
00371> #*****
00372> # Project Name: [Mayfield West] Project Number: [552-05]
00373> # Date : 2008/04/29
00374> # Modeller : [AV]
00375> # Company : JFSA
00376> # License # : 1155024
00377> #*****
00378> # The purpose of this lumped model of areas to Pond E3 and Pond E4 is to:
00379> # 1) Demonstrate the compatibility between SWMHYMO and DDSWMM / XPSWMM used
00380> # in the SWM Plan analyses of both areas and ponds.
00381> # 2) To confirm that the proposed Pond E3 will satisfy the SWM requirements
00382> # under interim and ultimate conditions. Under interim conditions, only
00383> # 26.48 ha will be developed and 78.21 ha of existing undeveloped lands
00384> # will be serviced by Pond E3 while under ultimate conditions, Pond E3
00385> # will collect the drainage from a total area of 62.2 ha.
00386> 010:0002-----
00387> READ STORM
00388> Filename = STORM.001
00389> Comment = 10yr/6hr
00390> [SDT=15.00:SDUR= 6.25:PTOT= 55.69]
00391> # SIMULATIONS FOR POST-DEVELOPMENT CONDITIONS
00392> # Drainage area for POND E3
00393> # Phase 1a and 2
00394> 010:0003-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00395> CALIB STANDHYD 01:E3-P1 26.48 1.944 No_date 2:45 35.39 .635
00396> [XIMP=.49:TIMP=.56]
00397> [LOSS= 2 :CN= 72.0]
00398> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00399> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 420.:MNI=.015:SCI= .0]
00400> # Remaining undeveloped lands
00401> 010:0004-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00402> CALIB NASHYD 01:E3-Ex1 78.21 1.074 No_date 4:20 16.08 .289
00403> [CN= 72.0: N= 3.00]
00404> [Tp= 1.38:DT= 5.00]
00405> 010:0005-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00406> ADD HYD 02:E3-P1 26.48 1.944 No_date 2:45 35.39 n/a
00407> + 03:E3-Ex1 78.21 1.074 No_date 4:20 16.08 n/a
00408> [DT= 5.00] SUM= 01:E3-S1 104.69 2.089 No_date 2:45 20.96 n/a
00409> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00410> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00411> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00412> # Engineering Ltd.
00413> 010:0006-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00414> ROUTE RESERVOIR -> 02:E3-S1 104.69 2.089 No_date 2:45 20.96 n/a
00415> [RDT= 1.00] out<- 01:PE3-1 104.69 .382 No_date 6:51 20.96 n/a
00416> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00417> {MxStoUsed=.1736E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00418> # Portion of ultimate development as residential lands
00419> 010:0007-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00420> CALIB STANDHYD 01:E3-2A 45.39 3.028 No_date 2:45 34.44 .618
00421> [XIMP=.44:TIMP=.56]
00422> [LOSS= 2 :CN= 72.0]
00423> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00424> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 550.:MNI=.015:SCI= .0]
00425> # Portion of ultimate development as employment lands
00426> 010:0008-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00427> CALIB STANDHYD 01:E3-2B 16.83 1.719 No_date 2:45 43.23 .776
00428> [XIMP=.67:TIMP=.79]
00429> [LOSS= 2 :CN= 72.0]
00430> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00431> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 335.:MNI=.015:SCI= .0]
00432> # Route reservoir to simulate effects of on-site storage within Development
00433> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00434> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00435> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00436> # Engineering Ltd.
00437> 010:0009-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00438> ROUTE RESERVOIR -> 02:E3-2B 16.83 1.719 No_date 2:45 43.23 n/a
00439> [RDT= 5.00] out<- 01:MiE3-2 16.83 1.662 No_date 2:45 43.23 n/a
00440> overflow <= 03:MaE3-2 .00 .000 No_date 0:00 .00 n/a
00441> {MxStoUsed=.3436E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00442> 010:0010-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00443> ADD HYD 02:E3-2A 45.39 3.028 No_date 2:45 34.44 n/a
00444> + 03:MiE3-2 16.83 1.662 No_date 2:45 43.23 n/a
00445> [DT= 5.00] SUM= 01:E3-2C 62.22 4.689 No_date 2:45 36.82 n/a

