

FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

FOR

5868 COUNTY ROAD 65

MUNICIPALITY OF PORT HOPE

PROJECT NO. 122049

DATE: March 2024

CIVIL

STRUCTURAL

MECHANICAL

ELECTRICAL

PLANNING

February 21, 2023

Rev: March 7, 2024

Hill Street Developments Inc.
2015 Altona Road
Pickering, ON
L1V 1M8

Attention: Mr. Larry MacDonell

**Re: Functional Servicing and Stormwater Management Report
5868 County Road 65, Osaca
Municipality of Port Hope
Our File: 122049**

Dear Sir:

In support of the Draft Plan of Subdivision for the above reference proposal, we herewith submit the following Functional Servicing and Stormwater Management Report. This report has been prepared to identify the method in which the proposed development will meet the stormwater management requirements for the Municipality of Port Hope, Northumberland County and Ganaraska Region Conservation Authority and identify the infrastructure required to service the proposed development.

We trust the Municipality of Port Hope will concur with our recommendations. Please provide positive comments on the Draft Plan of Subdivision to facilitate development. Should you have any questions on the foregoing, please do not hesitate to contact our office.

Yours Truly,
D.G. Biddle & Associates Limited



Matt Holmes, B. Eng.
Intermediate Designer
Civil Group

DDM/mjh
Encl.

X:\Staff\Job Files\122000\122049 5868 County Road 65\122049 Reports\122049 20240301 Functional Servicing & Stormwater Management Report.doc



David McNaull, P. Eng.
Senior Project Engineer, Associate
Civil Group



TABLE OF CONTENTS

1.0	INTRODUCTION
1.1	Purpose
1.2	Site Location and Description
2.0	WATER SUPPLY AND DISTRIBUTION
2.1	Existing System
2.2	Proposed System
3.0	SANITARY SERVICING
3.1	Existing System
3.2	Proposed System
4.0	STORM SERVICING
4.1	Existing System
4.2	Proposed System
5.0	PERMANENT STORMWATER QUALITY CONTROLS – BLK 41
5.1	Pond Sizing for Quality Control
5.2	Extended Detention Wet Pond Design Characteristics
5.3	Sediment Forebay
5.4	Water Quality Discharge Structure
6.0	PERMANENT STORMWATER QUANTITY CONTROLS – BLK 41
6.1	Pre-Development Hydrology
6.2	Post-Development Hydrology
7.0	PERMANENT STORMWATER QUALITY CONTROLS – BLK 42
7.1	Pond Sizing for Quality Control
7.2	Extended Detention Wet Pond Design Characteristics
7.3	Sediment Forebay
7.4	Water Quality Discharge Structure
8.0	PERMANENT STORMWATER QUANTITY CONTROLS – BLK 50
8.1	Pre-Development Hydrology
8.2	Post-Development Hydrology
9.0	INFILTRATION REQUIREMENTS
10.0	SITE GRADING
11.0	EROSION AND SEDIMENT CONTROLS
12.0	CONCLUSIONS

LIST OF FIGURES

1. FIGURE 1: Site Location Plan
2. FIGURE 2: VO Schematic – Pre-Development Flows
3. FIGURE 3: VO Schematic – Post-Development Flows to Southern Creek
4. FIGURE 4: VO Schematic – Post-Development Flows to Northern Creek
5. FIGURE 5: VO Schematic – Post-Development Flows – Required Culvert Sizing

LIST OF DRAWINGS

1. LG-1 Conceptual Grading and Servicing Plan
2. ES-1 Erosion and Sediment Control Plan
3. SD-1 Pre-Development Storm Drainage Plan
4. SD-2 Post-Development Storm Drainage Plan

LIST OF APPENDICES

1. APPENDIX 1:
 - GRCA Rainfall Intensity Formulas
 - Post-Development Weighted Runoff Coefficients
 - Pre-Development Time of Concentration Calculations
 - Post-Development Time of Concentration Calculations
 - Fire Fighting Calculations
 - Stage-Storage Discharge Calculations (BLK 41 – Pond A)
 - Stage-Storage Discharge Calculations (BLK 42 – Pond B)
 - Culvert Sizing Calculations & Design Charts
 - Infiltration Requirements
2. APPENDIX 2:
 - Visual Otthymo Schematics & Output Files



1.0 INTRODUCTION

1.1 Purpose

This Preliminary Functional Servicing and Stormwater Management Report has been prepared to satisfy the Conditions of Draft Approval for the proposed development. It will address sanitary services, watermain services, stormwater drainage works, and site grading required to proceed with the development. This report will also discuss the stormwater quality and quantity control objectives in accordance with the requirements of the local governing authorities.

1.2 Site Location and Description

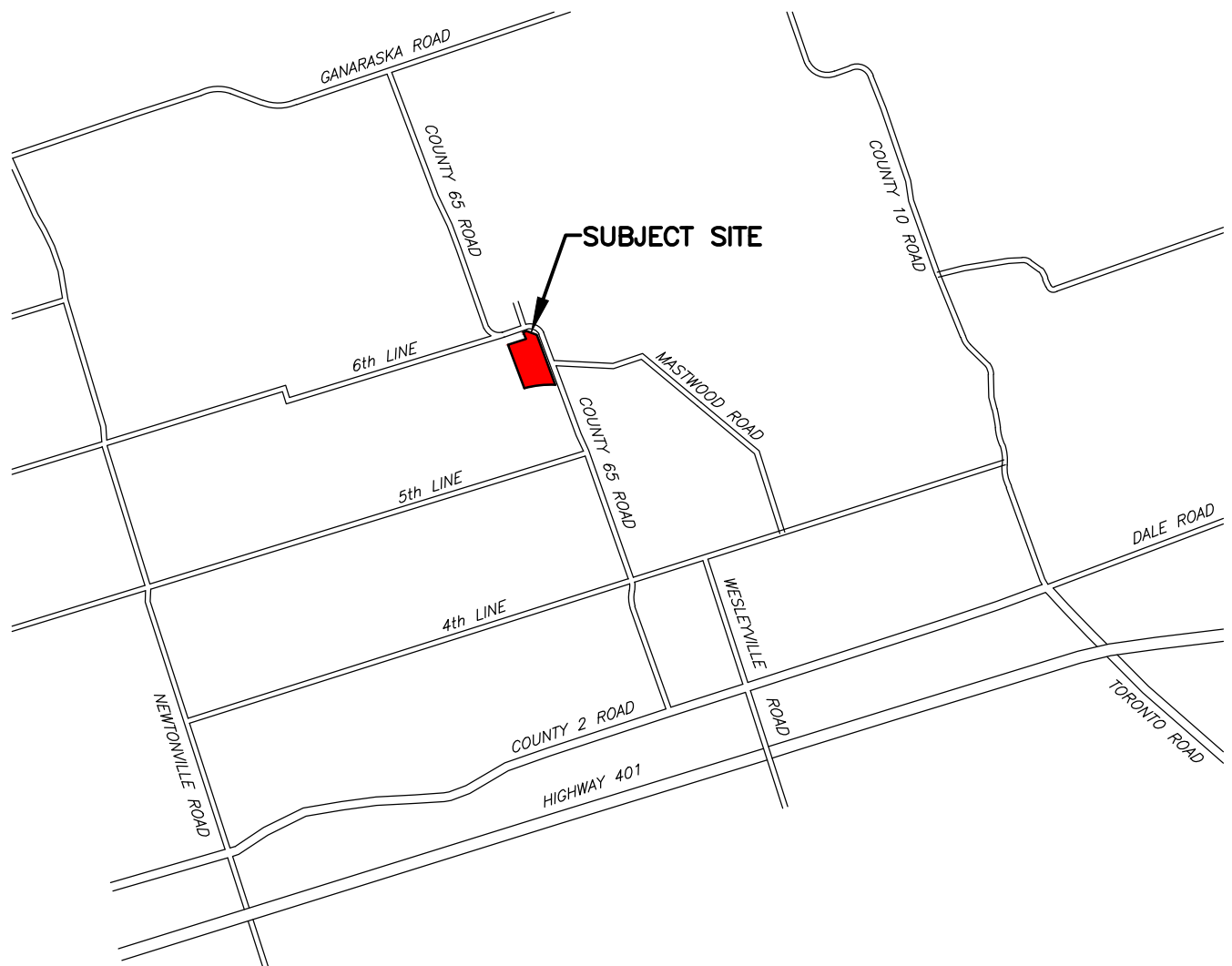
The subject property is located on the west side of County Road 65 within the Hamlet of Osaca located at 5868 County Road 65 in the Rural Area of the Municipality of Port Hope. The proposed development is bounded on the north and south by existing resident lands, west by agricultural/residential lands and on the east by County Road 65. A Site Location Plan is attached as Figure 1.

The drainage for the proposed development is divided into two areas draining to two unnamed creeks. Most of the site drains generally in a southerly direction, where it drains to an unnamed creek south of the property which flows to the east across County Road 65 via an existing culvert. The second unnamed creek runs through the north end of the property. The lands north of the second unnamed creek generally drain south to the creek before ultimately flowing to the east across County Road 65 via an existing culvert. The Pre-Development Drainage scheme is illustrated on the Pre-Development Storm Drainage Plan, drawing 122049-SD-1.

2.0 WATER SUPPLY & DISTRIBUTION

2.1 Existing System

Currently, the site is not serviced with a connection to a municipal water system. There is no municipal water infrastructure present on County Road 65.



5868 COUNTY ROAD 65, PORT HOPE, ON

SITE LOCATION PLAN



**D.G. BIDDLE
& ASSOCIATES**
CONSULTING ENGINEERS & PLANNERS

96 King Street East
Oshawa, Ontario, L1H 1B6
Phone: 905-576-8500
info@dgbiddle.com
dgbiddle.com

SCALE	N.T.S.
DRAWN	M.J.H.
DESIGN	M.J.H.
CHECKED	B.J.L.
DATE	JAN 2023

PROJECT	122049
---------	--------

DWG	FIG 1
-----	-------

2.2 Proposed System

The domestic and firefighting water will be provided privately on-site. Domestic water supply for each dwelling will be supplied by individual water wells located on each lot installed by a well driller who has been licensed by the Ministry of Environment and Climate Change. On-site firefighting water supply will be provided through the implementation of a dry hydrant system and underground water supply tank located on Block 50. The dry hydrant system has been designed in accordance with the Ontario Building Code.

The layout of the dry hydrant system is illustrated on the Site Servicing Plan (Drawing 122049 SS-1) attached at the end of this report. Supporting calculations are appended in Schedule 1.

3.0 SANITARY SERVICING

3.1 Existing System

Currently, the site is not serviced with a connection to a municipal sanitary system. There is no municipal sanitary infrastructure present on County Road 65.

3.2 Proposed System

Individual on-site septic systems will provide treatment of the sanitary sewage from the proposed dwellings. Detailed sizing of the individual septic systems will occur at building permit submission.

The approximate layout of the proposed individual septic systems is illustrated on the Conceptual Grading and Servicing Plan, drawing 122049 LG-1, attached at the end of this report.

4.0 STORM SERVICING

4.1 Existing System

Currently, the site is not serviced with a connection to a municipal storm system. There is no municipal storm infrastructure present on County Road 65.

4.2 Proposed System

The stormwater runoff will continue to the conveyed tributaries (the two creeks north and south of the property) using a combination of open ditch drainage system conveyance into extended detention stormwater management facilities located in Blocks 49 & 50. These systems will include the use of culverts to maintain positive drainage to the stormwater facilities prior to discharging to the unnamed creeks.

The proposed stormwater drainage system is illustrated on the attached Conceptual Grading and Servicing Plan, drawing 122049 LG-1, attached at the end of this report.

5.0 PERMANENT STORMWATER QUALITY CONTROLS – BLK 41

The northern stormwater management pond is located in the northeast corner of the southern parcel of land, Block 41 on the Draft Plan. Access to the pond will be provided by a 3.0m wide maintenance access from Street A to the pond block. The minor and major flows will be accommodated within the right of ways and all overland flow routes have been sized to ensure no flooding on private property will occur.

5.1 Pond Sizing for Quality Control

The following criteria must be followed in the design of the stormwater management pond:

- Enhanced fisheries protection in accordance with MOE (March 2003) and ORCA requirements;
- Provide 24–48-hour detention for run-off from a 25mm storm event for erosion control;

- Post-development to pre-development peak flow control for all storm events, up to and including a 100-year frequency;

Pond sizing requirements are based on the type of pond and impervious level of the development. The drainage area to the stormwater management pond is 4.01ha as shown on drawing 122049-SD-2. Since the development consists of estate lots and an open block, the impervious level was calculated based on a weighted runoff coefficient for each drainage catchment. Weighted runoff supporting calculations are appended in Schedule 1. The drainage catchment draining to the stormwater facility in Block 41 had a calculated percent impervious of 19.65%. Since this is below the minimum 35% shown in Table 3.2 of the MECP “Stormwater Management Planning and Design Manual”, a conservative permanent storage volume of 100m³/ha was used for the design.

The permanent and active (fluctuating) water quality storage requirements as per the M.O.E. guidelines are shown in the following table:

TABLE 1 – COMPOSITE IMPERVIOUSNESS

IMPERVIOUS LEVEL	PERMANENT STORAGE VOLUME REQUIRED (m³)	FLUCTUATING STORAGE VOLUME REQUIRED (m³)	TOTAL DRAINAGE AREA (ha)	PERMANENT VOLUME (m³)	FLUCTUATING VOLUME REQUIRED (m³)
19.65%	100	40	4.01	401.20	328.90
TOTAL			4.01	401.20	328.90

In addition to the fluctuating storage volume for stormwater quality required under M.O.E. Guidelines, additional storage volume to attenuate the runoff associated with increased erosion within the watercourse has been provided. Additional storage volume has been provided in the pond to detail the runoff generated by a 25mm, Chicago distribution rainfall for 4 hours which was simulated in Visual Otthymo. The erosion control volume requirement is shown in the below:

TABLE 2 – EROSION CONTROL VOLUME REQUIREMENTS

IMPERVIOUS LEVEL	TOTAL RAINFALL (mm)	AREA (ha)	RUN-OFF DEPTH (mm)	RUN-OFF VOLUME (m³)
19.65%	25	4.01	8.20	328.90
TOTAL			8.20	328.90

5.2 Extended Detention Wet Pond Design Characteristics

The proposed design for the wet pond, shown on drawing 122049-LG-1, has the following characteristics:

- 7:1 side slopes for 1.75m on both sides of the permanent pool
- 5:1 side slopes above active (fluctuating) water surface elevation
- 5:1 side slopes below 7:1 sloping
- 3.0m maintenance access
- 162.60m permanent pool elevation
- 651m³ permanent volume provided
- 162.84m maximum water erosion fluctuating elevation
- 330m³ water quality fluctuating volume provided
- Sediment forebay at inlet location
- 1,518 m³ water quantity fluctuating volume provided
- Detention time minimum of 24-hours

5.3 Sediment Forebay

The proposed sediment forebays will be separated from pond main cell by a submerged earth berm. The top of the berm will be set at the permanent pool water surface elevation of 162.60m. A 450mm CSP culvert will be in both sides of the berm to help direct pond flows to the discharge structures. In addition to the above, the sediment forebays will be designed with the following characteristics:

- The forebay will not exceed 1/3 of the total permanent pool
- The forebay length will be such that the velocity in the forebay will be 0.5m/s at the outlet culverts

- The minimum bottom width of the forebay will be 1/8 of the Forebay Dispersion Length

Calculations for the sediment forebay design are appended in Schedule 1.

5.4 Water Quality Discharge Structure

The design proposed for the pond quality discharge structure will be a reverse draw pipe connected to a 1500mm manhole before it ultimately outlets at existing grade at the property line via the proposed headwall. The 1500mm manhole will include a cast in place concrete wall with two openings which will be covered by orifice plates to control discharge. An 80mm orifice will be placed with an invert of 162.60 and a second orifice (150mm) will have an invert of 163.03.

Details of the water quality discharge structures are illustrated on the Conceptual grading and Servicing Plan, drawing 122049-LG-1. Calculations for the water quality discharge structure orifice sizing can be found in Schedule 1.

6.0 PERMANENT STORMWATER QUALITY CONTROL – BLK 41

As mentioned previously, the proposed stormwater management pond will provide quantity controls in addition to quality controls as outlined above. The Ganaraska Regional Conservation Authority (GRCA) design criteria states that the post-development release rates are to be attenuated to the pre-development release rates for each of the 2 through 100-year storm events. The residential lot fabric is tributary to 2 distinct drainage areas prior to discharging off-site. The stormwater management pond discussed in this section is tributary to the flows draining to the northern creek.

6.1 Pre-Development Hydrology

As illustrated on the Pre-Development Drainage Scheme, SD-1, the pre-development drainage area draining to the northern creek is 16.93ha. Using the NASHYD Sub-routine of the computer program VISUAL OTTHYMO 6.0, pre-development peak flows were computed using the Port Hope Rainfall intensity for the 2, 5, 10, 25, 50 and 100-year storm events. The results for the pre-development flows are tabulated below in the next section.

6.2 Post-Development Hydrology

The post-development flow has been modelled using a 4-hour Chicago distribution rainfall event. The STANDHYD subroutine was used to simulate the impervious surfaces of the site and calculate the post-development flows from the site. The drainage catchments were modelled with weighted runoff coefficients to calculate the percent imperviousness individually. Supporting calculations are appended in Schedule 1. The results are tabulated in Table 3 below.

The quantity control storage volume of approximately 1,518m³ (excludes the erosion volume of 330m³) is achieved through the excavation and berming of the pond to an elevation of 163.90. This provides approximately 0.30m free-board above the anticipated 100-year water surface elevation of the pond. The maximum required volume is 1,506m³. Through the implementation of the reverse draw pipe and manhole complete with two orifice plates, the proposed stormwater management pond will attenuate post-development peak flows to the pre-development levels. The ROUTE RESERVOIR Sub-Routine of HYMO 6.0 was used to simulate the performance of the pond. A comparison of pre- to post-development flows are tabulated below. The OTTHYMO Summary Files are attached in Schedule 2.

TABLE 3 – BLK 41 POND PRE- & POST-DEVELOPMENT PEAK FLOWS

RETURN FREQUENCY (Years)	PRE-DEV. PEAK FLOW (4hr CHICAGO)	POST- DEVELOPMENT FLOW (4hr CHICAGO)		
	*FLOW LEAVING SITE (m ³ /s)	**UNCONTROLLED FLOW LEAVING SITE (m ³ /s)	+ATTENUATED FLOW LEAVING SITE (m ³ /s)	++TOTAL FLOW TO NORTH CREEK (m ³ /s)
2	0.127	0.121	0.006	0.127
5	0.241	0.232	0.007	0.239
10	0.316	0.305	0.008	0.312
25	0.563	0.542	0.020	0.557
50	0.733	0.705	0.033	0.730
100	0.918	0.880	0.040	0.915

*Refer to Figure 2 (Schedule 2) NasHyd 1

** Refer to Figure 4 (Schedule 2) AddHyd 13

+ Refer to Figure 4 (Schedule 2) Route Reservoir 10

++ Refer to Figure 4 (Schedule 2) AddHyd 14

As reported above, all post-development peak flows up to and including the 100-year return frequency event will be attenuated to the pre-development flow rates. Therefore, no adverse impact to the downstream receiving watercourse is anticipated.

7.0 PERMANENT STORMWATER QUALITY CONTROLS – BLK 42

The southern stormwater management pond located in the southeast corner of the southern parcel of land, Block 42 on the Draft Plan. Access to the pond will be provided by a 3.0m wide maintenance access from Street C to the pond block. The minor and major flows will be accommodated within the right of ways and all overland flow routes have been sized to ensure no flooding on private property will occur.

7.1 Pond Sizing for Quality Control

The following criteria must be followed in the design of the stormwater management pond:

- Enhanced fisheries protection in accordance with MOE (March 2003) and ORCA requirements;
- Provide 24–48-hour detention for run-off from a 25mm storm event for erosion control;

- Post-development to pre-development peak flow control for all storm events, up to and including a 100-year frequency;

Pond sizing requirements are based on the type of pond and impervious level of the development. The drainage area to the stormwater management pond is 1.56ha as shown on drawing 122049-SD-2. Since the development consists of estate lots and an open block, the impervious level was calculated based on a weighted runoff coefficient for each drainage catchment. Weighted runoff supporting calculations are appended in Schedule 1. The drainage catchment draining to the stormwater facility in Block 42 had a calculated percent impervious of 24.38%. Since this is below the minimum 35% shown in Table 3.2 of the MECP “Stormwater Management Planning and Design Manual”, a conservative permanent storage volume of 100m³/ha was used for the design.

The permanent and active (fluctuating) water quality storage requirements as per the M.O.E. guidelines are shown in the following table:

TABLE 4 – COMPOSITE IMPERVIOUSNESS

IMPERVIOUS LEVEL	PERMANENT STORAGE VOLUME REQUIRED (m³)	FLUCTUATING STORAGE VOLUME REQUIRED (m³)	TOTAL DRAINAGE AREA (ha)	PERMANENT VOLUME (m³)	FLUCTUATING VOLUME REQUIRED (m³)
24.38%	100	40	1.56	155.54	62.22
TOTAL			1.56	155.54	62.22

In addition to the fluctuating storage volume for stormwater quality required under M.O.E. Guidelines, additional storage volume to attenuate the runoff associated with increased erosion within the watercourse has been provided. Additional storage volume has been provided in the pond to detail the runoff generated by a 25mm, Chicago distribution rainfall for 4 hours which was simulated in Visual Otthymo. The erosion control volume requirement is shown in the below:

TABLE 5 – EROSION CONTROL VOLUME REQUIREMENTS

IMPERVIOUS LEVEL	TOTAL RAINFALL (mm)	AREA (ha)	RUN-OFF DEPTH (mm)	RUN-OFF VOLUME (m³)
24.38%	25	1.56	9.12	141.29
TOTAL			9.12	141.29

7.2 Extended Detention Wet Pond Design Characteristics

The proposed design for the wet pond, shown on drawing 122049-LG-1, has the following characteristics:

- 7:1 side slopes for 1.75m on both sides of the permanent pool
- 5:1 side slopes above active (fluctuating) water surface elevation
- 5:1 side slopes below 7:1 sloping
- 3.0m maintenance access
- 161.65m permanent pool elevation
- 236m³ permanent volume provided
- 161.81m maximum water erosion fluctuating elevation
- 145m³ water quality fluctuating volume provided
- Sediment forebay at inlet location
- 651 m³ water quantity fluctuating volume provided
- Detention time minimum of 24-hours

7.3 Sediment Forebay

The proposed sediment forebay will be separated from pond main cell by a submerged earth berm. The top of the berm will be set at the permanent pool water surface elevation of 161.65m. A 450mm CSP culvert will be in both the north and south side of the berm to help direct pond flows to the discharge structures. In addition to the above, the sediment forebay will be designed with the following characteristics:

- The forebay will not exceed 1/3 of the total permanent pool
- The forebay length will be such that the velocity in the forebay will be 0.5m/s at the outlet culverts

- The minimum bottom width of the forebay will be 1/8 of the Forebay Dispersion Length

Calculations for the sediment forebay design are appended in Schedule 1.

7.4 Water Quality Discharge Structure

The design proposed for the pond quality discharge structure will be a reverse draw pipe connected to a 1500mm manhole before it ultimately outlets at existing grade at the property line via the proposed headwall. The 1500mm manhole will include a cast in place concrete wall with two openings which will be covered by orifice plates to control discharge. A 75mm orifice will be placed with an invert of 161.65 and a second orifice (75mm) will have an invert of 161.90.

Details of the water quality discharge structures are illustrated on the Conceptual grading and Servicing Plan, drawing 122049-LG-1. Calculations for the water quality discharge structure orifice sizing can be found in Schedule 1.

8.0 PERMANENT STORMWATER QUANTITY CONTROLS – BLK 42

As mentioned previously, the proposed stormwater management pond will provide quantity controls in addition to quality controls as outlined above. The Ganaraska Regional Conservation Authority (GRCA) design criteria states that the post-development release rates are to be attenuated to the pre-development release rates for each of the 2 through 100-year storm events. The residential lot fabric is tributary to 2 distinct drainage areas prior to discharging off-site. The stormwater management pond discussed in this section is tributary to the flows draining to the southern creek.

8.1 Pre-Development Hydrology

As outlined above, the drainage for the proposed development is divided into two areas draining to two unnamed creeks. As illustrated on the Pre-Development Drainage Scheme, SD-1, the pre-development drainage area draining to the southern creek is 13.87ha. Using the NASHYD Sub-routine of the computer program VISUAL OTTHYMO 6.0, pre-development peak flows were computed using the Port Hope Rainfall intensity for the 2, 5,

10, 25, 50 and 100-year storm events. The results for the pre-development flows are tabulated below in the next section.

8.2 Post-Development Hydrology

The post-development flow has been modelled using a 4-hour Chicago distribution rainfall event. The STANDHYD subroutine was used to simulate the impervious surfaces of the site and calculate the post-development flows from the site. The drainage catchments were modelled with weighted runoff coefficients to calculate the percent imperviousness individually. Supporting calculations are appended in Schedule 1. The results are tabulated in Table 3 below.

The quantity control storage volume of approximately 653m³ (excludes the erosion volume of 145m³) is achieved through the excavation and berming of the pond to an elevation of 162.70. This provides approximately 0.34m free-board above the anticipated 100-year water surface elevation of the pond. The maximum required volume is 608m³. Through the implementation of the reverse draw pipe and manhole complete with two orifice plates, the proposed stormwater management pond will attenuate post-development peak flows to the pre-development levels. The ROUTE RESERVOIR Sub-Routine of HYMO 6.0 was used to simulate the performance of the pond. A comparison of pre- to post-development flows are tabulated below. The OTTHYMO Summary Files are attached in Schedule 2.

TABLE 6 – BLK 42 POND PRE- & POST-DEVELOPMENT PEAK FLOWS

RETURN FREQUENCY (Years)	PRE-DEV. PEAK FLOW (4hr CHICAGO)	POST- DEVELOPMENT FLOW (4hr CHICAGO)		
	*FLOW LEAVING SITE (m ³ /s)	**UNCONTROLLED FLOW LEAVING SITE (m ³ /s)	*ATTENUATED FLOW LEAVING SITE (m ³ /s)	**TOTAL FLOW LEAVING SITE (m ³ /s)
2	0.114	0.112	0.003	0.114
5	0.215	0.207	0.005	0.210
10	0.283	0.274	0.007	0.277
25	0.504	0.483	0.011	0.488
50	0.652	0.597	0.014	0.603
100	0.814	0.726	0.015	0.733

*Refer to Figure 2 (Schedule 2) NasHyd 2

** Refer to Figure 3 (Schedule 2) AddHyd 7

+ Refer to Figure 3 (Schedule 2) Route Reservoir 6

++ Refer to Figure 3 (Schedule 2) AddHyd 8

As reported above, all post-development peak flows up to and including the 100-year return frequency event will be attenuated to the pre-development flow rates. Therefore, no adverse impact to the downstream receiving watercourse is anticipated.

9.0 INFILTRATION REQUIREMENTS

D.M. Wills was retained by the client to complete the water balance nitrate threshold study for the development. To ensure the development meets the nitrate threshold, the net result is that 40 lots and 2 stormwater management pond blocks can be developed through the implementation of infiltration galleries. Table 7 below illustrates the volume required in each catchment, as provided by D.M. Wills and the volume provided from the galleries. Supporting calculations and a scheme outlining D.M. Wills' catchments are appended in Schedule 1.

TABLE 7 – INFILTRATION GALLERIES

CATCHMENT	AREA (ha)	STONE VOLUME REQUIRED (m³)	STONE VOLUME PROVIDED (m³)	DIMENSIONS (LxWxD) (m)
3A	0.54	120.00	120.36	23.60 x 4.25 x 1.20
3B	0.58	90.00	90.00	24.00 x 2.50 x 1.50
9A	0.60	120.00	120.60	33.50 x 3.00 x 1.20
9B	0.46	60.00	60.30	16.75 x 3.00 x 1.20
9C	0.48	100.00	102.00	20.00 x 4.25 x 1.20

10.0 SITE GRADING

In general, the site will be graded in a manner which will satisfy the following goals:

- Satisfy the Municipality of Port Hope boulevard and road grading criteria including:
- Minimum Road Grade: 0.5%
- Maximum Road Grade: 5.0%
- Minimum Landscape Area Grade: 1.0%
- Maximum Landscape Area Grade: 5.0%
- Provide continuous grades for overland flow conveyance.
- Minimize the volume of earth to be moved and minimize cut/fill differential.
- Achieve stormwater management objectives required for the site.

Details of the site grading design is illustrated on the Conceptual Grading and Servicing Plan, drawing 122049 LG-1, attached at the end of this report.

11.0 EROSION & SEDIMENT CONTROL

During the construction period, the removal of natural vegetation causes the transport of large amounts of sediment during rainfall events. To minimize the sediment laden storm water leaving the site during construction, the following sediment control techniques are proposed to be implemented. These measures are detailed on the Erosion and Sediment Control Plan included in the site plan submission.

1. Construction Vehicle Access Route (Mud Mat)
2. Rock Check Dams
3. Perimeter Enviro Fence
4. Good Engineering Practices

The above techniques will be detailed on the Erosion and Sediment Control Plan (122049 Drawing ES-1).

