PRELIMINARY SERVICING AND STORMWATER MANAGEMENT REPORT
PERTHMORE SUBDIVISION - PHASE 6

Project No.: 0PP-13-9668-01
June 23, 2023

Prepared for:

Perthmore Development Co.
P.O. Box 20054
80 Dufferin Street
Perth, ON K7H 0B5

Prepared by:

McIntosh Perry Consulting Engineers Ltd.
115 Walgreen Road
Carp, Ontario K0A 1L0

McINTOSH PERRY

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

1.0 PROJECT DESCRIPTION

1.1 Purpose

McIntosh Perry (MP) has been retained by Perthmore Developments Co. to prepare this Preliminary Servicing and Stormwater Management Report in support of the Draft Plan of Subdivision Application for Phase 6 of the Perthmore Subdivision in Perth, Ontario.

The main purpose of this report is to present preliminary servicing options for the development in accordance with the recommendations and guidelines provided by the Ministry of the Environment, Conservation and Parks (MECP), Rideau Valley Conservation Authority (RVCA) and the Town of Perth (Town). This report will address the servicing for the entire development so that an overall servicing scheme can be presented, ensuring that existing and available services will adequately service the proposed development.

1.2 Site Description

The subject property is generally located within the northeastern quadrant of the Town of Perth and south of Provincial Highway 7. The property is legally described as Part of the northeast and southwest halves of Lot 3 and the southwest half of Lot 4, Concession 2, within the geographic Township of Drummond now in the Town of Perth and part of Block 15 registered plan 27M-21. This phase of development encompasses approximately 5.40 hectares and is bound by vacant land to the north and east, and by the existing phases of the subdivision immediately to the south and west. Refer to the Draft Plan of Subdivision in Appendix ‘A’ for more details.

The topography of the site varies with a ridge generally bisecting the property near the western limit and splitting the drainage in easterly and westerly directions. The elevation generally slopes off near the eastern limit at the proposed cul-de-sac of Street A. The land is generally overgrown with a variety of grass, shrubs and bush along with some trees located at the northeast portion of the site. At the time of writing of this report, portions of the property have been cleared or are in the process of being cleared.

Phase 6 is made up of 53 lots with 34 single family homes, 38 semi-detached units (18 lots) and 1 apartment block with 14 units. There is also approximately 725 meters of associated municipal roadway and municipal services. The Town and the RVCA will be reviewing and approving this report as part of the Draft Plan of Subdivision Application.

2.0 BACKGROUND INFORMATION

Background studies that have been completed for the site include review of as-built drawings, a topographical survey of the site, along with servicing and stormwater reports from previous phases of the development.

Various as-built drawings, design drawings and design calculations for the existing subdivision services were reviewed in order to determine proper servicing schemes for the site.

A topographic survey of the site was completed by MPSI dated August 2020 and was used to identify the existing drainage characteristics and to delineate catchment areas.

The following reports have previously been completed and are available under separate cover:

- Drainage Design Report – Perthmore Subdivision Phase 3 prepared by McIntosh Hill dated March 1998.
- Sanitary Sewer Report – Perthmore Subdivision Phase 3 prepared by McIntosh Hill dated February 1998.
- Stormwater Management Report – Perthmore Subdivision Phase 4 prepared by McIntosh Perry dated September 12, 2002
- Preliminary Stormwater Management Report – Perthmore Subdivision Phase 5 prepared by McIntosh Perry dated February 17, 2004

3.0 EXISTING SERVICES

Phase 6 of the Perthmore Subdivision will be serviced partially via existing services and infrastructure within the existing phases of the development. The majority of the proposed development will be serviced by the newly proposed storm sewers and an associated stormwater management facility.

Existing services within Senators Gate Drive include a 200mm sanitary sewer, a 200mm watermain and a 450mm storm sewer. Existing services within Perthmore Street include a 200mm sanitary sewer, a 300mm watermain and a 525mm storm sewer. Stubs have been left at the intersection of Senators Gate Drive and Perthmore Street. There are stubs extending in both the northeast and northwest directions. Stubs have also been left at the intersection of Senators Gate Drive and Street B. The storm sewer at this intersection is a 300mm and the sanitary and water are both 200mm in diameter.

A newly proposed stormwater management pond will be constructed to service Phase 6. Previous discussions of reconstructing the Phase 5 pond have been eliminated due to sizing constraints that push the pond too close to the existing wetland. The proposed facility is located outside of the wetland setback.

Gas, hydro, cable and telephone utilities are available nearby and locations will be confirmed from respective utility companies during detailed design process.

4.0 SERVICING PLAN

4.1 Proposed Servicing Overview

The overall servicing of Phase 6 of the subdivision will be accomplished through multiple connections to the existing stubs as detailed below. See below for more details pertaining to each specific service.

4.2 Watermain Design

Water servicing for the proposed development will be accomplished through connections at three locations: to the existing 200mm stub at the intersection of Senators Gate Drive and Street A and to the existing 300mm and 200mm stubs at the intersection of Senators Gate Drive and Perthmore Street. The watermain will be 200mm in diameter throughout Phase 6. Flow control valves will be installed as required. See *Drawing 100 – General Plan of Services* for details pertaining to the layout of the watermain.

Fire hydrants will be located on-site as required. The fire hydrants will be spaced 90m to 180m apart in order to meet municipal firefighting requirements. The fire hydrants will be owned and operated by the Town. Individual water services will be installed and will be Pex conforming to AWWA C904. Curb stops will be installed on all water services on the property line, away from driveways and any aboveground utilities. All watermains and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Drinking-Water Systems 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

The watermain is designed to have a minimum of 2.4m cover and when crossing over or under utilities the watermain will have a minimum 0.3m clearance. A minimum horizontal separation of 2.5m (from pipe wall to pipe wall) will be maintained between the proposed watermain and storm/sanitary mains.

Water demands have been calculated per MECP Design Guidelines for Drinking-Water Systems 2008. The population for Phase 6 is calculated as 243.4 people creating the following demands:

- Average Day Flow = 47.33 L/min
- Max. Day Flow = 130.15 L/min
- Peak Hourly Flow = 195.46 L/min

Water demands which account for the anticipated population from the future development areas have also been completed using a population of 570.4 people creating the following demands:

- Average Day Flow = 110.91 L/min
- Max. Day Flow = 305.01 L/min
- Peak Hourly Flow = 458.06 L/min

See *Water Demands Sheets 1 and 2* in Appendix 'B' of this report for more details.

Prior to connecting to the municipal water distribution system, it is essential to determine whether the system has adequate capacity and that the overall impact to the existing system is minimal. A WaterCAD model will be generated at the detailed design stage to confirm the capacity, pressure and size of pipes required to service the proposed site.

4.3 Sanitary Sewer Design

The sanitary sewers for the proposed development will flow by gravity to the existing sanitary sewers. Sanitary connections will be made to the stubs at the intersection of Senators Gate Drive and Perthmore Street. See *Drawing 100 – General Plan of Services* for details pertaining to the layout of the sanitary sewers.

The sanitary sewers within the new phase of development are 200mm diameter will be installed throughout with a minimum full flow target velocity (cleansing velocity) of 0.6 m/s and a full flow velocity of not more than 3.0 m/s. All sewers and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Sewage Works 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

Design parameters for Phase 6 include an extraneous infiltration rate of 0.33 L/s/ha. Daily per capita flow rates of 280 L/p/d and residential densities of 3.4 persons per single unit, 2.7 persons per semi-detached units, 1.8 persons per apartment unit and 60 persons per net hectare of futured development blocks were used in the design of this development. The residential peaking factor used is based on the Harmon Equation, with a maximum of 4.0 and a minimum of 2.0.

Phase 6 of the subdivision has been accounted for in the design of sanitary sewers of previous phases. As noted above the new phase of the subdivision will have multiple sanitary outlets. Ultimately the flows will be directed towards the Treelawn Boulevard and to Garden Avenue sewer outlets. Within the *Perthmore Development Phase III – Sanitary Sewer Report*, dated February 1998 by McIntosh Hill, the Treelawn Boulevard and Garden Avenue Sewers have been sized to accommodate the full buildout of the Perthmore Subdivision.

It was assumed the total number of lots being serviced by the Treelawn Boulevard sewer would be 258 lots with a total flow of 17.6 L/s for the full build-out of the development. According to the previous report, the existing 200mm sanitary sewer within Treelawn Boulevard is sloped at 0.40%, therefore the total capacity of the pipe is approximately 21.6 L/s. Phase 6 of the development will generate a total flow of 5.07 L/s to be captured by the Treelawn Boulevard sanitary sewer.

See *Sanitary Sewer Design Sheet* and *PP-13-9668-01 – Sanitary Drainage Areas - SAN* in Appendix 'C' of this report for more details.

4.4 Storm Sewer Design

Stormwater runoff will be conveyed through curb and gutter and rear-yard swale networks towards catch basins, where it will be captured and conveyed into the new storm sewer network. The storm sewers are designed with a minimum of 1.5m cover. The storm sewer network within the subdivision is designed to

accommodate a storm event with a 5-year return period. Storms in excess of this event will result in surcharging at catch basin and road sag locations. Stormwater runoff during these major events will be conveyed via overland flow routes within rear-yard swales and along the roadway, as is typical in subdivisions of this nature. A detailed lot grading and drainage plan will be prepared during the detailed design stage outlining the proposed drainage pattern within the subdivision.

The storm sewers within Phase 6 will flow via gravity to a newly proposed stormwater management facility located to the south of the Street A cul-de-sac at the eastern boundary of the property. Storm sewers stubs will be provided in support of the future medium/high-density residential development areas which have been detailed in Section 5.5. Future development areas will require additional design to be carried out during their respective designs. See Drawing 100 – General Plan of Services for details pertaining to the layout of the storm sewers.

The storm sewers within this phase of development range in diameter from 250mm to 975mm and are designed with a minimum full flow target velocity (cleansing velocity) of 0.8 m/s (cleansing velocity) and a full flow velocity of not more than 3.0 m/s. No storm sewer will have a slope less than 0.1%. Appropriately sized maintenance holes will be installed at every change in pipe size or direction and will be spaced no more than 120m apart in order to facilitate cleaning and maintenance. All sewers and associated structures will be designed and constructed per the design criteria detailed in the Design Guidelines for Sewage Works 2008 by the MECP and constructed per the Ontario Provincial Standard Details (OPSD's).

A preliminary storm sewer design sheet was created using the rational method, which allows for the proper sizing of the storm pipes within the development. Drainage area information, along with respective pipe slopes and other necessary information was utilized to evaluate the performance of the storm sewer network. The time of concentration calculated for the storm sewer system is based on a 20-minute inlet time. Rainfall intensities were obtained from Intensity-Duration-Frequency (IDF) curves for the Town of Perth from the Ministry of Transportation (MTO).

The preliminary storm sewer design sheet identifies the 5-year flow that is conveyed through each pipe section of the storm sewer network. The peak flow and peak velocity are the maximum results based on gravity flow. Included in the sheet is the full flow capacity of the pipe and the associated full flow velocity when the pipe is under gravity flow condition. The peak flow was checked against the full flow capacity to ensure that each storm sewer pipe can convey the 5-year flow unrestricted.

The proposed storm sewer layout and approach is further detailed in Section 5.0 *Proposed Stormwater Management.*

See *Storm Sewer Design Sheet* and *PP-13-9668-01 - Storm Drainage Areas - STM* in Appendix D of this report for more details regarding pipe sizing.

4.5 Site Utilities

All relevant utility companies will be contacted prior to construction in order to confirm adequate utility servicing for the site. Existing utilities are present in prior phases of the development and will be extended to provide service for this phase.

4.6 Service Locations/Cover

The minimum cover for the sanitary, storm and water mains will be as follows:

Service	Minimum Cover
Sanitary Sewer	1.8m
Storm Sewer	1.5m
Watermain	2.4m

All minimum cover requirements are as per municipal standards. Separation distances between the storm, water and sanitary will be maintained as per the MECP requirements.

5.0 PROPOSED STORMWATER MANAGEMENT

5.1 Design Criteria and Methodology

In the absence of a subwatershed plan for this area, the MECP *Stormwater Management Planning and Design Manual* (March 2003) is used to govern the management of stormwater. This methodology promotes stormwater management from an environmentally sustainable perspective. The intent of the stormwater management plan is to provide adequate stormwater treatment for both quantity and quality control.

Stormwater Best Management Practices (BMPs) will be implemented at the “lot level” and “conveyance” locations. These concepts are explained further in Section 5.7.1. To summarize, roof water will be directed to grass surfaces that in turn will be collected in grassed swales or in rear yard/roadway catchbasins prior to entering into the proposed storm sewer network.

An existing stormwater management (SWM) pond is located on the northeast side of Perthmore Street as shown on Figure 1, below. As part of development of this subsequent phase, this SWM facility will remain intact and a standalone SWM pond will be constructed to address the water quality and quantity control requirements for this tributary drainage area.

5.2 Overall SWM Strategy

As the existing stormwater pond will continue to serve Phase 5, this new phase will look to direct all runoff towards an end of pipe facility. The ultimate outlet for this site will remain consistent in being the Perth Long Swamp. However, previous submissions for the Perthmore Subdivision Phase 6 Stormwater Management Plan encountered challenges due to the need for the reconstruction of the existing Phase 5 pond. The required surficial area to accommodate a stormwater management (SWM) facility capable of adequately handling the volume of runoff from Phase 5 was extensive, leading to an expansion towards the wetland boundary.

Unfortunately, this expansion was deemed unacceptable by the Rideau Valley Conservation Authority (RVCA). In response to this, a new strategy has been devised to locate the new pond outside of the wetland boundary while ensuring it possesses the necessary capabilities to handle the stormwater management requirements of Phase 6 in isolation.

A Visual OTTHMO Version 5 (VO5) model was assembled for the analysis. The VO5 hydrologic model requires various measured and calculated input parameters. The calculations of these input parameters area detailed below.

5.3 Pre-Development Drainage

5.3.1 General

Since the pre-development land use was rural, the NASHYD command was employed in the VO5 model to calculate the runoff flows. NASHYD is used to simulate runoff flows with NASH instantaneous unit hydrograph. This hydrograph is made of a cascade of "n" linear reservoirs. The n (number of linear reservoirs) parameter was set at 3, in the model, and the rainfall losses were computed by the SCS CN procedure.

5.3.2 Time of Concentration/Time to Peak

The Time of Concentration (Tc), for the pre-development drainage basins, was calculated using the Airport Formula.

$$T_c = 3.26 * (1.1 - C) * L^{0.5} * S_w^{-0.33}$$

Where:

Tc = time of concentration in minutes
C = runoff coefficient
L = watershed length in metres
S_w = watershed slope in percentage

From the Tc value, the Time to Peak (Tp) value was calculated as 0.67 times Tc. The parameters employed in the calculation of Tc and Tp for the single drainage basins is shown in **Table 1**.

Table 1 – Time of Concentration and Time to Peak

Sub-Catchment	Area	Flow Length	Fall	Slope	Tc[1]	Tp[2]
	ha	m	m	%	min	hrs
Area 1	12.20	435	7	1.61	54.6	0.61

Notes:
1. Airport Formula
2. 0.67×Tc

5.3.3 SCS Curve Number

The Curve Number (CN) is the most important parameter in determining surface runoff when the SCS equation is used. **Table 2** shows the parameters and the resulting CN value for Area 1.

Table 2 – Hydrologic Parameters

Sub-Catchment	Land Use / Soil Type	Land Use / Soil Type	Land Use / Soil Type	Land Use / Soil Type	Runoff	CN[2]	Ia
	Pasture B (ha)	Pasture C (ha)	Forest B (ha)	Forest C (ha)	Coefficient[1]	(AMC II)	mm
Area 1	5.45	1.76	1.56	3.20	0.16	64.0	6.9

Notes:

3. MTO Drainage Management Manual – Design Chart 1.07
4. MTO Drainage Management Manual – Design Chart 1.09

5.3.4 Rainfall

For the rainfall input to the VO5 model, the 12-hour SCS rainfall distribution, representing a high volume lower intensity storm, and a 4 hour Chicago rainfall distribution, representing a high intensity "thunder storm" type of rainfall event were used ion the analysis. The Intensity-Duration-Frequency (IDF) curve was obtained from the Ministry of Transportation (MTO) IDF Curve Lookup tool with the location centred over the property.

5.4 Pre-Development Results

Employing the above noted parameters and the VO5 hydrologic model, **Table 3** shows the calculated pre-development flow values for the 12-hour SCS and 4-hour Chicago rainfall hyetographs. These flow values will be used for the water quantity control assessment of the proposed SWM facility.

Table 3 – Pre-Development Calculated Peak Flows

Return Period (Yrs)	12 hour SCS (m^3/s)	4 hour Chicago (m^3/s)
2	0.114	0.053
5	0.211	0.105
10	0.278	0.149
25	0.383	0.210
50	0.463	0.262
100	0.560	0.317

5.5 Post-Development Drainage

As discussed in Section 5.2, the proposed stormwater management (SWM) facility will serve the entirety of the Phase 6 development. The proposed SWM facility will receive runoff from future medium and high-density areas accounted for which will require their own site-specific stormwater management design, as the development of those blocks undergoes site plan control. Runoff from these controlled areas will still be

directed to the ponds and therefore, undergo a further reduction of peak flow rates. These areas have been broken down into three distinct blocks given the location of current proposed roadway connections.

They are labelled:

- **West Block,** located at the west portion of the site along the rear of Lots 49 to 53 (includes Block 54);
- **Central Block,** located at the north central portion of the site along the rear of Lots 38 to 48; and
- **East Block,** located at the northeastern portion of the site along the rear of Lots 34 to 37.

It is important to note that Phase 7 of the Perthmore development is planned for the west block, and it will have its own stormwater management (SWM) facility to handle its drainage needs before discharging into the Phase 6 SWM facility. No development is being proposed for the Centre and east blocks, and they will continue to drain towards the proposed SWM facility following the existing conditions. Therefore, the SWM facility has been appropriately sized to accommodate the flows from all these blocks, ensuring comprehensive stormwater management for the entire Perthmore Subdivision.

5.5.1 Post-Development Parameters

For the post-development hydrologic analysis, since the proposed development is fully urban with full municipal services, the STANHYD command was used in the VO5 model. **Table 4** shows the post-development input parameters for the VO5 model. The three blocks (West, Central and East) are slated for high density residential development and therefore the total imperviousness and directly connected parameters were set accordingly. The previous phases and the remaining sub-catchments, in the proposed additional phase, are slated or have been constructed as single-family residential development. The total imperviousness and directly connected parameters were calculated based on a typical lot in the existing development area. The flow lengths for the pervious area were assumed to be 10 m and the flow lengths for the impervious area were calculated by the standard equation in the VO5 model as shown in the notes below the **Table 4**. Lastly, the slopes used in the model for pervious and impervious areas were assumed to be 2.0% and 1.0% respectively.

Table 4 – Post-Development Hydrologic Model Parameters

					Pervious Area				Impervious Area			
Sub-Catchment	Area	Total Imp.	Directly Connected	CN	Slope	Flow Length	Manning n	Ia	Slope	Flow Length[1]	Manning n	Depression Storage
	ha	%	%		%	m		mm	%			mm
West Block [4]	3.43	70.0	60.0	59.0	2.0	10.0	0.25	5.0	1.0	150.0	151.2	0.013
Central Block[4]	1.56	70.0	60.0	59.0	2.0	10.0	0.25	5.0	1.0	150.0	102.0	0.013
East Block [4]	0.65	70.0	60.0	75.0	2.0	10.0	0.25	5.0	1.0	100.0	65.8	0.013
Block 70	0.83	0.0	0.0	75.0	2.0	10.0	0.25	10.0	1.0	75.0	74.4	0.013
SWM Block[2,4]	0.41	0.0	0.0	75.0	2.0	10.0	0.25	5.0	1.0	50.0	52.3	0.013
Developed Portions[3,4]	5.32	50.0	35.0	59.0	2.0	10.0	0.25	5.0	1.0	350.0	188.3	0.013

Notes:
1. Flow Length=SquareRoot (Area/1.5)-(Area m2)
2. Block 71
3. 604(1) - 0.56ha, 604(2) - 0.23ha, 606 - 1.07ha, 608 - 0.79ha, 609 - 0.16ha, 612 - 1.21ha, 614 - 0.25ha, 617 - 0.48ha, RY1 - 0.32ha and RY2 - 0.25ha
4. To Pond

5.6 Quantity Control

The quantity control for the site will mainly be provided by the proposed end of pipe facility. For the three blocks the hydrologic modelling assumes that the peak flows, up to and including the 100-year storm event, from the blocks will flow through the Phase 6 SWM facility. It is also noted, the west block outflow from future phases has to be restricted to existing levels through on-site SWM quantity controls within the block. The preliminary calculation of the required on-site detention storage is 1,100 m^3 for the West Block. The imperviousness value for the SWM block was assumed to be high, since and rainfall on the block would be converted to direct runoff.

Tables 5 and **6** show the calculated post-development (uncontrolled) and controlled flow values outletting from the proposed SWM facility. As the 12hr SCS storm resulted in higher outflows and more storage requirements, the results are shown below, however, the 4-year Chicago storm data can be found in **Appendix F**.

Table 5 – Post-Development Calculated Flows – Uncontrolled

12-hour SCS Uncontrolled								
Return Period	West Block	Central Block	East Block	Block 70	SWM Block	Developed Portions	Total	Pre-dev
Yrs.	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
2	0.215	0.035	0.019	0.022	0.011	0.184	0.284	0.114
5	0.306	0.068	0.037	0.043	0.020	0.278	0.456	0.211
10	0.384	0.090	0.049	0.056	0.027	0.355	0.611	0.278
25	0.481	0.124	0.067	0.077	0.037	0.447	0.794	0.383
50	0.551	0.150	0.081	0.092	0.044	0.542	0.953	0.463
100	0.634	0.181	0.098	0.110	0.053	0.631	1.121	0.560

Table 6 – Post-Development Calculated Flows – Controlled

12-hour SCS Controlled									
Return Period	West Block [1]	Central Block	East Block	Block 70	SWM Block	Developed Portions	Outflow From Pond	Outflow From Site	Pre-dev
Yrs	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
2	0.029	0.035	6.250	0.022	0.011	0.184	0.084	0.087	0.114
5	0.042	0.068	6.250	0.043	0.020	0.278	0.191	0.198	0.211
10	0.050	0.090	6.250	0.056	0.027	0.355	0.264	0.279	0.278
25	0.063	0.124	6.250	0.077	0.037	0.447	0.336	0.356	0.383
50	0.072	0.150	6.250	0.092	0.044	0.542	0.386	0.411	0.463
100	0.083	0.181	6.250	0.110	0.053	0.631	0.436	0.467	0.560

Notes:
1. Restricted flow from the West Block SWM facility.

The proposed stormwater management facility has been designed to have sufficient storage to attenuate the post-development peak flows leaving the site. The estimate of the active storage requirements based on the proposed SWM facility has been performed in VO6 and the results are provided in the **Table 7** below. To provide the quantity control as shown in the table would require a total of 1,614 m3 of detention storage. Further details of the SWM facility are available within **Appendix F**, which were used to ensure the conceptual pond met all MECP design criteria. Further pond details will be developed and confirmed during detailed design.

Table 7 – Quantity Control Storage Requirements

Catchment ID	5-Year Restricted Flow (m^3/s)	5-Year Required Active Storage (m^3)	100-Year Restricted Flow (m^3/s)	100-Year Required Active Storage (m^3)
Phase 6, Centre, East and West Blocks, and SWM Block	0.191	849	0.436	1,614

5.6.1 Major Drainage Route

The pipe network within the subdivision will be designed to accommodate the 5-year storm. Storm events greater that 5-year will make use the roadway as the major drainage route, and this will be incorporated into the grading plan design. The roadway will direct these flows to the proposed SWM pond. Rear yard drainage swales and easements will be incorporated to provide additional overflow capacity.

5.6.2 Peak Flow Comparison Summary

The stormwater pond to be constructed on-site will be equipped with a permanent multi-stage outlet flow control structure designed to restrict the outflow rates to meet the quantity control objectives. Based on the available storage and the discharge through the control structure, the peak flow rates to the respective outlets were modelled in VO6 and are summarized below.

Table 8 – Peak Flowrates Comparison Summary

12-hour SCS Storm Event				
	POST	PRE		
Return Period	Outflow From Site	Outflow from Site	Post to Pre	Post to Pre
Yrs.	m^3/s	m^3/s	Δ	%
2	0.087	0.114	-0.027	23.7%
5	0.198	0.211	-0.013	6.2%
10	0.279	0.278	0.001	-0.4%
25	0.356	0.383	-0.027	7.0%
50	0.411	0.463	-0.052	11.2%
100	0.467	0.560	-0.093	16.6%

The **Table 8** confirms that the proposed SWM facility will restrict the post-development flow rates to existing levels. The elevation and sizing details of the flow controls can be finalized during the detailed design phase of the development.

5.7 Quality Control

Water quality control will be provided by the proposed SWM facility. The facility will be designed as a wet pond to provide an enhanced level of water quality control (80% T.S.S. removal). Table 3.2 in the *Stormwater Management Planning and Design Manual* was used to calculate the required storage volume. The weighted impervious level for the total tributary drainage area is 46%. Therefore, interpreting between the specific storage volumes shown in Table 3.2, a total 165 m^3/ha of storage volume is required to provide an enhanced level of treatment. Given the upstream individual storage requirements for West Block, the MECP Manual notes (Section 3.3.2) that when upstream storage facilities exist, the extended detention can be increased from 40m^3/ha to 80m^3/ha to ensure that the flooding of downstream ponds does not occur. This increase to the extended detention reduces the permanent pool volume, as the majority of the runoff reaching the site has already achieved the 80% TSS removal from the upstream facilities. With that, the permanent pool for this site is required to be 966 m^3 with an extended detention volume (458 m^3) can be combined with the water quantity volume detailed.

Therefore, the total storage volume required for the proposed SWM facility would be approximately 3,700 m^3. As noted, conceptual pond details are included in Appendix F, which include forebay calculations, 25mm event and extended detention drawdown, pond cleanout, emergency spillway, outlet control device sizing and stage storage discharge tables that were used in modelling the site in VO5. All these features meet MECP requirements and will be further vetted and refined through the detailed design. The total permanent pool volume to be provided will exceed the minimum volume requirement for quality control.

Table 9 - MECP Table 3.2 Quality Control Storage Requirements

Extended Detention Volume Accounted	Permanent Pool Volume Required	Permanent Pool Volume Provided
80 m^3/ha	165 m^3/ha	1048 m^3
458 m^3	966 m^3	

5.7.1 Best Management Practices

The entire subdivision will employ Best Management Practices (BMPs) wherever possible. The intent of implementing stormwater BMPs throughout the entire development is to ensure that water quality and quantity concerns are addressed at all stages of the development. Stormwater BMPs will be implemented at lot, conveyance and end of pipe levels.

Lot level BMPs include the directing of roof leaders onto grassed areas, minimizing ground slopes and maintaining as much of the lot as possible in a natural state. Roof leaders will flow to grass areas, which will provide an opportunity for initial filtration of any sediment and provide an opportunity for absorption and ground water recharge. Recent recommendations by a number of Conservation Authorities and the MECP

suggest that yard grading as flat as 0.5% be implemented to promote infiltration. The target range for finished ground slopes will be 1% - 5% where possible. This range of slope will still provide an opportunity for the absorption and filtration process.

The conveyance system to be employed within the subdivision is a combination of side/rear swales and road catchbasins. All swales will be constructed at minimal gradient where possible, thus promoting absorption and infiltration, as well as providing some opportunity for particle filtration. The gradient of the system will be enough to ensure the continuous flow of stormwater, limiting any standing water. Rip-rap will be placed at erosion-prone areas and all disturbed areas shall be landscaped as soon as possible.

6.0 LOW IMPACT DEVELOPMENT

As the practice of SWM has evolved, increasing emphasis has been placed on treating the runoff as close as possible to the source using a sequence of treatment methods called “treatment train approach”. As a result, Low Impact Development approaches were established to mimic the existing natural hydrologic environment and to allow the rainwater to infiltrate, filter and evaporate close to the source.

Typical LID practices include Rainwater harvesting, green roofs, downspout disconnection, soak away pits, infiltration trenches and chambers, bio-retention, vegetated filter strips, enhanced grass swales and permeable pavements.

6.1 Treatment Train

Based on the type of the proposed development and the available geotechnical information, downspout disconnections, enhanced grass swales and infiltration basins are the most suitable LID features for the site.

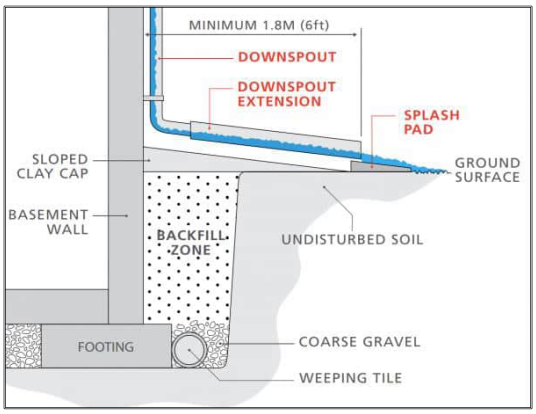
Alternative LID features, such as rainfall harvesting, green roofs, or soak away pits, may not be suitable for the site due to the inability of the municipality to maintain or mandate them when installed on private property. Additionally, LID features on roadways, including permeable pavement or bioswales, may also present a challenge if they go unmaintained and can in turn be detrimental to the overall submission. The soils in the area are not conducive to accepting stormwater runoff due to the high drawdown timing requirement and are thus likely to remain full at the next storm event, which will render them inefficient.

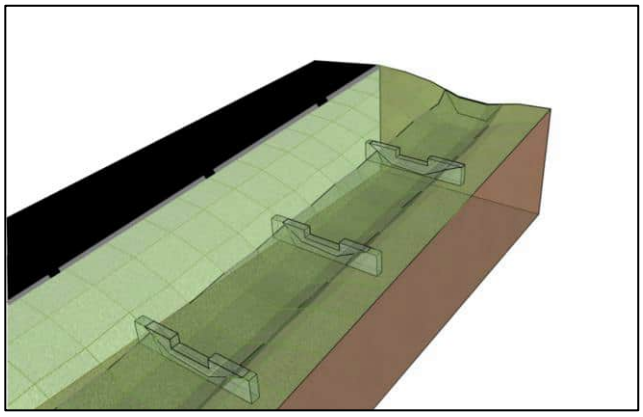
Lot Level - Downspout disconnection involves directing the runoff from roof leader downspouts to a pervious area, which drains away from the building. This gives an opportunity for the runoff to infiltrate before it reaches the typical curb and gutter system on the street. This also prevents the stormwater runoff from directly entering the storm sewer system or flowing across a “connected” impervious surface such as driveways.

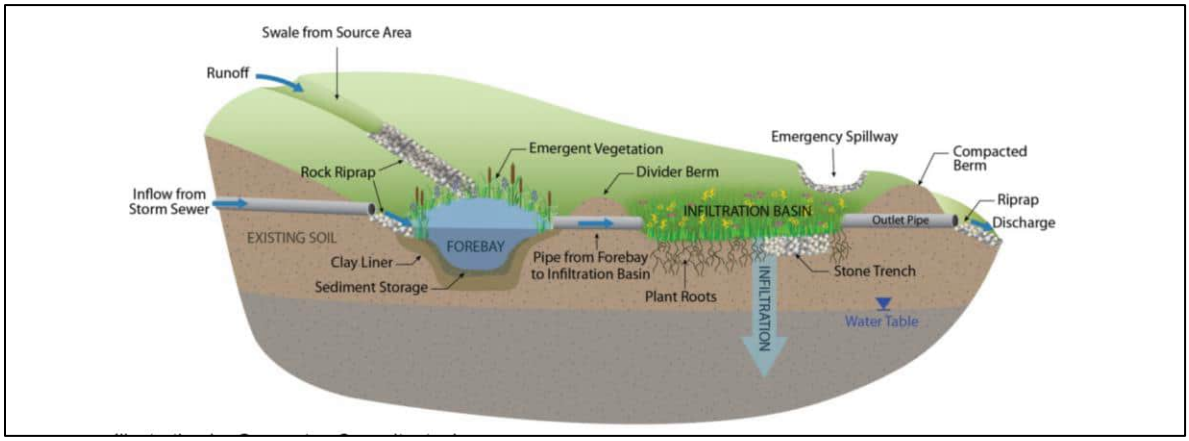
Conveyance Level - Enhanced Grass Swales are designed as vegetated open channels that serve multiple functions in stormwater management. Traditionally, simple grass channels or ditches have been utilized for stormwater conveyance, especially for road drainage. However, enhanced grass swales go beyond the basic design by incorporating modified geometry and check dams to enhance their performance in terms of contaminant removal and runoff reduction. These design features improve the functionality of simple grass channels and roadside ditches, providing more effective treatment of storm sewer runoff.

End-of-pipe Level - To promote infiltration and enhance the stormwater management facility, an **infiltration basin** will be integrated into the wet cell. It is advisable to position the infiltration trench within the wet cell area to mitigate the risk of sedimentation and clogging. By locating the trench within the wet cell, the potential for sediment accumulation and blockage is minimized, allowing for better functioning of the infiltration basin. This strategic placement ensures that the stormwater runoff is efficiently managed and encourages the natural process of infiltration, thereby facilitating groundwater recharge and reducing the volume of runoff leaving the proposed development.

Figure 1 – Typical Downspout Disconnection, Enhanced Grass Swale and Infiltration Basin (LID Planning and Design Guide, CVC 2011)







It is important to acknowledge that the recommendations for Low Impact Developments (LIDs) are made based on the available information. However, it is recognized that the design and recommendations may need to be revaluated and potentially adjusted during the detailed design phase, considering the geotechnical information and the maintenance requirements imposed by the Town of Perth. A conceptual LID treatment train plan illustrating the proposed LID features is included in **Appendix F**.

7.0 WATER BALANCE

7.1 Purpose

The RVCA through their review comments have requested that a water balance be reviewed for the site to ensure that the site did not reduce the overall infiltration volumes given that this area is a sensitive groundwater aquifer. As such, the following provides a review of the conceptual water balance, complete with mitigation measures for the site which were reviewed and broken into the requirements for the developed portion of the land as well as the individual blocks to provide guidance to the designers when they proceed through their site plan control process.

7.2 Land Use

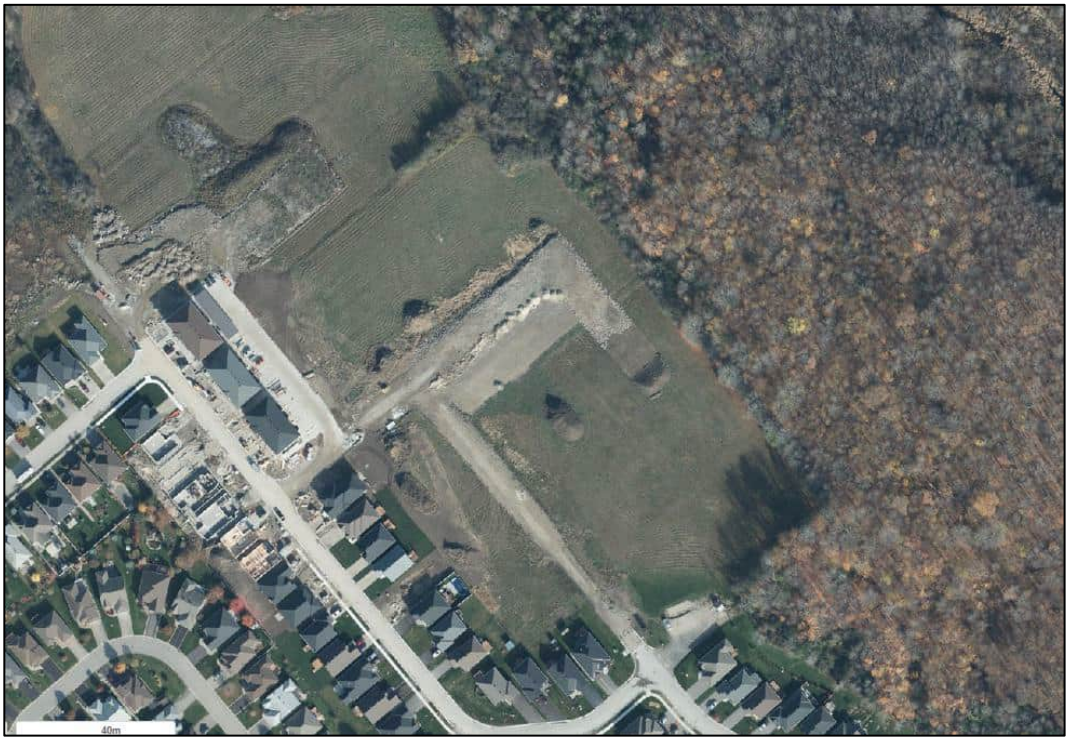


Figure 2 - Land Use

The current vacant land is predominantly a mixture of pasture sections (generally the western, southern and central portions of this phase) and treed areas (generally the northern and eastern extremities of this phase). Perthmore subdivision is directly adjacent to the Perth Long Swamp wetland which surrounds the site to the north, east and west. It is acknowledged that the Provincially Significant Wetlands are a significant natural

heritage feature therefore, tree removal and other disturbances will be limited as much as possible. The entire undeveloped site is sloped toward the above-noted wetland. Elevations range from 134 m at the northeast corner of the site to 141 m at the highpoint of the property.

7.3 Soil Conditions

A detailed Geotechnical Report is not available at the conceptual design stage. Therefore, MP used the publicly available documents on AgMaps to review the soils for the site. The area is primarily comprised of Hydrological Soil Group B and C soils through the developed portion of land. The surrounding wetland is Hydrological Soils Group D. Based on the previous phase, McIntosh Perry has assumed that here is approximately 2' or 0.6m of soil overlaying bedrock. This relatively thin soils has been accounted for within the calculations to determine the soil moisture retention capacities of the soils. It is anticipated that during the detailed design stage, a geotechnical report will be completed at which time, these values can be updated if required.

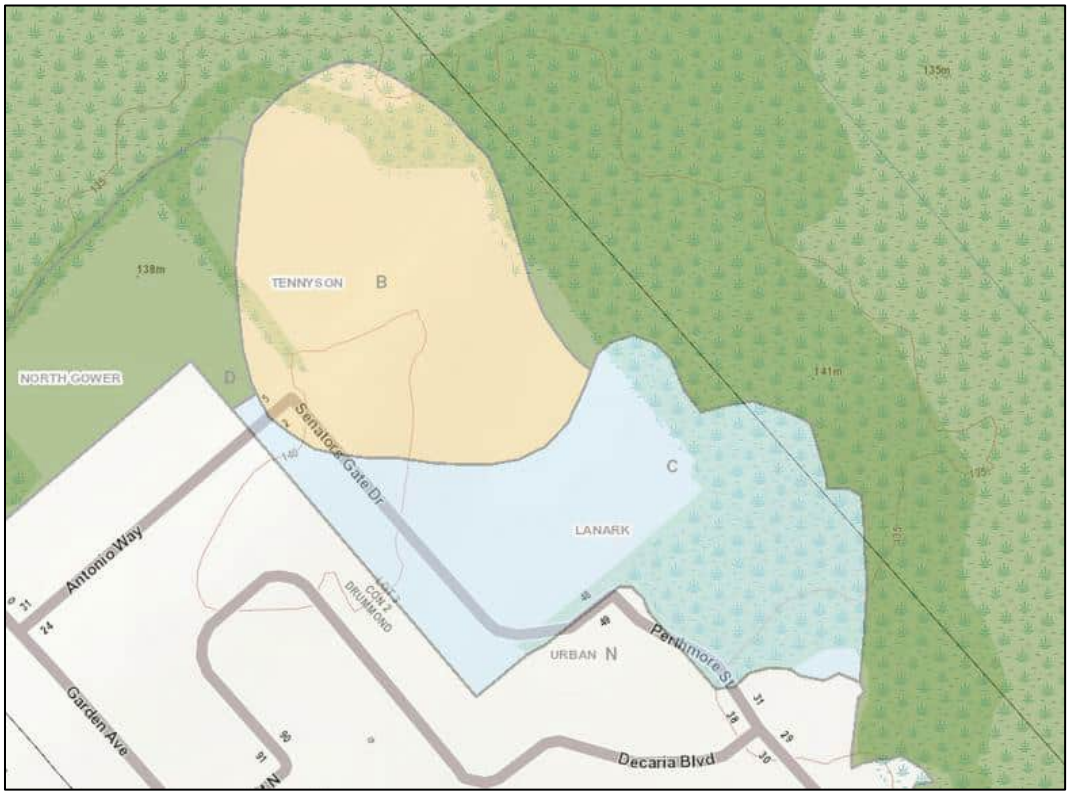


Figure 3 - AgMaps - Site Soils

7.4 Stormwater Management

As part of this assignment and to satisfy both RVCA and the Town, a servicing and stormwater management report has been prepared to ensure that the design criteria from both review agencies along with recommendations from the MNRF, MTO and MECP are adhered to. Site-specific stormwater management facilities will be located in the future high-density west block, which will be required to meet site-specific stormwater management criteria in order to be developed.

The stormwater management (SWM) strategy implemented for the Perthmore Subdivision Phase 6 adopts a treatment train approach, integrating a sequence of controls at various stages to effectively manage stormwater runoff. This comprehensive approach encompasses lot-level controls, conveyance controls, and end-of-pipe controls to address stormwater management requirements. Lot-level controls include measures such as downspout disconnection, which redirect roof runoff away from impervious surfaces and promote infiltration or reuse. Conveyance controls, such as enhanced grass swales, are incorporated to efficiently convey stormwater runoff while enhancing pollutant removal and runoff reduction capabilities. Lastly, end-of-pipe controls, such as infiltration basins, are implemented to facilitate the final treatment and infiltration of stormwater before it is discharged into the receiving environment. With the combination of these facilities, the mitigation measures that will be discussed below and the ultimate end of pipe facility, will ensure that runoff reaching the wetland is controlled to pre-development rates and meets an **enhanced** level of quality control (80% Total Suspended Solids (TSS) removal).

7.5 Water Balance Calculations

7.5.1 Data

Potential impacts to the existing wetland were reviewed through the use of standard water balance calculations. Data from Environment Canada for the Ottawa International Airport was used to calculate the runoff surplus and total precipitation for the site. Environment Canada data was limited to the precipitation and temperature data, while the remaining information was calculated using the Thornthwaite-Mather water balance methodology as described in the “Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance, C.W. Thornthwaite and J.R. Mather, 1957”. Please see sample typical calculations within Appendix D. The pre- and post-development conditions were subdivided for the water balance as follows:

Soils:

- Sandy loam, noted to be HSG B; and
- Silt / clay loam, noted to be HSG C.

Pervious Land uses:

- Pasture overtopping sandy loam;
- Pasture overtopping silt/clay loam;
- Forest overtopping sandy loam; and
- Forest overtopping silt/clay loam.

Impervious Land Uses:

- Dwellings and asphalt.

The infiltration factors were chosen based on the following data:

Table 10 - Infiltration Factors from the "Tier 1 Water Budget and Water Quantity Stress Assessment" prepared by the Mississippi-Rideau Source Protection Region, August 2009

Description of Area / Development Site	Value of Infiltration Factor
Topography	
Flat Land (<1.5 slope range)	0.172
Rolling land (1.5 – 3% slope range)	0.120
Hilly land (>3% slope range)	0.073
Soil	
Low (clay, silt)	0.10
Low-Medium (till, sand-silt)	0.15
Medium (till, silty sand)	0.20
Medium-High (sands)	0.30
High (gravel, sands, organic deposits)	0.40
Variable (till)	0.20
Variable (fill)	0.40
Variable (sand)	0.35
Variable (bedrock)	
Precambrian Bedrock	0.20
Paleozoic Bedrock	0.05
Land Cover	
Low Infiltration – urban, aggregate	0.05
Medium Infiltration – agriculture, pasture, abandoned fields, wetland	0.10
High Infiltration – forest and plantation	0.20

For pre-development, the site has slopes generally under 1.5%, and as such was assigned a topographic infiltration factor of 0.172.

The soil classification was predominately sandy loam (infiltration rate of 0.2) for the HSG B soils and 0.15 for the HSG C soils.

The site is comprised of open vegetated areas which will results in a value of 0.10 being used and in forested areas, a land cover infiltration factor of 0.20 was used.

The soil classification for each area will not be changed for the pervious surfaces. This will be confirmed when the detailed grading design is advanced.

7.6 Sensitivity Analysis

Each of the land use and soil type was reviewed based on Table 10 of the Thornthwaite – Mather literature to obtain the applicable soil moisture retention of the underlying soils. The soil moisture retention used in our calculations is provided as "mm/m", therefore once the average on-site soil depth above the groundwater (is estimated to be 0.6 m) was applied, a corresponding site-specific soil moisture retention value was obtained for each category above. These soil moisture retention values are used to determine the soil moisture storage,

given the accumulated water losses which are calculated based on the climatic data (temperature and precipitation) for the site. These tables are only noted in specific depths (25 mm and 50 mm intervals), therefore in some instances, the closest possible table was used. **Table 11** below illustrates an example at a soil moisture retention value of 75 mm. Located in **Appendix G**, calculations for 75 mm, 100 mm, 125 mm, 150 mm, 200 mm, 250 mm, 350 mm and 400 mm were completed as part of a bulk sensitivity analysis for the surplus data. Results of this analysis, as calculated for each soil moisture value noted above, indicate that changing moisture retention values by 25 mm to 50 mm yields approximately 1% change in water surplus. This would indicate that regardless of whether the soils had 150 mm or 200 mm of moisture retention, the difference in surplus will be minor.

Table 11 – Monthly Water Balance Example - 75mm - Climate Data per Environment Canada data for Ottawa International Airport (1981 - 2010)

Month	Temp	Heat Index	PET	P	ΔP = P - PET	WL	ST	ΔS	AET	D	S	RO	SMRO	TR	DT
January	-10.3	0	0	65	65		217	0	0	0	0	11	0	11	228
February	-8.1	0	0	54	54		271	0	0	0	0	5	0	5	276
March	-2.3	0	0	64	64		336	0	0	0	0	2	0	2	338
April	6.3	1.4	32	75	43		75	0	32	0	43	22	26	48	166
May	13.3	4.4	79	80	2		75	0	79	0	2	12	117	129	206
June	18.5	7.2	112	93	-19	-19	57	-18	111	1	0	6	59	65	122
July	21	8.8	133	92	-41	-60	33	-24	116	17	0	3	29	32	65
August	19.8	8.0	114	86	-29	-88	22	-11	97	18	0	2	15	17	39
September	15	5.3	73	90	17		39	17	73	0	0	1	7	8	47
October	8	2.0	34	86	52		75	36	34	0	17	9	4	13	105
November	1.5	0.2	5	82	77		75	0	5	0	77	43	2	45	197
December	-6.2	0	0	76	76		151	0	0	0	0	22	1	23	174
Total		37.4	580	944				0	545	35	138	138	260	398	

PET = Potential Evapotranspiration, P = Total Precipitation, ΔP = P-PET, WL = Accumulated Water Loss, ST= Storage, ΔS = Soil Moisture Storage, AET = Actual Evapotranspiration, D = Soil Moisture Deficit, S = Soil Moisture Surplus, RO = Water Runoff, SMRO = Snow Melt Runoff, TR = Total Runoff, DT = Total Moisture Detention

Note: Shaded cells taken from Thornwaite-Mather Tables. See sample calculation in Appendix D for cell by cell calculations. Total Surplus for example above is 398mm.

Monthly T from Environment Canada:

Heat Index (I) = 37.4, a: 1.06

Sample Calculations:

Calculated Potential Evapotranspiration (PET)

Thornthwaite Equation:

$$PET = 16\left(\frac{L}{12}\right)\left(\frac{N}{30}\right)\left(\frac{10Ta}{I}\right)^{\propto}$$

L = Average Daylight (hours)

N = Number of Days per Month

Ta = Average Temperature (°C)

I = Heat Index =

$$I = \sum_{i=1}^{12}\left(\frac{Tai}{5}\right)^{1.514}$$

$\alpha = (6.75x\ 10^{-7})\ I^3 - (7.71\ x\ 10^{-5})\ I^2 + (1.792\ x\ 10^{-2})\ I + 0.492$

Example April

Temperature (Ta) = 6.3°C

I = (Tai/5)^1.514 = (6.3/5)^1.514 = 1.4

Sum of all months I = 37.4

$\alpha = (6.75x\ 10^{-7})\ 37.4^3 - (7.71\ x\ 10^{-5})\ 37.4^2 + (1.792\ x\ 10^{-2})\ 37.4 + 0.49239 = 1.06$

L = 13.6 hours, N = 30 days

PET = 16 x (13.6/12) x (30/30) x ((10x6.3)/37.4)^1.06 = 32mm

Change between Precipitation and Potential Evapotranspiration (ΔP = P-PET)

Example April

P = 75mm

PET = 32mm

ΔP = P – APET = 75mm – 32mm = 43mm

Accumulated Water Loss

All Values where the ΔP are negative are brought forward and accumulated on a monthly basis

Example July

ΔP June = -19mm

ΔP July = -41mm

WL July = -19mm + -41mm = -60mm

Soil Moisture Storage

Starting Values Taken from Table 10 of Thornthwaite Mather's Water Balance 1957 for individual soil type.

For sample calculations below, assumed soil moisture storage maximum of 75mm. Start in first month with positive temperature (April), carry (75mm) to next month where ΔP is positive. When ΔP becomes negative, accumulated water loss (WL) is reviewed and the reduced soil moisture storage is inserted into the spreadsheet based on the Tables within the Thornthwaite Mather's Water Balance 1957. For the example, Table 25 is used for 75mm soil water retention. The values are then inserted into the ST table based on the corresponding WL for the given month.

WL July = -60mm

Table 25 is used and a ST of 33mm is obtained

Upon positive ΔP values, the ΔP and ST_{i-1} are added together for that months ST value until the maximum soil moisture storage is achieved.

ST September = ΔP September + ST_{i-1} (August) = 17mm + 22mm = 39mm

Upon achieving the maximum soil moisture storage, no additional storage is available until the temperature falls below -1°C, when snow is said to be able to be stored above the ground. At that time the P is added to the previous months ST (ST_{i-1}) until the temporary is above -1°C and snow melt occurs.

Change in Soil Moisture Storage

Change in Soil Moisture Storage = Soil Moisture Storage – Soil Moisture Storage of the previous month

($\Delta S = ST - ST_{i-1}$)

Example June

Storage (ST - May) = 75mm

ST June (Table 25, Thornthwaite Mather, 1957) = 57mm

ΔS= 57mm – 75mm = -18mm

Actual Evapotranspiration (AET)

Three Situations Exist:

1) No PET therefore, AET = 0 if, PET = 0;
2) WL > 0. AET = PET if, Soil Moisture Storage Capacity is positive; and
3) WL < 0. AET = Soil Moisture Storage Capacity + Total Precipitation ($AET = \Delta S + P_T$).

1) Example January

AET = 0 as PET = 0

2) Example April

WL = 0mm

ST = 75mm

PET = 32mm = AET

3) Example July

WL = -41 mm

ΔS = -18mm (June)

P (June) = 93mm

AET (June) = 18mm + 93mm = 111mm *Note disregard ΔS sign.

Monthly Soil Moisture Deficit or Surplus

Three Situations Exist:

1) Where Accumulated Potential Water Loss is lower than 0mm, a deficit exists;
2) Where Soil Moisture Capacity is above its maximum, a surplus exist; and
3) Where Soil Moisture Capacity is less than the maximum but there is no Accumulated Potential Water Loss, the runoff is being absorbed by the soil (soil is either wetting or drying).

1) Example Deficit (July):

WL = -41mm

ST (July) = 33mm

ΔS (July) = -24mm

PET = 133mm

AET = 116mm

Soil Moisture Deficit (July) = PET – AET = 133mm – 116mm = 17mm

2) Example Wetting (September)

WL = 0mm

ST (August) = 22mm

ΔP = 17mm

ST (September) = ΔP + ST (August) = 17mm + 22mm = 39mm, less than 75mm therefore wetting, no surplus, S = 0

3) Example Surplus (October):

WL = 0mm

S (September) = 39mm

ΔP = 52mm

Soil Moisture Surplus (October) = ΔP + S(September) = 39mm + 52mm = 91mm, as it is over 75mm, 75 is carried and the additional volume is a surplus of 91mm – 75mm = 16mm

Water Runoff

Thornthwaite Mather (1957) noted that the surplus water runoff values in no month can cause a runoff higher than 50% of the its total surplus volume, therefore, 50% is attributed to the month with the initial surplus, then carried forward at a 50% per month value until it is dissipated (i.e.: reaches 0mm).