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00446> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00447> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00448> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00449> # Engineering Ltd.
00450> 010:0011-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00451> ROUTE RESERVOIR -> 02:E3-2C 62.22 4.689 No_date 2:45 36.82 n/a
00452> [RDT= 1.00] out<- 01:PE3-2 62.22 .446 No_date 4:52 36.82 n/a
00453> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00454> {MxStoUsed=.1887E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00455> # Drainage area for POND E4
00456> # Portion of ultimate development as residential lands
00457> 010:0012-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00458> CALIB STANDHYD 01:E4-1A 31.20 2.212 No_date 2:45 35.06 .629
00459> [XIMP=.44:TIMP=.59]
00460> [LOSS= 2 :CN= 72.0]
00461> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00462> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 456.:MNI=.015:SCI= .0]
00463> # Portion of ultimate development as residential employment lands
00464> 010:0013-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00465> CALIB STANDHYD 01:E4-1B 57.05 5.286 No_date 2:45 43.23 .776
00466> [XIMP=.67:TIMP=.79]
00467> [LOSS= 2 :CN= 72.0]
00468> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00469> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 617.:MNI=.015:SCI= .0]
00470> # Route reservoir to simulate effects of on-site storage within Development
00471> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00472> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00473> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00474> # Engineering Ltd.
00475> 010:0014-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00476> ROUTE RESERVOIR -> 02:E4-1B 57.05 5.286 No_date 2:45 43.23 n/a
00477> [RDT= 5.00] out<- 01:ME4-1 57.05 4.754 No_date 2:55 43.23 n/a
00478> overflow <= 03:MAE4-1 .00 .000 No_date 0:00 .00 n/a
00479> {MxStoUsed=.3170E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00480> 010:0015-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00481> ADD HYD 02:E4-1A 31.20 2.212 No_date 2:45 35.06 n/a
00482> + 03:ME4-1 57.05 4.754 No_date 2:55 43.23 n/a
00483> [DT= 5.00] SUM= 01:E4-1C 88.25 6.698 No_date 2:50 40.34 n/a
00484> # Pond E4 as designed and described in the "Design Brief for SWM Ponds E3 and
00485> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00486> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00487> # Engineering Ltd.
00488> 010:0016-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00489> ROUTE RESERVOIR -> 02:E4-1C 88.25 6.698 No_date 2:50 40.34 n/a
00490> [RDT= 1.00] out<- 01:PE4-1 88.25 .784 No_date 4:49 40.34 n/a
00491> overflow <= 03:OVFP4- .00 .000 No_date 0:00 .00 n/a
00492> {MxStoUsed=.2900E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00493> ** END OF RUN : 24
00494>
00495> *****
00496>
00497>
00498>
00499>
00500>
00501> RUN:COMMAND#
00502> 025:0001-----
00503> START
00504> [TZERO = .00 hrs on 0]
00505> [METOUT= 2 (1=imperial, 2=metric output)]
00506> [NSTORM= 1 ]
00507> [NRUN = 25 ]
00508> #*****
00509> # Project Name: [Mayfield West] Project Number: [552-05]
00510> # Date : 2008/04/29
00511> # Modeller : [AV]
00512> # Company : JFSA
00513> # License # : 1155024
00514> #*****
00515> # The purpose of this lumped model of areas to Pond E3 and Pond E4 is to:
00516> # 1) Demonstrate the compatibility between SWMHYMO and DDSWMM / XPSWMM used
00517> # in the SWM Plan analyses of both areas and ponds.
00518> # 2) To confirm that the proposed Pond E3 will satisfy the SWM requirements
00519> # under interim and ultimate conditions. Under interim conditions, only
00520> # 26.48 ha will be developed and 78.21 ha of existing undeveloped lands
00521> # will be serviced by Pond E3 while under ultimate conditions, Pond E3
00522> # will collect the drainage from a total area of 62.2 ha.
00523> 025:0002-----
00524> READ STORM
00525> Filename = STORM.001
00526> Comment = 25yr/6hr
00527> [SDT=15.00:SDUR= 6.25:PTOT= 65.59]
00528> # SIMULATIONS FOR POST-DEVELOPMENT CONDITIONS
00529> # Drainage area for POND E3
00530> # Phase 1a and 2
00531> 025:0003-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00532> CALIB STANDHYD 01:E3-P1 26.48 2.428 No_date 2:45 43.41 .662
00533> [XIMP=.49:TIMP=.56]
00534> [LOSS= 2 :CN= 72.0]
```



LEGEND:

NOTE:

SCALE:

BY :

J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

600 ALDEN ROAD., SUITE 500
MARKHAM, ONTARIO, L3R 0E7
(905) 475-3080

PROJECT :

MOSCOP

BY	DATE	DESCRIPTION	APPR.

HEC-RAS Tributaries 18 and 19

FIGURE 1

DESIGNED:	
DRAWN:	-
VERIFIED:	-
APPROVED:	-
DATE	PROJECT No.
Aug/08	552-05

DRAWING REF:

Z:\PROJ\552-05\200807 1HEC-RAS Tributaries\Design\DWGs

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00535> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00536> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 420.:MNI=.015:SCI= .0]
00537> # Remaining undeveloped lands
00538> 025:0004-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00539> CALIB NASHYD 01:E3-Ex1 78.21 1.463 No_date 4:20 21.81 .333
00540> [CN= 72.0: N= 3.00]
00541> [Tp= 1.38:DT= 5.00]
00542> 025:0005-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00543> ADD HYD 02:E3-P1 26.48 2.428 No_date 2:45 43.41 n/a
00544> + 03:E3-Ex1 78.21 1.463 No_date 4:20 21.81 n/a
00545> [DT= 5.00] SUM= 01:E3-S1 104.69 2.644 No_date 2:45 27.28 n/a
00546> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00547> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00548> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00549> # Engineering Ltd.
00550> 025:0006-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00551> ROUTE RESERVOIR -> 02:E3-S1 104.69 2.644 No_date 2:45 27.28 n/a
00552> [RDT= 1.00] out<- 01:PE3-1 104.69 .566 No_date 6:41 27.27 n/a
00553> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00554> {MxStoUsed=.2150E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00555> # Portion of ultimate development as residential lands
00556> 025:0007-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00557> CALIB STANDHYD 01:E3-2A 45.39 3.840 No_date 2:45 42.44 .647
00558> [XIMP=.44:TIMP=.56]
00559> [LOSS= 2 :CN= 72.0]
00560> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00561> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 550.:MNI=.015:SCI= .0]
00562> # Portion of ultimate development as employment lands
00563> 025:0008-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00564> CALIB STANDHYD 01:E3-2B 16.83 2.079 No_date 2:45 52.22 .796
00565> [XIMP=.67:TIMP=.79]
00566> [LOSS= 2 :CN= 72.0]
00567> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00568> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 335.:MNI=.015:SCI= .0]
00569> # Route reservoir to simulate effects of on-site storage within Development
00570> # Lands as per DDSWM analysis documented in "Design Brief for SWM Ponds E3 and
00571> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00572> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00573> # Engineering Ltd.
00574> 025:0009-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00575> ROUTE RESERVOIR -> 02:E3-2B 16.83 2.079 No_date 2:45 52.22 n/a
00576> [RDT= 5.00] out<- 01:ME3-2 16.83 2.010 No_date 2:45 52.22 n/a
00577> overflow <= 03:ME3-2 .00 .000 No_date 0:00 .00 n/a
00578> {MxStoUsed=.4156E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00579> 025:0010-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00580> ADD HYD 02:E3-2A 45.39 3.840 No_date 2:45 42.44 n/a
00581> + 03:ME3-2 16.83 2.010 No_date 2:45 52.22 n/a
00582> [DT= 5.00] SUM= 01:E3-2C 62.22 5.850 No_date 2:45 45.09 n/a
00583> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00584> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00585> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00586> # Engineering Ltd.
00587> 025:0011-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00588> ROUTE RESERVOIR -> 02:E3-2C 62.22 5.850 No_date 2:45 45.09 n/a
00589> [RDT= 1.00] out<- 01:PE3-2 62.22 .650 No_date 4:39 45.08 n/a
00590> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00591> {MxStoUsed=.2257E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00592> # Drainage area for POND E4
00593> # Portion of ultimate development as residential lands
00594> 025:0012-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00595> CALIB STANDHYD 01:E4-1A 31.20 2.732 No_date 2:45 43.18 .658
00596> [XIMP=.44:TIMP=.59]
00597> [LOSS= 2 :CN= 72.0]
00598> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00599> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 456.:MNI=.015:SCI= .0]
00600> # Portion of ultimate development as residential employment lands
00601> 025:0013-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00602> CALIB STANDHYD 01:E4-1B 57.05 6.576 No_date 2:45 52.22 .796
00603> [XIMP=.67:TIMP=.79]
00604> [LOSS= 2 :CN= 72.0]
00605> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00606> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 617.:MNI=.015:SCI= .0]
00607> # Route reservoir to simulate effects of on-site storage within Development
00608> # Lands as per DDSWM analysis documented in "Design Brief for SWM Ponds E3 and
00609> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00610> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00611> # Engineering Ltd.
00612> 025:0014-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00613> ROUTE RESERVOIR -> 02:E4-1B 57.05 6.576 No_date 2:45 52.22 n/a
00614> [RDT= 5.00] out<- 01:ME4-1 57.05 5.745 No_date 2:50 52.22 n/a
00615> overflow <= 03:ME4-1 .00 .000 No_date 0:00 .00 n/a
00616> {MxStoUsed=.3883E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00617> 025:0015-----ID:NHYD-----AREA---QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00618> ADD HYD 02:E4-1A 31.20 2.732 No_date 2:45 43.18 n/a
00619> + 03:ME4-1 57.05 5.745 No_date 2:50 52.22 n/a
00620> [DT= 5.00] SUM= 01:E4-1C 88.25 8.374 No_date 2:50 49.02 n/a
00621> # Pond E4 as designed and described in the "Design Brief for SWM Ponds E3 and
00622> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00623> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer

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00624> # Engineering Ltd.
00625> 025:0016-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00626> ROUTE RESERVOIR -> 02:E4-1C 88.25 8.374 No_date 2:50 49.02 n/a
00627> [RDT= 1.00] out<- 01:PE4-1 88.25 1.062 No_date 4:40 49.02 n/a
00628> overflow <= 03:OVFP4- .00 .000 No_date 0:00 .00 n/a
00629> {MxStoUsed=.3444E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00630> ** END OF RUN : 49
00631>
00632> *****
00633>
00634>
00635>
00636>
00637>
00638> RUN:COMMAND#
00639> 050:0001-----
00640> START
00641> [TZERO = .00 hrs on 0]
00642> [METOUT= 2 (1=imperial, 2=metric output)]
00643> [NSTORM= 1]
00644> [NRUN = 50]
00645> #*****
00646> # Project Name: [Mayfield West] Project Number: [552-05]
00647> # Date : 2008/04/29
00648> # Modeller : [AV]
00649> # Company : JFSA
00650> # License # : 1155024
00651> #*****
00652> # The purpose of this lumped model of areas to Pond E3 and Pond E4 is to:
00653> # 1) Demonstrate the compatibility between SWMHYMO and DDSWMM / XPSWMM used
00654> # in the SWM Plan analyses of both areas and ponds.
00655> # 2) To confirm that the proposed Pond E3 will satisfy the SWM requirements
00656> # under interim and ultimate conditions. Under interim conditions, only
00657> # 26.48 ha will be developed and 78.21 ha of existing undevelopped lands
00658> # will be serviced by Pond E3 while under ultimate conditions, Pond E3
00659> # will collect the drainage from a total area of 62.2 ha.
00660> 050:0002-----
00661> READ STORM
00662> Filename = STORM.001
00663> Comment = 50yr/6hr
00664> [SDT=15.00:SDUR= 6.25:PTOT= 73.00]
00665> # SIMULATIONS FOR POST-DEVELOPMENT CONDITIONS
00666> # Drainage area for POND E3
00667> # Phase 1a and 2
00668> 050:0003-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00669> CALIB STANDHYD 01:E3-P1 26.48 2.774 No_date 2:45 49.57 .679
00670> [XIMP=.49:TIMP=.56]
00671> [LOSS= 2 :CN= 72.0]
00672> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00673> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 420.:MNI=.015:SCI= .0]
00674> # Remaining undevelopped lands
00675> 050:0004-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00676> CALIB NASHYD 01:E3-Ex1 78.21 1.776 No_date 4:20 26.44 .362
00677> [CN= 72.0: N= 3.00]
00678> [Tp= 1.38:DT= 5.00]
00679> 050:0005-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00680> ADD HYD 02:E3-P1 26.48 2.774 No_date 2:45 49.57 n/a
00681> + 03:E3-Ex1 78.21 1.776 No_date 4:20 26.44 n/a
00682> [DT= 5.00] SUM= 01:E3-S1 104.69 3.051 No_date 2:45 32.29 n/a
00683> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00684> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00685> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00686> # Engineering Ltd.
00687> 050:0006-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00688> ROUTE RESERVOIR -> 02:E3-S1 104.69 3.051 No_date 2:45 32.29 n/a
00689> [RDT= 1.00] out<- 01:PE3-1 104.69 .821 No_date 6:25 32.28 n/a
00690> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00691> {MxStoUsed=.2435E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00692> # Portion of ultimate development as residential lands
00693> 050:0007-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00694> CALIB STANDHYD 01:E3-2A 45.39 4.412 No_date 2:45 48.60 .666
00695> [XIMP=.44:TIMP=.56]
00696> [LOSS= 2 :CN= 72.0]
00697> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00698> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 550.:MNI=.015:SCI= .0]
00699> # Portion of ultimate development as employment lands
00700> 050:0008-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00701> CALIB STANDHYD 01:E3-2B 16.83 2.355 No_date 2:45 59.03 .809
00702> [XIMP=.67:TIMP=.79]
00703> [LOSS= 2 :CN= 72.0]
00704> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00705> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 335.:MNI=.015:SCI= .0]
00706> # Route reservoir to simulate effects of on-site storage within Development
00707> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00708> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00709> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00710> # Engineering Ltd.
00711> 050:0009-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00712> ROUTE RESERVOIR -> 02:E3-2B 16.83 2.355 No_date 2:45 59.03 n/a

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00713> [RDT= 5.00] out<- 01:MiE3-2 16.83 2.277 No_date 2:45 59.03 n/a
00714> overflow <= 03:MaE3-2 .00 .000 No_date 0:00 .00 n/a
00715> {MxStoUsed=.4706E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00716> 050:0010-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00717> ADD HYD 02:E3-2A 45.39 4.412 No_date 2:45 48.60 n/a
00718> + 03:MiE3-2 16.83 2.277 No_date 2:45 59.03 n/a
00719> [DT= 5.00] SUM= 01:E3-2C 62.22 6.689 No_date 2:45 51.42 n/a
00720> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00721> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00722> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00723> # Engineering Ltd.
00724> 050:0011-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00725> ROUTE RESERVOIR -> 02:E3-2C 62.22 6.689 No_date 2:45 51.42 n/a
00726> [RDT= 1.00] out<- 01:PE3-2 62.22 .899 No_date 4:28 51.42 n/a
00727> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00728> {MxStoUsed=.2506E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00729> # Drainage area for POND E4
00730> # Portion of ultimate development as residential lands
00731> 050:0012-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00732> CALIB STANDHYD 01:E4-1A 31.20 3.251 No_date 2:45 49.42 .677
00733> [XIMP=.44:TIMP=.59]
00734> [LOSS= 2 :CN= 72.0]
00735> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00736> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 456.:MNI=.015:SCI= .0]
00737> # Portion of ultimate development as residential employment lands
00738> 050:0013-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00739> CALIB STANDHYD 01:E4-1B 57.05 7.590 No_date 2:45 59.03 .809
00740> [XIMP=.67:TIMP=.79]
00741> [LOSS= 2 :CN= 72.0]
00742> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00743> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 617.:MNI=.015:SCI= .0]
00744> # Route reservoir to simulate effects of on-site storage within Development
00745> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00746> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00747> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00748> # Engineering Ltd.
00749> 050:0014-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00750> ROUTE RESERVOIR -> 02:E4-1B 57.05 7.590 No_date 2:45 59.03 n/a
00751> [RDT= 5.00] out<- 01:MiE4-1 57.05 6.621 No_date 2:50 59.03 n/a
00752> overflow <= 03:MaE4-1 .00 .000 No_date 0:00 .00 n/a
00753> {MxStoUsed=.4474E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00754> 050:0015-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00755> ADD HYD 02:E4-1A 31.20 3.251 No_date 2:45 49.42 n/a
00756> + 03:MiE4-1 57.05 6.621 No_date 2:50 59.03 n/a
00757> [DT= 5.00] SUM= 01:E4-1C 88.25 9.750 No_date 2:50 55.64 n/a
00758> # Pond E4 as designed and described in the "Design Brief for SWM Ponds E3 and
00759> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00760> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00761> # Engineering Ltd.
00762> 050:0016-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00763> ROUTE RESERVOIR -> 02:E4-1C 88.25 9.750 No_date 2:50 55.64 n/a
00764> [RDT= 1.00] out<- 01:PE4-1 88.25 1.386 No_date 4:31 55.63 n/a
00765> overflow <= 03:OVFP4- .00 .000 No_date 0:00 .00 n/a
00766> {MxStoUsed=.3836E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00767> ** END OF RUN : 99
00768>
00769> *****
00770>
00771>
00772>
00773>
00774>
00775> RUN:COMMAND#
00776> 100:0001-----
00777> START
00778> [TZERO = .00 hrs on 0]
00779> [METOUT= 2 (1=imperial, 2=metric output)]
00780> [NSTORM= 1]
00781> [NRUN = 100]
00782> #*****
00783> # Project Name: [Mayfield West] Project Number: [552-05]
00784> # Date : 2008/04/29
00785> # Modeller : [AV]
00786> # Company : JFSA
00787> # License # : 1155024
00788> #*****
00789> # The purpose of this lumped model of areas to Pond E3 and Pond E4 is to:
00790> # 1) Demonstrate the compatibility between SWMHYMO and DDSWMM / XPSWMM used
00791> # in the SWM Plan analyses of both areas and ponds.
00792> # 2) To confirm that the proposed Pond E3 will satisfy the SWM requirements
00793> # under interim and ultimate conditions. Under interim conditions, only
00794> # 26.48 ha will be developed and 78.21 ha of existing undeveloped lands
00795> # will be serviced by Pond E3 while under ultimate conditions, Pond E3
00796> # will collect the drainage from a total area of 62.2 ha.
00797> 100:0002-----
00798> READ STORM
00799> Filename = STORM.001
00800> Comment = 100yr/6hr
00801> [SDT=15.00:SDUR= 6.25:PTOT= 80.31]

