Stormwater Management Report

Goldmanco
545 King Street East
Cobourg, ON

D.M. Wills Project Number 18-10846

D.M. Wills Associates Limited
Partners in Engineering
Peterborough

October 2019

Prepared for:
Goldmanco Incorporated.

Summary of Revisions

Revision No.	Revision Title	Date of Release	Summary of Revisions
1	Stormwater Management Report	December 2018	1st Submission for Client Review
2	Stormwater Management Report	February 2019	1st Submission to Town of Cobourg
3	Stormwater Management Report	October 2019	2nd Submission to Town of Cobourg

This report has been formatted considering the requirements of the Accessibility for Ontarians with Disabilities Act.

Table of Contents

Figures

Tables

Appendices

1.0 Purpose

D.M. Wills Associates Limited (Wills) has been retained by Goldmanco Incorporated to prepare a detailed Stormwater Management Report for the development of the property located at 545 King Street East in Cobourg, Ontario.

The purpose of this report is to evaluate the existing drainage characteristics of the site and to advance an integrated plan for stormwater management that will permit the development to proceed with no adverse impacts to the receiving drainage system. This report has been prepared to address the requirements of the Town of Cobourg as well as Ganaraska Region Conservation Authority (GRCA).

2.0 Site Description

The location of the site is shown on **Figure 1** and is legally described as Lot 10, Concession B and part of the original road allowance between Lots 10 and 11. Registered Plan No. 606, Township of Hamilton, Town of Cobourg. The surrounding properties include agriculture land to the north and the east, residential land to the west and commercial land to the south.

The existing site is comprised of a grass field and gradually slopes from northeast to southwest. During major storm events, runoff will flow overland towards Willmott Street, where it is picked up in a storm sewer system within the right-of-way. The proposed development is to include new buildings, paved parking and landscaped areas.

The topographic survey of the site was completed by Ivan B. Wallace, Ontario Land Surveyor, on February 7, 2007. This data was used to determine the elevations and locations of existing site features, on-site drainage patterns and establish the proposed grades.

A Soils Investigation Report was prepared by Toronto Inspection Ltd. on February 7, 2007. The report presents the findings of the soils analysis and groundwater observations within twelve (12) boreholes across the site. A copy of the Soils Investigation Report can be found in **Appendix G**, along with a summary of key characteristics to be considered in the stormwater design.

Figure 1 – Site Location

3.0 Methodology

The present hierarchy of watershed planning in Ontario can be described by the following in descending order: Watershed Plans, Sub-watershed Plans and Individual Stormwater Management Plans. There have been several plans developed by Ganaraska Conservation that encompass the Town of Cobourg. The limits of these studies are identified in the GRCA design guidelines and have been referenced in **Appendix A**. The subject site is not covered by any of these Watershed or Sub-watershed Plans and; therefore, this report has been prepared as an Individual Stormwater Management Plan.

3.1 Site Specific Stormwater Design Criteria

Based on the requirements of the Town of Cobourg and GRCA, the following design criteria have been established for the site:

- Provide stormwater quantity controls to reduce the proposed peak flow rates to the existing condition for the 2 to 100-year design storms.
- Provide stormwater quality controls to achieve Ministry of the Environment "Enhanced" (Level 1) protection.

3.2 Catchment Characterization

The existing condition of the site has been analyzed as one (1) catchment area as shown on **Figure 2** and is described in detail below.

- Catchment **EX-100** represents the entire site and is comprised of a grassed field. The catchment slopes from northeast to southwest. The water flows overland towards **OUT-1** and ultimately to the Willmott Street storm sewer.

The proposed condition has been analyzed as three (3) catchments as shown on **Figure 3** and are described in detail below:

- Catchment **PR-100** includes the central and west portion of the site, and is comprised of buildings, asphalt parking and landscaped areas. Runoff will be directed through a proposed internal storm sewer network that will connect to the existing storm sewer on Willmott Street, **OUT-1**.
- Catchment **PR-101** includes the outside perimeter of the site and is comprised primarily of landscaped areas. Runoff from this catchment will flow uncontrolled off the site. As such, the site has been graded to minimize this catchment area as much as possible.
- Catchment **PR-102** includes the eastern portion of the site and is compromised of a new building and asphalt parking areas. Runoff will be directed to an internal storm sewer network that will connect to the existing storm sewer on Willmott Street, **OUT-1**.

The existing and proposed runoff characteristics were analyzed using individual sub-catchments. Hydrologic parameters, land use and runoff response were determined based on literature review and satellite images. Topographic mapping and AutoCAD Civil 3D 2017 software were used to establish sub-watershed areas, land use and slope. On-site soils were assessed using the Ministry of Agriculture Agricultural Information Atlas. The site was identified as containing a mixture of Tecumseth Sandy Loam with a Hydrologic Soil Group of AB and Smithfield Silty Clay Loam with a Hydrologic Soil Group of C. The hydrologic parameters for each catchment are summarized in **Table 1** and documented in **Appendix A**.

Table 1 – Existing and Proposed Hydrologic Parameters

Standhyd[1]							
Catchment ID	**Area (ha)**	**Impervious %**	**CN*[2]**	**Ia[3]**	**Pervious Length (m)**	**Pervious Slope (%)**	**Impervious Slope (%)**
PR-100	1.17	96	75.9	5.0	4	2.5	1.6
PR-102	0.77	100	47.5	5.0	4	2.5	1.0

Nashyd[1]					
Catchment ID	**Area (ha)**	**Impervious %**	**CN*[2]**	**Ia[3]**	**Tp[4] (hrs)**
EX-100	2.33	1.7	67.2	7.9	0.46
PR-101	0.39	3.5	63.4	4.9	0.17

Notes:
1. Command Line refers to the unit hydrograph used in the VO3 hydrologic model for the respective catchment area.
2. CN* refers to the modified CN number adjusted to Antecedent Moisture Conditions II. Excludes Impervious Area for Standhyd.
3. Ia refers to Initial Abstraction. Excludes Impervious Area for Standhyd.
4. Tp refers to Time of Peak.

EX-100
0.22 ha
CATCHMENT ID
CATCHMENT AREA
CATCHMENT BOUNDARY

OVERLAND FLOW DIRECTION
STORM SEWER FLOW DIRECTION

OUT
OUTLET LOCATION

Sketch No.
FIGURE 2
GOLDMANCO
PRE-DEVELOPMENT
DRAINAGE AREA PLAN

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Drawn By: CS	Scale: 1:750
Designed By: CS	Plot Date: FEBRUARY 2019
Checked By: CPB	Project No.: 10846
Engineer: CPB	Drawing File No.: 10846-DP

EXISTING CULVERT

PR-101
0.39 ha

KING STREET

250mm SAN

250mm SAN

300mm STM

250mm SAN

375mm STM

0.7ø culvert (west end not visible)

UNDERGROUND STORAGE FACILITY
TOP ELEV = 87.97m
BOTTOM ELEV = 86.45m
VOLUME = 1157m^3

WILLMONT STREET

300mm STM

ORIFICE PLATE 2

ORIFICE PLATE 1

375mm STM

PR-100
1.17 ha

PR-102
0.77 ha

OUT 1

OIL-GRIT SEPARATOR

375mm STM

EX-100
0.22 ha

CATCHMENT ID

CATCHMENT AREA

CATCHMENT BOUNDARY

OVERLAND FLOW DIRECTION

STORM SEWER FLOW DIRECTION

OUT

OUTLET LOCATION

Sketch No.
FIGURE 3
GOLDMANCO
POST DEVELOPMENT
DRAINAGE AREA PLAN

WILLS

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Drawn By: CS	Scale: 1: 750
Designed By: CS	Plot Date: OCTOBER 2019
Checked By: CPB	Project No.: 10846
Engineer: CPB	Drawing File No.: 10846-DP

4.0 Stormwater Management

4.1 Stormwater Quantity Control

The development of the existing site will result in increased peak flow rates and runoff volumes of stormwater leaving the site. In order to ensure that the receiving drainage system will not be adversely affected, stormwater management facilities are typically required to maintain post-development peak flows to existing levels.

4.1.1 Target Flow Rates

In order to ensure that the proposed development does not increase flooding potential to adjacent properties, the proposed peak flow rates will be controlled. Target flow rates were established based on the existing condition peak flow rates calculated using the Visual Otthymo Version 3.0 (VO3) hydrologic model. GRCA guidelines require that a range of storm events and distributions be considered in the analysis. As such, peak flow rates were calculated for the 2, 5, 10, 25, 50 and 100-year design storms for each of the 4-hour Chicago, 6-hour SCS, 12-hour SCS and 24-hour SCS distributions. The model schematic and detailed results have been included in **Appendix B**, peak flow rates are summarized in **Table 2** below.