For this example (rounded to the nearest mm), start at October;

S_{Oct} = 17mm,

RO_{Oct} = 17mm/2 = 9mm,

November

S_{Nov} = 77mm,

RO_{Nov} = (Remaining RO_{Oct} + S_{Nov})/2 = (9mm + 77mm)/2 = 43mm,

December

RO = (Remaining RO_{Nov} + S)/2 = (43mm + 0mm)/2 = 22mm.

This continues until 0mm is reached.

Snow Melt Runoff (SMRO)

Thornthwaite Mather (1957) noted that in areas with an elevation under 500m above sea level, that in the first month with temperatures above -1°C, only 10% of snow melt runoff occurs. A maximum of 50% melt will occur in each successive month until it is dissipated (i.e.: reaches 0mm).

For this example (rounded to the nearest mm), start at April (first positive average temperature, total snow fall is 260mm, note: 260mm = precipitation accumulated in months with negative temperatures (December through to March);

April

SMRO = 10% = 26mm, remaining 90% (234mm) brought forward to May;

May, 234mm x 50% = 117mm, carry remaining 117mm to June;

June, 117mm x 50% = 59mm.

This continues until 0mm is reached and all snow melt has been accounted for.

Total Runoff

Total runoff is the sum of the water runoff and snow runoff for each month.

TR (April) = RO_{April} + $SMRO_{April}$ = 22mm + 26mm = 48mm

7.6.1 Sensitivity Analysis Conclusion -For Soil Moisture Maximum Capacity

McIntosh Perry completed a sensitivity analysis on the soil moisture capacity and found that for soil depths above 100mm, the annual surplus volume in millimetres diminished at a rate of less than 1%/year per 25mm of available soil. Therefore, as the depths of soils have been averaged across the site and a conservative approach has been pushed forward, it is not expected that in concentrated areas where the soil is less than the indicated depth that the soils will function materially different.

7.7 Pre-Development, Post-Development and Post-Development with Mitigation

Under pre-development, post-development and post-development with mitigation, precipitation, drainage, and infiltration conditions were reviewed. In pre-development, one consolidated area was used, whereas in post-development and post-development with mitigation, the site was broken into each block (west, central, and east) as well as the remaining roadways, residential lots, SWM block and Block 70. The purpose of this breakdown is to provide each of those block's guidance when it comes to the site plan control to achieve

approval in order to meet the site-specific stormwater management criteria. If they were not separated from the "main" area, it would be difficult to break out their individual contributions for the future. The summary, however, combines all together to ensure that the site meets the requirements of pre-development as desired by the RVCA. The results have been summarized below:

Table 12 - Summary Water Balance Table

Characteristic	Pre-Development	Post-Development	Change (Pre – to Post)	Post-Development with Mitigation	Change (Pre- to Post- with Mitigation
Developed Lands to Perth Long Swamp Pre = Post Areas					
Input (Volumes)					
Precipitation (m^3/year)	115168	115168	0%	115168	0%
Output (Volumes)					
Total Infiltration (m^3/year)	23051	12320	-47%	23095	0%
Total Runoff (m^3/year)	23876	65413	174%	47360	98%

Table 12, above, illustrates that the pre-and post-development areas for the entire development remain relatively similar. The total infiltration is illustrated to indicate that in all instances, the development on-site (i.e.: when comparing post- to pre-development) results in a reduction in infiltration. To address the deficiency, infiltration-promoting measures will be required to ensure runoff is intercepted and permitted to recharge the groundwater aquifer.

Finally, the total runoff illustrated confirms that the wetland will see an increase in total volume as a result of the development. This will result in additional volume within the wetland temporarily until it is permitted to flow downstream. This information is critical for the natural sciences consultant to confirm that the vegetation communities are capable of withstanding the additional volume of runoff over the short term. The evaluation of the potential increase in runoff and its associated impacts on Perth Long Swamp is evaluated in **Section 8.0.** Please see **Appendix G** for the water balance tables broken out for each catchment.

7.8 Mitigation Measures

As a result of the lack of recharge when comparing post- to pre-development, the project will require infiltration trenches to ensure that the volume of runoff required enters the ground, providing groundwater recharge and continuing to ensure that the aquifer is maintained.

In order to design the trenches, the 5 mm event was reviewed. Environment Canada data as shown in **Table 13** below, indicates that there are 25.2 days with rain over 10 mm, 46.5 days with rain over 5 mm and 118.4 days of rain over 0.2 mm. Therefore, at a minimum there is:

- (46.5 – 25.2) days = 21.3 days x 5 mm = 107 mm; +
- (118.4 - 46.5) days = 71.9 days x 0.2 mm = 14 mm;
- Summing these volumes = 107 mm + 14 mm = 121 mm of minimum total volume that would be anticipated to be captured if the trenches are designed to accept the entire 5mm storm event.

Table 13 - Environment Canada - Days with Precipitation

1981 to 2010 Canadian Climate Normals station data

Days with Rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
>= 0.2 mm	4.4	3.9	6.7	10.9	13.4	13.2	11.9	11	12.3	13.7	11	6	118.4	A
>= 5 mm	1.6	1.2	2.1	4	4.9	5.8	5.4	4.8	5.1	5	4.2	2.3	46.5	A
>= 10 mm	0.87	0.57	1	2	2.7	2.9	3.1	2.8	3.2	2.7	2.1	1.2	25.2	A
>= 25 mm	0.13	0.07	0.10	0.33	0.47	0.73	0.77	0.67	0.60	0.47	0.43	0.13	4.9	A

As described above, the mitigation measures were reviewed for each catchment. The exact geometry and location within the catchment have been completed by the civil engineering team during the detailed design of the development. Based on the volume to be infiltrated, mitigation measures meet or exceed the required infiltration volume required to balance the site.

Table 14 - Mitigation Measure Sizing - Development Lands to Perth Long Swamp

Description	(Bk 70, SWM Bk, Residential Lots and Roadway)	West Block
Area of Asphalt (m^2)	26600	24010
Asphalt Runoff Coefficient	0.9	0.9
Volume of Runoff in 5 mm Event (m^3) to be infiltrated	120	108
Mitigation Required (m^3/yr)	2873	2593
Annual Volume to be infiltrated by designing for 5 mm Event (m^3)	2897	2615

Based on the analysis conducted, it is recommended to provide an infiltration storage volume of 120 cubic meters for the Phase 6 developments to meet the annual water balance infiltration targets. Additionally, a volume of 108 cubic meters should be allocated for the future west block to meet the annual water balance infiltration targets. To determine the rough sizing of the infiltration trench, typical depths of 0.5 meters and 0.75 meters were assumed. The resulting footprint area requirements are summarized in the following table, which helps estimate the necessary surface area for the implementation of the infiltration trench and ensure sufficient storage capacity for infiltration purposes. Detailed calculations are included in **Appendix G**.

Table 15 – Infiltration Trench Footprint Requirements

Description	Infiltration Target (m^3)	Assumed depth (m)	Footprint (m^2)
Phase 6 Developments	26600	0.50	600
		0.75	400
West Block	0.9	0.50	540
		0.75	360

7.8.1 Drawdown Of Infiltration Trenches

As detailed above, the trenches were sized to fully capture the 5 mm storm. The design criteria typical for a site draining to a wetland is that the trenches must be able to drawdown fully between 5 mm storm events. It is acknowledged that in larger events, the trenches will be overtopped and the grading on site will provide conveyance measures to direct the overtopped runoff towards the stormwater management facilities. With the assumed infiltration rates noted below, the drawdown values were reviewed to verify that the trenches were empty between 48-72 hrs as recommended by the TRCA.

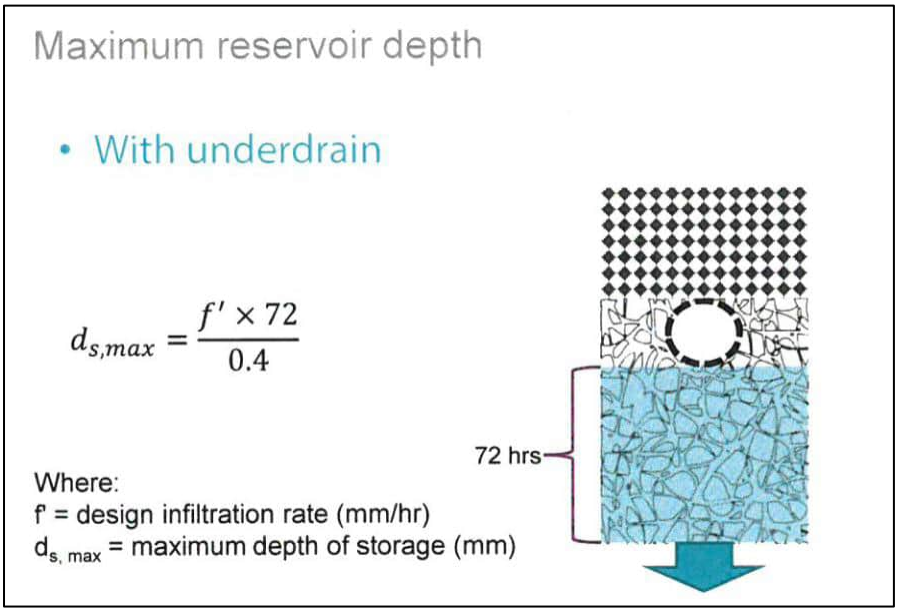


Figure 4 - Maximum Reservoir Depth (TRCA, 2018)

Table 16 - Drawdown Calculations

	Phase 6 Developments	West Block
Infiltration Rate (mm/hr)	25	25
Factor of Safety	4.5	4.5
Design Infiltration Rate (mm/hr) **assumed*	5.5	5.5
Maximum Depth of Storage – 72 hrs (mm)	990	990
Maximum Depth of Storage – 48 hrs (mm)	660	660
Depths of Trenches Provided On Site (mm)	500 / 750	500 / 750
Meets Infiltration Drawdown Criteria	Yes	Yes

As indicated above, the infiltration trench is anticipated to empty between 48 – 72 hrs and therefore, is assumed to meet the drawdown criteria and is anticipated to function as intended by being empty within 2 to 3 days of a 5 mm storm event.

8.0 ANALYSIS OF IMPACTS TO THE WETLAND

Drainage will be directed from the site to the underground storm sewer network prior to reaching the stormwater management pond and ultimately outlet towards the wetland. Riprap and other flow spreaders will be used at the pond outlet to disperse surface flows and dissipate the associated energy of the flows directed to the wetland. This will ensure that any concentrated flows are spread out to reduce the potential for downstream erosion. The discharge from this pond is expected to be reduced through infiltration and evaporation between the outlet of the stormwater management feature and the edge of the wetland.

To assess the water quantity impact of the uncontrolled post-development flows, the water depths in the wetlands were calculated for the pre-development and post-development conditions. To complete this analysis the runoff depth, from the VO6 model results, was multiplied by the tributary drainage area to obtain the runoff volume. Then this volume was divided by the surface area of the wetland to obtain the depth in the wetland. This is a conservative approach since it assumes "vertical walls" around the wetland were as the surface area of the wetland would increase and thus the water depths were lower than those shown in Table below.

Table 17 – Water Depths in Perth Long Swamp

Pre and Post Development Runoff from the site to Perth Long Swamp							
Return Period (yrs)	Pre-development Runoff Depth (mm)	Pre-development Runoff Volume (m^3)	Post-development Runoff Depth (mm)	Post-development Runoff Volume (m^3)	Pre-development Depth in Wetland (mm)	Post-development Depth in Wetland (mm)	Difference (mm)
2	7.35	897	17.23	2102	0.16	0.37	-0.21
5	13.28	1620	25.94	3165	0.28	0.56	-0.27
10	17.29	2110	31.45	3837	0.37	0.67	-0.30
25	23.63	2882	39.77	4851	0.51	0.85	-0.35
50	28.42	3467	45.85	5594	0.61	0.98	-0.37
100	34.22	4175	53.03	6470	0.73	1.14	-0.40

As shown in **Table 17**, the maximum increase in water depth in the wetlands is approximately 0.4 mm for the 100-year storm event. This increase in water elevation will have negligible impact on the wetlands or the downstream systems.

In conclusion, the overall area of the Perth Long Swamp wetland is immense when compared to the size of this site. Any additional volume, in excess of pre-development volume, once the pond and mitigation measures are in place will not make a measurable difference to the quality, function and operation of the wetland.

9.0 ENVIRONMENTAL COMPLIANCE APPROVAL

In compliance with Ontario's 2021 mandatory stormwater management (SWM) criteria for consolidated linear infrastructure, an environmental compliance approval will be necessary. As part of the approval process, a detailed application will be prepared and submitted during the detailed design phase. This application will

include comprehensive information on the storm sewer infrastructure, the proposed design and function of the SWM facility, and other relevant details.

10.0 SEDIMENT EROSION CONTROL

10.1 Temporary Measures

Before construction begins, temporary silt fence, straw bales or rock flow check dams will need to be installed at all-natural runoff outlets from the property. It is crucial that these controls be maintained throughout construction and inspection of sediment and erosion control will be facilitated by the Contractor or Contract Administration staff throughout the construction period.

The Contractor, at their discretion or at the instruction of the Town of Perth, RVCA or the Contract Administrator shall increase the quantity of sediment and erosion controls on-site to ensure that the site is operating as intended and no additional sediment finds its way into the storm sewer network on site. The straw bales and silt fences shall be inspected weekly and after rainfall events. Care shall be taken to properly remove sediment from the fences and check dams as required.

Work through winter months shall be closely monitored for erosion along sloped areas. Should erosion be noted, the Contractor shall be alerted and shall take all necessary steps to rectify the situation. Should the Contractor's efforts fail at remediating the eroded areas, the Contractor shall contact the Conservation Authority to review the site conditions and determine the appropriate course of action.

As each lot is developed, proper sediment and erosion controls will need to be installed and maintained. Sediment controls shall consist of, at minimum, straw bales at the down gradient property line. Grass shall be established as soon as possible, and excess fill shall be removed or leveled promptly. All manholes, catch basins and other drainage structures shall be covered in geosock when installed.

10.2 Permanent Measures

Rip-rap will be placed at all locations that have the potential for concentrated flow. It is crucial that the Contractor ensure that the geotextile is keyed in properly to ensure runoff does not undermine the rip-rapped area. Additional rip-rap is to be placed at erosion prone locations as identified by the Contractor / Contract Administrator / Town of Perth or RVCA.

It is expected that the Contractor will promptly ensure that all disturbed areas receive topsoil and seed/sod and that grass be established as soon as possible. Any areas of excess fill shall be removed or levelled as soon as possible and must be located a sufficient distance from any watercourse to ensure that no sediment is washed out into the watercourse. As the vegetation growth within the site provides a key component to the control of sediment for the site, it must be properly maintained once established. Once the construction is complete, it will be up to the landowner to maintain the vegetation and ensure that the vegetation is not overgrown or impeded by foreign objects.

11.0 SUMMARY

- A new subdivision with 34 single family homes, 38 semi-detached homes and 14 apartment units will be constructed in Phase 6 of the Perthmore Subdivision.
- Proposed watermains ranging in diameter from 200mm to 300mm will be installed throughout the subdivision and will have multiple connection points to existing infrastructure.
- The proposed sanitary sewer will be 200 mm in diameter, will be installed throughout the subdivision and will gravity drain through the existing subdivision infrastructure though multiple connections.
- The proposed storm sewer, ranging in diameter from 250 mm to 900 mm, will be installed throughout the subdivision and will drain to a newly proposed stormwater management facility.
- Stormwater quantity and quality control will be provided by the proposed SWM facility. The facility will be designed as a wet pond to provide an enhanced level of water quality control (80% T.S.S. removal). A treatment train approach has been enacted using infiltration trenches, conveyance measures in rear yard swales and the end of pipe facility.
- Water balance criteria was reviewed, and mitigation measures will be required to meet the pre-development infiltration volumes. Infiltration trenches have been proposed, volume sizing has been completed with further design details such as placement to be confirmed with the detailed grading and drainage plan in detailed design.
- Through ensuring that the stormwater management and water balance criteria are not exceed in post-development from pre-development rates and volumes, and by locating the pond upstream of the wetland, no adverse impacts are anticipated to the Perth Long Swamp.
- Sediment and erosion protection measures will be installed as soon as ground conditions warrant and permit and shall remain in place until construction is complete, and vegetation is re-established.

12.0 RECOMMENDATIONS

Based on the information presented in this report, we recommend that the Town approve this Preliminary Servicing and Stormwater Management Report in support of the Draft Plan of Subdivision Application for Phase 6 of the Perthmore Subdivision.

Please feel free to contact the personnel below if you have any questions or concerns.

Regards,

McIntosh Perry Consulting Engineers Ltd.

Brent Cuming, P.Eng.
Project Engineer | Land Development
McIntosh Perry Consulting Engineers
T: 343.764.2012
E: b.cuming@mcintoshperry.com

Raja Subramaniam Raja Chockalingam, M.Eng, P.Eng.
Design Lead | Water Resources
McIntosh Perry Consulting Engineers
T: 249.494.2971
E: r.rajachockalingam@mcintoshperry.com

13.0 STATEMENT OF LIMITATIONS

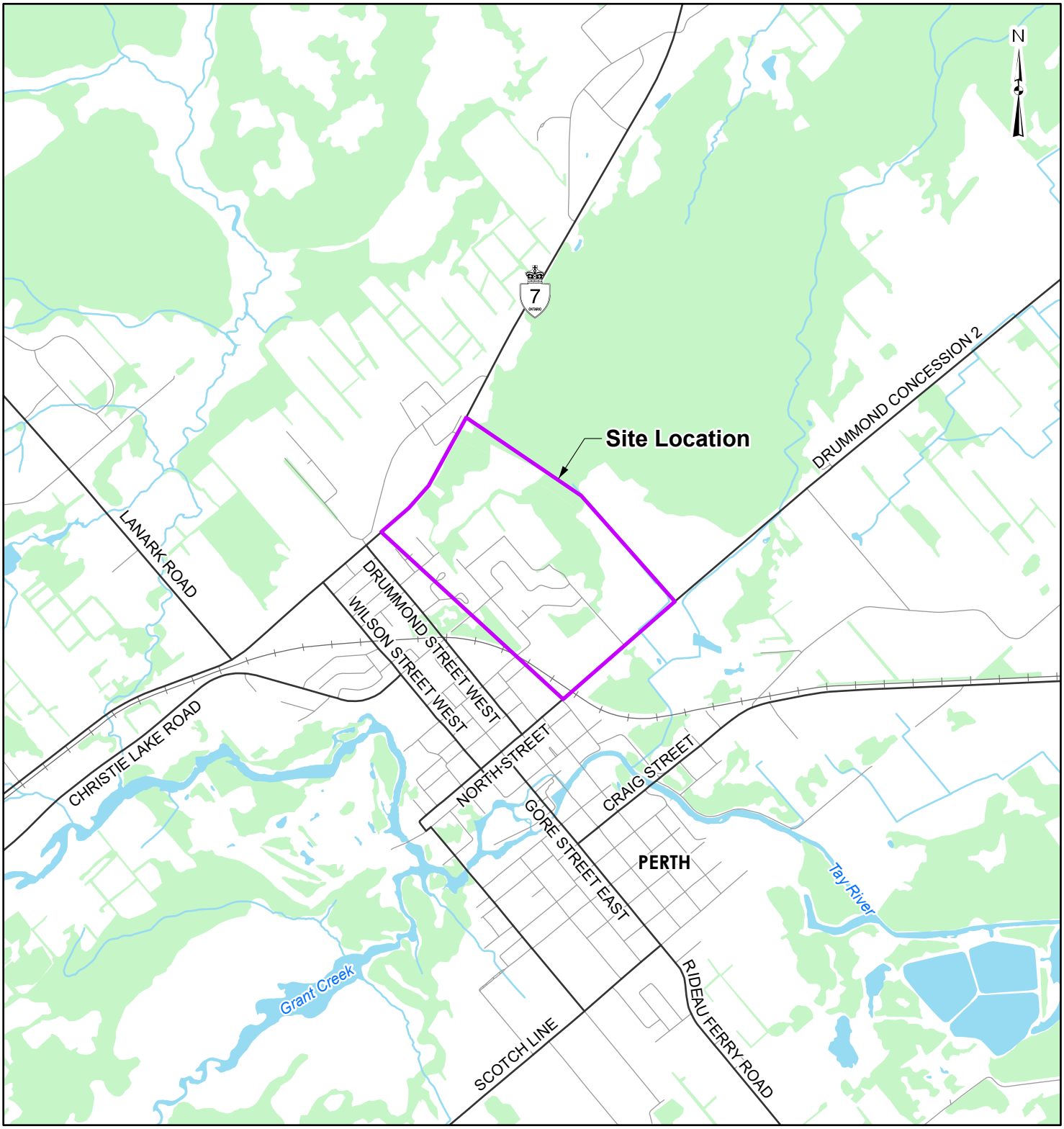
This report was produced for the exclusive use of Perthmore Developments Co. The purpose of the report is to assess the existing servicing infrastructure and to provide recommendations and designs for the post-construction scenario that are in compliance with the guidelines and standards from the Ministry of the Environment, Conservation and Parks, Town of Perth and local approval agencies. McIntosh Perry reviewed the site information and background documents listed in Section 2.0 of this report. While the previous data was reviewed by McIntosh Perry and site visits were performed, no field verification/measures of any information were conducted.

Any use of this review by a third party, or any reliance on decisions made based on it, without a reliance report is the responsibility of such third parties. McIntosh Perry accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions made based on this review.

The findings, conclusions and/or recommendations of this report are only valid as of the date of this report. No assurance is made regarding any changes in conditions subsequent to this date. If additional information is discovered or becomes available at a future date, McIntosh Perry should be requested to re-evaluate the conclusions presented in this report, and provide amendments, if required.

APPENDIX A
LOCATION PLAN

McINTOSH PERRY



LEGEND

- Approximate Site Boundary
- Local Road
- Major Road
- Railroad
- Watercourse
- Waterbody
- Wooded Area

1,000 500 0 1,000

Scale 1:30,000 Metres

REFERENCE

GIS data provided by the Ontario Ministry of Natural Resources and Forestry, 2020.

CLIENT: PERTHMORE DEVELOPMENT CO.

PROJECT: PERTHMORE SUBDIVISION PHASE 6

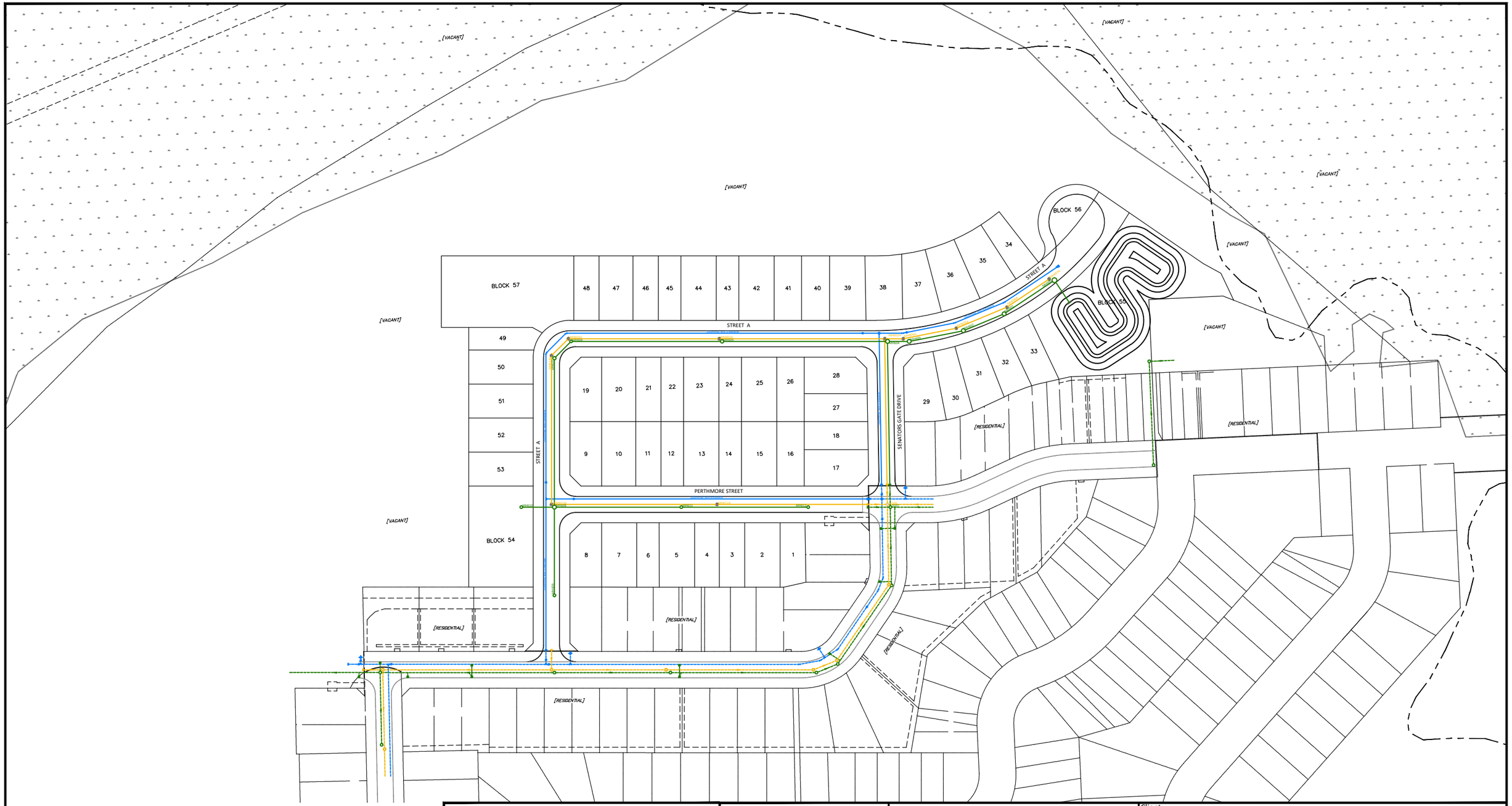
TITLE: LOCATION PLAN

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

PROJECT NO:	PP-13-9668-01
Date	Dec., 21, 2020
GIS	EU
Checked By	CH

FIGURE: 1

C:\Users\e.ungun\McIntosh Perry\GIS - Documents\Projects\2013\PP\PP-13-9668-01\aprx\KeyMap\PP-13-9668-01-SiteLocation.aprx



SCALE 1 : 2000

0 50 100 150 200 Metres

LEGEND

- EXISTING WATERMAIN
- PROPOSED WATERMAIN
- EXISTING SANITARY SEWER
- PROPOSED SANITARY SEWER
- EXISTING STORM SEWER
- PROPOSED STORM SEWER

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Client: PERTHMORE DEVELOPMENT CO.
80 DUFFERIN STREET PERTH, ON K7H 3M6

Project: PERTHMORE SUBDIVISION PHASE 6

Drawing Title: GENERAL PLAN OF SERVICES

Drawn by:	Checked By:
P.G.K.	B.S.C.
Scale: 1:2000	Project Number: PP-13-9668-01

No.	Revisions	Date
3	RE-ISSUED FOR DRAFT APPROVAL	JUNE 23, 2023
2	ISSUED FOR DRAFT PLAN APPROVAL	AUG. 03, 2022
1	ISSUED FOR DRAFT PLAN APPLICATION	DEC. 18, 2020

Drawing Number: 100

FILENAME: U:\Ottawa\01 Project - Proposals\2013 Jobs\09P-13-9668-01 Perthmore Development Co_Perthmore Subdivision\03-Drawings\Production\PP-13-9668-01_Drawings.dwg
LAST SAVED: Friday, June 23, 2023 LAST SAVED BY: s.hall
LAST PLOTTED: Friday, June 23, 2023 CTB FILE USED: ----

APPENDIX B
WATERMAIN DESIGN

McINTOSH PERRY

PP-13-9668-01 - Perthmore Subdivision Phase 6 - Water Demands 1

Peaking Factors:

Table 3-1: Peaking Factors

POPULATION	MINIMUM RATE FACTOR (MINIMUM HOUR)	MAXIMUM DAY FACTOR	PEAK RATE FACTOR (PEAK HOUR)
500 - 1,000	0.40	2.75	4.13
1,001 - 2,000	0.45	2.50	3.75
2,001 -3,000	0.45	2.25	3.38
3,001 - 10,000	0.50	2.00	3.00
10,001 - 25,000	0.60	1.90	2.85
25,001 - 50,000	0.65	1.80	2.70
50,001 - 75,000	0.65	1.75	2.62
75,001 - 150,000	0.70	1.65	2.48
greater than 150,000	0.80	1.50	2.25

Note: Domestic water demand peaking factors are per Section 3.4.2 of the Design Guidelines for Drinking-Water Systems 2008.

Population Density:

Unit Type	Persons Per Unit (ppu)
Single Family	3.4
Semi-detached	2.7
Townhouse	2.7
Apartment	1.8
Unknown	60/ha

Calculations:

Phase 6 - Consists of 34 single family, 38 Semi-detached units, 14 Apartment units

Population = 243.40 people

*Average Day Flow		Max. Day Flow		Peak Hourly Flow		
(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	
0.79	47.33	2.17	130.15	3.26	195.46	
0.79	**47.33**	**2.17**	**130.15**	**3.26**	**195.46**	**Total**

*Domestic flow was assumed to be 280L/(cap-day)

PP-13-9668-01 - Perthmore Subdivision Phase 6 - Water Demands 2

Peaking Factors:

Table 3-1: Peaking Factors

POPULATION	MINIMUM RATE FACTOR (MINIMUM HOUR)	MAXIMUM DAY FACTOR	PEAK RATE FACTOR (PEAK HOUR)
500 - 1,000	0.40	2.75	4.13
1,001 - 2,000	0.45	2.50	3.75
2,001 -3,000	0.45	2.25	3.38
3,001 - 10,000	0.50	2.00	3.00
10,001 - 25,000	0.60	1.90	2.85
25,001 - 50,000	0.65	1.80	2.70
50,001 - 75,000	0.65	1.75	2.62
75,001 - 150,000	0.70	1.65	2.48
greater than 150,000	0.80	1.50	2.25

Note: Domestic water demand peaking factors are per Section 3.4.2 of the Design Guidelines for Drinking-Water Systems 2008.

Population Density:

Unit Type	Persons Per Unit (ppu)
Single Family	3.4
Semi-detached	2.7
Townhouse	2.7
Apartment	1.8
Unknown	60/ha

Calculations:

Phase 6 - Consists of 34 single family, 38 Semi-detached units and 14 Apartment units

Future Development - Consists of 5.45 ha development area

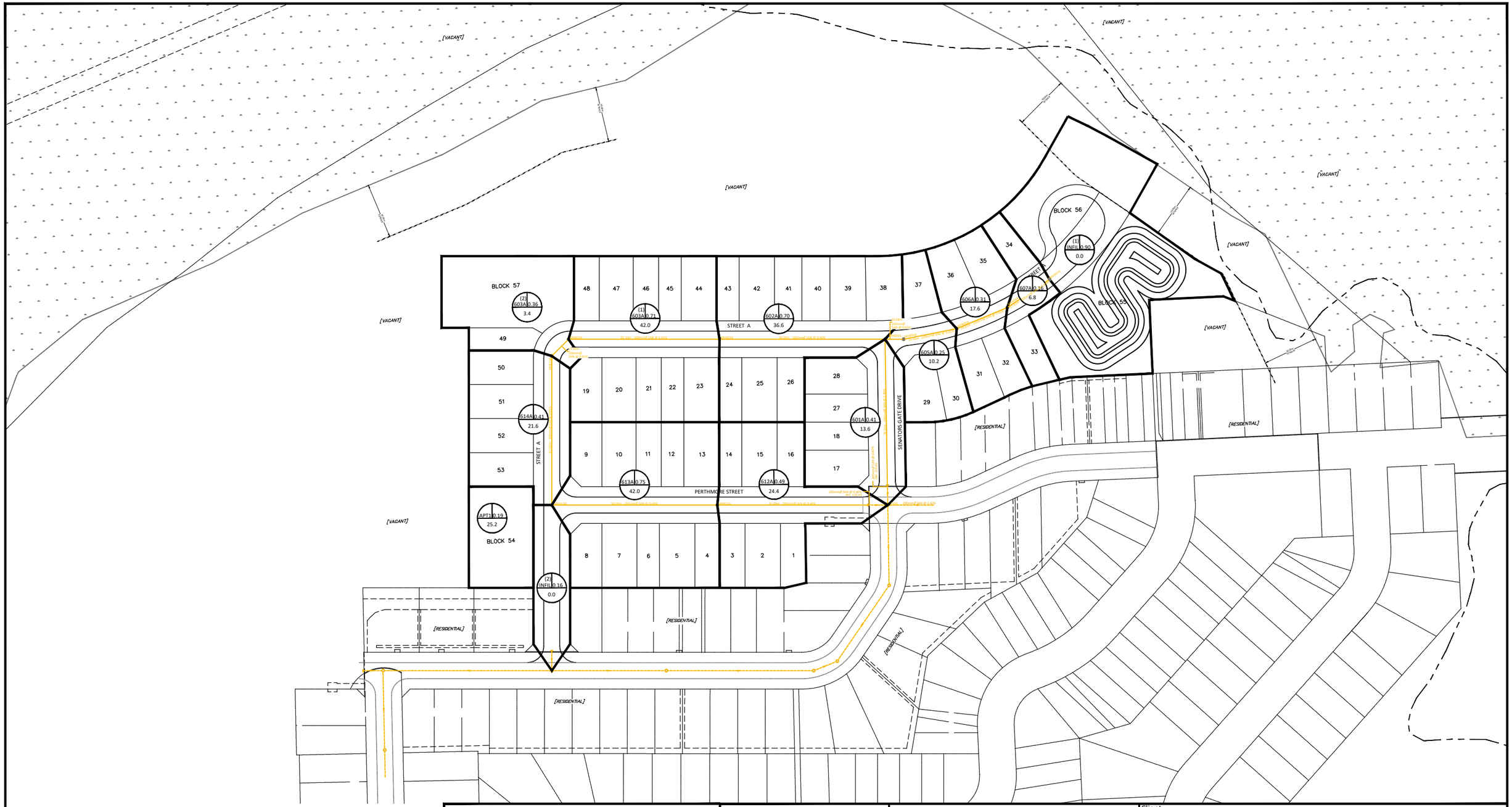
Population = 570.40 people

*Average Day Flow		Max. Day Flow		Peak Hourly Flow		
(L/s)	(L/min)	(L/s)	(L/min)	(L/s)	(L/min)	
1.85	110.91	5.08	305.01	7.63	458.06	
1.85	**110.91**	**5.08**	**305.01**	**7.63**	**458.06**	**Total**

*Domestic flow was assumed to be 280L/(cap-day)

APPENDIX C
SANITARY SEWER DESIGN

McINTOSH PERRY



LEGEND

LOCATION I.D. — AREA (ha)

123 0.25

6.8

POPULATION

SCALE 1 : 2000

0 50 100 150 200 Metres

N

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Client: PERTHMORE DEVELOPMENT CO.
80 DUFFERIN STREET PERTH, ON K7H 3M6

Project: PERTHMORE SUBDIVISION PHASE 6

Drawing Title: SANITARY DRAINAGE AREA PLAN

Drawn by:	Checked By:
P.G.K.	B.S.C.
Scale: 1:2000	Project Number: PP-13-9668-01

No.	Revisions	Date
3	RE-ISSUED FOR DRAFT APPROVAL	JUNE 23, 2023
2	ISSUED FOR DRAFT PLAN APPROVAL	AUG. 03, 2022
1	ISSUED FOR DRAFT PLAN APPLICATION	DEC. 18, 2020

Drawing Number: 500

FILENAME: I:\Ottawa\01 Project - Proposals\2013 Jobs\09PP-13-9668-01 Perthmore Development Co_Perthmore Subdivision\03-Drawings\Production\PP-13-9668-01_Drawing.dwg
LAST SAVED: Friday, June 23, 2023 LAST SAVED BY: s.hill
LAST PLOTTED: Friday, June 23, 2023 CTB FILE USED: ----

SANITARY SEWER DESIGN SHEET

PROJECT: PERTHMORE SUBDIVISION PHASE 6
LOCATION: PERTH, ON
CLIENT: PERTHMORE DEVELOPMENT CO.

McINTOSH PERRY

LOCATION				RESIDENTIAL									ICI AREAS							INFILTRATION ALLOWANCE			FLOW	SEWER DATA								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	30	31
STREET	AREA ID	FROM MH	TO MH	UNIT TYPES				AREA (ha)	POPULATION		PEAK FACTOR	PEAK FLOW (L/s)	AREA (ha)						PEAK FLOW (L/s)	AREA (ha)		FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	DIA (mm)	SLOPE (%)	VELOCITY (full) (m/s)	FLOW DEPTH (mm)	VELOCITY (actual) (m/s)	AVAILABLE CAPACITY	
				SF	SD	TH	APT		IND	CUM			INSTITUTIONAL		COMMERCIAL		INDUSTRIAL			IND	CUM										L/s	(%)
													IND	CUM	IND	CUM	IND	CUM													
STREET A	603A(1)	603A	602A	6	8			0.71	42.0	42.0	4.00	0.54		0.00		0.00		0.00	0.00	0.71	0.71	0.23	0.78	27.59	82.10	200	0.65	0.851	24.7	0.378	26.81	97.18
	602A	602A	601A	6	6			0.70	36.6	78.6	4.00	1.02		0.00		0.00		0.00	0.00	0.70	1.41	0.47	1.48	21.64	90.00	200	0.40	0.667	37.5	0.387	20.16	93.14
STREET A	INFIL(1), 607A	607A	606A	2				1.06	6.8	6.8	4.00	0.09		0.00		0.00		0.00	0.00	1.06	1.06	0.35	0.44	27.59	27.61	200	0.65	0.851	18.9	0.317	27.15	98.41
	606A	606A	605A	2	4			0.31	17.6	24.4	4.00	0.32		0.00		0.00		0.00	0.00	0.31	1.37	0.45	0.77	27.59	29.81	200	0.65	0.851	24.6	0.376	26.82	97.21
	605A	605A	604A	3				0.25	10.2	34.6	4.00	0.45		0.00		0.00		0.00	0.00	0.25	1.62	0.53	0.98	27.59	29.40	200	0.65	0.851	27.6	0.405	26.60	96.44
		604A	601A						0.0	34.6	4.00	0.45		0.00		0.00		0.00	0.00	0.00	1.62	0.53	0.98	27.59	10.08	200	0.65	0.851	27.6	0.405	26.60	96.44
SENATORS GATE DRIVE	601A	601A	*CAP*	4				0.41	13.6	126.8	4.00	1.64		0.00		0.00		0.00	0.00	0.41	3.44	1.14	2.78	21.64	79.13	200	0.40	0.667	50.4	0.465	18.86	87.16
		CAP-1	*S106*					0.00	0.0	126.8	4.00	1.64		0.00		0.00		0.00	0.00	0.00	3.44	1.14	2.78	21.64	*11.00*	*200*	*0.40*	0.667	50.4	0.465	18.86	87.16
STREET A	603A(2)	603A	614A	1				0.36	3.4	3.4	4.00	0.04		0.00		0.00		0.00	0.00	0.36	0.36	0.12	0.16	27.59	12.90	200	0.65	0.851	11.9	0.234	27.42	99.41
	614A	614A	613A		8			0.41	21.6	25.0	4.00	0.32		0.00		0.00		0.00	0.00	0.41	0.77	0.25	0.58	27.59	81.00	200	0.65	0.851	21.5	0.345	27.01	97.90
PERTHMORE STREET	APT1, INFIL(2), 613A	613A	612A	6	8		14	1.10	67.2	92.2	4.00	1.20		0.00		0.00		0.00	0.00	1.10	1.87	0.62	1.81	21.64	90.00	200	0.40	0.667	41.2	0.410	19.83	91.63
	612A	612A	*CAP*	4	4			0.49	24.4	116.6	4.00	1.51		0.00		0.00		0.00	0.00	0.49	2.36	0.78	2.29	21.64	81.68	200	0.40	0.667	46.0	0.439	19.35	89.42
		CAP-2	*S106*					0.00	0.0	116.6	4.00	1.51		0.00		0.00		0.00	0.00	0.00	2.36	0.78	2.29	21.64	*11.00*	*200*	*0.40*	0.667	46.0	0.439	19.35	89.42

Design Parameters:

Residential			ICI Areas			
						Peak Factor
SF	3.4	p/p/u				
SD	2.7	p/p/u	INST	28,000	L/Ha/day	1.5
TH	2.7	p/p/u	COM	28,000	L/Ha/day	1.5
APT	1.8	p/p/u	IND	35,000	L/Ha/day	MOE Chart
Other	60	p/p/Ha				

Notes:

1. Mannings coefficient (n) = 0.013
2. Demand (per capita): 280 L/day
3. Infiltration allowance: 0.33 L/s/Ha
4. Residential Peaking Factor:
   Harmon Formula = 1+(14/(4+P^0.5))
   where P = population in thousands

Designed: P.G.K.

Checked: B.S.C.

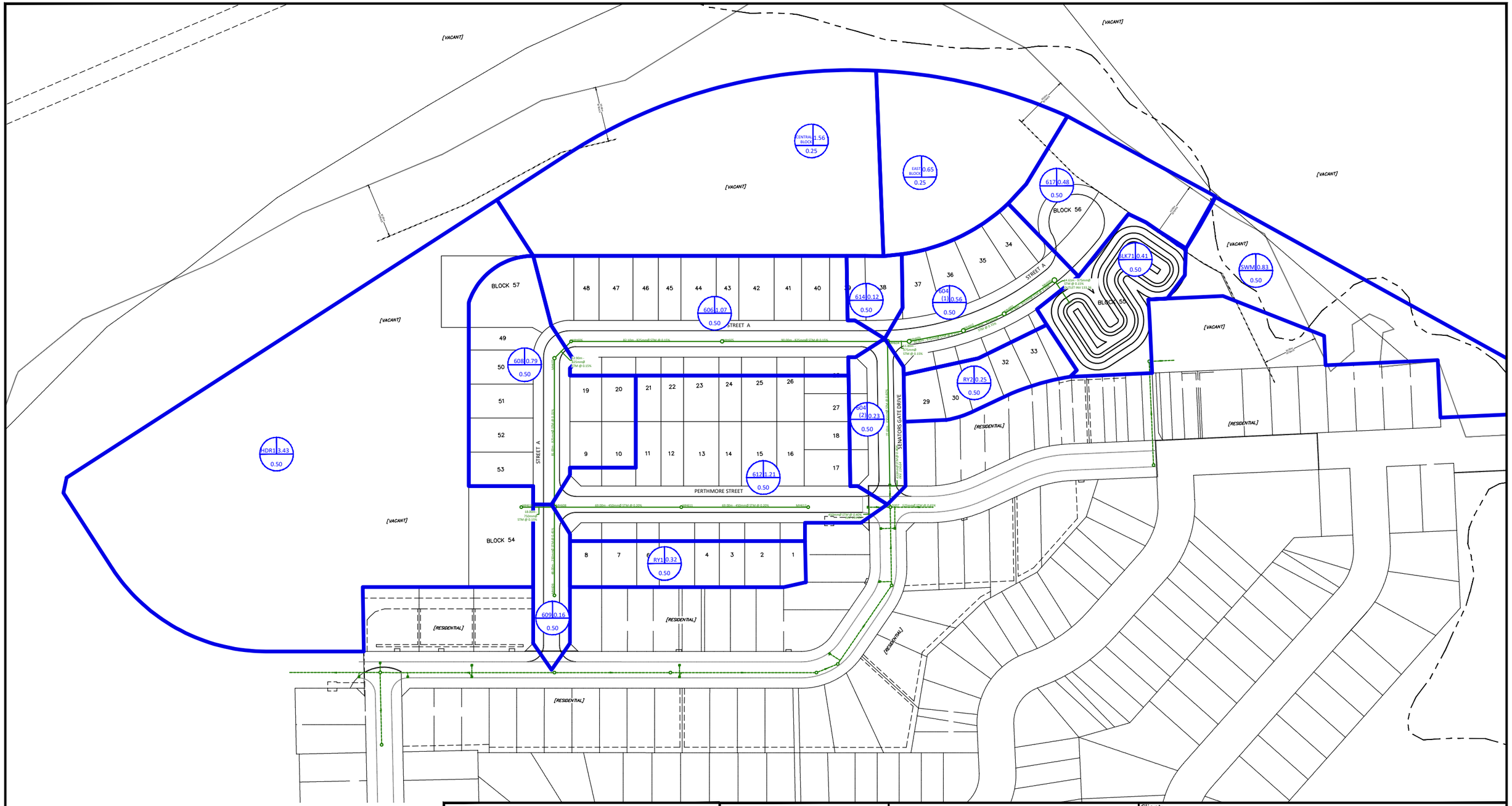
Project No.: PP-13-9668-01

No.	Revision	Date
1.	ISSUED FOR DRAFT PLAN APPLICATION	DEC. 18, 2020
2.	ISSUED FOR DRAFT PLAN APPROVAL	AUG.3, 2022
3.	ISSUED FOR DRAFT PLAN APPROVAL	JUN. 23, 2023

Sheet No: 1 of 1

APPENDIX D
STORM SEWER DESIGN

McINTOSH PERRY



SCALE 1 : 2000

0 50 100 150 200 Metres

LEGEND

LOCATION I.D. — AREA (ha)

123F 0.25

0.60

AVERAGE COEFFICIENT 5-year

N

McINTOSH PERRY

115 Walgreen Road, RR3, Carp, ON K0A 1L0

Tel: 613-836-2184 Fax: 613-836-3742

www.mcintoshperry.com

Client: PERTHMORE DEVELOPMENT CO.
80 DUFFERIN STREET PERTH, ON K7H 3M6

Project: PERTHMORE SUBDIVISION PHASE 6

Drawing Title: STORM DRAINAGE AREA PLAN

Drawn by:	Checked By:	No.	Revisions	Date
P.G.K.	B.S.C.	3	RE-ISSUED FOR DRAFT APPROVAL	JUNE 23, 2023
Scale: 1:2000	Project Number: PP-13-9668-01	2	ISSUED FOR DRAFT PLAN APPROVAL	AUG. 03, 2022
		1	ISSUED FOR DRAFT PLAN APPLICATION	DEC. 18, 2020

Drawing Number: 501

FILENAME: \\mcintoshperry.local\share\Ottawa\03 Project - Proposal\2013 Job\OPP-13-9668-01 Perthmore Development Co_Perthmore Subdivision\03-Drawings\Production\PP-13-9668-01_Drawings.dwg
LAST SAVED: Friday, June 23, 2023 LAST SAVED BY: J.Hewson
LAST PLOTTED: Friday, June 23, 2023 CTB FILE USED: ----

STORM SEWER DESIGN SHEET

PROJECT: PERTHMORE SUBDIVISION PHASE 6
LOCATION: PERTH, ON
CLIENT: PERTHMORE DEVELOPMENT CO.

McINTOSH PERRY

LOCATION				CONTRIBUTING AREA (ha)								RATIONAL DESIGN FLOW											SEWER DATA								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
STREET	AREA ID	FROM MH	TO MH	C-VALUE						INDIV AC	CUMUL AC	INLET (min)	TIME IN PIPE	TOTAL (min)	i (5) (mm/hr)	i (10) (mm/hr)	i (100) (mm/hr)	5yr PEAK FLOW (L/s)	10yr PEAK FLOW (L/s)	100yr PEAK FLOW (L/s)	FIXED FLOW (L/s)	DESIGN FLOW (L/s)	CAPACITY (L/s)	LENGTH (m)	PIPE SIZE (mm)			SLOPE (%)	VELOCITY (m/s)	AVAIL CAP (5yr)	
				0.20	0.40	0.50	0.60	0.80	1.00																DIA	W	H			(L/s)	(%)
	HDR2	610	608				3.28			1.97	1.97	20.00	0.30	20.30	58.41	67.89	97.42	319.56				319.56	449.81	18.00	750			0.15	0.986	130.26	28.96
STREET A	609	609	608			0.16				0.08	0.08	20.00	0.97	20.97	58.41	67.89	97.42	12.99				12.99	41.62	48.00	250			0.45	0.821	28.63	68.79
PERTHMORE STREET	612	612	611			1.21				0.61	0.61	20.00	1.42	21.42	58.41	67.89	97.42	98.24				98.24	133.02	69.00	450			0.20	0.810	34.78	26.15
		611	608							0.00	0.61	21.42	1.42	22.84	55.68	64.71	92.86	93.64				93.64	133.02	69.00	450			0.20	0.810	39.38	29.60
STREET A	608	608	607			0.94				0.47	3.12	22.84	1.28	24.12	53.23	61.88	88.79	462.17				462.17	579.98	81.00	825			0.15	1.051	117.81	20.31
		607	606							0.00	3.12	24.12	0.20	24.33	51.24	59.55	85.46	444.83				444.83	579.98	12.90	825			0.15	1.051	135.15	23.30
	606	606	605			1.11				0.56	3.68	24.33	1.30	25.63	50.93	59.20	84.95	520.80				520.80	579.98	82.10	825			0.15	1.051	59.18	10.20
		605	604							0.00	3.68	25.63	1.43	27.06	49.11	57.09	81.91	502.16				502.16	579.98	90.00	825			0.15	1.051	77.82	13.42
SENATORS GATE DRIVE	614, HDR1	BULKHEAD	604			0.07	2.34			1.44	1.44	20.00	0.33	20.33	58.41	67.89	97.42	233.66				233.66	339.63	18.00	675			0.15	0.919	105.98	31.20
STREET A	604(1)	604	603			0.68				0.34	5.46	27.06	0.17	27.22	47.29	54.96	78.87	717.35				717.35	905.48	11.80	975			0.15	1.175	188.13	20.78
		603	602							0.00	5.46	27.22	0.43	27.65	47.08	54.73	78.53	714.27				714.27	905.48	30.00	975			0.15	1.175	191.22	21.12
		602	601							0.00	5.46	27.65	0.34	27.99	46.58	54.14	77.68	706.57				706.57	905.48	24.00	975			0.15	1.175	198.92	21.97
		601	600							0.00	5.46	27.99	0.47	28.46	46.18	53.68	77.02	700.55				700.55	905.48	32.90	975			0.15	1.175	204.94	22.63
		600	POND							0.00	5.46	28.46	0.21	28.66	45.65	53.06	76.14	692.50				692.50	905.48	14.61	975			0.15	1.175	212.99	23.52
SENATORS GATE DRIVE	604(2)	604	*BULKHEAD*			0.23				0.12	0.12	20.00	1.13	21.13	58.41	67.89	97.42	18.67				18.67	188.11	77.63	450			0.40	1.146	169.44	90.07
		BULKHEAD	*D207*							0.00	0.12	21.13	0.18	21.31	56.21	65.33	93.75	17.97				17.97	188.11	*12.50*	*450*			*0.40*	1.146	170.14	90.45
PERTHMORE STREET		*BULKHEAD*	*D207*							0.00	0.00	20.00	0.18	20.18	58.41	67.89	97.42	0.00				0.00	188.11	*12.50*	*450*			*0.40*	1.146	188.11	100.00

Definitions:
Q = 2.78CiA, where:
Q = Peak Flow in Litres per Second (L/s)
A = Area in Hectares (ha)
i = Rainfall intensity in millimeters per hour (mm/hr)
[i = 27.1 * Tc^-0.699] 5 YEAR
[i = 31.5 * Tc^-0.699] 10 YEAR
[i = 45.2 * Tc^-0.699] 100 YEAR

Notes:
1. Mannings coefficient (n) = 0.013

Designed: P.G.K.
Checked: B.S.C.
Project No.: PP-13-9668-01

No.	Revision	Date
1.	ISSUED FOR DRAFT PLAN APPLICATION	DEC. 18, 2020
2.	ISSUED FOR DRAFT PLAN APPROVAL	AUG. 3, 2022
3.	ISSUED FOR DRAFT PLAN APPROVAL	JUN. 23, 2023

Sheet No: 1 of 1

APPENDIX E
EXISTING CONDITIONS MEMO

McINTOSH PERRY

McINTOSH PERRY

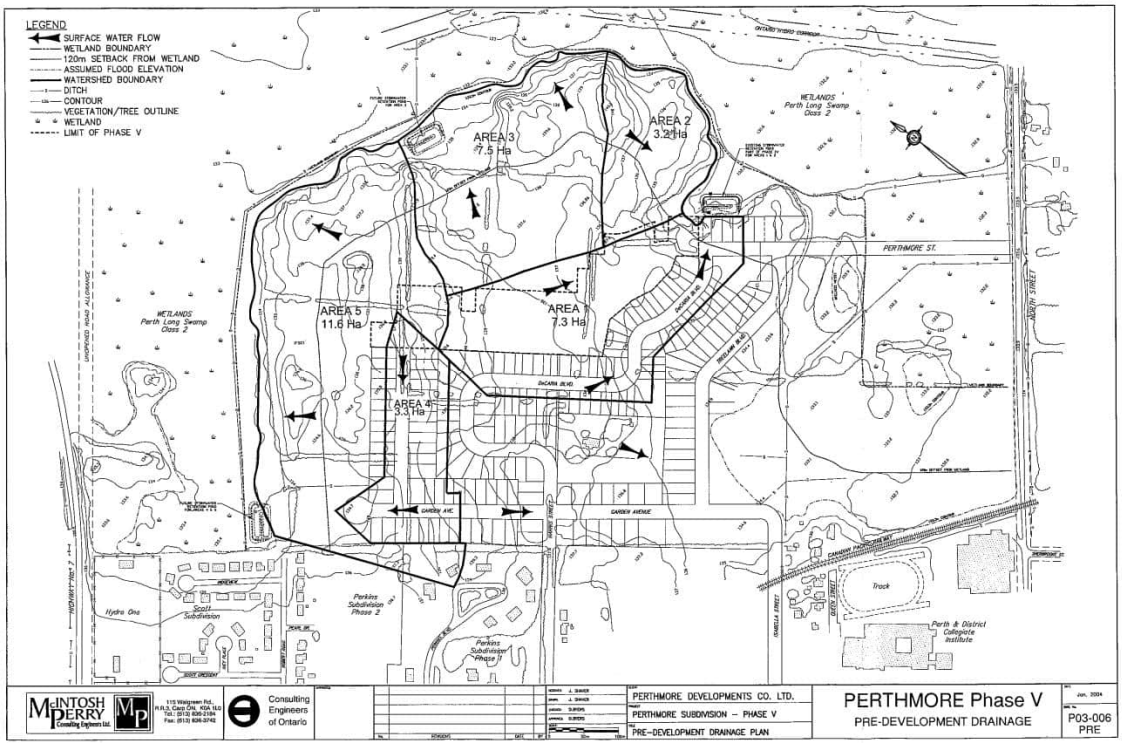
MEMORANDUM

To:	Ryan Kennedy, P. Eng., Practice Lead, Land Development Adam O'Connor, P.Eng., Assistant Vice President, Land Development
From:	John Price, P. Eng., Senior Water Resource Engineer
Cc:	Jason Sharp, P. Eng. Manager, Water Resources
Date:	December 2, 2020
Re:	Perthmore Subdivision

1.0 BACKGROUND

The Perthmore subdivision is located northwest of North Street in the Town of Perth. Various phases of the subdivision have been under development since the 1990s and the draft plan for a subsequent phase is now under consideration. The drainage and stormwater management infrastructure has also been constructed in phases over many years. The original pre-development flow values were first calculated in 1990s using the Rational Equation.