```

```

00802> # SIMULATIONS FOR POST-DEVELOPMENT CONDITIONS
00803> # Drainage area for POND E3
00804> # Phase 1a and 2
00805> 100:0003-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00806> CALIB STANDHYD 01:E3-P1 26.48 3.217 No_date 2:45 55.77 .694
00807> [XIMP=.49:TIMP=.56]
00808> [LOSS= 2 :CN= 72.0]
00809> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00810> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 420.:MNI=.015:SCI= .0]
00811> # Remaining undeveloped lands
00812> 100:0004-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00813> CALIB NASHYD 01:E3-Ex1 78.21 2.102 No_date 4:20 31.23 .389
00814> [CN= 72.0: N= 3.00]
00815> [Tp= 1.38:DT= 5.00]
00816> 100:0005-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00817> ADD HYD 02:E3-P1 26.48 3.217 No_date 2:45 55.77 n/a
00818> + 03:E3-Ex1 78.21 2.102 No_date 4:20 31.23 n/a
00819> [DT= 5.00] SUM= 01:E3-S1 104.69 3.560 No_date 2:45 37.44 n/a
00820> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00821> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00822> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00823> # Engineering Ltd.
00824> 100:0006-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00825> ROUTE RESERVOIR -> 02:E3-S1 104.69 3.560 No_date 2:45 37.44 n/a
00826> [RDT= 1.00] out<- 01:PE3-1 104.69 1.110 No_date 6:13 37.43 n/a
00827> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00828> {MxStoUsed=.2686E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00829> # Portion of ultimate development as residential lands
00830> 100:0007-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00831> CALIB STANDHYD 01:E3-2A 45.39 5.176 No_date 2:45 54.80 .682
00832> [XIMP=.44:TIMP=.56]
00833> [LOSS= 2 :CN= 72.0]
00834> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00835> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 550.:MNI=.015:SCI= .0]
00836> # Portion of ultimate development as employment lands
00837> 100:0008-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00838> CALIB STANDHYD 01:E3-2B 16.83 2.678 No_date 2:45 65.82 .820
00839> [XIMP=.67:TIMP=.79]
00840> [LOSS= 2 :CN= 72.0]
00841> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00842> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 335.:MNI=.015:SCI= .0]
00843> # Route reservoir to simulate effects of on-site storage within Development
00844> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00845> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00846> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00847> # Engineering Ltd.
00848> 100:0009-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00849> ROUTE RESERVOIR -> 02:E3-2B 16.83 2.678 No_date 2:45 65.82 n/a
00850> [RDT= 5.00] out<- 01:ME3-2 16.83 2.592 No_date 2:45 65.82 n/a
00851> overflow <= 03:MaE3-2 .00 .000 No_date 0:00 .00 n/a
00852> {MxStoUsed=.5353E-01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00853> 100:0010-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00854> ADD HYD 02:E3-2A 45.39 5.176 No_date 2:45 54.80 n/a
00855> + 03:ME3-2 16.83 2.592 No_date 2:45 65.82 n/a
00856> [DT= 5.00] SUM= 01:E3-2C 62.22 7.768 No_date 2:45 57.78 n/a
00857> # Pond E3 as designed and described in the "Design Brief for SWM Ponds E3 and
00858> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00859> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00860> # Engineering Ltd.
00861> 100:0011-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00862> ROUTE RESERVOIR -> 02:E3-2C 62.22 7.768 No_date 2:45 57.78 n/a
00863> [RDT= 1.00] out<- 01:PE3-2 62.22 1.178 No_date 4:20 57.77 n/a
00864> overflow <= 03:OVFP3- .00 .000 No_date 0:00 .00 n/a
00865> {MxStoUsed=.2742E+01, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}
00866> # Drainage area for POND E4
00867> # Portion of ultimate development as residential lands
00868> 100:0012-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00869> CALIB STANDHYD 01:E4-1A 31.20 3.686 No_date 2:45 55.70 .694
00870> [XIMP=.44:TIMP=.59]
00871> [LOSS= 2 :CN= 72.0]
00872> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00873> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 456.:MNI=.015:SCI= .0]
00874> # Portion of ultimate development as residential employment lands
00875> 100:0013-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00876> CALIB STANDHYD 01:E4-1B 57.05 8.502 No_date 2:45 65.82 .820
00877> [XIMP=.67:TIMP=.79]
00878> [LOSS= 2 :CN= 72.0]
00879> [Pervious area: IAper= 7.00:SLPP= .50:LGP= 40.:MNP=.300:SCP= .0]
00880> [Impervious area: IAimp= 2.50:SLPI= .50:LGI= 617.:MNI=.015:SCI= .0]
00881> # Route reservoir to simulate effects of on-site storage within Development
00882> # Lands as per DDSWMM analysis documented in "Design Brief for SWM Ponds E3 and
00883> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00884> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00885> # Engineering Ltd.
00886> 100:0014-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00887> ROUTE RESERVOIR -> 02:E4-1B 57.05 8.502 No_date 2:45 65.82 n/a
00888> [RDT= 5.00] out<- 01:ME4-1 57.05 7.418 No_date 2:50 65.82 n/a
00889> overflow <= 03:MaE4-1 .00 .000 No_date 0:00 .00 n/a
00890> {MxStoUsed=.5010E+00, TotOvfVol=.0000E+00, N-Ovf= 0, TotDurOvf= 0.hrs}