Table 2 – Existing and Uncontrolled Peak Flow Summary

Return Period (yr)	Peak Flow (m^3/s)							
	4 Hour Chicago		6 Hour SCS		12 Hour SCS		24 Hour SCS	
	Ex.	Pr.	Ex.	Pr.	Ex.	Pr.	Ex.	Pr.
2-Year	0.014	**0.406**	0.011	**0.239**	0.010	**0.205**	0.009	**0.173**
5-Year	0.030	**0.502**	0.026	**0.332**	0.024	**0.288**	0.020	**0.243**
10-Year	0.041	**0.577**	0.036	**0.383**	0.032	**0.331**	0.027	**0.280**
25-Year	0.078	**0.747**	0.071	**0.533**	0.064	**0.462**	0.054	**0.391**
50-Year	0.103	**0.756**	0.101	**0.646**	0.093	**0.565**	0.081	**0.481**
100-Year	0.130	**0.800**	0.135	**0.758**	0.124	**0.667**	0.109	**0.569**

Notes:
1. EX. refers to the existing conditions peak flow rates for the site area (VO3 NHYD = 1100).
2. UNC. refers to the proposed condition peak flow rates for the site area without accounting for any quantity controls (VO3 NHYD = 15).

A review of **Table 2** shows that without quantity controls, the proposed development will increase peak flow rates from the existing condition. Preliminary analyses determined that the 4-hour Chicago storm produced the largest storage volume requirements and has been used as the target flow rates for the proposed development.

4.1.2 Proposed Quantity Controls

Quantity controls for the site will be provided by an underground chamber system located within catchment **PR-100**. Flows will be conveyed through the internal storm sewer system to CBMH-2, where an orifice control will restrict flows during minor storm events. Flows in excess of the orifice capacity will back up into the underground chambers and be detained until sufficient capacity is available. In order to reduce the storage volume requirements, a second orifice control has been placed in MH-4. For storm events in excess of the 2-year storm, the second orifice will be activated, increasing the outflow rate from the underground chambers.

The underground system is proposed to be constructed using Stormtech MC-3500 chambers. A total of 228 chambers are proposed, providing a maximum storage volume of 1156 m^3. It is noted that storage within the clearstone layer below the chambers has not been accounted for, as the connection to the storm sewer will be located at the base of the chambers. The stage-storage-discharge characteristics for the underground chamber system are summarized in **Table 3** and detailed calculations are provided in **Appendix C**.

Table 3 – Underground Storage Chamber Summary

Elev. (m)	Storage Depth (m)	Peak Flows (m^3/s)	Storage Volume (m^3)	Remarks
86.08	0.00	0.000	0	75 mm Orifice Plate
86.45	0.37	0.007	0	Bottom of Underground Storage
86.90	0.82	0.010	444	2 Year (438 m^3)
86.96	0.88	0.011	500	180 mm Orifice Plate
87.05	0.97	0.026	582	5 Year (581 m^3)
87.14	1.06	0.032	661	10 Year (657 m^3)
87.41	1.33	0.054	873	25 Year (871 m^3)
87.66	1.58	0.067	1008	50 Year (1007 m^3)
87.95	1.87	0.080	1146	100 Year (1143 m^3)
87.97	1.89	0.081	1156	Top of Underground Storage

Notes:
1. Storage volumes used for each return period are based on VO3 model results for the 4 hour Chicago Storm.
2. 75 mm Orifice Plate installed in CBMH-02.
3. 180 mm Orifice Plate installed in MH-16.

A review of **Table 3** demonstrates that the underground chamber system has sufficient storage to contain the 100-year storm event.

4.1.3 Proposed Peak Flow Rates

The existing and proposed peak flow rates from the site are shown in **Table 4** for each return period and storm distribution. Output from the VO3 model is included in **Appendix B**.

Table 4 – Existing and Proposed Peak Flow Rates

Return Period (yr)	Peak Flow (m^3/s)							
	4 Hour Chicago		6 Hour SCS		12 Hour SCS		24 Hour SCS	
	Ex.	Pr.	Ex.	Pr.	Ex.	Pr.	Ex.	Pr.
2-Year	0.014	**0.015**	0.011	**0.014**	0.010	**0.013**	0.009	**0.012**
5-Year	0.030	0.029	0.026	0.021	0.024	0.018	0.020	0.016
10-Year	0.041	0.039	0.036	0.031	0.032	0.021	0.027	0.019
25-Year	0.078	0.069	0.071	0.064	0.064	0.054	0.054	0.038
50-Year	0.103	0.085	0.101	0.089	0.093	0.078	0.081	0.061
100-Year	0.130	0.102	0.135	0.114	0.124	0.103	0.109	0.083

Notes: 1. EX refers to the existing condition peak flow rates (VO3 NHYD = 1100).
2. PR refers to the proposed condition peak flow rates for the site (VO3 NHYD = 4).

A review of **Table 4** indicates that the peak flows for the 5-year to 100-year return period are less than the existing condition for all storm distributions. It is noted that the 2-year peak flow rates exceed the existing condition for each storm distribution. However, the Stormwater Management Planning and Design Manual (MOE, March 2003) recommends that orifice plates should not have diameters of less than 75 mm to prevent clogging. As such, the minimum allowable diameter has been specified and the minor increase in flow for the proposed condition is not significant.

4.2 Stormwater Quality Control

The proposed development may cause additional pollutants to be conveyed off-site and; therefore, water quality controls have been provided. The selection and sizing of the water quality measures have been based on the procedures set out in the *Stormwater Management Planning and Design Manual* (MOE, March 2003) for Enhanced (Level 1) protection. This level of treatment requires 80% total suspended solids (TSS) removal and treatment of 90% of the annual runoff volume.

The goal of stormwater management is to preserve the natural hydrologic cycle and mitigation measures should be assessed in the following order:

- Stormwater lot level controls.
- Stormwater conveyance controls.
- End-of-pipe stormwater management facilities.

Stormwater lot level controls represent measures that are implemented on an individual lot basis such as soak away pits, flatter grading and reduction of the impervious footprint. For the proposed development, lot level controls such as reduced grading will be used to supplement the proposed SWM strategy; however, these are not intended to become the primary means for stormwater quality control.

Stormwater conveyance controls represent the conveyance systems used to transport stormwater runoff from the lots to the receiving waters such as pervious pipes, catchbasin treatment and grassed swales. The proposed SWM strategy will include some conveyance controls to pretreat runoff; however, they are not meant to be the primary means of water quality treatment for the development.

End-of-pipe stormwater management facilities represent the common urban stormwater management measures used to service numerous lots or whole subdivisions. These facilities include Wet Ponds, Wetlands, Dry Ponds, Infiltration Basins, Infiltration Trenches, Filter Strips, Sand Filters and Oil-Grit Separators. End-of-pipe SWM facilities will be considered for this development.

Based on the development area, site configuration and maintenance requirements, the primary water quality control will be an Oil-Grit Separator unit, installed upstream of the underground storage chamber system. Secondary treatment will also be provided by an isolator row within the underground chamber system and additional treatment may also be provided by infiltration within the clearstone layer below the chambers, as the system will not include an impermeable liner.

PCSWMM for Stormceptor recommends an STC 6000 Oil-Grit Separator. Based on the site characteristics, this unit will capture 97% of the annual runoff volume and remove 80% total suspended solids, exceeding the MOE requirements for Enhanced (Level 1) treatment. Detailed information relating to the OGS can be found in **Appendix D.**

4.2.1 Uncontrolled Catchment Areas

Catchment **PR-101** will flow uncontrolled off the site, but consists primarily of landscaping. As such, this is not considered a significant source of contamination and no quality controls have been proposed.

5.0 Hydraulic Elements

An internal storm sewer system has been provided to convey runoff through the proposed stormwater management features and to the outlet on Willmott Street. All flows from the buildings and parking areas must be directed to the underground storage facility and oil-grit separator unit to ensure that quantity and quality controls are provided. As such, a 100-year hydraulic grade line (HGL) analysis has been completed to ensure:

1. Each storm sewer inlet is sufficiently sized to capture the runoff directed to it.

2. Each storm sewer pipe is sufficiently sized to convey the flow directed to it, under pressure flow conditions, without exceeding the maximum allowable ponding depth at each structure.
3. All runoff will be conveyed to the Oil-Grit Separator and Underground Storage, such that the orifice controls will perform as intended.

For structures between the orifice controls and underground storage facility, the hydraulic grade line has been set to the 100-year water surface elevation as determined in the VO3 modelling. For pipes downstream of the orifice controls, they have been sized based on the 100-year controlled flow rate as determined in the VO3 modelling. The storm sewer design sheet is provided in **Appendix E** for the 5-year and 100-year peak flow rates.

A review of these calculations demonstrates that each inlet provides full capture of the 100-year peak flow rate and that surface ponding will only occur at six locations. As expected, the maximum surface ponding depth occurs at the trench drain within the loading ramp. However, the maximum ponding depth within the areas accessed by the public is only 0.08 m at CB-15. As such, runoff during the 100-year storm will be safely conveyed to the stormwater management features for quantity and quality control.

6.0 Operation and Maintenance Considerations

The underground storage facility and OGS will require periodic maintenance to function properly. The following maintenance program is recommended:

- The OGS should be inspected post construction, prior to being put into service.
- Inspect the OGS every three (3) months for the first year to determine the oil and sediment accumulation rates.
- Cleaning is required once the sediment depth reaches 15% of the storage capacity, or every six (6) months, whichever comes first.
- Inspect the units immediately after an oil, fuel or chemical spill.
- A licensed waste management company should remove oil and sediment and dispose of it according to current regulations.
- At the time of OGS maintenance, inspect the internal storm sewer system and remove accumulated sediment to ensure proper maintenance of the entire drainage system.