An existing stormwater management (SWM) pond is located on the northeast side of Perthmore Street as shown on the figure below. As part of development of this subsequent phase, this SWM facility will be reconstructed and expanded to address the water quality and quantity control requirements for the tributary drainage area. For the SWM design the pre-development flows, to be used as the target flows for the quantity control, were reassessed.



2.0 ANALYSIS

A Visual OTTHMO Version 5 (VO5) model was assembled for the analysis. As shown in the figure above, the pre-development tributary area to the SWM facility consists of Areas 1 and 2 and the total tributary pre-development drainage area is 10.5 ha. The VO5 hydrologic model requires various measured and calculated input parameters. The calculations of these input parameters area detailed below.

2.1 Parameters

2.1.1 General

Since the pre-development land use was rural the NASHYD command was employed in the VO5 model to calculate the runoff flows. NASHYD is used to simulate runoff flows with NASH instantaneous unit hydrograph. This hydrograph is made of a cascade of "n" linear reservoirs. The n (number of linear reservoirs) parameter was set at 3, in the model, and the rainfall losses were computed by the SCS CN procedure.

2.1.2 Time of Concentration/Time to Peak

The Time of Concentration (Tc), for the pre-development drainage basins, was calculated using the Airport Formula.

$T_c = 3.26 * (1.1 - C) * L^{0.5} * S_w^{-0.33}$

Where:

Tc = time of concentration in minutes
C = runoff coefficient
L = watershed length in metres
S_w = watershed slope in percentage

From the Tc value, the Time to Peak (Tp) value was calculated as 0.67 times Tc. The parameters employed in the calculation of Tc and Tp for the two drainage basins are show in Table 1.

Table 1 – Time to Peak

Catchment	Area	Flow Length	Fall	Slope	Tc[1]	Tp[2]
	ha	m	m	%	min	hrs
Area 1	7.3	435	7	1.61	58.1	0.65
Area 2	3.2	165	7	4.24	26.0	0.29

Notes: 1 – Airport Formula
2 – 0.67*Tc

2.1.3 SCS Curve Number

The Curve Number (CN) is the most important parameter in determining surface runoff when the SCS equation is used. Table 2 shows the parameters and the resulting CN value for Areas 1 and 2.

Table 2 – Curve Number

Catchment	Soil Type	Hydrologic Soil Group[1]	Land Use (0-5% Slope)	Runoff Coefficient[2]	CN[3] (AMC II)	Ia mm
Area 1	Sandy Loam	AB	Pasture	0.10	59	5
Area 2	Sandy Loam	AB	Pasture	0.10	59	5

Notes: 1 – MTO Drainage Management Manual – Design Chart 1.08
2 - MTO Drainage Management Manual – Design Chart 1.07
3 - MTO Drainage Management Manual – Design Chart 1.09 (Pasture, fair condition – average of A and B Hydrologic Soil Groups)

2.1.4 Rainfall

For the rainfall input to the VO5 model, the 12 hour SCS rainfall distribution, representing a high volume lower intensity storm, and a 4 hour Chicago rainfall distribution, representing a high intensity "thunder storm" type of rainfall event were used ion the analysis. The Intensity-Duration-Frequency (IDF) curve was obtained from the Ministry of Transportation (MTO) IDF Curve Lookup tool with the location centred over the property.

3.0 RESULTS

Employing the above noted parameters and the VO5 hydrologic model, Table 3 shows the calculated pre-development flow values for the 12 hour SCS and 4 hour Chicago rainfall hyetographs. It is recommended that these flow values be used for the water quantity control assessment of the reconstructed SWM facility. The redesign of the end of pipe facility will also include water quality control for the post-development tributary drainage area.

Table 3 – Calculated Flows

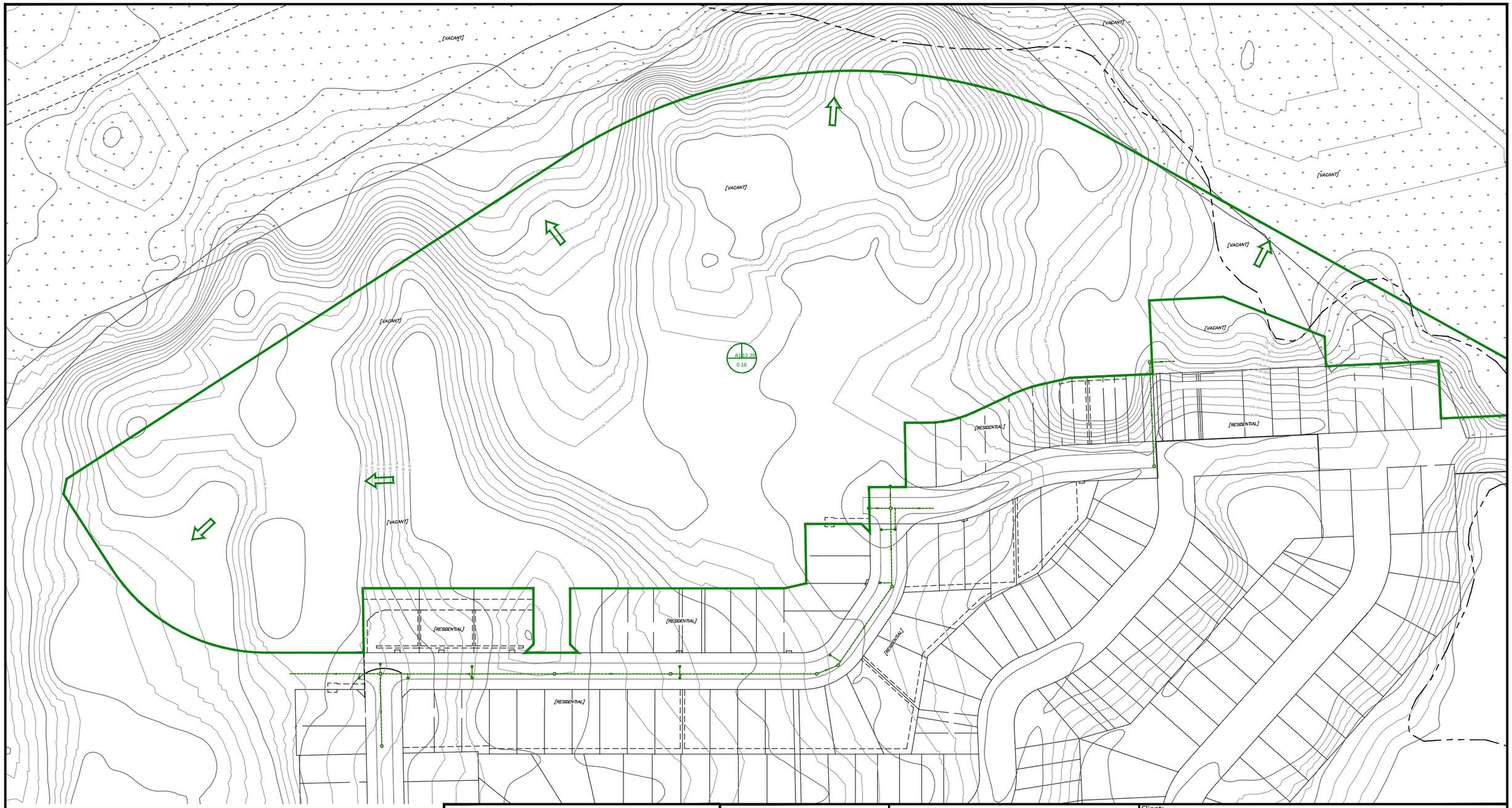
	12 hour SCS			4 hour Chicago		
Return Period	Area 1	Area 2	Total	Area 1	Area 2	Total
Yrs	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
2	0.061	0.047	0.093	0.030	0.022	0.045
5	0.110	0.085	0.168	0.057	0.041	0.085
10	0.143	0.111	0.220	0.080	0.058	0.119
25	0.197	0.152	0.303	0.111	0.083	0.166
50	0.238	0.184	0.367	0.137	0.101	0.206
100	0.288	0.223	0.444	0.165	0.122	0.248

This memorandum is respectfully submitted by,
McIntosh Perry Consulting Engineers Ltd.

John Price, P. Eng.
Senior Water Resource Engineer
PH No. 613 714 5906
Email. J.Price@McIntoshPerry.com

APPENDIX F
STORMWATER MANAGEMENT DESIGN

McINTOSH PERRY



SCALE 1 : 2000

0 50 100 150 200 Metres

LEGEND

LOCATION I.D. — AREA (ha)

123F 0.25

0.60

0.75

AVERAGE COEFFICIENT

5-year

100-year

N

McINTOSH PERRY

115 Walgreen Road, RR3, Carp, ON K0A 1L0

Tel: 613-836-2184 Fax: 613-836-3742

www.mcintoshperry.com

Client: PERTHMORE DEVELOPMENT CO.
80 DUFFERIN STREET PERTH, ON K7H 3M6

Project: PERTHMORE SUBDIVISION PHASE 6

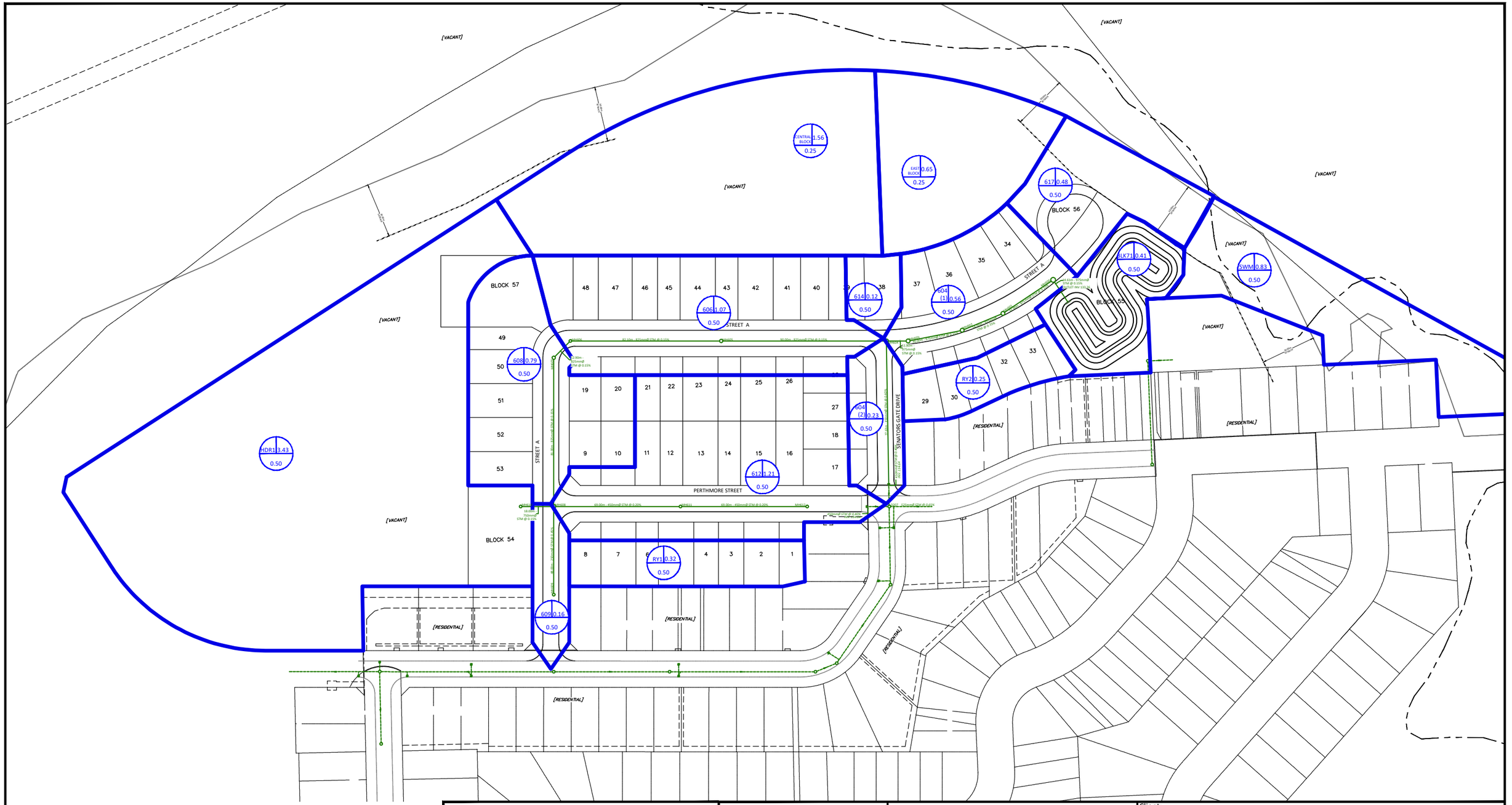
Drawing Title: PRE-DEVELOPMENT DRAINAGE AREA PLAN

Drawn by:	Checked By:
P.G.K.	B.S.C.
Scale:	Project Number:
1:2000	PP-13-9668-01

No.	Revisions	Date
2	RE-ISSUED FOR DRAFT APPROVAL	JUNE 23, 2023
1	ISSUED FOR DRAFT PLAN APPROVAL	AUG. 03, 2022

Drawing Number: PRE

FILENAME: U:\Ottawa\03 Project - Proposals\2013 Jobs\OPP-13-9668-01 Perthmore Development Co_Perthmore Subdivision\03-Drawings\Production\PP-13-9668-01_Drawings.dwg
LAST SAVED: Thursday, June 22, 2023 LAST SAVED BY: s.hall
LAST PLOTTED: Friday, June 23, 2023 CTB FILE USED: ----



SCALE 1 : 2000

0 50 100 150 200 Metres

LEGEND

LOCATION I.D. — AREA (ha)

123F 0.25

0.60

0.75

AVERAGE COEFFICIENT

5-year

100-year

McINTOSH PERRY
115 Walgreen Road, RR3, Carp, ON K0A 1L0
Tel: 613-836-2184 Fax: 613-836-3742
www.mcintoshperry.com

Client: PERTHMORE DEVELOPMENT CO.
80 DUFFERIN STREET PERTH, ON K7H 3M6

Project: PERTHMORE SUBDIVISION PHASE 6

Drawing Title: POST-DEVELOPMENT DRAINAGE AREA PLAN

Drawn by:	Checked By:
P.G.K.	B.S.C.
Scale: 1:2000	Project Number: PP-13-9668-01

No.	Revisions	Date
2	RE-ISSUED FOR DRAFT APPROVAL	JUNE 23, 2023
1	ISSUED FOR DRAFT PLAN APPROVAL	AUG. 03, 2022

Drawing Number: POST

VACANT LANDS
(TO REMAIN AS IN EXISTING CONDITIONS)

POTENTIAL TREE PRESERVATION AREA (APPROX.)

DOWNSPOUT DISCONNECTIONS

INFILTRATION BASIN
FOOTPRINT AREA=620M² (APPROX.)

PHASE 6 (DRAFT PLAN SUBMITTED)

27M-16

APPROXIMATE PHASE 7 BOUNDARIES

ENHANCED GRASS SWALES
LINEAR FOOTPRINT=550M (AAPROX.)

PL-28

LEGEND

- EXISTING LEGAL FABRIC
- WETLAND 30m SETBACK
- FLOODPLAIN BOUNDARY
- CONCEPTUAL LINEWORK
- MNRF PROVINCIALLY SIGNIFICANT WETLAND
- CONCEPTUAL PATHWAY
- DOWNSPOUT DISCONNECTION (LOT LEVEL LID)
- ENHANCED SWALE (CONVEYANCE LID)
- INFILTRATION BASIN (END-OF-PIPE LID)

DISCLAIMER:

BOUNDARIES SHOWN ON THIS SITE PLAN ARE COMPILED FROM EXISTING PLANS, FOR THE PURPOSES OF CREATING A CONCEPTUAL SUBDIVISION LAYOUT ONLY . MCINTOSH PERRY DOES NOT CERTIFY THAT THE BOUNDARIES OF THE PROPERTY SHOWN ON THIS PLAN ARE ACCURATE WITHIN THE MEANING OF THE SURVEYS ACT. PROPER LEGAL SURVEY RE-ESTABLISHMENT OF ANY BOUNDARY LOCATIONS OF PROPERTIES ON THIS PLAN MUST BE COMPLETED BY AN ONTARIO LAND SURVEYOR WORKING WITHIN THE SURVEYS ACT, SURVEYOR'S ACT, AND LAND TITLES OR REGISTRY ACT AND REGULATIONS MADE THEREUNDER.

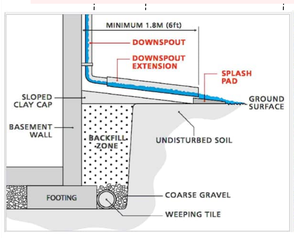
BUILDING ENVELOPES

LOTS 7-30 = 80' x 42'2"
LOTS 5 & 6 = 103'4"x 54'

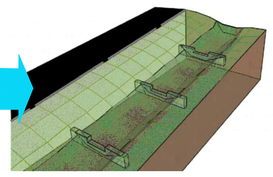
NOTE: LOT DIMENSIONS DISPLAYED IN FEET

LOW IMPACT DEVELOPMENT TREATMENT-TRAIN

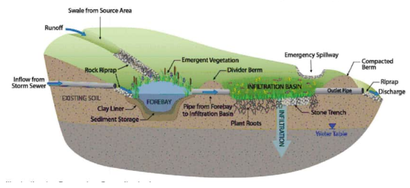
DOWNSPOUT DISCONNECTION



ENHANCED GRASS SWALES



INFILTRATION BASIN



SCALE 1 : 2000
0 50 100 150 200 Metres

NORTH:

STAMP:

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

No.	Revision/Issue	Date

McINTOSH PERRY
3240 Drummond Conc. 5A, R.R. #7
Perth, ON K7H 3C9
Tel: 613-267-6524 Fax: 613-267-7992
www.mcintoshperry.com

Designed by:	RP
Drawn by:	
Checked By:	BC
Scale:	1:2000

Client: PERTHMORE DEVLOPMENT CO. LTD

Project: PERTHMORE ESTATES - PHASE 7

Drawing Title: LOW IMPACT DEVELOPMENT CONCEPT PLAN

Check and verify all dimensions before proceeding with the work — Do not scale drawings

Date: MAY.2023
Project Number: PP-13-9668-03
Drawing Number: CON2

FILENAME: \\Ottawa\01 Project - Proposal\2013 Jobs\PP-13-9668-01 Perthmore Development Co_Perthmore Subdivision\03 Drawing\PP-13-9668 - Concept Plan - LID.dwg
LAST SAVED: Monday, June 19, 2023 LAST SAVED BY: rpackard
LAST PLOTTED: Friday, June 23, 2023 CTB FILE USED: ----

CCO-13-9668-01 - PERTHMORE SUBDIVISION - PRE-DEVELOPMENT

Values

Land Use	Pasture	Pasture	Forest	Forest
Hydrologic Soil Group	B	C	B	C
Runoff Coefficients*	0.1	0.28	0.08	0.25
CN Values**	59	75	60	73
IA (mm)	5	5	10	10

* Design Chart 1.07 MTO Drainage Management Manual

** Design Chart 1.09 MTO Drainage Management Manual

Land Use

Drainage Area ID	Total Area (ha)	Pasture B Sub-Area (ha)	Pasture C Sub-Area (ha)	Forest B Sub-Area (ha)	Forest C Sub-Area (ha)	Weighted CN Value	Weighted C Value	Weighted IA Value
A1	12.2	5.45	1.76	1.56	3.2	64.0	0.16	6.9

Airport Formula

For use when the runoff coefficient is less than 0.4

$t_c = 3.26 * (1.1 - C) * L^{0.5} * S_w^{-0.33}$

Where

tc = time of concentration in minutes

C = runoff coefficient

L = watershed length in metres

S_w = watershed slope in %

Source: MTO Drainage Manual 1997 - Chapter 8, page 28

A1

C =	0.16		**T_C =**	54.6 min	**T_p =**	36.6 min
L =	435 m		**T_C =**	0.91 hours	**T_p =**	0.61 hours
S_w =	1.61 %					

$T_p = 0.67\ T_c$

3240 Drummond Concession 5A, R.R.7 Perth, Ontario K7H 3C9 Tel.: 613.267.6524 Fax: 613.267.7992
info@mcintoshperry.com www.mcintoshperry.com

CCO-13-9668-01 - PERTHMORE SUBDIVISION - PRE-DEVELOPMENT RESULTS

	12 hour SCS	4 hour Chicago
Return Period	Area 1	Area 1
Yrs	m^3/s	m^3/s
2	0.114	0.053
5	0.211	0.105
10	0.278	0.149
25	0.383	0.210
50	0.463	0.262
100	0.560	0.317

19

Area 1
AREA [ha] - 12.200
PKFW [m^3/s] - 0.114

3240 Drummond Concession 5A, R.R.7 Perth, Ontario K7H 3C9 Tel.: 613.267.6524 Fax: 613.267.7992
info@mcintoshperry.com www.mcintoshperry.com

CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT

Values

Land Use	Pasture	Pasture	Forest	Forest
Hydrologic Soil Group	B	C	B	C
Runoff Coefficients*	0.1	0.28	0.08	0.25
CN Values**	59	75	60	73
IA (mm)	5	5	10	10

* Design Chart 1.07 MTO Drainage Management Manual
** Design Chart 1.09 MTO Drainage Management Manual

Land Use

Drainage Area ID	Total Area (ha)	Pasture B Sub-Area (ha)	Pasture C Sub-Area (ha)	Forest B Sub-Area (ha)	Forest C Sub-Area (ha)	Weighted CN Value	Weighted C Value	Weighted IA Value
Central Block	1.56	0	0	0.00	1.56	73.0	0.25	10.0
East Block	0.65	0	0	0.00	0.65	73.0	0.25	10.0

Airport Formula

For use when the runoff coefficient is less than 0.4

$t_c = 3.26 * (1.1 - C) * L^{0.5} * S_w^{-0.33}$

Where

tc = time of concentration in minutes
C = runoff coefficient
L = watershed length in metres
S_w = watershed slope in %

Source: MTO Drainage Manual 1997 - Chapter 8, page 28

Central Block:

C=	0.25	Tc=	19.7 min
L=	80.00	Tp=	0.22 hr
Sw=	2.00		

East Block:

C=	0.25	Tc=	12.6 min
L=	60.00	Tp=	0.14 hr
Sw=	5.00		

				Pervious Area					Impervious Area				
Sub-Catchment	Area	Total Imperviousness	Directly Connected	CN	Slope	Flow Length	Manning's n	Ia	Slope	Flow Length (measured)	Flow Length[3]	Manning's n	Depression Storage
	ha	%	%		%	m		mm	%	m			mm
West Block[6]	3.43	70.0	60.0	59.0	2.0	10.0	0.25	5.0	1.0	150.0	151.2	0.013	1.0
Central Block[6]	1.56	70.0	60.0	59.0	2.0	10.0	0.25	5.0	1.0	150.0	102.0	0.013	1.0
East Block[6]	0.65	70.0	60.0	75.0	2.0	10.0	0.25	5.0	1.0	100.0	65.8	0.013	1.0
Block 70	0.83	0.0	0.0	75.0	2.0	10.0	0.25	10.0	1.0	75.0	74.4	0.013	1.0
SWM Block[4,6]	0.41	0.0	0.0	75.0	2.0	10.0	0.25	5.0	1.0	50.0	52.3	0.013	1.0
Developed Portions[5,6]	5.32	50.0	35.0	59.0	2.0	10.0	0.25	5.0	1.0	350.0	188.3	0.013	1.0

Notes 1 -Airport Formula
2 - 0.67* Tc
3 - Flow Length = SquareRoot (Area/1.5) - (Area in square metres)
4 - Block 71
5 - 604(1) - 0.56ha, 604(2) - 0.23ha, 606 - 1.07ha, 608 - 0.79ha, 609 - 0.16ha, 612 - 1.21ha, 614 - 0.25ha, 617 - 0.48ha, RY1 - 0.32ha and RY2 - 0.25ha
6 - To Pond

Storage Requirements

Facility Type:	Wet Pond		
Level of Protection:	Enhanced		
			%Imperviousness
Req'd Permanent Pool Storage Volume			46%
Vs =	85	m^3/ha	(Table 3.2, p. 3-10, SWMP Manual - 165m3/ha - 80m3/ha)
Vs =	966	m^3	
			Given the upstream individual storage requirements from Blocks 67, 68 and 69, the MECP SWMP Manual notes that the extended detention is increased to account for upstream storage)
Req'd Extended Detention Volume			MECP SWMP Manual - Section 3.3.2.
Ved =	80	m^3/ha	*It should be noted that*
Ved =	458	m^3	

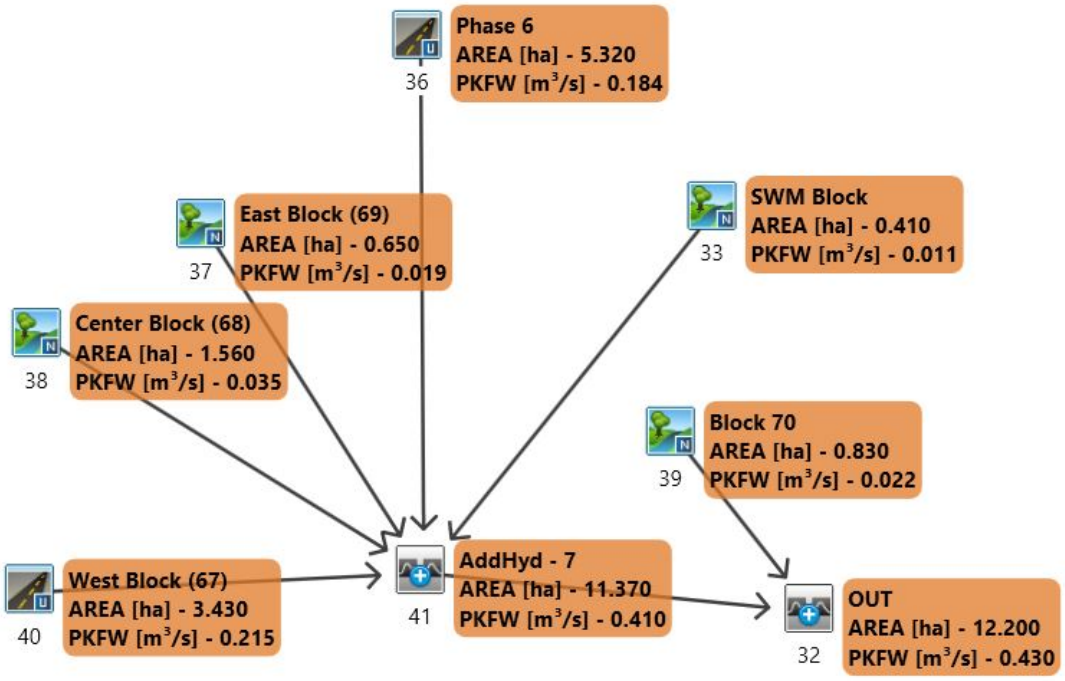
3240 Drummond Concession 5A, R.R.7 Perth, Ontario K7H 3C9 Tel.: 613.267.6524 Fax: 613.267.7992
info@mcintoshperry.com www.mcintoshperry.com

CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT - RESULTS - UNCONTROLLED

12 hour SCS							
Return Period	West Block	Central Block	East Block	Block 70	SWM Block	Developed Portions	Total
Yrs	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
2	0.215	0.035	0.019	0.022	0.011	0.184	0.284
5	0.306	0.068	0.037	0.043	0.020	0.278	0.456
10	0.384	0.090	0.049	0.056	0.027	0.355	0.611
25	0.481	0.124	0.067	0.077	0.037	0.447	0.794
50	0.551	0.150	0.081	0.092	0.044	0.542	0.953
100	0.634	0.181	0.098	0.110	0.053	0.631	1.121

4 hour Chicago							
Return Period	West Block	Central Block	East Block	Block 70	SWM Block	Developed Portions	Total
Yrs	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
2	0.228	0.012	0.006	0.007	0.004	0.153	0.198
5	0.315	0.027	0.014	0.017	0.008	0.223	0.311
10	0.374	0.041	0.022	0.026	0.012	0.292	0.417
25	0.461	0.059	0.033	0.038	0.018	0.368	0.546
50	0.523	0.076	0.042	0.048	0.023	0.423	0.646
100	0.587	0.094	0.051	0.059	0.028	0.481	0.751

Post-Development Uncontrolled - VO5 Model



3240 Drummond Concession 5A, R.R.7 Perth, Ontario K7H 3C9 Tel.: 613.267.6524 Fax: 613.267.7992
info@mcintoshperry.com www.mcintoshperry.com

CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT - RESULTS - CONTROLLED

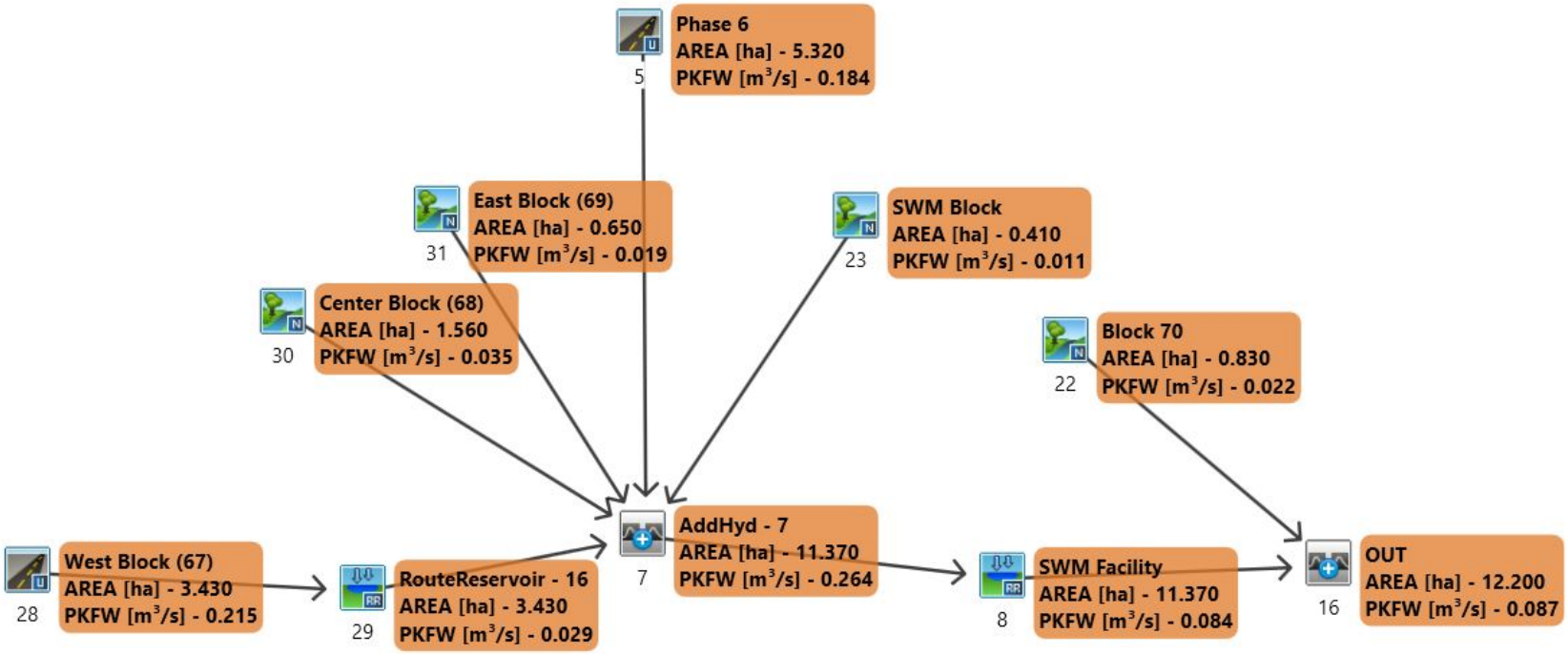
12 hour SCS								
Return Period	West Block[1]	Central Block	East Block	Block 70	SWM Block	Developed Portions	Outflow From Pond	Outflow From Site
Yrs	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
2	0.029	0.035	6.250	0.022	0.011	0.184	0.084	0.087
5	0.042	0.068	6.250	0.043	0.020	0.278	0.191	0.198
10	0.050	0.090	6.250	0.056	0.027	0.355	0.264	0.279
25	0.063	0.124	6.250	0.077	0.037	0.447	0.336	0.356
50	0.072	0.150	6.250	0.092	0.044	0.542	0.386	0.411
100	0.083	0.181	6.250	0.110	0.053	0.631	0.436	0.467

4 hour Chicago								
Return Period	West Block[1]	Central Block	East Block	Block 70	SWM Block	Developed Portions	Outflow From Pond	Outflow From Site
Yrs	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s	m^3/s
2	0.021	0.012	1.500	0.007	0.004	0.153	0.070	0.073
5	0.030	0.027	1.417	0.017	0.008	0.223	0.089	0.093
10	0.037	0.041	1.417	0.026	0.012	0.292	0.147	0.154
25	0.046	0.059	1.417	0.038	0.018	0.368	0.230	0.243
50	0.053	0.076	1.417	0.048	0.023	0.423	0.275	0.291
100	0.060	0.094	1.417	0.059	0.028	0.481	0.317	0.336

Notes

1. West Block to be restricted.

Post-Development Controlled - VO5 Model



CCO-13-9668-01 - PERTHMORE SUBDIVISION - POST-DEVELOPMENT - RESULTS - CONTROLLED

12 hour SCS				
Return Period	POST Outflow From Site	PRE Outflow from Site	Post to Pre	Post to Pre
Yrs	m^3/s	m^3/s	Δ	%
2	0.087	0.114	-0.027	23.7%
5	0.198	0.211	-0.013	6.2%
10	0.279	0.278	0.001	-0.4%
25	0.356	0.383	-0.027	7.0%
50	0.411	0.463	-0.052	11.2%
100	0.467	0.560	-0.093	16.6%

4 hour Chicago				
Return Period	POST Outflow From Site	PRE Outflow from Site	Post to Pre	Post to Pre
Yrs	m^3/s	m^3/s	Δ	Δ
2	0.073	0.053	0.020	-37.7%
5	0.093	0.105	-0.012	11.4%
10	0.154	0.149	0.005	-3.4%
25	0.240	0.210	0.030	-14.3%
50	0.290	0.262	0.028	-10.7%
100	0.330	0.317	0.013	-4.1%

3240 Drummond Concession 5A, R.R.7 Perth, Ontario K7H 3C9 Tel.: 613.267.6524 Fax: 613.267.7992
info@mcintoshperry.com www.mcintoshperry.com

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STAGE / STORAGE / DISCHARGE TABLE

VO6 Route Reservoir Input - Rating Curve

Stage (m)	Discharge (m^3/s)	Storage (ha.m)	Storage (m^3)	
133.36	0	0.0000	0	
133.46	0.041	0.0120	120	
133.56	0.058	0.0253	253	
133.66	0.071	0.0399	399	**25mm - 259 m³**
133.76	0.083	0.0559	559	
133.86	0.092	0.0732	732	
133.96	0.250	0.0918	918	**5year - 849 m³**
134.06	0.320	0.1116	1116	
134.16	0.375	0.1321	1321	
134.26	0.422	0.1535	1535	
134.36	0.463	0.1758	1758	**100year-1614 m³**
134.46	0.651	0.1989	1989	
134.56	0.748	0.2228	2228	
134.66	0.828	0.2476	2476	
134.76	0.899	0.2733	2733	
134.86	0.964	0.2998	2998	
134.96	1.024	0.3263	3263	
135.06	1.080	0.3528	3528	

For Orifice Flow, C =	0.60
For Weir Flow, C =	1.84

	Orifice 1	Orifice 2	Orifice 3
Invert Elevation	133.36	133.86	134.36
Center of Crest Elevation			
Orifice Width/Weir Length	250 mm	475 mm	475 mm
Orifice Height			
Orifice Area (m^2)	0.049	0.177	0.177

Elevation	Orifice 1		Orifice 2		Orifice 3		Total
	H [m]	Q [l/s]	H [m]	Q [l/s]	H [m]	Q [l/s]	Q [l/s]
133.36	0.00	0					0
133.46	0.10	41					41
133.56	0.20	58					58
133.66	0.30	71					71
133.76	0.40	83					83
133.86	0.50	92					92
133.96	0.60	101	0.10	149			250
134.06	0.70	109	0.20	211			320
134.16	0.80	117	0.30	258			375
134.26	0.90	124	0.40	298			422
134.36	1.00	130	0.50	333			463
134.46	1.10	137	0.60	365	0.10	149	651
134.56	1.20	143	0.70	394	0.20	211	748
134.66	1.30	149	0.80	421	0.30	258	828
134.76	1.40	154	0.90	447	0.40	298	899
134.86	1.50	160	1.00	471	0.50	333	964
134.96	1.60	165	1.10	494	0.60	365	1024
135.06	1.70	170	1.20	516	0.70	394	1080

Notes: 1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.

*2. Orifice Equation: $Q = cA(2gh)^{1/2}$ (m^3/s *1000 = l/s)*

*3. Weir Equation: $Q = CLH^{3/2}$ (m^3/s *1000 = l/s)*

4. These Computations Do Not Account for Submergence Effects

5. H for orifice equations is depth of water above the centroide of the orifice.

6. H for weir equations is depth of water above the weir crest.

Reference: Urban Hydrology, Hydraulics and Stormwater Quality: engineering application and computer modeling / A. Akan, Robert J. Houghtalen, 2003.

CCO-13-9668-01 - PERTHMORE SUBDIVISION - EXTENDED DETENSION AND DRAWDOWN

Table E-3

As per the Section 4.6.2 (Wet Ponds) of the MECP Stormwater Management Planning and Design Manual, March 2003, a detention time of 24 hours should be targeted in all instances. The detention time can be easily solved if the relationship between pond surface area and pond depth is approximated using a linear regression equation as follows:

A1 **Drawdown Time Equation ---->** $$t = \frac{0.66\, C_2\, h^{1.5} + 2\, C_3\, h^{0.5}}{2.75\, A_o}$$ Equation 4.11 (MECP SWM Planning Design Manual, 2003)

where,
- t = Drawdown time in seconds
- C_2 = Slope coefficient from the area-depth linear regression
- C_3 = Intercept from the area-depth linear regression
- h = Maximum water elevation above the orifice (m)
- A_o = Cross-sectional area of the orifice (m^2)

The relationship between A and h using Linear Regression (i.e., $A = C_2 h + C_3$)

Orifice Details:

Orifice Diameter =	75 mm	150 mm
Orifice Invert Elevation =	133.36 m	133.86 m

Active Storage Pond Details:

Active Storage Elevation (m)	Max Water Elevation Above Orifice (m)	Surface area of the Pond (m^2)	
133.36	0.00	1,374.00	Permanent Pool Level
133.46	0.10	1,452.00	
133.76	0.40	1,691.00	Extended Detention
133.86	0.50	1,772.00	150mm orifice
133.96	0.60	1,852.00	25mm event

Drawdown Time Results (During Construction):	Extended Detention	25mm Event	
Orifices	75 mm	75 mm	150 mm
Slope (C_2) =	793	793	800
Intercept (C_3) =	1,373	1,373	1,372
Maximum Water Elevation Above Orifice (h) =	0.40 m	0.40 m	0.20 m
Therefore, A =	1,691	1,691	1,532
Cross-sectional area of the orifice (A_o) =	0.004 m2	0.004 m2	0.018 m2
Drawdown time	153,899 s	153,899 s	26,224 s
Drawdown Time	**43 hrs**	**43 hrs**	**8 hrs**
		51 hrs	

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND FOREBAY AND PERMANENT POOL STORAGE VOLUME

Cell 1			Cell 2			Combined	
Elevation (m)	Total Storage (m^3)		Elevation (m)	Total Storage (m^3)		Elevation (m)	Total Storage (m^3)
131.76	0		131.26	0		131.26	0
131.86	9		131.36	6		131.36	6
131.96	20		131.46	14		131.46	14
132.06	32		131.56	23		131.56	23
132.16	47		131.66	34		131.66	34
132.26	64		131.76	46		131.76	46
132.36	82		131.86	60		131.86	60
132.46	103		131.96	76		131.96	76
132.56	127		132.06	93		132.06	93
132.66	153		132.16	113		132.16	113
132.76	181	*Top of forebay*	132.26	134		132.26	134
			132.36	158		132.36	158
			132.46	183		132.46	183
			132.56	211		132.56	211
			132.66	241		132.66	241
			132.76	274		132.76	454
			132.86	353		132.86	534
			132.96	441		132.96	621
			133.06	535		133.06	716
			133.16	638		133.16	818
			133.26	747		133.26	928
			133.36	867		133.36	1048

Top of Permanent Pool

1. Forebay Storage Volumes

A conservative estimate for forebay volume is equal to or greater than ten (10) years of sediment accumulation.
The conservative estimate for minimum forebay volume based on ten (10) times the sediment accumulation is 143 m3.
The total forebay volume is 181 m3.
Therefore, the forebay volume meets the conservative minimum requirements for total volume.

2. Permanent Pool Storage Volumes

Total Permanent Pool Volume Required = 966 m^3
Total Permanent Pool Volume Provided = 1048 m^3

Therefore, the permanent pool volume provided is greater than the required volume.

q

3. Settling Length

Distance = $\frac{rQ_p}{V_s}$ Equation 4.5 : Settling Length, MECP SMPDM, March 2003

Length-to-Width Ratio --->	r =	2	(recommended)
Peak Flow Rate --->	Q_p =	0.18 m^3/s	(quality storm outflow --- 25mm storm event)
Settling Velocity --->	V_s =	0.0003 m/s	(recommended)

Distance = 35 m Settling Length (based on settling particles of approx. 0.15mm diameter)

4. Dispersion Length

Distance = $\frac{(8Q)}{dV_f}$ Equation 4.6 : Dispersion Length, MECP SMPDM March 2003

Inlet Flow Rate --->	Q =	0.44 m^3/s	(5 year Post)
Depth of Permanent Pool --->	d =	1.00 m	(in Forebay)
Settling Velocity --->	V_f =	0.5 m/s	(recommended)

Distance = 7 m Length of dispersion (based on pipe full flow capacity)

The forebay should be 35 m long to settle particles and for pipe full flow dispersion.
The forebay length provided in the proposed pond design is 40 m long for particle settlement and dispersion.
Therefore, the forebay length meets the minimum requirements for particle settlement and dispersion

5. Forebay Width

Width = $\frac{\text{Dist.}}{8}$ Equation 4.7 : Minimum Forebay Bottom Width

Width = $\frac{35}{8}$ = 4 m

The forebay deep zone should be at least 4 m wide.
The forebay deep zone width provided in the proposed pond design is 4 m wide.
Therefore, the forebay deep zone provided meets the minimum requirements for bottom width.

6. Forebay Surface Area Sh

In all instances the forebay surface area should not exceed one-third (33.3 %) of the total permanent pool area:

Forebay surface area =	344	m^2
Permanent Pool surface area =	1374	m^2
The forebay surface area is	25.0%	of the pond surface area

Therefore, the pond surface area meets the MECP requirements.

7. Forebay Volume

In all instances the forebay volume should not exceed 20% of the total permanent pool volume:

Forebay volume =	181	m^3
Total Permanent Pool Volume =	1048	m^3
The forebay volume is --->	17%	of the total permanent pool volume

Therefore, the pond volume meets the MECP requirements.

3240 Drummond Concession 5A, R.R.7 Perth, Ontario K7H 3C9 Tel.: 613.267.6524 Fax: 613.267.7992
info@mcintoshperry.com www.mcintoshperry.com

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND CLEANOUT FREQUENCY

Catchment Imperviousness	Annual Loading (kg/ha)	Wet Density (kg/m^3)	Annual Loading (m^3/ha)
35%	770	1,230	0.6
55%	2,300	1,230	1.9
70%	3,495	1,230	2.8
85%	4,680	1,230	3.8

Requirements		Pond 1	Units
Catchment Imperviousness	=	50%	
Sediment Loading Per 1-Year	=	1.6	m^3/ha
Total Area to Pond	=	11.4	ha
Yearly Sediment to Pond	=	17.9	m^3
Initial Removal Efficiency	=	80%	
Yearly Accumulation in Pond	=	14.3	m^3
Required Quality Volume	=	*140*	m^3/ha
Required Permanent Pool Volume [(140 - 80 Extended Detention) x Total Area]	=	682	m^3
Permanent Pool Volume Provided	**=**	**1,048**	**m^3**
Required Quality Volume @ 5% less Efficient	=	*133*	m^3/ha
Required Permanent Pool Volume @ 5% less Efficient [(133 - 80 Extended Detention) x Total Area]	=	603	m^3
Total Sediment Accumlation Allowed Before Removal Required (Provided - Max Allowed 5% Reduction)	=	446	m^3
Total Approximate Number of Years Before Sediment Removal is Required	**=**	**32**	**years**

See Extended Detention and Permanent Pool Volumes

CCO-13-9668-01 - PERTHMORE SUBDIVISION - STORMWATER MANAGEMENT POND EMERGENCY SPILLWAY

Outlet Control Device - Outlet Control Structure

For Orifice Flow, C =	0.60
For Weir Flow, C =	1.70

	Emergency Weir
Invert Elevation	134.76
Weir Length	7.50 m

Elevation	Weir		Total
	H [m]	Q [l/s]	Q [l/s]
134.76	x	x	0
134.86	0.10	403	403
134.96	0.20	1140	1140
135.06	0.30	2095	2095

Notes: 1. For Orifice Flow, User is to Input an Elevation Higher than Crown of Orifice.