```

```
00891> 100:0015-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00892>      ADD HYD          02:E4-1A      31.20      3.686 No_date      2:45      55.70      n/a
00893>      + 03:MiE4-1      57.05      7.418 No_date      2:50      65.82      n/a
00894>      [DT= 5.00] SUM= 01:E4-1C      88.25      10.966 No_date      2:50      62.24      n/a
00895> # Pond E4 as designed and described in the "Design Brief for SWM Ponds E3 and
00896> # E4 in the South Fields Community, Moscorp 1A and Moscorp 2 Subdivisions,
00897> # Town of Caledon", Project No. 07-294, Revised August 2008, David Schaeffer
00898> # Engineering Ltd.
00899> 100:0016-----ID:NHYD-----AREA----QPEAK-TpeakDate_hh:mm----R.V.-R.C.-
00900>      ROUTE RESERVOIR -> 02:E4-1C      88.25      10.966 No_date      2:50      62.24      n/a
00901>      [RDT= 1.00] out<- 01:PE4-1      88.25      1.754 No_date      4:24      62.24      n/a
00902>      overflow <= 03:OVFP4-      .00      .000 No_date      0:00      .00      n/a
00903>      {MxStoUsed=.4199E+01, TotOvfVol=.0000E+00, N-Ovf=      0, TotDurOvf=      0.hrs}
00904> 100:0002-----
00905>      FINISH
00906> -----
00907> *****
00908>      WARNINGS / ERRORS / NOTES
00909>      -----
00910>      Simulation ended on 2008-08-12      at 21:22:29
00911> =====
00912>
00913>
```

APPENDIX K

MAYFIELD WEST – HEC-RAS MODEL OF TRIBUTARIES 18 AND 19



J.F. Sabourin and Associates Inc.

WATER RESOURCES AND ENVIRONMENTAL
CONSULTANTS

52 Springbrook Drive
Ottawa, Ontario Canada K2S 1B9
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WEB: www.jfsa.com

August 12, 2008

David Schaeffer Engineering Limited

600 Alden Road, Suite 500
Markham, Ontario L3R 0E7

Attention: Jennifer Cappola-Logullo, P.Eng.

Subject: Mayfield West Subdivision / HEC-Ras Model of Tributaries 18 and 19 *our file: 552/05*

As requested by your office, we have evaluated, based on the available information as described below, the 2 - 100 year and Regional design water levels along the Tributaries 18 and 19, from the outlets of Ponds E3 and E4 to their confluence with Etobicoke Creek.

In undertaking this work, the following information was considered:

- 1) A single 42-metre long 6096 x 3050 mm Con-Span culvert with wingwalls will be installed under the new Kennedy Road crossing (refer to Figure 1 for location). The upstream invert of this embedded culvert was set to an elevation of 249.73 m. This invert is located under the low flow channel, which at the same location, has an invert of 250.21 m (refer to the attached Drawing C-2, by G. D. Jewell Engineering Inc.) leaving a clear opening of 2.57 m. The centerline elevation of the proposed Kennedy Road near the culvert location is 260.443 m (see attached Drawing C-1).
- 2) The existing 29 m long 1500 mm diameter culvert under the current alignment of Kennedy Road (see Figure 1) was not entered in the HEC-Ras model.
- 3) Typical cross-sections upstream and downstream of the culvert were based on the attached Figure 2 (as designed by Dillon Consulting).
- 4) The storm flows inserted upstream of Tributaries 18 and 19 were obtained from the Pond Design brief report by JFSA and dated August 2008. These flows are presented in Table 1.
- 5) Downstream boundary water levels were obtained from TRCA's Etobicoke Creek HEC-2 model "Ec22.dat" at cross-section 22.17. Water levels of various return periods for section 22.17 are provided in Table 2.

Based on the above information, design water levels for both Tributary 18 and Tributary 19 were determined with HEC-RAS and are presented in Table 3.

Yours truly,

J.F. Sabourin and Associates Inc.