12.0 CONCLUSIONS

The preceding report identifies the functional servicing and stormwater management requirements for the development proposal. The investigations into these requirements have resulted in the following conclusions for the development proposal:

- Sanitary servicing for each dwelling will be provided through individual septic systems on each lot. Detailed sizing of the individual septic systems will occur during the building permit process.
- On-site firefighting water supply will be provided through the implementation of a dry hydrant system and on-site underground water supply tank;
- Domestic water supply for each dwelling will be supplied by individual water wells located on each lot installed by a well driller who has been licensed by the Ministry of Environment and Climate Change;
- A combination of formal end of pipe stormwater treatment facility for runoff quantity controls and infiltration galleries are proposed on-site. LID techniques are to be implemented as illustrated on the engineering drawings to assist in offsetting the increase in stormwater runoff;
- Stormwater quality controls are implemented through the use of open ditches, end of pipe stormwater treatment facilities and the infiltration galleries located in the ditches as illustrated on drawing 122049-LG-1;
- Temporary sediment controls during construction can be managed by the use of perimeter enviro fence, construction vehicle access route, rip rap check dams and good engineering practices;

APPENDIX 1

**GRCA RAINFALL INTENSITY FORMULAS
POST-DEVELOPMENT WEIGHTED RUNOFF
COEFFICIENTS**

**PRE-DEVELOPMENT TIME OF CONCENTRATION
CALCULATIONS**

**POST-DEVELOPMENT TIME OF CONCENTRATION
CALCULATIONS**

FIRE FIGHTING CALCULATIONS

**STAGE-STORAGE DISCHARGE CALCULATIONS
(BLK 41 – POND A)**

**STAGE-STORAGE DISCHARGE CALCULATIONS
(BLK 42 – POND B)**

**CULVERT SIZING CALCULATIONS & DESIGN
CHARTS**

INFILTRATION REQUIREMENTS

Clarington Intensity Formulas

IDF Equation	$I = a/(b+Td)$						Conservative
	Td --- Time in hour I -- Intensity in mm/Hr						$i = \frac{a}{(td + b)^c}$
Return Period Parameters	2 year	5 year	10 year	25 year	50 year	100 year	100year
a	1778	2464	2819	3886	4750	5588	1770
b	13	16	16	18	24	28	4
							0.82

Rainfall Intensity Formulas (beyond Clarington)

Yarnell Equation

Return Period Parameters	$I = a/(b+Td)$					
	Td --- Time in hour I -- Intensity in mm/Hr					
	2 year	5 year	10 year	25 year	50 year	100 year
a	1778	2464	2819	3886	4750	5588
b	13	16	16	18	24	28

Node 3 - Area Draining to Street C SWM Pond				Area =	1.57 ha
Material	Area (ha)	RC (I)	A*I		
Asphalt	0.243	0.9	0.2187		
Gravel Shoulder	0.076	0.6	0.0456		
Landscape	1.032	0.2	0.2064		
SWM Pond	0.219	0.5	0.1095		
Total	1.57		0.5802		
Weighted RC =	0.370				
% IMP =	24.38%				

Node 9 - Draining to Low Point at Street B (ST 1 +068) and Draining to BLK 49 Pond				Area =	4.01 ha
Material	Area	RC (I)	A*I		
Road & Driveways	0.505	0.9	0.454478		
Gravel Shoulder	0.161	0.6	0.096466		
SWM BLK	0.452	0.5	0.225827		
Landscape	2.895	0.2	0.578914		
Total	4.01		1.356		
Weighted RC =	0.338				
*% IMP =	19.65%				

Node 4 - Street A & Lots Draining to County Rd 65				Area =	2.39 ha
Material	Area (ha)	RC (I)	A*I		
Roads & Driveways	0.044	0.9	0.0396		
Gravel Shoulder	0.024	0.6	0.0144		
Landscape	2.319	0.2	0.463817		
Total	2.39		0.517817		
Weighted RC =	0.217				
% IMP =	2.44% *				
* Since % Imperviousness < 5%, model as a NasHyd					

Time of Concentration & Time to Peak Calculation (Pre-Development)

1)	Pre-Dev to Southern Creek	Slope =	$\frac{164.20-161.92}{470.72}$	=	0.48%
	Upstream Invert	164.20			
	Downstream Invert	161.92			
	Length (m)	470.72			
	Assume Pasture				
			From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)		
			$v = 0.15 \text{ m/s}$		
			$t_c = \frac{470.72}{0.15}$	=	3056.61 s
				=	0.849058 h
			$t_{p1} = \frac{2 \times t_c}{3}$	=	0.566039 h

2)	Pre-Dev to Northern Creek	Slope =	$\frac{170.00-162.83}{323.00}$	=	2.22%
Part 1	Upstream Invert	170.00			
	Downstream Invert	162.83			
	Length (m)	323.00			
	Assume Woodland, Fallow Contour				
			From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)		
			$v = 0.23 \text{ m/s}$		
			$t_c = \frac{323.00}{0.23}$	=	1404.35 s
				=	0.390096 h
			$t_{p1} = \frac{2 \times t_c}{3}$	=	0.260064 h

Part 2		Slope =	$\frac{162.83-157.61}{327.87}$	=	1.59%
	Upstream Invert	162.83			
	Downstream Invert	157.61			
	Length (m)	327.87			
	Assume Grassed Waterway				
			From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)		
			$v = 0.16 \text{ m/s}$		
			$t_c = \frac{327.87}{0.16}$	=	2049.16 s
				=	0.569212 h
			$t_{p2} = \frac{2 \times t_c}{3}$	=	0.379475 h
	$t_{p \text{ TOTAL}} = t_{p1} + t_{p2} =$				0.639539 h

Time of Concentration & Time to Peak Calculation (Post-Development)

1)	Rear Lots & BLK 51 Draining South	Slope =	$\frac{163.82-162.28}{176.42}$	=	0.87%
	Upstream Invert		163.82		
	Downstream Invert		162.28		
	Length (m)		176.42		
	Assume Woodland				
			From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)		
			$v =$	0.15	m/s
			$t_c =$	$\frac{176.42}{0.15}$	= 1192.03 s
					= 0.331119 h
			$t_p =$	$\frac{2 \times t_c}{3}$	= 0.220746 h

2)	Between Lot 14 & 15	Slope =	$\frac{163.03 - 162.58}{45.36}$	=	0.99%
	Upstream Invert		163.03		
	Downstream Invert		162.58		
	Length (m)		45.36		
	Assume Cultivated Straight Row				
			From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)		
			$v =$	0.28	m/s
			$t_c =$	$\frac{45.36}{0.28}$	= 162.00 s
					= 0.044999 h
			$t_p =$	$\frac{2 \times t_c}{3}$	= 0.029999 h

3)	Street A & Lots Draining to CR65	Slope =	$\frac{164.57 - 163.45}{72.43}$	=	1.55%
	Upstream Invert		164.57		
	Downstream Invert		163.45		
	Length (m)		72.43		
	Assume Cultivated Straight Row				
			From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)		
			$v =$	0.34	m/s
			$t_c =$	$\frac{72.43}{0.34}$	= 214.60 s
					= 0.059611 h
			$t_p =$	$\frac{2 \times t_c}{3}$	= 0.039741 h

4)	Open Space Flowing Directly into Creek	Slope =	$\frac{167.50 - 157.61}{594.68}$	=	1.66%
	Upstream Invert		167.50		
	Downstream Invert		157.61		
	Length (m)		594.68		
	Assume Woodland/Contour				
			From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)		
			$v =$	0.18	m/s
			$t_c =$	$\frac{594.68}{0.18}$	= 3249.63 s
					= 0.902674 h
			$t_p =$	$\frac{2 \times t_c}{3}$	= 0.601783 h

5)	Street D Uncontrolled Drainage	Slope =	$\frac{162.59 - 161.64}{37.02}$	=	0.81%
	Upstream Invert		161.94		
	Downstream Invert		161.64		
	Length (m)		37.02		
	Assume Cultivated Straight Row				
			From Figure A.5.2 : Upland Method for Estimating Tc (SCS National Engineering Handbook, 1971)		
			$v =$	0.45	m/s
			$t_c =$	$\frac{37.02}{0.45}$	= 82.28 s
					= 0.022855 h
			$t_p =$	$\frac{2 \times t_c}{3}$	= 0.015236 h

5865 County Road 65
Job File: 122049
Municipality of Port Hope
Dry Hydrant Design Chart

1/4

4. Design Flow Rate					713.26 gpm
5. Elevation Above Sea Level					539.70 ft
6. Normal Atmospheric Pressure [From Table I.1(a)]					14.43 psi
7. Lift	Height x 0.434 =	4.7 m x 0.434	=	15.42 ft x 0.434	= 6.69 psi
8. Water Temperature					0.18 psi
Vapour Pressure [From Table I.1(f)]					
9. Pressure Loss at pump intake					5.0 psi
Available Site Pressure					
10. Line 6 minus (Line 7 + 8 + 9)					2.56 psi
11. Pressure Loss in pipe & fittings (From Dry Hydrant Hardware Layout Worksheet)					1.30 psi
12. Pressure Loss from Sudden Reduction [From Table I.1(f)] Reduction: 6" x 6"					0 psi
13. Velocity in Suction Pipe [From Table I.1(g)]					0.446 psi
14. Pressure Loss in Suction Hose [From Table I.1(h)]					0.132 psi
15. Pressure to overcome piping and water movement loss Add (Line 11 + 12 + 13 + 14)					1.88 psi
16. Available Site Pressure (ASP)					
Available Site Pressure = Line 10 - Line 15					<u>0.68 psi</u>

Dry Hydrant Hardware Layout Worksheet

Job No. 122049

Dry Hydrant A

Friction Loss Per Foot (Table I.1e) Based on 713.26 gpm Design Flow:

0.01678 psi

Description & Size	Straight Line Equivalent feet of Pipe	Conversion for Pipe Coefficient	Loss (psi)
Strainer	5.00	0.01678	0.0839
90° Bend (8")	26.90	0.01678	0.451382
90° Bend (8")	26.90	0.01678	0.451382
6" PVC Pipe	8.04	0.01678	0.134911
6" PVC Pipe	9.84	0.01678	0.165115
1 ft of 6" pipe	1.00	0.01678	0.01678

Total Loss 1.30 psi

4. Design Flow Rate (L/min to gpm)

2700 L/min = 713.26 gallons per minute

5. Elevation Above Sea Level

164.50m = 539.70 ft

6. Normal Atmospheric Pressure [From Table I.1(a)]

Elevation Above Sea Level: 539.70 feet
Normal Atmospheric Pressure @ 0 ft = 14.70 psi
Normal Atmospheric Pressure @ 1000 ft = 14.20 psi

Normal Atmospheric Pressure @ 539.70 ft

$14.70 - [(539.7/1000)*(14.70-14.20)] = 14.43$ psi

7. Lift

Lift = Depth from FDC to Pipe Invert (Refer to Detail on Site Sevicng Drawing)

Lift = 2.10 + 0.3 + 0.6 = 3.00m = 9.84 ft

Lift = 9.84 ft x 0.434 = 4.27 psi

8. Vapour Pressure

Assume a water temperature of 50 Fahrenheit

From Table I.1(b): Vapour Pressure = 0.180 psi

10. Available Site Pressure

Atmospheric Pressure - Lift - Vapour Pressure - Pressure Loss @ Pump Intake
= 14.43 - 4.27 - 0.18 - 5.0 = **4.98 psi**

11. Friction Loss Per Foot of Pipe (psi)

Based on a Design Flow Rate of 713.26 gpm

Friction Loss/Foot of Pipe = 0.01678 psi [From Table I.1(e)]

12. Pressure Loss from Sudden Reduction

Since system is a 6" pipe, no reduction required.

Pressure Loss = 0 psi [From Table I.1(f)]

13. Velocity in Suction Pipe

Based on a Design Flow Rate of 713.26 gpm

Velocity in Suction Pipe = 0.446 psi [From Table I.1(g)]

14. Pressure Loss in Suction Hose

Based on a Design Flow Rate of 713.26 gpm

Pressure Loss in Section Hose = 0.132 psi [From Table I.1(h)]

Building Classification from Table 3.1.2.1: Type C - Residential Occupancies

Water Supply Coefficient (K): 23 (Table 1 - OBC Appendix A , Vol. 2)

Building Volume

Assume Average House Square Footage of 3500 ft² (325.16m²) and Average Building Height of 10m (3.00m basement, 3.00m 1st & second floors, 1.00m roof pitch)

$$\text{Average House Volume} = (325.16 \times 10) = 3251.61 \text{ m}^3$$

Spatial Coefficient

*Assume an average exposure distance of 9.5m for distance between houses

$$S_{\text{side}} = 0.05 \text{ (From Figure 1 - OBC Appendix A, Vol. 2)}$$

$$S_{\text{side}} = 0.00 \text{ (Front \& Back of House)}$$

$$S_{\text{tot}} = 1.0 + [S_{\text{side}} + S_{\text{side}2} + S_{\text{side}3} + S_{\text{side}4}] = 1.0 + [0.05 + 0.05 + 0 + 0]$$

$$S_{\text{tot}} = 1.1$$

Required Minimum Water Supply Flow Rate (L/min)

$$Q = KVS_{\text{tot}} = (23 \times 3251.61 \times 1.1) = 82265.63 \text{ L}$$

As per Table 2 , since $Q \leq 108,000 \text{ L}$:

$$\text{Required Minimum Water Supply Flow Rate} = 2700 \text{ L/min}$$

Minimum 30 Minute Water Supply Based on Table 2 Flow Rate

$$\text{Water Supply Flow Rate} = 2700 \text{ L/min}$$

$$\text{Water Supply} = 65000 \text{ L}$$

A minimum Water Supply of 30 minutes is required

$$\text{Water Supply/Water Supply Flow Rate} = 82265.60/2700 = 30.47 \text{ minutes}$$

Since 30.47 minutes > 30 minutes required, a storage tank is to be sized to hold 82,270 L (82.27 m³).

Note: While the tank is shown as being 2.15m deep, we cannot draw down the bottom 6" of water below the strainer, so only 2.00m can be counted towards the storage volume.

$$\text{Length: } 6.50$$

$$\text{Width: } 6.50$$

$$\text{Height: } 2.00$$

$$\text{Volume} = (6.50 \times 6.50 \times 2.00) = 84.50 \text{ m}^3$$

Since $95.06 \text{ m}^3 > 82.27 \text{ m}^3$, a storage tank 6.50m long, 6.50m wide and 2.15m deep will provide the required on site water supply for fire protection.

Osaca Street A Pond (Pond A - BLK 41) Calculations
Our File: 122068
November 8, 2023

Pond A Volmes and Discharge

Orifice 1		Orifice 2	
$Q=CA(2gh)^{0.5}$		$Q=CA(2gh)^{0.5}$	
Diameter=	0.080 m	Diameter=	0.150 m
Area=	0.0050 m ²	Area=	0.0177 m ²
C=	0.61 (PLATE)	C=	0.61 (PLATE)
C/L Elev=	162.64 m	C/L Elev=	163.11 m

	ELEV m	AREA m ²	AVERAGE AREA m ²	DEPTH m	VOLUME m ³	TOTAL VOLUME m ³	ORIFICE 1		ORIFICE 2		TOTAL FLOW cms
							HEAD m	FLOW cms	HEAD m	FLOW cms	
Permanent	161.60	284.63				0.00					
Pool			360.81	0.25	90.20						
	161.85	436.98				90.20					
			529.44	0.25	132.36						
	162.10	621.90				222.56					
			727.94	0.25	181.99						
	162.35	833.98				404.55					
			984.20	0.25	246.05						
	162.60	1134.41				650.60					
Active	162.60	1134.41				0.00	0.00	0.00			0.0000
Pool			1398.64	0.25	349.66						
	162.85	1662.87				349.66	0.21	0.0062			0.0062
			1771.97	0.25	442.99						
Quantity	163.10	1881.07				792.65	0.46	0.0092	0.0000	0.0000	0.0092
Control			1995.08	0.25	498.77						
	163.35	2109.08				1291.42	0.71	0.0114	0.2450	0.0236	0.0351
			2228.00	0.25	557.00						
	163.60	2346.92				1848.42	0.96	0.0133	0.4950	0.0336	0.0469

Osaca Street A Pond (Pond A - BLK 41) Quantity Requirements

2/5

Our File: 122049

March 1, 2024

WET POND QUANTITY REQUIREMENTS (80% TSS Removal)

***Imp Levels taken from Table 3.2 of MECP SWM Planning & Design Manual**

IMPERVIOUS LEVEL	PERMANENT STORAGE VOLUME REQUIRED(m ³ /ha)	FLUCTUATING STORAGE VOLUME REQUIRED (m ³ /ha)	TOTAL STORAGE REQUIRED (m ³ /ha)
85%	210	40	250
70%	185	40	225
55%	150	40	190
35%	100	40	140

Areas Draining to Pond B	Area (ha)	% Impervious	A x I
Node 9 - Area Draining to Street A Pond	4.01	19.65%	0.79
TOTAL	4.01		0.79
% IMP =	19.65%		

Since 19.65% is below the 35%, a conservative permanent storage volume of 100 m³/ha is required .

Fluctuating Storage is the greater of 40 m³/ha or 25mm storm event:

Total Drainage Area (ha)	Total Rainfall (mm)	Runoff Depth (mm)	Volume Required (m ³)
4.01	25	8.20	328.90

OR

$$40 \text{ m}^3/\text{ha} \times 3.53 \text{ ha} = 160.48 \text{ m}^3$$

Therefore, storage requirements are as follows:

Permanent Pool Storage Vol. (100 m³/ha) = 401.20 m³

Fluctuating Storage Volume = 328.90 m³

POND B FOREBAY CALCULATIONS

CONTRIBUTING AREA=	4.01 ha
Permanent Pool Required	401 m ³
Active Pool Required	329 m ³

Pond Characteristics

Permanent Pool Elevation=	162.60 m
Pond Invert Elevation=	161.60 m
Active Pool Elevation=	162.85 m

Permanent Pool Volume Provided	650.60 m ³
Active Pool Volume Provided	350 m ³

Orifice Sizing Calculations
 From MOE Stormwater Management Practices Manual

$$t = \frac{2x A_p}{C x A_o (2g)^{0.5}} x (h_1^{0.5} - h_2^{0.5})$$

$$86400 = \frac{2x 2337.22}{0.61 x A_o (2x 9.81)^{0.5}} x (0.25^{0.5} - 0.00^{0.5})$$

$$A_o = \frac{2337.22}{86400 x 2.701963}$$

$$A_o = 0.0100117 \text{ m}^2$$

t=Drawdown Time(s)	86400 s
A _p = Pond Area(@ Max WSE)=	2337.22 m ²
C= Discharge Coefficient=	0.61
h ₁ =Max. head(m)	
=	162.85 - 162.60
h ₂ =Min. head(m)	0.25 m
=	162.60 - 162.60
C/L Orifice=	162.64 m
g=Gravity=	9.81 m/s ²
A _o = Orifice Area	0.017671 m ²

Orifice Diameter

$$\text{Dia} = \frac{4x A_o}{\pi}$$

$$\text{Dia} = 0.150 \text{ m}$$

Check Drawdown time (Equation 4.10 - MOE 2003 Manual)

$$t = \frac{2 A_p}{C A_o (2g)^{0.5}} (h_1^{0.5} - h_2^{0.5})$$

$$= 172087.6 \text{ s}$$

$$= 47.80 \text{ h}$$

D= Orifice Diameter	0.080 m
A _o = Orifice Area	0.005027 m ²
g=Gravity=	9.81 m/s ²
A _p = Surface Area of Pond (m ²) =	2337.22 m ²
h ₁ = Starting Water Elevation =	0.00 m
Above the Orifice	
h ₂ = Ending Water Elevation =	0.25
Above the Orifice	
C= Discharge Coefficient=	0.61

2024-03-07

Maximum Discharge

$$Q = C \times A_o \times (2gh)^{0.5}$$

$$= 0.0077 \text{ m}^3/\text{s}$$

D= Orifice Diameter	0.085 m
A _o = Orifice Area	0.00567 m ²
g=Gravity=	9.81 m/s ²
Maximum Head(h)=	0.25 m
C= Discharge Coefficient=	0.61

Equation 4.5 - Forebay Settling Length

$$\text{Distance} = \sqrt{\frac{r \times Q_p}{V_s}}$$

$$= \sqrt{\frac{0.019165}{0.0003}}$$

$$= 8 \text{ m}$$

r=Length:Width Ratio	2.5 :1
Q _p =Orifice Peak Discharge=	0.0077 m ³ /s
V _s =Settling Velocity	0.0003 m/s

Equation 4.6 - Forebay Dispersion Length

$$\frac{8 \times Q}{d \times V_p}$$

$$= \frac{1.128}{0.5}$$

$$= 2.3 \text{ m}$$

d=Depth of Forebay	1 m
V _p =Velocity in Forebay	0.5 m/s
Q= $\frac{CiA}{360}$ m ³ /s	0.122 m ³ /s
Q (5Yr4hr) =	0.141 m ³ /s
C=Runoff Coefficient	0.44
i=43xC+5.9	24.8415 mm/hr
A=Area(ha)	4.012 ha

Equation 4.7 - Minimum Bottom Width

$$\text{Width} = \frac{\text{Distance}}{8}$$

$$= 0.2875 \text{ m}$$

PROJECT Osaca Subdivision - Pond A (BLK 41)
PROJECT # 122049
DATE Mar-24

POND VOLUMES AND DISCHARGE - BLOCKED CONDITIONS

Weir 1 - See diagram on following page

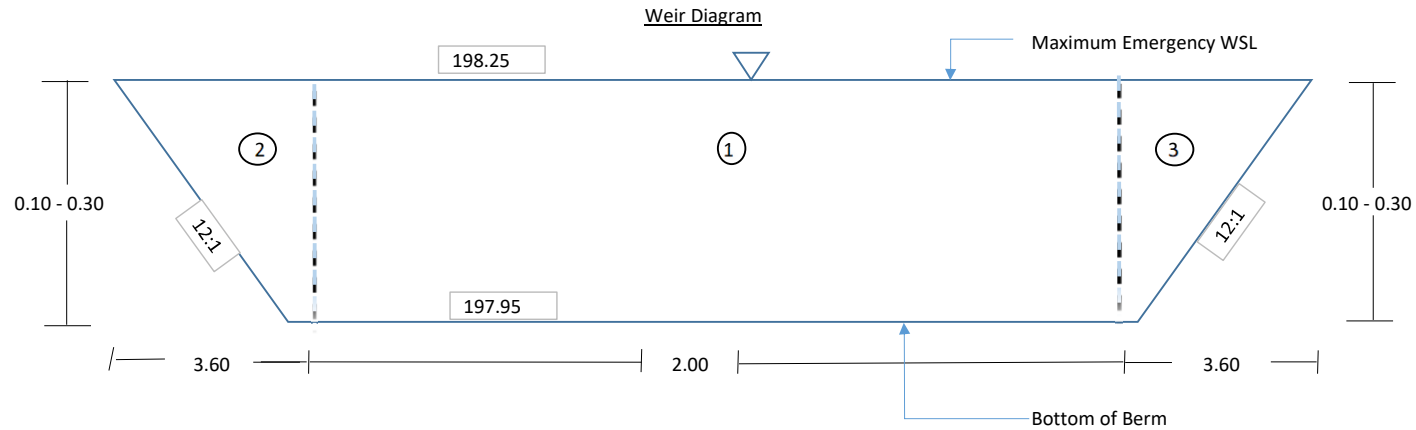
Section 1 (rectangular portion) Section 2 & 3 (triangular portion)

$$Q = \frac{2}{3} C_w B \sqrt{2g} (h)^{3/2}$$

$$Q = \frac{2}{3} C_w B \sqrt{2g} \left(\frac{2}{3} h\right)^{3/2}$$

$C_w = 0.577$ $C_w = 0.577$
 $B \text{ (width)} = 2.00 \text{ m}$ $B \text{ (width)} = d / (1/5) \text{ m}$
 Weir 1 163.6 m

	ELEV m	AREA m2	AVERAGE AREA m2	DEPTH m	VOLUME m3	TOTAL VOLUME m3	ORIFICE 1		ORIFICE 2		WEIR		TOTAL FLOW cms
							HEAD m	FLOW cms	HEAD m	FLOW cms	HEAD m	FLOW cms	
Emergency	163.60	1874.89				0.00				0.00	0.000	0.0000	
Flow			1915.64	0.10	191.56					0.10	0.137	0.1371	
	163.70	1956.39				191.56				0.20	0.471	0.4707	
			1997.14	0.10	199.71					0.30	1.017	1.0171	
	163.80	2037.89				391.28							
			2079.88	0.10	207.99								
	163.90	2121.87				599.27							



HYMO $Q_{100 \text{ YEAR}} = 0.521 \text{ m}^3/\text{s}$

Therefore, in the event of blocked conditions, the emergency overflow weir has the capacity to convey the 100 Year Flows.

Osaca Street C Pond (Pond B - BLK 42) Calculations

Our File: 122068

March 1, 2024

Pond C Volmes and Discharge

Orifice 1

$$Q=CA(2gh)^{0.5}$$

Diameter= 0.075 m

Area= 0.0044 m²

C= 0.61 (PLATE)

C/L Elev= 161.69 m

Orifice 2

$$Q=CA(2gh)^{0.5}$$

Diameter= 0.075 m

Area= 0.0044 m²

C= 0.61 (PLATE)

C/L Elev= 161.94 m

	ELEV m	AREA m ²	AVERAGE AREA m ²	DEPTH m	VOLUME m ³	TOTAL VOLUME m ³	ORIFICE 1		ORIFICE 2		TOTAL FLOW cms
							HEAD m	FLOW cms	HEAD m	FLOW cms	
Permanent	160.65	57.72				0.00					
Pool			87.33	0.25	21.83						
	160.90	116.95				21.83					
			164.42	0.25	41.10						
	161.15	211.89				62.94					
			271.74	0.25	67.94						
	161.40	331.59				130.87					
			420.78	0.25	105.19						
	161.65	509.96				236.07					
Active	161.65	800.67				0.00	0.00	0.00			0.0000
Pool			885.39	0.25	221.35						
	161.90	970.11				221.35	0.21	0.0055	0.0000	0.0000	0.0055
			1059.24	0.25	264.81						
Quantity	162.15	1148.37				486.16	0.46	0.0081	0.2125	0.0055	0.0136
Control			1240.53	0.25	310.13						
	162.40	1332.68				796.29	0.71	0.0101	0.4625	0.0081	0.0182

WET POND QUANTITY REQUIREMENTS (80% TSS Removal)

*Imp Levels taken from Table 3.2 of MECP SWM Planning & Design Manual

IMPERVIOUS LEVEL	PERMANENT STORAGE VOLUME REQUIRED(m ³ /ha)	FLUCTUATING STORAGE VOLUME REQUIRED (m ³ /ha)	TOTAL STORAGE REQUIRED (m ³ /ha)
85%	210	40	250
70%	185	40	225
55%	150	40	190
35%	100	40	140

Areas Draining to Pond B	Area (ha)	% Impervious	A x I
Node 3 - Area Draining to Street C Pond	1.56	24.38%	0.38
TOTAL	1.56		0.38
% IMP =	24.38%		

Since 24.38% is below the 35%, a conservative permanent storage volume of 100 m³/ha is required .