Additional maintenance requirements and recommendations will be provided by the Manufacturer at the time of purchase/installation.

The maintenance frequency for the underground storage chamber should be in excess of 25 years provided that the OGS unit is properly maintained. Specific maintenance requirements and recommendations will be provided by the manufacturer at the time of purchase/installation.

7.0 Erosion and Sediment Control

When soils are exposed during construction, there is a potential for transport of relatively large amounts of sediment off-site to downstream areas. In order to minimize the impacts associated with sediment transfer, the following measures will be completed in the order listed:

- Install silt barrier along the property limits as shown on Detailed Design Drawings and maintain as required.
- Install a mud mat at the proposed construction entrances.
- Install storm drain inlet protection on all internal catchbasin grates.
- Remove temporary erosion and sediment control devices/measures and clean out once vegetation is established.

When feasible, topsoil stripping should be limited to areas where development is to proceed in the near future. Topsoil stockpiles on sloped areas should be stabilized by hydro seeding. Where development is to be delayed, areas stripped of topsoil should also be hydro-seeded to minimize sediment runoff.

Regular inspection and maintenance of the silt fence will ensure continued protection to the downstream areas for the duration of the construction period. Additional information on the proposed erosion and sediment control measures are listed below:

Silt Fencing

Light duty silt fencing will be as per OPSD 219.110 (modified). The proposed silt fence shall be inspected after every rainfall to identify failed sections. Any failures shall be repaired immediately. When sediment accumulates to half the height of the geotextile, it is to be removed and disposed of in a controlled area. A supply of extra silt fence is to be kept on site to provide for quick repairs or the installation of additional fence, if required.

Mud Mat

The location of the proposed mud mat at the construction entrances is shown on the detailed design drawings. The mud mat is to be 400 mm thick and consist of 200 mm diameter angular stone. The mud mat is to be underlain with geotextile or a graded aggregate filter.

The granular material will require periodic replacement as it becomes contaminated by vehicle traffic. If sediment is tracked onto public roads, it shall be cleaned at the end of each day by shoveling or sweeping and disposed of properly in a controlled sediment disposal area.

Storm Drain Inlet Protection

Storm drain inlet protection will be provided by catchbasin filters placed on all catchbasin grates. The location of the catchbasin filters can be found on the detailed design drawings. The catchbasin filters treat runoff before it is released to the infiltration basin while permanent stabilization is taking place. The catchbasin filters will be inspected regularly and removed after the final lift of asphalt has been installed and vegetation is sufficiently established (>80%).

8.0 Conclusion

The proposed redevelopment is located at 545 King Street in the Town of Cobourg. This development will alter the runoff characteristics of the site and; therefore, stormwater quantity and quality control measures have been provided to ensure that the receiving drainage system will not be adversely affected.

Water quantity control will be provided by an underground storage facility. The sewer network will direct flow from the site to the existing outlet location. These controls will reduce proposed peak flow rates to less than the existing condition, for the 5 to 100-year storm events and the minor increase during the 2-year storm is not significant.

Water quality treatment will be provided primarily by an Oil-Grit Separator with secondary treatment measures also provided. The OGS is sufficiently sized to meet Ministry of Environment Level 1 (Enhanced) water quality treatment.

Erosion and sediment control measures have been prepared to ensure that off-site transport of sediment is minimized through temporary measures. These include the installation of silt barriers and a mud mat.

The proper installation and ongoing maintenance of the erosion and sediment control measures outlined in this report will ensure that the development can proceed without adversely affecting downstream drainage conditions. The maintenance of the proposed measures will be carried out by the property owner.

Respectfully submitted,

Chris Proctor-Bennett, P.Eng.
Water Resources Engineer

Christopher Sokol,
Water Resources Designer

CPB/CS/kr/gh

Statement of Limitations

This report has been prepared by D.M. Wills Associates Limited on behalf of Goldmanco Incorporated to address the requirements of the Town of Cobourg.

The conclusions and recommendations in this report are based on available background documentation and discussions with applicable agencies at the time of preparation.

The report is intended to demonstrate the means whereby stormwater runoff originating from the site will be managed with respect to both quantity and quality control. The report is applicable only to the project described in the text, constructed substantially in accordance with the plans and details accompanying this report.

Any use which a third party makes of this report other than a stormwater management report for the proposed development is the responsibility of such third parties. D.M. Wills Associates Limited accepts no responsibility for damages, if any, suffered by a third party as a result of decisions made or action taken based on using this report for purposes other than a stormwater management report for the 545 King Street East, Cobourg development.

D.M. Wills Associates Limited is not responsible for any changes made to the stormwater management measures which are not in accordance with the design drawings. Any person(s) relying on the "as-constructed" stormwater measures should confirm that the field conditions are in accordance with the design drawings.

Appendix A

Rainfall Data and Hydrology Parameters

Clarington Intensity Formulas

IDF Equation	I =a/(b+Td)		Td --- Time in hour I -- Intensity in mm/Hr				Conservative a i = --------- (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

	I =a/(b+Td)		Td --- Time in hour I -- Intensity in mm/Hr			
Return Period Parameters	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

Hydrologic Parameters for EX-100

Sheet 1 of 1

Project No: 10846
Project Name: Goldmanco
Designed/Checked By: CS / CPB
Date: November 6 2018

Land Use

Agriculture	0.00	0.00	ha
Range	1.17	1.13	ha
Grass	0.00	0.00	ha
Woods	0.00	0.00	ha
Wetland	0.00	0.00	ha
Gravel	0.00	0.00	ha
Impervious	0.00	0.04	ha
SUM	**1.17**	**1.17**	
Hydrologic Soil Group[1]	AB	C	
Soil Type	Tecumseth Sand Loam	Smithfield Silty Clay	
C	0.12	0.22	
CN (Nashyd)	51.0	76.7	

Rainfall Data

Gauging Station = Cobourg
12 hr, 100 Yr Rainfall = 76.4 mm

Drainage Area	**2.33**	ha
Impervious Area	**0.04**	ha
Percent Impervious	**1.7%**	

Pervious

Length	170	m
US Elev	89.0	m
DS Elev	87.5	m
Slope	0.9	%
	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient[2], C	**AB**	0.22	0.12	0.07	0.07	0.05	0.67	0.90	0.12	
	C	0.39	0.20	0.12	0.10	0.05	0.84	0.90	0.22	n.a.
SCS Curve No.[3], CN	**AB**	70	51	50	44	50	81	98	51.0	51.0
	C	82	76	74	71	50	89	98	76.7	76.0
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	7.9	8.0

Time of Concentration[6]

Total Length	170	m	
Average Slope	0.9	%	
Airport	**41.1**	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Bransby - Williams	9.1	min.	
Applicable Minimum[7]	10.0	min.	
Time to Peak	27.5	min.	
	0.46	**hr.**	

Composite Parameters

Drainage Area	2.33 ha	
Runoff Coefficient	0.17	
SCS Curve No.	63.9	63.3
Modified Curve No.[4], CN*	**67.2**	66.2
Initial Abstraction.	**7.9**	8.0

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Based on the results of the Uplands Method
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes

Hydrologic Parameters for PR-100

Sheet 1 of 1

Project No: 10846
Project Name: Goldmanco
Designed/Checked By: CS / CPB
Date: November 6 2018

Land Use

Agriculture	0.00	ha
Range	0.00	ha
Grass	0.05	ha
Woods	0.00	ha
Wetland	0.00	ha
Gravel	0.00	ha
Impervious	1.12	ha
SUM	**1.17**	

Hydrologic Soil Group[1]	C
Soil Type	Smithfield Silty Clay
C	0.87
CN (Nashyd)	97.0

Rainfall Data

Gauging Station = Cobourg
12 hr, 100 Yr Rainfall = 76.4 mm

Drainage Area	**1.17**	ha
Impervious Area	**1.12**	ha
Percent Impervious	**95.8%**	

	Pervious	Impervious	
Length	4	36	m
US Elev	88.7	89.0	m
DS Elev	88.6	88.4	m
Slope	2.5	1.6	%
	Rolling	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient[2], C	C	0.45	0.28	0.17	0.13	0.05	0.84	0.90	0.87	n.a.
SCS Curve No.[3], CN	C	82	76	74	71	50	89	98	97.0	74.0
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	2.1	5.0

Time of Concentration[6]

Total Length	40	m	
Average Slope	1.6	%	
Airport	4.0	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Bransby - Williams	2.0	min.	
Applicable Minimum[7]	**10.0**	min.	
Time to Peak	6.7	min.	
	0.11	**hr.**	

Composite Parameters

Drainage Area	1.17 ha	
Runoff Coefficient	0.87	
SCS Curve No.	97.0	74.0
Modified Curve No.[4], CN*	99.1	**75.9**
Initial Abstraction.	2.1	**5.0**

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Based on the results of the Uplands Method
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes

Hydrologic Parameters for PR-101

Sheet 1 of 1

Project No: 10846
Project Name: Goldmanco
Designed/Checked By: CS / CPB
Date: November 6 2018