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

Table 1: Design Flows

Return Period	Flows (m3/s)		
	Tributary 19	Tributary 18	Junction
2-year	0.220	0.136	0.356
5-year	0.554	0.311	0.865
10-year	0.791	0.448	1.239
25-year	1.063	0.663	1.726
50-year	1.387	0.922	2.309
100-year	1.753	1.201	2.954
Regional	10.447	5.452	15.899

Note: Flows on Tributary 18 are those from Pond E3 and flows on Tributary 19 are from Pond E4

**Table 2: Etobicoke Creek Water Levels
at Confluence with Outlet of Tributary 18 and 19**

Return Period	Water Level (m)
2	249.03*
5	249.03
10	249.26
25	249.48
50	249.62
100	249.74
Regional	250.72

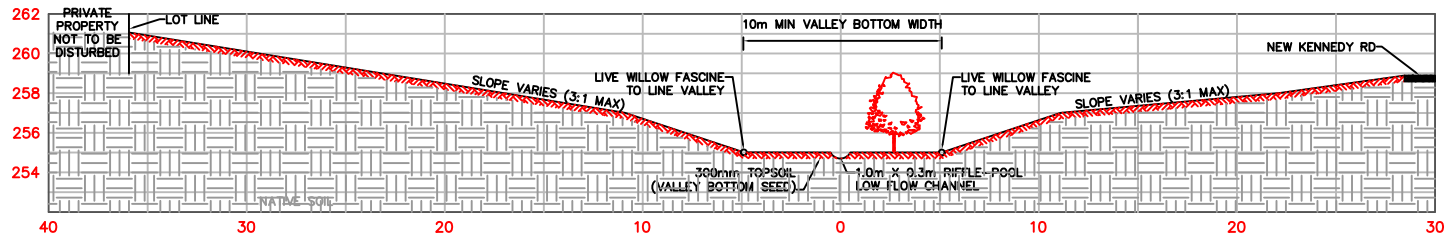
Note: * 2-year water level taken as 5-year since 2-year not modelled in HEC-2

Table 3: HEC-Ras Water Surface Levels for Tributary 18 and 19

Reach	Station	Water Level (m)						
		2-year	5-year	10-year	25-year	50-year	100-year	Regional
Tib 19	0220	253.75	253.8	253.82	253.84	253.87	253.89	254.23
	0180	253.01	253.06	253.08	253.1	253.13	253.15	253.49
	0140	252.23	252.28	252.3	252.32	252.35	252.37	252.69
	0100	251.47	251.50	251.52	251.54	251.57	251.6	251.99
	0087	250.57	250.73	250.80	250.86	250.92	251.00	251.59
	0045	250.37	250.42	250.45	250.49	250.52	250.56	251.04
	0040	250.33	250.39	250.43	250.47	250.51	250.55	251.10
Trib18	1170	256.67	256.75	256.77	256.79	256.81	256.83	257.03
	1130	254.83	254.91	254.93	254.95	254.97	254.99	255.19
	1090	252.99	253.07	253.09	253.11	253.13	253.15	253.35
	1050	251.15	251.23	251.25	251.27	251.29	251.31	251.51
	1030	250.20	250.27	250.31	250.35	250.39	250.44	251.03
Trib 18-19	0030	250.17	250.22	250.24	250.28	250.32	250.36	250.74
	0000	249.71	249.75	249.78	249.80	249.83	249.85	250.72

* Refer to Figure 1 for location of cross-sections

LOWER TRIBUTARY 18 – TYPICAL SECTION 3



LEGEND:

NOTE:

SCALE:



BY :  J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

CLIENT :  600 ALDEN ROAD., SUITE 500
MARKHAM, ONTARIO, L3R 0E7
(905) 475-3080

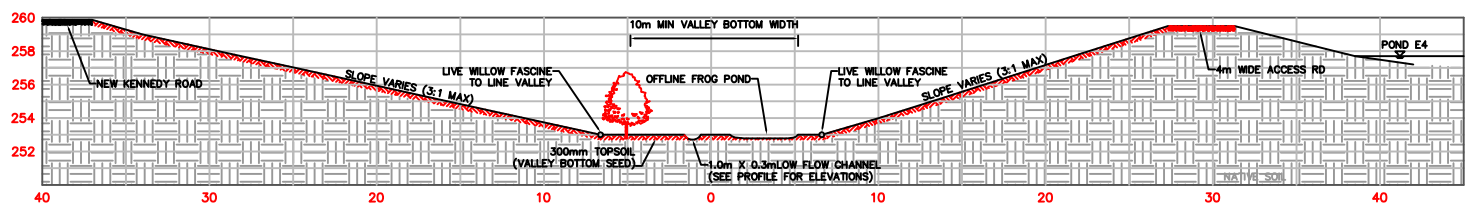
PROJECT :
MOSCOP

BY	DATE	DESCRIPTION	APPR.

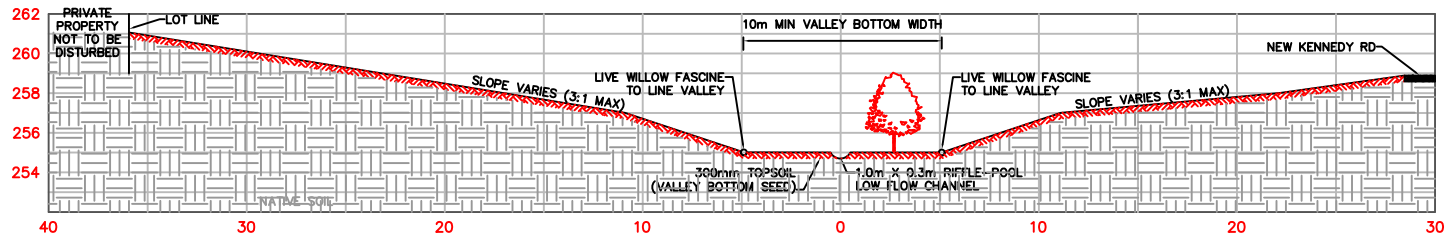
HEC-RAS Cross-Sections

FIGURE 2	DESIGNED:	
	DRAWN:	—
	VERIFIED:	—
	APPROVED:	—
DRAWING REF. Z:\PRO\552-05\200807 HEC-RAS Tributaries\Design\DWGs	DATE	PROJECT No.
	Aug/08	552-05

TRIBUTARY 19 – TYPICAL SECTION 1



LOWER TRIBUTARY 18 – TYPICAL SECTION 3



LEGEND:

NOTE:

SCALE:



BY :



J.F. Sabourin & Associates Inc.
WATER RESOURCES AND ENVIRONMENTAL CONSULTANTS
OTTAWA (613) 836-3884
GATINEAU (819) 243-6858

CLIENT :

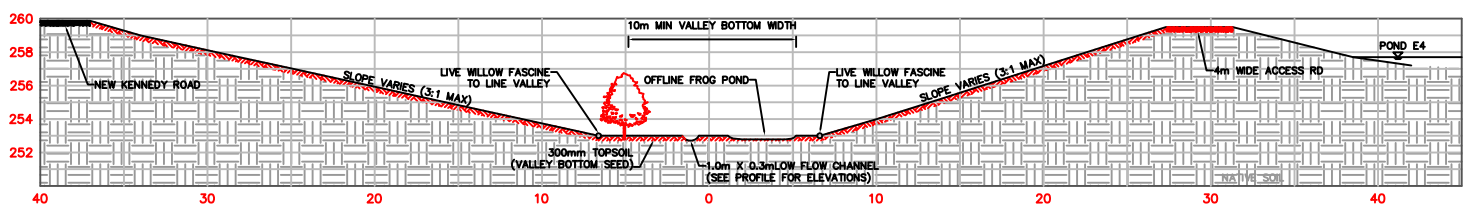


600 ALDEN ROAD., SUITE 500
MARKHAM, ONTARIO, L3R 0E7
(905) 475-3080

PROJECT :

MOSCOP

TRIBUTARY 19 – TYPICAL SECTION 1



BY	DATE	DESCRIPTION	APPR.