Fluctuating Storage is the greater of 40 m³/ha or 25mm storm event:

Total Drainage Area (ha)	Total Rainfall (mm)	Runoff Depth (mm)	Volume Required (m ³)
1.56	25	9.122	141.29

OR

$$40 \text{ m}^3/\text{ha} \times 1.56 \text{ ha} = 62.22 \text{ m}^3$$

Therefore, storage requirements are as follows:

Permanent Pool Storage Vol. (100 m³/ha) = 155.54 m³
Fluctuating Storage Volume = 141.29 m³

POND FOREBAY CALCULATIONS

CONTRIBUTING AREA=	1.56 ha
Permanent Pool Required	156 m ³
Active Pool Required	141 m ³

Pond Characteristics

Permanent Pool Elevation=	161.65 m
Pond Invert Elevation=	160.65 m
Active Pool Elevation=	161.90 m

Permanent Pool Volume Provided	236.07 m ³
Active Pool Volume Provided	221.00 m ³

Orifice Sizing Calculations
 From MOE Stormwater Management Practices Manual

$$t = \frac{2x A_p}{C x A_o (2g)^{0.5}} x (h_1^{0.5} - h_2^{0.5})$$

$$86400 = \frac{2x796.29}{0.61x A_o (2x9.81)^{0.5}} x (0.25^{0.5} - 0.00^{0.5})$$

$$A_o = \frac{1303.97}{86400 x 2.701963}$$

$$A_o = 0.0055856 \text{ m}^2$$

t=Drawdown Time(s)	86400 s
A _p = Pond Area(@ Max WSE)=	1303.97 m ²
C= Discharge Coefficient=	0.61
h ₁ =Max. head(m)	
=	162.90 - 162.65
	0.25 m
h ₂ =Min. head(m)	
=	162.90 - 162.90
	0.00 m
C/L Orifice=	161.69 m
g=Gravity=	9.81 m/s ²
A _o = Orifice Area	0.001963 m ²

Orifice Diameter

$$\text{Dia} = \frac{4x A_o}{\pi}$$

$$\text{Dia} = 0.050 \text{ m}$$

Check Drawdown time (Equation 4.10 - MOE 2003 Manual)

$$t = \frac{2 A_p}{C A_o (2g)^{0.5}} (h_1^{0.5} - h_2^{0.5})$$

$$= 97705.689 \text{ s}$$

$$= 27.14 \text{ h}$$

D= Orifice Diameter	0.075 m
A _o = Orifice Area	0.004418 m ²
g=Gravity=	9.81 m/s ²
A _p = Surface Area of Pond (m ²) =	1303.97 m ²
h ₁ = Starting Water Elevation =	0.00 m
Above the Orifice	
h ₂ = Ending Water Elevation =	0.20
Above the Orifice	
C= Discharge Coefficient=	0.61

Maximum Discharge

$$Q = C \times A_o \times (2gh)^{0.5}$$

$$= 0.0053 \text{ m}^3/\text{s}$$

D= Orifice Diameter	0.075 m
A _o = Orifice Area	0.00442 m ²
g=Gravity=	9.81 m/s ²
Maximum Head(h)=	0.20 m
C= Discharge Coefficient=	0.61

Equation 4.5 - Forebay Settling Length

$$\text{Distance} = \sqrt{\frac{r \times Q_p}{V_s}}$$

$$= \sqrt{\frac{0.008008}{0.0003}}$$

$$= 5.2 \text{ m}$$

r=Length:Width Ratio	1.5 :1
Q _p =Orifice Peak Discharge=	0.0053 m ³ /s
V _s =Settling Velocity	0.0003 m/s

Equation 4.6 - Forebay Dispersion Length

$$\frac{8 \times Q}{d \times V_p}$$

$$= \frac{0.872}{0.5}$$

$$= 1.7 \text{ m}$$

d=Depth of Forebay	1 m
V _p =Velocity in Forebay	0.5 m/s
Q= $\frac{CiA}{360}$ m ³ /s	0.047 m ³ /s
Q (5Yr4hr) =	0.109 m ³ /s
C=Runoff Coefficient	0.44
i=43xC+5.9	24.8415 mm/hr
A=Area(ha)	1.555 ha

Equation 4.7 - Minimum Bottom Width

$$\text{Width} = \frac{\text{Distance}}{8}$$

$$= 0.2125 \text{ m}$$

PROJECT OSACA Subdivision - Street C Pond (Pond B - BLK 42)
PROJECT # 122049
DATE Mar-24

POND VOLUMES AND DISCHARGE - BLOCKED CONDITIONS

Weir 1 - See diagram on following page

Section 1 (rectangular portion) Section 2 & 3 (triangular portion)

$$Q = \frac{2}{3} C_w B \sqrt{2g} (h)^{3/2}$$

$$Q = \frac{2}{3} C_w B \sqrt{2g} \left(\frac{2}{3} h\right)^{3/2}$$

C_w= 0.577

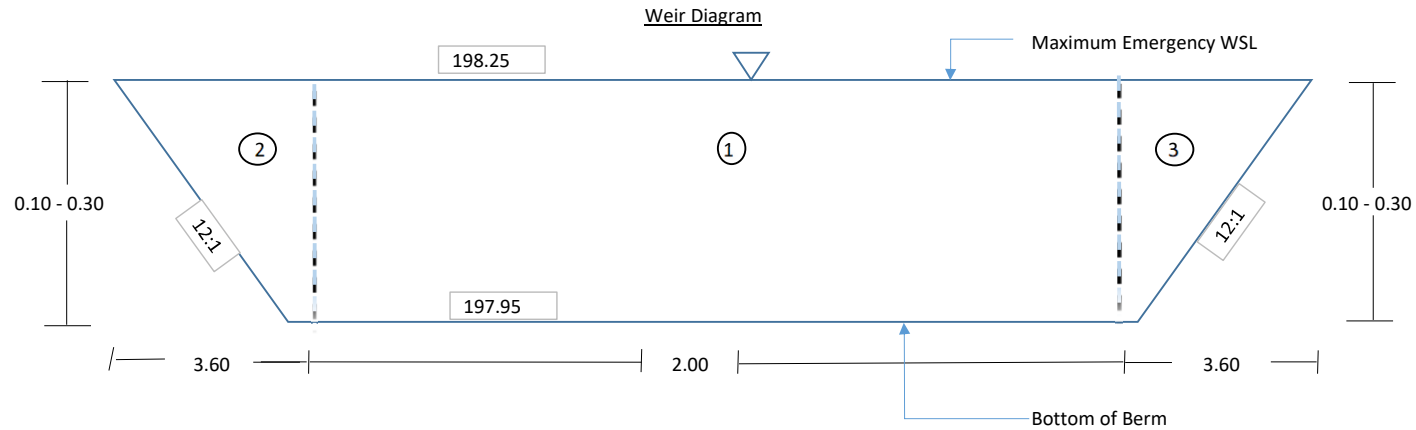
C_w= 0.577

B (width)= 2.00 m

B (width)= d / (1/5) m

Weir 1 162.4 m

	ELEV m	AREA m ²	AVERAGE AREA m ²	DEPTH m	VOLUME m ³	TOTAL VOLUME m ³	ORIFICE 1		ORIFICE 2		WEIR		TOTAL FLOW cms
							HEAD m	FLOW cms	HEAD m	FLOW cms	HEAD m	FLOW cms	
Emergency	162.40	1332.68				0.00				0.00	0.000	0.0000	
Flow			1355.73	0.10	135.57	135.57				0.10	0.137	0.1371	
	162.50	1378.78	1401.82	0.10	140.18	275.76				0.20	0.471	0.4707	
	162.60	1424.87	1448.62	0.10	144.86	420.62				0.30	1.017	1.0171	
	162.70	1472.36											



HYMO Q_{100 YEAR} = 0.721 m³/s

Therefore, in the event of blocked conditions, the emergency overflow weir has the capacity to convey the 100 Year Flows.

Job 5868 County Road 65 Subdivision

2024-03-07

Job # 122049

1/1

Culvert Design Crossing Under Street A Entrance

Area Draining to Culvert (Node 19)			
Material	Area	RC	A x I
Road	0.023075	0.9	0.020767
Shoulder	0.012002	0.6	0.007201
Landscape	1.920777	0.2	0.384155

TOTAL 1.955854 0.412124

Weighted RC 0.210713

% IMP = 1.54%

Inlet 162.26

Outlet 162.20

Q= 0.218 m³/s Refer to VH Output in Schedule 2

D = 0.375

N = 2.00

H_f/D = 1.04

H = 0.39 m

CULVERT DATA				Inlet Control		
DESCRIP.	DIA.	NO.	Q/N	AREA	HW/D	HW
	(m)	N	(m ³ /s)	(m ²)		(m)
7	8	9	10	11	13	14
375mm	0.375	2.00	0.11	0.11	1.04	0.39

9 NUMBER OF BARRELS

10 COL. 1 / COL. 9

11 AREA PER BARREL

12 BOX CULVERT ONLY

13 DESIGN CHART 2.32

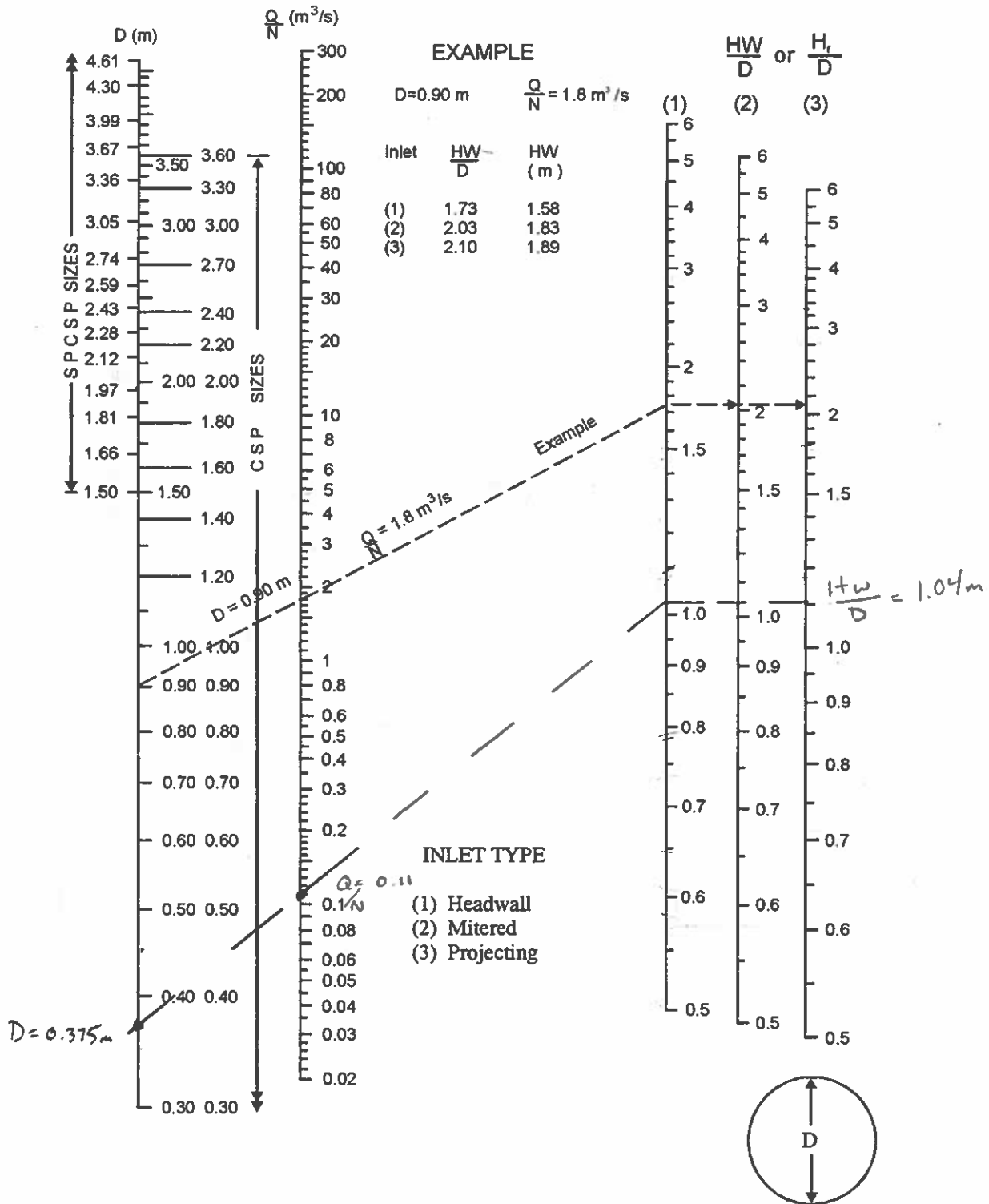
14 COL. 8 x COL. 13

Shoulder Elevation North side of Street A Intersection = 163.00

Max WSE @ Inlet = **162.65** < 163.00

Since water surface elevation at inlet is less than the height of the shoulder, water will not overtop Street A.

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts



Source: Herr (1977)

Job 5868 County Road 65 Subdivision

2024-03-07

Job # 122049

1/1

Culvert Design Crossing Under Street B At Street A & B Intersection

Area Draining to Culvert (Node 20)			
Material	Area	RC	A x I
Road	0.016549	0.9	0.014894
Shoulder	0.006806	0.6	0.004084
Landscape	0.050297	0.2	0.010059

TOTAL 0.073653 0.029037

Weighted RC 0.394

% IMP = 27.68%

Inlet 163.52

Outlet 163.45

Q= 0.013 m³/s Refer to VH Output in Schedule 2

D = 0.300

N = 1.00

H_t/D = 0.42

H = 0.13 m

CULVERT DATA				Inlet Control		
DESCRIP.	DIA.	NO.	Q/N	AREA	HW/D	HW
	(m)	N	(m ³ /s)	(m ²)		(m)
7	8	9	10	11	13	14
300mm	0.300	1.00	0.013	0.07	0.42	0.13

9 NUMBER OF BARRELS

10 COL. 1 / COL. 9

11 AREA PER BARREL

12 BOX CULVERT ONLY

13 DESIGN CHART 2.32

14 COL. 8 x COL. 13

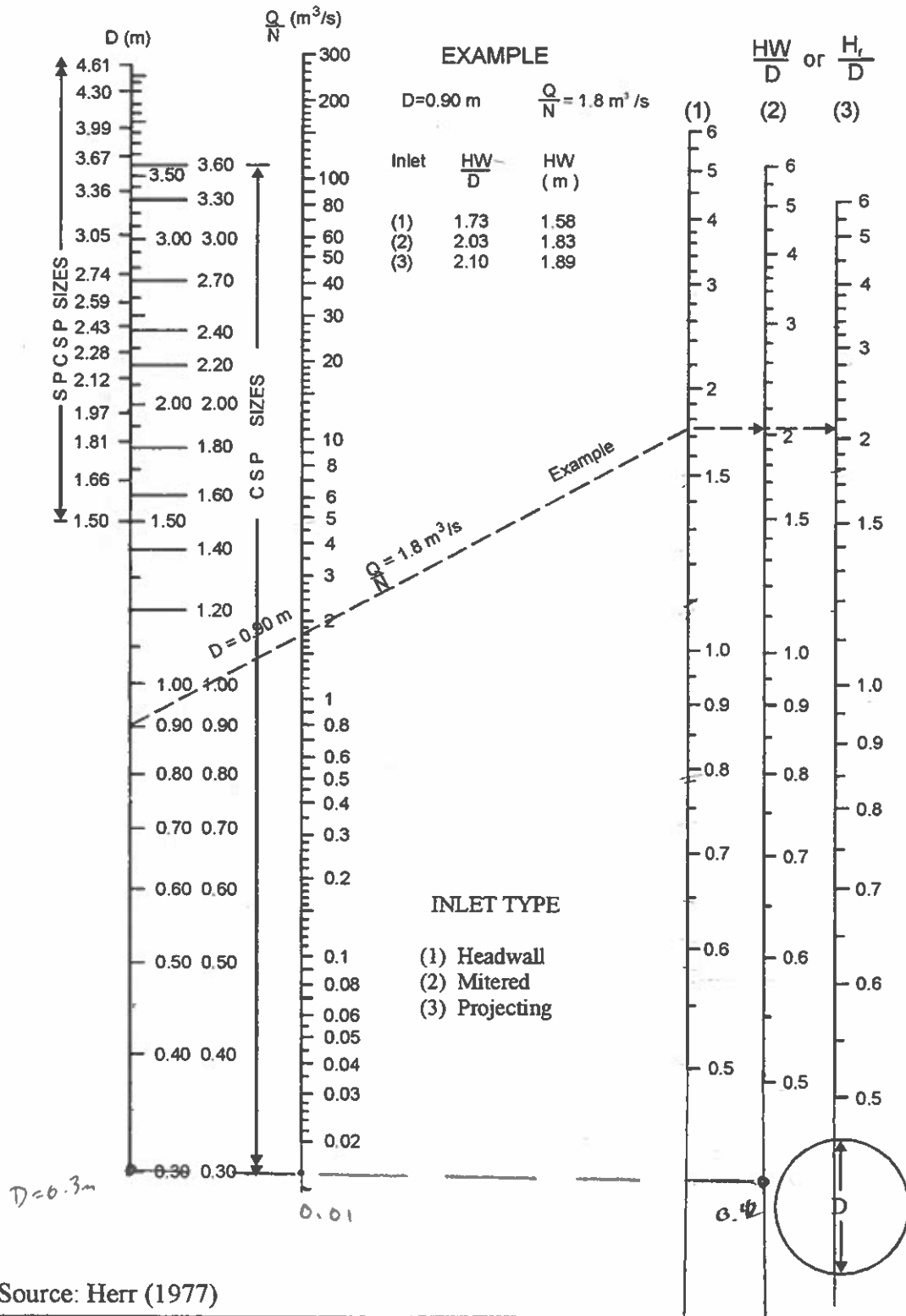
Shoulder Elevation North side of Street A Intersection = 164.15

Max WSE @ Inlet = **163.65** < 164.15

Since water surface elevation at inlet is less than the height of the shoulder, water will not overtop Street B.

122049: CROSSING UNDER STREET B AT STREET A/B INTERSECTION.

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts



Source: Herr (1977)

Job 5868 County Road 65 Subdivision

2024-03-07

Job # 122049

1/1

Culvert Design Crossing Under Street A From OLF Channel

Area Draining to Culvert (Node 21)			
Material	Area	RC	A x I
Road	0.29949	0.9	0.269544
Shoulder	0.09874	0.6	0.059243
Landscape	2.22092	0.2	0.444185

TOTAL 2.619156 0.772972

Weighted RC 0.295

% IMP = 13.56%

Inlet 162.71

Outlet 162.66

Q= 0.324 m³/s Refer to VH Output in Schedule 2

D = 0.375

N = 2.00

H_t/D = 1.55

H = 0.58 m

CULVERT DATA				Inlet Control		
DESCRIP.	DIA.	NO.	Q/N	AREA	HW/D	HW
	(m)	N	(m ³ /s)	(m ²)		(m)
7	8	9	10	11	13	14
375mm	0.375	2.00	0.16	0.11	1.55	0.58

9 NUMBER OF BARRELS

10 COL. 1 / COL. 9

11 AREA PER BARREL

12 BOX CULVERT ONLY

13 DESIGN CHART 2.32

14 COL. 8 x COL. 13

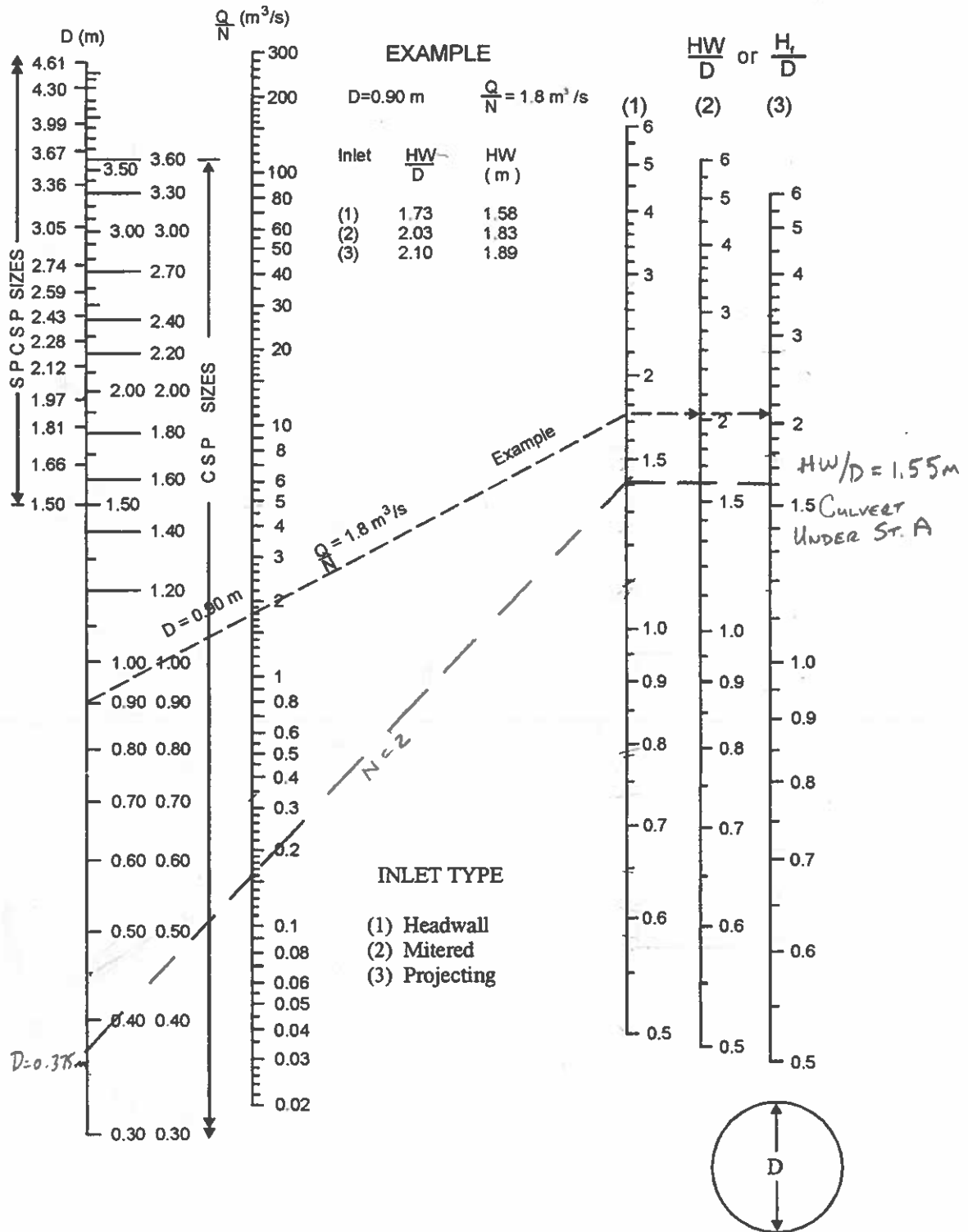
Shoulder Elevation North side of Street A Intersection = 163.45

Max WSE @ Inlet = **163.29** < 163.45

Since water surface elevation at inlet is less than the height of the shoulder, water will not overtop Street A.

122049: CULVERT UNDER STREET A TO SWM POND
BLK 41.

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts



Source: Herr (1977)

Job 5868 County Road 65 Subdivision
Job # 122049
Culvert Design Conveying OLF into Pond BLK 41

2024-03-07
 1/1

Area Draining to Culvert (Node 22)			
Material	Area	RC	A x I
Road	0.412511	0.9	0.37126
Shoulder	0.124345	0.6	0.074607
Landscape	2.622544	0.2	0.524509

TOTAL 3.159401 0.970376

Weighted RC 0.307

% IMP = 15.27%

Inlet 162.65

Outlet 162.60

Q= 0.396 m³/s Refer to VH Output in Schedule 2

D = 0.525

N = 2.00

H_f/D = 0.85

H = 0.44 m

CULVERT DATA				Inlet Control		
DESCRIP.	DIA.	NO.	Q/N	AREA	HW/D	HW
	(m)	N	(m ³ /s)	(m ²)		(m)
7	8	9	10	11	13	14
525mm	0.525	2.00	0.20	0.22	0.85	0.44

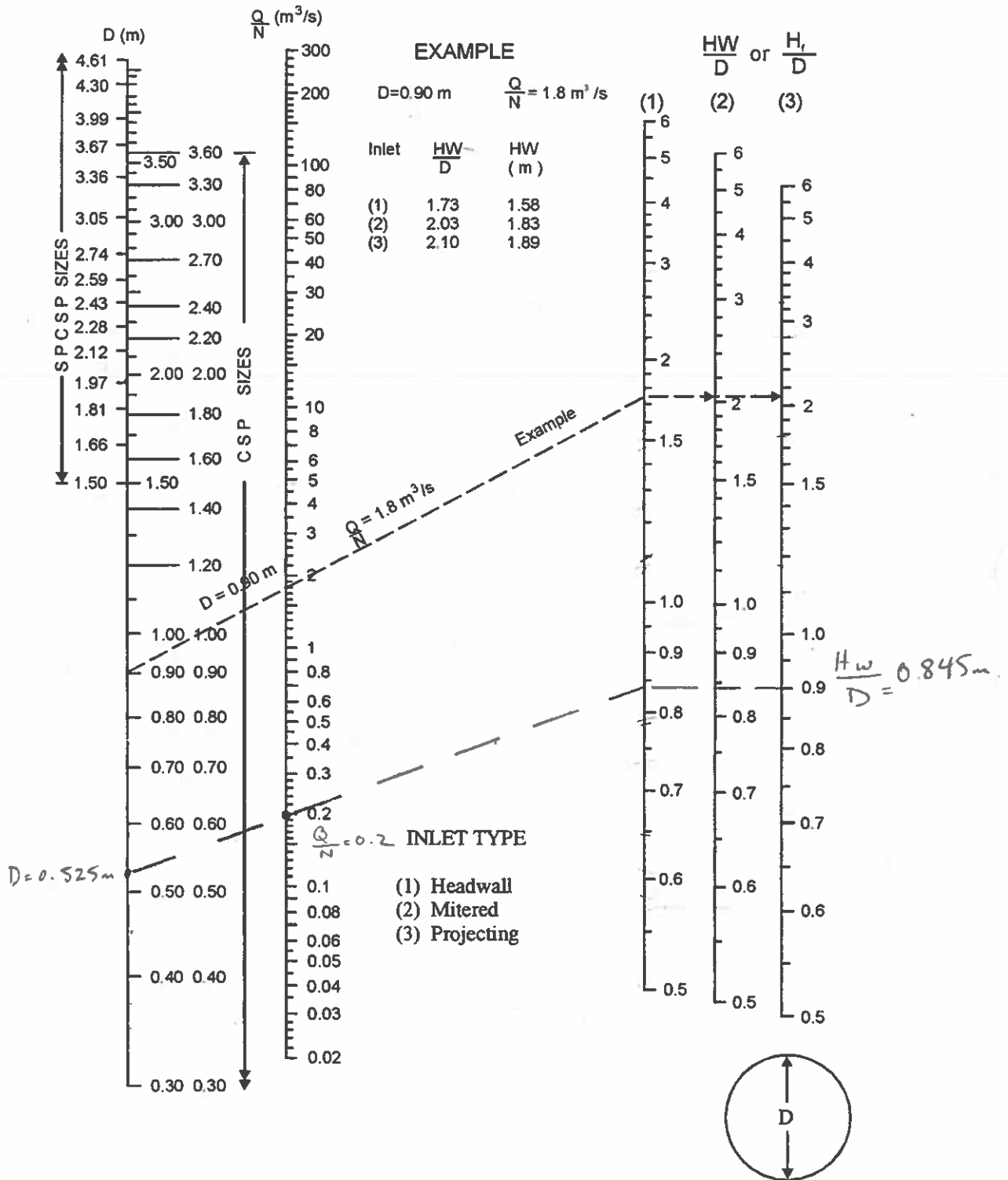
9 NUMBER OF BARRELS
 10 COL. 1 / COL. 9
 11 AREA PER BARREL
 12 BOX CULVERT ONLY
 13 DESIGN CHART 2.32
 14 COL. 8 x COL. 13

Shoulder Elevation North side of Street A Intersection = 163.45

Max WSE @ Inlet = **163.09** < 163.45

Since water surface elevation at inlet is less than the height of the shoulder, water will not overtop Street A.

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts



Source: Herr (1977)

Job 5868 County Road 65 Subdivision

2024-03-07

Job # 122049

1/1

Culvert Design Conveying OLF from Cul-de-sac into Pond BLK 41

Area Draining to Culvert (Node 23)			
Material	Area	RC	A x I
Road	0.10766	0.9	0.096894
Shoulder	0.030789	0.6	0.018474
Landscape	0.334513	0.2	0.066903

TOTAL 0.472962 0.18227

Weighted RC 0.385

% IMP = 26.42%

Inlet 162.79

Outlet 162.60

Q= 0.072 m³/s Refer to VH Output in Schedule 2

D = 0.375

N = 1.00

H_t/D = 0.77

H = 0.29 m

CULVERT DATA				Inlet Control		
DESCRIP.	DIA.	NO.	Q/N	AREA	HW/D	HW
	(m)	N	(m ³ /s)	(m ²)		(m)
7	8	9	10	11	13	14
375mm	0.375	1.00	0.07	0.11	0.77	0.29

9 NUMBER OF BARRELS

10 COL. 1 / COL. 9

11 AREA PER BARREL

12 BOX CULVERT ONLY

13 DESIGN CHART 2.32

14 COL. 8 x COL. 13

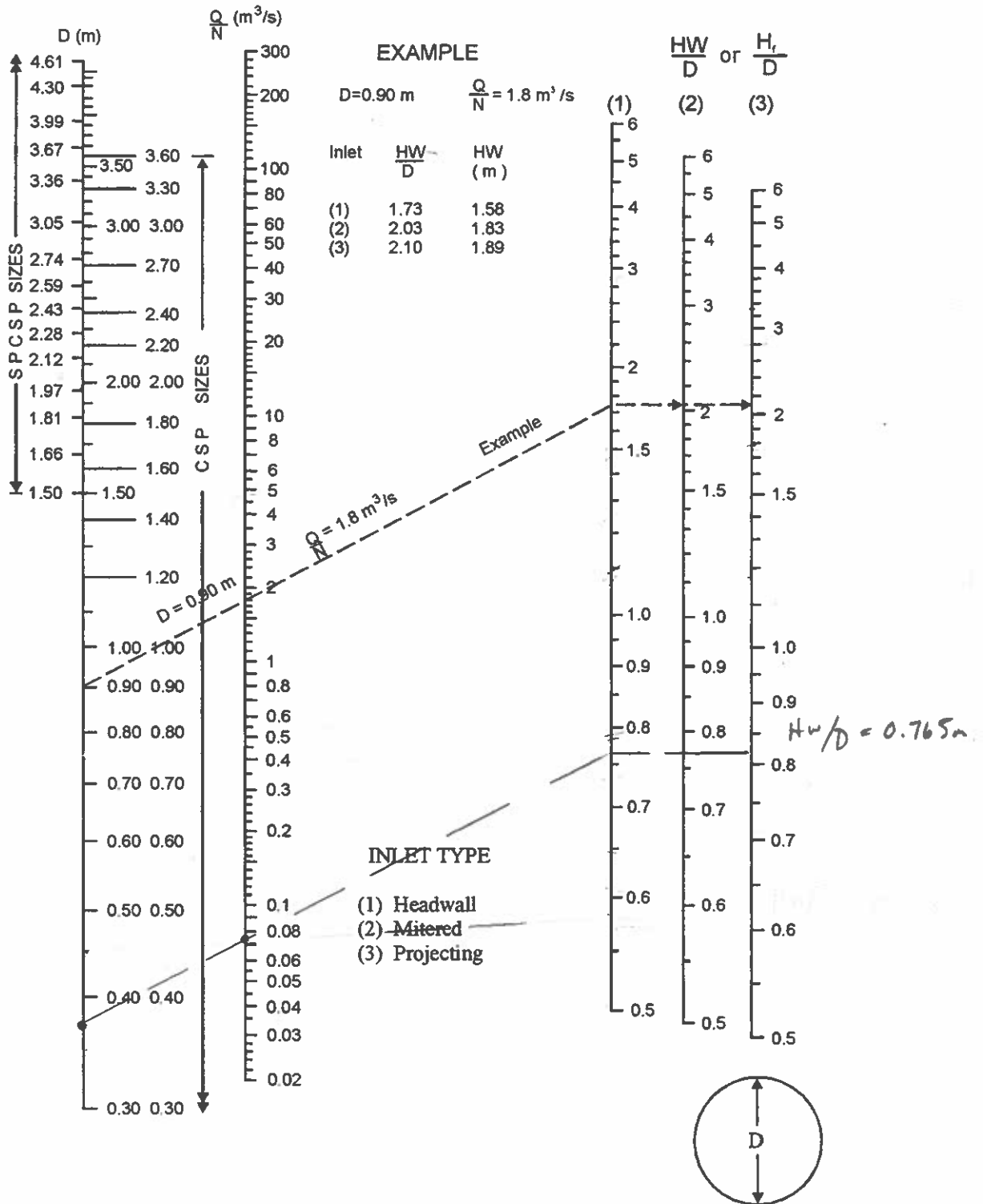
Shoulder Elevation North side of Street A Intersection = 163.60

Max WSE @ Inlet = **163.08** < 163.60

Since water surface elevation at inlet is less than the height of the shoulder, water will not overtop Street A.