Land Use

Agriculture	0.00	0.00	ha
Range	0.00	0.00	ha
Grass	0.19	0.19	ha
Woods	0.00	0.00	ha
Wetland	0.00	0.00	ha
Gravel	0.00	0.00	ha
Impervious	0.01	0.00	ha
SUM	**0.20**	**0.19**	
Hydrologic Soil Group[1]	C	AB	
Soil Type	Smithfield Silty Clay	0	
C	0.22	0.12	
CN (Nashyd)	75.6	50.0	

Rainfall Data

Gauging Station = Cobourg
12 hr, 100 Yr Rainfall = 76.4 mm

Drainage Area	**0.39**	ha
Impervious Area	**0.01**	ha
Percent Impervious	**3.5%**	

	Pervious	Impervious	
Length	7	1	m
US Elev	88.7	87.7	m
DS Elev	88.5	87.7	m
Slope	3.1	1.7	%
	Rolling	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient[2]**, C**	**C**	0.45	0.28	0.17	0.13	0.05	0.84	0.90	0.22	
	AB	0.26	0.19	0.12	0.10	0.05	0.67	0.90	0.12	n.a.
SCS Curve No.[3]**, CN**	**C**	82	76	74	71	50	89	98	75.6	74.0
	AB	70	51	50	44	50	81	98	50.0	50.0
Initial Abstraction[5]**, mm**		6.0	8.0	5.0	10.0	10.0	2.5	2.0	4.9	5.0

Time of Concentration[6]

Total Length	8	m	
Average Slope	2.9	%	
Airport	6.0	min.	
Bransby - Williams	0.4	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Applicable Minimum[7]	**15.0**	min.	
Time to Peak	10.1	min.	
	0.17	**hr.**	

Composite Parameters

Drainage Area	0.39 ha	
Runoff Coefficient	0.17	
SCS Curve No.	63.3	62.0
Modified Curve No.[4]**, CN***	**63.4**	62.0
Initial Abstraction.	**4.9**	5.0

Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Based on the results of the Uplands Method
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 15 minutes

Hydrologic Parameters for PR-102

Sheet 1 of 1

Project No: 10846
Project Name: Goldmanco
Designed/Checked By: CS / CPB
Date: November 6 2018

Land Use

Agriculture	0.00	ha
Range	0.00	ha
Grass	0.00	ha
Woods	0.00	ha
Wetland	0.00	ha
Gravel	0.00	ha
Impervious	0.77	ha
SUM	**0.77**	

Hydrologic Soil Group[1]	AB
Soil Type	Tecumseth Sandy Loam
C	0.90
CN (Nashyd)	98.0

Rainfall Data

Gauging Station = Cobourg
12 hr, 100 Yr Rainfall = 76.4 mm

Drainage Area	**0.77**	ha
Impervious Area	**0.77**	ha
Percent Impervious	**100.0%**	

	Pervious	Impervious	
Length	4	20	m
US Elev	88.7	89.0	m
DS Elev	88.6	88.8	m
Slope	2.5	1.0	%
	Rolling	Flat	

Parameter	Soil Group	Land Use							Weighted Value	
		Agriculture	Range	Grass	Woods	Wetland	Gravel	Imperv.	Incl. Imperv. Nashyd	Not Incl. Imperv. Standhyd
Runoff Coefficient[2], C	**AB**	0.26	0.19	0.12	0.10	0.05	0.67	0.90	0.90	n.a.
SCS Curve No.[3], CN	**AB**	70	51	50	44	50	81	98	98.0	50.0
Initial Abstraction[5], mm		6.0	8.0	5.0	10.0	10.0	2.5	2.0	2.0	5.0

Time of Concentration[6]

Impervious Length	20	m	
Slope	1.0	%	
Airport	2.9	min.	Flat: 0-2% Slopes Rolling: 2-6% Slopes Hilly: >6% Slopes
Bransby - Williams	1.2	min.	
Applicable Minimum[7]	**10.0**	min.	
Time to Peak	6.7	min.	
	0.11	**hr.**	

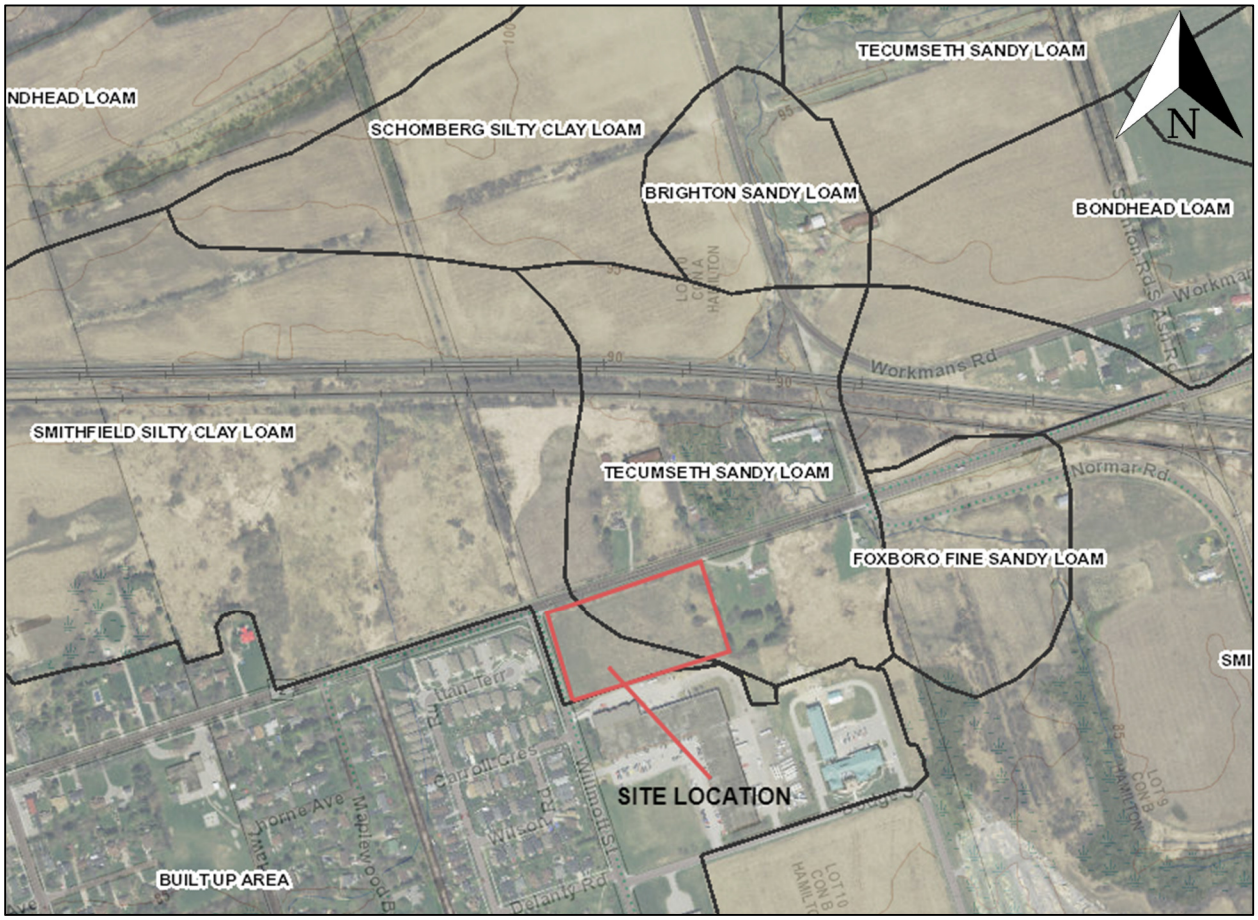
Composite Parameters

Drainage Area	0.77 ha	
Runoff Coefficient	0.90	
SCS Curve No.	98.0	50.0
Modified Curve No.[4], CN*	99.9	**47.5**
Initial Abstraction.	2.0	**5.0**