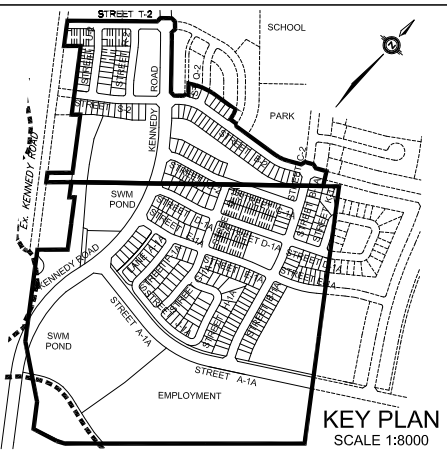
HEC-RAS Cross-Sections

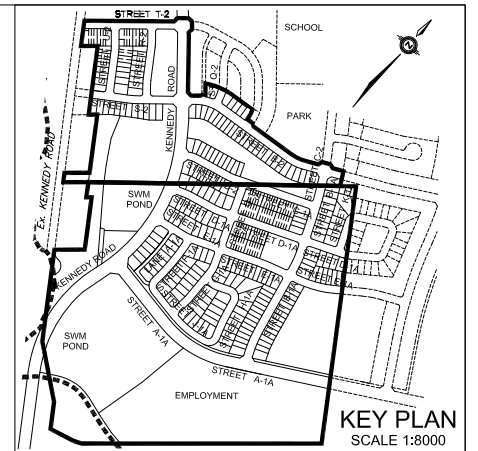
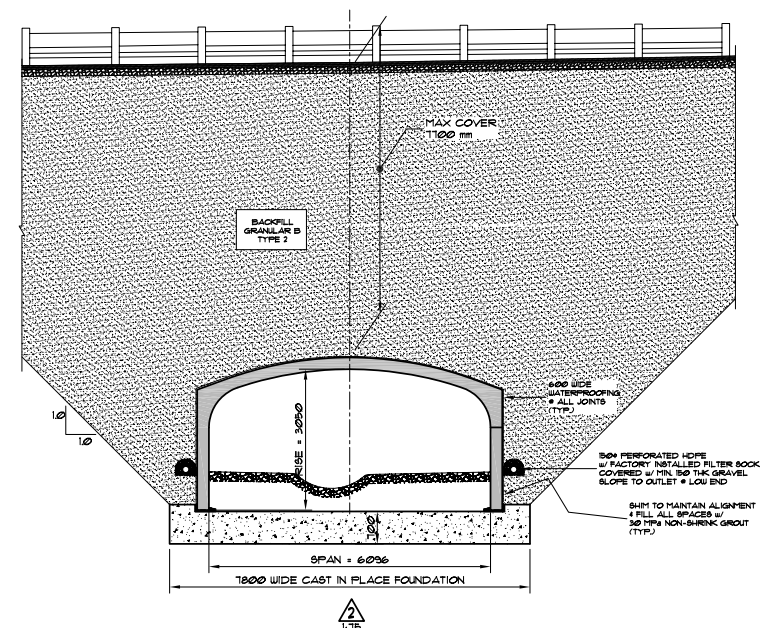
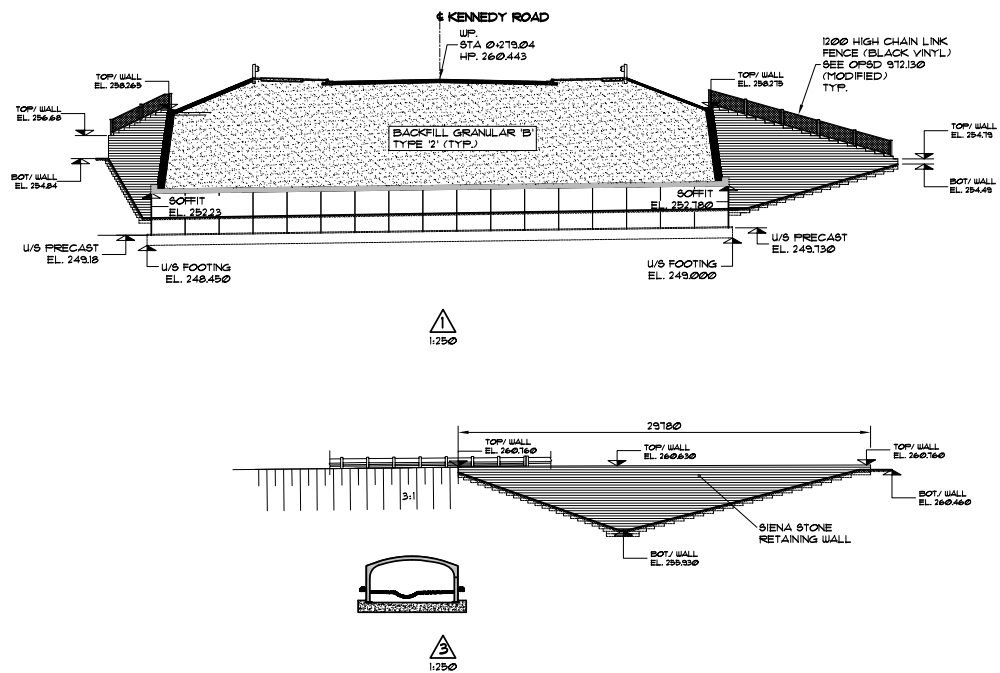
FIGURE 2

DESIGNED: —
DRAWN: —
VERIFIED: —
APPROVED: —

DRAWING REF.
Z:\PRO\552-05\200807 HEC-RAS Tributaries\Design\DWGs

DATE	PROJECT No.
Aug/08	552-05



[illegible]

SCALE: AS NOTED		PROJECT No. 280556
DESIGNED BY: L.Y.	DRAWN BY: L.Y.	
CHECKED BY: K.B.	DATE: MAY 2008	DRAWING No. C-1

APPENDIX L

MAYFIELD WEST – CONTINUOUS SIMULATION FOR EROSION ANALYSIS



J.F. Sabourin and Associates Inc.

WATER RESOURCES AND ENVIRONMENTAL
CONSULTANTS

52 Springbrook Drive
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August 12, 2008

David Schaeffer Engineering Limited

600 Alden Road, Suite 500
Markham, Ontario L3R 0E7

Attention: Jennifer Cappola-Logullo, P.Eng.

Subject: Mayfield West - Continuous Simulation for Erosion Analysis

our file: 552/05

In addressing the erosion control requirements for the proposed SWM Ponds E3 and E4, our analysis was based on the findings of the "TRCA Fluvial Geomorphology Study and Erosion Assessment - Etobicoke Creek-" study prepared by Parish Geomorphic and dated September 2005. It is believed that the noted study addressed all of TRCA's "Watercourse Erosion Analysis Requirements" except for the continuous erosion analysis which is described in the current letter report.

The above noted study undertook detailed geomorphic assessments including several site measurements of channel and bank characteristics, bankfull flow conditions and any other information pertinent to modeling erosion thresholds. Relevant sites that were analyzed by Parish are shown in the attached Figure taken from their report. It is noted that sites E25 and E26 are located in the vicinity of the Mayfield West community. Site E25 is located slightly downstream while site E26 appears to be slightly upstream from the outlet of the proposed SWM Ponds.

Critical flow discharge for both erosion sites E25 and E26 were evaluated by Parish to be 1.37 m³/s and 1.61 m³/s respectively (see attached Table 4.1 from Parish report). Since the critical flow discharge for Site E25 is lower than for Site E26 and given the fact that site E25 is just downstream of the proposed locations of Pond E3 and Pond E4, Site E25 was selected in our assessment of erosion exceedences.

A continuous SWMHYMO model for existing conditions was recreated from TRCA's VO2 model. With the exception of the continuous parameters, all of the input data was taken from the TRCA's Etobicoke Creek Hydrology Update model (Final Draft Study Report, March 2007). We understand that the Etobicoke Creek model was calibrated. An overall view of the Etobicoke Creek watershed is provided in the attached Figure 2.1 taken from the noted report. The Mayfield community is located in catchment area 228.

It is noted that SWMHYMO can simulate all of the same flows as the VO2 model. The commands in VO2 are available in SWMHYMO. The continuous simulation algorithms in SWMHYMO are similar (if not the same) as the continuous simulation algorithms in QUALHYMO.