*2. Orifice Equation: $Q = cA(2gh)^{1/2}$ (m^3/s *1000 = l/s)*

*3. Weir Equation: $Q = CLH^{3/2}$ (m^3/s *1000 = l/s)*

4. These Computations Do Not Account for Submergence Effects Within the Pond Riser.

Reference: Urban Hydrology, Hydraulics and Stormwater Quality: engineering application and computer modeling

```
================================================================================
======================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.

                  *****  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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\e71a1c02-8110-411f-84d6-8608f2
  Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\e71a1c02-8110-411f-84d6-8608f2


DATE: 06-15-2023                          TIME: 02:15:48

USER:


COMMENTS: _____________________________________________________


--------------------------------------------------------------------------------
-------------------------
  ************************************************
  ** SIMULATION : 002yr 12hr 15min SCS          **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\82441fcb
| Ptotal= 43.20 mm |    Comments: created from IDF Group New IDFGroup - 2
--------------------
                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    1.73 |  6.50    7.78 |  9.75    1.51
                0.25    1.08 |  3.50    1.73 |  6.75    3.46 | 10.00    1.51
                0.50    1.08 |  3.75    1.73 |  7.00    3.46 | 10.25    0.86
                0.75    1.08 |  4.00    1.73 |  7.25    2.59 | 10.50    0.86
                1.00    1.08 |  4.25    2.59 |  7.50    2.59 | 10.75    0.86
                1.25    1.08 |  4.50    2.59 |  7.75    2.59 | 11.00    0.86
                1.50    1.08 |  4.75    3.46 |  8.00    2.59 | 11.25    0.86
                1.75    1.08 |  5.00    3.46 |  8.25    1.51 | 11.50    0.86
                2.00    1.08 |  5.25    5.18 |  8.50    1.51 | 11.75    0.86
                2.25    1.30 |  5.50    5.18 |  8.75    1.51 | 12.00    0.86
                2.50    1.30 |  5.75   20.74 |  9.00    1.51 |
                2.75    1.30 |  6.00   57.02 |  9.25    1.51 |
                3.00    1.30 |  6.25    7.78 |  9.50    1.51 |

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.81         2.81
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     193.56        10.00
     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    1.30 | 6.250   57.02 |  9.33    1.51
               0.167    0.00 | 3.250    1.30 | 6.333    7.78 |  9.42    1.51
               0.250    0.00 | 3.333    1.73 | 6.417    7.78 |  9.50    1.51
               0.333    1.08 | 3.417    1.73 | 6.500    7.78 |  9.58    1.51
               0.417    1.08 | 3.500    1.73 | 6.583    7.78 |  9.67    1.51
               0.500    1.08 | 3.583    1.73 | 6.667    7.78 |  9.75    1.51
               0.583    1.08 | 3.667    1.73 | 6.750    7.78 |  9.83    1.51
               0.667    1.08 | 3.750    1.73 | 6.833    3.46 |  9.92    1.51
               0.750    1.08 | 3.833    1.73 | 6.917    3.46 | 10.00    1.51
               0.833    1.08 | 3.917    1.73 | 7.000    3.46 | 10.08    1.51
               0.917    1.08 | 4.000    1.73 | 7.083    3.46 | 10.17    1.51
               1.000    1.08 | 4.083    1.73 | 7.167    3.46 | 10.25    1.51
               1.083    1.08 | 4.167    1.73 | 7.250    3.46 | 10.33    0.86
               1.167    1.08 | 4.250    1.73 | 7.333    2.59 | 10.42    0.86
               1.250    1.08 | 4.333    2.59 | 7.417    2.59 | 10.50    0.86
               1.333    1.08 | 4.417    2.59 | 7.500    2.59 | 10.58    0.86
               1.417    1.08 | 4.500    2.59 | 7.583    2.59 | 10.67    0.86
               1.500    1.08 | 4.583    2.59 | 7.667    2.59 | 10.75    0.86
               1.583    1.08 | 4.667    2.59 | 7.750    2.59 | 10.83    0.86
               1.667    1.08 | 4.750    2.59 | 7.833    2.59 | 10.92    0.86
               1.750    1.08 | 4.833    3.46 | 7.917    2.59 | 11.00    0.86
               1.833    1.08 | 4.917    3.46 | 8.000    2.59 | 11.08    0.86
               1.917    1.08 | 5.000    3.46 | 8.083    2.59 | 11.17    0.86
               2.000    1.08 | 5.083    3.46 | 8.167    2.59 | 11.25    0.86
               2.083    1.08 | 5.167    3.46 | 8.250    2.59 | 11.33    0.86
               2.167    1.08 | 5.250    3.46 | 8.333    1.51 | 11.42    0.86
               2.250    1.08 | 5.333    5.18 | 8.417    1.51 | 11.50    0.86
               2.333    1.30 | 5.417    5.18 | 8.500    1.51 | 11.58    0.86
               2.417    1.30 | 5.500    5.18 | 8.583    1.51 | 11.67    0.86
               2.500    1.30 | 5.583    5.18 | 8.667    1.51 | 11.75    0.86
               2.583    1.30 | 5.667    5.18 | 8.750    1.51 | 11.83    0.86
               2.667    1.30 | 5.750    5.18 | 8.833    1.51 | 11.92    0.86
               2.750    1.30 | 5.833   20.74 | 8.917    1.51 | 12.00    0.86
               2.833    1.30 | 5.917   20.74 | 9.000    1.51 | 12.08    0.86
               2.917    1.30 | 6.000   20.74 | 9.083    1.51 | 12.17    0.86
               3.000    1.30 | 6.083   57.02 | 9.167    1.51 | 12.25    0.86
               3.083    1.30 | 6.167   57.02 | 9.250    1.51 |

     Max.Eff.Inten.(mm/hr)=      57.02        18.93
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       4.75 (ii)    9.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.22         0.12
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.10          0.406 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.33           6.25
     RUNOFF VOLUME    (mm)=      42.20         8.84          20.52
     TOTAL RAINFALL   (mm)=      43.20        43.20          43.20
     RUNOFF COEFFICIENT   =       0.98         0.20           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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            |
| NASHYD   (  0022)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

        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    1.30 | 6.250   57.02 |  9.33    1.51
               0.167    0.00 | 3.250    1.30 | 6.333    7.78 |  9.42    1.51
               0.250    0.00 | 3.333    1.73 | 6.417    7.78 |  9.50    1.51
               0.333    1.08 | 3.417    1.73 | 6.500    7.78 |  9.58    1.51
               0.417    1.08 | 3.500    1.73 | 6.583    7.78 |  9.67    1.51
               0.500    1.08 | 3.583    1.73 | 6.667    7.78 |  9.75    1.51
               0.583    1.08 | 3.667    1.73 | 6.750    7.78 |  9.83    1.51
               0.667    1.08 | 3.750    1.73 | 6.833    3.46 |  9.92    1.51
               0.750    1.08 | 3.833    1.73 | 6.917    3.46 | 10.00    1.51
               0.833    1.08 | 3.917    1.73 | 7.000    3.46 | 10.08    1.51
               0.917    1.08 | 4.000    1.73 | 7.083    3.46 | 10.17    1.51
               1.000    1.08 | 4.083    1.73 | 7.167    3.46 | 10.25    1.51
               1.083    1.08 | 4.167    1.73 | 7.250    3.46 | 10.33    0.86
               1.167    1.08 | 4.250    1.73 | 7.333    2.59 | 10.42    0.86
               1.250    1.08 | 4.333    2.59 | 7.417    2.59 | 10.50    0.86
               1.333    1.08 | 4.417    2.59 | 7.500    2.59 | 10.58    0.86
               1.417    1.08 | 4.500    2.59 | 7.583    2.59 | 10.67    0.86
               1.500    1.08 | 4.583    2.59 | 7.667    2.59 | 10.75    0.86
               1.583    1.08 | 4.667    2.59 | 7.750    2.59 | 10.83    0.86
               1.667    1.08 | 4.750    2.59 | 7.833    2.59 | 10.92    0.86
               1.750    1.08 | 4.833    3.46 | 7.917    2.59 | 11.00    0.86
               1.833    1.08 | 4.917    3.46 | 8.000    2.59 | 11.08    0.86
               1.917    1.08 | 5.000    3.46 | 8.083    2.59 | 11.17    0.86
               2.000    1.08 | 5.083    3.46 | 8.167    2.59 | 11.25    0.86
               2.083    1.08 | 5.167    3.46 | 8.250    2.59 | 11.33    0.86
               2.167    1.08 | 5.250    3.46 | 8.333    1.51 | 11.42    0.86
               2.250    1.08 | 5.333    5.18 | 8.417    1.51 | 11.50    0.86
               2.333    1.30 | 5.417    5.18 | 8.500    1.51 | 11.58    0.86
               2.417    1.30 | 5.500    5.18 | 8.583    1.51 | 11.67    0.86
               2.500    1.30 | 5.583    5.18 | 8.667    1.51 | 11.75    0.86
               2.583    1.30 | 5.667    5.18 | 8.750    1.51 | 11.83    0.86
               2.667    1.30 | 5.750    5.18 | 8.833    1.51 | 11.92    0.86
               2.750    1.30 | 5.833   20.74 | 8.917    1.51 | 12.00    0.86
               2.833    1.30 | 5.917   20.74 | 9.000    1.51 | 12.08    0.86
               2.917    1.30 | 6.000   20.74 | 9.083    1.51 | 12.17    0.86
               3.000    1.30 | 6.083   57.02 | 9.167    1.51 | 12.25    0.86
               3.083    1.30 | 6.167   57.02 | 9.250    1.51 |

     Unit Hyd Qpeak  (cms)=   0.167

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   6.333
     RUNOFF VOLUME    (mm)=   9.330
     TOTAL RAINFALL   (mm)=  43.200
     RUNOFF COEFFICIENT   =   0.216

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

```
| CALIB            |
| NASHYD   (  0023)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20
```

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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.011 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 9.333
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.216

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

```
| CALIB            |
| NASHYD   (  0030)|   Area    (ha)=   1.56   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22
```

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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86

```
| CALIB            |
| NASHYD   (  0031)|   Area    (ha)=   0.65   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.14
```

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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.035 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 8.657
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.200

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

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 8.604
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.199

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

```
| CALIB            |
| STANDHYD (  0005)|   Area    (ha)=   5.32
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51

0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Max.Eff.Inten.(mm/hr)=	47.95	13.86
over (min)	20.00	40.00
Storage Coeff. (min)=	19.95 (ii)	39.10 (ii)
Unit Hyd. Tpeak (min)=	20.00	40.00
Unit Hyd. peak (cms)=	0.06	0.03
		TOTALS
PEAK FLOW (cms)=	0.16	0.04 0.184 (iii)
TIME TO PEAK (hrs)=	6.42	6.83 6.42
RUNOFF VOLUME (mm)=	42.20	8.84 20.51
TOTAL RAINFALL (mm)=	43.20	43.20 43.20
RUNOFF COEFFICIENT =	0.98	0.20 0.47

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (  0028)|   Area    (ha)=   3.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Max.Eff.Inten.(mm/hr)=	57.02	17.16
over (min)	5.00	20.00
Storage Coeff. (min)=	4.10 (ii)	18.38 (ii)
Unit Hyd. Tpeak (min)=	5.00	20.00
Unit Hyd. peak (cms)=	0.24	0.06
		TOTALS
PEAK FLOW (cms)=	0.19	0.04 0.215 (iii)
TIME TO PEAK (hrs)=	6.25	6.42 6.25
RUNOFF VOLUME (mm)=	42.20	8.84 20.52
TOTAL RAINFALL (mm)=	43.20	43.20 43.20
RUNOFF COEFFICIENT =	0.98	0.20 0.47

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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(  0029)|     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   |   0.0900     0.1200

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0028)     3.430     0.215     6.25      20.52
   OUTFLOW: ID= 1 (  0029)     3.430     0.029     7.08      20.42

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.41
                 TIME SHIFT OF PEAK FLOW          (min)= 50.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.0384
```

```
-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.41   0.011     6.33     9.33
     + ID2= 2 (  0029):     3.43   0.029     7.08    20.42
       ================================================
       ID = 3 (  0007):     3.84   0.034     6.42    19.23
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     3.84   0.034     6.42    19.23
     + ID2= 2 (  0030):     1.56   0.035     6.33     8.66
       ================================================
       ID = 1 (  0007):     5.40   0.068     6.33    16.18
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     5.40   0.068     6.33    16.18
     + ID2= 2 (  0031):     0.65   0.019     6.25     8.60
       ================================================
       ID = 3 (  0007):     6.05   0.086     6.33    15.37
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.086     6.33    15.37
     + ID2= 2 (  0005):     5.32   0.184     6.42    20.51
       ================================================
       ID = 1 (  0007):    11.37   0.264     6.42    17.77
```

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   |   0.4220     0.1535
                         0.0410     0.0120   |   0.4630     0.1758
                         0.0580     0.0253   |   0.6510     0.1989
                         0.0710     0.0399   |   0.7480     0.2228
                         0.0830     0.0559   |   0.8280     0.2476
                         0.0920     0.0732   |   0.8990     0.2733
                         0.2500     0.0918   |   0.9640     0.2998
                         0.3200     0.1116   |   1.0240     0.3263
                         0.3750     0.1321   |   1.0800     0.3528
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	11.370	0.264	6.42	17.77
OUTFLOW: ID= 1 (0008)	11.370	0.084	7.50	17.77

PEAK FLOW REDUCTION [Qout/Qin](%)= 31.99
TIME SHIFT OF PEAK FLOW (min)= 65.00
MAXIMUM STORAGE USED (ha.m.)= 0.0588

ADD HYD (0016)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0022):	0.83	0.022	6.33	9.33
	+ ID2= 2 (0008):	11.37	0.084	7.50	17.77
	ID = 3 (0016):	12.20	0.087	7.33	17.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0019)	Area	(ha)=	12.20	Curve Number	(CN)= 64.0
ID= 1 DT= 5.0 min	Ia	(mm)=	6.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.61		

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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.022 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 9.330
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.216

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

CALIB					
NASHYD (0033)	Area	(ha)=	0.41	Curve Number	(CN)= 75.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.20		

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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Unit Hyd Qpeak (cms)= 0.764

PEAK FLOW (cms)= 0.114 (i)
TIME TO PEAK (hrs)= 6.833
RUNOFF VOLUME (mm)= 7.354
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.170

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

CALIB					
NASHYD (0039)	Area	(ha)=	0.83	Curve Number	(CN)= 75.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.19		

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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.011 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 9.333
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.216

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

CALIB

| STANDHYD (0036)| Area (ha)= 5.32
|ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.019 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 8.604
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.199

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

CALIB
NASHYD (0038)| Area (ha)= 1.56 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.22

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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

		STANDHYD	NASHYD		
Max.Eff.Inten.(mm/hr)=		47.95	13.86		
over (min)		20.00	40.00		
Storage Coeff. (min)=		19.95 (ii)	39.10 (ii)		
Unit Hyd. Tpeak (min)=		20.00	40.00		
Unit Hyd. peak (cms)=		0.06	0.03		
				TOTALS	
PEAK FLOW	(cms)=	0.16	0.04	0.184 (iii)	
TIME TO PEAK	(hrs)=	6.42	6.83	6.42	
RUNOFF VOLUME	(mm)=	42.20	8.84	20.51	
TOTAL RAINFALL	(mm)=	43.20	43.20	43.20	
RUNOFF COEFFICIENT	=	0.98	0.20	0.47	

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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
NASHYD (0037)| Area (ha)= 0.65 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.14

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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.035 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 8.657
TOTAL RAINFALL (mm)= 43.200
RUNOFF COEFFICIENT = 0.200

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

CALIB
STANDHYD (0040)| Area (ha)= 3.43
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	1.30	6.250	57.02	9.33	1.51
0.167	0.00	3.250	1.30	6.333	7.78	9.42	1.51
0.250	0.00	3.333	1.73	6.417	7.78	9.50	1.51
0.333	1.08	3.417	1.73	6.500	7.78	9.58	1.51
0.417	1.08	3.500	1.73	6.583	7.78	9.67	1.51
0.500	1.08	3.583	1.73	6.667	7.78	9.75	1.51
0.583	1.08	3.667	1.73	6.750	7.78	9.83	1.51
0.667	1.08	3.750	1.73	6.833	3.46	9.92	1.51
0.750	1.08	3.833	1.73	6.917	3.46	10.00	1.51
0.833	1.08	3.917	1.73	7.000	3.46	10.08	1.51
0.917	1.08	4.000	1.73	7.083	3.46	10.17	1.51
1.000	1.08	4.083	1.73	7.167	3.46	10.25	1.51
1.083	1.08	4.167	1.73	7.250	3.46	10.33	0.86
1.167	1.08	4.250	1.73	7.333	2.59	10.42	0.86
1.250	1.08	4.333	2.59	7.417	2.59	10.50	0.86
1.333	1.08	4.417	2.59	7.500	2.59	10.58	0.86
1.417	1.08	4.500	2.59	7.583	2.59	10.67	0.86
1.500	1.08	4.583	2.59	7.667	2.59	10.75	0.86
1.583	1.08	4.667	2.59	7.750	2.59	10.83	0.86
1.667	1.08	4.750	2.59	7.833	2.59	10.92	0.86
1.750	1.08	4.833	3.46	7.917	2.59	11.00	0.86
1.833	1.08	4.917	3.46	8.000	2.59	11.08	0.86
1.917	1.08	5.000	3.46	8.083	2.59	11.17	0.86
2.000	1.08	5.083	3.46	8.167	2.59	11.25	0.86
2.083	1.08	5.167	3.46	8.250	2.59	11.33	0.86
2.167	1.08	5.250	3.46	8.333	1.51	11.42	0.86
2.250	1.08	5.333	5.18	8.417	1.51	11.50	0.86
2.333	1.30	5.417	5.18	8.500	1.51	11.58	0.86
2.417	1.30	5.500	5.18	8.583	1.51	11.67	0.86
2.500	1.30	5.583	5.18	8.667	1.51	11.75	0.86
2.583	1.30	5.667	5.18	8.750	1.51	11.83	0.86
2.667	1.30	5.750	5.18	8.833	1.51	11.92	0.86
2.750	1.30	5.833	20.74	8.917	1.51	12.00	0.86
2.833	1.30	5.917	20.74	9.000	1.51	12.08	0.86
2.917	1.30	6.000	20.74	9.083	1.51	12.17	0.86
3.000	1.30	6.083	57.02	9.167	1.51	12.25	0.86
3.083	1.30	6.167	57.02	9.250	1.51		

Max.Eff.Inten.(mm/hr)=	57.02	17.16	
over (min)	5.00	20.00	
Storage Coeff. (min)=	4.10 (ii)	18.38 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.24	0.06	
			TOTALS
PEAK FLOW (cms)=	0.19	0.04	0.215 (iii)
TIME TO PEAK (hrs)=	6.25	6.42	6.25
RUNOFF VOLUME (mm)=	42.20	8.84	20.52
TOTAL RAINFALL (mm)=	43.20	43.20	43.20
RUNOFF COEFFICIENT =	0.98	0.20	0.47

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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.

ADD HYD (0041)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0033):	0.41	0.011	6.33	9.33
	+ ID2= 2 (0036):	5.32	0.184	6.42	20.51
	ID = 3 (0041):	5.73	0.193	6.42	19.71

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)		AREA	QPEAK	TPEAK	R.V.
3 + 2 = 1		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0041):	5.73	0.193	6.42	19.71
	+ ID2= 2 (0037):	0.65	0.019	6.25	8.60
	ID = 1 (0041):	6.38	0.206	6.42	18.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0041):	6.38	0.206	6.42	18.58
	+ ID2= 2 (0038):	1.56	0.035	6.33	8.66
	ID = 3 (0041):	7.94	0.239	6.42	16.63

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)

3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 3 (0041):	7.94	0.239	6.42	16.63
	+ ID2= 2 (0040):	3.43	0.215	6.25	20.52
	ID = 1 (0041):	11.37	0.410	6.25	17.80

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0039):	0.83	0.022	6.33	9.33
	+ ID2= 2 (0041):	11.37	0.410	6.25	17.80
	ID = 3 (0032):	12.20	0.430	6.25	17.23

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.
```

***** 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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\b7e8d506-c5f4-4dd3-a1a5-9c15a5

Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\b7e8d506-c5f4-4dd3-a1a5-9c15a5

DATE: 06-15-2023 TIME: 02:15:48

USER:

COMMENTS: _____

```
  ************************************************
  ** SIMULATION : 005yr 12hr 15min SCS          **
  ************************************************
```

READ STORM	Filename: C:\Users\r.rajachockalingam\AppData\Local\Temp\073789e9-0d0b-43a3-ada4-078b0c00e084\e8698180
Ptotal= 57.60 mm	Comments: created from IDF Group New IDFGroup - 2

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	2.30	6.50	10.37	9.75	2.02
0.25	1.44	3.50	2.30	6.75	4.61	10.00	2.02
0.50	1.44	3.75	2.30	7.00	4.61	10.25	1.15
0.75	1.44	4.00	2.30	7.25	3.46	10.50	1.15
1.00	1.44	4.25	3.46	7.50	3.46	10.75	1.15
1.25	1.44	4.50	3.46	7.75	3.46	11.00	1.15
1.50	1.44	4.75	4.61	8.00	3.46	11.25	1.15
1.75	1.44	5.00	4.61	8.25	2.02	11.50	1.15
2.00	1.44	5.25	6.91	8.50	2.02	11.75	1.15
2.25	1.73	5.50	6.91	8.75	2.02	12.00	1.15
2.50	1.73	5.75	27.65	9.00	2.02		
2.75	1.73	6.00	76.03	9.25	2.02		
3.00	1.73	6.25	10.37	9.50	2.02		

CALIB			
STANDHYD (0006)	Area (ha)=	5.62	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.81	2.81
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	193.56	10.00
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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

			TOTALS
Max.Eff.Inten.(mm/hr)=	76.03	32.55	
over (min)	5.00	10.00	
Storage Coeff. (min)=	4.24 (ii)	8.19 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.24	0.13	
PEAK FLOW (cms)=	0.41	0.19	0.595 (iii)
TIME TO PEAK (hrs)=	6.25	6.25	6.25
RUNOFF VOLUME (mm)=	56.60	15.25	29.72
TOTAL RAINFALL (mm)=	57.60	57.60	57.60
RUNOFF COEFFICIENT =	0.98	0.26	0.52

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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			
NASHYD (0022)	Area (ha)=	0.83	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.19	

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.043 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 17.090
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.297

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

CALIB			
NASHYD (0023)	Area (ha)=	0.41	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.20	

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.020 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 17.097
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.297

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

CALIB			
NASHYD (0030)	Area (ha)=	1.56	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.22	

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02

0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.068 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 15.986
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.278

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

CALIB							
NASHYD (0031)	Area (ha)= 0.65	Curve Number (CN)= 73.0					
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00					
	U.H. Tp(hrs)= 0.14						

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 15.887
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.276

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

CALIB	
STANDHYD (0005)	Area (ha)= 5.32
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Max.Eff.Inten.(mm/hr)=	63.94	29.81	
over (min)	20.00	35.00	
Storage Coeff. (min)=	17.78 (ii)	31.88 (ii)	
Unit Hyd. Tpeak (min)=	20.00	35.00	
Unit Hyd. peak (cms)=	0.06	0.03	
			TOTALS
PEAK FLOW (cms)=	0.22	0.08	0.278 (iii)
TIME TO PEAK (hrs)=	6.42	6.75	6.42
RUNOFF VOLUME (mm)=	56.60	15.25	29.72
TOTAL RAINFALL (mm)=	57.60	57.60	57.60
RUNOFF COEFFICIENT =	0.98	0.26	0.52

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (0028)	Area (ha)= 3.43						
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 35.00					

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15

1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Max.Eff.Inten.(mm/hr)=	76.03	29.81	
over (min)	5.00	20.00	
Storage Coeff. (min)=	3.65 (ii)	15.11 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.25	0.07	
			TOTALS
PEAK FLOW (cms)=	0.25	0.08	0.306 (iii)
TIME TO PEAK (hrs)=	6.25	6.42	6.25
RUNOFF VOLUME (mm)=	56.60	15.25	29.72
TOTAL RAINFALL (mm)=	57.60	57.60	57.60
RUNOFF COEFFICIENT =	0.98	0.26	0.52

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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(0029)	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	0.0900	0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0028)	3.430	0.306	6.25	29.72
OUTFLOW: ID= 1 (0029)	3.430	0.042	7.08	29.62

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.71
TIME SHIFT OF PEAK FLOW (min)= 50.00
MAXIMUM STORAGE USED (ha.m.)= 0.0559

ADD HYD (0007)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	0.41	0.020	6.33	17.10
+ ID2= 2 (0029):	3.43	0.042	7.08	29.62
ID = 3 (0007):	3.84	0.053	6.42	28.28

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	3.84	0.053	6.42	28.28
+ ID2= 2 (0030):	1.56	0.068	6.33	15.99
ID = 1 (0007):	5.40	0.121	6.33	24.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0007):	5.40	0.121	6.33	24.73
+ ID2= 2 (0031):	0.65	0.037	6.25	15.89
ID = 3 (0007):	6.05	0.154	6.33	23.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)			
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)

ID1= 3 (0007):	6.05	0.154	6.33	23.78
+ ID2= 2 (0005):	5.32	0.278	6.42	29.72
ID = 1 (0007):	11.37	0.419	6.42	26.56

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	0.4220	0.1535
	0.0410	0.0120	0.4630	0.1758
	0.0580	0.0253	0.6510	0.1989
	0.0710	0.0399	0.7480	0.2228
	0.0830	0.0559	0.8280	0.2476
	0.0920	0.0732	0.8990	0.2733
	0.2500	0.0918	0.9640	0.2998
	0.3200	0.1116	1.0240	0.3263
	0.3750	0.1321	1.0800	0.3528

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	11.370	0.419	6.42	26.56
OUTFLOW: ID= 1 (0008)	11.370	0.191	7.08	26.55

PEAK FLOW REDUCTION [Qout/Qin](%)= 45.56
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.0849

ADD HYD (0016)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	0.83	0.043	6.33	17.09
+ ID2= 2 (0008):	11.37	0.191	7.08	26.55
ID = 3 (0016):	12.20	0.198	7.00	25.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0019)	Area (ha)=	12.20	Curve Number (CN)=	64.0
ID= 1 DT= 5.0 min	Ia (mm)=	6.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.61		

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)=	0.764	
PEAK FLOW (cms)=	0.211	(i)
TIME TO PEAK (hrs)=	6.833	
RUNOFF VOLUME (mm)=	13.279	
TOTAL RAINFALL (mm)=	57.600	
RUNOFF COEFFICIENT =	0.231	

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

```
| CALIB            |
| NASHYD   (  0039)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19
```

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.043 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 17.090
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.297

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

```
| CALIB            |
| NASHYD   (  0033)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20
```

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15

```
| CALIB            |
| STANDHYD (  0036)|   Area    (ha)=   5.32
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.020 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 17.097
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.297

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

Max.Eff.Inten.(mm/hr)=	63.94	29.81					
over (min)	20.00	35.00					
Storage Coeff. (min)=	17.78 (ii)	31.88 (ii)					
Unit Hyd. Tpeak (min)=	20.00	35.00					
Unit Hyd. peak (cms)=	0.06	0.03					
			TOTALS				
PEAK FLOW (cms)=	0.22	0.08	0.278 (iii)				
TIME TO PEAK (hrs)=	6.42	6.75	6.42				
RUNOFF VOLUME (mm)=	56.60	15.25	29.72				
TOTAL RAINFALL (mm)=	57.60	57.60	57.60				
RUNOFF COEFFICIENT =	0.98	0.26	0.52				

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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            |
| NASHYD   (  0037)|   Area    (ha)=   0.65   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.14
```

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 15.887
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.276

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

PEAK FLOW (cms)= 0.068 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 15.986
TOTAL RAINFALL (mm)= 57.600
RUNOFF COEFFICIENT = 0.278

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

CALIB	
STANDHYD (0040)	Area (ha)= 3.43
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15

CALIB	
NASHYD (0038)	Area (ha)= 1.56 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.22

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	1.73	6.250	76.03	9.33	2.02
0.167	0.00	3.250	1.73	6.333	10.37	9.42	2.02
0.250	0.00	3.333	2.30	6.417	10.37	9.50	2.02
0.333	1.44	3.417	2.30	6.500	10.37	9.58	2.02
0.417	1.44	3.500	2.30	6.583	10.37	9.67	2.02
0.500	1.44	3.583	2.30	6.667	10.37	9.75	2.02
0.583	1.44	3.667	2.30	6.750	10.37	9.83	2.02
0.667	1.44	3.750	2.30	6.833	4.61	9.92	2.02
0.750	1.44	3.833	2.30	6.917	4.61	10.00	2.02
0.833	1.44	3.917	2.30	7.000	4.61	10.08	2.02
0.917	1.44	4.000	2.30	7.083	4.61	10.17	2.02
1.000	1.44	4.083	2.30	7.167	4.61	10.25	2.02
1.083	1.44	4.167	2.30	7.250	4.61	10.33	1.15
1.167	1.44	4.250	2.30	7.333	3.46	10.42	1.15
1.250	1.44	4.333	3.46	7.417	3.46	10.50	1.15
1.333	1.44	4.417	3.46	7.500	3.46	10.58	1.15
1.417	1.44	4.500	3.46	7.583	3.46	10.67	1.15
1.500	1.44	4.583	3.46	7.667	3.46	10.75	1.15
1.583	1.44	4.667	3.46	7.750	3.46	10.83	1.15
1.667	1.44	4.750	3.46	7.833	3.46	10.92	1.15
1.750	1.44	4.833	4.61	7.917	3.46	11.00	1.15
1.833	1.44	4.917	4.61	8.000	3.46	11.08	1.15
1.917	1.44	5.000	4.61	8.083	3.46	11.17	1.15
2.000	1.44	5.083	4.61	8.167	3.46	11.25	1.15
2.083	1.44	5.167	4.61	8.250	3.46	11.33	1.15
2.167	1.44	5.250	4.61	8.333	2.02	11.42	1.15
2.250	1.44	5.333	6.91	8.417	2.02	11.50	1.15
2.333	1.73	5.417	6.91	8.500	2.02	11.58	1.15
2.417	1.73	5.500	6.91	8.583	2.02	11.67	1.15
2.500	1.73	5.583	6.91	8.667	2.02	11.75	1.15
2.583	1.73	5.667	6.91	8.750	2.02	11.83	1.15
2.667	1.73	5.750	6.91	8.833	2.02	11.92	1.15
2.750	1.73	5.833	27.65	8.917	2.02	12.00	1.15
2.833	1.73	5.917	27.65	9.000	2.02	12.08	1.15
2.917	1.73	6.000	27.65	9.083	2.02	12.17	1.15
3.000	1.73	6.083	76.03	9.167	2.02	12.25	1.15
3.083	1.73	6.167	76.03	9.250	2.02		

Unit Hyd Qpeak (cms)= 0.271

				TOTALS
Max.Eff.Inten.(mm/hr)=		76.03	29.81	
over (min)		5.00	20.00	
Storage Coeff. (min)=		3.65 (ii)	15.11 (ii)	
Unit Hyd. Tpeak (min)=		5.00	20.00	
Unit Hyd. peak (cms)=		0.25	0.07	
PEAK FLOW	(cms)=	0.25	0.08	0.306 (iii)
TIME TO PEAK	(hrs)=	6.25	6.42	6.25
RUNOFF VOLUME	(mm)=	56.60	15.25	29.72
TOTAL RAINFALL	(mm)=	57.60	57.60	57.60
RUNOFF COEFFICIENT	=	0.98	0.26	0.52

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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.

ADD HYD (0041)					
1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0033):	0.41	0.020	6.33	17.10
	+ ID2= 2 (0036):	5.32	0.278	6.42	29.72
	ID = 3 (0041):	5.73	0.297	6.42	28.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
3 + 2 = 1		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 3 (0041):	5.73	0.297	6.42	28.81

```
     + ID2= 2 (  0037):     0.65   0.037     6.25    15.89
       ================================================
       ID = 1 (  0041):     6.38   0.320     6.42    27.50

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0041):     6.38   0.320     6.42    27.50
     + ID2= 2 (  0038):     1.56   0.068     6.33    15.99
       ================================================
       ID = 3 (  0041):     7.94   0.384     6.42    25.23

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     7.94   0.384     6.42    25.23
     + ID2= 2 (  0040):     3.43   0.306     6.25    29.72
       ================================================
       ID = 1 (  0041):    11.37   0.627     6.25    26.59

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0032)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0039):     0.83   0.043     6.33    17.09
     + ID2= 2 (  0041):    11.37   0.627     6.25    26.59
       ================================================
       ID = 3 (  0032):    12.20   0.666     6.25    25.94

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
========================

      V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
      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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.


                *****  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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\dc0b50a8-bc98-4087-bb05-526673
  Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\dc0b50a8-bc98-4087-bb05-526673


DATE: 06-15-2023                          TIME: 02:15:49

USER:


COMMENTS: _____________________________________________________


--------------------------------------------------------------------------------
-----------------------
  ***********************************************
  ** SIMULATION : 010yr 12hr 15min SCS          **
  ***********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\ed4b58ae
| Ptotal= 66.00 mm |    Comments: created from IDF Group New IDFGroup - 2
-------------------
                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    2.64 |  6.50   11.88 |  9.75    2.31
                0.25    1.65 |  3.50    2.64 |  6.75    5.28 | 10.00    2.31
                0.50    1.65 |  3.75    2.64 |  7.00    5.28 | 10.25    1.32
                0.75    1.65 |  4.00    2.64 |  7.25    3.96 | 10.50    1.32
                1.00    1.65 |  4.25    3.96 |  7.50    3.96 | 10.75    1.32
                1.25    1.65 |  4.50    3.96 |  7.75    3.96 | 11.00    1.32
                1.50    1.65 |  4.75    5.28 |  8.00    3.96 | 11.25    1.32
                1.75    1.65 |  5.00    5.28 |  8.25    2.31 | 11.50    1.32
                2.00    1.65 |  5.25    7.92 |  8.50    2.31 | 11.75    1.32
                2.25    1.98 |  5.50    7.92 |  8.75    2.31 | 12.00    1.32
                2.50    1.98 |  5.75   31.68 |  9.00    2.31 |
                2.75    1.98 |  6.00   87.12 |  9.25    2.31 |
                3.00    1.98 |  6.25   11.88 |  9.50    2.31 |

--------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.81         2.81
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     193.56        10.00
     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    1.98 | 6.250   87.12 |  9.33    2.31
               0.167    0.00 | 3.250    1.98 | 6.333   11.88 |  9.42    2.31
               0.250    0.00 | 3.333    2.64 | 6.417   11.88 |  9.50    2.31
               0.333    1.65 | 3.417    2.64 | 6.500   11.88 |  9.58    2.31
               0.417    1.65 | 3.500    2.64 | 6.583   11.88 |  9.67    2.31
               0.500    1.65 | 3.583    2.64 | 6.667   11.88 |  9.75    2.31
               0.583    1.65 | 3.667    2.64 | 6.750   11.88 |  9.83    2.31
               0.667    1.65 | 3.750    2.64 | 6.833    5.28 |  9.92    2.31
               0.750    1.65 | 3.833    2.64 | 6.917    5.28 | 10.00    2.31
               0.833    1.65 | 3.917    2.64 | 7.000    5.28 | 10.08    2.31
               0.917    1.65 | 4.000    2.64 | 7.083    5.28 | 10.17    2.31
               1.000    1.65 | 4.083    2.64 | 7.167    5.28 | 10.25    2.31
               1.083    1.65 | 4.167    2.64 | 7.250    5.28 | 10.33    1.32
               1.167    1.65 | 4.250    2.64 | 7.333    3.96 | 10.42    1.32
               1.250    1.65 | 4.333    3.96 | 7.417    3.96 | 10.50    1.32
               1.333    1.65 | 4.417    3.96 | 7.500    3.96 | 10.58    1.32
               1.417    1.65 | 4.500    3.96 | 7.583    3.96 | 10.67    1.32
               1.500    1.65 | 4.583    3.96 | 7.667    3.96 | 10.75    1.32
               1.583    1.65 | 4.667    3.96 | 7.750    3.96 | 10.83    1.32
               1.667    1.65 | 4.750    3.96 | 7.833    3.96 | 10.92    1.32
               1.750    1.65 | 4.833    5.28 | 7.917    3.96 | 11.00    1.32
               1.833    1.65 | 4.917    5.28 | 8.000    3.96 | 11.08    1.32
               1.917    1.65 | 5.000    5.28 | 8.083    3.96 | 11.17    1.32
               2.000    1.65 | 5.083    5.28 | 8.167    3.96 | 11.25    1.32
               2.083    1.65 | 5.167    5.28 | 8.250    3.96 | 11.33    1.32
               2.167    1.65 | 5.250    5.28 | 8.333    2.31 | 11.42    1.32
               2.250    1.65 | 5.333    7.92 | 8.417    2.31 | 11.50    1.32
               2.333    1.98 | 5.417    7.92 | 8.500    2.31 | 11.58    1.32
               2.417    1.98 | 5.500    7.92 | 8.583    2.31 | 11.67    1.32
               2.500    1.98 | 5.583    7.92 | 8.667    2.31 | 11.75    1.32
               2.583    1.98 | 5.667    7.92 | 8.750    2.31 | 11.83    1.32
               2.667    1.98 | 5.750    7.92 | 8.833    2.31 | 11.92    1.32
               2.750    1.98 | 5.833   31.68 | 8.917    2.31 | 12.00    1.32
               2.833    1.98 | 5.917   31.68 | 9.000    2.31 | 12.08    1.32
               2.917    1.98 | 6.000   31.68 | 9.083    2.31 | 12.17    1.32
               3.000    1.98 | 6.083   87.12 | 9.167    2.31 | 12.25    1.32
               3.083    1.98 | 6.167   87.12 | 9.250    2.31 |

    Max.Eff.Inten.(mm/hr)=      87.12        41.61
              over (min)         5.00        10.00
    Storage Coeff.  (min)=       4.01 (ii)    7.76 (ii)
    Unit Hyd. Tpeak (min)=       5.00        10.00
    Unit Hyd. peak  (cms)=       0.24         0.13
                                                      *TOTALS*
    PEAK FLOW       (cms)=       0.47         0.25          0.715 (iii)
    TIME TO PEAK    (hrs)=       6.25         6.25           6.25
    RUNOFF VOLUME    (mm)=      65.00        19.52          35.44
    TOTAL RAINFALL   (mm)=      66.00        66.00          66.00
    RUNOFF COEFFICIENT   =       0.98         0.30           0.54

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  59.0    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            |
| NASHYD   (  0022)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

        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    1.98 | 6.250   87.12 |  9.33    2.31
               0.167    0.00 | 3.250    1.98 | 6.333   11.88 |  9.42    2.31
               0.250    0.00 | 3.333    2.64 | 6.417   11.88 |  9.50    2.31
               0.333    1.65 | 3.417    2.64 | 6.500   11.88 |  9.58    2.31
               0.417    1.65 | 3.500    2.64 | 6.583   11.88 |  9.67    2.31
               0.500    1.65 | 3.583    2.64 | 6.667   11.88 |  9.75    2.31
```

0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.056 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 22.242
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.337

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

CALIB							
NASHYD (0023)	Area (ha)= 0.41	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.20	

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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Unit Hyd Qpeak (cms)= 0.271

---- 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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.027 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 22.250
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.337

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

CALIB							
NASHYD (0030)	Area (ha)= 1.56	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.22	

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

PEAK FLOW (cms)= 0.090 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 20.887
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.316

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

CALIB							
NASHYD (0031)	Area (ha)= 0.65	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.14	

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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32

2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.049 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 20.757
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.314

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

CALIB	
STANDHYD (0005)	Area (ha)= 5.32
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.66	2.66
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	1.00
Length (m)=	188.33	40.00
Mannings n =	0.130	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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Max.Eff.Inten.(mm/hr)=	87.12	38.29	
over (min)	15.00	30.00	
Storage Coeff. (min)=	15.71 (ii)	28.47 (ii)	
Unit Hyd. Tpeak (min)=	15.00	30.00	
Unit Hyd. peak (cms)=	0.07	0.04	
			TOTALS
PEAK FLOW (cms)=	0.28	0.11	0.355 (iii)
TIME TO PEAK (hrs)=	6.33	6.58	6.33
RUNOFF VOLUME (mm)=	65.00	19.52	35.43
TOTAL RAINFALL (mm)=	66.00	19.52	66.00
RUNOFF COEFFICIENT =	0.98	0.30	0.54

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (0028)	Area (ha)= 3.43
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.71	1.71
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	151.22	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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Max.Eff.Inten.(mm/hr)=	87.12	38.29	
over (min)	5.00	15.00	
Storage Coeff. (min)=	3.46 (ii)	13.82 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.26	0.08	
			TOTALS
PEAK FLOW (cms)=	0.29	0.11	0.384 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	65.00	19.52	35.43
TOTAL RAINFALL (mm)=	66.00	19.52	66.00
RUNOFF COEFFICIENT =	0.98	0.30	0.54

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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(0029)	OVERFLOW IS OFF
IN= 2---> OUT= 1	
DT= 5.0 min	OUTFLOW STORAGE (cms) (ha.m.)	OUTFLOW STORAGE (cms) (ha.m.)
	0.0000 0.0000	0.0900 0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0028)	3.430	0.384	6.25	35.43
OUTFLOW: ID= 1 (0029)	3.430	0.050	7.00	35.34

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.12
TIME SHIFT OF PEAK FLOW (min)= 45.00
MAXIMUM STORAGE USED (ha.m.)= 0.0672

ADD HYD (0007)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0023):	0.41	0.027	6.33	22.25
	+ ID2= 2 (0029):	3.43	0.050	7.00	35.34
	ID = 3 (0007):	3.84	0.067	6.42	33.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1	ID1= 3 (0007):	3.84	0.067	6.42	33.94
	+ ID2= 2 (0030):	1.56	0.090	6.33	20.89

```
       ID = 1 (  0007):     5.40   0.157     6.33    30.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     5.40   0.157     6.33    30.17
     + ID2= 2 (  0031):     0.65   0.049     6.25    20.76
       ================================================
       ID = 3 (  0007):     6.05   0.200     6.33    29.16

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.200     6.33    29.16
     + ID2= 2 (  0005):     5.32   0.355     6.33    35.43
       ================================================
       ID = 1 (  0007):    11.37   0.555     6.33    32.09

    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   |   0.4220     0.1535
                        0.0410     0.0120   |   0.4630     0.1758
                        0.0580     0.0253   |   0.6510     0.1989
                        0.0710     0.0399   |   0.7480     0.2228
                        0.0830     0.0559   |   0.8280     0.2476
                        0.0920     0.0732   |   0.8990     0.2733
                        0.2500     0.0918   |   0.9640     0.2998
                        0.3200     0.1116   |   1.0240     0.3263
                        0.3750     0.1321   |   1.0800     0.3528

                             AREA     QPEAK     TPEAK       R.V.
                             (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0007)    11.370     0.555     6.33     32.09
   OUTFLOW: ID= 1 (  0008)    11.370     0.264     6.92     32.09

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 47.53
                TIME SHIFT OF PEAK FLOW         (min)= 35.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0958
```

```
    2.333    1.98 | 5.417    7.92 | 8.500    2.31 | 11.58    1.32
    2.417    1.98 | 5.500    7.92 | 8.583    2.31 | 11.67    1.32
    2.500    1.98 | 5.583    7.92 | 8.667    2.31 | 11.75    1.32
    2.583    1.98 | 5.667    7.92 | 8.750    2.31 | 11.83    1.32
    2.667    1.98 | 5.750    7.92 | 8.833    2.31 | 11.92    1.32
    2.750    1.98 | 5.833   31.68 | 8.917    2.31 | 12.00    1.32
    2.833    1.98 | 5.917   31.68 | 9.000    2.31 | 12.08    1.32
    2.917    1.98 | 6.000   31.68 | 9.083    2.31 | 12.17    1.32
    3.000    1.98 | 6.083   87.12 | 9.167    2.31 | 12.25    1.32
    3.083    1.98 | 6.167   87.12 | 9.250    2.31 |

Unit Hyd Qpeak  (cms)=   0.764

PEAK FLOW       (cms)=   0.278 (i)
TIME TO PEAK    (hrs)=   6.833
RUNOFF VOLUME    (mm)=  17.293
TOTAL RAINFALL   (mm)=  66.000
RUNOFF COEFFICIENT   =   0.262

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

------------------
| CALIB            |
| NASHYD   (  0039)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
------------------   U.H. Tp(hrs)=   0.19

        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    1.98 | 6.250   87.12 |  9.33    2.31
0.167    0.00 | 3.250    1.98 | 6.333   11.88 |  9.42    2.31
0.250    0.00 | 3.333    2.64 | 6.417   11.88 |  9.50    2.31
0.333    1.65 | 3.417    2.64 | 6.500   11.88 |  9.58    2.31
0.417    1.65 | 3.500    2.64 | 6.583   11.88 |  9.67    2.31
0.500    1.65 | 3.583    2.64 | 6.667   11.88 |  9.75    2.31
0.583    1.65 | 3.667    2.64 | 6.750   11.88 |  9.83    2.31
0.667    1.65 | 3.750    2.64 | 6.833    5.28 |  9.92    2.31
0.750    1.65 | 3.833    2.64 | 6.917    5.28 | 10.00    2.31
0.833    1.65 | 3.917    2.64 | 7.000    5.28 | 10.08    2.31
0.917    1.65 | 4.000    2.64 | 7.083    5.28 | 10.17    2.31
1.000    1.65 | 4.083    2.64 | 7.167    5.28 | 10.25    2.31
1.083    1.65 | 4.167    2.64 | 7.250    5.28 | 10.33    1.32
1.167    1.65 | 4.250    2.64 | 7.333    3.96 | 10.42    1.32
1.250    1.65 | 4.333    3.96 | 7.417    3.96 | 10.50    1.32
1.333    1.65 | 4.417    3.96 | 7.500    3.96 | 10.58    1.32
1.417    1.65 | 4.500    3.96 | 7.583    3.96 | 10.67    1.32
1.500    1.65 | 4.583    3.96 | 7.667    3.96 | 10.75    1.32
```

```
--------------------------------------------------------------------------------

------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     0.83   0.056     6.33    22.24
     + ID2= 2 (  0008):    11.37   0.264     6.92    32.09
       ================================================
       ID = 3 (  0016):    12.20   0.279     6.83    31.42

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

------------------
| CALIB            |
| NASHYD   (  0019)|   Area    (ha)=  12.20   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.90   # of Linear Res.(N)= 3.00
------------------   U.H. Tp(hrs)=   0.61

        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    1.98 | 6.250   87.12 |  9.33    2.31
0.167    0.00 | 3.250    1.98 | 6.333   11.88 |  9.42    2.31
0.250    0.00 | 3.333    2.64 | 6.417   11.88 |  9.50    2.31
0.333    1.65 | 3.417    2.64 | 6.500   11.88 |  9.58    2.31
0.417    1.65 | 3.500    2.64 | 6.583   11.88 |  9.67    2.31
0.500    1.65 | 3.583    2.64 | 6.667   11.88 |  9.75    2.31
0.583    1.65 | 3.667    2.64 | 6.750   11.88 |  9.83    2.31
0.667    1.65 | 3.750    2.64 | 6.833    5.28 |  9.92    2.31
0.750    1.65 | 3.833    2.64 | 6.917    5.28 | 10.00    2.31
0.833    1.65 | 3.917    2.64 | 7.000    5.28 | 10.08    2.31
0.917    1.65 | 4.000    2.64 | 7.083    5.28 | 10.17    2.31
1.000    1.65 | 4.083    2.64 | 7.167    5.28 | 10.25    2.31
1.083    1.65 | 4.167    2.64 | 7.250    5.28 | 10.33    1.32
1.167    1.65 | 4.250    2.64 | 7.333    3.96 | 10.42    1.32
1.250    1.65 | 4.333    3.96 | 7.417    3.96 | 10.50    1.32
1.333    1.65 | 4.417    3.96 | 7.500    3.96 | 10.58    1.32
1.417    1.65 | 4.500    3.96 | 7.583    3.96 | 10.67    1.32
1.500    1.65 | 4.583    3.96 | 7.667    3.96 | 10.75    1.32
1.583    1.65 | 4.667    3.96 | 7.750    3.96 | 10.83    1.32
1.667    1.65 | 4.750    3.96 | 7.833    3.96 | 10.92    1.32
1.750    1.65 | 4.833    5.28 | 7.917    3.96 | 11.00    1.32
1.833    1.65 | 4.917    5.28 | 8.000    3.96 | 11.08    1.32
1.917    1.65 | 5.000    5.28 | 8.083    3.96 | 11.17    1.32
2.000    1.65 | 5.083    5.28 | 8.167    3.96 | 11.25    1.32
2.083    1.65 | 5.167    5.28 | 8.250    3.96 | 11.33    1.32
2.167    1.65 | 5.250    5.28 | 8.333    2.31 | 11.42    1.32
2.250    1.65 | 5.333    7.92 | 8.417    2.31 | 11.50    1.32
2.333    1.98 | 5.417    7.92 | 8.500    2.31 | 11.58    1.32
2.417    1.98 | 5.500    7.92 | 8.583    2.31 | 11.67    1.32
2.500    1.98 | 5.583    7.92 | 8.667    2.31 | 11.75    1.32
2.583    1.98 | 5.667    7.92 | 8.750    2.31 | 11.83    1.32
2.667    1.98 | 5.750    7.92 | 8.833    2.31 | 11.92    1.32
2.750    1.98 | 5.833   31.68 | 8.917    2.31 | 12.00    1.32
2.833    1.98 | 5.917   31.68 | 9.000    2.31 | 12.08    1.32
2.917    1.98 | 6.000   31.68 | 9.083    2.31 | 12.17    1.32
3.000    1.98 | 6.083   87.12 | 9.167    2.31 | 12.25    1.32
3.083    1.98 | 6.167   87.12 | 9.250    2.31 |

Unit Hyd Qpeak  (cms)=   0.167

PEAK FLOW       (cms)=   0.056 (i)
TIME TO PEAK    (hrs)=   6.333
RUNOFF VOLUME    (mm)=  22.242
TOTAL RAINFALL   (mm)=  66.000
RUNOFF COEFFICIENT   =   0.337

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

------------------
| CALIB            |
| NASHYD   (  0033)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
------------------   U.H. Tp(hrs)=   0.20

        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    1.98 | 6.250   87.12 |  9.33    2.31
0.167    0.00 | 3.250    1.98 | 6.333   11.88 |  9.42    2.31
0.250    0.00 | 3.333    2.64 | 6.417   11.88 |  9.50    2.31
0.333    1.65 | 3.417    2.64 | 6.500   11.88 |  9.58    2.31
0.417    1.65 | 3.500    2.64 | 6.583   11.88 |  9.67    2.31
0.500    1.65 | 3.583    2.64 | 6.667   11.88 |  9.75    2.31
0.583    1.65 | 3.667    2.64 | 6.750   11.88 |  9.83    2.31
0.667    1.65 | 3.750    2.64 | 6.833    5.28 |  9.92    2.31
0.750    1.65 | 3.833    2.64 | 6.917    5.28 | 10.00    2.31
```

0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.027 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 22.250
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.337

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

CALIB		
STANDHYD (0036)	Area (ha)=	5.32
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Max.Eff.Inten.(mm/hr)=		87.12	38.29	
	over (min)	15.00	30.00	
Storage Coeff. (min)=		15.71 (ii)	28.47 (ii)	
Unit Hyd. Tpeak (min)=		15.00	30.00	
Unit Hyd. peak (cms)=		0.07	0.04	
				TOTALS
PEAK FLOW	(cms)=	0.28	0.11	0.355 (iii)
TIME TO PEAK	(hrs)=	6.33	6.58	6.33
RUNOFF VOLUME	(mm)=	65.00	19.52	35.43
TOTAL RAINFALL	(mm)=	66.00	66.00	66.00
RUNOFF COEFFICIENT	=	0.98	0.30	0.54

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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		
NASHYD (0037)	Area (ha)=	0.65 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14

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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.049 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 20.757
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.314

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

CALIB		
NASHYD (0038)	Area (ha)=	1.56 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.22

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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32

1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.090 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 20.887
TOTAL RAINFALL (mm)= 66.000
RUNOFF COEFFICIENT = 0.316

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

CALIB	
STANDHYD (0040)	Area (ha)= 3.43
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.71	1.71
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	151.22	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	1.98	6.250	87.12	9.33	2.31
0.167	0.00	3.250	1.98	6.333	11.88	9.42	2.31
0.250	0.00	3.333	2.64	6.417	11.88	9.50	2.31
0.333	1.65	3.417	2.64	6.500	11.88	9.58	2.31
0.417	1.65	3.500	2.64	6.583	11.88	9.67	2.31
0.500	1.65	3.583	2.64	6.667	11.88	9.75	2.31
0.583	1.65	3.667	2.64	6.750	11.88	9.83	2.31
0.667	1.65	3.750	2.64	6.833	5.28	9.92	2.31
0.750	1.65	3.833	2.64	6.917	5.28	10.00	2.31
0.833	1.65	3.917	2.64	7.000	5.28	10.08	2.31
0.917	1.65	4.000	2.64	7.083	5.28	10.17	2.31
1.000	1.65	4.083	2.64	7.167	5.28	10.25	2.31
1.083	1.65	4.167	2.64	7.250	5.28	10.33	1.32
1.167	1.65	4.250	2.64	7.333	3.96	10.42	1.32
1.250	1.65	4.333	3.96	7.417	3.96	10.50	1.32
1.333	1.65	4.417	3.96	7.500	3.96	10.58	1.32
1.417	1.65	4.500	3.96	7.583	3.96	10.67	1.32
1.500	1.65	4.583	3.96	7.667	3.96	10.75	1.32
1.583	1.65	4.667	3.96	7.750	3.96	10.83	1.32
1.667	1.65	4.750	3.96	7.833	3.96	10.92	1.32
1.750	1.65	4.833	5.28	7.917	3.96	11.00	1.32
1.833	1.65	4.917	5.28	8.000	3.96	11.08	1.32
1.917	1.65	5.000	5.28	8.083	3.96	11.17	1.32
2.000	1.65	5.083	5.28	8.167	3.96	11.25	1.32
2.083	1.65	5.167	5.28	8.250	3.96	11.33	1.32
2.167	1.65	5.250	5.28	8.333	2.31	11.42	1.32
2.250	1.65	5.333	7.92	8.417	2.31	11.50	1.32
2.333	1.98	5.417	7.92	8.500	2.31	11.58	1.32
2.417	1.98	5.500	7.92	8.583	2.31	11.67	1.32
2.500	1.98	5.583	7.92	8.667	2.31	11.75	1.32
2.583	1.98	5.667	7.92	8.750	2.31	11.83	1.32
2.667	1.98	5.750	7.92	8.833	2.31	11.92	1.32
2.750	1.98	5.833	31.68	8.917	2.31	12.00	1.32
2.833	1.98	5.917	31.68	9.000	2.31	12.08	1.32
2.917	1.98	6.000	31.68	9.083	2.31	12.17	1.32
3.000	1.98	6.083	87.12	9.167	2.31	12.25	1.32
3.083	1.98	6.167	87.12	9.250	2.31		

Max.Eff.Inten.(mm/hr)=	87.12	38.29	
over (min)	5.00	15.00	
Storage Coeff. (min)=	3.46 (ii)	13.82 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.26	0.08	
			TOTALS
PEAK FLOW (cms)=	0.29	0.11	0.384 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	65.00	19.52	35.43
TOTAL RAINFALL (mm)=	66.00	66.00	66.00
RUNOFF COEFFICIENT =	0.98	0.30	0.54

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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.