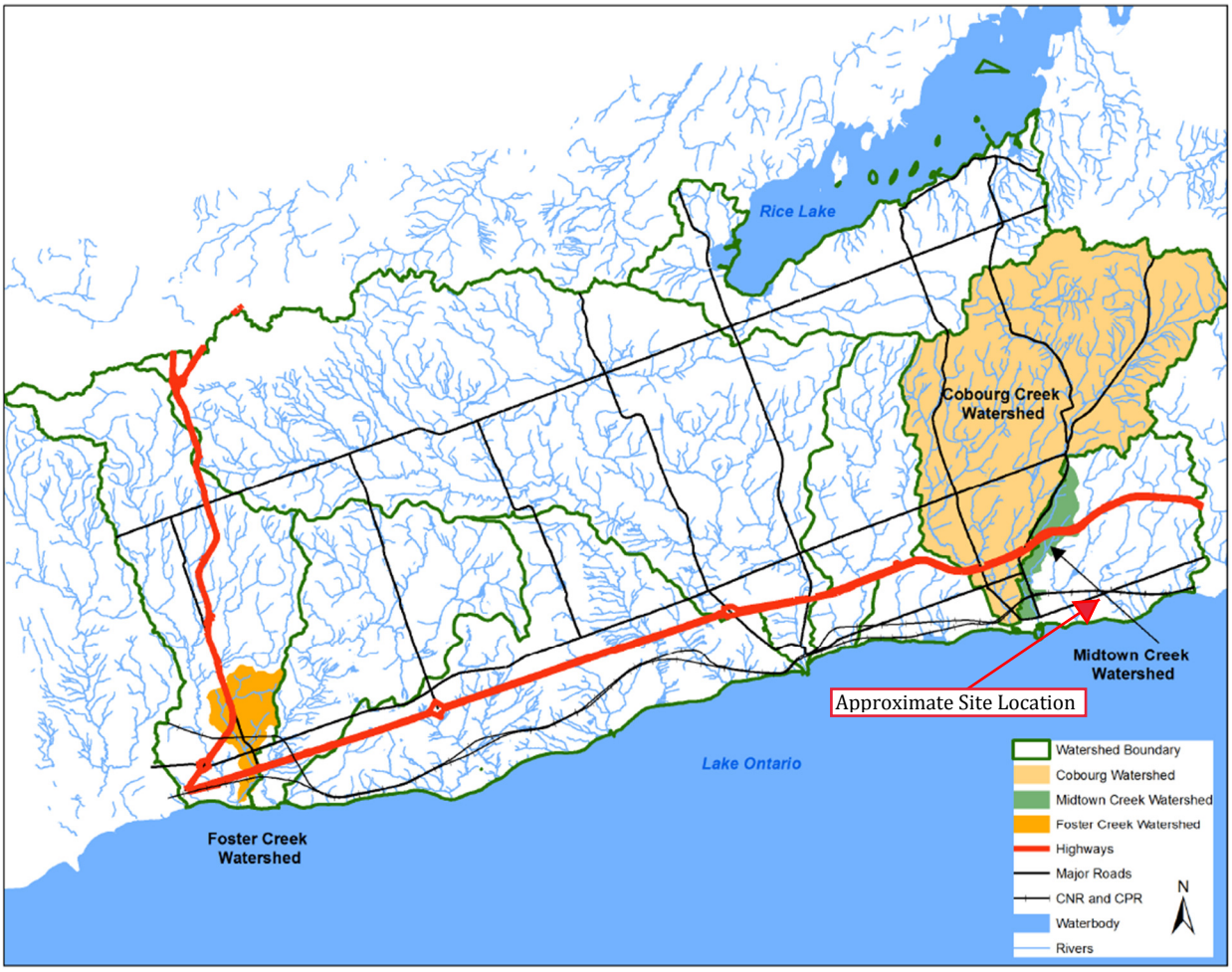
Notes:

1. Hydrologic Soil Group obtained from Design Chart H2-6A, M.T.O. Drainage Manual, 1980.
2. Runoff coefficient obtained from M.T.O. Design Chart 1.07, M.T.O. Drainage Management Manual, 1997, Hydrologic Analysis and Design, McCuen 2004 and New Jersey Technical Manual for Stream Encroachment, 1984.
3. SCS Curve No. obtained from M.T.O. Design Chart 1.09, M.T.O. Drainage Management Manual, 1997, and Table 2-2a, TR-55, page 2-5.
4. The modified curve number is adjusted as per Paul Wisner & Associates (1982) and represents anticedent moisture conditions Type II
5. Initial Abstraction values taken from the Environmental and Engineering Services Department, The Corporation of the City of London, Dec 2005
6. Based on the results of the Uplands Method
7. Minimum Time of Concentration for use in the Rational Method and Hydrologic Model has been set to 10 minutes

Hydrologic Soil Groups



Watershed Boundary

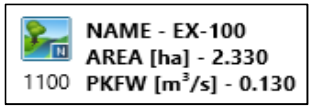


Appendix B

Hydrologic Modelling

VO3 Schematic

Existing



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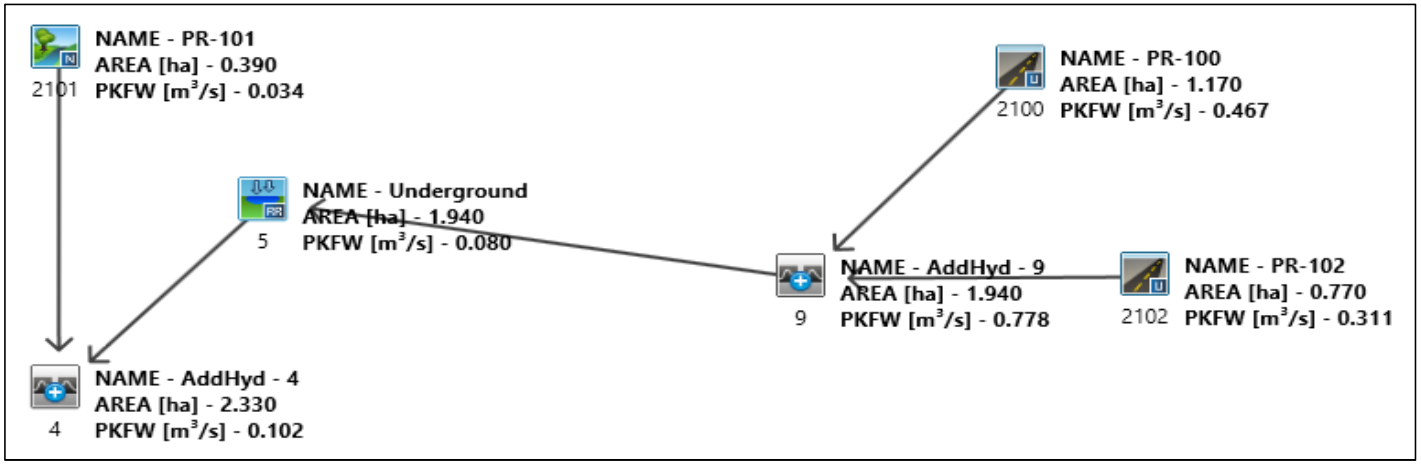

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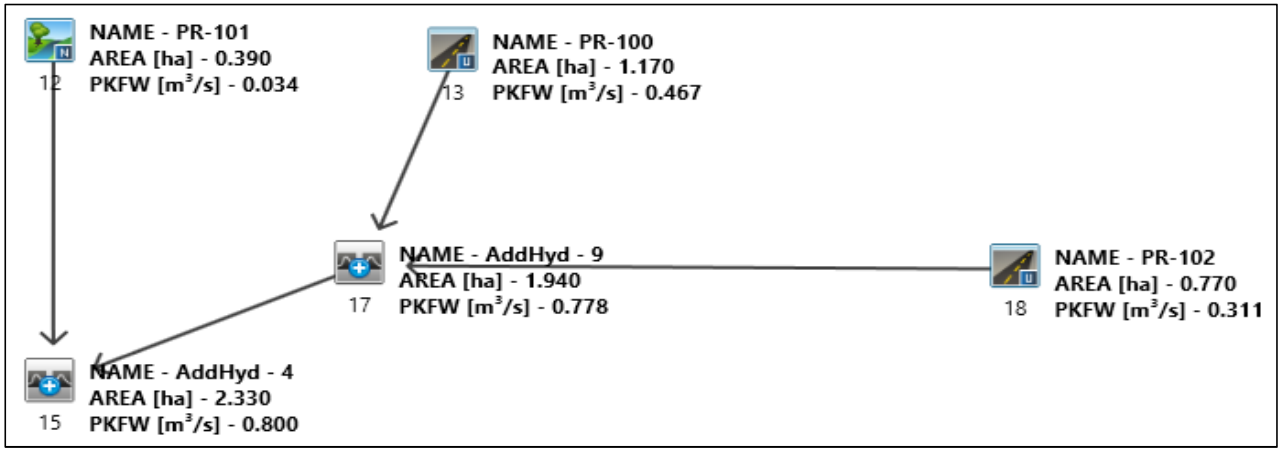

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         VV     I    SSSSS  UUUUU  A   A  LLLLL

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       O   O    T      T    H   H   Y Y   MM MM  O   O
       O   O    T      T    H   H    Y    M   M  O   O
        OOO     T      T    H   H    Y    M   M   OOO
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                  *****  D E T A I L E D   O U T P U T *****


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DATE: 10-28-2019                          TIME: 10:15:44

USER:



COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
---------------------
  ***************************
  ** SIMULATION NUMBER:   1 **
  ***************************


--------------------
| 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
0.17	0.49	1.17	18.95	2.17	2.84	3.17	0.71
0.33	0.66	1.33	77.30	2.33	2.09	3.33	0.61
0.50	0.93	1.50	26.45	2.50	1.60	3.50	0.52
0.67	1.43	1.67	11.48	2.67	1.26	3.67	0.46
0.83	2.46	1.83	6.42	2.83	1.02	3.83	0.40
1.00	5.25	2.00	4.10	3.00	0.85	4.00	0.35

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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)=   0.193

    PEAK FLOW       (cms)=   0.014 (i)
    TIME TO PEAK    (hrs)=   1.917
    RUNOFF VOLUME    (mm)=   2.831
    TOTAL RAINFALL   (mm)=  28.106
    RUNOFF COEFFICIENT   =   0.101