The parameters that needed to be entered in our continuous model that were not available in the VO2 model are as follows;

APII=[50], APIK=[0.90]/day;	used to compute the Antecedent Precipitation Index during the continuous simulation. Without model calibration these are default values.
IaRECper=[3](hrs);	is the time that it takes for the Initial Abstraction over pervious areas to recover during a dry period.
IaRECimp=[1.5](hrs);	is the time that it takes for the Initial Abstraction over impervious areas to recover during a dry period.
SMIN=[-1], SMAX=[-1](mm);	the -ve values indicate that the Storage volume in the SCS procedure will vary between the "S" determined for AMC I and AMC III conditions of the entered CN value.
SK=[0.010]/(mm);	is a calibration coefficient that can typically vary from 0.01 to 0.3. The higher the value, the more runoff is generated. To set the baseline for existing conditions, we decided to take a value in the low range. The same value was also used in the proposed conditions model.
InterEventTime=[24](hrs);	identifies the period during which if there is no rain, the parameters in the SCS procedure are reset to their initial values.
InitGWResVol=[50](mm), GWResK=[0.99](mm/day/mm), VhydCond=[0.075](mm/hr);	are parameters in the NASHYD commands that are used to simulate both the groundwater storage and discharge to surface watercourses. Without adequate field measurements, these parameters were selected based on previous experience.

Under existing and future conditions, and for continuous simulations conducted with Toronto hourly data from 1960 to 1998 inclusive, cumulative exceedences of annual erosion hours (erosion indices) were computed and compared. For the future conditions, the ultimate drainage areas for Ponds E3 and E4, as well as the proposed operation of the ponds were entered in the Etobicoke model. It is noted that the same stage-storage-outflow curves that were entered for Ponds E3 and E4 are the same as those that were used in the Pond Design Briefs and SWM Plan reports.

Under existing conditions, the continuous simulation indicates that, on average, flows at Site E25 would exceed the critical discharge value of 1.37 m³/s, 76.6 hours per year of simulation (8366 hours on average based on the available rainfall data), or 0.92% of the time.

While the process of determining the volume and release rate of the required erosion controls for Ponds E3 and E4 is iterative, the objectives were to;

- 1) determine a combination of storage volume and release rate that would not increase number of annual erosion hours at downstream site E3,
- 2) determine a combination of storage volume and release rate that would minimize the detention time of the said volume, and
- 3) determine a combination of storage volume and release rate that would not jeopardize the quality control requirements of the ponds.

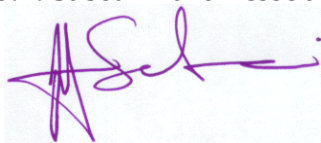
In following the above, it was determined that the detention of the runoff from a 25 mm rainfall to be released over a maximum duration of five (5) days provided an optimum solution. As such, and under proposed conditions, the continuous simulation indicates that, on average, flows at Site E25 would exceed the critical discharge value of 1.37 m³/s, 78.7 hours per year of simulation (8366 hours on average based on the available rainfall data), or 0.94% of the time. The increase of 0.02% between proposed future conditions and existing conditions is considered to be negligible.

A summary of the annual hours of erosion exceedences for both existing and proposed future conditions are presented in Table 1. The SWMHYMO input and output files for existing and proposed future conditions with the ultimate drainage conditions of Ponds E3 and E4 are provided in the Attachment 1.

A sensitivity analysis demonstrated that annual average erosion exceedences would increase to 1.24% if the detention time of a larger runoff volume was reduced to a maximum of three (3) days. Alternatively, increasing the detention time to a range of 15 to 20 days, would reduce the annual erosion exceedences to approximately 0.7%. However, TRCA found such lengthy detention times to be unacceptable.

Yours truly,

J.F. Sabourin and Associates Inc.



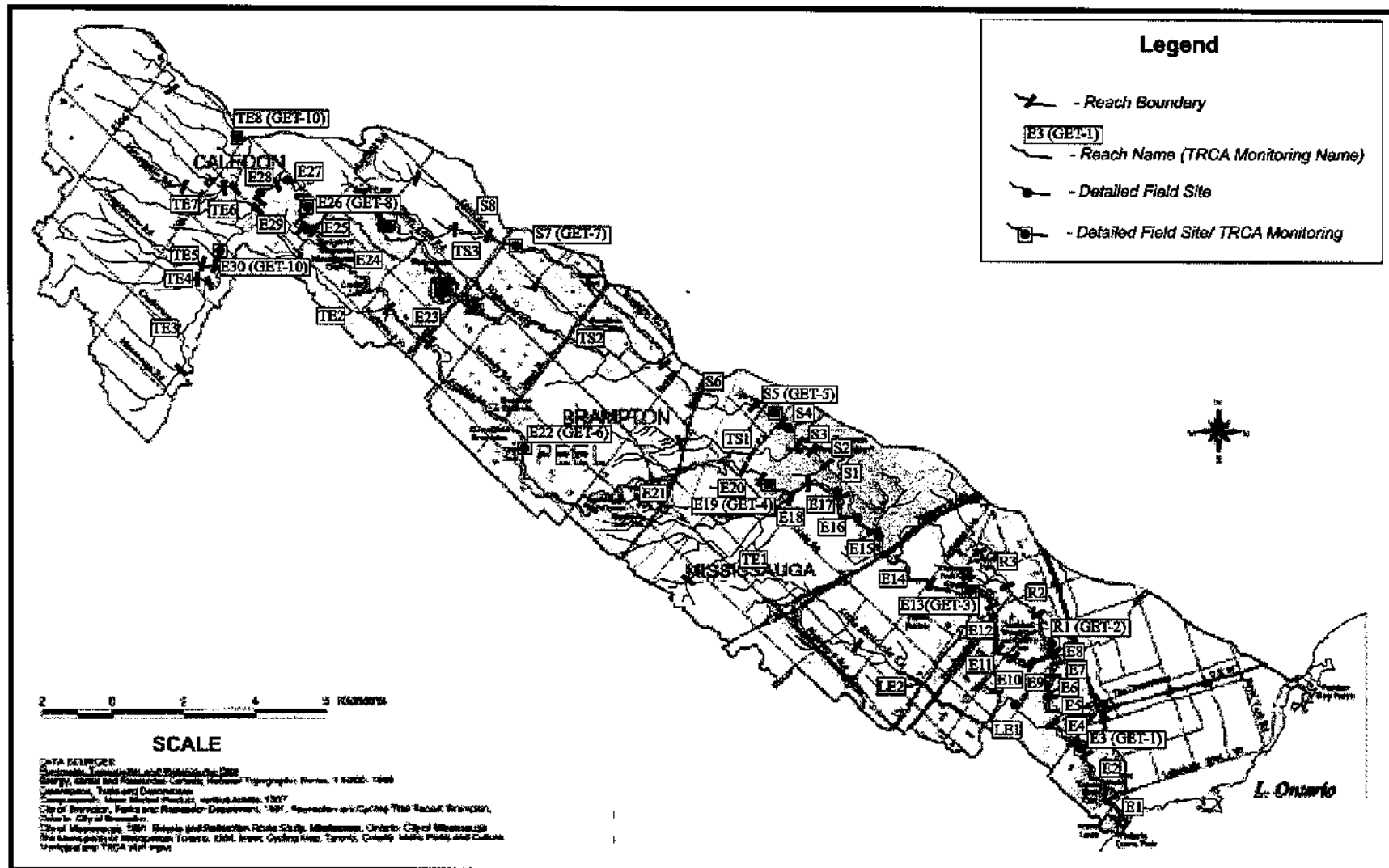
J.F. Sabourin, M.Eng, P.Eng.