122049: CULVERT CONVEYING OLF FROM CUL-DE-SAC INTO POND BLK 41.

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts



Source: Herr (1977)

Job 5868 County Road 65 Subdivision

2024-03-07

Job # 122049

1/1

Culvert Design Conveying under Street B to OLF

Area Draining to Culvert (Node 24)			
Material	Area	RC	A x I
Road	0.197876	0.9	0.178089
Shoulder	0.049317	0.6	0.02959
Landscape	0.794265	0.2	0.158853

TOTAL 1.041458 0.366532

Weighted RC 0.352

% IMP = 21.65%

Inlet 163.46

Outlet 163.40

Q= 0.14 m³/s Refer to VH Output in Schedule 2

D = 0.300

N = 2.00

H_f/D = 1.08

H = 0.32 m

CULVERT DATA				Inlet Control		
DESCRIP.	DIA.	NO.	Q/N	AREA	HW/D	HW
	(m)	N	(m ³ /s)	(m ²)		(m)
7	8	9	10	11	13	14
300mm	0.300	2.00	0.07	0.07	1.08	0.32

9 NUMBER OF BARRELS

10 COL. 1 / COL. 9

11 AREA PER BARREL

12 BOX CULVERT ONLY

13 DESIGN CHART 2.32

14 COL. 8 x COL. 13

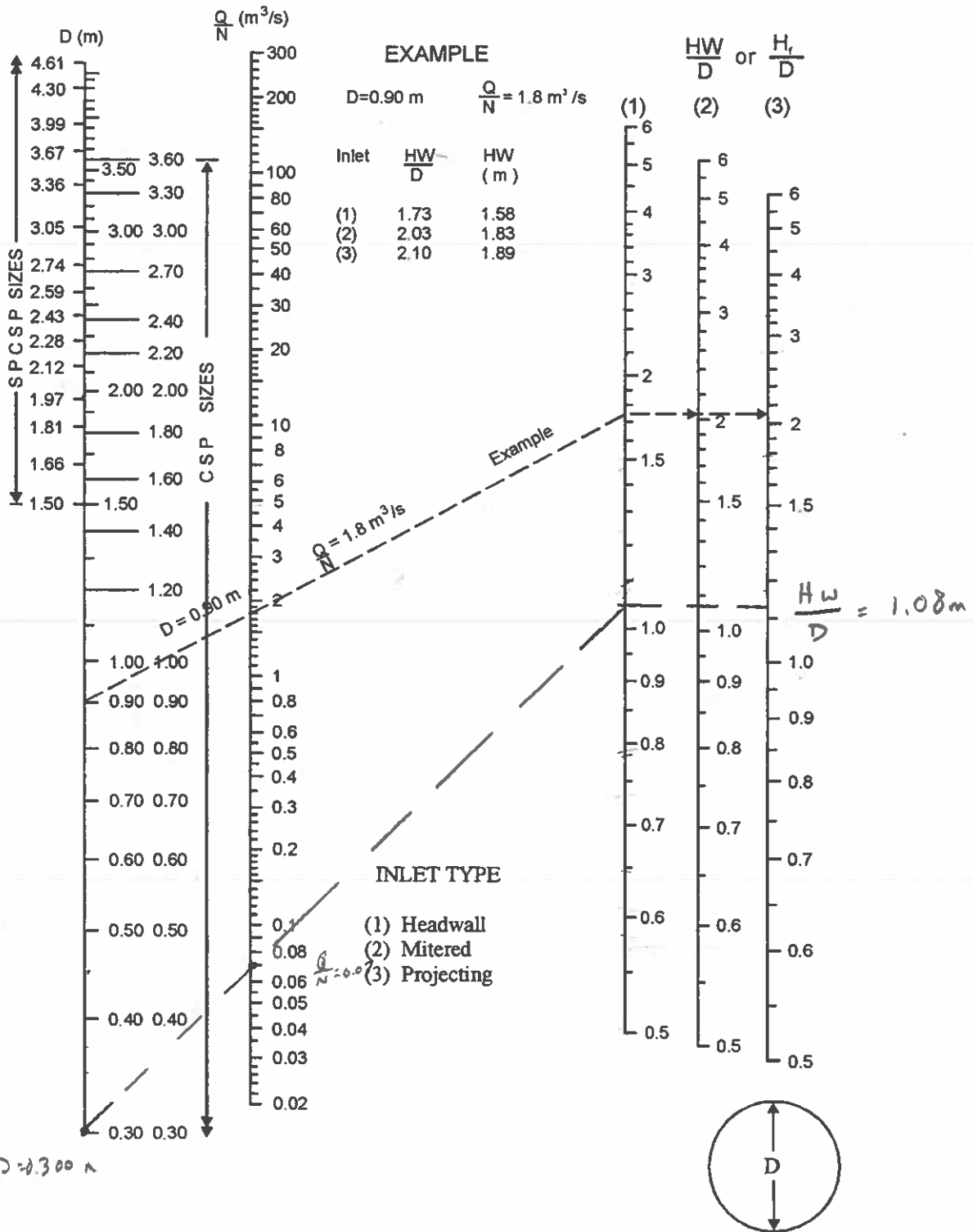
Shoulder Elevation North side of Street A Intersection = 164.10

Max WSE @ Inlet = **163.78** < 164.10

Since water surface elevation at inlet is less than the height of the shoulder, water will not overtop Street B.

122049: CULVERT UNDER STREET B TO OLD ROUTE

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts



Source: Herr (1977)

Job 5868 County Road 65 Subdivision

2024-03-07

Job # 122049

1/1

Culvert Design Conveying Under Street A & C Intersection

Area Draining to Culvert (Node 25)			
Material	Area	RC	A x I
Road	0.057967	0.9	0.05217
Shoulder	0.017353	0.6	0.010412
Landscape	0.247206	0.2	0.049441

TOTAL 0.322526 0.112023

Weighted RC 0.347

% IMP = 20.99%

Inlet 162.75

Outlet 162.42

Q= 0.044 m³/s Refer to VH Output in Schedule 2

D = 0.300

N = 1.00

H_t/D = 0.74

H = 0.22 m

CULVERT DATA				Inlet Control		
DESCRIP.	DIA.	NO.	Q/N	AREA	HW/D	HW
	(m)	N	(m ³ /s)	(m ²)		(m)
7	8	9	10	11	13	14
300mm	0.300	1.00	0.04	0.07	0.74	0.22

- 9 NUMBER OF BARRELS
- 10 COL. 1 / COL. 9
- 11 AREA PER BARREL
- 12 BOX CULVERT ONLY
- 13 DESIGN CHART 2.32
- 14 COL. 8 x COL. 13

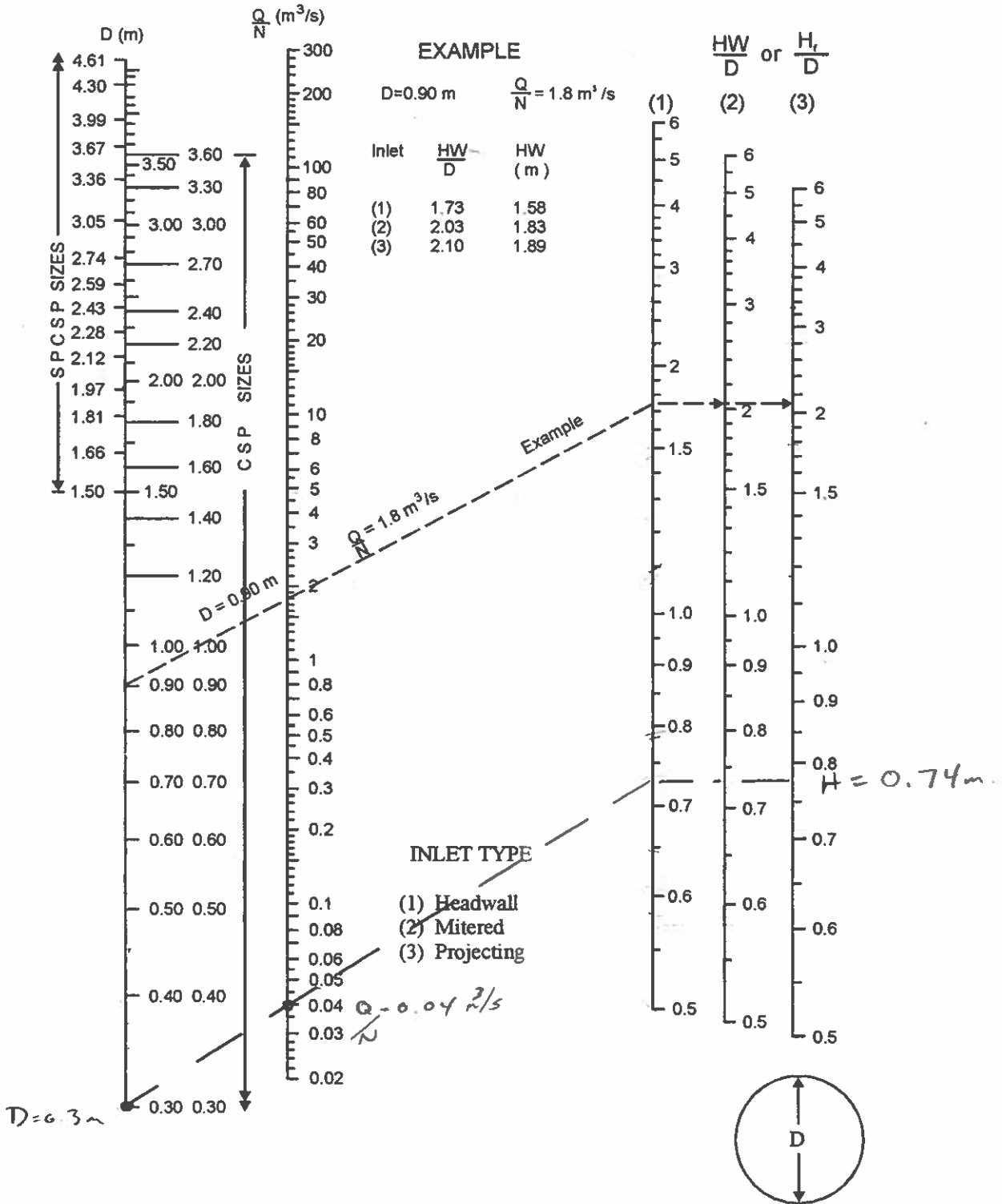
Shoulder Elevation North side of Street A & C Intersection = 163.18

Max WSE @ Inlet = **162.97** < 163.18

Since water surface elevation at inlet is less than the height of the shoulder, water will not overtop Street A or C.

122049: CULVERT UNDER STREET
A/C INTERSECTION.

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts



Source: Herr (1977)

Job 5868 County Road 65 Subdivision
Job # 122049
Culvert Design Conveying OLF into Pond BLK 42

2024-03-07
 1/1

Area Draining to Culvert (Node 26)			
Material	Area	RC	A x I
Road	0.242793	0.9	0.218514
Shoulder	0.075765	0.6	0.045459
Landscape	1.028592	0.2	0.205718

TOTAL 1.34715 0.469691

Weighted RC 0.349

% IMP = 21.18%

Inlet 161.70

Outlet 161.65

Q= 0.179 m³/s Refer to VH Output in Schedule 2

D = 0.450

N = 1.00

H_t/D = 1.01

H = 0.45 m

CULVERT DATA				Inlet Control		
DESCRIP.	DIA.	NO.	Q/N	AREA	HW/D	HW
	(m)	N	(m ³ /s)	(m ²)		(m)
7	8	9	10	11	13	14
450mm	0.450	1.00	0.18	0.16	1.01	0.45

- 9 NUMBER OF BARRELS
- 10 COL. 1 / COL. 9
- 11 AREA PER BARREL
- 12 BOX CULVERT ONLY
- 13 DESIGN CHART 2.32
- 14 COL. 8 x COL. 13

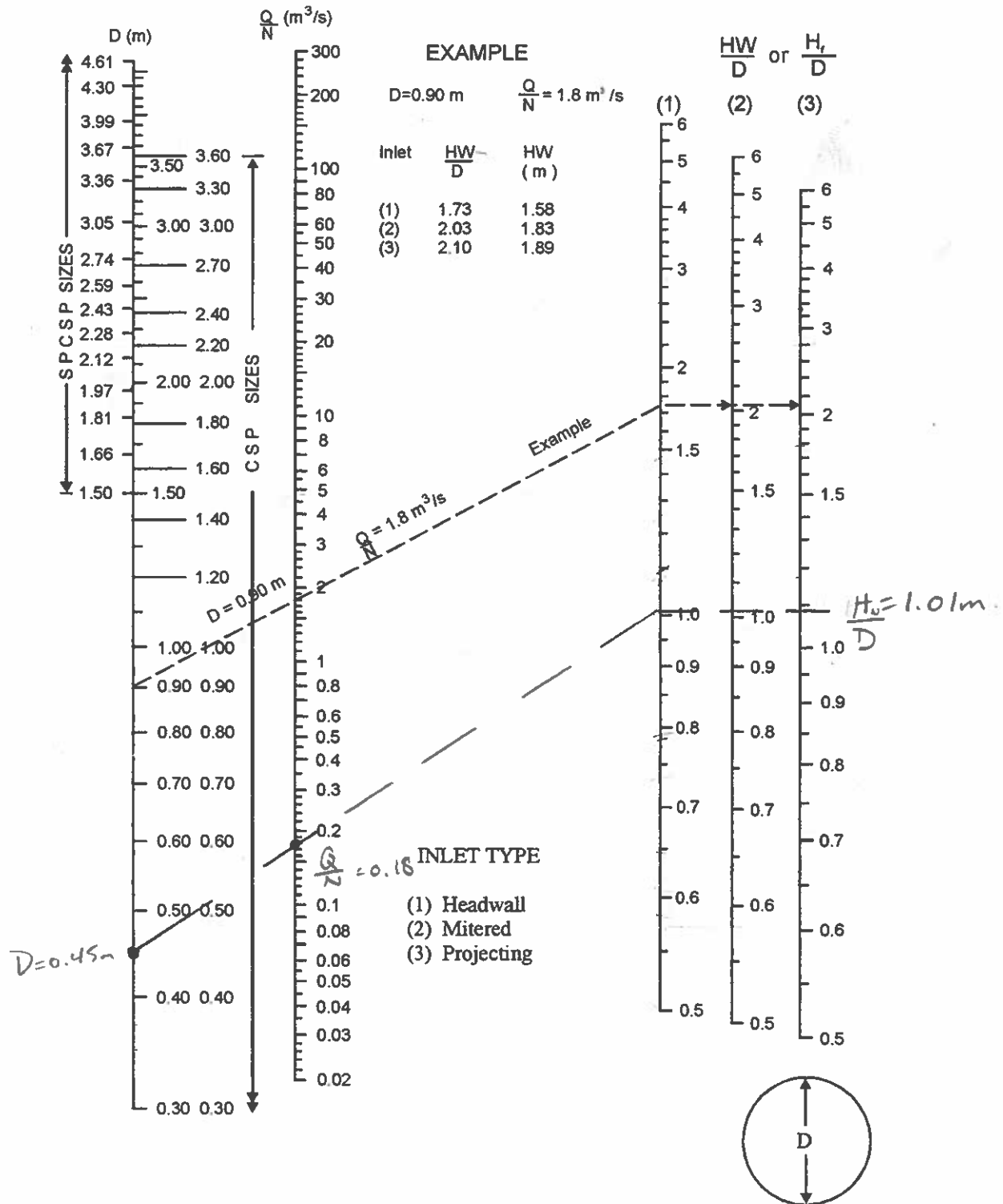
Shoulder Elevation North side of Street A & C Intersection = 162.57

Max WSE @ Inlet = **162.15** < 162.57

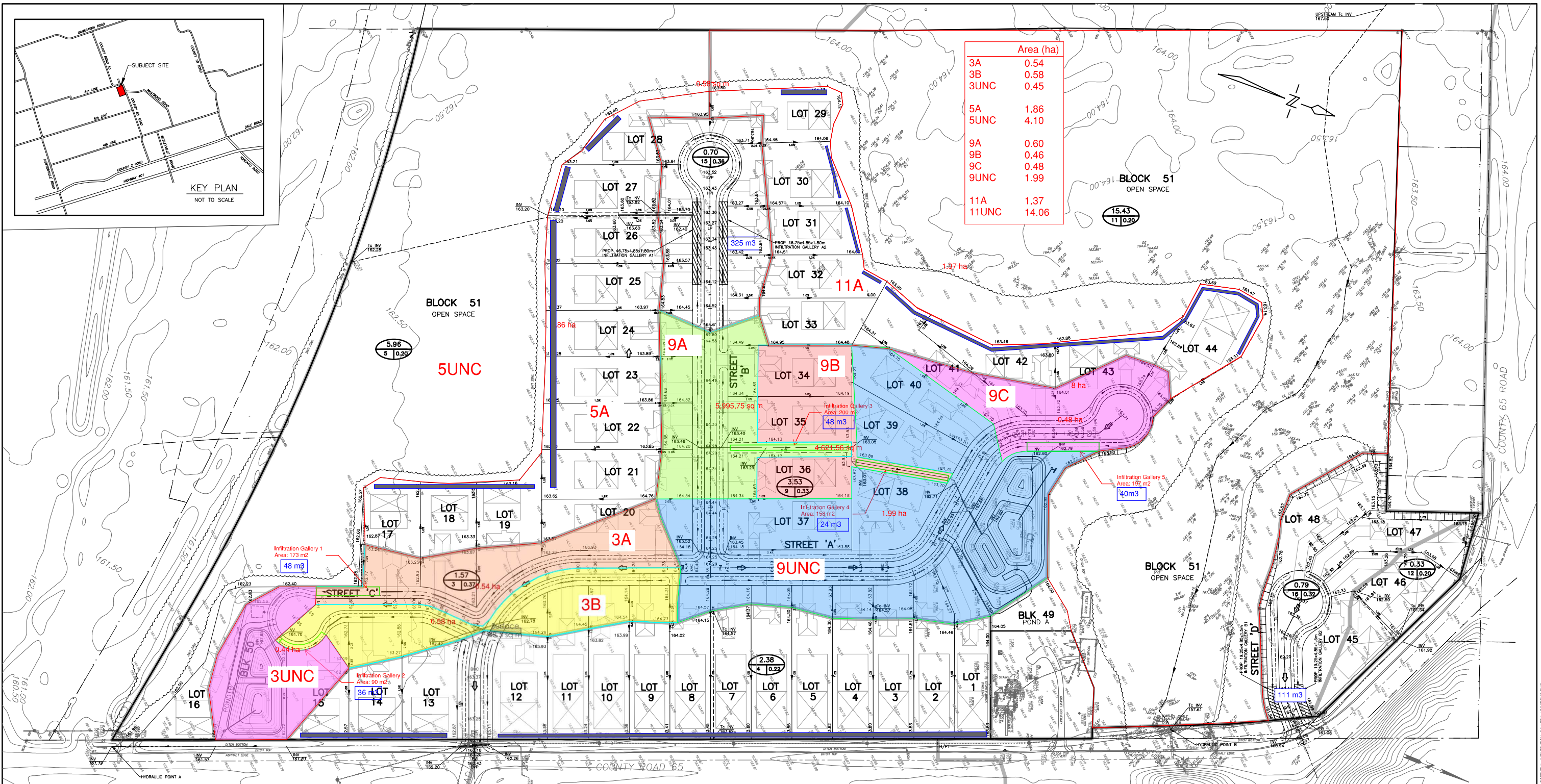
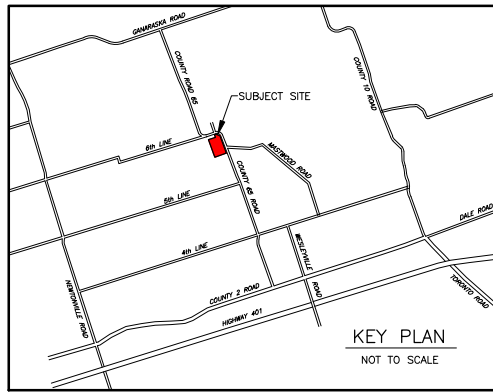
Since water surface elevation at inlet is less than the height of the shoulder, water will not overtop Street B.

122049: CULVERT CONVEYING BLF TO POND BLK 42.

Design Chart 2.32: Inlet Control: Circular CSP and SPCSP Culverts



Source: Herr (1977)



	Area (ha)
3A	0.54
3B	0.58
3UNC	0.45
5A	1.86
5UNC	4.10
9A	0.60
9B	0.46
9C	0.48
9UNC	1.99
11A	1.37
11UNC	14.06

LEGEND

- DRAINAGE BOUNDARY
- DRAINAGE AREA ID/RUN-OFF COEFFICIENT
- OVERLAND FLOW DIRECTION

NOTE: THIS PLAN IS FOR STORM DRAINAGE AREAS ONLY

TOPOGRAPHIC INFORMATION
 TOPOGRAPHIC INFORMATION OBTAINED FROM TOPOGRAPHIC BASE PLAN OF 5868 COUNTY ROAD 65 MUNICIPALITY OF PORT HOPE BY IBW SURVEYORS DATED JULY 22, 2022.

NO.	DATE	REVISION	BY
1.	10 11/2023	REVISED AS PER 1ST SUBMISSION COMMENTS	MH
REVISIONS			

PRELIMINARY
NOT FOR CONSTRUCTION

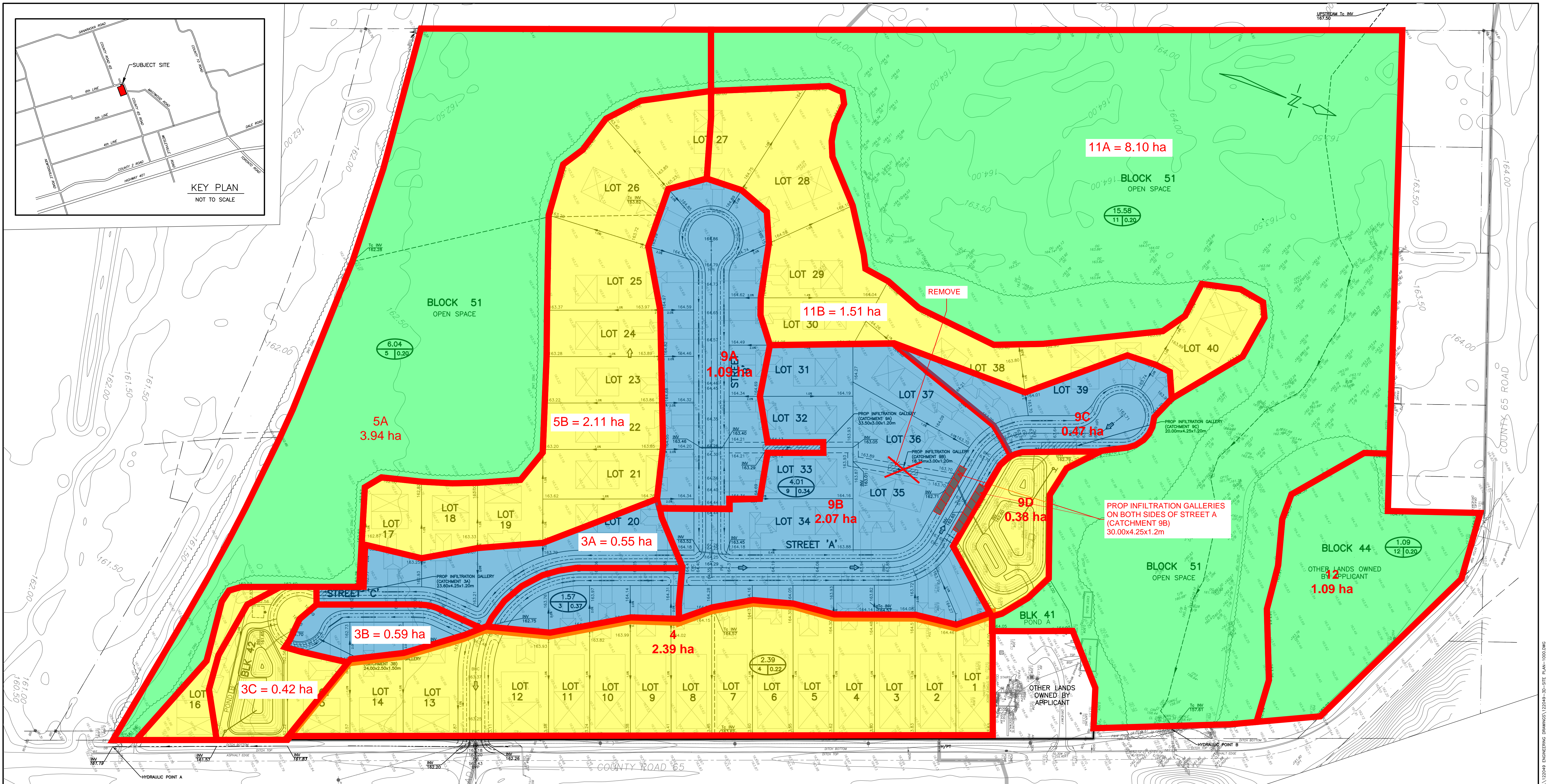
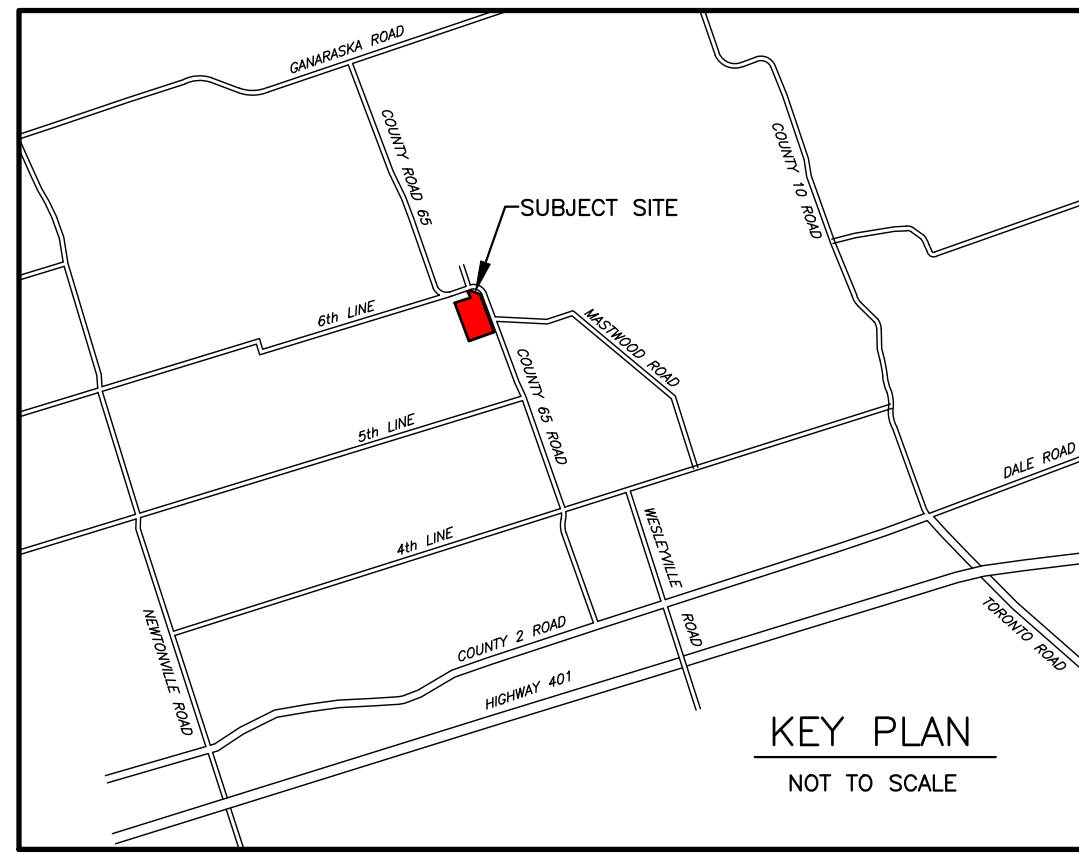
5868 COUNTY 65 ROAD, PORT HOPE

**POST-DEVELOPMENT
STORM DRAINAGE PLAN**

D.G. Biddle & Associates Limited
 consulting engineers and planners
 98 KING STREET EAST • OSHAWA, ON L1H 1B6
 PHONE (905) 576-8500 • FAX (905) 576-9730
 info@dgbiddle.com

SCALE:	1:1000	PROJECT NO.	122049
DRAWN BY:	M.J.H.	DRAWING NO.	SD-2
DESIGN BY:	M.J.H.		
CHECKED BY:	D.D.M.		
DATE:	JAN 2023		

C:\USERS\MATTHEW.HOUGHTON\WORKING - D.G. BIDDLE AND ASSOCIATES\DOCUMENTS\122049 - 2024\1014 - POTENTIAL INFILTRATION GALLERY LOCATIONS.DWG



- DEVELOPED CATCHMENT DIRECTED TO INFILTRATION FACILITY
- DEVELOPED CATCHMENT NOT DIRECTED TO INFILTRATION FACILITY
- UNDISTURBED CATCHMENT

LEGEND

- DRAINAGE BOUNDARY
- 0.25
1 | 90 DRAINAGE AREA ID/RUN-OFF COEFFICIENT
- OVERLAND FLOW DIRECTION

NOTE: THIS PLAN IS FOR STORM DRAINAGE AREAS ONLY

TOPOGRAPHIC INFORMATION

TOPOGRAPHIC INFORMATION OBTAINED FROM TOPOGRAPHIC BASE PLAN OF 5868 COUNTY ROAD 65 MUNICIPALITY OF PORT HOPE BY IBW SURVEYORS DATED JULY 22, 2022

PRELIMINARY
NOT FOR CONSTRUCTION

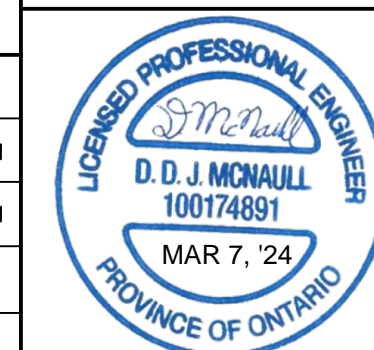
NO.	DATE	REVISION	BY
2.	01 03/2024	REVISED AS PER UPDATED LOT LAYOUT	MH
1.	10 11/2023	REVISED AS PER 1ST SUBMISSION COMMENTS	MH
REVISIONS			

5868 COUNTY 65 ROAD, PORT HOPE

**POST-DEVELOPMENT
STORM DRAINAGE PLAN**

D.G. BIDDLE & ASSOCIATES
CONSULTING ENGINEERS & PLANNERS

96 King Street East
Oshawa, Ontario, L1H 1B6
Phone: 905-576-8500
info@dgbiddle.com
dgbiddle.com



SCALE: 1:1000	PROJECT NO. 122049
DRAWN BY: M.J.H.	DRAWING NO. SD-2
DESIGN BY: M.J.H.	
CHECKED BY: D.D.M.	
DATE: JAN 2023	

Based on the water balance completed by D.M. Wills, the following catchments required the below outlined infiltration per catchment table.