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17
```

```
     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   3.158
     TOTAL RAINFALL   (mm)=  28.106
     RUNOFF COEFFICIENT   =   0.112

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

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      77.30        11.43
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.30 (ii)    2.82 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.28
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.00          0.241 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      27.11         5.15          26.23
     TOTAL RAINFALL   (mm)=      28.11        28.11          28.11
     RUNOFF COEFFICIENT   =       0.96         0.18           0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
-------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
```



```
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      77.30         3.76
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.32 (ii)    2.61 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.00          0.162 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      27.11         1.76          26.85
     TOTAL RAINFALL   (mm)=      28.11        28.11          28.11
     RUNOFF COEFFICIENT   =       0.96         0.06           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

-------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.241     1.33    26.23
        + ID2= 2 (2102):     0.77   0.162     1.33    26.85
          ================================================
          ID = 3 (0009):     1.94   0.403     1.33    26.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0107      0.0490
                         0.0068     0.0001   |   0.0177      0.0518
                         0.0073     0.0051   |   0.0365      0.0695
                         0.0077     0.0101   |   0.0514      0.0844
                         0.0081     0.0142   |   0.0624      0.0960
                         0.0090     0.0251   |   0.0751      0.1089
                         0.0097     0.0348   |   0.0768      0.1108
                         0.0104     0.0444   |   0.0808      0.1156

                               AREA     QPEAK     TPEAK       R.V.
```

```
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)      1.940      0.403      1.33      26.47
     OUTFLOW: ID= 1 (0005)      1.940      0.010      2.37      26.47

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  2.57
                   TIME SHIFT OF PEAK FLOW         (min)= 62.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0438

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

--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.005     1.50     3.16
        + ID2= 2 (0005):     1.94   0.010     2.37    26.47
          ================================================
          ID = 3 (0004):     2.33   0.015     1.52    22.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.005 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   3.158
     TOTAL RAINFALL   (mm)=  28.106
     RUNOFF COEFFICIENT   =   0.112

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      77.30     ********
                over (min)        5.00         5.00
```



```
     Storage Coeff.  (min)=       2.30 (ii)    2.82 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.28
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.00          0.241 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      27.11         5.15         26.23
     TOTAL RAINFALL   (mm)=      28.11        28.11         28.11
     RUNOFF COEFFICIENT   =       0.96         0.18          0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      77.30     ********
                over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.32 (ii)    2.61 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.00          0.162 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33          1.33
     RUNOFF VOLUME    (mm)=      27.11         1.76         26.85
     TOTAL RAINFALL   (mm)=      28.11        28.11         28.11
     RUNOFF COEFFICIENT   =       0.96         0.06          0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.241     1.33    26.23
       + ID2= 2 (0018):     0.77   0.162     1.33    26.85
         ================================================
         ID = 3 (0017):     1.94   0.403     1.33    26.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.005     1.50     3.16
       + ID2= 2 (0017):     1.94   0.403     1.33    26.47
         ================================================
         ID = 3 (0015):     2.33   0.406     1.33    22.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ***************************
  ** SIMULATION NUMBER:   2 **
  ***************************

--------------------
| 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
                0.17    0.81 |  1.17   27.06 |  2.17    4.54 |  3.17    1.17
                0.33    1.09 |  1.33   94.77 |  2.33    3.37 |  3.33    1.00
                0.50    1.53 |  1.50   36.99 |  2.50    2.60 |  3.50    0.87
                0.67    2.32 |  1.67   17.18 |  2.67    2.06 |  3.67    0.76
                0.83    3.95 |  1.83    9.92 |  2.83    1.68 |  3.83    0.67
                1.00    8.18 |  2.00    6.46 |  3.00    1.39 |  4.00    0.59


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--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
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```
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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)=   0.193

     PEAK FLOW       (cms)=   0.030 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   6.054
     TOTAL RAINFALL   (mm)=  38.492
     RUNOFF COEFFICIENT   =   0.157

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

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--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   6.238
     TOTAL RAINFALL   (mm)=  38.492
     RUNOFF COEFFICIENT   =   0.162

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

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--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
```

|ID= 1 DT= 5.0 min | Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	94.77	19.83	
over	(min)	5.00	5.00	
Storage Coeff.	(min)=	2.12 (ii)	2.60 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.31	0.29	
				TOTALS
PEAK FLOW	(cms)=	0.29	0.00	0.297 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	37.49	9.83	36.38
TOTAL RAINFALL	(mm)=	38.49	38.49	38.49
RUNOFF COEFFICIENT	=	0.97	0.26	0.95

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.76	0.01	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.50	
Length	(m)=	71.65	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	94.77	6.84	
over	(min)	5.00	5.00	
Storage Coeff.	(min)=	2.14 (ii)	2.41 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.31	0.30	
				TOTALS
PEAK FLOW	(cms)=	0.20	0.00	0.200 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	37.49	3.57	37.15
TOTAL RAINFALL	(mm)=	38.49	38.49	38.49
RUNOFF COEFFICIENT	=	0.97	0.09	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0009)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2100):	1.17	0.297	1.33	36.38
	+ ID2= 2 (2102):	0.77	0.200	1.33	37.15
	ID = 3 (0009):	1.94	0.496	1.33	36.69

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.496	1.33	36.69
OUTFLOW: ID= 1 (0005)	1.940	0.024	2.15	36.69

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.91
TIME SHIFT OF PEAK FLOW (min)= 49.00
MAXIMUM STORAGE USED (ha.m.)= 0.0581

ADD HYD (0004)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2101):	0.39	0.009	1.50	6.24

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        + ID2= 2 (0005):     1.94   0.024     2.15    36.69
          ================================================
          ID = 3 (0004):     2.33   0.029     1.73    31.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   6.238
     TOTAL RAINFALL   (mm)=  38.492
     RUNOFF COEFFICIENT   =   0.162

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      94.77     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.12 (ii)    2.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.00          0.297 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      37.49         9.83          36.38
     TOTAL RAINFALL   (mm)=      38.49        38.49          38.49
     RUNOFF COEFFICIENT   =       0.97         0.26           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
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           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      94.77     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.14 (ii)    2.41 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.20         0.00          0.200 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      37.49         3.57          37.15
     TOTAL RAINFALL   (mm)=      38.49        38.49          38.49
     RUNOFF COEFFICIENT   =       0.97         0.09           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.297     1.33    36.38
       + ID2= 2 (0018):     0.77   0.200     1.33    37.15
         ================================================
         ID = 3 (0017):     1.94   0.496     1.33    36.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
```

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0012):	0.39	0.009	1.50	6.24
+ ID2= 2 (0017):	1.94	0.496	1.33	36.69
ID = 3 (0015):	2.33	0.502	1.33	31.59

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
**** SIMULATION NUMBER: 3 ****
****

CHICAGO STORM
Ptotal= 44.04 mm

IDF curve parameters: A=2819.000
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
0.17	0.93	1.17	30.96	2.17	5.20	3.17	1.34
0.33	1.24	1.33	108.42	2.33	3.85	3.33	1.15
0.50	1.75	1.50	42.32	2.50	2.97	3.50	0.99
0.67	2.66	1.67	19.65	2.67	2.36	3.67	0.87
0.83	4.51	1.83	11.35	2.83	1.92	3.83	0.76
1.00	9.35	2.00	7.39	3.00	1.59	4.00	0.68

CALIB	
NASHYD (1100)	Area (ha)= 2.33 Curve Number (CN)= 67.2
ID= 1 DT= 5.0 min	Ia (mm)= 7.90 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.46

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)= 0.193

PEAK FLOW (cms)= 0.041 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 8.155
TOTAL RAINFALL (mm)= 44.038
RUNOFF COEFFICIENT = 0.185

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

CALIB	
NASHYD (2101)	Area (ha)= 0.39 Curve Number (CN)= 63.4
ID= 1 DT= 5.0 min	Ia (mm)= 4.90 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.013 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 8.215
TOTAL RAINFALL (mm)= 44.038
RUNOFF COEFFICIENT = 0.187

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

CALIB	
STANDHYD (2100)	Area (ha)= 1.17
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.12	0.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.56	2.50
Length (m)=	88.32	4.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	108.42	26.56
over (min)	5.00	5.00
Storage Coeff. (min)=	2.01 (ii)	2.46 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.31	0.30

TOTALS

```
     PEAK FLOW       (cms)=       0.34         0.00          0.341 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      43.04        12.73          41.83
     TOTAL RAINFALL   (mm)=      44.04        44.04          44.04
     RUNOFF COEFFICIENT   =       0.98         0.29           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  75.9    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.

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--------------------
| CALIB            |
| STANDHYD  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n             =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     108.42         9.17
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.02 (ii)    2.28 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.23         0.00          0.229 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      43.04         4.77          42.65
     TOTAL RAINFALL   (mm)=      44.04        44.04          44.04
     RUNOFF COEFFICIENT   =       0.98         0.11           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```



```
       ID1= 1 (2100):     1.17   0.341     1.33    41.83
     + ID2= 2 (2102):     0.77   0.229     1.33    42.65
       ================================================
       ID = 3 (0009):     1.94   0.569     1.33    42.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.569      1.33      42.15
     OUTFLOW: ID= 1 (0005)     1.940      0.032      2.05      42.15