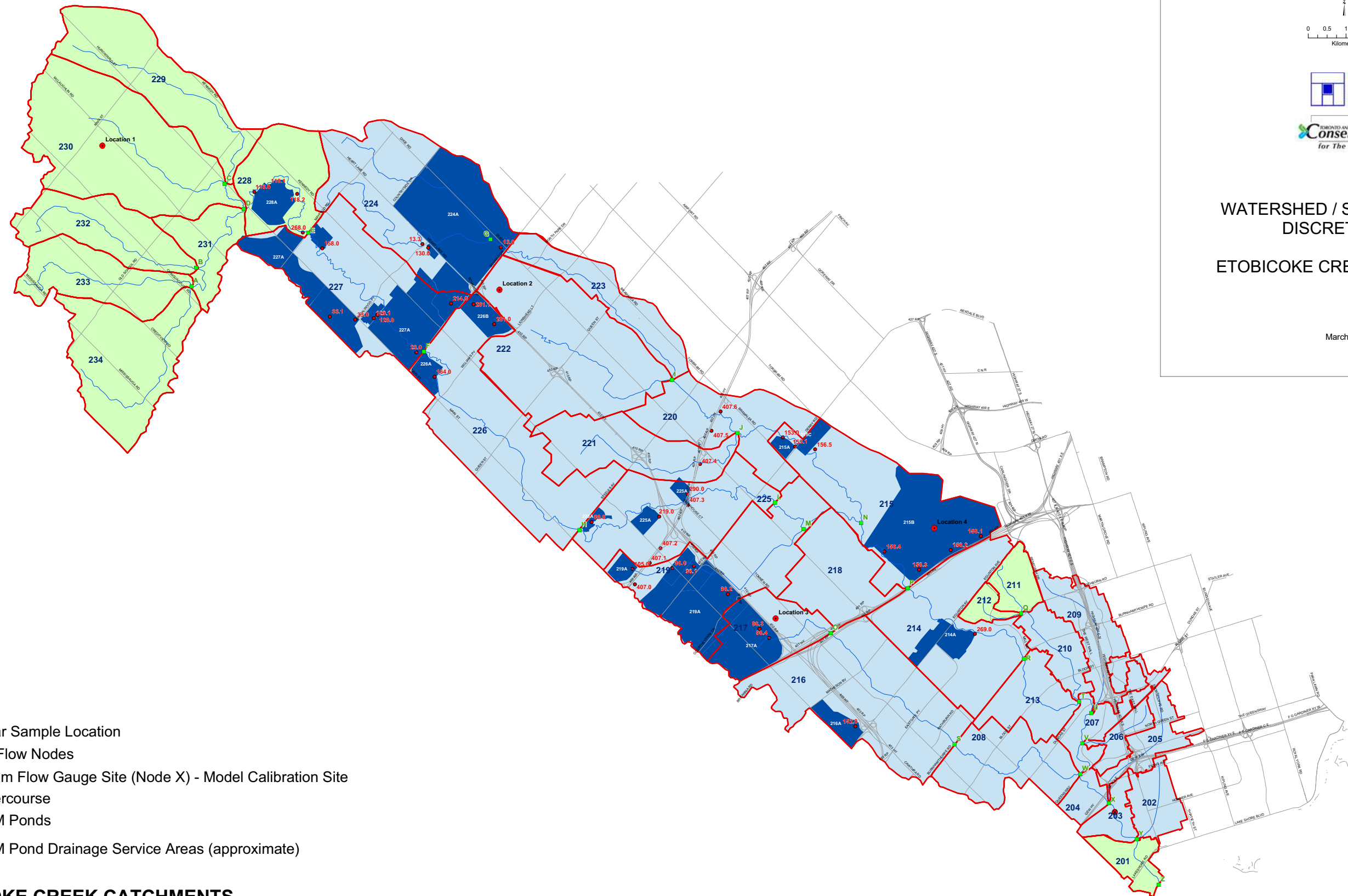
Director of Water Resources Projects

Table 1:	Comparison of Simulated Annual Erosion Hours for Site E25
Figure (un-named):	From Parish report showing erosion monitoring site locations
Table 4.1:	From Parish report showing erosion threshold values for specific sites
Figure 2.1:	From TRCA Etobicoke Creek Hydrology Model Update showing Etobicoke Creek Watershed
Attachment 1:	SWMHYMO Input and Output Files (Refer to CD)

Table 1: Comparison of Simulated Annual Erosion Hours for Site E25

Year	Duration (h)	Existing Conditions		Proposed Conditions	
		Erosion Hours (h)	%	Erosion Hours (h)	%
1960	8061	30	0.38	34	0.42
1961	6633	23	0.34	24	0.35
1962	8782	88	1.00	90	1.02
1963	7370	40	0.55	41	0.56
1964	8062	86	1.07	89	1.10
1965	8045	70	0.86	71	0.89
1966	6625	80	1.21	83	1.25
1967	8790	85	0.97	87	0.99
1968	8075	95	1.18	98	1.21
1969	7364	84	1.14	86	1.16
1970	7357	60	0.81	62	0.85
1971	8781	57	0.65	59	0.67
1972	8822	80	0.90	82	0.93
1973	8790	137	1.56	140	1.60
1974	8781	92	1.04	94	1.06
1975	8787	73	0.83	75	0.85
1976	8816	58	0.66	59	0.67
1977	8035	126	1.57	131	1.63
1978	8807	36	0.41	37	0.42
1979	8795	74	0.84	77	0.88
1980	8798	93	1.05	95	1.08
1981	8041	95	1.18	98	1.21
1982	8779	83	0.94	85	0.96
1983	8787	78	0.88	80	0.91
1984	8818	48	0.55	51	0.58
1985	8783	79	0.90	82	0.93
1986	8778	141	1.60	144	1.64
1987	8781	63	0.71	64	0.73
1988	8809	34	0.38	35	0.39
1989	8041	46	0.57	47	0.59
1990	8793	72	0.81	74	0.84
1991	8784	76	0.87	78	0.89
1992	8814	162	1.83	165	1.87
1993	8075	79	0.97	80	0.99
1994	7372	34	0.45	35	0.47
1995	8777	165	1.88	169	1.92
1996	8810	97	1.10	99	1.13
1997	8798	40	0.46	42	0.47
1998	8071	33	0.40	33	0.41
Average	8366	76.6	0.92	78.7	0.94



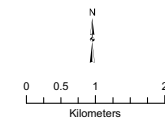


- Radar Sample Location
- Key Flow Nodes
- ⊗ Stream Flow Gauge Site (Node X) - Model Calibration Site
- Watercourse
- SWM Ponds
- SWM Pond Drainage Service Areas (approximate)

ETOBICOKE CREEK CATCHMENTS

Visual Otthymo Hydrograph Commands (Existing Conditions)

- Nashyd (Rural Land Use, < 20% Impervious)
- Standhyd (Urban Land Use, > 20% Impervious)



WATERSHED / SUBWATERSHED DISCRETIZATION

ETOBICOKE CREEK WATERSHED

March 2006

Figure 2.1

Table 4.1. Bankfull channel characteristics and erosion threshold values from detailed reaches.

Parameter	TE8	E25	E26	E27	E28	E30
Average Bankfull Width (m)	3.22	9.50	10.43	9.83	9.64	6.54
Average Bankfull Depth (m)	0.398	0.77	0.76	0.73	0.80	0.42
Bankfull Gradient (%)	0.77	0.21	0.96	0.02	0.17	0.056
Bed Material D ₅₀ (m)	0.000012	0.0094	0.010	0.0066	0.0036	Clay/silt/ sand
Bed Material D ₈₄ (m)	0.015	0.040	0.086	0.068	0.028	Clay/silt/ sand
Bedrock Exposure/Control	No	No	No	No	No	No
Manning's n at Bankfull	0.033*	0.035*	0.036	0.033	0.033	0.033
Average Bankfull Velocity (ms ⁻¹)	1.44	1.10	2.34	0.34	1.07	0.94
Average Bankfull Discharge (m ³ s ⁻¹)	1.90	8.36	19.14	2.54	8.20	1.07
Flow competence (ms ⁻¹) @ D ₅₀	--	0.39	0.58	0.47	0.36	--
Flow competence (ms ⁻¹) @ D ₈₄	0.68	1.07	1.54	1.38	0.91	--
Tractive Force (Nm ⁻²)	30.09	15.92	71.56	1.43	13.29	2.26
Critical Shear (Nm ⁻²) @ D ₅₀	12.45c	3.17	7.61	4.79	2.66	9.60c
Critical Shear (Nm ⁻²) @ D ₈₄	10.83	28.78	63.03	49.69	20.27	--
Stream Power (Wm ⁻¹)	188.03	217.71	1802.10	4.93	162.65	13.03
Stream Power per Unit Width (Wm ⁻²)	58.67	22.76	171.0	0.50	17.03	1.99
Critical Discharge (m ³ s ⁻¹)	0.25	1.37	1.61	4.53	1.44	30.82
Critical Depth (m)	0.16	1.37	0.28	1.10	0.35	1.76
Critical Velocity (ms ⁻¹)	1.02	0.69	1.00	0.47	0.72	2.15
Method	Fischenich (2001) permissible shear	Chow (1959) unit tractive force	Komar (1987)	Komar (1987)	Chow (1959) permissible velocity	Chow (1959) permissible shear

c cohesive strength defined from Fischenich (2001) and Chow (1959)

* visually estimated Manning's number