ADD HYD (0041)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0033):	0.41	0.027	6.33	22.25
+ ID2= 2 (0036):	5.32	0.355	6.33	35.43
ID = 3 (0041):	5.73	0.382	6.33	34.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0041):	5.73	0.382	6.33	34.49
+ ID2= 2 (0037):	0.65	0.049	6.25	20.76
ID = 1 (0041):	6.38	0.426	6.33	33.09

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0041):	6.38	0.426	6.33	33.09
+ ID2= 2 (0038):	1.56	0.090	6.33	20.89
ID = 3 (0041):	7.94	0.515	6.33	30.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0041):	7.94	0.515	6.33	30.69
+ ID2= 2 (0040):	3.43	0.384	6.25	35.43
ID = 1 (0041):	11.37	0.848	6.25	32.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0039):	0.83	0.056	6.33	22.24
+ ID2= 2 (0041):	11.37	0.848	6.25	32.12
ID = 3 (0032):	12.20	0.900	6.25	31.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V V I SSSSS U U A L (v 6.2.2011)
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

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.

***** 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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\da9b7f30-67ff-4641-9a4c-6b11a6

Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\da9b7f30-67ff-4641-9a4c-6b11a6

DATE: 06-15-2023 TIME: 02:15:49

USER:

COMMENTS: _____

```
----------------------
  ************************************************
  ** SIMULATION : 025yr 12hr 15min SCS          **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\5e378c83
| Ptotal= 78.00 mm |    Comments: created from IDF Group New IDFGroup - 2
--------------------
```

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	3.12	6.50	14.04	9.75	2.73
0.25	1.95	3.50	3.12	6.75	6.24	10.00	2.73
0.50	1.95	3.75	3.12	7.00	6.24	10.25	1.56
0.75	1.95	4.00	3.12	7.25	4.68	10.50	1.56
1.00	1.95	4.25	4.68	7.50	4.68	10.75	1.56
1.25	1.95	4.50	4.68	7.75	4.68	11.00	1.56
1.50	1.95	4.75	6.24	8.00	4.68	11.25	1.56
1.75	1.95	5.00	6.24	8.25	2.73	11.50	1.56
2.00	1.95	5.25	9.36	8.50	2.73	11.75	1.56
2.25	2.34	5.50	9.36	8.75	2.73	12.00	1.56
2.50	2.34	5.75	37.44	9.00	2.73		
2.75	2.34	6.00	102.96	9.25	2.73		
3.00	2.34	6.25	14.04	9.50	2.73		

```
--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.81	2.81
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	193.56	10.00
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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Max.Eff.Inten.(mm/hr)=		102.96	55.74
	over (min)	5.00	10.00
Storage Coeff.	(min)=	3.75 (ii)	7.25 (ii)
Unit Hyd. Tpeak	(min)=	5.00	10.00
Unit Hyd. peak	(cms)=	0.25	0.14

				TOTALS
PEAK FLOW	(cms)=	0.56	0.34	0.895 (iii)
TIME TO PEAK	(hrs)=	6.25	6.25	6.25
RUNOFF VOLUME	(mm)=	77.00	26.19	43.98
TOTAL RAINFALL	(mm)=	78.00	78.00	78.00
RUNOFF COEFFICIENT	=	0.99	0.34	0.56

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  59.0    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            |
| NASHYD   (  0022)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

        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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56

```
    Unit Hyd Qpeak  (cms)=   0.167

    PEAK FLOW       (cms)=   0.077 (i)
    TIME TO PEAK    (hrs)=   6.333
    RUNOFF VOLUME    (mm)=  30.217
    TOTAL RAINFALL   (mm)=  78.000
    RUNOFF COEFFICIENT   =   0.387

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0023)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

        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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56

2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 30.229
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.388

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

CALIB							
NASHYD (0030)	Area (ha)= 1.56	Curve Number (CN)= 73.0					
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00					
	U.H. Tp(hrs)= 0.22						

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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.067 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 28.339
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.363

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

CALIB		
STANDHYD (0005)	Area (ha)= 5.32	
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.66	2.66
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	1.00
Length (m)=	188.33	40.00
Mannings n =	0.130	0.250

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

1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.124 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 28.515
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.366

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

CALIB							
NASHYD (0031)	Area (ha)= 0.65	Curve Number (CN)= 73.0					
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00					
	U.H. Tp(hrs)= 0.14						

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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73

---- 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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Max.Eff.Inten.(mm/hr)=	102.96	51.58	
over (min)	15.00	30.00	
Storage Coeff. (min)=	14.70 (ii)	26.02 (ii)	
Unit Hyd. Tpeak (min)=	15.00	30.00	
Unit Hyd. peak (cms)=	0.08	0.04	
			TOTALS
PEAK FLOW (cms)=	0.34	0.16	0.447 (iii)
TIME TO PEAK (hrs)=	6.33	6.58	6.33
RUNOFF VOLUME (mm)=	77.00	26.19	43.97

```
     TOTAL RAINFALL   (mm)=      78.00        78.00          78.00
     RUNOFF COEFFICIENT   =       0.99         0.34           0.56


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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 (  0028)|   Area    (ha)=   3.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71         1.71
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     151.22        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    2.34 | 6.250  102.96 |  9.33    2.73
 0.167    0.00 | 3.250    2.34 | 6.333   14.04 |  9.42    2.73
 0.250    0.00 | 3.333    3.12 | 6.417   14.04 |  9.50    2.73
 0.333    1.95 | 3.417    3.12 | 6.500   14.04 |  9.58    2.73
 0.417    1.95 | 3.500    3.12 | 6.583   14.04 |  9.67    2.73
 0.500    1.95 | 3.583    3.12 | 6.667   14.04 |  9.75    2.73
 0.583    1.95 | 3.667    3.12 | 6.750   14.04 |  9.83    2.73
 0.667    1.95 | 3.750    3.12 | 6.833    6.24 |  9.92    2.73
 0.750    1.95 | 3.833    3.12 | 6.917    6.24 | 10.00    2.73
 0.833    1.95 | 3.917    3.12 | 7.000    6.24 | 10.08    2.73
 0.917    1.95 | 4.000    3.12 | 7.083    6.24 | 10.17    2.73
 1.000    1.95 | 4.083    3.12 | 7.167    6.24 | 10.25    2.73
 1.083    1.95 | 4.167    3.12 | 7.250    6.24 | 10.33    1.56
 1.167    1.95 | 4.250    3.12 | 7.333    4.68 | 10.42    1.56
 1.250    1.95 | 4.333    4.68 | 7.417    4.68 | 10.50    1.56
 1.333    1.95 | 4.417    4.68 | 7.500    4.68 | 10.58    1.56
 1.417    1.95 | 4.500    4.68 | 7.583    4.68 | 10.67    1.56
 1.500    1.95 | 4.583    4.68 | 7.667    4.68 | 10.75    1.56
 1.583    1.95 | 4.667    4.68 | 7.750    4.68 | 10.83    1.56
 1.667    1.95 | 4.750    4.68 | 7.833    4.68 | 10.92    1.56
 1.750    1.95 | 4.833    6.24 | 7.917    4.68 | 11.00    1.56
 1.833    1.95 | 4.917    6.24 | 8.000    4.68 | 11.08    1.56
 1.917    1.95 | 5.000    6.24 | 8.083    4.68 | 11.17    1.56
 2.000    1.95 | 5.083    6.24 | 8.167    4.68 | 11.25    1.56
 2.083    1.95 | 5.167    6.24 | 8.250    4.68 | 11.33    1.56
 2.167    1.95 | 5.250    6.24 | 8.333    2.73 | 11.42    1.56
 2.250    1.95 | 5.333    9.36 | 8.417    2.73 | 11.50    1.56
 2.333    2.34 | 5.417    9.36 | 8.500    2.73 | 11.58    1.56
 2.417    2.34 | 5.500    9.36 | 8.583    2.73 | 11.67    1.56
 2.500    2.34 | 5.583    9.36 | 8.667    2.73 | 11.75    1.56
 2.583    2.34 | 5.667    9.36 | 8.750    2.73 | 11.83    1.56
 2.667    2.34 | 5.750    9.36 | 8.833    2.73 | 11.92    1.56
 2.750    2.34 | 5.833   37.44 | 8.917    2.73 | 12.00    1.56
 2.833    2.34 | 5.917   37.44 | 9.000    2.73 | 12.08    1.56
 2.917    2.34 | 6.000   37.44 | 9.083    2.73 | 12.17    1.56
 3.000    2.34 | 6.083  102.96 | 9.167    2.73 | 12.25    1.56
 3.083    2.34 | 6.167  102.96 | 9.250    2.73 |

     Max.Eff.Inten.(mm/hr)=     102.96        55.74
               over (min)        5.00        15.00
     Storage Coeff.  (min)=       3.24 (ii)   12.15 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.27         0.09
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.34         0.16          0.481 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.33           6.25
     RUNOFF VOLUME    (mm)=      77.00        26.19          43.97
     TOTAL RAINFALL   (mm)=      78.00        78.00          78.00
     RUNOFF COEFFICIENT   =       0.99         0.34           0.56

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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(  0029)|     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   |   0.0900     0.1200

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0028)     3.430     0.481      6.25      43.97
   OUTFLOW: ID= 1 (  0029)     3.430     0.063      7.00      43.88

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.08
                TIME SHIFT OF PEAK FLOW         (min)= 45.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0839

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.41   0.037     6.33    30.23
     + ID2= 2 (  0029):     3.43   0.063     7.00    43.88
       ==================================================
       ID = 3 (  0007):     3.84   0.086     6.33    42.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     3.84   0.086     6.33    42.42
     + ID2= 2 (  0030):     1.56   0.124     6.33    28.52
       ==================================================
       ID = 1 (  0007):     5.40   0.211     6.33    38.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     5.40   0.211     6.33    38.40
     + ID2= 2 (  0031):     0.65   0.067     6.25    28.34
       ==================================================
       ID = 3 (  0007):     6.05   0.271     6.33    37.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.271     6.33    37.32
     + ID2= 2 (  0005):     5.32   0.447     6.33    43.97
       ==================================================
       ID = 1 (  0007):    11.37   0.717     6.33    40.43

     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   |   0.4220     0.1535
                         0.0410     0.0120   |   0.4630     0.1758
                         0.0580     0.0253   |   0.6510     0.1989
                         0.0710     0.0399   |   0.7480     0.2228
                         0.0830     0.0559   |   0.8280     0.2476
                         0.0920     0.0732   |   0.8990     0.2733
                         0.2500     0.0918   |   0.9640     0.2998
                         0.3200     0.1116   |   1.0240     0.3263
                         0.3750     0.1321   |   1.0800     0.3528

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0007)    11.370     0.717      6.33      40.43
   OUTFLOW: ID= 1 (  0008)    11.370     0.336      6.92      40.43

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 46.87
                TIME SHIFT OF PEAK FLOW         (min)= 35.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.1178

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     0.83   0.077     6.33    30.22
     + ID2= 2 (  0008):    11.37   0.336     6.92    40.43
       ==================================================
       ID = 3 (  0016):    12.20   0.356     6.83    39.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0019)|   Area    (ha)=  12.20   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.90   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.61

         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    2.34 | 6.250  102.96 |  9.33    2.73
 0.167    0.00 | 3.250    2.34 | 6.333   14.04 |  9.42    2.73
 0.250    0.00 | 3.333    3.12 | 6.417   14.04 |  9.50    2.73
 0.333    1.95 | 3.417    3.12 | 6.500   14.04 |  9.58    2.73
 0.417    1.95 | 3.500    3.12 | 6.583   14.04 |  9.67    2.73
 0.500    1.95 | 3.583    3.12 | 6.667   14.04 |  9.75    2.73
```

0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Unit Hyd Qpeak (cms)= 0.764

PEAK FLOW (cms)= 0.383 (i)
TIME TO PEAK (hrs)= 6.833
RUNOFF VOLUME (mm)= 23.625
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.303

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

CALIB					
NASHYD (0039)	Area	(ha)=	0.83	Curve Number	(CN)= 75.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)=	0.19		

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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.077 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 30.217
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.387

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

CALIB					
NASHYD (0033)	Area	(ha)=	0.41	Curve Number	(CN)= 75.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.	(N)= 3.00
	U.H. Tp	(hrs)=	0.20		

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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 30.229
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.388

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

STANDHYD (0036)	Area	(ha)=	5.32		
ID= 1 DT= 5.0 min	Total Imp	(%)=	50.00	Dir. Conn.	(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56

2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Max.Eff.Inten.(mm/hr)=	102.96	51.58	
over (min)	15.00	30.00	
Storage Coeff. (min)=	14.70 (ii)	26.02 (ii)	
Unit Hyd. Tpeak (min)=	15.00	30.00	
Unit Hyd. peak (cms)=	0.08	0.04	
			TOTALS
PEAK FLOW (cms)=	0.34	0.16	0.447 (iii)
TIME TO PEAK (hrs)=	6.33	6.58	6.33
RUNOFF VOLUME (mm)=	77.00	26.19	43.97
TOTAL RAINFALL (mm)=	78.00	78.00	78.00
RUNOFF COEFFICIENT =	0.99	0.34	0.56

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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			
NASHYD (0037)	Area (ha)=	0.65	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14	

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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.124 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 28.515
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.366

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

0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56
3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.067 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 28.339
TOTAL RAINFALL (mm)= 78.000
RUNOFF COEFFICIENT = 0.363

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

CALIB			
NASHYD (0038)	Area (ha)=	1.56	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.22	

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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56

CALIB			
STANDHYD (0040)	Area (ha)=	3.43	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	2.34	6.250	102.96	9.33	2.73
0.167	0.00	3.250	2.34	6.333	14.04	9.42	2.73
0.250	0.00	3.333	3.12	6.417	14.04	9.50	2.73
0.333	1.95	3.417	3.12	6.500	14.04	9.58	2.73
0.417	1.95	3.500	3.12	6.583	14.04	9.67	2.73
0.500	1.95	3.583	3.12	6.667	14.04	9.75	2.73
0.583	1.95	3.667	3.12	6.750	14.04	9.83	2.73
0.667	1.95	3.750	3.12	6.833	6.24	9.92	2.73
0.750	1.95	3.833	3.12	6.917	6.24	10.00	2.73
0.833	1.95	3.917	3.12	7.000	6.24	10.08	2.73
0.917	1.95	4.000	3.12	7.083	6.24	10.17	2.73
1.000	1.95	4.083	3.12	7.167	6.24	10.25	2.73
1.083	1.95	4.167	3.12	7.250	6.24	10.33	1.56
1.167	1.95	4.250	3.12	7.333	4.68	10.42	1.56
1.250	1.95	4.333	4.68	7.417	4.68	10.50	1.56
1.333	1.95	4.417	4.68	7.500	4.68	10.58	1.56
1.417	1.95	4.500	4.68	7.583	4.68	10.67	1.56
1.500	1.95	4.583	4.68	7.667	4.68	10.75	1.56
1.583	1.95	4.667	4.68	7.750	4.68	10.83	1.56
1.667	1.95	4.750	4.68	7.833	4.68	10.92	1.56
1.750	1.95	4.833	6.24	7.917	4.68	11.00	1.56
1.833	1.95	4.917	6.24	8.000	4.68	11.08	1.56
1.917	1.95	5.000	6.24	8.083	4.68	11.17	1.56
2.000	1.95	5.083	6.24	8.167	4.68	11.25	1.56
2.083	1.95	5.167	6.24	8.250	4.68	11.33	1.56
2.167	1.95	5.250	6.24	8.333	2.73	11.42	1.56
2.250	1.95	5.333	9.36	8.417	2.73	11.50	1.56
2.333	2.34	5.417	9.36	8.500	2.73	11.58	1.56
2.417	2.34	5.500	9.36	8.583	2.73	11.67	1.56
2.500	2.34	5.583	9.36	8.667	2.73	11.75	1.56
2.583	2.34	5.667	9.36	8.750	2.73	11.83	1.56
2.667	2.34	5.750	9.36	8.833	2.73	11.92	1.56
2.750	2.34	5.833	37.44	8.917	2.73	12.00	1.56
2.833	2.34	5.917	37.44	9.000	2.73	12.08	1.56
2.917	2.34	6.000	37.44	9.083	2.73	12.17	1.56

3.000	2.34	6.083	102.96	9.167	2.73	12.25	1.56
3.083	2.34	6.167	102.96	9.250	2.73		

Max.Eff.Inten.(mm/hr)=	102.96	55.74	
over (min)	5.00	15.00	
Storage Coeff. (min)=	3.24 (ii)	12.15 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.27	0.09	
		TOTALS	
PEAK FLOW (cms)=	0.34	0.16	0.481 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	77.00	26.19	43.97
TOTAL RAINFALL (mm)=	78.00	78.00	78.00
RUNOFF COEFFICIENT =	0.99	0.34	0.56

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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.

ADD HYD (0041)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0033):		0.41	0.037	6.33	30.23
+ ID2= 2 (0036):		5.32	0.447	6.33	43.97
ID = 3 (0041):		5.73	0.484	6.33	42.99

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):		5.73	0.484	6.33	42.99
+ ID2= 2 (0037):		0.65	0.067	6.25	28.34
ID = 1 (0041):		6.38	0.544	6.33	41.50

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0041):		6.38	0.544	6.33	41.50
+ ID2= 2 (0038):		1.56	0.124	6.33	28.52
ID = 3 (0041):		7.94	0.668	6.33	38.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
3 + 2 = 1		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 3 (0041):		7.94	0.668	6.33	38.95
+ ID2= 2 (0040):		3.43	0.481	6.25	43.97
ID = 1 (0041):		11.37	1.084	6.25	40.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0039):		0.83	0.077	6.33	30.22
+ ID2= 2 (0041):		11.37	1.084	6.25	40.46
ID = 3 (0032):		12.20	1.156	6.25	39.77

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

V V I SSSSS U U A L (v 6.2.2011)
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

***** 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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\e387f366-ff51-4f79-8e27-b8ee68
Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\e387f366-ff51-4f79-8e27-b8ee68

DATE: 06-15-2023 TIME: 02:15:49

USER:

COMMENTS: _____

** SIMULATION : 050yr 12hr 15min SCS **

READ STORM	Filename: C:\Users\r.rajachockalingam\AppData\Local\Temp\073789e9-0d0b-43a3-ada4-078b0c00e084\b3fa3004
Ptotal= 86.40 mm	Comments: created from IDF Group New IDFGroup - 2

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	3.46	6.50	15.55	9.75	3.02
0.25	2.16	3.50	3.46	6.75	6.91	10.00	3.02
0.50	2.16	3.75	3.46	7.00	6.91	10.25	1.73
0.75	2.16	4.00	3.46	7.25	5.18	10.50	1.73
1.00	2.16	4.25	5.18	7.50	5.18	10.75	1.73
1.25	2.16	4.50	5.18	7.75	5.18	11.00	1.73
1.50	2.16	4.75	6.91	8.00	5.18	11.25	1.73
1.75	2.16	5.00	6.91	8.25	3.02	11.50	1.73
2.00	2.16	5.25	10.37	8.50	3.02	11.75	1.73
2.25	2.59	5.50	10.37	8.75	3.02	12.00	1.73
2.50	2.59	5.75	41.47	9.00	3.02		
2.75	2.59	6.00	114.05	9.25	3.02		
3.00	2.59	6.25	15.55	9.50	3.02		

CALIB			
STANDHYD (0006)	Area (ha)=	5.62	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.81	2.81
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	193.56	10.00
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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73

3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Max.Eff.Inten.(mm/hr)=	114.05	66.34	
over (min)	5.00	10.00	
Storage Coeff. (min)=	3.60 (ii)	6.96 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.26	0.14	
			TOTALS
PEAK FLOW (cms)=	0.62	0.41	1.028 (iii)
TIME TO PEAK (hrs)=	6.25	6.25	6.25
RUNOFF VOLUME (mm)=	85.40	31.21	50.18
TOTAL RAINFALL (mm)=	86.40	86.40	86.40
RUNOFF COEFFICIENT =	0.99	0.36	0.58

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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					
NASHYD (0022)	Area	(ha)=	0.83	Curve Number	(CN)= 75.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.19		

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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.044 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 36.170
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.419

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

CALIB					
NASHYD (0030)	Area	(ha)=	1.56	Curve Number	(CN)= 73.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.22		

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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.092 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 36.155
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.418

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

CALIB					
NASHYD (0023)	Area	(ha)=	0.41	Curve Number	(CN)= 75.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.20		

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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.150 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 34.220
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.396

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

```
| CALIB           |
| NASHYD   (  0031)|   Area    (ha)=   0.65   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14
```

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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.081 (i)

TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 34.008
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.394

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

```
| CALIB           |
| STANDHYD (  0005)|   Area    (ha)=   5.32
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

			TOTALS
Max.Eff.Inten.(mm/hr)=	114.05	61.59	
over (min)	15.00	25.00	
Storage Coeff. (min)=	14.11 (ii)	24.66 (ii)	
Unit Hyd. Tpeak (min)=	15.00	25.00	
Unit Hyd. peak (cms)=	0.08	0.05	
PEAK FLOW (cms)=	0.39	0.20	0.542 (iii)
TIME TO PEAK (hrs)=	6.33	6.50	6.42
RUNOFF VOLUME (mm)=	85.40	31.21	50.18
TOTAL RAINFALL (mm)=	86.40	86.40	86.40
RUNOFF COEFFICIENT =	0.99	0.36	0.58

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (  0028)|   Area    (ha)=   3.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

			TOTALS
Max.Eff.Inten.(mm/hr)=	114.05	66.34	
over (min)	5.00	15.00	
Storage Coeff. (min)=	3.11 (ii)	11.42 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.27	0.09	
PEAK FLOW (cms)=	0.38	0.20	0.551 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	85.40	31.21	50.18
TOTAL RAINFALL (mm)=	86.40	86.40	86.40
RUNOFF COEFFICIENT =	0.99	0.36	0.58

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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(0029)| 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 | 0.0900 0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0028)	3.430	0.551	6.25	50.18
OUTFLOW: ID= 1 (0029)	3.430	0.072	7.00	50.08

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.06
TIME SHIFT OF PEAK FLOW (min)= 45.00
MAXIMUM STORAGE USED (ha.m.)= 0.0960

| ADD HYD (0007)|

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	0.41	0.044	6.33	36.17
+ ID2= 2 (0029):	3.43	0.072	7.00	50.08
ID = 3 (0007):	3.84	0.101	6.33	48.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0007)|

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	3.84	0.101	6.33	48.59
+ ID2= 2 (0030):	1.56	0.150	6.33	34.22
ID = 1 (0007):	5.40	0.251	6.33	44.44

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0007)|

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0007):	5.40	0.251	6.33	44.44
+ ID2= 2 (0031):	0.65	0.081	6.25	34.01
ID = 3 (0007):	6.05	0.323	6.33	43.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0007)|

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	6.05	0.323	6.33	43.32
+ ID2= 2 (0005):	5.32	0.542	6.42	50.18
ID = 1 (0007):	11.37	0.861	6.33	46.53

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 | 0.4220 0.1535
0.0410 0.0120 | 0.4630 0.1758
0.0580 0.0253 | 0.6510 0.1989
0.0710 0.0399 | 0.7480 0.2228
0.0830 0.0559 | 0.8280 0.2476
0.0920 0.0732 | 0.8990 0.2733
0.2500 0.0918 | 0.9640 0.2998
0.3200 0.1116 | 1.0240 0.3263
0.3750 0.1321 | 1.0800 0.3528

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	11.370	0.861	6.33	46.53
OUTFLOW: ID= 1 (0008)	11.370	0.386	6.92	46.52

PEAK FLOW REDUCTION [Qout/Qin](%)= 44.80
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.1372

| ADD HYD (0016)|

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	0.83	0.092	6.33	36.15
+ ID2= 2 (0008):	11.37	0.386	6.92	46.52
ID = 3 (0016):	12.20	0.411	6.75	45.82

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB |
| NASHYD (0019)| Area (ha)= 12.20 Curve Number (CN)= 64.0
|ID= 1 DT= 5.0 min | Ia (mm)= 6.90 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.61

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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Unit Hyd Qpeak (cms)= 0.764

PEAK FLOW (cms)= 0.463 (i)
TIME TO PEAK (hrs)= 6.833
RUNOFF VOLUME (mm)= 28.421
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.329

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

| CALIB |
| NASHYD (0039)| Area (ha)= 0.83 Curve Number (CN)= 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.19

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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73

2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.092 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 36.155
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.418

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

CALIB			
NASHYD (0033)	Area (ha)=	0.41	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.20	

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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.044 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 36.170
TOTAL RAINFALL (mm)= 86.400
RUNOFF COEFFICIENT = 0.419

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

CALIB			
STANDHYD (0036)	Area (ha)=	5.32	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

Max.Eff.Inten.(mm/hr)=	114.05	61.59	
over (min)	15.00	25.00	
Storage Coeff. (min)=	14.11 (ii)	24.66 (ii)	
Unit Hyd. Tpeak (min)=	15.00	25.00	
Unit Hyd. peak (cms)=	0.08	0.05	
			TOTALS
PEAK FLOW (cms)=	0.39	0.20	0.542 (iii)
TIME TO PEAK (hrs)=	6.33	6.50	6.42
RUNOFF VOLUME (mm)=	85.40	31.21	50.18
TOTAL RAINFALL (mm)=	86.40	86.40	86.40
RUNOFF COEFFICIENT =	0.99	0.36	0.58

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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			
NASHYD (0037)	Area (ha)=	0.65	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14	

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	2.59	6.250	114.05	9.33	3.02
0.167	0.00	3.250	2.59	6.333	15.55	9.42	3.02
0.250	0.00	3.333	3.46	6.417	15.55	9.50	3.02
0.333	2.16	3.417	3.46	6.500	15.55	9.58	3.02
0.417	2.16	3.500	3.46	6.583	15.55	9.67	3.02
0.500	2.16	3.583	3.46	6.667	15.55	9.75	3.02
0.583	2.16	3.667	3.46	6.750	15.55	9.83	3.02
0.667	2.16	3.750	3.46	6.833	6.91	9.92	3.02
0.750	2.16	3.833	3.46	6.917	6.91	10.00	3.02
0.833	2.16	3.917	3.46	7.000	6.91	10.08	3.02
0.917	2.16	4.000	3.46	7.083	6.91	10.17	3.02
1.000	2.16	4.083	3.46	7.167	6.91	10.25	3.02
1.083	2.16	4.167	3.46	7.250	6.91	10.33	1.73
1.167	2.16	4.250	3.46	7.333	5.18	10.42	1.73
1.250	2.16	4.333	5.18	7.417	5.18	10.50	1.73
1.333	2.16	4.417	5.18	7.500	5.18	10.58	1.73
1.417	2.16	4.500	5.18	7.583	5.18	10.67	1.73
1.500	2.16	4.583	5.18	7.667	5.18	10.75	1.73
1.583	2.16	4.667	5.18	7.750	5.18	10.83	1.73
1.667	2.16	4.750	5.18	7.833	5.18	10.92	1.73
1.750	2.16	4.833	6.91	7.917	5.18	11.00	1.73
1.833	2.16	4.917	6.91	8.000	5.18	11.08	1.73
1.917	2.16	5.000	6.91	8.083	5.18	11.17	1.73
2.000	2.16	5.083	6.91	8.167	5.18	11.25	1.73
2.083	2.16	5.167	6.91	8.250	5.18	11.33	1.73
2.167	2.16	5.250	6.91	8.333	3.02	11.42	1.73
2.250	2.16	5.333	10.37	8.417	3.02	11.50	1.73
2.333	2.59	5.417	10.37	8.500	3.02	11.58	1.73
2.417	2.59	5.500	10.37	8.583	3.02	11.67	1.73
2.500	2.59	5.583	10.37	8.667	3.02	11.75	1.73
2.583	2.59	5.667	10.37	8.750	3.02	11.83	1.73
2.667	2.59	5.750	10.37	8.833	3.02	11.92	1.73
2.750	2.59	5.833	41.47	8.917	3.02	12.00	1.73
2.833	2.59	5.917	41.47	9.000	3.02	12.08	1.73
2.917	2.59	6.000	41.47	9.083	3.02	12.17	1.73
3.000	2.59	6.083	114.05	9.167	3.02	12.25	1.73
3.083	2.59	6.167	114.05	9.250	3.02		

```
    Unit Hyd Qpeak  (cms)=   0.177

    PEAK FLOW       (cms)=   0.081 (i)
    TIME TO PEAK    (hrs)=   6.250
    RUNOFF VOLUME    (mm)=  34.008
    TOTAL RAINFALL   (mm)=  86.400
    RUNOFF COEFFICIENT   =   0.394

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

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0038)|   Area    (ha)=   1.56   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

        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    2.59 | 6.250  114.05 |  9.33    3.02
0.167    0.00 | 3.250    2.59 | 6.333   15.55 |  9.42    3.02
0.250    0.00 | 3.333    3.46 | 6.417   15.55 |  9.50    3.02
0.333    2.16 | 3.417    3.46 | 6.500   15.55 |  9.58    3.02
0.417    2.16 | 3.500    3.46 | 6.583   15.55 |  9.67    3.02
0.500    2.16 | 3.583    3.46 | 6.667   15.55 |  9.75    3.02
0.583    2.16 | 3.667    3.46 | 6.750   15.55 |  9.83    3.02
0.667    2.16 | 3.750    3.46 | 6.833    6.91 |  9.92    3.02
0.750    2.16 | 3.833    3.46 | 6.917    6.91 | 10.00    3.02
0.833    2.16 | 3.917    3.46 | 7.000    6.91 | 10.08    3.02
0.917    2.16 | 4.000    3.46 | 7.083    6.91 | 10.17    3.02
1.000    2.16 | 4.083    3.46 | 7.167    6.91 | 10.25    3.02
1.083    2.16 | 4.167    3.46 | 7.250    6.91 | 10.33    1.73
1.167    2.16 | 4.250    3.46 | 7.333    5.18 | 10.42    1.73
1.250    2.16 | 4.333    5.18 | 7.417    5.18 | 10.50    1.73
1.333    2.16 | 4.417    5.18 | 7.500    5.18 | 10.58    1.73
1.417    2.16 | 4.500    5.18 | 7.583    5.18 | 10.67    1.73
1.500    2.16 | 4.583    5.18 | 7.667    5.18 | 10.75    1.73
1.583    2.16 | 4.667    5.18 | 7.750    5.18 | 10.83    1.73
1.667    2.16 | 4.750    5.18 | 7.833    5.18 | 10.92    1.73
1.750    2.16 | 4.833    6.91 | 7.917    5.18 | 11.00    1.73
1.833    2.16 | 4.917    6.91 | 8.000    5.18 | 11.08    1.73
1.917    2.16 | 5.000    6.91 | 8.083    5.18 | 11.17    1.73
2.000    2.16 | 5.083    6.91 | 8.167    5.18 | 11.25    1.73
2.083    2.16 | 5.167    6.91 | 8.250    5.18 | 11.33    1.73
2.167    2.16 | 5.250    6.91 | 8.333    3.02 | 11.42    1.73
2.250    2.16 | 5.333   10.37 | 8.417    3.02 | 11.50    1.73
2.333    2.59 | 5.417   10.37 | 8.500    3.02 | 11.58    1.73
2.417    2.59 | 5.500   10.37 | 8.583    3.02 | 11.67    1.73
2.500    2.59 | 5.583   10.37 | 8.667    3.02 | 11.75    1.73
2.583    2.59 | 5.667   10.37 | 8.750    3.02 | 11.83    1.73
2.667    2.59 | 5.750   10.37 | 8.833    3.02 | 11.92    1.73
2.750    2.59 | 5.833   41.47 | 8.917    3.02 | 12.00    1.73
2.833    2.59 | 5.917   41.47 | 9.000    3.02 | 12.08    1.73
2.917    2.59 | 6.000   41.47 | 9.083    3.02 | 12.17    1.73
3.000    2.59 | 6.083  114.05 | 9.167    3.02 | 12.25    1.73
3.083    2.59 | 6.167  114.05 | 9.250    3.02 |

    Max.Eff.Inten.(mm/hr)=     114.05        66.34
              over (min)         5.00        15.00
    Storage Coeff.  (min)=       3.11 (ii)   11.42 (ii)
    Unit Hyd. Tpeak (min)=       5.00        15.00
    Unit Hyd. peak  (cms)=       0.27         0.09
                                                    *TOTALS*
    PEAK FLOW       (cms)=       0.38         0.20          0.551 (iii)
    TIME TO PEAK    (hrs)=       6.25         6.33           6.25
    RUNOFF VOLUME    (mm)=      85.40        31.21          50.18
    TOTAL RAINFALL   (mm)=      86.40        86.40          86.40
    RUNOFF COEFFICIENT   =       0.99         0.36           0.58

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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.

--------------------------------------------------------------------------------
-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0033):     0.41   0.044     6.33    36.17
     + ID2= 2 (  0036):     5.32   0.542     6.42    50.18
       ================================================
       ID = 3 (  0041):     5.73   0.582     6.33    49.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     5.73   0.582     6.33    49.17
     + ID2= 2 (  0037):     0.65   0.081     6.25    34.01
       ================================================
       ID = 1 (  0041):     6.38   0.654     6.33    47.63

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0041):     6.38   0.654     6.33    47.63
     + ID2= 2 (  0038):     1.56   0.150     6.33    34.22
       ================================================
       ID = 3 (  0041):     7.94   0.804     6.33    44.99

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     7.94   0.804     6.33    44.99
     + ID2= 2 (  0040):     3.43   0.551     6.25    50.18
       ================================================
       ID = 1 (  0041):    11.37   1.277     6.25    46.56

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0032)|
|   1 +  2 =  3    |        AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0039):     0.83   0.092     6.33    36.15
     + ID2= 2 (  0041):    11.37   1.277     6.25    46.56
       ================================================
       ID = 3 (  0032):    12.20   1.364     6.25    45.85

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

    Unit Hyd Qpeak  (cms)=   0.271

    PEAK FLOW       (cms)=   0.150 (i)
    TIME TO PEAK    (hrs)=   6.333
    RUNOFF VOLUME    (mm)=  34.220
    TOTAL RAINFALL   (mm)=  86.400
    RUNOFF COEFFICIENT   =   0.396

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

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0040)|   Area    (ha)=   3.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       1.71        1.71
    Dep. Storage     (mm)=       1.00        5.00
    Average Slope     (%)=       1.00        2.00
    Length            (m)=     151.22       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    2.59 | 6.250  114.05 |  9.33    3.02
0.167    0.00 | 3.250    2.59 | 6.333   15.55 |  9.42    3.02
0.250    0.00 | 3.333    3.46 | 6.417   15.55 |  9.50    3.02
0.333    2.16 | 3.417    3.46 | 6.500   15.55 |  9.58    3.02
0.417    2.16 | 3.500    3.46 | 6.583   15.55 |  9.67    3.02
0.500    2.16 | 3.583    3.46 | 6.667   15.55 |  9.75    3.02
0.583    2.16 | 3.667    3.46 | 6.750   15.55 |  9.83    3.02
0.667    2.16 | 3.750    3.46 | 6.833    6.91 |  9.92    3.02
0.750    2.16 | 3.833    3.46 | 6.917    6.91 | 10.00    3.02
0.833    2.16 | 3.917    3.46 | 7.000    6.91 | 10.08    3.02
0.917    2.16 | 4.000    3.46 | 7.083    6.91 | 10.17    3.02
1.000    2.16 | 4.083    3.46 | 7.167    6.91 | 10.25    3.02
1.083    2.16 | 4.167    3.46 | 7.250    6.91 | 10.33    1.73
1.167    2.16 | 4.250    3.46 | 7.333    5.18 | 10.42    1.73
```

```
--------------------------------------------------------------------------------
================================================================================
======================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       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 M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.


                  *****  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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\31c89148-d84a-4193-b080-5177fa
  Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\31c89148-d84a-4193-b080-5177fa


DATE: 06-15-2023                          TIME: 02:15:49

USER:


COMMENTS: _____________________________________________________


--------------------------------------------------------------------------------
------------------------
  ************************************************
  ** SIMULATION : 100yr 12hr 15min SCS          **
  ************************************************


--------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\c34a575a

| Ptotal= 96.00 mm |    Comments: created from IDF Group New IDFGroup - 2
--------------------
                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    3.84 |  6.50   17.28 |  9.75    3.36
                0.25    2.40 |  3.50    3.84 |  6.75    7.68 | 10.00    3.36
                0.50    2.40 |  3.75    3.84 |  7.00    7.68 | 10.25    1.92
                0.75    2.40 |  4.00    3.84 |  7.25    5.76 | 10.50    1.92
                1.00    2.40 |  4.25    5.76 |  7.50    5.76 | 10.75    1.92
                1.25    2.40 |  4.50    5.76 |  7.75    5.76 | 11.00    1.92
                1.50    2.40 |  4.75    7.68 |  8.00    5.76 | 11.25    1.92
                1.75    2.40 |  5.00    7.68 |  8.25    3.36 | 11.50    1.92
                2.00    2.40 |  5.25   11.52 |  8.50    3.36 | 11.75    1.92
                2.25    2.88 |  5.50   11.52 |  8.75    3.36 | 12.00    1.92
                2.50    2.88 |  5.75   46.08 |  9.00    3.36 |
                2.75    2.88 |  6.00  126.72 |  9.25    3.36 |
                3.00    2.88 |  6.25   17.28 |  9.50    3.36 |

--------------------------------------------------------------------------------

--------------------
| CALIB            |
| STANDHYD (   0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.81         2.81
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     193.56        10.00
     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    2.88 | 6.250  126.72 |  9.33    3.36
               0.167    0.00 | 3.250    2.88 | 6.333   17.28 |  9.42    3.36
               0.250    0.00 | 3.333    3.84 | 6.417   17.28 |  9.50    3.36
               0.333    2.40 | 3.417    3.84 | 6.500   17.28 |  9.58    3.36
               0.417    2.40 | 3.500    3.84 | 6.583   17.28 |  9.67    3.36
               0.500    2.40 | 3.583    3.84 | 6.667   17.28 |  9.75    3.36
               0.583    2.40 | 3.667    3.84 | 6.750   17.28 |  9.83    3.36
               0.667    2.40 | 3.750    3.84 | 6.833    7.68 |  9.92    3.36
               0.750    2.40 | 3.833    3.84 | 6.917    7.68 | 10.00    3.36
               0.833    2.40 | 3.917    3.84 | 7.000    7.68 | 10.08    3.36
               0.917    2.40 | 4.000    3.84 | 7.083    7.68 | 10.17    3.36
               1.000    2.40 | 4.083    3.84 | 7.167    7.68 | 10.25    3.36
               1.083    2.40 | 4.167    3.84 | 7.250    7.68 | 10.33    1.92
               1.167    2.40 | 4.250    3.84 | 7.333    5.76 | 10.42    1.92
               1.250    2.40 | 4.333    5.76 | 7.417    5.76 | 10.50    1.92
               1.333    2.40 | 4.417    5.76 | 7.500    5.76 | 10.58    1.92
               1.417    2.40 | 4.500    5.76 | 7.583    5.76 | 10.67    1.92
               1.500    2.40 | 4.583    5.76 | 7.667    5.76 | 10.75    1.92
               1.583    2.40 | 4.667    5.76 | 7.750    5.76 | 10.83    1.92
               1.667    2.40 | 4.750    5.76 | 7.833    5.76 | 10.92    1.92
               1.750    2.40 | 4.833    7.68 | 7.917    5.76 | 11.00    1.92
               1.833    2.40 | 4.917    7.68 | 8.000    5.76 | 11.08    1.92
               1.917    2.40 | 5.000    7.68 | 8.083    5.76 | 11.17    1.92
               2.000    2.40 | 5.083    7.68 | 8.167    5.76 | 11.25    1.92
               2.083    2.40 | 5.167    7.68 | 8.250    5.76 | 11.33    1.92
               2.167    2.40 | 5.250    7.68 | 8.333    3.36 | 11.42    1.92
               2.250    2.40 | 5.333   11.52 | 8.417    3.36 | 11.50    1.92
               2.333    2.88 | 5.417   11.52 | 8.500    3.36 | 11.58    1.92
               2.417    2.88 | 5.500   11.52 | 8.583    3.36 | 11.67    1.92
               2.500    2.88 | 5.583   11.52 | 8.667    3.36 | 11.75    1.92
               2.583    2.88 | 5.667   11.52 | 8.750    3.36 | 11.83    1.92
               2.667    2.88 | 5.750   11.52 | 8.833    3.36 | 11.92    1.92
               2.750    2.88 | 5.833   46.08 | 8.917    3.36 | 12.00    1.92
               2.833    2.88 | 5.917   46.08 | 9.000    3.36 | 12.08    1.92
               2.917    2.88 | 6.000   46.08 | 9.083    3.36 | 12.17    1.92
               3.000    2.88 | 6.083  126.72 | 9.167    3.36 | 12.25    1.92
               3.083    2.88 | 6.167  126.72 | 9.250    3.36 |

     Max.Eff.Inten.(mm/hr)=     126.72        79.06
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.45 (ii)    6.68 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.26         0.14
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.69         0.50          1.185 (iii)
     TIME TO PEAK    (hrs)=       6.25         6.25           6.25
     RUNOFF VOLUME    (mm)=      95.00        37.26          57.47
     TOTAL RAINFALL   (mm)=      96.00        96.00          96.00
     RUNOFF COEFFICIENT   =       0.99         0.39           0.60

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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            |
| NASHYD   (   0022)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

        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    2.88 | 6.250  126.72 |  9.33    3.36
               0.167    0.00 | 3.250    2.88 | 6.333   17.28 |  9.42    3.36
               0.250    0.00 | 3.333    3.84 | 6.417   17.28 |  9.50    3.36
               0.333    2.40 | 3.417    3.84 | 6.500   17.28 |  9.58    3.36
               0.417    2.40 | 3.500    3.84 | 6.583   17.28 |  9.67    3.36
               0.500    2.40 | 3.583    3.84 | 6.667   17.28 |  9.75    3.36
               0.583    2.40 | 3.667    3.84 | 6.750   17.28 |  9.83    3.36
               0.667    2.40 | 3.750    3.84 | 6.833    7.68 |  9.92    3.36
               0.750    2.40 | 3.833    3.84 | 6.917    7.68 | 10.00    3.36
               0.833    2.40 | 3.917    3.84 | 7.000    7.68 | 10.08    3.36
               0.917    2.40 | 4.000    3.84 | 7.083    7.68 | 10.17    3.36
               1.000    2.40 | 4.083    3.84 | 7.167    7.68 | 10.25    3.36
               1.083    2.40 | 4.167    3.84 | 7.250    7.68 | 10.33    1.92
               1.167    2.40 | 4.250    3.84 | 7.333    5.76 | 10.42    1.92
               1.250    2.40 | 4.333    5.76 | 7.417    5.76 | 10.50    1.92
               1.333    2.40 | 4.417    5.76 | 7.500    5.76 | 10.58    1.92
               1.417    2.40 | 4.500    5.76 | 7.583    5.76 | 10.67    1.92
               1.500    2.40 | 4.583    5.76 | 7.667    5.76 | 10.75    1.92
               1.583    2.40 | 4.667    5.76 | 7.750    5.76 | 10.83    1.92
               1.667    2.40 | 4.750    5.76 | 7.833    5.76 | 10.92    1.92
               1.750    2.40 | 4.833    7.68 | 7.917    5.76 | 11.00    1.92
               1.833    2.40 | 4.917    7.68 | 8.000    5.76 | 11.08    1.92
               1.917    2.40 | 5.000    7.68 | 8.083    5.76 | 11.17    1.92
               2.000    2.40 | 5.083    7.68 | 8.167    5.76 | 11.25    1.92
               2.083    2.40 | 5.167    7.68 | 8.250    5.76 | 11.33    1.92
               2.167    2.40 | 5.250    7.68 | 8.333    3.36 | 11.42    1.92
               2.250    2.40 | 5.333   11.52 | 8.417    3.36 | 11.50    1.92
               2.333    2.88 | 5.417   11.52 | 8.500    3.36 | 11.58    1.92
               2.417    2.88 | 5.500   11.52 | 8.583    3.36 | 11.67    1.92
               2.500    2.88 | 5.583   11.52 | 8.667    3.36 | 11.75    1.92
               2.583    2.88 | 5.667   11.52 | 8.750    3.36 | 11.83    1.92
               2.667    2.88 | 5.750   11.52 | 8.833    3.36 | 11.92    1.92
               2.750    2.88 | 5.833   46.08 | 8.917    3.36 | 12.00    1.92
               2.833    2.88 | 5.917   46.08 | 9.000    3.36 | 12.08    1.92
               2.917    2.88 | 6.000   46.08 | 9.083    3.36 | 12.17    1.92
               3.000    2.88 | 6.083  126.72 | 9.167    3.36 | 12.25    1.92
               3.083    2.88 | 6.167  126.72 | 9.250    3.36 |

     Unit Hyd Qpeak  (cms)=   0.167

     PEAK FLOW       (cms)=   0.110 (i)
     TIME TO PEAK    (hrs)=   6.333
     RUNOFF VOLUME    (mm)=  43.235
     TOTAL RAINFALL   (mm)=  96.000
     RUNOFF COEFFICIENT   =   0.450

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

CALIB					
NASHYD (0023)	Area	(ha)=	0.41	Curve Number	(CN)= 75.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.20		

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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.181 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 41.047
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.428

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

CALIB					
NASHYD (0031)	Area	(ha)=	0.65	Curve Number	(CN)= 73.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.14		

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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 43.252
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.451

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

CALIB					
NASHYD (0030)	Area	(ha)=	1.56	Curve Number	(CN)= 73.0
ID= 1 DT= 5.0 min	Ia	(mm)=	10.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.22		

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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.098 (i)
TIME TO PEAK (hrs)= 6.250
RUNOFF VOLUME (mm)= 40.793
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.425

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

CALIB					
STANDHYD (0005)	Area	(ha)=	5.32		
ID= 1 DT= 5.0 min	Total Imp(%)=		50.00	Dir. Conn.(%)=	35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36

0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Max.Eff.Inten.(mm/hr)=	126.72	79.06	
over (min)	15.00	25.00	
Storage Coeff. (min)=	13.53 (ii)	23.07 (ii)	
Unit Hyd. Tpeak (min)=	15.00	25.00	
Unit Hyd. peak (cms)=	0.08	0.05	
			TOTALS
PEAK FLOW (cms)=	0.44	0.25	0.631 (iii)
TIME TO PEAK (hrs)=	6.33	6.50	6.42
RUNOFF VOLUME (mm)=	95.00	37.26	57.47
TOTAL RAINFALL (mm)=	96.00	96.00	96.00
RUNOFF COEFFICIENT =	0.99	0.39	0.60

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (0028)	Area (ha)= 3.43
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92

2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Max.Eff.Inten.(mm/hr)=	126.72	79.06	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.98 (ii)	10.73 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.28	0.09	
			TOTALS
PEAK FLOW (cms)=	0.42	0.24	0.634 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	95.00	37.26	57.47
TOTAL RAINFALL (mm)=	96.00	96.00	96.00
RUNOFF COEFFICIENT =	0.99	0.39	0.60

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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(0029)	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	0.0900	0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0028)	3.430	0.634	6.25	57.47
OUTFLOW: ID= 1 (0029)	3.430	0.083	6.92	57.37

PEAK FLOW REDUCTION [Qout/Qin](%)= 13.04
TIME SHIFT OF PEAK FLOW (min)= 40.00
MAXIMUM STORAGE USED (ha.m.)= 0.1102

ADD HYD (0007)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0023):	0.41	0.053	6.33	43.25
+ ID2= 2 (0029):	3.43	0.083	6.92	57.37
ID = 3 (0007):	3.84	0.118	6.33	55.86

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1				
ID1= 3 (0007):	3.84	0.118	6.33	55.86
+ ID2= 2 (0030):	1.56	0.181	6.33	41.05
ID = 1 (0007):	5.40	0.299	6.33	51.58

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0007):	5.40	0.299	6.33	51.58
+ ID2= 2 (0031):	0.65	0.098	6.25	40.79
ID = 3 (0007):	6.05	0.385	6.33	50.42

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
3 + 2 = 1				
ID1= 3 (0007):	6.05	0.385	6.33	50.42
+ ID2= 2 (0005):	5.32	0.631	6.42	57.47
ID = 1 (0007):	11.37	1.010	6.33	53.72

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	0.4220	0.1535
	0.0410	0.0120	0.4630	0.1758
	0.0580	0.0253	0.6510	0.1989
	0.0710	0.0399	0.7480	0.2228
	0.0830	0.0559	0.8280	0.2476
	0.0920	0.0732	0.8990	0.2733
	0.2500	0.0918	0.9640	0.2998
	0.3200	0.1116	1.0240	0.3263

	0.3750	0.1321	|	1.0800	0.3528		

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	11.370	1.010	6.33	53.72
OUTFLOW: ID= 1 (0008)	11.370	0.436	6.92	53.71

PEAK FLOW REDUCTION [Qout/Qin](%)= 43.17
TIME SHIFT OF PEAK FLOW (min)= 35.00
MAXIMUM STORAGE USED (ha.m.)= 0.1614

ADD HYD (0016)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	0.83	0.110	6.33	43.23
+ ID2= 2 (0008):	11.37	0.436	6.92	53.71
ID = 3 (0016):	12.20	0.467	6.75	53.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0019)	Area (ha)=	12.20	Curve Number (CN)=	64.0	
ID= 1 DT= 5.0 min	Ia (mm)=	6.90	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.61			

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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Unit Hyd Qpeak (cms)= 0.764

PEAK FLOW (cms)= 0.560 (i)
TIME TO PEAK (hrs)= 6.833
RUNOFF VOLUME (mm)= 34.222
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.356

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

CALIB					
NASHYD (0039)	Area (ha)=	0.83	Curve Number (CN)=	75.0	
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.19			

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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.110 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 43.235
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.450

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

CALIB					
NASHYD (0033)	Area (ha)=	0.41	Curve Number (CN)=	75.0	
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.053 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 43.252
TOTAL RAINFALL (mm)= 96.000
RUNOFF COEFFICIENT = 0.451

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

CALIB	
STANDHYD (0036)	Area (ha)= 5.32
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW	(cms)=	0.098 (i)
TIME TO PEAK	(hrs)=	6.250
RUNOFF VOLUME	(mm)=	40.793
TOTAL RAINFALL	(mm)=	96.000
RUNOFF COEFFICIENT	=	0.425

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

CALIB	
NASHYD (0038)	Area (ha)= 1.56 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.22

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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Max.Eff.Inten.(mm/hr)=		126.72	79.06
over (min)		15.00	25.00
Storage Coeff. (min)=		13.53 (ii)	23.07 (ii)
Unit Hyd. Tpeak (min)=		15.00	25.00
Unit Hyd. peak (cms)=		0.08	0.05
			TOTALS
PEAK FLOW	(cms)=	0.44	0.25 0.631 (iii)
TIME TO PEAK	(hrs)=	6.33	6.50 6.42
RUNOFF VOLUME	(mm)=	95.00	37.26 57.47
TOTAL RAINFALL	(mm)=	96.00	96.00 96.00
RUNOFF COEFFICIENT	=	0.99	0.39 0.60

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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	
NASHYD (0037)	Area (ha)= 0.65 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.14

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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW	(cms)=	0.181 (i)
TIME TO PEAK	(hrs)=	6.333
RUNOFF VOLUME	(mm)=	41.047
TOTAL RAINFALL	(mm)=	96.000
RUNOFF COEFFICIENT	=	0.428

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

CALIB	
STANDHYD (0040)	Area (ha)= 3.43
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	2.88	6.250	126.72	9.33	3.36
0.167	0.00	3.250	2.88	6.333	17.28	9.42	3.36
0.250	0.00	3.333	3.84	6.417	17.28	9.50	3.36
0.333	2.40	3.417	3.84	6.500	17.28	9.58	3.36
0.417	2.40	3.500	3.84	6.583	17.28	9.67	3.36
0.500	2.40	3.583	3.84	6.667	17.28	9.75	3.36
0.583	2.40	3.667	3.84	6.750	17.28	9.83	3.36
0.667	2.40	3.750	3.84	6.833	7.68	9.92	3.36
0.750	2.40	3.833	3.84	6.917	7.68	10.00	3.36
0.833	2.40	3.917	3.84	7.000	7.68	10.08	3.36
0.917	2.40	4.000	3.84	7.083	7.68	10.17	3.36
1.000	2.40	4.083	3.84	7.167	7.68	10.25	3.36
1.083	2.40	4.167	3.84	7.250	7.68	10.33	1.92
1.167	2.40	4.250	3.84	7.333	5.76	10.42	1.92
1.250	2.40	4.333	5.76	7.417	5.76	10.50	1.92
1.333	2.40	4.417	5.76	7.500	5.76	10.58	1.92
1.417	2.40	4.500	5.76	7.583	5.76	10.67	1.92
1.500	2.40	4.583	5.76	7.667	5.76	10.75	1.92
1.583	2.40	4.667	5.76	7.750	5.76	10.83	1.92
1.667	2.40	4.750	5.76	7.833	5.76	10.92	1.92
1.750	2.40	4.833	7.68	7.917	5.76	11.00	1.92
1.833	2.40	4.917	7.68	8.000	5.76	11.08	1.92
1.917	2.40	5.000	7.68	8.083	5.76	11.17	1.92
2.000	2.40	5.083	7.68	8.167	5.76	11.25	1.92
2.083	2.40	5.167	7.68	8.250	5.76	11.33	1.92
2.167	2.40	5.250	7.68	8.333	3.36	11.42	1.92
2.250	2.40	5.333	11.52	8.417	3.36	11.50	1.92
2.333	2.88	5.417	11.52	8.500	3.36	11.58	1.92
2.417	2.88	5.500	11.52	8.583	3.36	11.67	1.92
2.500	2.88	5.583	11.52	8.667	3.36	11.75	1.92
2.583	2.88	5.667	11.52	8.750	3.36	11.83	1.92
2.667	2.88	5.750	11.52	8.833	3.36	11.92	1.92
2.750	2.88	5.833	46.08	8.917	3.36	12.00	1.92
2.833	2.88	5.917	46.08	9.000	3.36	12.08	1.92
2.917	2.88	6.000	46.08	9.083	3.36	12.17	1.92
3.000	2.88	6.083	126.72	9.167	3.36	12.25	1.92
3.083	2.88	6.167	126.72	9.250	3.36		

			TOTALS
Max.Eff.Inten.(mm/hr)=	126.72	79.06	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.98 (ii)	10.73 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.28	0.09	
PEAK FLOW (cms)=	0.42	0.24	0.634 (iii)
TIME TO PEAK (hrs)=	6.25	6.33	6.25
RUNOFF VOLUME (mm)=	95.00	37.26	57.47
TOTAL RAINFALL (mm)=	96.00	96.00	96.00
RUNOFF COEFFICIENT =	0.99	0.39	0.60

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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.