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.70
                TIME SHIFT OF PEAK FLOW         (min)= 43.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0657

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (2101):     0.39   0.013     1.50     8.22
     + ID2= 2 (0005):     1.94   0.032     2.05    42.15
       ================================================
       ID = 3 (0004):     2.33   0.039     1.70    36.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088
```

```
     PEAK FLOW       (cms)=   0.013 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   8.215
     TOTAL RAINFALL   (mm)=  44.038
     RUNOFF COEFFICIENT   =   0.187

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

--------------------------------------------------------------------------------
-------------------
| CALIB           |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     108.42     ********
                 over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.01 (ii)    2.46 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.34         0.00          0.341 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      43.04        12.73          41.83
     TOTAL RAINFALL   (mm)=      44.04        44.04          44.04
     RUNOFF COEFFICIENT   =       0.98         0.29           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
-------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n            =      0.013        0.250
```



```
     Max.Eff.Inten.(mm/hr)=     108.42     ********
                 over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.02 (ii)    2.28 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.23         0.00          0.229 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      43.04         4.77          42.65
     TOTAL RAINFALL   (mm)=      44.04        44.04          44.04
     RUNOFF COEFFICIENT   =       0.98         0.11           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

-------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.341     1.33    41.83
        + ID2= 2 (0018):     0.77   0.229     1.33    42.65
          ================================================
          ID = 3 (0017):     1.94   0.569     1.33    42.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

-------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.013     1.50     8.22
        + ID2= 2 (0017):     1.94   0.569     1.33    42.15
          ================================================
          ID = 3 (0015):     2.33   0.577     1.33    36.47

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   4 **
  ****************************

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

CALIB NASHYD (1100)	ID= 1 DT= 5.0 min

Area (ha)= 2.33 Curve Number (CN)= 67.2
Ia (mm)= 7.90 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.46

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)= 0.193

PEAK FLOW (cms)= 0.078 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 15.533
TOTAL RAINFALL (mm)= 60.234
RUNOFF COEFFICIENT = 0.258

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

CALIB NASHYD (2101)	ID= 1 DT= 5.0 min

Area (ha)= 0.39 Curve Number (CN)= 63.4
Ia (mm)= 4.90 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.022 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 15.105
TOTAL RAINFALL (mm)= 60.234
RUNOFF COEFFICIENT = 0.251

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

CALIB STANDHYD (2100)	ID= 1 DT= 5.0 min

Area (ha)= 1.17
Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		138.79	46.26	
over (min)		5.00	5.00	
Storage Coeff. (min)=		1.82 (ii)	2.23 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.32	0.30	
				TOTALS
PEAK FLOW	(cms)=	0.43	0.01	0.439 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	59.23	22.45	57.76
TOTAL RAINFALL	(mm)=	60.23	60.23	60.23
RUNOFF COEFFICIENT	=	0.98	0.37	0.96

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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.

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--------------------
| CALIB            |
| STANDHYD  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.76         0.01
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.50
     Length            (m)=     71.65         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    138.79        16.69
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      1.83 (ii)    2.07 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.32         0.31
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.29         0.00          0.293 (iii)
     TIME TO PEAK    (hrs)=      1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=     59.23         9.08          58.73
     TOTAL RAINFALL   (mm)=     60.23        60.23          60.23
     RUNOFF COEFFICIENT   =      0.98         0.15           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (2100):     1.17   0.439     1.33    57.76
        + ID2= 2 (2102):     0.77   0.293     1.33    58.73
          ================================================
          ID = 3 (0009):     1.94   0.732     1.33    58.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0107     0.0490
                         0.0068     0.0001   |   0.0177     0.0518
```



```
                         0.0073     0.0051   |   0.0365     0.0695
                         0.0077     0.0101   |   0.0514     0.0844
                         0.0081     0.0142   |   0.0624     0.0960
                         0.0090     0.0251   |   0.0751     0.1089
                         0.0097     0.0348   |   0.0768     0.1108
                         0.0104     0.0444   |   0.0808     0.1156

                                   AREA     QPEAK     TPEAK       R.V.
                                   (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)      1.940      0.732      1.33      58.15
     OUTFLOW: ID= 1 (0005)      1.940      0.054      2.02      58.14

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.39
                TIME SHIFT OF PEAK FLOW         (min)= 41.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0872

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

--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (2101):     0.39   0.022     1.50    15.11
        + ID2= 2 (0005):     1.94   0.054     2.02    58.14
          ================================================
          ID = 3 (0004):     2.33   0.069     1.67    50.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  15.105
     TOTAL RAINFALL   (mm)=  60.234
     RUNOFF COEFFICIENT   =   0.251

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
```

```
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     138.79     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.82 (ii)    2.23 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.32         0.30
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.43         0.01          0.439 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      59.23        22.45          57.76
     TOTAL RAINFALL   (mm)=      60.23        60.23          60.23
     RUNOFF COEFFICIENT   =       0.98         0.37           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     138.79     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.83 (ii)    2.07 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.32         0.31
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.00          0.293 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      59.23         9.08          58.73
     TOTAL RAINFALL   (mm)=      60.23        60.23          60.23
     RUNOFF COEFFICIENT   =       0.98         0.15           0.98

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



```
       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.439     1.33    57.76
       + ID2= 2 (0018):     0.77   0.293     1.33    58.73
         ================================================
         ID = 3 (0017):     1.94   0.732     1.33    58.15

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.022     1.50    15.11
       + ID2= 2 (0017):     1.94   0.732     1.33    58.15
         ================================================
         ID = 3 (0015):     2.33   0.747     1.33    50.94

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ***************************
  ** SIMULATION NUMBER:   5 **
  ***************************

--------------------
| 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    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    2.18 |  1.17   52.37 |  2.17   11.13 |  3.17    3.12
                0.33    2.89 |  1.33  139.71 |  2.33    8.44 |  3.33    2.68
                0.50    4.02 |  1.50   68.44 |  2.50    6.62 |  3.50    2.33
                0.67    5.96 |  1.67   36.37 |  2.67    5.33 |  3.67    2.04
```

0.83	9.77	1.83	22.56	2.83	4.38	3.83	1.81
1.00	18.93	2.00	15.36	3.00	3.67	4.00	1.61

CALIB			
NASHYD (1100)	Area (ha)= 2.33	Curve Number (CN)= 67.2	
ID= 1 DT= 5.0 min	Ia (mm)= 7.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.46		

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)= 0.193

PEAK FLOW (cms)= 0.103 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 21.816
TOTAL RAINFALL (mm)= 71.949
RUNOFF COEFFICIENT = 0.303

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

CALIB			
NASHYD (2101)	Area (ha)= 0.39	Curve Number (CN)= 63.4	
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.17		

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.028 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 20.962
TOTAL RAINFALL (mm)= 71.949

RUNOFF COEFFICIENT = 0.291

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

CALIB			
STANDHYD (2100)	Area (ha)= 1.17		
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.12	0.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.56	2.50
Length (m)=	88.32	4.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	139.71	53.47
over (min)	5.00	5.00
Storage Coeff. (min)=	1.82 (ii)	2.22 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.32	0.30

		TOTALS
PEAK FLOW (cms)=	0.43	0.01 0.443 (iii)
TIME TO PEAK (hrs)=	1.33	1.33 1.33
RUNOFF VOLUME (mm)=	70.95	30.37 69.32
TOTAL RAINFALL (mm)=	71.95	71.95 71.95
RUNOFF COEFFICIENT =	0.99	0.42 0.96

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.76	0.01
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	71.65	4.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	139.71	19.91
over (min)	5.00	5.00
Storage Coeff. (min)=	1.83 (ii)	2.06 (ii)

```
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.32         0.31
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.00          0.296 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      70.95        12.89          70.37
     TOTAL RAINFALL   (mm)=      71.95        71.95          71.95
     RUNOFF COEFFICIENT   =       0.99         0.18           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.443     1.33    69.32
        + ID2= 2 (2102):     0.77   0.296     1.33    70.37
          ================================================
          ID = 3 (0009):     1.94   0.738     1.33    69.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.738      1.33      69.74
     OUTFLOW: ID= 1 (0005)     1.940      0.067      2.07      69.73

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.09
                    TIME SHIFT OF PEAK FLOW         (min)= 44.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.1008
```



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

--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.028     1.50    20.96
        + ID2= 2 (0005):     1.94   0.067     2.07    69.73
          ================================================
          ID = 3 (0004):     2.33   0.085     1.67    61.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  20.962
     TOTAL RAINFALL   (mm)=  71.949
     RUNOFF COEFFICIENT   =   0.291

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12          0.05
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.56          2.50
     Length            (m)=      88.32          4.00
     Mannings n            =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     139.71      ********
               over (min)         5.00          5.00
     Storage Coeff.  (min)=       1.82 (ii)     2.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00          5.00
     Unit Hyd. peak  (cms)=       0.32          0.30
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.43          0.01          0.443 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.33           1.33
     RUNOFF VOLUME    (mm)=      70.95         30.37          69.32
```