Catchment	Area (ha)	Infiltration Required (m ³)
3A	0.55	48.00
3B	0.59	36.00
3UNC	0.45	0.00
5A	1.86	0.00
5UNC	4.10	0.00
9A	0.60	48.00
9B	0.46	120.00
9C	0.48	40.00
9UNC	1.99	0.00
11A	1.37	N/A
11UNC	14.06	N/A

Since all infiltration volumes are known, apply the void ratio of 0.40 to calculate total stone required per catchment.

$$\text{Stone Volume Required} = \frac{\text{Infiltration Required (m}^3\text{)}}{0.4}$$

Catchment	Area (ha)	Stone Volume Required (m ³)	Length (m)	Width (m)	Depth (m)	Volume Provided (m ³)
3A	0.55	120	23.600	4.25	1.20	120.36
3B	0.59	90	24.00	2.50	1.50	90.00
9A	0.60	120	33.50	3.00	1.20	120.60
9B	0.46	300	59.00	4.25	1.20	300.90
9C	0.48	100	20.00	4.25	1.20	102.00

APPENDIX 2

VISUAL OTTHYMO SCHEMATICS & OUTPUT FILES



1

Area Draining to North Creek

AREA [ha] - 16.925



2

Area Draining to South Creek

AREA [ha] - 13.868

5868 COUNTY ROAD 65, PORT HOPE, ON
 VISUAL OTTHYMO SCHEME
 PRE-DEVELOPMENT FLOWS



**D.G. BIDDLE
& ASSOCIATES**

CONSULTING ENGINEERS & PLANNERS

96 King Street East
 Oshawa, Ontario, L1H 1B6
 Phone: 905-576-8500
 info@dgbiddle.com
 dgbiddle.com

SCALE N.T.S.
 DRAWN M.J.H.
 DESIGN M.J.H.
 CHECKED D.D.M.
 DATE JAN 2023

PROJECT 122049

DWG FIG 2

V V I SSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
WV I SSSS UUUU A A LLLLL

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

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voindat
Output filename: C:\Users\matthew.holmes\AppData\Local\Civica\H5\171054d8-64b5-4298-a9dc-5cbfd415d770\A68C
Summary filename: C:\Users\matthew.holmes\AppData\Local\Civica\H5\171054d8-64b5-4298-a9dc-5cbfd415d770\A68C

DATE: 03-01-2024 TIME: 12:53:43

USER:

COMMENTS: _____

** SIMULATION : 1) 2-Year **

CHICAGO STORM IDF curve parameters: A=1778.000
Ptotal= 28.11 mm B= 13.000
C= 1.000
used in: INTENSITY = A / (t + B)^C
Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.49	1.00	18.95	2.00	2.84	3.00	0.71
0.17	0.66	1.17	77.30	2.17	2.09	3.17	0.61
0.33	0.93	1.33	26.45	2.33	1.60	3.33	0.52
0.50	1.43	1.50	11.48	2.50	1.26	3.50	0.46
0.67	2.46	1.67	6.42	2.67	1.02	3.67	0.40
0.83	5.25	1.83	4.10	2.83	0.85	3.83	0.35

CALIB NASHYD (0002) Area (ha)= 13.87 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.57

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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Unit Hyd Qpeak (cms)= 0.936

PEAK FLOW (cms)= 0.114 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 4.208
TOTAL RAINFALL (mm)= 28.106
RUNOFF COEFFICIENT = 0.150

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

CALIB NASHYD (0001) Area (ha)= 16.92 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.64

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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Unit Hyd Qpeak (cms)= 1.011

PEAK FLOW (cms)= 0.127 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 4.209
TOTAL RAINFALL (mm)= 28.106
RUNOFF COEFFICIENT = 0.150

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

V V I SSSS U U A L (v 6.2.2015)
V V I SS U U A A L
V V I SS U U A A A A L
V V I SS U U A A L
WV I SSSS UUUU A A LLLLL

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

Developed and Distributed by Smart City Water Inc
Copyright 2007 - 2022 Smart City Water Inc
All rights reserved.

***** DETAILED OUTPUT *****

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voindat
Output filename: C:\Users\matthew.holmes\AppData\Local\Civica\H5\171054d8-64b5-4298-a9dc-5cbfd415d770\8b10
Summary filename: C:\Users\matthew.holmes\AppData\Local\Civica\H5\171054d8-64b5-4298-a9dc-5cbfd415d770\8b10

DATE: 03-01-2024 TIME: 12:53:43

USER:

COMMENTS: _____

** SIMULATION : 2) 5-Year **

CHICAGO STORM | IDF curve parameters: A=2464.000
 Ptotal= 38.49 mm | B= 16.000
 C= 1.000
 used in: INTENSITY = A / (t + B)^C
 Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.81	1.00	27.06	2.00	4.54	3.00	1.17
0.17	1.09	1.17	94.77	2.17	3.37	3.17	1.00
0.33	1.53	1.33	36.99	2.33	2.60	3.33	0.87
0.50	2.32	1.50	17.18	2.50	2.06	3.50	0.76
0.67	3.95	1.67	9.92	2.67	1.68	3.67	0.67
0.83	8.18	1.83	6.46	2.83	1.39	3.83	0.59

CALIB | Area (ha)= 13.87 Curve Number (CN)= 71.0
 NASHYD (0002) | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 ID= 1 DT= 5.0 min | U.H. Tp(hrs)= 0.57

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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Unit Hyd Qpeak (cms)= 0.936

PEAK FLOW (cms)= 0.215 (i)
 TIME TO PEAK (hrs)= 2.000
 RUNOFF VOLUME (mm)= 8.173
 TOTAL RAINFALL (mm)= 38.492
 RUNOFF COEFFICIENT = 0.212

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

CALIB | Area (ha)= 16.92 Curve Number (CN)= 71.0
 NASHYD (0001) | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 ID= 1 DT= 5.0 min | U.H. Tp(hrs)= 0.64

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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Unit Hyd Qpeak (cms)= 1.011

PEAK FLOW (cms)= 0.241 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 8.173
 TOTAL RAINFALL (mm)= 38.492
 RUNOFF COEFFICIENT = 0.212

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

V V I SSSS U U A L (v 6.2.2015)
 V V I SS U U A A L
 V V I SS U U A A A A L
 V V I SS U U A A L
 VV I SSSS UUUU A A LLLLL

OOO TTTT TTTT H H Y Y M M OOO TM
 O O T T H H Y Y M M 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 - 2022 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\matthew.holmes\AppData\Local\Civica\vh5\171054d8-64b5-4298-a9dc-5cbfd415d770\ebac
 Summary filename: C:\Users\matthew.holmes\AppData\Local\Civica\vh5\171054d8-64b5-4298-a9dc-5cbfd415d770\ebac

DATE: 03-01-2024 TIME: 12:53:43

USER:

COMMENTS: _____

 ** SIMULATION : 3) 10-Year **

CHICAGO STORM | IDF curve parameters: A=2819.000
 Ptotal= 44.04 mm | B= 16.000
 C= 1.000

used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.93	1.00	30.96	2.00	5.20	3.00	1.34
0.17	1.24	1.17	108.42	2.17	3.85	3.17	1.15
0.33	1.75	1.33	42.32	2.33	2.97	3.33	0.99
0.50	2.66	1.50	19.65	2.50	2.36	3.50	0.87
0.67	4.51	1.67	11.35	2.67	1.92	3.67	0.76
0.83	9.35	1.83	7.39	2.83	1.59	3.83	0.68

CALIB | Area (ha)= 13.87 Curve Number (CN)= 71.0
 NASHYD (0002) | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 ID= 1 DT= 5.0 min | U.H. Tp(hrs)= 0.57

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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

0.083	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Unit Hyd Qpeak (cms)= 0.936

PEAK FLOW (cms)= 0.283 (i)
 TIME TO PEAK (hrs)= 2.000
 RUNOFF VOLUME (mm)= 10.673
 TOTAL RAINFALL (mm)= 44.038
 RUNOFF COEFFICIENT = 0.242

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

CALIB NASHYD (0001) Area (ha)= 16.92 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.64

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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Unit Hyd Qpeak (cms)= 1.011

PEAK FLOW (cms)= 0.316 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 10.673
 TOTAL RAINFALL (mm)= 44.038
 RUNOFF COEFFICIENT = 0.242

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

FINISH

V V I SSSSS U U A L (v 6.2.2015)
 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
 W I SSSSS UUUUU A LLLLL

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

Developed and Distributed by Smart City Water Inc
 Copyright 2007 - 2022 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\matthew.holmes\AppData\Local\Civica\XH5\171054d8-64b5-4298-a9dc-5cbfd415d770\52d9
 Summary filename: C:\Users\matthew.holmes\AppData\Local\Civica\XH5\171054d8-64b5-4298-a9dc-5cbfd415d770\52d9

DATE: 03-01-2024 TIME: 12:53:43

USER:

COMMENTS:

 ** SIMULATION : 4) 25-Year **

CHICAGO STORM IDf curve parameters: A=3886.000
 Ptotal= 60.23 mm B= 18.000
 C= 1.000
 used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.41	1.00	43.05	2.00	7.72	3.00	2.04
0.17	1.89	1.17	138.79	2.17	5.76	3.17	1.74
0.33	2.65	1.33	58.11	2.33	4.46	3.33	1.51
0.50	4.00	1.50	28.06	2.50	3.56	3.50	1.32
0.67	6.73	1.67	16.53	2.67	2.90	3.67	1.16
0.83	13.69	1.83	10.90	2.83	2.41	3.83	1.03

CALIB NASHYD (0002) Area (ha)= 13.87 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.57

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Unit Hyd Qpeak (cms)= 0.936

PEAK FLOW (cms)= 0.504 (i)
 TIME TO PEAK (hrs)= 2.000
 RUNOFF VOLUME (mm)= 19.189
 TOTAL RAINFALL (mm)= 60.234
 RUNOFF COEFFICIENT = 0.319

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

CALIB NASHYD (0001) Area (ha)= 16.92 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.64

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

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Unit Hyd Qpeak (cms)= 1.011

PEAK FLOW (cms)= 0.563 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 19.189
 TOTAL RAINFALL (mm)= 60.234
 RUNOFF COEFFICIENT = 0.319

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

V V I SSSSS U U A L (v 6.2.2015)
 V V I SS U U A A L
 V V I SS U U A A A A L
 V V I SS U U A A L
 V V I SSSSS UUUUU A A LLLLL

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

Developed and Distributed by Smart City Water Inc
 Copyright 2007 - 2022 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\voindat
 Output filename: C:\Users\matthew.holmes\AppData\Local\Civica\VH5\171054d8-64b5-4298-a9dc-5cbfd415d770\040d
 Summary filename: C:\Users\matthew.holmes\AppData\Local\Civica\VH5\171054d8-64b5-4298-a9dc-5cbfd415d770\040d

DATE: 03-01-2024 TIME: 12:53:42

USER:

COMMENTS: _____

 ** SIMULATION : 5) 50-Year **

CHICAGO STORM IDF curve parameters: A=4750.000
 Ptotal= 71.95 mm B= 24.000
 C= 1.000
 used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.18	1.00	52.37	2.00	11.13	3.00	3.12
0.17	2.89	1.17	139.71	2.17	8.44	3.17	2.68
0.33	4.02	1.33	68.44	2.33	6.62	3.33	2.33
0.50	5.96	1.50	36.37	2.50	5.33	3.50	2.04
0.67	9.77	1.67	22.56	2.67	4.38	3.67	1.81

0.83 18.93 | 1.83 15.36 | 2.83 3.67 | 3.83 1.61

CALIB NASHYD (0002) Area (ha)= 13.87 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.57

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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Unit Hyd Qpeak (cms)= 0.936

PEAK FLOW (cms)= 0.652 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 26.257
 TOTAL RAINFALL (mm)= 71.949
 RUNOFF COEFFICIENT = 0.365

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

CALIB NASHYD (0001) Area (ha)= 16.92 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.64

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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Unit Hyd Qpeak (cms)= 1.011

PEAK FLOW (cms)= 0.733 (i)
 TIME TO PEAK (hrs)= 2.167
 RUNOFF VOLUME (mm)= 26.257
 TOTAL RAINFALL (mm)= 71.949
 RUNOFF COEFFICIENT = 0.365

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

V V I SSSSS U U A L (v 6.2.2015)
 V V I SS U U A A L
 V V I SS U U A A A A L
 V V I SS U U A A L
 V V I SSSSS UUUUU A A LLLLL

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

Developed and Distributed by Smart City Water Inc
 Copyright 2007 - 2022 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\voindat
 Output filename: C:\Users\matthew.holmes\AppData\Local\Civica\XH5\171054d8-64b5-4298-a9dc-5cbfd415d770\0c4f
 Summary filename: C:\Users\matthew.holmes\AppData\Local\Civica\XH5\171054d8-64b5-4298-a9dc-5cbfd415d770\0c4f

DATE: 03-01-2024 TIME: 12:53:43

USER:

COMMENTS: _____

 ** SIMULATION : 6) 100-Year **

CHICAGO STORM IDF curve parameters: A=5588.000
 Ptotal= 83.38 mm B= 28.000
 C= 1.000
 used in: INTENSITY = A / (t + B)^C
 Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.89	1.00	60.52	2.00	14.14	3.00	4.10
0.17	3.81	1.17	147.05	2.17	10.82	3.17	3.54
0.33	5.26	1.33	77.70	2.33	8.55	3.33	3.08
0.50	7.73	1.50	43.43	2.50	6.93	3.50	2.71
0.67	12.46	1.67	27.74	2.67	5.73	3.67	2.40
0.83	23.45	1.83	19.25	2.83	4.81	3.83	2.14

CALIB NASHYD (0002) Area (ha)= 13.87 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.57

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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Unit Hyd Qpeak (cms)= 0.936

PEAK FLOW (cms)= 0.814 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 33.727
 TOTAL RAINFALL (mm)= 83.375
 RUNOFF COEFFICIENT = 0.405

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

CALIB NASHYD (0001) Area (ha)= 16.92 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.64

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

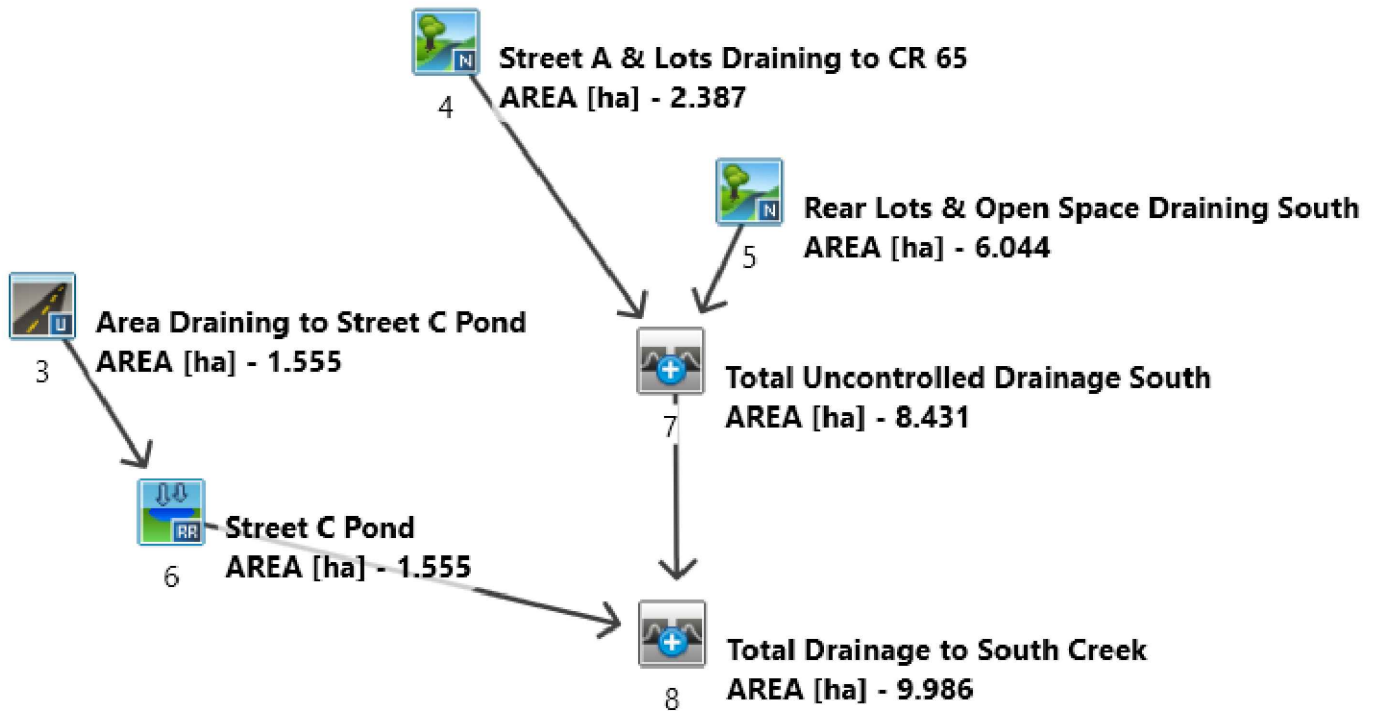
----- TRANSFORMED HYETOGRAPH -----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Unit Hyd Qpeak (cms)= 1.011

PEAK FLOW (cms)= 0.918 (i)
 TIME TO PEAK (hrs)= 2.167
 RUNOFF VOLUME (mm)= 33.728
 TOTAL RAINFALL (mm)= 83.375
 RUNOFF COEFFICIENT = 0.405

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



5868 COUNTY ROAD 65, PORT HOPE, ON
 VISUAL OTTHYMO SCHEME POST-DEVELOPMENT
 FLOWS TO SOUTHERN CREEK



96 King Street East
 Oshawa, Ontario, L1H 1B6
 Phone: 905-576-8500
 info@dgbiddle.com
 dgbiddle.com

SCALE N.T.S.
 DRAWN M.J.H.
 DESIGN M.J.H.
 CHECKED D.D.M.
 DATE JAN 2023

PROJECT	122049
DWG	FIG 3

 ** SIMULATION:1) 2-Year **

CHICAGO STORM IDF curve parameters: A=1778.000
 Ptotal= 28.11 mm B= 13.000
 C= 1.000
 used in: INTENSITY = A / (t + B)^C
 Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	0.49	1.00	18.95	2.00	2.84	3.00	0.71
0.17	0.66	1.17	77.30	2.17	2.09	3.17	0.61
0.33	0.93	1.33	26.45	2.33	1.60	3.33	0.52
0.50	1.43	1.50	11.48	2.50	1.26	3.50	0.46
0.67	2.46	1.67	6.42	2.67	1.02	3.67	0.40
0.83	5.25	1.83	4.10	2.83	0.85	3.83	0.35

CALIB NASHYD (0005) Area (ha)= 6.04 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # 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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Unit Hyd Qpeak (cms)= 1.046

PEAK FLOW (cms)= 0.092 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 4.203
 TOTAL RAINFALL (mm)= 28.106
 RUNOFF COEFFICIENT = 0.150

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

CALIB NASHYD (0004) Area (ha)= 2.39 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.04

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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Unit Hyd Qpeak (cms)= 2.294

PEAK FLOW (cms)= 0.047 (i)
 TIME TO PEAK (hrs)= 1.333
 RUNOFF VOLUME (mm)= 2.488
 TOTAL RAINFALL (mm)= 28.106
 RUNOFF COEFFICIENT = 0.089

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

ADD HYD (0007)
 1 + 2 = 3

ID	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	2.39	0.047	1.33	2.49
+ ID2= 2 (0005):	6.04	0.092	1.58	4.20

ID = 3 (0007):	8.43	0.112	1.50	3.72

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0003) Area (ha)= 1.56
 ID= 1 DT= 5.0 min Total Imp(%)= 24.38 Dir. Conn.(%)= 24.38

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.38 1.18
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 101.83 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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max. Eff. Inten. (mm/hr)= 77.30 10.09
 over (min) = 5.00 25.00
 Storage Coeff. (min)= 2.86 (ii) 20.53 (ii)
 Unit Hyd. Tpeak (min)= 5.00 25.00
 Unit Hyd. peak (cms)= 0.28 0.05

PEAK FLOW (cms)= 0.08 0.02 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.67 0.083 (iii)
 RUNOFF VOLUME (mm)= 27.11 5.43 10.71
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.38

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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(0006) OVERFLOW IS OFF
 IN= 2--> OUT= 1
 DT= 5.0 min

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0136	0.0486
0.0055	0.0221	0.0182	0.0796

INFLOW : ID= 2 (0003)
 OUTFLOW: ID= 1 (0006)

AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1.555	0.083	1.33	10.71
1.555	0.003	3.00	10.05

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.19
 TIME SHIFT OF PEAK FLOW (min)=100.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0140

ADD HYD (0008)
 1 + 2 = 3

ID	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0006):	1.56	0.003	3.00	10.05
+ ID2= 2 (0007):	8.43	0.112	1.50	3.72
=====				
ID = 3 (0008):	9.99	0.114	1.50	4.70

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:2) 5-Year **

CHICAGO STORM | IDF curve parameters: A=2464.000
 Ptotal= 38.49 mm | B= 16.000
 C= 1.000
 used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.81	1.00	27.06	2.00	4.54	3.00	1.17
0.17	1.09	1.17	94.77	2.17	3.37	3.17	1.00
0.33	1.53	1.33	36.99	2.33	2.60	3.33	0.87
0.50	2.32	1.50	17.18	2.50	2.06	3.50	0.76
0.67	3.95	1.67	9.92	2.67	1.68	3.67	0.67
0.83	8.18	1.83	6.46	2.83	1.39	3.83	0.59

CALIB | NASHYD (0005) | Area (ha)= 6.04 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # 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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Unit Hyd Qpeak (cms)= 1.046

PEAK FLOW (cms)= 0.170 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 8.163
 TOTAL RAINFALL (mm)= 38.492
 RUNOFF COEFFICIENT = 0.212

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

CALIB

NASHYD (0004) | Area (ha)= 2.39 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.04

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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Unit Hyd Qpeak (cms)= 2.294

PEAK FLOW (cms)= 0.082 (i)
 TIME TO PEAK (hrs)= 1.333
 RUNOFF VOLUME (mm)= 4.832
 TOTAL RAINFALL (mm)= 38.492
 RUNOFF COEFFICIENT = 0.126

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

ADD HYD (0007)
 1 + 2 = 3

ID	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	2.39	0.082	1.33	4.83
+ ID2= 2 (0005):	6.04	0.170	1.58	8.16
=====				
ID = 3 (0007):	8.43	0.207	1.50	7.22

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB | STANDHYD (0003) | Area (ha)= 1.56
 ID= 1 DT= 5.0 min | Total Imp(%)= 24.38 Dir. Conn.(%)= 24.38

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.38	1.18
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	101.83	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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max. Eff. Inten. (mm/hr)= 94.77
 over (min)= 5.00
 Storage Coeff. (min)= 2.64 (ii)
 Unit Hyd. Tpeak (min)= 5.00
 Unit Hyd. peak (cms)= 0.29

TOTALS
 0.109 (iii)

PEAK FLOW (cms)= 0.10 0.03

TIME TO PEAK (hrs)= 1.33 1.58 1.33
 RUNOFF VOLUME (mm)= 37.49 9.72 16.49
 TOTAL RAINFALL (mm)= 38.49 38.49 38.49
 RUNOFF COEFFICIENT = 0.97 0.25 0.43

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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(0006) | OVERFLOW IS OFF
 | IN= 2---> OUT= 1 |
 | DT= 5.0 min |

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0136	0.0486
0.0055	0.0221	0.0182	0.0796

INFLOW : ID= 2 (0003)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
OUTFLOW: ID= 1 (0006)	1.555	0.109	1.33	16.49
	1.555	0.005	3.00	15.83

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.93
 TIME SHIFT OF PEAK FLOW (min)=100.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0216

 | ADD HYD (0008) |
 | 1 + 2 = 3 |

ID	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0006):	1.56	0.005	3.00	15.83
+ ID2= 2 (0007):	8.43	0.207	1.50	7.22
ID = 3 (0008):	9.99	0.210	1.50	8.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:3) 10-Year **

| CHICAGO STORM | IDF curve parameters: A=2819.000
 | Ptotal= 44.04 mm | B= 16.000
 C= 1.000
 used in: INTENSITY = A / (t + B)^C
 Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.93	1.00	30.96	2.00	5.20	3.00	1.34
0.17	1.24	1.17	108.42	2.17	3.85	3.17	1.15
0.33	1.75	1.33	42.32	2.33	2.97	3.33	0.99
0.50	2.66	1.50	19.65	2.50	2.36	3.50	0.87
0.67	4.51	1.67	11.35	2.67	1.92	3.67	0.76
0.83	9.35	1.83	7.39	2.83	1.59	3.83	0.68

 | CALIB |
 | NASHYD (0005) | Area (ha)= 6.04 Curve Number (CN)= 71.0
 | ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # 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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15

0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Unit Hyd Qpeak (cms)= 1.046

PEAK FLOW (cms)= 0.224 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 10.659
 TOTAL RAINFALL (mm)= 44.038
 RUNOFF COEFFICIENT = 0.242

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

 | CALIB |
 | NASHYD (0004) | Area (ha)= 2.39 Curve Number (CN)= 71.0
 | ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.04

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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Unit Hyd Qpeak (cms)= 2.294

PEAK FLOW (cms)= 0.108 (i)
 TIME TO PEAK (hrs)= 1.333
 RUNOFF VOLUME (mm)= 6.310
 TOTAL RAINFALL (mm)= 44.038
 RUNOFF COEFFICIENT = 0.143

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

 | ADD HYD (0007) |
 | 1 + 2 = 3 |

ID	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	2.39	0.108	1.33	6.31
+ ID2= 2 (0005):	6.04	0.224	1.58	10.66
ID = 3 (0007):	8.43	0.274	1.50	9.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 | CALIB |
 | STANDHYD (0003) | Area (ha)= 1.56
 | ID= 1 DT= 5.0 min | Total Imp(%)= 24.38 Dir. Conn.(%)= 24.38
 U.H. Tp(hrs)= 0.22

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.38	1.18
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	101.83	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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max. Eff. Inten. (mm/hr)= 108.42
over (min) = 5.00
Storage Coeff. (min)= 2.50 (ii)
Unit Hyd. Tpeak (min)= 5.00
Unit Hyd. peak (cms)= 0.29

PEAK FLOW (cms)= 0.11
TIME TO PEAK (hrs)= 1.33
RUNOFF VOLUME (mm)= 43.04
TOTAL RAINFALL (mm)= 44.04
RUNOFF COEFFICIENT = 0.98

TOTALS
0.128 (iii)
1.33
19.84
44.04
0.45

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0006)
IN= 2---> OUT= 1
DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0136	0.0486
0.0055	0.0221	0.0182	0.0796