ADD HYD (0041)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0033):	0.41	0.053	6.33	43.25
+ ID2= 2 (0036):	5.32	0.631	6.42	57.47
ID = 3 (0041):	5.73	0.679	6.33	56.45

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0041):	5.73	0.679	6.33	56.45
+ ID2= 2 (0037):	0.65	0.098	6.25	40.79
ID = 1 (0041):	6.38	0.765	6.33	54.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0041):	6.38	0.765	6.33	54.85
+ ID2= 2 (0038):	1.56	0.181	6.33	41.05
ID = 3 (0041):	7.94	0.946	6.33	52.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)					
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0041):	7.94	0.946	6.33	52.14
+ ID2= 2 (0040):	3.43	0.634	6.25	57.47
ID = 1 (0041):	11.37	1.490	6.25	53.75

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0039):	0.83	0.110	6.33	43.23
+ ID2= 2 (0041):	11.37	1.490	6.25	53.75
ID = 3 (0032):	12.20	1.595	6.25	53.03

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.
```

***** 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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\f82b2933-6454-44e7-825f-1f59f9

Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\f82b2933-6454-44e7-825f-1f59f9

DATE: 06-15-2023 TIME: 02:15:46

USER:

COMMENTS: _____

```
  ************************************************
  ** SIMULATION : 2-002yr 4hr 10min Chicago     **
  ************************************************
```

READ STORM	Filename: C:\Users\r.rajachockalingam\AppData\Local\Temp\073789e9-0d0b-43a3-ada4-078b0c00e084\36b3cd67
Ptotal= 31.29 mm	Comments: created from IDF Group New IDFGroup - 2

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.45	1.00	13.68	2.00	5.08	3.00	2.85
0.17	2.76	1.17	71.35	2.17	4.44	3.17	2.67
0.33	3.17	1.33	17.30	2.33	3.96	3.33	2.52
0.50	3.78	1.50	10.08	2.50	3.59	3.50	2.39
0.67	4.76	1.67	7.43	2.67	3.30	3.67	2.27
0.83	6.70	1.83	5.99	2.83	3.05	3.83	2.16

CALIB		
STANDHYD (0006)	Area (ha)=	5.62
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.81	2.81
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	193.56	10.00
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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Max.Eff.Inten.(mm/hr)=	71.35	10.26	
over (min)	5.00	10.00	
Storage Coeff. (min)=	4.35 (ii)	8.40 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.23	0.12	
			TOTALS
PEAK FLOW (cms)=	0.36	0.06	0.398 (iii)
TIME TO PEAK (hrs)=	1.33	1.42	1.33
RUNOFF VOLUME (mm)=	30.29	4.61	13.60
TOTAL RAINFALL (mm)=	31.29	31.29	31.29
RUNOFF COEFFICIENT =	0.97	0.15	0.43

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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			
NASHYD (0022)	Area (ha)=	0.83	Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.19	

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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 4.268
TOTAL RAINFALL (mm)= 31.287
RUNOFF COEFFICIENT = 0.136

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

CALIB			
NASHYD (0030)	Area (ha)=	1.56	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.22	

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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 3.927
TOTAL RAINFALL (mm)= 31.287
RUNOFF COEFFICIENT = 0.126

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

CALIB			
NASHYD (0031)	Area (ha)=	0.65	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14	

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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 3.902
TOTAL RAINFALL (mm)= 31.287
RUNOFF COEFFICIENT = 0.125

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

CALIB			
STANDHYD (0005)	Area (ha)=	5.32	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

```
     Max.Eff.Inten.(mm/hr)=      44.33         5.85
               over (min)       20.00        50.00
     Storage Coeff.  (min)=     20.59 (ii)   47.63 (ii)
     Unit Hyd. Tpeak (min)=     20.00        50.00
     Unit Hyd. peak  (cms)=      0.06         0.02
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.15         0.02          0.153 (iii)
     TIME TO PEAK    (hrs)=      1.58         2.25           1.58
     RUNOFF VOLUME    (mm)=     30.29         4.61          13.59
     TOTAL RAINFALL   (mm)=     31.29        31.29          31.29
     RUNOFF COEFFICIENT   =      0.97         0.15           0.43


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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 (  0028)|   Area    (ha)=   3.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71         1.71
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     151.22        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    2.45 | 1.083   13.68 | 2.083    5.08 |  3.08    2.85
 0.167    2.45 | 1.167   13.68 | 2.167    5.08 |  3.17    2.85
 0.250    2.76 | 1.250   71.35 | 2.250    4.44 |  3.25    2.67
 0.333    2.76 | 1.333   71.35 | 2.333    4.44 |  3.33    2.67
 0.417    3.17 | 1.417   17.30 | 2.417    3.96 |  3.42    2.52
 0.500    3.17 | 1.500   17.30 | 2.500    3.96 |  3.50    2.52
 0.583    3.78 | 1.583   10.08 | 2.583    3.59 |  3.58    2.39
 0.667    3.78 | 1.667   10.08 | 2.667    3.59 |  3.67    2.39
 0.750    4.76 | 1.750    7.43 | 2.750    3.30 |  3.75    2.27
 0.833    4.76 | 1.833    7.43 | 2.833    3.30 |  3.83    2.27
 0.917    6.70 | 1.917    5.99 | 2.917    3.05 |  3.92    2.16
 1.000    6.70 | 2.000    5.99 | 3.000    3.05 |  4.00    2.16

     Max.Eff.Inten.(mm/hr)=      71.35         6.44
               over (min)        5.00        25.00
     Storage Coeff.  (min)=      3.75 (ii)   24.89 (ii)
     Unit Hyd. Tpeak (min)=      5.00        25.00
     Unit Hyd. peak  (cms)=      0.25         0.05
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.22         0.02          0.228 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=     30.29         4.61          13.60
     TOTAL RAINFALL   (mm)=     31.29        31.29          31.29
     RUNOFF COEFFICIENT   =      0.97         0.15           0.43

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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(  0029)|     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   |   0.0900     0.1200

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0028)     3.430     0.228      1.33      13.60
   OUTFLOW: ID= 1 (  0029)     3.430     0.021      2.67      13.50

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.25
                TIME SHIFT OF PEAK FLOW         (min)= 80.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0281

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.41   0.004     1.58     4.27
     + ID2= 2 (  0029):     3.43   0.021     2.67    13.50
       ================================================
       ID = 3 (  0007):     3.84   0.023     2.42    12.51

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     3.84   0.023     2.42    12.51
     + ID2= 2 (  0030):     1.56   0.012     1.67     3.93
       ================================================
       ID = 1 (  0007):     5.40   0.033     1.67    10.03

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     5.40   0.033     1.67    10.03
     + ID2= 2 (  0031):     0.65   0.006     1.50     3.90
       ================================================
       ID = 3 (  0007):     6.05   0.038     1.67     9.37

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.038     1.67     9.37
     + ID2= 2 (  0005):     5.32   0.153     1.58    13.59
       ================================================
       ID = 1 (  0007):    11.37   0.190     1.58    11.35

    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   |   0.4220     0.1535
                         0.0410     0.0120   |   0.4630     0.1758
                         0.0580     0.0253   |   0.6510     0.1989
                         0.0710     0.0399   |   0.7480     0.2228
                         0.0830     0.0559   |   0.8280     0.2476
                         0.0920     0.0732   |   0.8990     0.2733
                         0.2500     0.0918   |   0.9640     0.2998
                         0.3200     0.1116   |   1.0240     0.3263
                         0.3750     0.1321   |   1.0800     0.3528

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0007)    11.370     0.190      1.58      11.35

   OUTFLOW: ID= 1 (  0008)    11.370     0.070      2.83      11.34

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 36.70
                TIME SHIFT OF PEAK FLOW         (min)= 75.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0387

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     0.83   0.007     1.58     4.27
     + ID2= 2 (  0008):    11.37   0.070     2.83    11.34
       ================================================
       ID = 3 (  0016):    12.20   0.073     2.75    10.86

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0019)|   Area    (ha)=  12.20   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.90   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.61

        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    2.45 | 1.083   13.68 | 2.083    5.08 |  3.08    2.85
 0.167    2.45 | 1.167   13.68 | 2.167    5.08 |  3.17    2.85
 0.250    2.76 | 1.250   71.35 | 2.250    4.44 |  3.25    2.67
 0.333    2.76 | 1.333   71.35 | 2.333    4.44 |  3.33    2.67
 0.417    3.17 | 1.417   17.30 | 2.417    3.96 |  3.42    2.52
 0.500    3.17 | 1.500   17.30 | 2.500    3.96 |  3.50    2.52
 0.583    3.78 | 1.583   10.08 | 2.583    3.59 |  3.58    2.39
 0.667    3.78 | 1.667   10.08 | 2.667    3.59 |  3.67    2.39
 0.750    4.76 | 1.750    7.43 | 2.750    3.30 |  3.75    2.27
 0.833    4.76 | 1.833    7.43 | 2.833    3.30 |  3.83    2.27
 0.917    6.70 | 1.917    5.99 | 2.917    3.05 |  3.92    2.16
 1.000    6.70 | 2.000    5.99 | 3.000    3.05 |  4.00    2.16

     Unit Hyd Qpeak  (cms)=   0.764

     PEAK FLOW       (cms)=   0.053 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=   3.556
     TOTAL RAINFALL   (mm)=  31.287
     RUNOFF COEFFICIENT   =   0.114
```

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

CALIB									
NASHYD (0039)	Area (ha)= 0.83	Curve Number (CN)= 75.0							
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00							
	U.H. Tp(hrs)= 0.19								

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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.007 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 4.266
TOTAL RAINFALL (mm)= 31.287
RUNOFF COEFFICIENT = 0.136

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

CALIB									
NASHYD (0033)	Area (ha)= 0.41	Curve Number (CN)= 75.0							
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00							
	U.H. Tp(hrs)= 0.20								

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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 4.268
TOTAL RAINFALL (mm)= 31.287
RUNOFF COEFFICIENT = 0.136

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

CALIB			
STANDHYD (0036)	Area (ha)= 5.32		
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 35.00	
	IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)= 2.66	2.66	
Dep. Storage	(mm)= 1.00	5.00	
Average Slope	(%)= 1.00	1.00	
Length	(m)= 188.33	40.00	
Mannings n	= 0.130	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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Max.Eff.Inten.(mm/hr)=	44.33	5.85	
over (min)	20.00	50.00	
Storage Coeff. (min)=	20.59 (ii)	47.63 (ii)	
Unit Hyd. Tpeak (min)=	20.00	50.00	
Unit Hyd. peak (cms)=	0.06	0.02	
			TOTALS
PEAK FLOW (cms)=	0.15	0.02	0.153 (iii)
TIME TO PEAK (hrs)=	1.58	2.25	1.58
RUNOFF VOLUME (mm)=	30.29	4.61	13.59
TOTAL RAINFALL (mm)=	31.29	31.29	31.29
RUNOFF COEFFICIENT =	0.97	0.15	0.43

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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									
NASHYD (0037)	Area (ha)= 0.65	Curve Number (CN)= 73.0							
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00							
	U.H. Tp(hrs)= 0.14								

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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 3.902

TOTAL RAINFALL (mm)= 31.287
RUNOFF COEFFICIENT = 0.125

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

CALIB									
NASHYD (0038)	Area (ha)= 1.56	Curve Number (CN)= 73.0							
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00							
	U.H. Tp(hrs)= 0.22								

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	2.45	1.083	13.68	2.083	5.08	3.08	2.85
0.167	2.45	1.167	13.68	2.167	5.08	3.17	2.85
0.250	2.76	1.250	71.35	2.250	4.44	3.25	2.67
0.333	2.76	1.333	71.35	2.333	4.44	3.33	2.67
0.417	3.17	1.417	17.30	2.417	3.96	3.42	2.52
0.500	3.17	1.500	17.30	2.500	3.96	3.50	2.52
0.583	3.78	1.583	10.08	2.583	3.59	3.58	2.39
0.667	3.78	1.667	10.08	2.667	3.59	3.67	2.39
0.750	4.76	1.750	7.43	2.750	3.30	3.75	2.27
0.833	4.76	1.833	7.43	2.833	3.30	3.83	2.27
0.917	6.70	1.917	5.99	2.917	3.05	3.92	2.16
1.000	6.70	2.000	5.99	3.000	3.05	4.00	2.16

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 3.927
TOTAL RAINFALL (mm)= 31.287
RUNOFF COEFFICIENT = 0.126

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

CALIB			
STANDHYD (0040)	Area (ha)= 3.43		
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 35.00	
	IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)= 1.71	1.71	
Dep. Storage	(mm)= 1.00	5.00	
Average Slope	(%)= 1.00	2.00	
Length	(m)= 151.22	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    2.45 | 1.083   13.68 | 2.083    5.08 |  3.08    2.85
               0.167    2.45 | 1.167   13.68 | 2.167    5.08 |  3.17    2.85
               0.250    2.76 | 1.250   71.35 | 2.250    4.44 |  3.25    2.67
               0.333    2.76 | 1.333   71.35 | 2.333    4.44 |  3.33    2.67
               0.417    3.17 | 1.417   17.30 | 2.417    3.96 |  3.42    2.52
               0.500    3.17 | 1.500   17.30 | 2.500    3.96 |  3.50    2.52
               0.583    3.78 | 1.583   10.08 | 2.583    3.59 |  3.58    2.39
               0.667    3.78 | 1.667   10.08 | 2.667    3.59 |  3.67    2.39
               0.750    4.76 | 1.750    7.43 | 2.750    3.30 |  3.75    2.27
               0.833    4.76 | 1.833    7.43 | 2.833    3.30 |  3.83    2.27
               0.917    6.70 | 1.917    5.99 | 2.917    3.05 |  3.92    2.16
               1.000    6.70 | 2.000    5.99 | 3.000    3.05 |  4.00    2.16

     Max.Eff.Inten.(mm/hr)=      71.35         6.44
               over (min)        5.00        25.00
     Storage Coeff.  (min)=       3.75 (ii)   24.89 (ii)
     Unit Hyd. Tpeak (min)=       5.00        25.00
     Unit Hyd. peak  (cms)=       0.25         0.05
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.02          0.228 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.67           1.33
     RUNOFF VOLUME    (mm)=      30.29         4.61          13.60
     TOTAL RAINFALL   (mm)=      31.29        31.29          31.29
     RUNOFF COEFFICIENT   =       0.97         0.15           0.43

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0033):     0.41   0.004     1.58     4.27
     + ID2= 2 (  0036):     5.32   0.153     1.58    13.59
       ================================================
       ID = 3 (  0041):     5.73   0.156     1.58    12.93

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     5.73   0.156     1.58    12.93
     + ID2= 2 (  0037):     0.65   0.006     1.50     3.90
       ================================================
       ID = 1 (  0041):     6.38   0.162     1.58    12.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0041):     6.38   0.162     1.58    12.01
     + ID2= 2 (  0038):     1.56   0.012     1.67     3.93
       ================================================
       ID = 3 (  0041):     7.94   0.173     1.58    10.42

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     7.94   0.173     1.58    10.42
     + ID2= 2 (  0040):     3.43   0.228     1.33    13.60
       ================================================
       ID = 1 (  0041):    11.37   0.317     1.33    11.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0032)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0039):     0.83   0.007     1.58     4.27
     + ID2= 2 (  0041):    11.37   0.317     1.33    11.38
       ================================================
       ID = 3 (  0032):    12.20   0.320     1.33    10.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
======================


      V    V   I    SSSSS  U   U    A    L             (v 6.2.2011)
      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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.


                  *****  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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\6a5948be-f7d0-4ef1-9bb6-200d1f
  Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\6a5948be-f7d0-4ef1-9bb6-200d1f


DATE: 06-15-2023                          TIME: 02:15:47

USER:



COMMENTS: _____


--------------------------------------------------------------------------------
-------------------------
  ************************************************
  ** SIMULATION : 2-005yr 4hr 10min Chicago     **
  ************************************************



--------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\e64c0150
| Ptotal= 41.38 mm |    Comments: created from IDF Group New IDFGroup - 2
--------------------
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.00    3.23 |  1.00   18.09 |  2.00    6.70 |  3.00    3.75
               0.17    3.63 |  1.17   94.66 |  2.17    5.86 |  3.17    3.52
               0.33    4.18 |  1.33   22.88 |  2.33    5.23 |  3.33    3.32
               0.50    4.98 |  1.50   13.31 |  2.50    4.74 |  3.50    3.14
               0.67    6.28 |  1.67    9.80 |  2.67    4.35 |  3.67    2.99
               0.83    8.85 |  1.83    7.91 |  2.83    4.02 |  3.83    2.85

--------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------

                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.81         2.81
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     193.56        10.00
     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    3.23 | 1.083   18.09 | 2.083    6.70 |  3.08    3.75
               0.167    3.23 | 1.167   18.09 | 2.167    6.70 |  3.17    3.75
               0.250    3.63 | 1.250   94.66 | 2.250    5.86 |  3.25    3.52
               0.333    3.63 | 1.333   94.66 | 2.333    5.86 |  3.33    3.52
               0.417    4.18 | 1.417   22.88 | 2.417    5.23 |  3.42    3.32
               0.500    4.18 | 1.500   22.88 | 2.500    5.23 |  3.50    3.32
               0.583    4.98 | 1.583   13.31 | 2.583    4.74 |  3.58    3.14
               0.667    4.98 | 1.667   13.31 | 2.667    4.74 |  3.67    3.14
               0.750    6.28 | 1.750    9.80 | 2.750    4.35 |  3.75    2.99
               0.833    6.28 | 1.833    9.80 | 2.833    4.35 |  3.83    2.99
               0.917    8.85 | 1.917    7.91 | 2.917    4.02 |  3.92    2.85
               1.000    8.85 | 2.000    7.91 | 3.000    4.02 |  4.00    2.85

     Max.Eff.Inten.(mm/hr)=      94.66        19.23
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.88 (ii)    7.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.25         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.49         0.11          0.567 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      40.38         8.13          19.42
     TOTAL RAINFALL   (mm)=      41.38        41.38          41.38
     RUNOFF COEFFICIENT   =       0.98         0.20           0.47
```

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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					
NASHYD (0022)	Area (ha)=	0.83	Curve Number (CN)=	75.0	
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.19			

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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.466
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.205

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

CALIB					
NASHYD (0023)	Area (ha)=	0.41	Curve Number (CN)=	75.0	
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.027 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 7.847
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.190

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

CALIB					
NASHYD (0031)	Area (ha)=	0.65	Curve Number (CN)=	73.0	
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.14			

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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 7.798
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.188

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

CALIB

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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.469
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.205

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

CALIB					
NASHYD (0030)	Area (ha)=	1.56	Curve Number (CN)=	73.0	
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.22			

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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99

STANDHYD (0005)	Area (ha)=	5.32		
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)=	35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Max.Eff.Inten.(mm/hr)=		58.77	13.48	
over (min)		20.00	40.00	
Storage Coeff. (min)=		18.39 (ii)	37.76 (ii)	
Unit Hyd. Tpeak (min)=		20.00	40.00	
Unit Hyd. peak (cms)=		0.06	0.03	
				TOTALS
PEAK FLOW	(cms)=	0.21	0.04	0.223 (iii)
TIME TO PEAK	(hrs)=	1.58	2.00	1.58
RUNOFF VOLUME	(mm)=	40.38	8.13	19.41
TOTAL RAINFALL	(mm)=	41.38	41.38	41.38
RUNOFF COEFFICIENT	=	0.98	0.20	0.47

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (0028)	Area (ha)= 3.43

```
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71         1.71
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     151.22        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    3.23 | 1.083   18.09 | 2.083    6.70 |  3.08    3.75
              0.167    3.23 | 1.167   18.09 | 2.167    6.70 |  3.17    3.75
              0.250    3.63 | 1.250   94.66 | 2.250    5.86 |  3.25    3.52
              0.333    3.63 | 1.333   94.66 | 2.333    5.86 |  3.33    3.52
              0.417    4.18 | 1.417   22.88 | 2.417    5.23 |  3.42    3.32
              0.500    4.18 | 1.500   22.88 | 2.500    5.23 |  3.50    3.32
              0.583    4.98 | 1.583   13.31 | 2.583    4.74 |  3.58    3.14
              0.667    4.98 | 1.667   13.31 | 2.667    4.74 |  3.67    3.14
              0.750    6.28 | 1.750    9.80 | 2.750    4.35 |  3.75    2.99
              0.833    6.28 | 1.833    9.80 | 2.833    4.35 |  3.83    2.99
              0.917    8.85 | 1.917    7.91 | 2.917    4.02 |  3.92    2.85
              1.000    8.85 | 2.000    7.91 | 3.000    4.02 |  4.00    2.85

     Max.Eff.Inten.(mm/hr)=     94.66        15.30
               over (min)        5.00        20.00
     Storage Coeff.  (min)=     3.35 (ii)   18.30 (ii)
     Unit Hyd. Tpeak (min)=     5.00        20.00
     Unit Hyd. peak  (cms)=     0.26         0.06
                                                      *TOTALS*
     PEAK FLOW       (cms)=     0.30         0.04        0.315 (iii)
     TIME TO PEAK    (hrs)=     1.33         1.58         1.33
     RUNOFF VOLUME    (mm)=    40.38         8.13        19.41
     TOTAL RAINFALL   (mm)=    41.38        41.38        41.38
     RUNOFF COEFFICIENT   =     0.98         0.20         0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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(  0029)|     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   |   0.0900     0.1200

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0028)      3.430      0.315      1.33      19.41
   OUTFLOW: ID= 1 (  0029)      3.430      0.030      2.58      19.32

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.66
                  TIME SHIFT OF PEAK FLOW         (min)= 75.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0406

-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.41   0.008     1.50     8.47
     + ID2= 2 (  0029):     3.43   0.030     2.58    19.32
       ==================================================
       ID = 3 (  0007):     3.84   0.033     2.17    18.16

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     3.84   0.033     2.17    18.16
     + ID2= 2 (  0030):     1.56   0.027     1.58     7.85
       ==================================================
       ID = 1 (  0007):     5.40   0.059     1.58    15.18

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     5.40   0.059     1.58    15.18
     + ID2= 2 (  0031):     0.65   0.014     1.42     7.80
       ==================================================
       ID = 3 (  0007):     6.05   0.071     1.58    14.39

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.071     1.58    14.39
     + ID2= 2 (  0005):     5.32   0.223     1.58    19.41
       ==================================================
       ID = 1 (  0007):    11.37   0.294     1.58    16.74

    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   |   0.4220     0.1535
                         0.0410     0.0120   |   0.4630     0.1758
                         0.0580     0.0253   |   0.6510     0.1989
                         0.0710     0.0399   |   0.7480     0.2228
                         0.0830     0.0559   |   0.8280     0.2476
                         0.0920     0.0732   |   0.8990     0.2733
                         0.2500     0.0918   |   0.9640     0.2998
                         0.3200     0.1116   |   1.0240     0.3263
                         0.3750     0.1321   |   1.0800     0.3528

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0007)     11.370      0.294      1.58      16.74
   OUTFLOW: ID= 1 (  0008)     11.370      0.089      3.17      16.73

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 30.25
                  TIME SHIFT OF PEAK FLOW         (min)= 95.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0674

-------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     0.83   0.017     1.50     8.47
     + ID2= 2 (  0008):    11.37   0.089     3.17    16.73
       ==================================================
       ID = 3 (  0016):    12.20   0.093     2.92    16.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
-------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0019)|   Area    (ha)=  12.20   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.90   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.61

        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    3.23 | 1.083   18.09 | 2.083    6.70 |  3.08    3.75
              0.167    3.23 | 1.167   18.09 | 2.167    6.70 |  3.17    3.75
              0.250    3.63 | 1.250   94.66 | 2.250    5.86 |  3.25    3.52
              0.333    3.63 | 1.333   94.66 | 2.333    5.86 |  3.33    3.52
              0.417    4.18 | 1.417   22.88 | 2.417    5.23 |  3.42    3.32
              0.500    4.18 | 1.500   22.88 | 2.500    5.23 |  3.50    3.32
              0.583    4.98 | 1.583   13.31 | 2.583    4.74 |  3.58    3.14
              0.667    4.98 | 1.667   13.31 | 2.667    4.74 |  3.67    3.14
              0.750    6.28 | 1.750    9.80 | 2.750    4.35 |  3.75    2.99
              0.833    6.28 | 1.833    9.80 | 2.833    4.35 |  3.83    2.99
              0.917    8.85 | 1.917    7.91 | 2.917    4.02 |  3.92    2.85
              1.000    8.85 | 2.000    7.91 | 3.000    4.02 |  4.00    2.85

     Unit Hyd Qpeak  (cms)=   0.764

     PEAK FLOW       (cms)=   0.105 (i)
     TIME TO PEAK    (hrs)=   2.167
     RUNOFF VOLUME    (mm)=   6.703
     TOTAL RAINFALL   (mm)=  41.381
     RUNOFF COEFFICIENT   =   0.162

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

-------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0039)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

        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    3.23 | 1.083   18.09 | 2.083    6.70 |  3.08    3.75
              0.167    3.23 | 1.167   18.09 | 2.167    6.70 |  3.17    3.75
              0.250    3.63 | 1.250   94.66 | 2.250    5.86 |  3.25    3.52
              0.333    3.63 | 1.333   94.66 | 2.333    5.86 |  3.33    3.52
              0.417    4.18 | 1.417   22.88 | 2.417    5.23 |  3.42    3.32
              0.500    4.18 | 1.500   22.88 | 2.500    5.23 |  3.50    3.32
              0.583    4.98 | 1.583   13.31 | 2.583    4.74 |  3.58    3.14
              0.667    4.98 | 1.667   13.31 | 2.667    4.74 |  3.67    3.14
              0.750    6.28 | 1.750    9.80 | 2.750    4.35 |  3.75    2.99
```

0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.466
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.205

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

CALIB
NASHYD (0033) | Area (ha)= 0.41 Curve Number (CN)= 75.0
ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.20

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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.469
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.205

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

CALIB
STANDHYD (0036) | Area (ha)= 5.32
ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.66	2.66
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	1.00
Length (m)=	188.33	40.00
Mannings n =	0.130	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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

			TOTALS
Max.Eff.Inten.(mm/hr)=	58.77	13.48	
over (min)	20.00	40.00	
Storage Coeff. (min)=	18.39 (ii)	37.76 (ii)	
Unit Hyd. Tpeak (min)=	20.00	40.00	
Unit Hyd. peak (cms)=	0.06	0.03	
PEAK FLOW (cms)=	0.21	0.04	0.223 (iii)
TIME TO PEAK (hrs)=	1.58	2.00	1.58
RUNOFF VOLUME (mm)=	40.38	8.13	19.41
TOTAL RAINFALL (mm)=	41.38	41.38	41.38
RUNOFF COEFFICIENT =	0.98	0.20	0.47

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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

NASHYD (0037) | Area (ha)= 0.65 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.14

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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.014 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 7.798
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.188

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

CALIB
NASHYD (0038) | Area (ha)= 1.56 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.027 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 7.847
TOTAL RAINFALL (mm)= 41.381
RUNOFF COEFFICIENT = 0.190

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

CALIB
STANDHYD (0040) | Area (ha)= 3.43
ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.71	1.71
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	151.22	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	3.23	1.083	18.09	2.083	6.70	3.08	3.75
0.167	3.23	1.167	18.09	2.167	6.70	3.17	3.75
0.250	3.63	1.250	94.66	2.250	5.86	3.25	3.52
0.333	3.63	1.333	94.66	2.333	5.86	3.33	3.52
0.417	4.18	1.417	22.88	2.417	5.23	3.42	3.32
0.500	4.18	1.500	22.88	2.500	5.23	3.50	3.32
0.583	4.98	1.583	13.31	2.583	4.74	3.58	3.14
0.667	4.98	1.667	13.31	2.667	4.74	3.67	3.14
0.750	6.28	1.750	9.80	2.750	4.35	3.75	2.99
0.833	6.28	1.833	9.80	2.833	4.35	3.83	2.99
0.917	8.85	1.917	7.91	2.917	4.02	3.92	2.85
1.000	8.85	2.000	7.91	3.000	4.02	4.00	2.85

Max.Eff.Inten.(mm/hr)=	94.66	15.30
over (min)	5.00	20.00
Storage Coeff. (min)=	3.35 (ii)	18.30 (ii)

```
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.26         0.06
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.04          0.315 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      40.38         8.13          19.41
     TOTAL RAINFALL   (mm)=      41.38        41.38          41.38
     RUNOFF COEFFICIENT   =       0.98         0.20           0.47

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0033):     0.41   0.008     1.50     8.47
     + ID2= 2 (  0036):     5.32   0.223     1.58    19.41
       ================================================
       ID = 3 (  0041):     5.73   0.231     1.58    18.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     5.73   0.231     1.58    18.63
     + ID2= 2 (  0037):     0.65   0.014     1.42     7.80
       ================================================
       ID = 1 (  0041):     6.38   0.243     1.58    17.53

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0041):     6.38   0.243     1.58    17.53
     + ID2= 2 (  0038):     1.56   0.027     1.58     7.85
       ================================================
       ID = 3 (  0041):     7.94   0.270     1.58    15.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     7.94   0.270     1.58    15.62
     + ID2= 2 (  0040):     3.43   0.315     1.33    19.41
       ================================================
       ID = 1 (  0041):    11.37   0.457     1.33    16.77

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0032)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0039):     0.83   0.017     1.50     8.47
     + ID2= 2 (  0041):    11.37   0.457     1.33    16.77
       ================================================
       ID = 3 (  0032):    12.20   0.466     1.33    16.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
========================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.


                  *****  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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\d61ef36d-bf63-46ca-b062-ef10e4
```

```
  Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\d61ef36d-bf63-46ca-b062-ef10e4


DATE: 06-15-2023                          TIME: 02:15:47

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
----------------------
  ***********************************************
  ** SIMULATION : 2-010yr 4hr 10min Chicago     **
  ***********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\81712ad3
| Ptotal= 48.34 mm |    Comments: created from IDF Group New IDFGroup - 2
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    3.78 |  1.00   21.14 |'  2.00    7.85 |  3.00    4.40
                0.17    4.26 |  1.17  110.25 |'  2.17    6.86 |  3.17    4.13
                0.33    4.90 |  1.33   26.74 |'  2.33    6.13 |  3.33    3.89
                0.50    5.83 |  1.50   15.57 |'  2.50    5.55 |  3.50    3.69
                0.67    7.35 |  1.67   11.47 |'  2.67    5.09 |  3.67    3.50
                0.83   10.36 |  1.83    9.26 |'  2.83    4.72 |  3.83    3.34

--------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.81         2.81
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     193.56        10.00
     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    3.78 | 1.083   21.14 | 2.083    7.85 |  3.08    4.40
                0.167    3.78 | 1.167   21.14 | 2.167    7.85 |  3.17    4.40
                0.250    4.26 | 1.250  110.25 | 2.250    6.86 |  3.25    4.13
                0.333    4.26 | 1.333  110.25 | 2.333    6.86 |  3.33    4.13
                0.417    4.90 | 1.417   26.74 | 2.417    6.13 |  3.42    3.89
                0.500    4.90 | 1.500   26.74 | 2.500    6.13 |  3.50    3.89
                0.583    5.83 | 1.583   15.57 | 2.583    5.55 |  3.58    3.69
                0.667    5.83 | 1.667   15.57 | 2.667    5.55 |  3.67    3.69
                0.750    7.35 | 1.750   11.47 | 2.750    5.09 |  3.75    3.50
                0.833    7.35 | 1.833   11.47 | 2.833    5.09 |  3.83    3.50
                0.917   10.36 | 1.917    9.26 | 2.917    4.72 |  3.92    3.34
                1.000   10.36 | 2.000    9.26 | 3.000    4.72 |  4.00    3.34

     Max.Eff.Inten.(mm/hr)=     110.25        26.58
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       3.65 (ii)    7.06 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.25         0.14
                                                    *TOTALS*
     PEAK FLOW       (cms)=       0.57         0.15          0.689 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      47.34        10.98          23.71
     TOTAL RAINFALL   (mm)=      48.34        48.34          48.34
     RUNOFF COEFFICIENT   =       0.98         0.23           0.49

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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            |
| NASHYD   (  0022)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

         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    3.78 | 1.083   21.14 | 2.083    7.85 |  3.08    4.40
                0.167    3.78 | 1.167   21.14 | 2.167    7.85 |  3.17    4.40
```

0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.924
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.247

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

CALIB							
NASHYD (0023)	Area (ha)= 0.41	Curve Number (CN)= 75.0					
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00					
	U.H. Tp(hrs)= 0.20						

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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.928

TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.247

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

CALIB							
NASHYD (0030)	Area (ha)= 1.56	Curve Number (CN)= 73.0					
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00					
	U.H. Tp(hrs)= 0.22						

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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.041 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 11.099
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.230

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

CALIB							
NASHYD (0031)	Area (ha)= 0.65	Curve Number (CN)= 73.0					
ID= 1 DT= 5.0 min	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00					
	U.H. Tp(hrs)= 0.14						

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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.022 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 11.030
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.228

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

CALIB							
STANDHYD (0005)	Area (ha)= 5.32						
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 35.00					

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Max.Eff.Inten.(mm/hr)=		82.41	18.48	
	over (min)	15.00	35.00	
Storage Coeff. (min)=		16.07 (ii)	33.14 (ii)	
Unit Hyd. Tpeak (min)=		15.00	35.00	
Unit Hyd. peak (cms)=		0.07	0.03	
				TOTALS
PEAK FLOW	(cms)=	0.27	0.06	0.292 (iii)
TIME TO PEAK	(hrs)=	1.50	1.83	1.50
RUNOFF VOLUME	(mm)=	47.34	10.98	23.71
TOTAL RAINFALL	(mm)=	48.34	48.34	48.34
RUNOFF COEFFICIENT	=	0.98	0.23	0.49

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (0028)	Area (ha)= 3.43						
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00	Dir. Conn.(%)= 35.00					

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50

0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Max.Eff.Inten.(mm/hr)=	110.25	21.07	
over (min)	5.00	20.00	
Storage Coeff. (min)=	3.15 (ii)	16.31 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.27	0.06	
			TOTALS
PEAK FLOW (cms)=	0.36	0.06	0.374 (iii)
TIME TO PEAK (hrs)=	1.33	1.58	1.33
RUNOFF VOLUME (mm)=	47.34	10.98	23.71
TOTAL RAINFALL (mm)=	48.34	48.34	48.34
RUNOFF COEFFICIENT =	0.98	0.23	0.49

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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(0029)|	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	0.0900	0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0028)	3.430	0.374	1.33	23.71
OUTFLOW: ID= 1 (0029)	3.430	0.037	2.58	23.61

PEAK FLOW REDUCTION [Qout/Qin](%)= 9.95
TIME SHIFT OF PEAK FLOW (min)= 75.00
MAXIMUM STORAGE USED (ha.m.)= 0.0496

ADD HYD (0007)|				
1 + 2 = 3 |	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	0.41	0.012	1.50	11.93
+ ID2= 2 (0029):	3.43	0.037	2.58	23.61
ID = 3 (0007):	3.84	0.042	1.75	22.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)|				
3 + 2 = 1 |	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	3.84	0.042	1.75	22.36
+ ID2= 2 (0030):	1.56	0.041	1.58	11.10
ID = 1 (0007):	5.40	0.081	1.58	19.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)|				
1 + 2 = 3 |	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0007):	5.40	0.081	1.58	19.11
+ ID2= 2 (0031):	0.65	0.022	1.42	11.03
ID = 3 (0007):	6.05	0.099	1.50	18.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)|				
3 + 2 = 1 |	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	6.05	0.099	1.50	18.24
+ ID2= 2 (0005):	5.32	0.292	1.50	23.71
ID = 1 (0007):	11.37	0.391	1.50	20.80

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	0.4220	0.1535
	0.0410	0.0120	0.4630	0.1758
	0.0580	0.0253	0.6510	0.1989
	0.0710	0.0399	0.7480	0.2228
	0.0830	0.0559	0.8280	0.2476
	0.0920	0.0732	0.8990	0.2733
	0.2500	0.0918	0.9640	0.2998
	0.3200	0.1116	1.0240	0.3263
	0.3750	0.1321	1.0800	0.3528

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0007)	11.370	0.391	1.50	20.80
OUTFLOW: ID= 1 (0008)	11.370	0.147	2.50	20.79

PEAK FLOW REDUCTION [Qout/Qin](%)= 37.58
TIME SHIFT OF PEAK FLOW (min)= 60.00
MAXIMUM STORAGE USED (ha.m.)= 0.0797

ADD HYD (0016)|				
1 + 2 = 3 |	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0022):	0.83	0.026	1.50	11.92
+ ID2= 2 (0008):	11.37	0.147	2.50	20.79
ID = 3 (0016):	12.20	0.154	2.50	20.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB |			
NASHYD (0019)|	Area (ha)= 12.20	Curve Number (CN)= 64.0	
ID= 1 DT= 5.0 min |	Ia (mm)= 6.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.61		

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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.764

PEAK FLOW (cms)= 0.149 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 9.318
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.193

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

CALIB |			
NASHYD (0039)|	Area (ha)= 0.83	Curve Number (CN)= 75.0	
ID= 1 DT= 5.0 min |	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.19		

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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.026 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.924
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.247

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

CALIB |			
NASHYD (0033)|	Area (ha)= 0.41	Curve Number (CN)= 75.0	
ID= 1 DT= 5.0 min |	Ia (mm)= 10.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.20		

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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.012 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 11.928
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.247

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

CALIB
STANDHYD (0036)
ID= 1 DT= 5.0 min

Area (ha)= 5.32
Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.66	2.66
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	1.00
Length (m)=	188.33	40.00
Mannings n =	0.130	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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.022 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 11.030
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.228

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

CALIB
NASHYD (0038)
ID= 1 DT= 5.0 min

Area (ha)= 1.56 Curve Number (CN)= 73.0
Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.22

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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.041 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 11.099
TOTAL RAINFALL (mm)= 48.343
RUNOFF COEFFICIENT = 0.230

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

CALIB
STANDHYD (0040)
ID= 1 DT= 5.0 min

Area (ha)= 3.43
Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.71	1.71
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	151.22	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	3.78	1.083	21.14	2.083	7.85	3.08	4.40
0.167	3.78	1.167	21.14	2.167	7.85	3.17	4.40
0.250	4.26	1.250	110.25	2.250	6.86	3.25	4.13
0.333	4.26	1.333	110.25	2.333	6.86	3.33	4.13
0.417	4.90	1.417	26.74	2.417	6.13	3.42	3.89
0.500	4.90	1.500	26.74	2.500	6.13	3.50	3.89
0.583	5.83	1.583	15.57	2.583	5.55	3.58	3.69
0.667	5.83	1.667	15.57	2.667	5.55	3.67	3.69
0.750	7.35	1.750	11.47	2.750	5.09	3.75	3.50
0.833	7.35	1.833	11.47	2.833	5.09	3.83	3.50
0.917	10.36	1.917	9.26	2.917	4.72	3.92	3.34
1.000	10.36	2.000	9.26	3.000	4.72	4.00	3.34

Max.Eff.Inten.(mm/hr)= 110.25 21.07
over (min) 5.00 20.00
Storage Coeff. (min)= 3.15 (ii) 16.31 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.27 0.06

			TOTALS
PEAK FLOW	(cms)=	0.36	0.06	0.374 (iii)
TIME TO PEAK	(hrs)=	1.33	1.58	1.33
RUNOFF VOLUME	(mm)=	47.34	10.98	23.71
TOTAL RAINFALL	(mm)=	48.34	48.34	48.34
RUNOFF COEFFICIENT	=	0.98	0.23	0.49

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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.

ADD HYD (0041)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0033):	0.41	0.012	1.50	11.93

```
     + ID2= 2 (  0036):     5.32   0.292     1.50    23.71
       ================================================
       ID = 3 (  0041):     5.73   0.305     1.50    22.86

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     5.73   0.305     1.50    22.86
     + ID2= 2 (  0037):     0.65   0.022     1.42    11.03
       ================================================
       ID = 1 (  0041):     6.38   0.325     1.50    21.66

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0041):     6.38   0.325     1.50    21.66
     + ID2= 2 (  0038):     1.56   0.041     1.58    11.10
       ================================================
       ID = 3 (  0041):     7.94   0.365     1.50    19.58

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     7.94   0.365     1.50    19.58
     + ID2= 2 (  0040):     3.43   0.374     1.33    23.71
       ================================================
       ID = 1 (  0041):    11.37   0.603     1.33    20.83

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0032)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0039):     0.83   0.026     1.50    11.92
     + ID2= 2 (  0041):    11.37   0.603     1.33    20.83
       ================================================
       ID = 3 (  0032):    12.20   0.617     1.33    20.22
```

```
    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
======================

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2011)
       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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.


                  *****  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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\7ccc5064-45ad-4e72-9bdd-52779b
  Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\7ccc5064-45ad-4e72-9bdd-52779b


DATE: 06-15-2023                          TIME: 02:15:47

USER:


COMMENTS: _____________________________________________________


--------------------------------------------------------------------------------
-----------------------
  ***********************************************
  ** SIMULATION : 2-025yr 4hr 10min Chicago     **
  ***********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
```

```
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\53809fdb
| Ptotal= 56.70 mm |    Comments: created from IDF Group New IDFGroup - 2
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    4.44 |  1.00   24.80 |  2.00    9.21 |  3.00    5.16
                0.17    4.99 |  1.17  129.30 |  2.17    8.05 |  3.17    4.84
                0.33    5.75 |  1.33   31.36 |  2.33    7.18 |  3.33    4.56
                0.50    6.84 |  1.50   18.26 |  2.50    6.51 |  3.50    4.32
                0.67    8.62 |  1.67   13.46 |  2.67    5.97 |  3.67    4.11
                0.83   12.15 |  1.83   10.86 |  2.83    5.53 |  3.83    3.92

--------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.81         2.81
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     193.56        10.00
     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    4.44 | 1.083   24.80 | 2.083    9.21 |  3.08    5.16
               0.167    4.44 | 1.167   24.80 | 2.167    9.21 |  3.17    5.16
               0.250    4.99 | 1.250  129.30 | 2.250    8.05 |  3.25    4.84
               0.333    4.99 | 1.333  129.30 | 2.333    8.05 |  3.33    4.84
               0.417    5.75 | 1.417   31.36 | 2.417    7.18 |  3.42    4.56
               0.500    5.75 | 1.500   31.36 | 2.500    7.19 |  3.50    4.56
               0.583    6.84 | 1.583   18.26 | 2.583    6.51 |  3.58    4.32
               0.667    6.84 | 1.667   18.26 | 2.667    6.51 |  3.67    4.32
               0.750    8.62 | 1.750   13.46 | 2.750    5.97 |  3.75    4.11
               0.833    8.62 | 1.833   13.46 | 2.833    5.97 |  3.83    4.11
               0.917   12.15 | 1.917   10.86 | 2.917    5.53 |  3.92    3.92
               1.000   12.15 | 2.000   10.86 | 3.000    5.53 |  4.00    3.92

     Max.Eff.Inten.(mm/hr)=     129.30        36.73
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       3.43 (ii)    6.62 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.26         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.68         0.22          0.847 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      55.70        14.81          29.12
     TOTAL RAINFALL   (mm)=      56.70        56.70          56.70
     RUNOFF COEFFICIENT   =       0.98         0.26           0.51

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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            |
| NASHYD   (  0022)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

         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    4.44 | 1.083   24.80 | 2.083    9.21 |  3.08    5.16
               0.167    4.44 | 1.167   24.80 | 2.167    9.21 |  3.17    5.16
               0.250    4.99 | 1.250  129.30 | 2.250    8.05 |  3.25    4.84
               0.333    4.99 | 1.333  129.30 | 2.333    8.05 |  3.33    4.84
               0.417    5.75 | 1.417   31.36 | 2.417    7.18 |  3.42    4.56
               0.500    5.75 | 1.500   31.36 | 2.500    7.19 |  3.50    4.56
               0.583    6.84 | 1.583   18.26 | 2.583    6.51 |  3.58    4.32
               0.667    6.84 | 1.667   18.26 | 2.667    6.51 |  3.67    4.32
               0.750    8.62 | 1.750   13.46 | 2.750    5.97 |  3.75    4.11
               0.833    8.62 | 1.833   13.46 | 2.833    5.97 |  3.83    4.11
               0.917   12.15 | 1.917   10.86 | 2.917    5.53 |  3.92    3.92
               1.000   12.15 | 2.000   10.86 | 3.000    5.53 |  4.00    3.92

     Unit Hyd Qpeak  (cms)=   0.167

     PEAK FLOW       (cms)=   0.038 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  16.562
     TOTAL RAINFALL   (mm)=  56.700
     RUNOFF COEFFICIENT   =   0.292

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
```

| NASHYD (0023)| Area (ha)= 0.41 Curve Number (CN)= 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.20

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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.018 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 16.569
TOTAL RAINFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.292

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

CALIB	
NASHYD (0030)	Area (ha)= 1.56 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.22

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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.059 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 15.486
TOTAL RAINFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.273

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

CALIB	
NASHYD (0031)	Area (ha)= 0.65 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
--- U.H. Tp(hrs)= 0.14

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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 15.389
TOTAL RAINFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.271

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

CALIB	
STANDHYD (0005)	Area (ha)= 5.32
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

Max.Eff.Inten.(mm/hr)=		96.65	28.99	
over (min)		15.00	30.00	
Storage Coeff. (min)=		15.07 (ii)	29.33 (ii)	
Unit Hyd. Tpeak (min)=		15.00	30.00	
Unit Hyd. peak (cms)=		0.07	0.04	
				TOTALS
PEAK FLOW	(cms)=	0.32	0.09	0.368 (iii)
TIME TO PEAK	(hrs)=	1.50	1.75	1.50
RUNOFF VOLUME	(mm)=	55.70	14.81	29.12
TOTAL RAINFALL	(mm)=	56.70	56.70	56.70
RUNOFF COEFFICIENT	=	0.98	0.26	0.51

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (0028)	Area (ha)= 3.43
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

Max.Eff.Inten.(mm/hr)=		129.30	28.99	
over (min)		5.00	15.00	
Storage Coeff. (min)=		2.95 (ii)	14.54 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.28	0.08	
				TOTALS
PEAK FLOW	(cms)=	0.42	0.09	0.461 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	55.70	14.81	29.12
TOTAL RAINFALL	(mm)=	56.70	56.70	56.70
RUNOFF COEFFICIENT	=	0.98	0.26	0.51

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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(  0029)|     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   |   0.0900     0.1200

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0028)     3.430     0.461     1.33       29.12
   OUTFLOW: ID= 1 (  0029)     3.430     0.046     2.58       29.02

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.98
                  TIME SHIFT OF PEAK FLOW         (min)= 75.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0613

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.41   0.018     1.50    16.57
     + ID2= 2 (  0029):     3.43   0.046     2.58    29.02
       ================================================
       ID = 3 (  0007):     3.84   0.054     1.67    27.69

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     3.84   0.054     1.67    27.69
     + ID2= 2 (  0030):     1.56   0.059     1.58    15.49
       ================================================
       ID = 1 (  0007):     5.40   0.113     1.58    24.17

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     5.40   0.113     1.58    24.17
     + ID2= 2 (  0031):     0.65   0.033     1.42    15.39
       ================================================
       ID = 3 (  0007):     6.05   0.140     1.50    23.22

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.140     1.50    23.22
     + ID2= 2 (  0005):     5.32   0.368     1.50    29.12
       ================================================
       ID = 1 (  0007):    11.37   0.508     1.50    25.98

    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   |   0.4220     0.1535
                          0.0410     0.0120   |   0.4630     0.1758
                          0.0580     0.0253   |   0.6510     0.1989
                          0.0710     0.0399   |   0.7480     0.2228
                          0.0830     0.0559   |   0.8280     0.2476
                          0.0920     0.0732   |   0.8990     0.2733
                          0.2500     0.0918   |   0.9640     0.2998
                          0.3200     0.1116   |   1.0240     0.3263
                          0.3750     0.1321   |   1.0800     0.3528

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0007)    11.370     0.508      1.50      25.98
   OUTFLOW: ID= 1 (  0008)    11.370     0.230      2.17      25.97

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 45.26
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0896

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     0.83   0.038     1.50    16.56
     + ID2= 2 (  0008):    11.37   0.230     2.17    25.97
       ================================================
       ID = 3 (  0016):    12.20   0.243     2.17    25.33

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
```

```
| CALIB            |
| NASHYD   (  0019)|   Area    (ha)=  12.20   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.61

        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    4.44 | 1.083   24.80 | 2.083    9.21 |  3.08    5.16
   0.167    4.44 | 1.167   24.80 | 2.167    9.21 |  3.17    5.16
   0.250    4.99 | 1.250  129.30 | 2.250    8.05 |  3.25    4.84
   0.333    4.99 | 1.333  129.30 | 2.333    8.05 |  3.33    4.84
   0.417    5.75 | 1.417   31.36 | 2.417    7.18 |  3.42    4.56
   0.500    5.75 | 1.500   31.36 | 2.500    7.19 |  3.50    4.56
   0.583    6.84 | 1.583   18.26 | 2.583    6.51 |  3.58    4.32
   0.667    6.84 | 1.667   18.26 | 2.667    6.51 |  3.67    4.32
   0.750    8.62 | 1.750   13.46 | 2.750    5.97 |  3.75    4.11
   0.833    8.62 | 1.833   13.46 | 2.833    5.97 |  3.83    4.11
   0.917   12.15 | 1.917   10.86 | 2.917    5.53 |  3.92    3.92
   1.000   12.15 | 2.000   10.86 | 3.000    5.53 |  4.00    3.92

    Unit Hyd Qpeak  (cms)=   0.764

    PEAK FLOW       (cms)=   0.210 (i)
    TIME TO PEAK    (hrs)=   2.083
    RUNOFF VOLUME    (mm)=  12.871
    TOTAL RAINFALL   (mm)=  56.700
    RUNOFF COEFFICIENT   =   0.227

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

```
--------------------
| CALIB            |
| NASHYD   (  0039)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.19

        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    4.44 | 1.083   24.80 | 2.083    9.21 |  3.08    5.16
   0.167    4.44 | 1.167   24.80 | 2.167    9.21 |  3.17    5.16
   0.250    4.99 | 1.250  129.30 | 2.250    8.05 |  3.25    4.84
   0.333    4.99 | 1.333  129.30 | 2.333    8.05 |  3.33    4.84
   0.417    5.75 | 1.417   31.36 | 2.417    7.18 |  3.42    4.56
   0.500    5.75 | 1.500   31.36 | 2.500    7.19 |  3.50    4.56
   0.583    6.84 | 1.583   18.26 | 2.583    6.51 |  3.58    4.32
   0.667    6.84 | 1.667   18.26 | 2.667    6.51 |  3.67    4.32
   0.750    8.62 | 1.750   13.46 | 2.750    5.97 |  3.75    4.11
   0.833    8.62 | 1.833   13.46 | 2.833    5.97 |  3.83    4.11
   0.917   12.15 | 1.917   10.86 | 2.917    5.53 |  3.92    3.92
   1.000   12.15 | 2.000   10.86 | 3.000    5.53 |  4.00    3.92

    Unit Hyd Qpeak  (cms)=   0.167

    PEAK FLOW       (cms)=   0.038 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  16.562
    TOTAL RAINFALL   (mm)=  56.700
    RUNOFF COEFFICIENT   =   0.292

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

```
--------------------
| CALIB            |
| NASHYD   (  0033)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

        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    4.44 | 1.083   24.80 | 2.083    9.21 |  3.08    5.16
   0.167    4.44 | 1.167   24.80 | 2.167    9.21 |  3.17    5.16
   0.250    4.99 | 1.250  129.30 | 2.250    8.05 |  3.25    4.84
   0.333    4.99 | 1.333  129.30 | 2.333    8.05 |  3.33    4.84
   0.417    5.75 | 1.417   31.36 | 2.417    7.18 |  3.42    4.56
   0.500    5.75 | 1.500   31.36 | 2.500    7.19 |  3.50    4.56
   0.583    6.84 | 1.583   18.26 | 2.583    6.51 |  3.58    4.32
   0.667    6.84 | 1.667   18.26 | 2.667    6.51 |  3.67    4.32
   0.750    8.62 | 1.750   13.46 | 2.750    5.97 |  3.75    4.11
   0.833    8.62 | 1.833   13.46 | 2.833    5.97 |  3.83    4.11
   0.917   12.15 | 1.917   10.86 | 2.917    5.53 |  3.92    3.92
   1.000   12.15 | 2.000   10.86 | 3.000    5.53 |  4.00    3.92

    Unit Hyd Qpeak  (cms)=   0.078

    PEAK FLOW       (cms)=   0.018 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  16.569
    TOTAL RAINFALL   (mm)=  56.700
    RUNOFF COEFFICIENT   =   0.292
```

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

CALIB	
STANDHYD (0036)	Area (ha)= 5.32
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.66	2.66
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	1.00
Length (m)=	188.33	40.00
Mannings n =	0.130	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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

			TOTALS
Max.Eff.Inten.(mm/hr)=	96.65	28.99	
over (min)	15.00	30.00	
Storage Coeff. (min)=	15.07 (ii)	29.33 (ii)	
Unit Hyd. Tpeak (min)=	15.00	30.00	
Unit Hyd. peak (cms)=	0.07	0.04	
PEAK FLOW (cms)=	0.32	0.09	0.368 (iii)
TIME TO PEAK (hrs)=	1.50	1.75	1.50
RUNOFF VOLUME (mm)=	55.70	14.81	29.12
TOTAL RAINFALL (mm)=	56.70	56.70	56.70
RUNOFF COEFFICIENT =	0.98	0.26	0.51

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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	
NASHYD (0037)	Area (ha)= 0.65 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.14

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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.033 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 15.389
TOTAL RAINFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.271

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

CALIB	
NASHYD (0038)	Area (ha)= 1.56 Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.22

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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.059 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 15.486
TOTAL RAINFALL (mm)= 56.700
RUNOFF COEFFICIENT = 0.273

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

CALIB	
STANDHYD (0040)	Area (ha)= 3.43
ID= 1 DT= 5.0 min	Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.71	1.71
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	151.22	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	4.44	1.083	24.80	2.083	9.21	3.08	5.16
0.167	4.44	1.167	24.80	2.167	9.21	3.17	5.16
0.250	4.99	1.250	129.30	2.250	8.05	3.25	4.84
0.333	4.99	1.333	129.30	2.333	8.05	3.33	4.84
0.417	5.75	1.417	31.36	2.417	7.18	3.42	4.56
0.500	5.75	1.500	31.36	2.500	7.19	3.50	4.56
0.583	6.84	1.583	18.26	2.583	6.51	3.58	4.32
0.667	6.84	1.667	18.26	2.667	6.51	3.67	4.32
0.750	8.62	1.750	13.46	2.750	5.97	3.75	4.11
0.833	8.62	1.833	13.46	2.833	5.97	3.83	4.11
0.917	12.15	1.917	10.86	2.917	5.53	3.92	3.92
1.000	12.15	2.000	10.86	3.000	5.53	4.00	3.92

			TOTALS
Max.Eff.Inten.(mm/hr)=	129.30	28.99	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.95 (ii)	14.54 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.28	0.08	
PEAK FLOW (cms)=	0.42	0.09	0.461 (iii)
TIME TO PEAK (hrs)=	1.33	1.50	1.33
RUNOFF VOLUME (mm)=	55.70	14.81	29.12
TOTAL RAINFALL (mm)=	56.70	56.70	56.70
RUNOFF COEFFICIENT =	0.98	0.26	0.51

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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.

ADD HYD (0041)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0033):	0.41	0.018	1.50	16.57
+ ID2= 2 (0036):	5.32	0.368	1.50	29.12
ID = 3 (0041):	5.73	0.386	1.50	28.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0041):	5.73	0.386	1.50	28.22
+ ID2= 2 (0037):	0.65	0.033	1.42	15.39
ID = 1 (0041):	6.38	0.416	1.50	26.91

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0041):	6.38	0.416	1.50	26.91

```
     + ID2= 2 (  0038):     1.56   0.059     1.58    15.49
       ================================================
       ID = 3 (  0041):     7.94   0.475     1.50    24.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     7.94   0.475     1.50    24.67
     + ID2= 2 (  0040):     3.43   0.461     1.33    29.12
       ================================================
       ID = 1 (  0041):    11.37   0.760     1.33    26.01

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0032)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0039):     0.83   0.038     1.50    16.56
     + ID2= 2 (  0041):    11.37   0.760     1.33    26.01
       ================================================
       ID = 3 (  0032):    12.20   0.782     1.33    25.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
========================

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.