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	1.555	0.128	1.33	19.84
OUTFLOW: ID= 1 (0006)	1.555	0.007	2.92	19.19

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.24
TIME SHIFT OF PEAK FLOW (min)= 95.00
MAXIMUM STORAGE USED (ha.m.)= 0.0260

ADD HYD (0008)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0006):	1.56	0.007	2.92	19.19
+ ID2= 2 (0007):	8.43	0.274	1.50	9.43
ID = 3 (0008):	9.99	0.277	1.50	10.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:4) 25-Year **

CHICAGO STORM
Ptotal= 60.23 mm

IDF curve parameters: A=3886.000
B= 18.000
C= 1.000
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 10.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.41	1.00	43.05	2.00	7.72	3.00	2.04
0.17	1.89	1.17	138.79	2.17	5.76	3.17	1.74
0.33	2.65	1.33	58.11	2.33	4.46	3.33	1.51

0.50	4.00	1.50	28.06	2.50	3.56	3.50	1.32
0.67	6.73	1.67	16.53	2.67	2.90	3.67	1.16
0.83	13.69	1.83	10.90	2.83	2.41	3.83	1.03

CALIB
NASHYD (0005) Area (ha)= 6.04 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # 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	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Unit Hyd Qpeak (cms)= 1.046

PEAK FLOW (cms)= 0.394 (i)
TIME TO PEAK (hrs)= 1.583
RUNOFF VOLUME (mm)= 19.165
TOTAL RAINFALL (mm)= 60.234
RUNOFF COEFFICIENT = 0.318

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

CALIB
NASHYD (0004) Area (ha)= 2.39 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.04

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

--- TRANSFORMED HYETOGRAPH ---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Unit Hyd Qpeak (cms)= 2.294

PEAK FLOW (cms)= 0.183 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 11.346
TOTAL RAINFALL (mm)= 60.234
RUNOFF COEFFICIENT = 0.188

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

ADD HYD (0007)
1 + 2 = 3

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0004):	2.39	0.183	1.33	11.35

+ ID2= 2 (0005): 6.04 0.394 1.58 19.16
 ID = 3 (0007): 8.43 0.483 1.50 16.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
 STANHYD (0003) | Area (ha)= 1.56
 ID= 1 DT= 5.0 min | Total Imp(%)= 24.38 Dir. Conn.(%)= 24.38

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.38	1.18
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	101.83	40.00
Mannings n =	0.013	0.250

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

--- TRANSFORMED HYETOGRAPH ---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max. Eff. Inten. (mm/hr)= 138.79
 over (min)= 5.00
 Storage Coeff. (min)= 2.27 (ii)
 Unit Hyd. Tpeak (min)= 5.00
 Unit Hyd. peak (cms)= 0.30

PEAK FLOW (cms)= 0.14
 TIME TO PEAK (hrs)= 1.33
 RUNOFF VOLUME (mm)= 59.23
 TOTAL RAINFALL (mm)= 60.23
 RUNOFF COEFFICIENT = 0.98

TOTALS
 0.187 (iii)
 30.49
 60.23
 0.51

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 71.0 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(0006)
 IN= 2--> OUT= 1
 DT= 5.0 min

OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m)	OUTFLOW (cms)	STORAGE (ha.m)
0.0000	0.0000	0.0136	0.0486
0.0055	0.0221	0.0182	0.0796

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0003)	1.555	0.187	1.33	30.49
OUTFLOW: ID= 1 (0006)	1.555	0.011	2.83	29.84

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.81
 TIME SHIFT OF PEAK FLOW (min)= 90.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0396

ADD HYD (0008)
 1 + 2 = 3

ID1= 1 (0006): 1.56 0.011 2.83 29.84
 + ID2= 2 (0007): 8.43 0.483 1.50 16.95

ID = 3 (0008): 9.99 0.488 1.50 18.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION: 5) 50-Year

CHICAGO STORM | IDf curve parameters: A=4750.000
 Ptotal= 71.95 mm | B= 24.000
 C= 1.000

used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	2.18	1.00	52.37	2.00	11.13	3.00	3.12
0.17	2.89	1.17	139.71	2.17	8.44	3.17	2.68
0.33	4.02	1.33	68.44	2.33	6.62	3.33	2.33
0.50	5.96	1.50	36.37	2.50	5.33	3.50	2.04
0.67	9.77	1.67	22.56	2.67	4.38	3.67	1.81
0.83	18.93	1.83	15.36	2.83	3.67	3.83	1.61

CALIB
 NASHYD (0005) | Area (ha)= 6.04 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.22

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Unit Hyd Qpeak (cms)= 1.046

PEAK FLOW (cms)= 0.488 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 26.224
 TOTAL RAINFALL (mm)= 71.949
 RUNOFF COEFFICIENT = 0.364

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

CALIB
 NASHYD (0004) | Area (ha)= 2.39 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.04

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04

0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Unit Hyd Qpeak (cms)= 2.294

PEAK FLOW (cms)= 0.206 (i)
 TIME TO PEAK (hrs)= 1.333
 RUNOFF VOLUME (mm)= 15.525
 TOTAL RAINFALL (mm)= 71.949
 RUNOFF COEFFICIENT = 0.216

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

ADD HYD (0007)					
1 + 2 = 3					
	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0004):	2.39	0.206	1.33	15.52	
+ ID2= 2 (0005):	6.04	0.488	1.58	26.22	
=====					
ID = 3 (0007):	8.43	0.597	1.50	23.19	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
STANDHYD (0003)			
ID= 1 DT= 5.0 min	Area (ha)= 1.56	Total Imp(%)= 24.38	Dir. Conn.(%)= 24.38

		IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.38		1.18
Dep. Storage (mm)=	1.00		1.50
Average Slope (%)=	1.00		2.00
Length (m)=	101.83		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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max.Eff.Inten.(mm/hr)= 139.71 over (min)= 5.00
 Storage Coeff. (min)= 2.26 (ii)
 Unit Hyd. Tpeak (min)= 5.00
 Unit Hyd. peak (cms)= 0.30

TOTALS
 PEAK FLOW (cms)= 0.15
 TIME TO PEAK (hrs)= 1.33
 RUNOFF VOLUME (mm)= 70.95
 TOTAL RAINFALL (mm)= 71.95
 RUNOFF COEFFICIENT = 0.99

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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(0006)			
OVERFLOW IS OFF			
IN= 2--> OUT= 1			
DT= 5.0 min	OUTFLOW	STORAGE	OUTFLOW STORAGE

		(cms)	(ha.m.)	(cms)	(ha.m.)
		0.0000	0.0000	0.0136	0.0486
		0.0055	0.0221	0.0182	0.0796

		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
INFLOW : ID= 2 (0003)		1.555	0.200	1.33	38.84
OUTFLOW: ID= 1 (0006)		1.555	0.014	3.00	38.18

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.89
 TIME SHIFT OF PEAK FLOW (min)=100.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0498

ADD HYD (0008)					
1 + 2 = 3					
	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (0006):	1.56	0.014	3.00	38.18	
+ ID2= 2 (0007):	8.43	0.597	1.50	23.19	
=====					
ID = 3 (0008):	9.99	0.603	1.50	25.53	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:6) 100-Year **

CHICAGO STORM		IDF curve parameters: A=5588.000
Ptotal= 83.38 mm		B= 28.000
		C= 1.000
		used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
 Storm time step = 10.00 min
 Time to peak ratio = 0.33

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	2.89	1.00	60.52	2.00	14.14	3.00	4.10
0.17	3.81	1.17	147.05	2.17	10.82	3.17	3.54
0.33	5.26	1.33	77.70	2.33	8.55	3.33	3.08
0.50	7.73	1.50	43.43	2.50	6.93	3.50	2.71
0.67	12.46	1.67	27.74	2.67	5.73	3.67	2.40
0.83	23.45	1.83	19.25	2.83	4.81	3.83	2.14

CALIB			
NASHYD (0005)			
ID= 1 DT= 5.0 min	Area (ha)= 6.04	Curve Number (CN)= 71.0	
	Ia (mm)= 5.00	# 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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Unit Hyd Qpeak (cms)= 1.046

PEAK FLOW (cms)= 0.594 (i)
 TIME TO PEAK (hrs)= 1.583
 RUNOFF VOLUME (mm)= 33.685
 TOTAL RAINFALL (mm)= 83.375
 RUNOFF COEFFICIENT = 0.404

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

CALIB
NASHYD (0004) Area (ha)= 2.39 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.04

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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Unit Hyd Qpeak (cms)= 2.294

PEAK FLOW (cms)= 0.238 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 19.941
TOTAL RAINFALL (mm)= 83.375
RUNOFF COEFFICIENT = 0.239

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

ADD HYD (0007)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0004):	2.39	0.238	1.33	19.94
+ ID2= 2 (0005):	6.04	0.594	1.58	33.68
ID = 3 (0007):	8.43	0.726	1.50	29.79

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0003) Area (ha)= 1.56
ID= 1 DT= 5.0 min Total Imp(%)= 24.38 Dir. Conn.(%)= 24.38

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.38	1.18
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	101.83	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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
over (min) 5.00 15.00
Storage Coeff. (min)= 2.21 (ii) 10.99 (ii)

Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.30 0.09
TOTALS
PEAK FLOW (cms)= 0.15 0.13 0.222 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.33
RUNOFF VOLUME (mm)= 82.38 36.11 47.39
TOTAL RAINFALL (mm)= 83.38 83.38 83.38
RUNOFF COEFFICIENT = 0.99 0.43 0.57

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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(0006)	OVERFLOW IS OFF			
IN= 2--> OUT= 1	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
DT= 5.0 min	0.0000	0.0000	0.0136	0.0486
	0.0055	0.0221	0.0182	0.0796

INFLOW : ID= 2 (0003)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	1.555	0.222	1.33	47.39
OUTFLOW: ID= 1 (0006)	1.555	0.015	3.17	46.74

PEAK FLOW REDUCTION [Qout/Qin](%)= 6.93
TIME SHIFT OF PEAK FLOW (min)=110.00
MAXIMUM STORAGE USED (ha.m.)= 0.0608

ADD HYD (0008)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0006):	1.56	0.015	3.17	46.74
+ ID2= 2 (0007):	8.43	0.726	1.50	29.79
ID = 3 (0008):	9.99	0.733	1.50	32.43

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:7) 25mm Event **

READ STORM Filename: C:\Users\matthew.holmes\AppData
ata\Local\Temp\
03541dd5-2333-4f66-8279-e731f1ca90a4\402bd030
Ptotal= 25.00 mm Comments: 25MM4HR

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.00	2.07	1.00	5.70	2.00	5.19	3.00	2.80
0.17	2.27	1.17	10.78	2.17	4.47	3.17	2.62
0.33	2.52	1.33	50.71	2.33	3.95	3.33	2.48
0.50	2.88	1.50	13.37	2.50	3.56	3.50	2.35
0.67	3.38	1.67	8.29	2.67	3.25	3.67	2.23
0.83	4.18	1.83	6.30	2.83	3.01	3.83	2.14

CALIB
NASHYD (0005) Area (ha)= 6.04 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # 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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62

0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 1.046

PEAK FLOW (cms)= 0.040 (i)
 TIME TO PEAK (hrs)= 1.750
 RUNOFF VOLUME (mm)= 3.227
 TOTAL RAINFALL (mm)= 24.997
 RUNOFF COEFFICIENT = 0.129

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

CALIB							
NASHYD (0004)	Area (ha)=	2.39	Curve Number (CN)=	71.0			
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res. (N)=	3.00			
	U.H. Tp(hrs)=	0.04					

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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Unit Hyd Qpeak (cms)= 2.294

PEAK FLOW (cms)= 0.023 (i)
 TIME TO PEAK (hrs)= 1.500
 RUNOFF VOLUME (mm)= 1.911
 TOTAL RAINFALL (mm)= 24.997
 RUNOFF COEFFICIENT = 0.076

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

ADD HYD (0007)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (0004):	2.39	0.023	1.50	1.91	
+ ID2= 2 (0005):	6.04	0.040	1.75	3.23	
ID = 3 (0007):	8.43	0.048	1.67	2.85	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0003)	Area (ha)=	1.56	Dir. Conn.(%)=	24.38	
ID= 1 DT= 5.0 min	Total Imp(%)=	24.38			

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.38	1.18
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	101.83	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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max. Eff. Inten. (mm/hr)= 50.21 4.41
 over (min) 5.00 30.00
 Storage Coeff. (min)= 3.40 (ii) 28.01 (ii)
 Unit Hyd. Tpeak (min)= 5.00 30.00
 Unit Hyd. peak (cms)= 0.26 0.04

TOTALS

PEAK FLOW (cms)= 0.05 0.01 0.052 (iii)
 TIME TO PEAK (hrs)= 1.50 1.92 1.50
 RUNOFF VOLUME (mm)= 24.00 4.34 9.12
 TOTAL RAINFALL (mm)= 25.00 25.00 25.00
 RUNOFF COEFFICIENT = 0.96 0.17 0.36

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

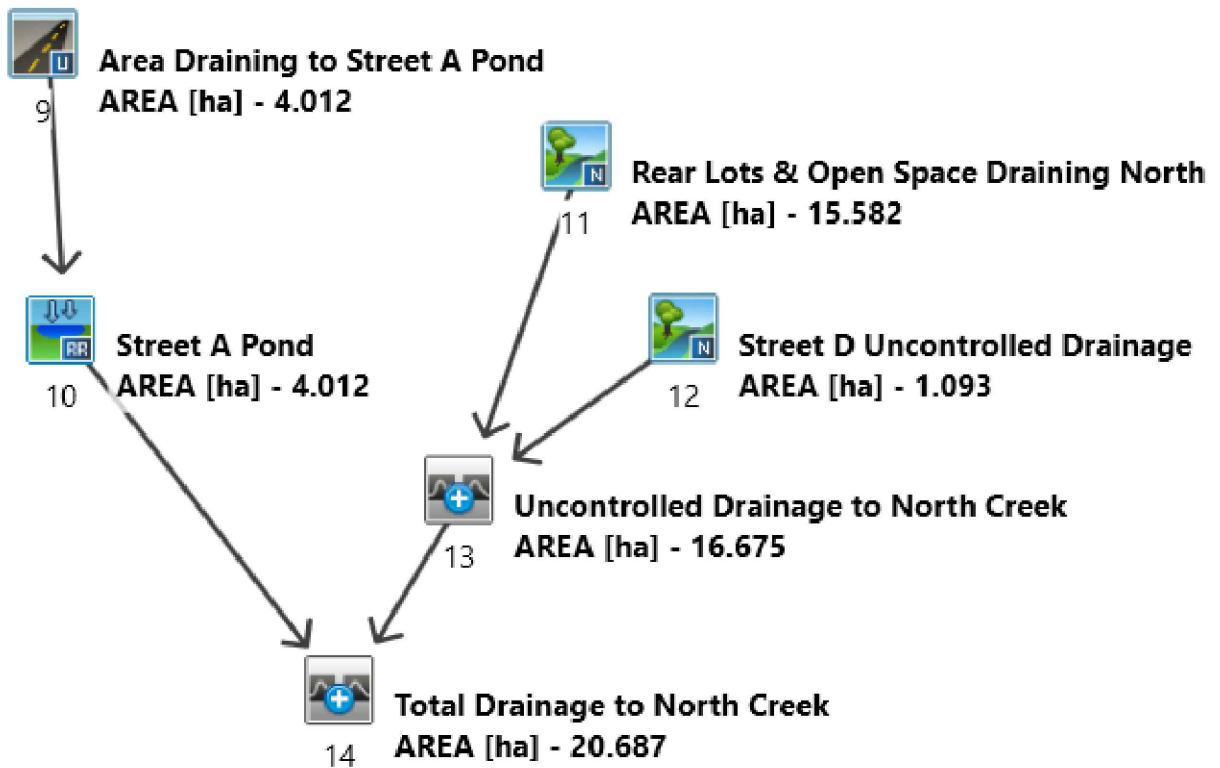
- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES: CN* = 71.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0006)	OVERFLOW IS OFF			
IN= 2--> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0136	0.0486
	0.0055	0.0221	0.0182	0.0796
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW: ID= 2 (0003)	1.555	0.052	1.50	9.12
OUTFLOW: ID= 1 (0006)	1.555	0.003	4.17	8.47

PEAK FLOW REDUCTION [Qout/Qin] (%) = 5.42
 TIME SHIFT OF PEAK FLOW (min) = 160.00
 MAXIMUM STORAGE USED (ha.m.) = 0.0114

ADD HYD (0008)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0006):	1.56	0.003	4.17	8.47
+ ID2= 2 (0007):	8.43	0.048	1.67	2.85
ID = 3 (0008):	9.99	0.049	1.67	3.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.



5868 COUNTY ROAD 65, PORT HOPE, ON
 VISUAL OTTHYMO SCHEME POST-DEVELOPMENT
 FLOWS TO NORTHERN CREEK



96 King Street East
 Oshawa, Ontario, L1H 1B6
 Phone: 905-576-8500
 info@dgbiddle.com
 dgbiddle.com

SCALE N.T.S.
 DRAWN M.J.H.
 DESIGN M.J.H.
 CHECKED D.D.M.
 DATE JAN 2023

PROJECT 122049

DWG FIG 4

 ** SIMULATION:1) 2-Year **

CALIB					
NASHYD (0011)	Area (ha)=	15.58	Curve Number (CN)=	71.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.60			

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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Unit Hyd Qpeak (cms)= 0.989

PEAK FLOW (cms)= 0.122 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 4.208
 TOTAL RAINFALL (mm)= 28.106
 RUNOFF COEFFICIENT = 0.150

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

CALIB					
NASHYD (0012)	Area (ha)=	1.09	Curve Number (CN)=	71.0	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.02			

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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Unit Hyd Qpeak (cms)= 2.740

PEAK FLOW (cms)= 0.000 (i)
 TIME TO PEAK (hrs)= 1.333
 RUNOFF VOLUME (mm)= 0.046
 TOTAL RAINFALL (mm)= 28.106
 RUNOFF COEFFICIENT = 0.002

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

ADD HYD (0013)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0011):	15.58	0.122	2.08	4.21
+ ID2= 2 (0012):	1.09	0.000	1.33	0.05
ID = 3 (0013):	16.68	0.122	2.08	3.94

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
STANDHYD (0009)	Area (ha)=	4.01			
ID= 1 DT= 5.0 min	Total Imp(%)=	19.65	Dir. Conn.(%)=	19.65	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.79	3.22
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	163.54	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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max. Eff. Inten. (mm/hr)= 77.30 10.09
 over (min) = 5.00 25.00
 Storage Coeff. (min)= 3.80 (ii) 21.47 (ii)
 Unit Hyd. Tpeak (min)= 5.00 25.00
 Unit Hyd. peak (cms)= 0.25 0.05

PEAK FLOW (cms)= 0.16 0.05 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.67 0.170 (iii)
 RUNOFF VOLUME (mm)= 27.11 5.43 9.69
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.34

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0010)	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
IN= 2---> OUT= 1				
DT= 5.0 min				
	0.0000	0.0000	0.0351	0.1291
	0.0062	0.0350	0.0469	0.1848
	0.0092	0.0793	0.0000	0.0000
	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	4.012	0.170	1.33	9.69
OUTFLOW : ID= 1 (0010)	4.012	0.006	3.25	9.33

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.53
 TIME SHIFT OF PEAK FLOW (min)=115.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0339

ADD HYD (0014)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0010):	4.01	0.006	3.25	9.33
+ ID2= 2 (0013):	16.68	0.122	2.08	3.94

ID = 3 (0014): 20.69 0.127 2.08 4.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

*** SIMULATION:2) 5-Year ***

CALIB NASHYD (0011) | Area (ha)= 15.58 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.60

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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Unit Hyd Qpeak (cms)= 0.989

PEAK FLOW (cms)= 0.232 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 8.173
 TOTAL RAINFALL (mm)= 38.492
 RUNOFF COEFFICIENT = 0.212

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

CALIB NASHYD (0012) | Area (ha)= 1.09 Curve Number (CN)= 71.0
 ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
 U.H. Tp(hrs)= 0.02

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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Unit Hyd Qpeak (cms)= 2.740

PEAK FLOW (cms)= 0.001 (i)
 TIME TO PEAK (hrs)= 1.333
 RUNOFF VOLUME (mm)= 0.094
 TOTAL RAINFALL (mm)= 38.492
 RUNOFF COEFFICIENT = 0.002

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

ADD HYD (0013) | AREA QPEAK TPEAK R.V.
 1 + 2 = 3 | (ha) (cms) (hrs) (mm)

ID1= 1 (0011): 15.58 0.232 2.08 8.17
 + ID2= 2 (0012): 1.09 0.001 1.33 0.09

ID = 3 (0013): 16.68 0.232 2.08 7.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0009) | Area (ha)= 4.01
 ID= 1 DT= 5.0 min | Total Imp(%)= 19.65 Dir. Conn.(%)= 19.65

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.79 3.22
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 163.54 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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max. Eff. Inten. (mm/hr)= 94.77 17.92
 over (min) = 5.00 20.00
 Storage Coeff. (min)= 3.51 (ii) 17.54 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00
 Unit Hyd. peak (cms)= 0.26 0.06

PEAK FLOW (cms)= 0.20 0.09 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.67 0.227 (iii)
 RUNOFF VOLUME (mm)= 37.49 9.72 15.18
 TOTAL RAINFALL (mm)= 38.49 38.49 38.49
 RUNOFF COEFFICIENT = 0.97 0.25 0.39

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010) | OVERFLOW IS OFF
 IN= 2--> OUT= 1 |
 DT= 5.0 min |

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0351	0.1291
0.0062	0.0350	0.0469	0.1848
0.0092	0.0793	0.0000	0.0000

INFLOW : ID= 2 (0009)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	4.012	0.227	1.33	15.18
OUTFLOW: ID= 1 (0010)	4.012	0.007	3.50	14.82

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.29
 TIME SHIFT OF PEAK FLOW (min)=130.00
 MAXIMUM STORAGE USED (ha.m.)= 0.0540

ADD HYD (0014) | AREA QPEAK TPEAK R.V.
 1 + 2 = 3 | (ha) (cms) (hrs) (mm)

```

-----
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0010):  4.01  0.007  3.50  14.82
+ ID2= 2 ( 0013): 16.68  0.232  2.08  7.64
-----
ID = 3 ( 0014): 20.69  0.239  2.08  9.04

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:3) 10-Year **

```

-----
| CALIB |
| NASHYD ( 0011) | Area (ha)= 15.58 Curve Number (CN)= 71.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.60

```

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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Unit Hyd Qpeak (cms)= 0.989

PEAK FLOW (cms)= 0.304 (i)
TIME TO PEAK (hrs)= 2.083
RUNOFF VOLUME (mm)= 10.673
TOTAL RAINFALL (mm)= 44.038
RUNOFF COEFFICIENT = 0.242

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

```

-----
| CALIB |
| NASHYD ( 0012) | Area (ha)= 1.09 Curve Number (CN)= 71.0
| ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
| U.H. Tp(hrs)= 0.02

```

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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Unit Hyd Qpeak (cms)= 2.740

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 1.333
RUNOFF VOLUME (mm)= 0.124
TOTAL RAINFALL (mm)= 44.038
RUNOFF COEFFICIENT = 0.003

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

```

-----
| ADD HYD ( 0013) |
| 1 + 2 = 3 |
          AREA   QPEAK   TPEAK   R.V.
          (ha)   (cms)   (hrs)   (mm)
ID1= 1 ( 0011): 15.58  0.304  2.08  10.67
+ ID2= 2 ( 0012):  1.09  0.001  1.33  0.12
-----
ID = 3 ( 0013): 16.68  0.305  2.08  9.98

```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```

-----
| CALIB |
| STANDHYD ( 0009) | Area (ha)= 4.01
| ID= 1 DT= 5.0 min | Total Imp(%)= 19.65 Dir. Conn.(%)= 19.65

```

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.79	3.22
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	163.54	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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max. Eff. Inten. (mm/hr)= 108.42 over (min)= 5.00
Storage Coeff. (min)= 3.32 (ii)
Unit Hyd. Tpeak (min)= 5.00
Unit Hyd. peak (cms)= 0.26

TOTALS

PEAK FLOW (cms)= 0.23 0.12 0.268 (iii)
TIME TO PEAK (hrs)= 1.33 1.58 1.33
RUNOFF VOLUME (mm)= 43.04 12.37 18.39
TOTAL RAINFALL (mm)= 44.04 44.04 44.04
RUNOFF COEFFICIENT = 0.98 0.28 0.42