                  *****  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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\0190bef0-d295-4ffa-89e8-0f7b80
  Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\0190bef0-d295-4ffa-89e8-0f7b80

DATE: 06-15-2023                          TIME: 02:15:47

USER:


COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
------------------------
  ***********************************************
  ** SIMULATION : 2-050yr 4hr 10min Chicago     **
  ***********************************************


-------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\64963d3c
| Ptotal= 63.12 mm |    Comments: created from IDF Group New IDFGroup - 2
-------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    4.96 |  1.00   27.61 |  2.00   10.27 |  3.00    5.76
                0.17    5.58 |  1.17  143.50 |  2.17    8.98 |  3.17    5.40
                0.33    6.42 |  1.33   34.91 |  2.33    8.02 |  3.33    5.10
                0.50    7.64 |  1.50   20.35 |  2.50    7.27 |  3.50    4.83
                0.67    9.62 |  1.67   15.00 |  2.67    6.67 |  3.67    4.59
                0.83   13.55 |  1.83   12.12 |  2.83    6.17 |  3.83    4.38

--------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.81          2.81
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     193.56         10.00

     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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
               0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
               0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
               0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
               0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
               0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
               0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
               0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
               0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
               0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
               0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
               1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

     Max.Eff.Inten.(mm/hr)=     143.50        45.22
           over (min)        5.00         10.00
     Storage Coeff.  (min)=      3.29 (ii)    6.35 (ii)
     Unit Hyd. Tpeak (min)=      5.00         10.00
     Unit Hyd. peak  (cms)=      0.27          0.15
                                                    *TOTALS*
     PEAK FLOW       (cms)=      0.75          0.27          0.970 (iii)
     TIME TO PEAK    (hrs)=      1.33          1.42           1.33
     RUNOFF VOLUME    (mm)=     62.12         18.01          33.45
     TOTAL RAINFALL   (mm)=     63.12         63.12          63.12
     RUNOFF COEFFICIENT   =      0.98          0.29           0.53

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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            |
| NASHYD   (  0022)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

         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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
               0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
               0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
               0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
               0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
               0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
               0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
               0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
               0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
               0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
               0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
               1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

     Unit Hyd Qpeak  (cms)=   0.167

     PEAK FLOW       (cms)=   0.048 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  20.429
     TOTAL RAINFALL   (mm)=  63.117
     RUNOFF COEFFICIENT   =   0.324

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0023)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

         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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
               0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
               0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
               0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
               0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
               0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
               0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
               0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
               0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
               0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
               0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
               1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

     Unit Hyd Qpeak  (cms)=   0.078
```

```
     PEAK FLOW      (cms)=   0.023 (i)
     TIME TO PEAK   (hrs)=   1.500
     RUNOFF VOLUME   (mm)=  20.437
     TOTAL RAINFALL  (mm)=  63.117
     RUNOFF COEFFICIENT   =   0.324

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0030)|   Area    (ha)=   1.56   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

         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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
              0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
              0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
              0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
              0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
              0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
              0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
              0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
              0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
              0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
              0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
              1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

     Unit Hyd Qpeak  (cms)=   0.271

     PEAK FLOW      (cms)=   0.076 (i)
     TIME TO PEAK   (hrs)=   1.500
     RUNOFF VOLUME   (mm)=  19.159
     TOTAL RAINFALL  (mm)=  63.117
     RUNOFF COEFFICIENT   =   0.304

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0031)|   Area    (ha)=   0.65   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.14
```

```
              0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
              0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
              0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
              0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
              0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
              0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
              0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
              1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

     Max.Eff.Inten.(mm/hr)=     107.30        35.61
               over (min)       15.00        30.00
     Storage Coeff.  (min)=     14.46 (ii)   27.59 (ii)
     Unit Hyd. Tpeak (min)=     15.00        30.00
     Unit Hyd. peak  (cms)=      0.08         0.04
                                                      *TOTALS*
     PEAK FLOW      (cms)=      0.37         0.11          0.423 (iii)
     TIME TO PEAK   (hrs)=      1.50         1.75           1.50
     RUNOFF VOLUME   (mm)=     62.12        18.01          33.44
     TOTAL RAINFALL  (mm)=     63.12        63.12          63.12
     RUNOFF COEFFICIENT   =     0.98         0.29           0.53


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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 (  0028)|   Area    (ha)=   3.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.71         1.71
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.00
     Length            (m)=    151.22        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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
              0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
              0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
              0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
              0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
```

```
         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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
              0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
              0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
              0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
              0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
              0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
              0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
              0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
              0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
              0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
              0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
              1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

     Unit Hyd Qpeak  (cms)=   0.177

     PEAK FLOW      (cms)=   0.042 (i)
     TIME TO PEAK   (hrs)=   1.417
     RUNOFF VOLUME   (mm)=  19.041
     TOTAL RAINFALL  (mm)=  63.117
     RUNOFF COEFFICIENT   =   0.302

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0005)|   Area    (ha)=   5.32
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.66         2.66
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         1.00
     Length            (m)=    188.33        40.00
     Mannings n           =     0.130        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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
              0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
              0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
              0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
              0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
              0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
              0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
              0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
              0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
              0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
              0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
              1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

     Max.Eff.Inten.(mm/hr)=     143.50        45.22
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      2.83 (ii)   12.53 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.28         0.08
                                                      *TOTALS*
     PEAK FLOW      (cms)=      0.47         0.12          0.523 (iii)
     TIME TO PEAK   (hrs)=      1.33         1.50           1.33
     RUNOFF VOLUME   (mm)=     62.12        18.01          33.45
     TOTAL RAINFALL  (mm)=     63.12        63.12          63.12
     RUNOFF COEFFICIENT   =     0.98         0.29           0.53

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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(  0029)|     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   |   0.0900     0.1200

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0028)     3.430     0.523      1.33      33.45
   OUTFLOW: ID= 1 (  0029)     3.430     0.053      2.58      33.35

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.10
                 TIME SHIFT OF PEAK FLOW         (min)= 75.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.0705

--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.41   0.023     1.50    20.44
```

```
     + ID2= 2 (  0029):     3.43   0.053     2.58    33.35
       ================================================
       ID = 3 (  0007):     3.84   0.064     1.67    31.97

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     3.84   0.064     1.67    31.97
     + ID2= 2 (  0030):     1.56   0.076     1.50    19.16
       ================================================
       ID = 1 (  0007):     5.40   0.139     1.58    28.27

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     5.40   0.139     1.58    28.27
     + ID2= 2 (  0031):     0.65   0.042     1.42    19.04
       ================================================
       ID = 3 (  0007):     6.05   0.174     1.50    27.28

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.174     1.50    27.28
     + ID2= 2 (  0005):     5.32   0.423     1.50    33.44
       ================================================
       ID = 1 (  0007):    11.37   0.598     1.50    30.16

    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   |   0.4220     0.1535
                          0.0410     0.0120   |   0.4630     0.1758
                          0.0580     0.0253   |   0.6510     0.1989
                          0.0710     0.0399   |   0.7480     0.2228
                          0.0830     0.0559   |   0.8280     0.2476
                          0.0920     0.0732   |   0.8990     0.2733
                          0.2500     0.0918   |   0.9640     0.2998
                          0.3200     0.1116   |   1.0240     0.3263
                          0.3750     0.1321   |   1.0800     0.3528

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0007)     11.370     0.598      1.50      30.16
   OUTFLOW: ID= 1 (  0008)     11.370     0.275      2.17      30.16

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 46.06
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0990

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     0.83   0.048     1.50    20.43
     + ID2= 2 (  0008):    11.37   0.275     2.17    30.16
       ================================================
       ID = 3 (  0016):    12.20   0.291     2.08    29.50

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0019)|   Area    (ha)=  12.20   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.90   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.61

        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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
 0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
 0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
 0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
 0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
 0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
 0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
 0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
 0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
 0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
 0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
 1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

    Unit Hyd Qpeak  (cms)=   0.764

    PEAK FLOW       (cms)=   0.262 (i)
    TIME TO PEAK    (hrs)=   2.083
    RUNOFF VOLUME    (mm)=  15.873
    TOTAL RAINFALL   (mm)=  63.117
    RUNOFF COEFFICIENT   =   0.251

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0039)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

        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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
 0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
 0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
 0.333    5.58 | 1.333  143.50 | 2.333    8.98 |  3.33    5.40
 0.417    6.42 | 1.417   34.91 | 2.417    8.02 |  3.42    5.10
 0.500    6.42 | 1.500   34.91 | 2.500    8.02 |  3.50    5.10
 0.583    7.64 | 1.583   20.35 | 2.583    7.27 |  3.58    4.83
 0.667    7.64 | 1.667   20.35 | 2.667    7.27 |  3.67    4.83
 0.750    9.62 | 1.750   15.00 | 2.750    6.67 |  3.75    4.59
 0.833    9.62 | 1.833   15.00 | 2.833    6.67 |  3.83    4.59
 0.917   13.55 | 1.917   12.12 | 2.917    6.17 |  3.92    4.38
 1.000   13.55 | 2.000   12.12 | 3.000    6.17 |  4.00    4.38

    Unit Hyd Qpeak  (cms)=   0.167

    PEAK FLOW       (cms)=   0.048 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  20.429
    TOTAL RAINFALL   (mm)=  63.117
    RUNOFF COEFFICIENT   =   0.324

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0033)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

        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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
 0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
 0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40

    Unit Hyd Qpeak  (cms)=   0.078

    PEAK FLOW       (cms)=   0.023 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  20.437
    TOTAL RAINFALL   (mm)=  63.117
    RUNOFF COEFFICIENT   =   0.324

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0036)|   Area    (ha)=   5.32
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      2.66         2.66
    Dep. Storage     (mm)=      1.00         5.00
    Average Slope     (%)=      1.00         1.00
    Length            (m)=    188.33        40.00
    Mannings n          =     0.130        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    4.96 | 1.083   27.61 | 2.083   10.27 |  3.08    5.76
 0.167    4.96 | 1.167   27.61 | 2.167   10.27 |  3.17    5.76
 0.250    5.58 | 1.250  143.50 | 2.250    8.98 |  3.25    5.40
```

0.333	5.58	1.333	143.50	2.333	8.98	3.33	5.40
0.417	6.42	1.417	34.91	2.417	8.02	3.42	5.10
0.500	6.42	1.500	34.91	2.500	8.02	3.50	5.10
0.583	7.64	1.583	20.35	2.583	7.27	3.58	4.83
0.667	7.64	1.667	20.35	2.667	7.27	3.67	4.83
0.750	9.62	1.750	15.00	2.750	6.67	3.75	4.59
0.833	9.62	1.833	15.00	2.833	6.67	3.83	4.59
0.917	13.55	1.917	12.12	2.917	6.17	3.92	4.38
1.000	13.55	2.000	12.12	3.000	6.17	4.00	4.38

Max.Eff.Inten.(mm/hr)=	107.30	35.61	
over (min)	15.00	30.00	
Storage Coeff. (min)=	14.46 (ii)	27.59 (ii)	
Unit Hyd. Tpeak (min)=	15.00	30.00	
Unit Hyd. peak (cms)=	0.08	0.04	
			TOTALS
PEAK FLOW (cms)=	0.37	0.11	0.423 (iii)
TIME TO PEAK (hrs)=	1.50	1.75	1.50
RUNOFF VOLUME (mm)=	62.12	18.01	33.44
TOTAL RAINFALL (mm)=	63.12	63.12	63.12
RUNOFF COEFFICIENT =	0.98	0.29	0.53

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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			
NASHYD (0037)	Area (ha)=	0.65	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14	

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	4.96	1.083	27.61	2.083	10.27	3.08	5.76
0.167	4.96	1.167	27.61	2.167	10.27	3.17	5.76
0.250	5.58	1.250	143.50	2.250	8.98	3.25	5.40
0.333	5.58	1.333	143.50	2.333	8.98	3.33	5.40
0.417	6.42	1.417	34.91	2.417	8.02	3.42	5.10
0.500	6.42	1.500	34.91	2.500	8.02	3.50	5.10
0.583	7.64	1.583	20.35	2.583	7.27	3.58	4.83
0.667	7.64	1.667	20.35	2.667	7.27	3.67	4.83
0.750	9.62	1.750	15.00	2.750	6.67	3.75	4.59
0.833	9.62	1.833	15.00	2.833	6.67	3.83	4.59
0.917	13.55	1.917	12.12	2.917	6.17	3.92	4.38
1.000	13.55	2.000	12.12	3.000	6.17	4.00	4.38

Unit Hyd Qpeak (cms)=	0.177		
PEAK FLOW (cms)=	0.042 (i)		
TIME TO PEAK (hrs)=	1.417		
RUNOFF VOLUME (mm)=	19.041		
TOTAL RAINFALL (mm)=	63.117		
RUNOFF COEFFICIENT =	0.302		

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

CALIB			
NASHYD (0038)	Area (ha)=	1.56	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.22	

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	4.96	1.083	27.61	2.083	10.27	3.08	5.76
0.167	4.96	1.167	27.61	2.167	10.27	3.17	5.76
0.250	5.58	1.250	143.50	2.250	8.98	3.25	5.40
0.333	5.58	1.333	143.50	2.333	8.98	3.33	5.40
0.417	6.42	1.417	34.91	2.417	8.02	3.42	5.10
0.500	6.42	1.500	34.91	2.500	8.02	3.50	5.10
0.583	7.64	1.583	20.35	2.583	7.27	3.58	4.83
0.667	7.64	1.667	20.35	2.667	7.27	3.67	4.83
0.750	9.62	1.750	15.00	2.750	6.67	3.75	4.59
0.833	9.62	1.833	15.00	2.833	6.67	3.83	4.59
0.917	13.55	1.917	12.12	2.917	6.17	3.92	4.38
1.000	13.55	2.000	12.12	3.000	6.17	4.00	4.38

Unit Hyd Qpeak (cms)=	0.271		
PEAK FLOW (cms)=	0.076 (i)		
TIME TO PEAK (hrs)=	1.500		
RUNOFF VOLUME (mm)=	19.159		
TOTAL RAINFALL (mm)=	63.117		
RUNOFF COEFFICIENT =	0.304		

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

CALIB	

STANDHYD (0040)	Area (ha)=	3.43	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	4.96	1.083	27.61	2.083	10.27	3.08	5.76
0.167	4.96	1.167	27.61	2.167	10.27	3.17	5.76
0.250	5.58	1.250	143.50	2.250	8.98	3.25	5.40
0.333	5.58	1.333	143.50	2.333	8.98	3.33	5.40
0.417	6.42	1.417	34.91	2.417	8.02	3.42	5.10
0.500	6.42	1.500	34.91	2.500	8.02	3.50	5.10
0.583	7.64	1.583	20.35	2.583	7.27	3.58	4.83
0.667	7.64	1.667	20.35	2.667	7.27	3.67	4.83
0.750	9.62	1.750	15.00	2.750	6.67	3.75	4.59
0.833	9.62	1.833	15.00	2.833	6.67	3.83	4.59
0.917	13.55	1.917	12.12	2.917	6.17	3.92	4.38
1.000	13.55	2.000	12.12	3.000	6.17	4.00	4.38

Max.Eff.Inten.(mm/hr)=	143.50	45.22		
over (min)	5.00	15.00		
Storage Coeff. (min)=	2.83 (ii)	12.53 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.28	0.08		
			TOTALS	
PEAK FLOW (cms)=	0.47	0.12	0.523 (iii)	
TIME TO PEAK (hrs)=	1.33	1.50	1.33	
RUNOFF VOLUME (mm)=	62.12	18.01	33.45	
TOTAL RAINFALL (mm)=	63.12	63.12	63.12	
RUNOFF COEFFICIENT =	0.98	0.29	0.53	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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.

ADD HYD (0041)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0033):	0.41	0.023	1.50	20.44
+ ID2= 2 (0036):	5.32	0.423	1.50	33.44
ID = 3 (0041):	5.73	0.446	1.50	32.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0041):	5.73	0.446	1.50	32.51
+ ID2= 2 (0037):	0.65	0.042	1.42	19.04
ID = 1 (0041):	6.38	0.484	1.50	31.14

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0041):	6.38	0.484	1.50	31.14
+ ID2= 2 (0038):	1.56	0.076	1.50	19.16
ID = 3 (0041):	7.94	0.560	1.50	28.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0041)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0041):	7.94	0.560	1.50	28.79
+ ID2= 2 (0040):	3.43	0.523	1.33	33.45
ID = 1 (0041):	11.37	0.878	1.33	30.19

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0032)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0039):	0.83	0.048	1.50	20.43

```
 + ID2= 2 (  0041):    11.37   0.878     1.33    30.19
   ================================================
   ID = 3 (  0032):    12.20   0.908     1.33    29.53

  NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
======================

    V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
    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 M  O   O
     OOO     T      T    H   H    Y    M   M   OOO
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.


                *****  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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\d7b5f2ef-03fb-4ece-8a0d-3aa02d
  Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776
f7886e\d7b5f2ef-03fb-4ece-8a0d-3aa02d


DATE: 06-15-2023                          TIME: 02:15:48

USER:



COMMENTS: _____


--------------------------------------------------------------------------------
-------------------------
  ************************************************
  ** SIMULATION : 2-100yr 4hr 10min Chicago     **
  ************************************************
```

```
-------------------
|    READ STORM    |    Filename: C:\Users\r.rajachockalingam\AppD
|                  |              ata\Local\Temp\
|                  |              073789e9-0d0b-43a3-ada4-078b0c00e084\e8f7a499
| Ptotal= 69.46 mm |    Comments: created from IDF Group New IDFGroup - 2
-------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	5.46	1.00	30.39	2.00	11.31	3.00	6.34
0.17	6.14	1.17	157.92	2.17	9.88	3.17	5.95
0.33	7.06	1.33	38.42	2.33	8.83	3.33	5.61
0.50	8.40	1.50	22.40	2.50	8.00	3.50	5.31
0.67	10.58	1.67	16.51	2.67	7.34	3.67	5.05
0.83	14.91	1.83	13.33	2.83	6.80	3.83	4.82

```
--------------------------------------------------------------------------------

-------------------
| CALIB            |
| STANDHYD (  0006)|   Area    (ha)=   5.62
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       2.81         2.81
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     193.56        10.00
     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	5.46	1.083	30.39	2.083	11.31	3.08	6.34
0.167	5.46	1.167	30.39	2.167	11.31	3.17	6.34
0.250	6.14	1.250	157.92	2.250	9.88	3.25	5.95
0.333	6.14	1.333	157.92	2.333	9.88	3.33	5.95
0.417	7.06	1.417	38.42	2.417	8.83	3.42	5.61
0.500	7.06	1.500	38.42	2.500	8.83	3.50	5.61
0.583	8.40	1.583	22.40	2.583	8.00	3.58	5.31
0.667	8.40	1.667	22.40	2.667	8.00	3.67	5.31
0.750	10.58	1.750	16.51	2.750	7.34	3.75	5.05
0.833	10.58	1.833	16.51	2.833	7.34	3.83	5.05
0.917	14.91	1.917	13.33	2.917	6.80	3.92	4.82
1.000	14.91	2.000	13.33	3.000	6.80	4.00	4.82

```
    Max.Eff.Inten.(mm/hr)=     157.92        54.39
             over (min)        5.00         10.00
    Storage Coeff.  (min)=     3.16 (ii)    6.11 (ii)
```

```
    Unit Hyd. Tpeak (min)=       5.00        10.00
    Unit Hyd. peak  (cms)=       0.27         0.15
                                                    *TOTALS*
    PEAK FLOW       (cms)=       0.83         0.33          1.100 (iii)
    TIME TO PEAK    (hrs)=       1.33         1.42           1.33
    RUNOFF VOLUME    (mm)=      68.46        21.38          37.86
    TOTAL RAINFALL   (mm)=      69.46        69.46          69.46
    RUNOFF COEFFICIENT   =       0.99         0.31           0.54

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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            |
| NASHYD   (  0022)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

        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	5.46	1.083	30.39	2.083	11.31	3.08	6.34
0.167	5.46	1.167	30.39	2.167	11.31	3.17	6.34
0.250	6.14	1.250	157.92	2.250	9.88	3.25	5.95
0.333	6.14	1.333	157.92	2.333	9.88	3.33	5.95
0.417	7.06	1.417	38.42	2.417	8.83	3.42	5.61
0.500	7.06	1.500	38.42	2.500	8.83	3.50	5.61
0.583	8.40	1.583	22.40	2.583	8.00	3.58	5.31
0.667	8.40	1.667	22.40	2.667	8.00	3.67	5.31
0.750	10.58	1.750	16.51	2.750	7.34	3.75	5.05
0.833	10.58	1.833	16.51	2.833	7.34	3.83	5.05
0.917	14.91	1.917	13.33	2.917	6.80	3.92	4.82
1.000	14.91	2.000	13.33	3.000	6.80	4.00	4.82

```
    Unit Hyd Qpeak  (cms)=   0.167

    PEAK FLOW       (cms)=   0.059 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  24.473
    TOTAL RAINFALL   (mm)=  69.460
    RUNOFF COEFFICIENT   =   0.352

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

```
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0023)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

        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	5.46	1.083	30.39	2.083	11.31	3.08	6.34
0.167	5.46	1.167	30.39	2.167	11.31	3.17	6.34
0.250	6.14	1.250	157.92	2.250	9.88	3.25	5.95
0.333	6.14	1.333	157.92	2.333	9.88	3.33	5.95
0.417	7.06	1.417	38.42	2.417	8.83	3.42	5.61
0.500	7.06	1.500	38.42	2.500	8.83	3.50	5.61
0.583	8.40	1.583	22.40	2.583	8.00	3.58	5.31
0.667	8.40	1.667	22.40	2.667	8.00	3.67	5.31
0.750	10.58	1.750	16.51	2.750	7.34	3.75	5.05
0.833	10.58	1.833	16.51	2.833	7.34	3.83	5.05
0.917	14.91	1.917	13.33	2.917	6.80	3.92	4.82
1.000	14.91	2.000	13.33	3.000	6.80	4.00	4.82

```
    Unit Hyd Qpeak  (cms)=   0.078

    PEAK FLOW       (cms)=   0.028 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  24.483
    TOTAL RAINFALL   (mm)=  69.460
    RUNOFF COEFFICIENT   =   0.352

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0030)|   Area    (ha)=   1.56   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

        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	5.46	1.083	30.39	2.083	11.31	3.08	6.34
0.167	5.46	1.167	30.39	2.167	11.31	3.17	6.34

0.250	6.14	1.250	157.92	2.250	9.88	3.25	5.95
0.333	6.14	1.333	157.92	2.333	9.88	3.33	5.95
0.417	7.06	1.417	38.42	2.417	8.83	3.42	5.61
0.500	7.06	1.500	38.42	2.500	8.83	3.50	5.61
0.583	8.40	1.583	22.40	2.583	8.00	3.58	5.31
0.667	8.40	1.667	22.40	2.667	8.00	3.67	5.31
0.750	10.58	1.750	16.51	2.750	7.34	3.75	5.05
0.833	10.58	1.833	16.51	2.833	7.34	3.83	5.05
0.917	14.91	1.917	13.33	2.917	6.80	3.92	4.82
1.000	14.91	2.000	13.33	3.000	6.80	4.00	4.82

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.094 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 23.016
TOTAL RAINFALL (mm)= 69.460
RUNOFF COEFFICIENT = 0.331

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

CALIB			
NASHYD (0031)	Area (ha)=	0.65	Curve Number (CN)= 73.0
ID= 1 DT= 5.0 min	Ia (mm)=	10.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.14	

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	5.46	1.083	30.39	2.083	11.31	3.08	6.34
0.167	5.46	1.167	30.39	2.167	11.31	3.17	6.34
0.250	6.14	1.250	157.92	2.250	9.88	3.25	5.95
0.333	6.14	1.333	157.92	2.333	9.88	3.33	5.95
0.417	7.06	1.417	38.42	2.417	8.83	3.42	5.61
0.500	7.06	1.500	38.42	2.500	8.83	3.50	5.61
0.583	8.40	1.583	22.40	2.583	8.00	3.58	5.31
0.667	8.40	1.667	22.40	2.667	8.00	3.67	5.31
0.750	10.58	1.750	16.51	2.750	7.34	3.75	5.05
0.833	10.58	1.833	16.51	2.833	7.34	3.83	5.05
0.917	14.91	1.917	13.33	2.917	6.80	3.92	4.82
1.000	14.91	2.000	13.33	3.000	6.80	4.00	4.82

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.051 (i)
TIME TO PEAK (hrs)= 1.417
RUNOFF VOLUME (mm)= 22.874

TOTAL RAINFALL (mm)= 69.460
RUNOFF COEFFICIENT = 0.329

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

CALIB			
STANDHYD (0005)	Area (ha)=	5.32	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	2.66	2.66
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	1.00
Length	(m)=	188.33	40.00
Mannings n	=	0.130	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	5.46	1.083	30.39	2.083	11.31	3.08	6.34
0.167	5.46	1.167	30.39	2.167	11.31	3.17	6.34
0.250	6.14	1.250	157.92	2.250	9.88	3.25	5.95
0.333	6.14	1.333	157.92	2.333	9.88	3.33	5.95
0.417	7.06	1.417	38.42	2.417	8.83	3.42	5.61
0.500	7.06	1.500	38.42	2.500	8.83	3.50	5.61
0.583	8.40	1.583	22.40	2.583	8.00	3.58	5.31
0.667	8.40	1.667	22.40	2.667	8.00	3.67	5.31
0.750	10.58	1.750	16.51	2.750	7.34	3.75	5.05
0.833	10.58	1.833	16.51	2.833	7.34	3.83	5.05
0.917	14.91	1.917	13.33	2.917	6.80	3.92	4.82
1.000	14.91	2.000	13.33	3.000	6.80	4.00	4.82

				TOTALS
Max.Eff.Inten.(mm/hr)=	118.09	42.74		
over (min)	15.00	30.00		
Storage Coeff. (min)=	13.91 (ii)	26.12 (ii)		
Unit Hyd. Tpeak (min)=	15.00	30.00		
Unit Hyd. peak (cms)=	0.08	0.04		
PEAK FLOW (cms)=	0.41	0.13		0.481 (iii)
TIME TO PEAK (hrs)=	1.50	1.75		1.50
RUNOFF VOLUME (mm)=	68.46	21.38		37.85
TOTAL RAINFALL (mm)=	69.46	69.46		69.46
RUNOFF COEFFICIENT =	0.99	0.31		0.54

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (0028)	Area (ha)=	3.43	
ID= 1 DT= 5.0 min	Total Imp(%)=	50.00	Dir. Conn.(%)= 35.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.71	1.71
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.00
Length	(m)=	151.22	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	5.46	1.083	30.39	2.083	11.31	3.08	6.34
0.167	5.46	1.167	30.39	2.167	11.31	3.17	6.34
0.250	6.14	1.250	157.92	2.250	9.88	3.25	5.95
0.333	6.14	1.333	157.92	2.333	9.88	3.33	5.95
0.417	7.06	1.417	38.42	2.417	8.83	3.42	5.61
0.500	7.06	1.500	38.42	2.500	8.83	3.50	5.61
0.583	8.40	1.583	22.40	2.583	8.00	3.58	5.31
0.667	8.40	1.667	22.40	2.667	8.00	3.67	5.31
0.750	10.58	1.750	16.51	2.750	7.34	3.75	5.05
0.833	10.58	1.833	16.51	2.833	7.34	3.83	5.05
0.917	14.91	1.917	13.33	2.917	6.80	3.92	4.82
1.000	14.91	2.000	13.33	3.000	6.80	4.00	4.82

				TOTALS
Max.Eff.Inten.(mm/hr)=	157.92	54.39		
over (min)	5.00	15.00		
Storage Coeff. (min)=	2.73 (ii)	11.73 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.29	0.09		
PEAK FLOW (cms)=	0.52	0.14		0.587 (iii)
TIME TO PEAK (hrs)=	1.33	1.50		1.33
RUNOFF VOLUME (mm)=	68.46	21.38		37.85
TOTAL RAINFALL (mm)=	69.46	69.46		69.46
RUNOFF COEFFICIENT =	0.99	0.31		0.54

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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(0029)	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	0.0900	0.1200

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0028)	3.430	0.587	1.33	37.85
OUTFLOW: ID= 1 (0029)	3.430	0.060	2.50	37.76

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.21
TIME SHIFT OF PEAK FLOW (min)= 70.00
MAXIMUM STORAGE USED (ha.m.)= 0.0799

ADD HYD (0007)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0023):	0.41	0.028	1.50	24.48
+ ID2= 2 (0029):	3.43	0.060	2.50	37.76
ID = 3 (0007):	3.84	0.074	1.58	36.34

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)				
3 + 2 = 1	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 3 (0007):	3.84	0.074	1.58	36.34
+ ID2= 2 (0030):	1.56	0.094	1.50	23.02
ID = 1 (0007):	5.40	0.166	1.58	32.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0007)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0007):	5.40	0.166	1.58	32.49

```
     + ID2= 2 (  0031):     0.65   0.051     1.42    22.87
       ================================================
       ID = 3 (  0007):     6.05   0.211     1.50    31.46

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.211     1.50    31.46
     + ID2= 2 (  0005):     5.32   0.481     1.50    37.85
       ================================================
       ID = 1 (  0007):    11.37   0.692     1.50    34.45

    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   |   0.4220     0.1535
                         0.0410     0.0120   |   0.4630     0.1758
                         0.0580     0.0253   |   0.6510     0.1989
                         0.0710     0.0399   |   0.7480     0.2228
                         0.0830     0.0559   |   0.8280     0.2476
                         0.0920     0.0732   |   0.8990     0.2733
                         0.2500     0.0918   |   0.9640     0.2998
                         0.3200     0.1116   |   1.0240     0.3263
                         0.3750     0.1321   |   1.0800     0.3528

                              AREA     QPEAK     TPEAK      R.V.
                              (ha)     (cms)     (hrs)      (mm)
   INFLOW : ID= 2 (  0007)    11.370     0.692     1.50     34.45
   OUTFLOW: ID= 1 (  0008)    11.370     0.317     2.17     34.44

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 45.83
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.1108

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     0.83   0.059     1.50    24.47
     + ID2= 2 (  0008):    11.37   0.317     2.17    34.44
       ================================================
       ID = 3 (  0016):    12.20   0.336     2.08    33.77
```

```
    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0019)|   Area    (ha)=  12.20   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.90   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.61

        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    5.46 | 1.083   30.39 | 2.083   11.31 |  3.08    6.34
               0.167    5.46 | 1.167   30.39 | 2.167   11.31 |  3.17    6.34
               0.250    6.14 | 1.250  157.92 | 2.250    9.88 |  3.25    5.95
               0.333    6.14 | 1.333  157.92 | 2.333    9.88 |  3.33    5.95
               0.417    7.06 | 1.417   38.42 | 2.417    8.83 |  3.42    5.61
               0.500    7.06 | 1.500   38.42 | 2.500    8.83 |  3.50    5.61
               0.583    8.40 | 1.583   22.40 | 2.583    8.00 |  3.58    5.31
               0.667    8.40 | 1.667   22.40 | 2.667    8.00 |  3.67    5.31
               0.750   10.58 | 1.750   16.51 | 2.750    7.34 |  3.75    5.05
               0.833   10.58 | 1.833   16.51 | 2.833    7.34 |  3.83    5.05
               0.917   14.91 | 1.917   13.33 | 2.917    6.80 |  3.92    4.82
               1.000   14.91 | 2.000   13.33 | 3.000    6.80 |  4.00    4.82

    Unit Hyd Qpeak  (cms)=   0.764

    PEAK FLOW       (cms)=   0.317 (i)
    TIME TO PEAK    (hrs)=   2.083
    RUNOFF VOLUME    (mm)=  19.050
    TOTAL RAINFALL   (mm)=  69.460
    RUNOFF COEFFICIENT   =   0.274

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0039)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

        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    5.46 | 1.083   30.39 | 2.083   11.31 |  3.08    6.34
               0.167    5.46 | 1.167   30.39 | 2.167   11.31 |  3.17    6.34
               0.250    6.14 | 1.250  157.92 | 2.250    9.88 |  3.25    5.95
               0.333    6.14 | 1.333  157.92 | 2.333    9.88 |  3.33    5.95
               0.417    7.06 | 1.417   38.42 | 2.417    8.83 |  3.42    5.61
               0.500    7.06 | 1.500   38.42 | 2.500    8.83 |  3.50    5.61
               0.583    8.40 | 1.583   22.40 | 2.583    8.00 |  3.58    5.31
               0.667    8.40 | 1.667   22.40 | 2.667    8.00 |  3.67    5.31
               0.750   10.58 | 1.750   16.51 | 2.750    7.34 |  3.75    5.05
               0.833   10.58 | 1.833   16.51 | 2.833    7.34 |  3.83    5.05
               0.917   14.91 | 1.917   13.33 | 2.917    6.80 |  3.92    4.82
               1.000   14.91 | 2.000   13.33 | 3.000    6.80 |  4.00    4.82

    Unit Hyd Qpeak  (cms)=   0.167

    PEAK FLOW       (cms)=   0.059 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  24.473
    TOTAL RAINFALL   (mm)=  69.460
    RUNOFF COEFFICIENT   =   0.352

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0033)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

        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    5.46 | 1.083   30.39 | 2.083   11.31 |  3.08    6.34
               0.167    5.46 | 1.167   30.39 | 2.167   11.31 |  3.17    6.34
               0.250    6.14 | 1.250  157.92 | 2.250    9.88 |  3.25    5.95
               0.333    6.14 | 1.333  157.92 | 2.333    9.88 |  3.33    5.95
               0.417    7.06 | 1.417   38.42 | 2.417    8.83 |  3.42    5.61
               0.500    7.06 | 1.500   38.42 | 2.500    8.83 |  3.50    5.61
               0.583    8.40 | 1.583   22.40 | 2.583    8.00 |  3.58    5.31
               0.667    8.40 | 1.667   22.40 | 2.667    8.00 |  3.67    5.31
               0.750   10.58 | 1.750   16.51 | 2.750    7.34 |  3.75    5.05
               0.833   10.58 | 1.833   16.51 | 2.833    7.34 |  3.83    5.05
               0.917   14.91 | 1.917   13.33 | 2.917    6.80 |  3.92    4.82
               1.000   14.91 | 2.000   13.33 | 3.000    6.80 |  4.00    4.82

    Unit Hyd Qpeak  (cms)=   0.078

    PEAK FLOW       (cms)=   0.028 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  24.483
    TOTAL RAINFALL   (mm)=  69.460
    RUNOFF COEFFICIENT   =   0.352

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0036)|   Area    (ha)=   5.32
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------

                              IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=       2.66          2.66
    Dep. Storage     (mm)=       1.00          5.00
    Average Slope     (%)=       1.00          1.00
    Length            (m)=     188.33         40.00
    Mannings n          =      0.130         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    5.46 | 1.083   30.39 | 2.083   11.31 |  3.08    6.34
               0.167    5.46 | 1.167   30.39 | 2.167   11.31 |  3.17    6.34
               0.250    6.14 | 1.250  157.92 | 2.250    9.88 |  3.25    5.95
               0.333    6.14 | 1.333  157.92 | 2.333    9.88 |  3.33    5.95
               0.417    7.06 | 1.417   38.42 | 2.417    8.83 |  3.42    5.61
               0.500    7.06 | 1.500   38.42 | 2.500    8.83 |  3.50    5.61
               0.583    8.40 | 1.583   22.40 | 2.583    8.00 |  3.58    5.31
               0.667    8.40 | 1.667   22.40 | 2.667    8.00 |  3.67    5.31
               0.750   10.58 | 1.750   16.51 | 2.750    7.34 |  3.75    5.05
               0.833   10.58 | 1.833   16.51 | 2.833    7.34 |  3.83    5.05
               0.917   14.91 | 1.917   13.33 | 2.917    6.80 |  3.92    4.82
               1.000   14.91 | 2.000   13.33 | 3.000    6.80 |  4.00    4.82

    Max.Eff.Inten.(mm/hr)=     118.09        42.74
              over (min)       15.00        30.00
    Storage Coeff.  (min)=     13.91 (ii)   26.12 (ii)
    Unit Hyd. Tpeak (min)=     15.00        30.00
    Unit Hyd. peak  (cms)=      0.08         0.04
                                                      *TOTALS*
    PEAK FLOW       (cms)=      0.41         0.13        0.481 (iii)
    TIME TO PEAK    (hrs)=      1.50         1.75         1.50
    RUNOFF VOLUME    (mm)=     68.46        21.38        37.85
    TOTAL RAINFALL   (mm)=     69.46        69.46        69.46
    RUNOFF COEFFICIENT   =      0.99         0.31         0.54

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
          CN*  =  59.0    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           |
| NASHYD   (  0037)|   Area    (ha)=   0.65   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.14

        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    5.46 | 1.083   30.39 | 2.083   11.31 |  3.08    6.34
 0.167    5.46 | 1.167   30.39 | 2.167   11.31 |  3.17    6.34
 0.250    6.14 | 1.250  157.92 | 2.250    9.88 |  3.25    5.95
 0.333    6.14 | 1.333  157.92 | 2.333    9.88 |  3.33    5.95
 0.417    7.06 | 1.417   38.42 | 2.417    8.83 |  3.42    5.61
 0.500    7.06 | 1.500   38.42 | 2.500    8.83 |  3.50    5.61
 0.583    8.40 | 1.583   22.40 | 2.583    8.00 |  3.58    5.31
 0.667    8.40 | 1.667   22.40 | 2.667    8.00 |  3.67    5.31
 0.750   10.58 | 1.750   16.51 | 2.750    7.34 |  3.75    5.05
 0.833   10.58 | 1.833   16.51 | 2.833    7.34 |  3.83    5.05
 0.917   14.91 | 1.917   13.33 | 2.917    6.80 |  3.92    4.82
 1.000   14.91 | 2.000   13.33 | 3.000    6.80 |  4.00    4.82

    Unit Hyd Qpeak  (cms)=   0.177

    PEAK FLOW       (cms)=   0.051 (i)
    TIME TO PEAK    (hrs)=   1.417
    RUNOFF VOLUME    (mm)=  22.874
    TOTAL RAINFALL   (mm)=  69.460
    RUNOFF COEFFICIENT   =   0.329

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

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| NASHYD   (  0038)|   Area    (ha)=   1.56   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.22

        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    5.46 | 1.083   30.39 | 2.083   11.31 |  3.08    6.34
 0.167    5.46 | 1.167   30.39 | 2.167   11.31 |  3.17    6.34
 0.250    6.14 | 1.250  157.92 | 2.250    9.88 |  3.25    5.95
 0.333    6.14 | 1.333  157.92 | 2.333    9.88 |  3.33    5.95
 0.417    7.06 | 1.417   38.42 | 2.417    8.83 |  3.42    5.61
 0.500    7.06 | 1.500   38.42 | 2.500    8.83 |  3.50    5.61
 0.583    8.40 | 1.583   22.40 | 2.583    8.00 |  3.58    5.31
 0.667    8.40 | 1.667   22.40 | 2.667    8.00 |  3.67    5.31
 0.750   10.58 | 1.750   16.51 | 2.750    7.34 |  3.75    5.05
 0.833   10.58 | 1.833   16.51 | 2.833    7.34 |  3.83    5.05
 0.917   14.91 | 1.917   13.33 | 2.917    6.80 |  3.92    4.82
 1.000   14.91 | 2.000   13.33 | 3.000    6.80 |  4.00    4.82

    Max.Eff.Inten.(mm/hr)=     157.92       54.39
          over (min)        5.00        15.00
    Storage Coeff.  (min)=    2.73 (ii)   11.73 (ii)
    Unit Hyd. Tpeak (min)=    5.00        15.00
    Unit Hyd. peak  (cms)=    0.29         0.09
                                                 *TOTALS*
    PEAK FLOW       (cms)=    0.52         0.14          0.587 (iii)
    TIME TO PEAK    (hrs)=    1.33         1.50           1.33
    RUNOFF VOLUME    (mm)=   68.46        21.38          37.85
    TOTAL RAINFALL   (mm)=   69.46        69.46          69.46
    RUNOFF COEFFICIENT   =    0.99         0.31           0.54

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

     (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
          CN*  =  59.0    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.

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0033):     0.41   0.028     1.50    24.48
     + ID2= 2 (  0036):     5.32   0.481     1.50    37.85
       ================================================
       ID = 3 (  0041):     5.73   0.510     1.50    36.90

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     5.73   0.510     1.50    36.90
     + ID2= 2 (  0037):     0.65   0.051     1.42    22.87
       ================================================
       ID = 1 (  0041):     6.38   0.556     1.50    35.47

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
```

```
  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.083    5.46 | 1.083   30.39 | 2.083   11.31 |  3.08    6.34
 0.167    5.46 | 1.167   30.39 | 2.167   11.31 |  3.17    6.34
 0.250    6.14 | 1.250  157.92 | 2.250    9.88 |  3.25    5.95
 0.333    6.14 | 1.333  157.92 | 2.333    9.88 |  3.33    5.95
 0.417    7.06 | 1.417   38.42 | 2.417    8.83 |  3.42    5.61
 0.500    7.06 | 1.500   38.42 | 2.500    8.83 |  3.50    5.61
 0.583    8.40 | 1.583   22.40 | 2.583    8.00 |  3.58    5.31
 0.667    8.40 | 1.667   22.40 | 2.667    8.00 |  3.67    5.31
 0.750   10.58 | 1.750   16.51 | 2.750    7.34 |  3.75    5.05
 0.833   10.58 | 1.833   16.51 | 2.833    7.34 |  3.83    5.05
 0.917   14.91 | 1.917   13.33 | 2.917    6.80 |  3.92    4.82
 1.000   14.91 | 2.000   13.33 | 3.000    6.80 |  4.00    4.82

    Unit Hyd Qpeak  (cms)=   0.271

    PEAK FLOW       (cms)=   0.094 (i)
    TIME TO PEAK    (hrs)=   1.500
    RUNOFF VOLUME    (mm)=  23.016
    TOTAL RAINFALL   (mm)=  69.460
    RUNOFF COEFFICIENT   =   0.331

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

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD (  0040)|   Area    (ha)=   3.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------

                        IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=      1.71         1.71
    Dep. Storage     (mm)=      1.00         5.00
    Average Slope     (%)=      1.00         2.00
    Length            (m)=    151.22        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    5.46 | 1.083   30.39 | 2.083   11.31 |  3.08    6.34
 0.167    5.46 | 1.167   30.39 | 2.167   11.31 |  3.17    6.34
 0.250    6.14 | 1.250  157.92 | 2.250    9.88 |  3.25    5.95
 0.333    6.14 | 1.333  157.92 | 2.333    9.88 |  3.33    5.95
 0.417    7.06 | 1.417   38.42 | 2.417    8.83 |  3.42    5.61
 0.500    7.06 | 1.500   38.42 | 2.500    8.83 |  3.50    5.61
 0.583    8.40 | 1.583   22.40 | 2.583    8.00 |  3.58    5.31
 0.667    8.40 | 1.667   22.40 | 2.667    8.00 |  3.67    5.31

| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0041):     6.38   0.556     1.50    35.47
     + ID2= 2 (  0038):     1.56   0.094     1.50    23.02
       ================================================
       ID = 3 (  0041):     7.94   0.649     1.50    33.02

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     7.94   0.649     1.50    33.02
     + ID2= 2 (  0040):     3.43   0.587     1.33    37.85
       ================================================
       ID = 1 (  0041):    11.37   1.001     1.33    34.48

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0032)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0039):     0.83   0.059     1.50    24.47
     + ID2= 2 (  0041):    11.37   1.001     1.33    34.48
       ================================================
       ID = 3 (  0032):    12.20   1.039     1.33    33.80

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
================================================================================
========================


      V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
      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
Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2021 Smart City Water Inc
All rights reserved.
```

***** 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\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\aed83e90-3df7-4aba-a7ed-7ee224
Summary filename:
C:\Users\r.rajachockalingam\AppData\Local\Civica\VH5\98a3b801-fe45-439a-999a-909776f7886e\aed83e90-3df7-4aba-a7ed-7ee224

DATE: 06-15-2023 TIME: 02:15:50

USER:

COMMENTS: _____

** SIMULATION : 25mm Chicago Storm **

| READ STORM | Filename: C:\Users\r.rajachockalingam\AppData\Local\Temp\073789e9-0d0b-43a3-ada4-078b0c00e084\63c7cc5a
| Ptotal= 24.91 mm | Comments:

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.64	1.00	6.46	2.00	4.30	3.00	2.17
0.08	1.73	1.08	9.64	2.08	3.94	3.08	2.09
0.17	1.84	1.17	21.94	2.17	3.64	3.17	2.01
0.25	1.96	1.25	83.39	2.25	3.39	3.25	1.95
0.33	2.10	1.33	28.52	2.33	3.18	3.33	1.89
0.42	2.27	1.42	15.63	2.42	3.00	3.42	1.83
0.50	2.48	1.50	10.96	2.50	2.83	3.50	1.77
0.58	2.73	1.58	8.53	2.58	2.69	3.58	1.72
0.67	3.05	1.67	7.04	2.67	2.56	3.67	1.68
0.75	3.48	1.75	6.03	2.75	2.45	3.75	1.63
0.83	4.07	1.83	5.30	2.83	2.34	3.83	1.59
0.92	4.96	1.92	4.74	2.92	2.25	3.92	1.55

| CALIB |
| STANDHYD (0006) | Area (ha)= 5.62
|ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.81	2.81
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	193.56	10.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	83.39	6.59
over (min)	5.00	10.00
Storage Coeff. (min)=	4.08 (ii)	7.89 (ii)
Unit Hyd. Tpeak (min)=	5.00	10.00
Unit Hyd. peak (cms)=	0.24	0.13

			TOTALS
PEAK FLOW	(cms)=	0.35	0.03	0.364 (iii)
TIME TO PEAK	(hrs)=	1.33	1.50	1.33
RUNOFF VOLUME	(mm)=	23.91	2.83	10.21
TOTAL RAINFALL	(mm)=	24.91	24.91	24.91
RUNOFF COEFFICIENT	=	0.96	0.11	0.41

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 |
| NASHYD (0022) | Area (ha)= 0.83 Curve Number (CN)= 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.19

Unit Hyd Qpeak (cms)= 0.167

PEAK FLOW (cms)= 0.003 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 2.228
TOTAL RAINFALL (mm)= 24.913
RUNOFF COEFFICIENT = 0.089

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

| CALIB |

| NASHYD (0023) | Area (ha)= 0.41 Curve Number (CN)= 75.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.20

Unit Hyd Qpeak (cms)= 0.078

PEAK FLOW (cms)= 0.002 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 2.228
TOTAL RAINFALL (mm)= 24.913
RUNOFF COEFFICIENT = 0.089

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

| CALIB |
| NASHYD (0030) | Area (ha)= 1.56 Curve Number (CN)= 73.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.22

Unit Hyd Qpeak (cms)= 0.271

PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 1.750
RUNOFF VOLUME (mm)= 2.040
TOTAL RAINFALL (mm)= 24.913
RUNOFF COEFFICIENT = 0.082

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

| CALIB |
| NASHYD (0031) | Area (ha)= 0.65 Curve Number (CN)= 73.0
|ID= 1 DT= 5.0 min | Ia (mm)= 10.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.14

Unit Hyd Qpeak (cms)= 0.177

PEAK FLOW (cms)= 0.003 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 2.027
TOTAL RAINFALL (mm)= 24.913
RUNOFF COEFFICIENT = 0.081

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

| CALIB |
| STANDHYD (0005) | Area (ha)= 5.32
|ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	2.66	2.66
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	1.00
Length (m)=	188.33	40.00
Mannings n =	0.130	0.250
Max.Eff.Inten.(mm/hr)=	32.09	3.41
over (min)	25.00	60.00
Storage Coeff. (min)=	23.43 (ii)	56.98 (ii)
Unit Hyd. Tpeak (min)=	25.00	60.00
Unit Hyd. peak (cms)=	0.05	0.02

			TOTALS
PEAK FLOW	(cms)=	0.11	0.01	0.114 (iii)
TIME TO PEAK	(hrs)=	1.67	2.50	1.67
RUNOFF VOLUME	(mm)=	23.91	2.83	10.20
TOTAL RAINFALL	(mm)=	24.91	24.91	24.91
RUNOFF COEFFICIENT	=	0.96	0.11	0.41

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 59.0 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 (0028) | Area (ha)= 3.43
|ID= 1 DT= 5.0 min | Total Imp(%)= 50.00 Dir. Conn.(%)= 35.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.71	1.71
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.00
Length (m)=	151.22	40.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	83.39	3.73
over (min)	5.00	30.00
Storage Coeff. (min)=	3.52 (ii)	29.82 (ii)
Unit Hyd. Tpeak (min)=	5.00	30.00
Unit Hyd. peak (cms)=	0.26	0.04

			TOTALS
PEAK FLOW	(cms)=	0.23	0.01	0.227 (iii)
TIME TO PEAK	(hrs)=	1.33	1.92	1.33
RUNOFF VOLUME	(mm)=	23.91	2.83	10.20
TOTAL RAINFALL	(mm)=	24.91	24.91	24.91
RUNOFF COEFFICIENT	=	0.96	0.11	0.41

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  59.0    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(  0029)|     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   |   0.0900     0.1200

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0028)    3.430     0.227      1.33      10.20
   OUTFLOW: ID= 1 (  0029)    3.430     0.016      2.58      10.11

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.10
                  TIME SHIFT OF PEAK FLOW         (min)= 75.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0215

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0023):     0.41   0.002     1.67     2.23
     + ID2= 2 (  0029):     3.43   0.016     2.58    10.11
       ================================================
       ID = 3 (  0007):     3.84   0.017     2.42     9.27

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     3.84   0.017     2.42     9.27
     + ID2= 2 (  0030):     1.56   0.006     1.75     2.04
       ================================================
       ID = 1 (  0007):     5.40   0.022     1.83     7.18

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
```

```
-------------------
| ADD HYD  (  0007)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0007):     5.40   0.022     1.83     7.18
     + ID2= 2 (  0031):     0.65   0.003     1.58     2.03
       ================================================
       ID = 3 (  0007):     6.05   0.024     1.75     6.62

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0007)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0007):     6.05   0.024     1.75     6.62
     + ID2= 2 (  0005):     5.32   0.114     1.67    10.20
       ================================================
       ID = 1 (  0007):    11.37   0.138     1.67     8.30

    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   |   0.4220     0.1535
                         0.0410     0.0120   |   0.4630     0.1758
                         0.0580     0.0253   |   0.6510     0.1989
                         0.0710     0.0399   |   0.7480     0.2228
                         0.0830     0.0559   |   0.8280     0.2476
                         0.0920     0.0732   |   0.8990     0.2733
                         0.2500     0.0918   |   0.9640     0.2998
                         0.3200     0.1116   |   1.0240     0.3263
                         0.3750     0.1321   |   1.0800     0.3528

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0007)    11.370     0.138      1.67       8.30
   OUTFLOW: ID= 1 (  0008)    11.370     0.059      2.75       8.29

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 42.46
                  TIME SHIFT OF PEAK FLOW         (min)= 65.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0259

--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0016)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

```
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0022):     0.83   0.003     1.67     2.23
     + ID2= 2 (  0008):    11.37   0.059     2.75     8.29
       ================================================
       ID = 3 (  0016):    12.20   0.060     2.67     7.88

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0019)|   Area    (ha)=  12.20   Curve Number   (CN)= 64.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=   6.90   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.61

    Unit Hyd Qpeak  (cms)=   0.764

    PEAK FLOW       (cms)=   0.031 (i)
    TIME TO PEAK    (hrs)=   2.250
    RUNOFF VOLUME    (mm)=   2.017
    TOTAL RAINFALL   (mm)=  24.913
    RUNOFF COEFFICIENT   =   0.081

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0039)|   Area    (ha)=   0.83   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.19

    Unit Hyd Qpeak  (cms)=   0.167

    PEAK FLOW       (cms)=   0.003 (i)
    TIME TO PEAK    (hrs)=   1.667
    RUNOFF VOLUME    (mm)=   2.228
    TOTAL RAINFALL   (mm)=  24.913
    RUNOFF COEFFICIENT   =   0.089

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD   (  0033)|   Area    (ha)=   0.41   Curve Number   (CN)= 75.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

    Unit Hyd Qpeak  (cms)=   0.078

    PEAK FLOW       (cms)=   0.002 (i)
    TIME TO PEAK    (hrs)=   1.667
    RUNOFF VOLUME    (mm)=   2.228
    TOTAL RAINFALL   (mm)=  24.913
    RUNOFF COEFFICIENT   =   0.089

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

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| STANDHYD (  0036)|   Area    (ha)=   5.32
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
-------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      2.66         2.66
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         1.00
     Length            (m)=    188.33        40.00
     Mannings n           =     0.130        0.250

     Max.Eff.Inten.(mm/hr)=     32.09         3.41
               over (min)       25.00        60.00
     Storage Coeff.  (min)=     23.43 (ii)   56.98 (ii)
     Unit Hyd. Tpeak (min)=     25.00        60.00
     Unit Hyd. peak  (cms)=      0.05         0.02
                                                          *TOTALS*
     PEAK FLOW       (cms)=      0.11         0.01          0.114 (iii)
     TIME TO PEAK    (hrs)=      1.67         2.50           1.67
     RUNOFF VOLUME    (mm)=     23.91         2.83          10.20
     TOTAL RAINFALL   (mm)=     24.91        24.91          24.91
     RUNOFF COEFFICIENT   =      0.96         0.11           0.41


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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            |
| NASHYD   (  0037)|   Area    (ha)=   0.65   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.14

    Unit Hyd Qpeak  (cms)=   0.177

    PEAK FLOW       (cms)=   0.003 (i)
    TIME TO PEAK    (hrs)=   1.583
    RUNOFF VOLUME    (mm)=   2.027
    TOTAL RAINFALL   (mm)=  24.913
    RUNOFF COEFFICIENT   =   0.081
```

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0038)|   Area    (ha)=   1.56   Curve Number   (CN)= 73.0
|ID= 1 DT= 5.0 min |   Ia      (mm)=  10.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.22

     Unit Hyd Qpeak  (cms)=   0.271

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   1.750
     RUNOFF VOLUME    (mm)=   2.040
     TOTAL RAINFALL   (mm)=  24.913
     RUNOFF COEFFICIENT   =   0.082

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0040)|   Area    (ha)=   3.43
|ID= 1 DT= 5.0 min |   Total Imp(%)=  50.00   Dir. Conn.(%)=  35.00
--------------------

                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.71         1.71
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     151.22        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      83.39         3.73
               over (min)        5.00        30.00
     Storage Coeff.  (min)=       3.52 (ii)   29.82 (ii)
     Unit Hyd. Tpeak (min)=       5.00        30.00
     Unit Hyd. peak  (cms)=       0.26         0.04
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.23         0.01          0.227 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.92           1.33
     RUNOFF VOLUME    (mm)=      23.91         2.83          10.20
     TOTAL RAINFALL   (mm)=      24.91        24.91          24.91
     RUNOFF COEFFICIENT   =       0.96         0.11           0.41

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  59.0    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.

| ADD HYD  (  0032)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0039):     0.83   0.003     1.67     2.23
     + ID2= 2 (  0041):    11.37   0.264     1.33     8.33
       ================================================
       ID = 3 (  0032):    12.20   0.265     1.33     7.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

 FINISH
================================================================================
========================
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0033):     0.41   0.002     1.67     2.23
     + ID2= 2 (  0036):     5.32   0.114     1.67    10.20
       ================================================
       ID = 3 (  0041):     5.73   0.116     1.67     9.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     5.73   0.116     1.67     9.63
     + ID2= 2 (  0037):     0.65   0.003     1.58     2.03
       ================================================
       ID = 1 (  0041):     6.38   0.118     1.67     8.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0041):     6.38   0.118     1.67     8.86
     + ID2= 2 (  0038):     1.56   0.006     1.75     2.04
       ================================================
       ID = 3 (  0041):     7.94   0.124     1.67     7.52

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
| ADD HYD  (  0041)|
|   3 +  2 =  1    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 3 (  0041):     7.94   0.124     1.67     7.52
     + ID2= 2 (  0040):     3.43   0.227     1.33    10.20
       ================================================
       ID = 1 (  0041):    11.37   0.264     1.33     8.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------

-------------------
```

APPENDIX G
WATER BALANCE

McINTOSH PERRY

CCO-13-9668-01 - PERTHMORE SUBDIVISION - Water Balance Information - Monthly Review

The site exhibits five primary types of pervious land use / soil combinations:

	Values from Thornthwaite-Mather Table 10				Table 10 Values Applied to Site Conditions		
Pre-development / Post-development	Soil Type	Available Water (mm)	Root Zone (m)	Applicable Soil Moisture Rentention Table	Available Average Soil Depth (m)	Soil Moisture Retention Table Given Soil Depth (mm)	Values to use (mm)
Pasture overtopping sandy soils (class B soils)	Sandy Loam	150	1	150	0.6	90	100
Pasture overtopping sandy soils (class C soils)	Silty/Clay Loam	250	1	250	0.6	150	150
Forest overtopping sandy soils (class B soils)	Sandy Loam	150	2	300	0.6	180	200
Forest overtopping sandy soils (class C soils)	Silty/Clay Loam	250	1.6	400	0.6	240	250

Summary of data below:

Soil Moisture Storage	Surplus
75	398
100	391
125	387
150	384
200	380
250	377
350	373
400	371

Soil Moisture Storage Data

75mm															
Month	Temperature	Heat Index	PET	P = Total Precipitation	ΔP = P-PET	Acc Pot WL	ST= Storage	ΔS = Soil Moisture Storage	AET	Soil Moisture Deficit (D)	Soil Moisture Surplus (S)	Water Runoff RO	Snow Melt Runoff	Total Runoff	Total Moisture Detention
January	-10.3	0	0	65	65		217	0	0	0	0	11	0	11	228
February	-8.1	0	0	54	54		271	0	0	0	0	5	0	5	276
March	-2.3	0	0	64	64		336	0	0	0	0	2	0	2	338
April	6.3	1.4	32	75	43		75	0	32	0	43	22	26	48	166
May	13.3	4.4	79	80	2		75	0	79	0	2	12	117	129	206
June	18.5	7.2	112	93	-19	-19	57	-18	111	1	0	6	59	65	122
July	21	8.8	133	92	-41	-60	33	-24	116	17	0	3	29	32	65
August	19.8	8.0	114	86	-29	-88	22	-11	97	18	0	2	15	17	39
September	15	5.3	73	90	17		39	17	73	0	0	1	7	8	47
October	8	2.0	34	86	52		75	36	34	0	17	9	4	13	105
November	1.5	0.2	5	82	77		75	0	5	0	77	43	2	45	197
December	-6.2	0	0	76	76		151	0	0	0	0	22	1	23	174
		37.4	580	944				0	545	35	138	138	260	398	

Monthly T and P from Environment Canada
Heat Index (I) 37.4
a: 1.06

Table 25 - 75mm soil moisture retention in Thornthwaite [1957]

100mm															
Month	Temperature	Heat Index	PET	P = Total Precipitation	ΔP = P-PET	Acc Pot WL	ST= Storage	ΔS = Soil Moisture Storage	AET	Soil Moisture Deficit (D)	Soil Moisture Surplus (S)	Water Runoff RO	Snow Melt Runoff	Total Runoff	Total Moisture Detention
January	-10.3	0	0	65	65		241	0	0	0	0	11	0	11	252
February	-8.1	0	0	54	54		296	0	0	0	0	5	0	5	301
March	-2.3	0	0	64	64		360	0	0	0	0	2	0	2	362
April	6.3	1.4	32	75	43		100	0	32	0	43	22	26	48	191
May	13.3	4.4	79	80	2		100	0	79	0	2	12	117	129	231
June	18.5	7.2	112	93	-19	-19	82	-18	111	1	0	6	59	65	147
July	21	8.8	133	92	-41	-60	54	-28	120	13	0	3	29	32	86
August	19.8	8.0	114	86	-29	-88	40	-14	100	15	0	2	15	17	57
September	15	5.3	73	90	17		57	17	73	0	0	1	7	8	65
October	8	2.0	34	86	52		100	43	34	0	10	5	4	9	119
November	1.5	0.2	5	82	77		100	0	5	0	77	41	2	43	220
December	-6.2	0	0	76	76		176	0	0	0	0	21	1	22	198
		37.4	580	944				0	552	28	131	131	260	391	

Monthly T and P from Environment Canada

Table 26 - 100mm soil moisture retention in Thornthwaite [1957]

Heat Index (I)

a: 37.4

125mm															
Month	Temperature	Heat Index	PET	P = Total Precipitation	ΔP = P-PET	Acc Pot WL	ST= Storage	ΔS = Soil Moisture Storage	AET	Soil Moisture Deficit (D)	Soil Moisture Surplus (S)	Water Runoff RO	Snow Melt Runoff	Total Runoff	Total Moisture Detention
January	-10.3	0	0	65	65		267	0	0	0	0	10	0	10	277
February	-8.1	0	0	54	54		321	0	0	0	0	5	0	5	326
March	-2.3	0	0	64	64		386	0	0	0	0	2	0	2	388
April	6.3	1.4	32	75	43		125	0	32	0	43	23	26	49	217
May	13.3	4.4	79	80	2		125	0	79	0	2	12	117	129	256
June	18.5	7.2	112	93	-19	-19	106	-19	112	0	0	6	59	65	171
July	21	8.8	133	92	-41	-60	76	-30	122	11	0	3	29	32	108
August	19.8	8.0	114	86	-29	-88	61	-15	101	14	0	2	15	17	78
September	15	5.3	73	90	17		78	17	73	0	0	1	7	8	86
October	8	2.0	34	86	52		125	47	34	0	6	3	4	7	138
November	1.5	0.2	5	82	77		125	0	5	0	77	40	2	42	244
December	-6.2	0	0	76	76		201	0	0	0	0	20	1	21	222
		37.4	580	944				0	556	24	127	127	260	387	

Monthly T from Environment Canada

Table 27 - 100mm soil moisture retention in Thornthwaite [1957]

Heat Index (I) 37.4

a: 1.06

150mm															
Month	Temperature	Heat Index	PET	P = Total Precipitation	ΔP = P-PET	Acc Pot WL	ST= Storage	ΔS = Soil Moisture Storage	AET	Soil Moisture Deficit (D)	Soil Moisture Surplus (S)	Water Runoff RO	Snow Melt Runoff	Total Runoff	Total Moisture Detention
January	-10.3	0	0	65	65		292	0	0	0	0	10	0	10	302
February	-8.1	0	0	54	54		346	0	0	0	0	5	0	5	351
March	-2.3	0	0	64	64		411	0	0	0	0	2	0	2	413
April	6.3	1.4	32	75	43		150	0	32	0	43	23	26	49	242
May	13.3	4.4	79	80	2		150	0	79	0	2	12	117	129	281
June	18.5	7.2	112	93	-19	-19	132	-18	111	1	0	6	59	65	197
July	21	8.8	133	92	-41	-60	100	-32	124	9	0	3	29	32	132
August	19.8	8.0	114	86	-29	-88	83	-17	103	12	0	2	15	17	100
September	15	5.3	73	90	17		100	17	73	0	0	1	7	8	108
October	8	2.0	34	86	52		150	50	34	0	3	2	4	6	159
November	1.5	0.2	5	82	77		150	0	5	0	77	39	2	41	268
December	-6.2	0	0	76	76		226	0	0	0	0	19	1	20	246
		37.4	580	944				0	559	21	124	124	260	384	

Monthly T from Environment Canada
Heat Index (I) 37.4
a: 1.06

Table 28 - 150mm soil moisture retention in Thornthwaite [1957]

200mm															
Month	Temperature	Heat Index	PET	P = Total Precipitation	ΔP = P-PET	Acc Pot WL	ST= Storage	ΔS = Soil Moisture Storage	AET	Soil Moisture Deficit (D)	Soil Moisture Surplus (S)	Water Runoff RO	Snow Melt Runoff	Total Runoff	Total Moisture Detention
January	-10.3	0	0	65	65		341	0	0	0	0	10	0	10	351
February	-8.1	0	0	54	54		396	0	0	0	0	5	0	5	401
March	-2.3	0	0	64	64		460	0	0	0	0	2	0	2	462
April	6.3	1.4	32	75	43		200	0	32	0	43	22	26	48	291
May	13.3	4.4	79	80	2		200	0	79	0	2	12	117	129	331
June	18.5	7.2	112	93	-19	-19	182	-18	111	1	0	6	59	65	247
July	21	8.8	133	92	-41	-60	148	-34	126	7	0	3	29	32	180
August	19.8	8.0	114	86	-29	-88	128	-20	106	9	0	2	15	17	145
September	15	5.3	73	90	17		145	17	73	0	0	1	7	8	153
October	8	2.0	34	86	52		198	52	34	0	0	0	4	4	202
November	1.5	0.2	5	82	77		200	2	5	0	75	38	2	40	315
December	-6.2	0	0	76	76		276	0	0	0	0	19	1	20	296
		37.4	580	944				0	564	16	120	120	260	380	

Monthly T from Environment Canada
Heat Index (I) 37.4
a: 1.06

Table 29 - 200mm soil moisture retention in Thornthwaite [1957]

250mm															
Month	Temperature	Heat Index	PET	P = Total Precipitation	ΔP = P-PET	Acc Pot WL	ST= Storage	ΔS = Soil Moisture Storage	AET	Soil Moisture Deficit (D)	Soil Moisture Surplus (S)	Water Runoff RO	Snow Melt Runoff	Total Runoff	Total Moisture Detention
January	-10.3	0	0	65	65		392	0	0	0	0	9	0	9	401
February	-8.1	0	0	54	54		446	0	0	0	0	5	0	5	451
March	-2.3	0	0	64	64		511	0	0	0	0	2	0	2	513
April	6.3	1.4	32	75	43		250	0	32	0	43	23	26	49	342
May	13.3	4.4	79	80	2		250	0	79	0	2	12	117	129	381
June	18.5	7.2	112	93	-19	-19	231	-19	112	0	0	6	59	65	296
July	21	8.8	133	92	-41	-60	196	-35	127	6	0	3	29	32	228
August	19.8	8.0	114	86	-29	-88	175	-21	107	8	0	2	15	17	192
September	15	5.3	73	90	17		192	17	73	0	0	1	7	8	200
October	8	2.0	34	86	52		245	52	34	0	0	0	4	4	249
November	1.5	0.2	5	82	77		250	5	5	0	72	36	2	38	360
December	-6.2	0	0	76	76		326	0	0	0	0	18	1	19	345
		37.4	580	944				0	567	13	117	117	260	377	

Monthly T from Environment Canada
Heat Index (I) 37.4
a: 1.06

Table 30 - 250mm soil moisture retention in Thornthwaite [1957]

350mm															
Month	Temperature	Heat Index	PET	P = Total Precipitation	ΔP = P-PET	Acc Pot WL	ST= Storage	ΔS = Soil Moisture Storage	AET	Soil Moisture Deficit (D)	Soil Moisture Surplus (S)	Water Runoff RO	Snow Melt Runoff	Total Runoff	Total Moisture Detention
January	-10.3	0	0	65	65		492	0	0	0	0	9	0	9	501
February	-8.1	0	0	54	54		546	0	0	0	0	4	0	4	550
March	-2.3	0	0	64	64		611	0	0	0	0	2	0	2	613
April	6.3	1.4	32	75	43		350	0	32	0	43	23	26	49	442
May	13.3	4.4	79	80	2		350	0	79	0	2	12	117	129	481
June	18.5	7.2	112	93	-19	-19	331	-19	112	0	0	6	59	65	396
July	21	8.8	133	92	-41	-60	294	-37	129	4	0	3	29	32	326
August	19.8	8.0	114	86	-29	-88	271	-23	109	6	0	2	15	17	288
September	15	5.3	73	90	17		288	17	73	0	0	1	7	8	296
October	8	2.0	34	86	52		341	52	34	0	0	0	4	4	345
November	1.5	0.2	5	82	77		350	9	5	0	68	34	2	36	454
December	-6.2	0	0	76	76		426	0	0	0	0	17	1	18	444
		37.4	580	944				0	571	9	113	113	260	373	

Monthly T from Environment Canada
Heat Index (I) 37.4
a: 1.06

Table 32 - 350mm soil moisture retention in Thornthwaite [1957]

400mm															
Month	Temperature	Heat Index	PET	P = Total Precipitation	ΔP = P-PET	Acc Pot WL	ST= Storage	ΔS = Soil Moisture Storage	AET	Soil Moisture Deficit (D)	Soil Moisture Surplus (S)	Water Runoff RO	Snow Melt Runoff	Total Runoff	Total Moisture Detention
January	-10.3	0	0	65	65		542	0	0	0	0	8	0	8	550
February	-8.1	0	0	54	54		596	0	0	0	0	4	0	4	600
March	-2.3	0	0	64	64		661	0	0	0	0	2	0	2	663
April	6.3	1.4	32	75	43		400	0	32	0	43	23	26	49	492
May	13.3	4.4	79	80	2		400	0	79	0	2	12	117	129	531
June	18.5	7.2	112	93	-19	-19	381	-19	112	0	0	6	59	65	446
July	21	8.8	133	92	-41	-60	344	-37	129	4	0	3	29	32	376
August	19.8	8.0	114	86	-29	-88	320	-24	110	5	0	2	15	17	337
September	15	5.3	73	90	17		337	17	73	0	0	1	7	8	345
October	8	2.0	34	86	52		390	52	34	0	0	0	4	4	394
November	1.5	0.2	5	82	77		400	10	5	0	66	33	2	35	501
December	-6.2	0	0	76	76		476	0	0	0	0	17	1	18	494
		37.4	580	944				0	572	8	111	111	260	371	

Monthly T from Environment Canada
Heat Index (I) 37.4
a: 1.06

Table 33 - 450mm soil moisture retention in Thornthwaite [1957]

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - PRE-DEVELOPMENT

Water Balance / Water Budget Assessment

	Development Lands to Perth Long Swamp (A1)						
Land Use	**Forest**		**Pasture**		**Gravel**	**Asphalt**	**Total**
Soil (HSG)	**C**	**B**	**C**	**B**			
Soil Characterization	***Silt/Clay Loam (250)***	***Sandy Loam (200)***	***Silt/Clay Loam (150)***	***Sandy Loam (100)***			
Area (m^2)	34300	15600	17600	54500	-	-	122000
Pervious Area (m^2)	34300	15600	17600	54500	-	-	122000
Impervious Area (m^2)	-	-	-	-	-	-	-
Infiltration Factors							
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	-	-	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	-	-	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	-	-	
MOE infiltration Factor	0.522	0.572	0.422	0.472	-	-	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	-	-	
Run-off Coefficient	0.478	0.428	0.578	0.528	-	-	
Runoff from Impervious Surfaces*	0	0	0	0	-	-	
Inputs (per Unit Area)							
Precipitation (mm/year)	944	944	944	944	-	-	944
Run-on (mm/year)	0	0	0	0	-	-	0
Other Inputs (mm/year)	0	0	0	0	-	-	0
Total Inputs (mm/year)	944	944	944	944	-	-	944
Outputs (per Unit Area)							
Precipitation Surplus (mm/year)	377	380	384	391	-	-	385
Net Surplus (mm/year)	377	380	384	391	-	-	385
Evapotranspiration (mm/year)	567	564	560	553	-	-	559
Infiltration (mm/year)	197	217	162	185	-	-	189
Rooftop Infiltration (mm/year)	0	0	0	0	-	-	0
Total Infiltration (mm/year)	197	217	162	185	-	-	189
Runoff Pervious Areas	180	163	222	206	-	-	771
Runoff Impervious Areas	0	0	0	0	-	-	0
Total Runoff (mm/year)	180	163	222	206	-	-	196
Total Outputs (mm/year)	944	944	944	944	-	-	944
Difference (Inputs - Outputs)	0	0	0	0	-	-	0
Inputs (Volume)							
Precipitation (m^3/year)	32379	14726	16614	51448	-	-	115168
Run-on (m^3/year)	0	0	0	0	-	-	0
Other Inputs m^3/year)	0	0	0	0	-	-	0
Total Inputs (m^3/year)	32379	14726	16614	51448	-	-	115168
Outputs (Volume)							
Precipitation Surplus (m^3/year)	12931	5928	6758	21310	-	-	46927
Net Surplus (m^3/year)	12931	5928	6758	21310	-	-	46927
Evapotranspiration (m^3/year)	19448	8798	9856	30139	-	-	68241
Infiltration (m^3/year)	6750	3391	2852	10058	-	-	23051
Rooftop infiltration (m^3/year)	0	0	0	0	-	-	0
Total Infiltration (m^3/year)	6750	3391	2852	10058	-	-	23051
Runoff Pervious Areas (m^3/year)	6181	2537	3906	11251	-	-	23876
Runoff Impervious Areas (m^3/year)	0	0	0	0	-	-	0
Total Runoff (m^3/year)	6181	2537	3906	11251	-	-	23876
Total Outputs (m^3/year)	**32379**	**14726**	**16614**	**51448**	-	-	**115168**
Difference (Inputs - Outputs)	0	0	0	0	-	-	0

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - POST-DEVELOPMENT

Water Balance / Water Budget Assessment

	Development Lands to Perth Long Swamp (Block 70, SWM Block, Residential Lots and Roadway)							
Land Use	**Forest**		**Pasture**					
Soil (HSG)	**C**	**B**	**C**	**B**				
Soil Characterization	***Silt/Clay Loam (250)***	***Sandy Loam (200)***	***Silt/Clay Loam (150)***	***Sandy Loam (100)***	***Sand (75)***	**Gravel**	**Asphalt**	**Total**
Area (m^2)	8300	0	17400	13300	0	0	26600	65600
Pervious Area (m^2)	8300	0	17400	13300	0	-	-	39000
Impervious Area (m^2)	-	-	-	-	-	0	26600	26600
Infiltration Factors								
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0	
Run-off Coefficient	0.478	0.428	0.578	0.528	0.43	0.78	0.9	
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9	
Inputs (per Unit Area)								
Precipitation (mm/year)	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944
Outputs (per Unit Area)								
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	573
Net Surplus (mm/year)	377	380	384	391	398	398	850	573
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	371
Infiltration (mm/year)	197	217	162	185	227	88	85	140
Rooftop and Trench Infiltration (mm/year)	0	0	0	0	0	0	0	0
Total Infiltration (mm/year)	197	217	162	185	227	88	85	140
Runoff Pervious Areas	180	163	222	206	171	0	0	942
Runoff Impervious Areas	0	0	0	0	0	310	765	1075
Total Runoff (mm/year)	180	163	222	206	171	310	765	434
Total Outputs (mm/year)	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
Inputs (Volume)								
Precipitation (m^3/year)	7835	0	16426	12555	0	0	25110	61926
Run-on (m^3/year)	0	0	0	0	0	0	0	0
Other Inputs m^3/year)	0	0	0	0	0	0	0	0
Total Inputs (m^3/year)	7835	0	16426	12555	0	0	25110	61926
Outputs (Volume)								
Precipitation Surplus (m^3/year)	3129	0	6682	5200	0	0	22599	37610
Net Surplus (m^3/year)	3129	0	6682	5200	0	0	22599	37610
Evapotranspiration (m^3/year)	4706	0	9744	7355	0	0	2511	24316
Infiltration (m^3/year)	1633	0	2820	2455	0	0	2260	9168
Rooftop and Trench Infiltration (m^3/year)	0	0	0	0	0	0	0	0
Total Infiltration (m^3/year)	1633	0	2820	2455	0	0	2260	9168
Runoff Pervious Areas (m^3/year)	1496	0	3862	2746	0	0	0	8103
Runoff Impervious Areas (m^3/year)	0	0	0	0	0	0	20339	20339
Total Runoff (m^3/year)	1496	0	3862	2746	0	0	20339	28443
Total Outputs (m^3/year)	**7835**	**0**	**16426**	**12555**	**0**	**0**	**25110**	**61926**
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

	Development Lands to Perth Long Swamp (West Block)							
Land Use	**Forest**		**Pasture**					
Soil (HSG)	**C**	**B**	**C**	**B**				
Soil Characterization	***Silt/Clay Loam (250)***	***Sandy Loam (200)***	***Silt/Clay Loam (150)***	***Sandy Loam (100)***	***Sand (75)***	**Gravel**	**Asphalt**	**Total**
Area (m^2)	0	0	0	10290	0	0	24010	34300
Pervious Area (m^2)	0	0	0	10290	0	-	-	10290
Impervious Area (m^2)	-	-	-	-	-	0	24010	24010
Infiltration Factors								
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.3	0.05	0	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.52	0.22	0	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.52	0.22	0	
Run-off Coefficient	0.478	0.428	0.578	0.528	0.48	0.78	0.9	
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9	
Inputs (per Unit Area)								
Precipitation (mm/year)	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944
Outputs (per Unit Area)								
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	712
Net Surplus (mm/year)	377	380	384	391	398	398	850	712
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	232
Infiltration (mm/year)	197	217	162	185	207	88	0	55
Rooftop and Trench Infiltration (mm/year)	0	0	0	0	0	0	0	0
Total Infiltration (mm/year)	197	217	162	185	207	88	0	55
Runoff Pervious Areas	180	163	222	206	191	0	0	962
Runoff Impervious Areas	0	0	0	0	0	310	850	1160
Total Runoff (mm/year)	180	163	222	206	191	310	850	657
Total Outputs (mm/year)	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
Inputs (Volume)								
Precipitation (m^3/year)	0	0	0	9714	0	0	22665	32379
Run-on (m^3/year)	0	0	0	0	0	0	0	0
Other Inputs m^3/year)	0	0	0	0	0	0	0	0
Total Inputs (m^3/year)	0	0	0	9714	0	0	22665	32379
Outputs (Volume)								
Precipitation Surplus (m^3/year)	0	0	0	4023	0	0	20399	24422
Net Surplus (m^3/year)	0	0	0	4023	0	0	20399	24422
Evapotranspiration (m^3/year)	0	0	0	5690	0	0	2267	7957
Infiltration (m^3/year)	0	0	0	1899	0	0	0	1899
Rooftop and Trench Infiltration (m^3/year)	0	0	0	0	0	0	0	0
Total Infiltration (m^3/year)	0	0	0	1899	0	0	0	1899
Runoff Pervious Areas (m^3/year)	0	0	0	2124	0	0	0	2124
Runoff Impervious Areas (m^3/year)	0	0	0	0	0	0	20399	20399
Total Runoff (m^3/year)	0	0	0	2124	0	0	20399	22523
Total Outputs (m^3/year)	**0**	**0**	**0**	**9714**	**0**	**0**	**22665**	**32379**
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

	Development Lands to Perth Long Swamp (Central Block)							
Land Use	**Forest**		**Pasture**					
Soil (HSG)	**C**	**B**	**C**	**B**				
Soil Characterization	***Silt/Clay Loam (250)***	***Sandy Loam (200)***	***Silt/Clay Loam (150)***	***Sandy Loam (100)***	***Sand (75)***	**Gravel**	**Asphalt**	**Total**
Area (m^2)	0	1560	0	3120	0	0	10920	15600
Pervious Area (m^2)	0	1560	0	3120	0	-	-	4680
Impervious Area (m^2)	-	-	-	-	-	0	10920	10920
Infiltration Factors								
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.3	0.05	0	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.52	0.22	0	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.52	0.22	0	
Run-off Coefficient	0.478	0.428	0.578	0.528	0.48	0.78	0.9	
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9	
Inputs (per Unit Area)								
Precipitation (mm/year)	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944
Outputs (per Unit Area)								
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	711
Net Surplus (mm/year)	377	380	384	391	398	398	850	711
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	233
Infiltration (mm/year)	197	217	162	185	207	88	0	59
Rooftop and Trench Infiltration (mm/year)	0	0	0	0	0	0	0	0
Total Infiltration (mm/year)	197	217	162	185	207	88	0	59
Runoff Pervious Areas	180	163	222	206	191	0	0	962
Runoff Impervious Areas	0	0	0	0	0	310	850	1160
Total Runoff (mm/year)	180	163	222	206	191	310	850	652
Total Outputs (mm/year)	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
Inputs (Volume)								
Precipitation (m^3/year)	0	1473	0	2945	0	0	10308	14726
Run-on (m^3/year)	0	0	0	0	0	0	0	0
Other Inputs m^3/year)	0	0	0	0	0	0	0	0
Total Inputs (m^3/year)	0	1473	0	2945	0	0	10308	14726
Outputs (Volume)								
Precipitation Surplus (m^3/year)	0	593	0	1220	0	0	9278	11090
Net Surplus (m^3/year)	0	593	0	1220	0	0	9278	11090
Evapotranspiration (m^3/year)	0	880	0	1725	0	0	1031	3636
Infiltration (m^3/year)	0	339	0	576	0	0	0	915
Rooftop and Trench Infiltration (m^3/year)	0	0	0	0	0	0	0	0
Total Infiltration (m^3/year)	0	339	0	576	0	0	0	915
Runoff Pervious Areas (m^3/year)	0	254	0	644	0	0	0	898
Runoff Impervious Areas (m^3/year)	0	0	0	0	0	0	9278	9278
Total Runoff (m^3/year)	0	254	0	644	0	0	9278	10175
Total Outputs (m^3/year)	**0**	**1473**	**0**	**2945**	**0**	**0**	**10308**	**14726**
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

	Development Lands to Perth Long Swamp (East Block)							
Land Use	**Forest**		**Pasture**					
Soil (HSG)	**C**	**B**	**C**	**B**				
Soil Characterization	***Silt/Clay Loam (250)***	***Sandy Loam (200)***	***Silt/Clay Loam (150)***	***Sandy Loam (100)***	***Sand (75)***	**Gravel**	**Asphalt**	**Total**
Area (m^2)	650	0	1300	0	0	0	4550	6500
Pervious Area (m^2)	650	0	1300	0	0	-	-	1950
Impervious Area (m^2)	-	-	-	-	-	0	4550	4550
Infiltration Factors								
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.3	0.05	0	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.52	0.22	0	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.52	0.22	0	
Run-off Coefficient	0.478	0.428	0.578	0.528	0.48	0.78	0.9	
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9	
Inputs (per Unit Area)								
Precipitation (mm/year)	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944
Outputs (per Unit Area)								
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	709
Net Surplus (mm/year)	377	380	384	391	398	398	850	709
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	235
Infiltration (mm/year)	197	217	162	185	207	88	0	52
Rooftop and Trench Infiltration (mm/year)	0	0	0	0	0	0	0	0
Total Infiltration (mm/year)	197	217	162	185	207	88	0	52
Runoff Pervious Areas	180	163	222	206	191	0	0	962
Runoff Impervious Areas	0	0	0	0	0	310	850	1160
Total Runoff (mm/year)	180	163	222	206	191	310	850	657
Total Outputs (mm/year)	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
Inputs (Volume)								
Precipitation (m^3/year)	614	0	1227	0	0	0	4295	6136
Run-on (m^3/year)	0	0	0	0	0	0	0	0
Other Inputs m^3/year)	0	0	0	0	0	0	0	0
Total Inputs (m^3/year)	614	0	1227	0	0	0	4295	6136
Outputs (Volume)								
Precipitation Surplus (m^3/year)	245	0	499	0	0	0	3866	4610
Net Surplus (m^3/year)	245	0	499	0	0	0	3866	4610
Evapotranspiration (m^3/year)	369	0	728	0	0	0	430	1526
Infiltration (m^3/year)	128	0	211	0	0	0	0	339
Rooftop and Trench Infiltration (m^3/year)	0	0	0	0	0	0	0	0
Total Infiltration (m^3/year)	128	0	211	0	0	0	0	339
Runoff Pervious Areas (m^3/year)	117	0	289	0	0	0	0	406
Runoff Impervious Areas (m^3/year)	0	0	0	0	0	0	3866	3866
Total Runoff (m^3/year)	117	0	289	0	0	0	3866	4271
Total Outputs (m^3/year)	**614**	**0**	**1227**	**0**	**0**	**0**	**4295**	**6136**
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - MITIGATION REQUIRED

Water Balance / Water Budget Assessment

Data Input	
944	mm of precipitation per year avg.
118.4	days with precipitation per year avg.
10	mm design rainfall event

1981 to 2010 Canadian Climate Normals station data

Days with Rainfall

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	Code
>= 0.2 mm	4.4	3.9	6.7	10.9	13.4	13.2	11.9	11	12.3	13.7	11	6	118.4	A
>= 5 mm	1.6	1.2	2.1	4	4.9	5.8	5.4	4.8	5.1	5	4.2	2.3	46.5	A
>= 10 mm	0.87	0.57	1	2	2.7	2.9	3.1	2.8	3.2	2.7	2.1	1.2	25.2	A
>= 25 mm	0.13	0.07	0.10	0.33	0.47	0.73	0.77	0.67	0.60	0.47	0.43	0.13	4.9	A

Environment Canada	Days exceeding rainfall noted	Days per section	Minimum volume of rain (mm)
0.2 mm	118.4	71.9	14
5 mm	46.5	21.3	107
10 mm	25.2	25.2	252
		Total	373

*Example - Days per section over 5mm = 46.5 - 25.2 = 21.3 days (which are more than 5 mm but, less than 10 mm).
21.3 days x 5 mm = 107 mm

	Development Lands to Perth Long Swamp (Block 70, SWM Block, Residential Lots and Roadway)	**Development Lands to Perth Long Swamp (West Block #67)**
Area of Asphalt (m^2)	26600	24010
Asphalt Runoff Coefficient	0.9	0.9
Volume of Runoff in 5 mm Event (m^3) to be infiltrated	120	108
Mitigation Required (m^3/year)	2873	2593
Annual Volume to be infiltrated by designing for 5 mm Event	2897	2615

By installing trenches sized for the 5 mm event, the annual volume to be infiltrated will exceed that of the mitigation required by the water balance mitigation.

Infiltration Area Footprint Calculation

Phase 6:	**For 0.5m depth**	**For 0.75m depth**
Infiltration Target=	120 m^3	120 m^3
Assumed trench depth=	0.5 m^3	0.75 m^3
Porosity =	0.4	0.4
Trench footprint area required=	**600 m^2**	**400 m^2**

West Block:	**For 0.5m depth**	**For 0.75m depth**
Infiltration Target=	108 m^3	108 m^3
Assumed trench depth=	0.5 m^3	0.75 m^3
Porosity =	0.4	0.4
Trench footprint area required=	**540 m^2**	**360 m^2**

1-1329 Gardiners Road, Kingston, ON K7P 0L8 | T. 613.542.3788 | F. 613.542.7583
info@mcintoshperry.com | www.mcintoshperry.com

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - POST-DEVELOPMENT WITH MITIGATION

Water Balance / Water Budget Assessment

Development Lands to Perth Long Swamp (Block 70, SWM Block, Residential Lots and Roadway)

Land Use	Forest		Pasture					
Soil (HSG)	C	B	C	B				
Soil Characterization	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total
Area (m^2)	8300	0	17400	13300	0	0	26600	65600
Pervious Area (m^2)	8300	0	17400	13300	0	-	-	39000
Impervious Area (m^2)	-	-	-	-	-	0	26600	26600
Infiltration Factors								
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0	
Run-off Coefficient	0.478	0.428	0.578	0.528	0.43	0.78	0.9	
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9	
Inputs (per Unit Area)								
Precipitation (mm/year)	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944
Outputs (per Unit Area)								
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	573
Net Surplus (mm/year)	377	380	384	391	398	398	850	573
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	371
Infiltration (mm/year)	197	217	162	185	227	88	85	140
Rooftop and Infiltration Basin (mm/year)	0	0	0	0	0	0	108	44
Total Infiltration (mm/year)	197	217	162	185	227	88	193	184
Runoff Pervious Areas	180	163	222	206	171	0	0	942
Runoff Impervious Areas	0	0	0	0	0	310	657	967
Total Runoff (mm/year)	180	163	222	206	171	310	657	390
Total Outputs (mm/year)	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
Inputs (Volume)								
Precipitation (m^3/year)	7835	0	16426	12555	0	0	25110	61926
Run-on (m^3/year)	0	0	0	0	0	0	0	0
Other Inputs m^3/year)	0	0	0	0	0	0	0	0
Total Inputs (m^3/year)	7835	0	16426	12555	0	0	25110	61926
Outputs (Volume)								
Precipitation Surplus (m^3/year)	3129	0	6682	5200	0	0	22599	37610
Net Surplus (m^3/year)	3129	0	6682	5200	0	0	22599	37610
Evapotranspiration (m^3/year)	4706	0	9744	7355	0	0	2511	24316
Infiltration (m^3/year)	1633	0	2820	2455	0	0	2260	9168
Rooftop and Trench Infiltration (m^3/year)	0	0	0	0	0	0	2873	2873
Total Infiltration (m^3/year)	1633	0	2820	2455	0	0	5133	12040
Runoff Pervious Areas (m^3/year)	1496	0	3862	2746	0	0	0	8103
Runoff Impervious Areas (m^3/year)	0	0	0	0	0	0	17467	17467
Total Runoff (m^3/year)	1496	0	3862	2746	0	0	17467	25570
Total Outputs (m^3/year)	**7835**	**0**	**16426**	**12555**	**0**	**0**	**25110**	**61926**
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

Development Lands to Perth Long Swamp (West Block)

Land Use	Forest		Pasture					
Soil (HSG)	C	B	C	B				
Soil Characterization	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total
Area (m^2)	0	0	0	10290	0	0	24010	34300
Pervious Area (m^2)	0	0	0	10290	0	-	-	10290
Impervious Area (m^2)	-	-	-	-	-	0	24010	24010
Infiltration Factors								
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0	
Run-off Coefficient	0.478	0.428	0.578	0.528	0.43	0.78	0.9	
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9	
Inputs (per Unit Area)								
Precipitation (mm/year)	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944
Outputs (per Unit Area)								
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	712
Net Surplus (mm/year)	377	380	384	391	398	398	850	712
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	232
Infiltration (mm/year)	197	217	162	185	227	88	85	115
Rooftop and Infiltration Basin (mm/year)	0	0	0	0	0	0	108	76
Total Infiltration (mm/year)	197	217	162	185	227	88	193	190
Runoff Pervious Areas	180	163	222	206	171	0	0	942
Runoff Impervious Areas	0	0	0	0	0	310	657	967
Total Runoff (mm/year)	180	163	222	206	171	310	657	522
Total Outputs (mm/year)	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
Inputs (Volume)								
Precipitation (m^3/year)	0	0	0	9714	0	0	22665	32379
Run-on (m^3/year)	0	0	0	0	0	0	0	0
Other Inputs m^3/year)	0	0	0	0	0	0	0	0
Total Inputs (m^3/year)	0	0	0	9714	0	0	22665	32379
Outputs (Volume)								
Precipitation Surplus (m^3/year)	0	0	0	4023	0	0	20399	24422
Net Surplus (m^3/year)	0	0	0	4023	0	0	20399	24422
Evapotranspiration (m^3/year)	0	0	0	5690	0	0	2267	7957
Infiltration (m^3/year)	0	0	0	1899	0	0	2040	3939
Rooftop and Trench Infiltration (m^3/year)	0	0	0	0	0	0	2593	2593
Total Infiltration (m^3/year)	0	0	0	1899	0	0	4633	6532
Runoff Pervious Areas (m^3/year)	0	0	0	2124	0	0	0	2124
Runoff Impervious Areas (m^3/year)	0	0	0	0	0	0	15766	15766
Total Runoff (m^3/year)	0	0	0	2124	0	0	15766	17890
Total Outputs (m^3/year)	**0**	**0**	**0**	**9714**	**0**	**0**	**22665**	**32379**
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

Lands to Perth Long Swamp (Central Block)

Land Use	Forest		Pasture					
Soil (HSG)	C	B	C	B				
Soil Characterization	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total
Area (m^2)	0	12480	0	3120	0	0	0	15600
Pervious Area (m^2)	0	12480	0	3120	0	-	-	15600
Impervious Area (m^2)	-	-	-	-	-	0	0	0
Infiltration Factors								
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0	
Run-off Coefficient	0.478	0.428	0.578	0.528	0.43	0.78	0.9	
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9	
Inputs (per Unit Area)								
Precipitation (mm/year)	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944
Outputs (per Unit Area)								
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	382
Net Surplus (mm/year)	377	380	384	391	398	398	850	382
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	562
Infiltration (mm/year)	197	217	162	185	227	88	85	211
Rooftop and Infiltration Basin (mm/year)	0	0	0	0	0	0	0	0
Total Infiltration (mm/year)	197	217	162	185	227	88	85	211
Runoff Pervious Areas	180	163	222	206	171	0	0	942
Runoff Impervious Areas	0	0	0	0	0	310	765	1075
Total Runoff (mm/year)	180	163	222	206	171	310	765	171
Total Outputs (mm/year)	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
Inputs (Volume)								
Precipitation (m^3/year)	0	11781	0	2945	0	0	0	14726
Run-on (m^3/year)	0	0	0	0	0	0	0	0
Other Inputs m^3/year)	0	0	0	0	0	0	0	0
Total Inputs (m^3/year)	0	11781	0	2945	0	0	0	14726
Outputs (Volume)								
Precipitation Surplus (m^3/year)	0	4742	0	1220	0	0	0	5962
Net Surplus (m^3/year)	0	4742	0	1220	0	0	0	5962
Evapotranspiration (m^3/year)	0	7039	0	1725	0	0	0	8764
Infiltration (m^3/year)	0	2713	0	576	0	0	0	3288
Rooftop and Trench Infiltration (m^3/year)	0	0	0	0	0	0	0	0
Total Infiltration (m^3/year)	0	2713	0	576	0	0	0	3288
Runoff Pervious Areas (m^3/year)	0	2030	0	644	0	0	0	2674
Runoff Impervious Areas (m^3/year)	0	0	0	0	0	0	0	0
Total Runoff (m^3/year)	0	2030	0	644	0	0	0	2674
Total Outputs (m^3/year)	**0**	**11781**	**0**	**2945**	**0**	**0**	**0**	**14726**
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

Lands to Perth Long Swamp (East Block)

Land Use	Forest		Pasture					
Soil (HSG)	C	B	C	B				
Soil Characterization	Silt/Clay Loam (250)	Sandy Loam (200)	Silt/Clay Loam (150)	Sandy Loam (100)	Sand (75)	Gravel	Asphalt	Total
Area (m^2)	5200	0	1300	0	0	0	0	6500
Pervious Area (m^2)	5200	0	1300	0	0	-	-	6500
Impervious Area (m^2)	-	-	-	-	-	0	0	0
Infiltration Factors								
Topographic Infiltration Factor	0.172	0.172	0.172	0.172	0.12	0.12	0	
Soil Infiltration Factor	0.15	0.2	0.15	0.2	0.35	0.05	0	
Land Cover Infiltration Factor	0.2	0.2	0.1	0.1	0.1	0.05	0	
MOE infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0.1	
Actual Infiltration Factor	0.522	0.572	0.422	0.472	0.57	0.22	0	
Run-off Coefficient	0.478	0.428	0.578	0.528	0.43	0.78	0.9	
Runoff from Impervious Surfaces*	0	0	0	0	0	0.78	0.9	
Inputs (per Unit Area)								
Precipitation (mm/year)	944	944	944	944	944	944	944	944
Run-on (mm/year)	0	0	0	0	0	0	0	0
Other Inputs (mm/year)	0	0	0	0	0	0	0	0
Total Inputs (mm/year)	944	944	944	944	944	944	944	944
Outputs (per Unit Area)								
Precipitation Surplus (mm/year)	377	380	384	391	398	398	850	378
Net Surplus (mm/year)	377	380	384	391	398	398	850	378
Evapotranspiration (mm/year)	567	564	560	553	546	546	94	566
Infiltration (mm/year)	197	217	162	185	227	88	85	190
Rooftop and Infiltration Basin (mm/year)	0	0	0	0	0	0	0	0
Total Infiltration (mm/year)	197	217	162	185	227	88	85	190
Runoff Pervious Areas	180	163	222	206	171	0	0	942
Runoff Impervious Areas	0	0	0	0	0	310	765	1075
Total Runoff (mm/year)	180	163	222	206	171	310	765	189
Total Outputs (mm/year)	944	944	944	944	944	944	944	944
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0
Inputs (Volume)								
Precipitation (m^3/year)	4909	0	1227	0	0	0	0	6136
Run-on (m^3/year)	0	0	0	0	0	0	0	0
Other Inputs m^3/year)	0	0	0	0	0	0	0	0
Total Inputs (m^3/year)	4909	0	1227	0	0	0	0	6136
Outputs (Volume)								
Precipitation Surplus (m^3/year)	1960	0	499	0	0	0	0	2460
Net Surplus (m^3/year)	1960	0	499	0	0	0	0	2460
Evapotranspiration (m^3/year)	2948	0	728	0	0	0	0	3676
Infiltration (m^3/year)	1023	0	211	0	0	0	0	1234
Rooftop and Trench Infiltration (m^3/year)	0	0	0	0	0	0	0	0
Total Infiltration (m^3/year)	1023	0	211	0	0	0	0	1234
Runoff Pervious Areas (m^3/year)	937	0	289	0	0	0	0	1226
Runoff Impervious Areas (m^3/year)	0	0	0	0	0	0	0	0
Total Runoff (m^3/year)	937	0	289	0	0	0	0	1226
Total Outputs (m^3/year)	**4909**	**0**	**1227**	**0**	**0**	**0**	**0**	**6136**
Difference (Inputs - Outputs)	0	0	0	0	0	0	0	0

CCO-13-9668-01 - PERTHMORE SUBDIVISION - WATER BUDGET - SUMMARY

Water Balance / Water Budget Assessment

Development Lands to Perth Long Swamp Pre = Post					
Characteristic	Pre-Development	Post-Development	Change (Pre- to Post)	Post-Development with Mitigation	Change (Pre- to Post-with Mitigation
Inputs (Volumes)					
Precipitation (m^3/year)	115168	115168	0%	115168	0%
Run-on (m^3/year)	0	0	0%	0	0%
Other Inputs m^3/year)	0	0	0%	0	0%
Total Inputs (m^3/year)	115168	115168	0%	115168	0%
Outputs (Volumes)					
Precipitation Surplus (m^3/year)	46927	77733	66%	70455	50%
Net Surplus (m^3/year)	46927	77733	66%	70455	50%
Evapotranspiration (m^3/year)	68241	37435	-45%	44713	-34%
Infiltration (m^3/year)	23051	12320	-47%	17629	-24%
Rooftop infiltration (m^3/year)	0	0	0%	5466	0%
Total Infiltration (m^3/year)	23051	12320	-47%	23095	0%
Runoff Pervious Areas (m^3/year)	23876	11531	-52%	14127	-41%
Runoff Impervious Areas (m^3/year)	0	53882	0%	33233	0%
Total Runoff (m^3/year)	23876	65413	174%	47360	98%
Total Outputs (m^3/year)	115168	115168	0%	115168	0%