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| RESERVOIR ( 0010) | OVERFLOW IS OFF
| IN= 2--> OUT= 1 |
| DT= 5.0 min |
          OUTFLOW   STORAGE   OUTFLOW   STORAGE
          (cms)   (ha.m.)   (cms)   (ha.m.)
0.0000  0.0000  0.0351  0.1291
0.0062  0.0350  0.0469  0.1848
0.0092  0.0793  0.0000  0.0000

```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	4.012	0.268	1.33	18.39
OUTFLOW: ID= 1 (0010)	4.012	0.008	3.58	18.04

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.09
TIME SHIFT OF PEAK FLOW (min)=135.00
MAXIMUM STORAGE USED (ha.m.)= 0.0660

ADD HYD (0014)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0010):	4.01	0.008	3.58	18.04
+ ID2= 2 (0013):	16.68	0.305	2.08	9.98
ID = 3 (0014):	20.69	0.312	2.08	11.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:4) 25-Year **

CALIB	Area	(ha)=	15.58	Curve Number	(CN)=	71.0
NASHYD (0011)	Ia	(mm)=	5.00	# of Linear Res.	(N)=	3.00
ID= 1 DT= 5.0 min	U.H. Tp	(hrs)=	0.60			

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Unit Hyd Qpeak (cms)= 0.989

PEAK FLOW (cms)= 0.542 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 19.189
 TOTAL RAINFALL (mm)= 60.234
 RUNOFF COEFFICIENT = 0.319

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

CALIB	Area	(ha)=	1.09	Curve Number	(CN)=	71.0
NASHYD (0012)	Ia	(mm)=	5.00	# of Linear Res.	(N)=	3.00
ID= 1 DT= 5.0 min	U.H. Tp	(hrs)=	0.02			

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Unit Hyd Qpeak (cms)= 2.740

PEAK FLOW (cms)= 0.002 (i)
 TIME TO PEAK (hrs)= 1.333
 RUNOFF VOLUME (mm)= 0.223
 TOTAL RAINFALL (mm)= 60.234
 RUNOFF COEFFICIENT = 0.004

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

ADD HYD (0013)	AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3	(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0011):	15.58	0.542	2.08	19.19
+ ID2= 2 (0012):	1.09	0.002	1.33	0.22
ID = 3 (0013):	16.68	0.542	2.08	17.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	Area	(ha)=	4.01	Dir. Conn.(%)=	19.65
STANDHYD (0009)	Total Imp	(%)=	19.65		
ID= 1 DT= 5.0 min					

Surface Area	(ha)=	0.79	PERVIOUS (i)	3.22
Dep. Storage	(mm)=	1.00		1.50
Average Slope	(%)=	1.00		2.00
Length	(m)=	163.54		40.00
Mannings n	=	0.013		0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97
 over (min) 5.00 15.00
 Storage Coeff. (min)= 3.01 (ii) 12.81 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.28 0.08

TOTALS

PEAK FLOW (cms)= 0.30 0.24 0.408 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.33
 RUNOFF VOLUME (mm)= 59.23 21.23 28.70
 TOTAL RAINFALL (mm)= 60.23 60.23 60.23
 RUNOFF COEFFICIENT = 0.98 0.35 0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
 THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010)	OVERFLOW IS OFF			
IN= 2---> OUT= 1	OUTFLOW	STORAGE	OUTFLOW	STORAGE
DT= 5.0 min	(cms)	(ha.m.)	(cms)	(ha.m.)
	0.0000	0.0000	0.0351	0.1291
	0.0062	0.0350	0.0469	0.1848
	0.0092	0.0793	0.0000	0.0000

INFLOW : ID= 2 (0009) AREA QPEAK TPEAK R.V.
 (ha) (cms) (hrs) (mm)
 4.012 0.408 1.33 28.70
 4.012 0.020 3.08 28.34
 OUTFLOW: ID= 1 (0010)

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.97

TIME SHIFT OF PEAK FLOW (min)=105.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1006

ADD HYD ()	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3 (0014)				
ID1= 1 (0010):	4.01	0.020	3.08	28.34
+ ID2= 2 (0013):	16.68	0.542	2.08	17.95
ID = 3 (0014):	20.69	0.557	2.08	19.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:5) 50-Year **

CALIB NASHYD ()	Area (ha)	Curve Number (CN)	# of Linear Res.(N)
ID= 1 DT= 5.0 min (0011)	15.58	71.0	3.00
	Ia (mm)= 5.00		
	U.H. Tp(hrs)= 0.60		

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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Unit Hyd Qpeak (cms)= 0.989

PEAK FLOW (cms)= 0.705 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 26.257
 TOTAL RAINFALL (mm)= 71.949
 RUNOFF COEFFICIENT = 0.365

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

CALIB NASHYD ()	Area (ha)	Curve Number (CN)	# of Linear Res.(N)
ID= 1 DT= 5.0 min (0012)	1.09	71.0	3.00
	Ia (mm)= 5.00		
	U.H. Tp(hrs)= 0.02		

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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Unit Hyd Qpeak (cms)= 2.740

PEAK FLOW (cms)= 0.002 (i)
 TIME TO PEAK (hrs)= 1.333

RUNOFF VOLUME (mm)= 0.305
 TOTAL RAINFALL (mm)= 71.949
 RUNOFF COEFFICIENT = 0.004

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

ADD HYD ()	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3 (0013)				
ID1= 1 (0011):	15.58	0.705	2.08	26.26
+ ID2= 2 (0012):	1.09	0.002	1.33	0.31
ID = 3 (0013):	16.68	0.705	2.08	24.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD ()	Area (ha)	Dir. Conn.(%)
ID= 1 DT= 5.0 min (0009)	4.01	19.65
	Total Imp(%)= 19.65	Dir. Conn.(%)= 19.65

IMPERVIOUS (i) PERVIOUS (i)
 Surface Area (ha)= 0.79 3.22
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 163.54 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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max. Eff. Inten. (mm/hr)= 139.71 49.88
 over (min) 5.00 15.00
 Storage Coeff. (min)= 3.00 (ii) 12.32 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.28 0.08

TOTALS
 PEAK FLOW (cms)= 0.30 0.28 0.442 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.33
 RUNOFF VOLUME (mm)= 70.95 28.49 36.83
 TOTAL RAINFALL (mm)= 71.95 71.95 71.95
 RUNOFF COEFFICIENT = 0.99 0.40 0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 ()	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
ID= 2 DT= 5.0 min (0010)	0.0000	0.0000	0.0351	0.1291
	0.0062	0.0350	0.0469	0.1848
	0.0092	0.0793	0.0000	0.0000

AREA (ha) QPEAK (cms) TPEAK (hrs) R.V. (mm)

INFLOW : ID= 2 (0009) 4.012 0.442 1.33 36.83
 OUTFLOW: ID= 1 (0010) 4.012 0.033 3.08 36.47

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.40
 TIME SHIFT OF PEAK FLOW (min)=105.00
 MAXIMUM STORAGE USED (ha.m.)= 0.1245

ADD HYD (0014)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0010):	4.01	0.033	3.08	36.47
+ ID2= 2 (0013):	16.68	0.705	2.08	24.56
ID = 3 (0014):	20.69	0.730	2.08	26.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

 ** SIMULATION:6) 100-Year **

CALIB NASHYD (0011)	Area (ha)	Ia (mm)	U.H. Tp (hrs)	Curve Number (CN)=	# of Linear Res. (N)=
ID= 1 DT= 5.0 min	15.58	5.00	0.60	71.0	3.00

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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Unit Hyd Qpeak (cms)= 0.989

PEAK FLOW (cms)= 0.880 (i)
 TIME TO PEAK (hrs)= 2.083
 RUNOFF VOLUME (mm)= 33.728
 TOTAL RAINFALL (mm)= 83.375
 RUNOFF COEFFICIENT = 0.405

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

CALIB NASHYD (0012)	Area (ha)	Ia (mm)	U.H. Tp (hrs)	Curve Number (CN)=	# of Linear Res. (N)=
ID= 1 DT= 5.0 min	1.09	5.00	0.02	71.0	3.00

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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Unit Hyd Qpeak (cms)= 2.740

PEAK FLOW (cms)= 0.002 (i)
 TIME TO PEAK (hrs)= 1.333
 RUNOFF VOLUME (mm)= 0.392
 TOTAL RAINFALL (mm)= 83.375
 RUNOFF COEFFICIENT = 0.005

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

ADD HYD (0013)	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3				
ID1= 1 (0011):	15.58	0.880	2.08	33.73
+ ID2= 2 (0012):	1.09	0.002	1.33	0.39
ID = 3 (0013):	16.68	0.880	2.08	31.54

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB STANDHYD (0009)	Area (ha)	Total Imp (%)	Dir. Conn. (%)
ID= 1 DT= 5.0 min	4.01	19.65	19.65

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.79 3.22
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 163.54 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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max. Eff. Inten. (mm/hr)= 147.05 57.97
 over (min) 5.00 15.00
 Storage Coeff. (min)= 2.94 (ii) 11.72 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.28 0.09

TOTALS
 PEAK FLOW (cms)= 0.32 0.35 0.521 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.50
 RUNOFF VOLUME (mm)= 82.38 36.11 45.20
 TOTAL RAINFALL (mm)= 83.38 83.38 83.38
 RUNOFF COEFFICIENT = 0.99 0.43 0.54

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 Ia = Dep. Storage (Above)
 (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
 (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR (0010)	OVERFLOW IS OFF
IN= 2--> OUT= 1	
DT= 5.0 min	
OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000
0.0062	0.0350
OUTFLOW (cms)	STORAGE (ha.m.)
0.0351	0.1291
0.0469	0.1848

0.0092 0.0793 | 0.0000 0.0000

AREA QPEAK TPEAK R.V.
(ha) (cms) (hrs) (mm)
INFLOW : ID= 2 (0009) 4.012 0.521 1.50 45.20
OUTFLOW : ID= 1 (0010) 4.012 0.040 3.17 44.84

PEAK FLOW REDUCTION [Qout/Qin](%)= 7.61
TIME SHIFT OF PEAK FLOW (min)=100.00
MAXIMUM STORAGE USED (ha.m.)= 0.1506

ADD HYD (0014)
1 + 2 = 3
ID1= 1 (0010): 4.01 0.040 3.17 44.84
+ ID2= 2 (0013): 16.68 0.880 2.08 31.54
ID = 3 (0014): 20.69 0.915 2.08 34.12

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION:7) 25mm Event **

CALIB
NASHYD (0011) Area (ha)= 15.58 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.60

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

Unit Hyd Qpeak (cms)= 0.989

PEAK FLOW (cms)= 0.061 (i)
TIME TO PEAK (hrs)= 2.417
RUNOFF VOLUME (mm)= 3.231
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.129

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

CALIB
NASHYD (0012) Area (ha)= 1.09 Curve Number (CN)= 71.0
ID= 1 DT= 5.0 min Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.02

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

0.833 3.38 | 1.833 8.29 | 2.833 3.25 | 3.83 2.23
0.917 4.18 | 1.917 6.30 | 2.917 3.01 | 3.92 2.14
1.000 4.18 | 2.000 6.30 | 3.000 3.01 | 4.00 2.14

Unit Hyd Qpeak (cms)= 2.740

PEAK FLOW (cms)= 0.000 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 0.038
TOTAL RAINFALL (mm)= 24.997
RUNOFF COEFFICIENT = 0.002

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

ADD HYD (0013)
1 + 2 = 3
ID1= 1 (0011): 15.58 0.061 2.42 3.23
+ ID2= 2 (0012): 1.09 0.000 1.50 0.04
ID = 3 (0013): 16.68 0.061 2.42 3.02

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
STANDHYD (0009) Area (ha)= 4.01
ID= 1 DT= 5.0 min Total Imp(%)= 19.65 Dir. Conn.(%)= 19.65

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.79 3.22
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 163.54 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

Max.Eff.Inten.(mm/hr)= 50.21 4.41
over (min)= 5.00 30.00
Storage Coeff. (min)= 4.52 (ii) 29.12 (ii)
Unit Hyd. Tpeak (min)= 5.00 30.00
Unit Hyd. peak (cms)= 0.23 0.04

PEAK FLOW (cms)= 0.10 0.02 *TOTALS*
TIME TO PEAK (hrs)= 1.50 1.92 0.105 (iii)
RUNOFF VOLUME (mm)= 24.00 4.34 8.20
TOTAL RAINFALL (mm)= 25.00 25.00 25.00
RUNOFF COEFFICIENT = 0.96 0.17 0.33

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

RESERVOIR(0010) OVERFLOW IS OFF
IN= 2--> OUT= 1 |

| DT= 5.0 min |

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	0.0351	0.1291
0.0062	0.0350	0.0469	0.1848
0.0092	0.0793	0.0000	0.0000

INFLOW : ID=	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
2 (0009)	4.012	0.105	1.50	8.20
OUTFLOW: ID= 1 (0010)	4.012	0.005	4.42	7.84

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.70
TIME SHIFT OF PEAK FLOW (min)=175.00
MAXIMUM STORAGE USED (ha.m.)= 0.0278

| ADD HYD (0014) |
| 1 + 2 = 3 |

ID	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0010):	4.01	0.005	4.42	7.84
+ ID2= 2 (0013):	16.68	0.061	2.42	3.02
ID = 3 (0014):	20.69	0.064	2.42	3.96

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.



19 **Area Draining to Street A Entrance Culvert**
AREA [ha] - 1.956



20 **Area Draining to Street A & B Int Culvert**
AREA [ha] - 0.074



21 **OLF Channel Culvert Under Street A**
AREA [ha] - 2.619



22 **Culvert from Street A to BLK 41 Pond**
AREA [ha] - 3.159



23 **Culvert from Street A to BLK 41 Pond**
AREA [ha] - 0.473



24 **Culvert under Street B to OLF**
AREA [ha] - 1.041



25 **Culvert under Street A & C Intersection**
AREA [ha] - 0.323



26 **Culvert from Street C to BLK 42**
AREA [ha] - 1.347

5868 COUNTY ROAD 65, PORT HOPE, ON
VISUAL OTTHYMO SCHEME POST-DEVELOPMENT
FLOWS – REQUIRED FOR CULVERT SIZING



**D.G. BIDDLE
& ASSOCIATES**
CONSULTING ENGINEERS & PLANNERS

96 King Street East
Oshawa, Ontario, L1H 1B6
Phone: 905-576-8500
info@dgbiddle.com
dgbiddle.com

SCALE	N.T.S.
DRAWN	M.J.H.
DESIGN	M.J.H.
CHECKED	D.D.M.
DATE	JAN 2023

PROJECT	122049
DWG	FIG 5

 ** SIMULATION:1) 2-Year **

CALIB
 STANDHYD (0019)
 ID= 1 DT= 5.0 min

Area (ha)= 1.96
 Total Imp(%)= 1.54 Dir. Conn.(%)= 1.54

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.03 1.93
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 114.19 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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max.Eff.Inten.(mm/hr)= 77.30 10.09
 over (min)= 5.00 25.00
 Storage Coeff. (min)= 3.07 (ii) 20.73 (ii)
 Unit Hyd. Tpeak (min)= 5.00 25.00
 Unit Hyd. peak (cms)= 0.27 0.05

PEAK FLOW (cms)= 0.01 0.03 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.67 0.031 (iii)
 RUNOFF VOLUME (mm)= 27.11 5.43 1.67
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.20

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0020)
 ID= 1 DT= 5.0 min

Area (ha)= 0.07
 Total Imp(%)= 27.68 Dir. Conn.(%)= 27.68

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.02 0.05
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 22.16 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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40

0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max.Eff.Inten.(mm/hr)= 77.30 10.09
 over (min)= 5.00 25.00
 Storage Coeff. (min)= 1.15 (ii) 18.81 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00
 Unit Hyd. peak (cms)= 0.34 0.06

PEAK FLOW (cms)= 0.00 0.00 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.58 0.005 (iii)
 RUNOFF VOLUME (mm)= 27.11 5.43 1.33
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.40

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0021)
 ID= 1 DT= 5.0 min

Area (ha)= 2.62
 Total Imp(%)= 13.56 Dir. Conn.(%)= 13.56

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.36 2.26
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 132.14 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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max.Eff.Inten.(mm/hr)= 77.30 10.09
 over (min)= 5.00 25.00
 Storage Coeff. (min)= 3.35 (ii) 21.01 (ii)
 Unit Hyd. Tpeak (min)= 5.00 25.00
 Unit Hyd. peak (cms)= 0.26 0.05

PEAK FLOW (cms)= 0.07 0.03 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.67 0.081 (iii)
 RUNOFF VOLUME (mm)= 27.11 5.43 1.33
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.30

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0022)
 ID= 1 DT= 5.0 min

Area (ha)= 3.16
 Total Imp(%)= 15.27 Dir. Conn.(%)= 15.27

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.48 2.68
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 145.13 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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max.Eff.Inten.(mm/hr)= 77.30 10.09
 over (min) = 5.00 25.00
 Storage Coeff. (min)= 3.54 (ii) 21.20 (ii)
 Unit Hyd. Tpeak (min)= 5.00 25.00
 Unit Hyd. peak (cms)= 0.26 0.05

TOTALS
 PEAK FLOW (cms)= 0.10 0.04 0.107 (iii)
 TIME TO PEAK (hrs)= 1.33 1.67 1.33
 RUNOFF VOLUME (mm)= 27.11 5.43 8.74
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.31

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0023) | Area (ha)= 0.47
 ID= 1 DT= 5.0 min | Total Imp(%)= 26.42 Dir. Conn.(%)= 26.42

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.12 0.35
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 56.15 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	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max.Eff.Inten.(mm/hr)= 77.30 10.09
 over (min) = 5.00 20.00
 Storage Coeff. (min)= 2.00 (ii) 19.67 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00

Unit Hyd. peak (cms)= 0.31 0.06 *TOTALS*
 PEAK FLOW (cms)= 0.03 0.01 0.028 (iii)
 TIME TO PEAK (hrs)= 1.33 1.67 1.33
 RUNOFF VOLUME (mm)= 27.11 5.43 11.13
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.40

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0024) | Area (ha)= 1.04
 ID= 1 DT= 5.0 min | Total Imp(%)= 21.65 Dir. Conn.(%)= 21.65

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.23 0.82
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 83.32 40.00
 Mannings n = 0.013 0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max.Eff.Inten.(mm/hr)= 77.30 10.09
 over (min) = 5.00 25.00
 Storage Coeff. (min)= 2.54 (ii) 20.20 (ii)
 Unit Hyd. Tpeak (min)= 5.00 25.00
 Unit Hyd. peak (cms)= 0.29 0.05

TOTALS
 PEAK FLOW (cms)= 0.05 0.01 0.050 (iii)
 TIME TO PEAK (hrs)= 1.33 1.67 1.33
 RUNOFF VOLUME (mm)= 27.11 5.43 10.11
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.36

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0025) | Area (ha)= 0.32
 ID= 1 DT= 5.0 min | Total Imp(%)= 20.99 Dir. Conn.(%)= 20.99

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.07 0.25
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 46.37 40.00
 Mannings n = 0.013 0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	1.43	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max.Eff.Inten.(mm/hr)= 77.30 10.09
 over (min) = 5.00 20.00
 Storage Coeff. (min)= 1.79 (ii) 19.45 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00
 Unit Hyd. peak (cms)= 0.32 0.06

TOTALS
 PEAK FLOW (cms)= 0.01 0.00 0.016 (iii)
 TIME TO PEAK (hrs)= 1.33 1.67 1.33
 RUNOFF VOLUME (mm)= 27.11 5.43 9.94
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.35

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 STANDBY (0026) Area (ha)= 1.35
 ID= 1 DT= 5.0 min Total Imp(%)= 21.18 Dir. Conn.(%)= 21.18

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.29 1.06
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 94.77 40.00
 Mannings n = 0.013 0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.49	1.083	18.95	2.083	2.84	3.08	0.71
0.167	0.49	1.167	18.95	2.167	2.84	3.17	0.71
0.250	0.66	1.250	77.30	2.250	2.09	3.25	0.61
0.333	0.66	1.333	77.30	2.333	2.09	3.33	0.61
0.417	0.93	1.417	26.45	2.417	1.60	3.42	0.52
0.500	0.93	1.500	26.45	2.500	1.60	3.50	0.52
0.583	1.43	1.583	11.48	2.583	1.26	3.58	0.46
0.667	1.43	1.667	11.48	2.667	1.26	3.67	0.46
0.750	2.46	1.750	6.42	2.750	1.02	3.75	0.40
0.833	2.46	1.833	6.42	2.833	1.02	3.83	0.40
0.917	5.25	1.917	4.10	2.917	0.85	3.92	0.35
1.000	5.25	2.000	4.10	3.000	0.85	4.00	0.35

Max.Eff.Inten.(mm/hr)= 77.30 10.09
 over (min) = 5.00 25.00
 Storage Coeff. (min)= 2.74 (ii) 20.41 (ii)
 Unit Hyd. Tpeak (min)= 5.00 25.00
 Unit Hyd. peak (cms)= 0.28 0.05

TOTALS
 PEAK FLOW (cms)= 0.06 0.02 0.064 (iii)
 TIME TO PEAK (hrs)= 1.33 1.67 1.33
 RUNOFF VOLUME (mm)= 27.11 5.43 10.01
 TOTAL RAINFALL (mm)= 28.11 28.11 28.11
 RUNOFF COEFFICIENT = 0.96 0.19 0.36

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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.

 ** SIMULATION: 2015-Year **

CALIB STANDBY (0019) Area (ha)= 1.96
 ID= 1 DT= 5.0 min Total Imp(%)= 1.54 Dir. Conn.(%)= 1.54

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.03 1.93
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 114.19 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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max.Eff.Inten.(mm/hr)= 94.77 17.92
 over (min) = 5.00 20.00
 Storage Coeff. (min)= 2.83 (ii) 16.86 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00
 Unit Hyd. peak (cms)= 0.28 0.06

TOTALS
 PEAK FLOW (cms)= 0.01 0.06 0.058 (iii)
 TIME TO PEAK (hrs)= 1.33 1.58 1.58
 RUNOFF VOLUME (mm)= 37.49 9.72 10.15
 TOTAL RAINFALL (mm)= 38.49 38.49 38.49
 RUNOFF COEFFICIENT = 0.97 0.25 0.26

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 STANDBY (0020) Area (ha)= 0.07
 ID= 1 DT= 5.0 min Total Imp(%)= 27.68 Dir. Conn.(%)= 27.68

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.02 0.05
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 22.16 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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00

0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max.Eff.Inten.(mm/hr)= 94.77 17.92
over (min) 5.00 20.00
Storage Coeff. (min)= 1.06 (ii) 15.09 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.34 0.07

TOTALS

PEAK FLOW (cms)= 0.01 0.00 0.006 (iii)
TIME TO PEAK (hrs)= 1.33 1.58 1.33
RUNOFF VOLUME (mm)= 37.49 9.72 17.21
TOTAL RAINFALL (mm)= 38.49 38.49 38.49
RUNOFF COEFFICIENT = 0.97 0.25 0.45

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0021)
ID= 1 DT= 5.0 min
Area (ha)= 2.62
Total Imp(%)= 13.56 Dir. Conn.(%)= 13.56

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.36	2.26
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	132.14	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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max.Eff.Inten.(mm/hr)= 94.77 17.92
over (min) 5.00 20.00
Storage Coeff. (min)= 3.09 (ii) 17.12 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.27 0.06

TOTALS

PEAK FLOW (cms)= 0.09 0.07 0.111 (iii)
TIME TO PEAK (hrs)= 1.33 1.58 1.33
RUNOFF VOLUME (mm)= 37.49 9.72 13.49
TOTAL RAINFALL (mm)= 38.49 38.49 38.49
RUNOFF COEFFICIENT = 0.97 0.25 0.35

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

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0022)
ID= 1 DT= 5.0 min
Area (ha)= 3.16
Total Imp(%)= 15.27 Dir. Conn.(%)= 15.27

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.48	2.68
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	145.13	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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max.Eff.Inten.(mm/hr)= 94.77 17.92
over (min) 5.00 20.00
Storage Coeff. (min)= 3.26 (ii) 17.30 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.27 0.06

TOTALS

PEAK FLOW (cms)= 0.12 0.08 0.146 (iii)
TIME TO PEAK (hrs)= 1.33 1.58 1.33
RUNOFF VOLUME (mm)= 37.49 9.72 13.96
TOTAL RAINFALL (mm)= 38.49 38.49 38.49
RUNOFF COEFFICIENT = 0.97 0.25 0.36

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

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0023)
ID= 1 DT= 5.0 min
Area (ha)= 0.47
Total Imp(%)= 26.42 Dir. Conn.(%)= 26.42

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.12	0.35
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	56.15	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	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max.Eff.Inten.(mm/hr)= 94.77 17.92
over (min)= 5.00 20.00
Storage Coeff. (min)= 1.85 (ii) 15.88 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.32 0.07

PEAK FLOW (cms)= 0.03 0.01
TIME TO PEAK (hrs)= 1.33 1.58
RUNOFF VOLUME (mm)= 37.49 9.72
TOTAL RAINFALL (mm)= 38.49 38.49
RUNOFF COEFFICIENT = 0.97 0.25

TOTALS
0.036 (iii)

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0024)
ID= 1 DT= 5.0 min

Area (ha)= 1.04
Total Imp(%)= 21.65 Dir. Conn.(%)= 21.65

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.23 0.82
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 83.32 40.00
Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max.Eff.Inten.(mm/hr)= 94.77 17.92
over (min)= 5.00 20.00
Storage Coeff. (min)= 2.34 (ii) 16.38 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.30 0.06

PEAK FLOW (cms)= 0.06 0.02
TIME TO PEAK (hrs)= 1.33 1.58
RUNOFF VOLUME (mm)= 37.49 9.72
TOTAL RAINFALL (mm)= 38.49 38.49
RUNOFF COEFFICIENT = 0.97 0.41

TOTALS
0.066 (iii)

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0025)
ID= 1 DT= 5.0 min

Area (ha)= 0.32
Total Imp(%)= 20.99 Dir. Conn.(%)= 20.99

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.07 0.25
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 46.37 40.00

Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max.Eff.Inten.(mm/hr)= 94.77 17.92
over (min)= 5.00 20.00
Storage Coeff. (min)= 1.65 (ii) 15.68 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.32 0.07

PEAK FLOW (cms)= 0.02 0.01
TIME TO PEAK (hrs)= 1.33 1.58
RUNOFF VOLUME (mm)= 37.49 9.72
TOTAL RAINFALL (mm)= 38.49 38.49
RUNOFF COEFFICIENT = 0.97 0.25

TOTALS
0.020 (iii)

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0026)
ID= 1 DT= 5.0 min

Area (ha)= 1.35
Total Imp(%)= 21.18 Dir. Conn.(%)= 21.18

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.29 1.06
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 94.77 40.00
Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.81	1.083	27.06	2.083	4.54	3.08	1.17
0.167	0.81	1.167	27.06	2.167	4.54	3.17	1.17
0.250	1.09	1.250	94.77	2.250	3.37	3.25	1.00
0.333	1.09	1.333	94.77	2.333	3.37	3.33	1.00
0.417	1.53	1.417	36.99	2.417	2.60	3.42	0.87
0.500	1.53	1.500	36.99	2.500	2.60	3.50	0.87
0.583	2.32	1.583	17.18	2.583	2.06	3.58	0.76
0.667	2.32	1.667	17.18	2.667	2.06	3.67	0.76
0.750	3.95	1.750	9.92	2.750	1.68	3.75	0.67
0.833	3.95	1.833	9.92	2.833	1.68	3.83	0.67
0.917	8.18	1.917	6.46	2.917	1.39	3.92	0.59
1.000	8.18	2.000	6.46	3.000	1.39	4.00	0.59

Max.Eff.Inten.(mm/hr)= 94.77 17.92
over (min)= 5.00 20.00
Storage Coeff. (min)= 2.53 (ii) 16.57 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.29 0.06

PEAK FLOW (cms)= 0.07 0.03
TIME TO PEAK (hrs)= 1.33 1.58
RUNOFF VOLUME (mm)= 37.49 9.72
TOTAL RAINFALL (mm)= 38.49 38.49
RUNOFF COEFFICIENT = 0.97 0.25

TOTALS
0.084 (iii)

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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.

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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.

** SIMULATION:3) 10-Year **

CALIB
STANDHYD (0019) | Area (ha)= 1.96
ID= 1 DT= 5.0 min | Total Imp(%)= 1.54 Dir. Conn.(%)= 1.54

		IMPERVIOUS		PERVIOUS (i)	
Surface Area	(ha)=	0.03	1.93		
Dep. Storage	(mm)=	1.00	1.50		
Average Slope	(%)=	1.00	2.00		
Length	(m)=	114.19	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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max.Eff.Inten.(mm/hr)= 108.42 23.02
over (min) = 5.00 20.00
Storage Coeff. (min)= 2.68 (ii) 15.38 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.29 0.07

PEAK FLOW (cms)= 0.01 0.08 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.58 0.078 (iii)
RUNOFF VOLUME (mm)= 43.04 12.37 12.84
TOTAL RAINFALL (mm)= 44.04 44.04 44.04
RUNOFF COEFFICIENT = 0.98 0.28 0.29

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0020) | Area (ha)= 0.07
ID= 1 DT= 5.0 min | Total Imp(%)= 27.68 Dir. Conn.(%)= 27.68

		IMPERVIOUS		PERVIOUS (i)	
Surface Area	(ha)=	0.02	0.05		
Dep. Storage	(mm)=	1.00	1.50		
Average Slope	(%)=	1.00	2.00		
Length	(m)=	22.16	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

hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max.Eff.Inten.(mm/hr)= 108.42 23.02
over (min) = 5.00 15.00
Storage Coeff. (min)= 1.00 (ii) 13.70 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.34 0.08

PEAK FLOW (cms)= 0.01 0.00 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.50 0.007 (iii)
RUNOFF VOLUME (mm)= 43.04 12.37 20.74
TOTAL RAINFALL (mm)= 44.04 44.04 44.04
RUNOFF COEFFICIENT = 0.98 0.28 0.47

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0021) | Area (ha)= 2.62
ID= 1 DT= 5.0 min | Total Imp(%)= 13.56 Dir. Conn.(%)= 13.56

		IMPERVIOUS		PERVIOUS (i)	
Surface Area	(ha)=	0.36	2.26		
Dep. Storage	(mm)=	1.00	1.50		
Average Slope	(%)=	1.00	2.00		
Length	(m)=	132.14	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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max.Eff.Inten.(mm/hr)= 108.42 23.02
over (min) = 5.00 20.00
Storage Coeff. (min)= 2.92 (ii) 15.62 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.28 0.07

PEAK FLOW (cms)= 0.10 0.09 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.58 0.132 (iii)
RUNOFF VOLUME (mm)= 43.04 12.37 16.52
TOTAL RAINFALL (mm)= 44.04 44.04 44.04
RUNOFF COEFFICIENT = 0.98 0.28 0.38

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0022)
ID= 1 DT= 5.0 min

Area (ha)= 3.16
Total Imp(%)= 15.27 Dir. Conn.(%)= 15.27

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.48 2.68
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 145.13 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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max.Eff.Inten.(mm/hr)= 108.42 23.02
over (min) 5.00 20.00
Storage Coeff. (min)= 3.09 (ii) 15.79 (ii)
Unit Hyd. Tpeak (min)= 5.00 20.00
Unit Hyd. peak (cms)= 0.27 0.07

PEAK FLOW (cms)= 0.14 0.10 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.58 0.174 (iii)
RUNOFF VOLUME (mm)= 43.04 12.37 1.33
TOTAL RAINFALL (mm)= 44.04 44.04 44.04
RUNOFF COEFFICIENT = 0.98 0.28 0.39

- ***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
- ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0023)
ID= 1 DT= 5.0 min

Area (ha)= 0.47
Total Imp(%)= 26.42 Dir. Conn.(%)= 26.42

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.12 0.35
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 56.15 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	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87

0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max.Eff.Inten.(mm/hr)= 108.42 23.02
over (min) 5.00 15.00
Storage Coeff. (min)= 1.75 (ii) 14.45 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.32 0.08

PEAK FLOW (cms)= 0.04 0.01 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.50 0.044 (iii)
RUNOFF VOLUME (mm)= 43.04 12.37 1.33
TOTAL RAINFALL (mm)= 44.04 44.04 44.04
RUNOFF COEFFICIENT = 0.98 0.28 0.46

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0024)
ID= 1 DT= 5.0 min

Area (ha)= 1.04
Total Imp(%)= 21.65 Dir. Conn.(%)= 21.65

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.23 0.82
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 83.32 40.00
Mannings n = 0.013 0.250

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max.Eff.Inten.(mm/hr)= 108.42 23.02
over (min) 5.00 15.00
Storage Coeff. (min)= 2.22 (ii) 14.92 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.30 0.08

PEAK FLOW (cms)= 0.07 0.03 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.50 0.082 (iii)
RUNOFF VOLUME (mm)= 43.04 12.37 1.33
TOTAL RAINFALL (mm)= 44.04 44.04 44.04
RUNOFF COEFFICIENT = 0.98 0.28 0.43

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0025)
ID= 1 DT= 5.0 min

Area (ha)= 0.32
Total Imp(%)= 20.99 Dir. Conn.(%)= 20.99

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.07 0.25
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 46.37 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max.Eff.Inten.(mm/hr)= 108.42 23.02
 over (min) = 5.00 15.00
 Storage Coeff. (min)= 1.56 (ii) 14.26 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.33 0.08

TOTALS
 PEAK FLOW (cms)= 0.02 0.01 0.025 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.33
 RUNOFF VOLUME (mm)= 43.04 12.37 18.78
 TOTAL RAINFALL (mm)= 44.04 44.04 44.04
 RUNOFF COEFFICIENT = 0.98 0.28 0.43

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0026)
 ID= 1 DT= 5.0 min
 Area (ha)= 1.35
 Total Imp(%)= 21.18 Dir. Conn.(%)= 21.18

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.29 1.06
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 94.77 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.93	1.083	30.96	2.083	5.20	3.08	1.34
0.167	0.93	1.167	30.96	2.167	5.20	3.17	1.34
0.250	1.24	1.250	108.42	2.250	3.85	3.25	1.15
0.333	1.24	1.333	108.42	2.333	3.85	3.33	1.15
0.417	1.75	1.417	42.32	2.417	2.97	3.42	0.99
0.500	1.75	1.500	42.32	2.500	2.97	3.50	0.99
0.583	2.66	1.583	19.65	2.583	2.36	3.58	0.87
0.667	2.66	1.667	19.65	2.667	2.36	3.67	0.87
0.750	4.51	1.750	11.35	2.750	1.92	3.75	0.76
0.833	4.51	1.833	11.35	2.833	1.92	3.83	0.76
0.917	9.35	1.917	7.39	2.917	1.59	3.92	0.68
1.000	9.35	2.000	7.39	3.000	1.59	4.00	0.68

Max.Eff.Inten.(mm/hr)= 108.42 23.02
 over (min) = 5.00 20.00
 Storage Coeff. (min)= 2.39 (ii) 15.10 (ii)
 Unit Hyd. Tpeak (min)= 5.00 20.00
 Unit Hyd. peak (cms)= 0.30 0.07

TOTALS

PEAK FLOW (cms)= 0.08 0.04 0.098 (iii)
 TIME TO PEAK (hrs)= 1.33 1.58 1.33
 RUNOFF VOLUME (mm)= 43.04 12.37 18.86
 TOTAL RAINFALL (mm)= 44.04 44.04 44.04
 RUNOFF COEFFICIENT = 0.98 0.28 0.43

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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.

 ** SIMULATION:4) 25-Year **

CALIB STANDHYD (0019)
 ID= 1 DT= 5.0 min
 Area (ha)= 1.96
 Total Imp(%)= 1.54 Dir. Conn.(%)= 1.54

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.03 1.93
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 114.19 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97
 over (min) = 5.00 15.00
 Storage Coeff. (min)= 2.43 (ii) 12.23 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.30 0.09

TOTALS
 PEAK FLOW (cms)= 0.01 0.14 0.149 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.50
 RUNOFF VOLUME (mm)= 59.23 21.23 21.81
 TOTAL RAINFALL (mm)= 60.23 60.23 60.23
 RUNOFF COEFFICIENT = 0.98 0.35 0.36

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0020)
 ID= 1 DT= 5.0 min
 Area (ha)= 0.07
 Total Imp(%)= 27.68 Dir. Conn.(%)= 27.68

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.02 0.05
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 22.16 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97
 over (min) 5.00 15.00
 Storage Coeff. (min)= 0.91 (ii) 10.71 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.34 0.09

PEAK FLOW (cms)= 0.01 0.00 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.50 0.010 (iii)
 RUNOFF VOLUME (mm)= 59.23 21.23 31.63
 TOTAL RAINFALL (mm)= 60.23 60.23 60.23
 RUNOFF COEFFICIENT = 0.98 0.35 0.53

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 STANDBY (0021) ID= 1 DT= 5.0 min			
Area (ha)=	2.62	Dir. Conn.(%)=	13.56
Total Imp(%)=	13.56		

Surface Area (ha)= 0.36 2.26
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 132.14 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97
 over (min) 5.00 15.00
 Storage Coeff. (min)= 2.65 (ii) 12.45 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.29 0.08

PEAK FLOW (cms)= 0.13 0.17 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.50 0.227 (iii)
 RUNOFF VOLUME (mm)= 59.23 21.23 26.38
 TOTAL RAINFALL (mm)= 60.23 60.23 60.23
 RUNOFF COEFFICIENT = 0.98 0.35 0.44

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

***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 STANDBY (0022) ID= 1 DT= 5.0 min			
Area (ha)=	3.16	Dir. Conn.(%)=	15.27
Total Imp(%)=	15.27		

Surface Area (ha)= 0.48 2.68
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 145.13 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97
 over (min) 5.00 15.00
 Storage Coeff. (min)= 2.80 (ii) 12.61 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.28 0.08

PEAK FLOW (cms)= 0.18 0.20 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.50 0.278 (iii)
 RUNOFF VOLUME (mm)= 59.23 21.23 27.03
 TOTAL RAINFALL (mm)= 60.23 60.23 60.23
 RUNOFF COEFFICIENT = 0.98 0.35 0.45

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING:FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 STANDBY (0023) ID= 1 DT= 5.0 min			
Area (ha)=	0.47	Dir. Conn.(%)=	26.42
Total Imp(%)=	26.42		

Surface Area (ha)= 0.12 0.35
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 56.15 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04

0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97
over (min) 5.00 15.00
Storage Coeff. (min)= 1.58 (ii) 11.39 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.33 0.09

TOTALS
PEAK FLOW (cms)= 0.05 0.03 0.061 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.33
RUNOFF VOLUME (mm)= 59.23 21.23 31.26
TOTAL RAINFALL (mm)= 60.23 60.23 60.23
RUNOFF COEFFICIENT = 0.98 0.35 0.52

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 STANHYD (0024) Area (ha)= 1.04
ID= 1 DT= 5.0 min Total Imp(%)= 21.65 Dir. Conn.(%)= 21.65

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.23 0.82
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 83.32 40.00
Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97
over (min) 5.00 15.00
Storage Coeff. (min)= 2.01 (ii) 11.81 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.31 0.09

TOTALS
PEAK FLOW (cms)= 0.09 0.06 0.116 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.33
RUNOFF VOLUME (mm)= 59.23 21.23 29.45
TOTAL RAINFALL (mm)= 60.23 60.23 60.23
RUNOFF COEFFICIENT = 0.98 0.35 0.49

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 STANHYD (0025) Area (ha)= 0.32
ID= 1 DT= 5.0 min Total Imp(%)= 20.99 Dir. Conn.(%)= 20.99

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.07 0.25
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 46.37 40.00
Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97
over (min) 5.00 15.00
Storage Coeff. (min)= 1.41 (ii) 11.22 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.33 0.09

TOTALS
PEAK FLOW (cms)= 0.03 0.02 0.036 (iii)
TIME TO PEAK (hrs)= 1.33 1.50 1.33
RUNOFF VOLUME (mm)= 59.23 21.23 29.18
TOTAL RAINFALL (mm)= 60.23 60.23 60.23
RUNOFF COEFFICIENT = 0.98 0.35 0.48

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 STANHYD (0026) Area (ha)= 1.35
ID= 1 DT= 5.0 min Total Imp(%)= 21.18 Dir. Conn.(%)= 21.18

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.29 1.06
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 94.77 40.00
Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.41	1.083	43.05	2.083	7.72	3.08	2.04
0.167	1.41	1.167	43.05	2.167	7.72	3.17	2.04
0.250	1.89	1.250	138.79	2.250	5.76	3.25	1.74
0.333	1.89	1.333	138.79	2.333	5.76	3.33	1.74
0.417	2.65	1.417	58.11	2.417	4.46	3.42	1.51
0.500	2.65	1.500	58.11	2.500	4.46	3.50	1.51
0.583	4.00	1.583	28.06	2.583	3.56	3.58	1.32
0.667	4.00	1.667	28.06	2.667	3.56	3.67	1.32
0.750	6.73	1.750	16.53	2.750	2.90	3.75	1.16
0.833	6.73	1.833	16.53	2.833	2.90	3.83	1.16
0.917	13.69	1.917	10.90	2.917	2.41	3.92	1.03
1.000	13.69	2.000	10.90	3.000	2.41	4.00	1.03

Max.Eff.Inten.(mm/hr)= 138.79 43.97

over (min) 5.00 15.00
 Storage Coeff. (min)= 2.17 (ii) 11.97 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.31 0.09

TOTALS
 PEAK FLOW (cms)= 0.11 0.08 0.147 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.33
 RUNOFF VOLUME (mm)= 59.23 21.23 29.27
 TOTAL RAINFALL (mm)= 60.23 60.23 60.23
 RUNOFF COEFFICIENT = 0.98 0.35 0.49

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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.

 ** SIMULATION: 5) 50-Year **

CALIB STANDHYD (0019) ID= 1 DT= 5.0 min	Area (ha)= 1.96 Total Imp(%)= 1.54	Dir. Conn.(%)= 1.54
--	---------------------------------------	---------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.03	1.93
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	114.19	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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max. Eff. Inten. (mm/hr)= 139.71 49.88
 over (min) 5.00 15.00
 Storage Coeff. (min)= 2.42 (ii) 11.74 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.30 0.09

TOTALS
 PEAK FLOW (cms)= 0.01 0.17 0.180 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.50
 RUNOFF VOLUME (mm)= 70.95 28.49 29.14
 TOTAL RAINFALL (mm)= 71.95 71.95 71.95
 RUNOFF COEFFICIENT = 0.99 0.40 0.41

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0020) ID= 1 DT= 5.0 min	Area (ha)= 0.07 Total Imp(%)= 27.68	Dir. Conn.(%)= 27.68
--	--	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.02	0.05

Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 22.16 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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max. Eff. Inten. (mm/hr)= 139.71 49.88
 over (min) 5.00 15.00
 Storage Coeff. (min)= 0.90 (ii) 10.23 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.34 0.09

TOTALS
 PEAK FLOW (cms)= 0.01 0.01 0.011 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.33
 RUNOFF VOLUME (mm)= 70.95 28.49 40.17
 TOTAL RAINFALL (mm)= 71.95 71.95 71.95
 RUNOFF COEFFICIENT = 0.99 0.40 0.56

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0021) ID= 1 DT= 5.0 min	Area (ha)= 2.62 Total Imp(%)= 13.56	Dir. Conn.(%)= 13.56
--	--	----------------------

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.36	2.26
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	132.14	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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max. Eff. Inten. (mm/hr)= 139.71 49.88
 over (min) 5.00 15.00
 Storage Coeff. (min)= 2.64 (ii) 11.96 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.29 0.09

TOTALS
 PEAK FLOW (cms)= 0.14 0.20 0.272 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.50

RUNOFF VOLUME (mm)= 70.95 28.49 34.25
 TOTAL RAINFALL (mm)= 71.95 71.95 71.95
 RUNOFF COEFFICIENT = 0.99 0.40 0.48

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0022) | Area (ha)= 3.16
 ID= 1 DT= 5.0 min | Total Imp(%)= 15.27 Dir. Conn.(%)= 15.27

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.48 2.68
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 145.13 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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max.Eff.Inten.(mm/hr)= 139.71 49.88
 over (min) = 5.00 15.00
 Storage Coeff. (min)= 2.79 (ii) 12.12 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.28 0.09

TOTALS

PEAK FLOW (cms)= 0.18 0.24 0.333 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.50
 RUNOFF VOLUME (mm)= 70.95 28.49 34.97
 TOTAL RAINFALL (mm)= 71.95 71.95 71.95
 RUNOFF COEFFICIENT = 0.99 0.40 0.49

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0023) | Area (ha)= 0.47
 ID= 1 DT= 5.0 min | Total Imp(%)= 26.42 Dir. Conn.(%)= 26.42

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.12 0.35
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 56.15 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	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max.Eff.Inten.(mm/hr)= 139.71 49.88
 over (min) = 5.00 15.00
 Storage Coeff. (min)= 1.58 (ii) 10.90 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.33 0.09

TOTALS

PEAK FLOW (cms)= 0.05 0.03 0.065 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.33
 RUNOFF VOLUME (mm)= 70.95 28.49 39.69
 TOTAL RAINFALL (mm)= 71.95 71.95 71.95
 RUNOFF COEFFICIENT = 0.99 0.40 0.55

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0024) | Area (ha)= 1.04
 ID= 1 DT= 5.0 min | Total Imp(%)= 21.65 Dir. Conn.(%)= 21.65

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.23 0.82
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 83.32 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max.Eff.Inten.(mm/hr)= 139.71 49.88
 over (min) = 5.00 15.00
 Storage Coeff. (min)= 2.00 (ii) 11.32 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.31 0.09

TOTALS

PEAK FLOW (cms)= 0.09 0.07 0.125 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.33
 RUNOFF VOLUME (mm)= 70.95 28.49 37.67
 TOTAL RAINFALL (mm)= 71.95 71.95 71.95
 RUNOFF COEFFICIENT = 0.99 0.40 0.52

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0025)
ID= 1 DT= 5.0 min

Area (ha)= 0.32
Total Imp(%)= 20.99 Dir. Conn.(%)= 20.99

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.07 0.25
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 46.37 40.00
Mannings n = 0.013 0.250

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

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81
0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max.Eff.Inten.(mm/hr)= 139.71 49.88
over (min) 5.00 15.00
Storage Coeff. (min)= 1.41 (ii) 10.73 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.33 0.09

PEAK FLOW (cms)= 0.03 0.02 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.50 0.038 (iii)
RUNOFF VOLUME (mm)= 70.95 28.49 1.33
TOTAL RAINFALL (mm)= 71.95 71.95 37.38
RUNOFF COEFFICIENT = 0.99 0.40 0.52

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0026)
ID= 1 DT= 5.0 min

Area (ha)= 1.35
Total Imp(%)= 21.18 Dir. Conn.(%)= 21.18

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.29 1.06
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 94.77 40.00
Mannings n = 0.013 0.250

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

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	2.18	1.083	52.37	2.083	11.13	3.08	3.12
0.167	2.18	1.167	52.37	2.167	11.13	3.17	3.12
0.250	2.89	1.250	139.71	2.250	8.44	3.25	2.68
0.333	2.89	1.333	139.71	2.333	8.44	3.33	2.68
0.417	4.02	1.417	68.44	2.417	6.62	3.42	2.33
0.500	4.02	1.500	68.44	2.500	6.62	3.50	2.33
0.583	5.96	1.583	36.37	2.583	5.33	3.58	2.04
0.667	5.96	1.667	36.37	2.667	5.33	3.67	2.04
0.750	9.77	1.750	22.56	2.750	4.38	3.75	1.81

0.833	9.77	1.833	22.56	2.833	4.38	3.83	1.81
0.917	18.93	1.917	15.36	2.917	3.67	3.92	1.61
1.000	18.93	2.000	15.36	3.000	3.67	4.00	1.61

Max.Eff.Inten.(mm/hr)= 139.71 49.88
over (min) 5.00 15.00
Storage Coeff. (min)= 2.16 (ii) 11.49 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.31 0.09

PEAK FLOW (cms)= 0.11 0.10 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.50 0.159 (iii)
RUNOFF VOLUME (mm)= 70.95 28.49 1.33
TOTAL RAINFALL (mm)= 71.95 71.95 37.48
RUNOFF COEFFICIENT = 0.99 0.40 0.52

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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.

** SIMULATION:6) 100-Year **

CALIB
STANDHYD (0019)
ID= 1 DT= 5.0 min

Area (ha)= 1.96
Total Imp(%)= 1.54 Dir. Conn.(%)= 1.54

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.03 1.93
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 114.19 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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
over (min) 5.00 15.00
Storage Coeff. (min)= 2.37 (ii) 11.15 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.30 0.09

PEAK FLOW (cms)= 0.01 0.21 *TOTALS*
TIME TO PEAK (hrs)= 1.33 1.50 0.218 (iii)
RUNOFF VOLUME (mm)= 82.38 36.11 1.50
TOTAL RAINFALL (mm)= 83.38 83.38 36.82
RUNOFF COEFFICIENT = 0.99 0.43 0.44

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0020) | Area (ha)= 0.07
 ID= 1 DT= 5.0 min | Total Imp(%)= 27.68 Dir. Conn.(%)= 27.68

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.02 0.05
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 22.16 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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
 over (min) = 5.00 10.00
 Storage Coeff. (min)= 0.89 (ii) 9.66 (ii)
 Unit Hyd. Tpeak (min)= 5.00 10.00
 Unit Hyd. peak (cms)= 0.34 0.11

TOTALS

PEAK FLOW (cms)= 0.01 0.01 0.013 (iii)
 TIME TO PEAK (hrs)= 1.33 1.42 1.33
 RUNOFF VOLUME (mm)= 82.38 36.11 48.85
 TOTAL RAINFALL (mm)= 83.38 83.38 83.38
 RUNOFF COEFFICIENT = 0.99 0.43 0.59

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0021) | Area (ha)= 2.62
 ID= 1 DT= 5.0 min | Total Imp(%)= 13.56 Dir. Conn.(%)= 13.56

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.36 2.26
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 132.14 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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
 over (min) = 5.00 15.00
 Storage Coeff. (min)= 2.59 (ii) 11.37 (ii)

Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.29 0.09

TOTALS
 PEAK FLOW (cms)= 0.14 0.25 0.324 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.50
 RUNOFF VOLUME (mm)= 82.38 36.11 42.39
 TOTAL RAINFALL (mm)= 83.38 83.38 83.38
 RUNOFF COEFFICIENT = 0.99 0.43 0.51

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0022) | Area (ha)= 3.16
 ID= 1 DT= 5.0 min | Total Imp(%)= 15.27 Dir. Conn.(%)= 15.27

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.48 2.68
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 145.13 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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
 over (min) = 5.00 15.00
 Storage Coeff. (min)= 2.74 (ii) 11.52 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.29 0.09

TOTALS
 PEAK FLOW (cms)= 0.19 0.29 0.396 (iii)
 TIME TO PEAK (hrs)= 1.33 1.50 1.50
 RUNOFF VOLUME (mm)= 82.38 36.11 43.17
 TOTAL RAINFALL (mm)= 83.38 83.38 83.38
 RUNOFF COEFFICIENT = 0.99 0.43 0.52

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0023) | Area (ha)= 0.47
 ID= 1 DT= 5.0 min | Total Imp(%)= 26.42 Dir. Conn.(%)= 26.42

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.12 0.35
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 56.15 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	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
 over (min) 5.00 15.00
 Storage Coeff. (min)= 1.55 (ii) 10.33 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.33 0.09

PEAK FLOW (cms)= 0.05 0.04 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.50 0.072 (iii)
 RUNOFF VOLUME (mm)= 82.38 36.11 48.32
 TOTAL RAINFALL (mm)= 83.38 83.38 83.38
 RUNOFF COEFFICIENT = 0.99 0.43 0.58

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0024)	Area (ha)=	1.04
ID= 1 DT= 5.0 min	Total Imp(%)=	21.65	Dir. Conn.(%)= 21.65

Surface Area (ha)= 0.23 0.82
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 83.32 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
 over (min) 5.00 15.00
 Storage Coeff. (min)= 1.96 (ii) 10.74 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.31 0.09

PEAK FLOW (cms)= 0.09 0.09 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.50 0.140 (iii)
 RUNOFF VOLUME (mm)= 82.38 36.11 46.12
 TOTAL RAINFALL (mm)= 83.38 83.38 83.38
 RUNOFF COEFFICIENT = 0.99 0.43 0.55

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0025)	Area (ha)=	0.32
ID= 1 DT= 5.0 min	Total Imp(%)=	20.99	Dir. Conn.(%)= 20.99

Surface Area (ha)= 0.07 0.25
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 46.37 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54
0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
 over (min) 5.00 15.00
 Storage Coeff. (min)= 1.38 (ii) 10.16 (ii)
 Unit Hyd. Tpeak (min)= 5.00 15.00
 Unit Hyd. peak (cms)= 0.33 0.10

PEAK FLOW (cms)= 0.03 0.03 *TOTALS*
 TIME TO PEAK (hrs)= 1.33 1.50 1.50
 RUNOFF VOLUME (mm)= 82.38 36.11 45.81
 TOTAL RAINFALL (mm)= 83.38 83.38 83.38
 RUNOFF COEFFICIENT = 0.99 0.43 0.55

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0026)	Area (ha)=	1.35
ID= 1 DT= 5.0 min	Total Imp(%)=	21.18	Dir. Conn.(%)= 21.18

Surface Area (ha)= 0.29 1.06
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 94.77 40.00
 Mannings n = 0.013 0.250

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

--- TRANSFORMED HYETOGRAPH ---							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.89	1.083	60.52	2.083	14.14	3.08	4.10
0.167	2.89	1.167	60.52	2.167	14.14	3.17	4.10
0.250	3.81	1.250	147.05	2.250	10.82	3.25	3.54
0.333	3.81	1.333	147.05	2.333	10.82	3.33	3.54

0.417	5.26	1.417	77.70	2.417	8.55	3.42	3.08
0.500	5.26	1.500	77.70	2.500	8.55	3.50	3.08
0.583	7.73	1.583	43.43	2.583	6.93	3.58	2.71
0.667	7.73	1.667	43.43	2.667	6.93	3.67	2.71
0.750	12.46	1.750	27.74	2.750	5.73	3.75	2.40
0.833	12.46	1.833	27.74	2.833	5.73	3.83	2.40
0.917	23.45	1.917	19.25	2.917	4.81	3.92	2.14
1.000	23.45	2.000	19.25	3.000	4.81	4.00	2.14

Max.Eff.Inten.(mm/hr)= 147.05 57.97
over (min) = 5.00 15.00
Storage Coeff. (min)= 2.12 (ii) 10.90 (ii)
Unit Hyd. Tpeak (min)= 5.00 15.00
Unit Hyd. peak (cms)= 0.31 0.09

TOTALS
0.179 (iii)
1.50
45.91
83.38
0.55

PEAK FLOW (cms)= 0.12 0.12
TIME TO PEAK (hrs)= 1.33 1.50
RUNOFF VOLUME (mm)= 82.38 36.11
TOTAL RAINFALL (mm)= 83.38 83.38
RUNOFF COEFFICIENT = 0.99 0.43

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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.

** SIMULATION:7) 25mm Event **

CALIB	Area (ha)=	1.96
STANDHYD (0019)	Total Imp(%)=	1.54
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	1.54

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.03 1.93
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 114.19 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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)= 50.21 4.41
over (min) = 5.00 30.00
Storage Coeff. (min)= 3.64 (ii) 28.25 (ii)
Unit Hyd. Tpeak (min)= 5.00 30.00
Unit Hyd. peak (cms)= 0.25 0.04

TOTALS
0.013 (iii)
1.92
4.63
25.00
0.19

PEAK FLOW (cms)= 0.00 0.01
TIME TO PEAK (hrs)= 1.50 1.92
RUNOFF VOLUME (mm)= 24.00 4.34
TOTAL RAINFALL (mm)= 25.00 25.00
RUNOFF COEFFICIENT = 0.96 0.17

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20% YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.

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

CALIB	Area (ha)=	0.07
STANDHYD (0020)	Total Imp(%)=	27.68
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	27.68

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.02 0.05
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 22.16 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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)= 50.21 4.41
over (min) = 5.00 30.00
Storage Coeff. (min)= 1.36 (ii) 25.97 (ii)
Unit Hyd. Tpeak (min)= 5.00 30.00
Unit Hyd. peak (cms)= 0.33 0.04

TOTALS
0.003 (iii)
1.50
9.56
25.00
0.38

PEAK FLOW (cms)= 0.00 0.00
TIME TO PEAK (hrs)= 1.50 1.92
RUNOFF VOLUME (mm)= 24.00 4.34
TOTAL RAINFALL (mm)= 25.00 25.00
RUNOFF COEFFICIENT = 0.96 0.17

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 Ia = Dep. Storage (Above)
- (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL THAN THE STORAGE COEFFICIENT.
- (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB	Area (ha)=	2.62
STANDHYD (0021)	Total Imp(%)=	13.56
ID= 1 DT= 5.0 min	Dir. Conn.(%)=	13.56

IMPERVIOUS PERVIOUS (i)
Surface Area (ha)= 0.36 2.26
Dep. Storage (mm)= 1.00 1.50
Average Slope (%)= 1.00 2.00
Length (m)= 132.14 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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14

1.000 4.18 | 2.000 6.30 | 3.000 3.01 | 4.00 2.14

Max. Eff. Inten. (mm/hr)= 50.21 4.41
 over (min) = 5.00 30.00
 Storage Coeff. (min)= 3.98 (ii) 28.58 (ii)
 Unit Hyd. Tpeak (min)= 5.00 30.00
 Unit Hyd. peak (cms)= 0.24 0.04

PEAK FLOW (cms)= 0.05 0.01 *TOTALS* 0.050 (iii)
 TIME TO PEAK (hrs)= 1.50 1.92 1.50
 RUNOFF VOLUME (mm)= 24.00 4.34 7.00
 TOTAL RAINFALL (mm)= 25.00 25.00 25.00
 RUNOFF COEFFICIENT = 0.96 0.17 0.28

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0022) | Area (ha)= 3.16
 ID= 1 DT= 5.0 min | Total Imp(%)= 15.27 Dir. Conn.(%)= 15.27

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.48 2.68
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 145.13 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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max. Eff. Inten. (mm/hr)= 50.21 4.41
 over (min) = 5.00 30.00
 Storage Coeff. (min)= 4.21 (ii) 28.81 (ii)
 Unit Hyd. Tpeak (min)= 5.00 30.00
 Unit Hyd. peak (cms)= 0.24 0.04

PEAK FLOW (cms)= 0.06 0.02 *TOTALS* 0.066 (iii)
 TIME TO PEAK (hrs)= 1.50 1.92 1.50
 RUNOFF VOLUME (mm)= 24.00 4.34 7.33
 TOTAL RAINFALL (mm)= 25.00 25.00 25.00
 RUNOFF COEFFICIENT = 0.96 0.17 0.29

***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!
 ***** WARNING: FOR AREAS WITH IMPERVIOUS RATIOS BELOW 20%
 YOU SHOULD CONSIDER SPLITTING THE AREA.

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0023) | Area (ha)= 0.47
 ID= 1 DT= 5.0 min | Total Imp(%)= 26.42 Dir. Conn.(%)= 26.42

IMPERVIOUS PERVIOUS (i)

Surface Area (ha)= 0.12 0.35
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 56.15 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	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max. Eff. Inten. (mm/hr)= 50.21 4.41
 over (min) = 5.00 30.00
 Storage Coeff. (min)= 2.38 (ii) 26.98 (ii)
 Unit Hyd. Tpeak (min)= 5.00 30.00
 Unit Hyd. peak (cms)= 0.30 0.04

PEAK FLOW (cms)= 0.02 0.00 *TOTALS* 0.018 (iii)
 TIME TO PEAK (hrs)= 1.50 1.92 1.50
 RUNOFF VOLUME (mm)= 24.00 4.34 9.50
 TOTAL RAINFALL (mm)= 25.00 25.00 25.00
 RUNOFF COEFFICIENT = 0.96 0.17 0.38

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
 CN* = 71.0 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 (0024) | Area (ha)= 1.04
 ID= 1 DT= 5.0 min | Total Imp(%)= 21.65 Dir. Conn.(%)= 21.65

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.23 0.82
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 83.32 40.00
 Mannings n = 0.013 0.250

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

----- TRANSFORMED HYETOGRAPH -----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max. Eff. Inten. (mm/hr)= 50.21 4.41
 over (min) = 5.00 30.00
 Storage Coeff. (min)= 3.02 (ii) 27.62 (ii)
 Unit Hyd. Tpeak (min)= 5.00 30.00
 Unit Hyd. peak (cms)= 0.28 0.04

TOTALS

PEAK FLOW (cms)= 0.03 0.01 0.032 (iii)
 TIME TO PEAK (hrs)= 1.50 1.92 1.50
 RUNOFF VOLUME (mm)= 24.00 4.34 8.58
 TOTAL RAINFALL (mm)= 25.00 25.00 25.00
 RUNOFF COEFFICIENT = 0.96 0.17 0.34

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0025) | Area (ha)= 0.32
 ID= 1 DT= 5.0 min | Total Imp(%)= 20.99 Dir. Conn.(%)= 20.99

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.07 0.25
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 46.37 40.00
 Mannings n = 0.013 0.250

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

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)= 50.21 4.41
 over (min) = 5.00 30.00
 Storage Coeff. (min)= 2.12 (ii) 26.73 (ii)
 Unit Hyd. Tpeak (min)= 5.00 30.00
 Unit Hyd. peak (cms)= 0.31 0.04

TOTALS

PEAK FLOW (cms)= 0.01 0.00 0.010 (iii)
 TIME TO PEAK (hrs)= 1.50 1.92 1.50
 RUNOFF VOLUME (mm)= 24.00 4.34 8.42
 TOTAL RAINFALL (mm)= 25.00 25.00 25.00
 RUNOFF COEFFICIENT = 0.96 0.17 0.34

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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 (0026) | Area (ha)= 1.35
 ID= 1 DT= 5.0 min | Total Imp(%)= 21.18 Dir. Conn.(%)= 21.18

IMPERVIOUS PERVIOUS (i)
 Surface Area (ha)= 0.29 1.06
 Dep. Storage (mm)= 1.00 1.50
 Average Slope (%)= 1.00 2.00
 Length (m)= 94.77 40.00
 Mannings n = 0.013 0.250

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

---- TRANSFORMED HYETOGRAPH ----							
TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN

0.083	2.07	1.083	5.70	2.083	5.19	3.08	2.80
0.167	2.07	1.167	5.70	2.167	5.19	3.17	2.80
0.250	2.27	1.250	10.78	2.250	4.47	3.25	2.62
0.333	2.27	1.333	10.78	2.333	4.47	3.33	2.62
0.417	2.52	1.417	50.21	2.417	3.95	3.42	2.48
0.500	2.52	1.500	50.21	2.500	3.95	3.50	2.48
0.583	2.88	1.583	13.37	2.583	3.56	3.58	2.35
0.667	2.88	1.667	13.37	2.667	3.56	3.67	2.35
0.750	3.38	1.750	8.29	2.750	3.25	3.75	2.23
0.833	3.38	1.833	8.29	2.833	3.25	3.83	2.23
0.917	4.18	1.917	6.30	2.917	3.01	3.92	2.14
1.000	4.18	2.000	6.30	3.000	3.01	4.00	2.14

Max.Eff.Inten.(mm/hr)= 50.21 4.41
 over (min) = 5.00 30.00
 Storage Coeff. (min)= 3.26 (ii) 27.86 (ii)
 Unit Hyd. Tpeak (min)= 5.00 30.00
 Unit Hyd. peak (cms)= 0.27 0.04

TOTALS

PEAK FLOW (cms)= 0.04 0.01 0.040 (iii)
 TIME TO PEAK (hrs)= 1.50 1.92 1.50
 RUNOFF VOLUME (mm)= 24.00 4.34 8.49
 TOTAL RAINFALL (mm)= 25.00 25.00 25.00
 RUNOFF COEFFICIENT = 0.96 0.17 0.34

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

- (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 71.0 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.