```
     TOTAL RAINFALL   (mm)=      71.95        71.95          71.95
     RUNOFF COEFFICIENT   =       0.99         0.42           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     139.71     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.83 (ii)    2.06 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.32         0.31
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.00          0.296 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      70.95        12.89          70.37
     TOTAL RAINFALL   (mm)=      71.95        71.95          71.95
     RUNOFF COEFFICIENT   =       0.99         0.18           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.443     1.33    69.32
        + ID2= 2 (0018):     0.77   0.296     1.33    70.37
          ================================================
```



```
          ID = 3 (0017):     1.94   0.738     1.33    69.74

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.028     1.50    20.96
        + ID2= 2 (0017):     1.94   0.738     1.33    69.74
          ================================================
          ID = 3 (0015):     2.33   0.756     1.33    61.57

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ***************************
  ** SIMULATION NUMBER:   6 **
  ***************************


--------------------
| 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
               0.17    2.89 |  1.17   60.52 |  2.17   14.14 |  3.17    4.10
               0.33    3.81 |  1.33  147.05 |  2.33   10.82 |  3.33    3.54
               0.50    5.26 |  1.50   77.70 |  2.50    8.55 |  3.50    3.08
               0.67    7.73 |  1.67   43.43 |  2.67    6.93 |  3.67    2.71
               0.83   12.46 |  1.83   27.74 |  2.83    5.73 |  3.83    2.40
               1.00   23.45 |  2.00   19.25 |  3.00    4.81 |  4.00    2.14


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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)= 0.193

PEAK FLOW (cms)= 0.130 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 28.559
TOTAL RAINFALL (mm)= 83.375
RUNOFF COEFFICIENT = 0.343

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

CALIB			
NASHYD (2101)	Area (ha)= 0.39	Curve Number (CN)= 63.4	
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.17		

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.034 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 27.259
TOTAL RAINFALL (mm)= 83.375
RUNOFF COEFFICIENT = 0.327

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

CALIB		
STANDHYD (2100)	Area (ha)= 1.17	
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.12	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.56	2.50
Length	(m)=	88.32	4.00

Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	147.05	62.81
over (min)		5.00	5.00
Storage Coeff. (min)	=	1.78 (ii)	2.18 (ii)
Unit Hyd. Tpeak (min)	=	5.00	5.00
Unit Hyd. peak (cms)	=	0.32	0.31

				TOTALS
PEAK FLOW	(cms)=	0.46	0.01	0.467 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	82.38	38.63	80.62
TOTAL RAINFALL	(mm)=	83.38	83.38	83.38
RUNOFF COEFFICIENT	=	0.99	0.46	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77	
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.76	0.01
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.50
Length	(m)=	71.65	4.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	147.05	24.16
over (min)		5.00	5.00
Storage Coeff. (min)	=	1.79 (ii)	2.02 (ii)
Unit Hyd. Tpeak (min)	=	5.00	5.00
Unit Hyd. peak (cms)	=	0.32	0.31

				TOTALS
PEAK FLOW	(cms)=	0.31	0.00	0.311 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	82.38	17.11	81.72
TOTAL RAINFALL	(mm)=	83.38	83.38	83.38
RUNOFF COEFFICIENT	=	0.99	0.21	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

ADD HYD (0009)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2100):	1.17	0.467	1.33	80.62
	+ ID2= 2 (2102):	0.77	0.311	1.33	81.72
	ID = 3 (0009):	1.94	0.778	1.33	81.06

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.778	1.33	81.06
OUTFLOW: ID= 1 (0005)	1.940	0.080	2.07	81.05

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.26
TIME SHIFT OF PEAK FLOW (min)= 44.00
MAXIMUM STORAGE USED (ha.m.)= 0.1144

ADD HYD (0004)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2101):	0.39	0.034	1.50	27.26
	+ ID2= 2 (0005):	1.94	0.080	2.07	81.05
	ID = 3 (0004):	2.33	0.102	1.68	72.05

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0012)	Area (ha)= 0.39	Curve Number (CN)= 63.4	
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.17		

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.034 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 27.259
TOTAL RAINFALL (mm)= 83.375
RUNOFF COEFFICIENT = 0.327

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

CALIB			
STANDHYD (0013)	Area (ha)= 1.17		
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.12	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.56	2.50
Length	(m)=	88.32	4.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		147.05	********
over (min)		5.00	5.00
Storage Coeff. (min)=		1.78 (ii)	2.18 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.32	0.31

				TOTALS
PEAK FLOW	(cms)=	0.46	0.01	0.467 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	82.38	38.63	80.62
TOTAL RAINFALL	(mm)=	83.38	83.38	83.38
RUNOFF COEFFICIENT	=	0.99	0.46	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (0018)	Area (ha)=	0.77

```
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     147.05     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.79 (ii)    2.02 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.32         0.31
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.31         0.00          0.311 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      82.38        17.11          81.72
     TOTAL RAINFALL   (mm)=      83.38        83.38          83.38
     RUNOFF COEFFICIENT   =       0.99         0.21           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.467     1.33    80.62
       + ID2= 2 (0018):     0.77   0.311     1.33    81.72
         ==================================================
         ID = 3 (0017):     1.94   0.778     1.33    81.06

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.034     1.50    27.26
       + ID2= 2 (0017):     1.94   0.778     1.33    81.06
         ==================================================
         ID = 3 (0015):     2.33   0.800     1.33    72.05
```



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

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  ***************************
  ** SIMULATION NUMBER:   7 **
  ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\1a8bfd12
| Ptotal= 28.55 mm |    Comments: 2-Year, 6 hour SCS Type II, Ganaraska Re
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    1.10 |  1.75    2.90 |  3.25    6.30 |  4.75    1.70
                0.50    1.10 |  2.00    2.90 |  3.50    6.30 |  5.00    1.70
                0.75    1.70 |  2.25    3.40 |  3.75    2.90 |  5.25    1.10
                1.00    1.70 |  2.50    3.40 |  4.00    2.90 |  5.50    1.10
                1.25    1.70 |  2.75   17.20 |  4.25    2.30 |  5.75    1.10
                1.50    1.70 |  3.00   44.60 |  4.50    2.30 |  6.00    1.10

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

--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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    1.10 | 1.583    2.90 | 3.083    6.30 |  4.58    1.70
               0.167    1.10 | 1.667    2.90 | 3.167    6.30 |  4.67    1.70
               0.250    1.10 | 1.750    2.90 | 3.250    6.30 |  4.75    1.70
               0.333    1.10 | 1.833    2.90 | 3.333    6.30 |  4.83    1.70
               0.417    1.10 | 1.917    2.90 | 3.417    6.30 |  4.92    1.70
               0.500    1.10 | 2.000    2.90 | 3.500    6.30 |  5.00    1.70
               0.583    1.70 | 2.083    3.40 | 3.583    2.90 |  5.08    1.10
               0.667    1.70 | 2.167    3.40 | 3.667    2.90 |  5.17    1.10
               0.750    1.70 | 2.250    3.40 | 3.750    2.90 |  5.25    1.10
               0.833    1.70 | 2.333    3.40 | 3.833    2.90 |  5.33    1.10
               0.917    1.70 | 2.417    3.40 | 3.917    2.90 |  5.42    1.10
               1.000    1.70 | 2.500    3.40 | 4.000    2.90 |  5.50    1.10
               1.083    1.70 | 2.583   17.20 | 4.083    2.30 |  5.58    1.10
               1.167    1.70 | 2.667   17.20 | 4.167    2.30 |  5.67    1.10
               1.250    1.70 | 2.750   17.20 | 4.250    2.30 |  5.75    1.10
               1.333    1.70 | 2.833   44.60 | 4.333    2.30 |  5.83    1.10
```

```
            1.417    1.70 | 2.917   44.60 | 4.417    2.30 |  5.92    1.10
            1.500    1.70 | 3.000   44.60 | 4.500    2.30 |  6.00    1.10

     Unit Hyd Qpeak  (cms)=   0.193

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   3.500
     RUNOFF VOLUME    (mm)=   2.948
     TOTAL RAINFALL   (mm)=  28.550
     RUNOFF COEFFICIENT   =   0.103

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   3.272
     TOTAL RAINFALL   (mm)=  28.550
     RUNOFF COEFFICIENT   =   0.115

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.12         0.05
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.56         2.50
     Length            (m)=     88.32         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     44.60        10.85
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      2.87 (ii)    3.51 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.28         0.26
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.14         0.00         0.140 (iii)
     TIME TO PEAK    (hrs)=      3.00         3.00          3.00
     RUNOFF VOLUME    (mm)=     27.55         5.32         26.66
     TOTAL RAINFALL   (mm)=     28.55        28.55         28.55
```



```
     RUNOFF COEFFICIENT   =      0.96         0.19          0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.76         0.01
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.50
     Length            (m)=     71.65         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     44.60         3.61
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      2.89 (ii)    3.25 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.28         0.27
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.09         0.00         0.094 (iii)
     TIME TO PEAK    (hrs)=      3.00         3.00          3.00
     RUNOFF VOLUME    (mm)=     27.55         1.82         27.29
     TOTAL RAINFALL   (mm)=     28.55        28.55         28.55
     RUNOFF COEFFICIENT   =      0.96         0.06          0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.140     3.00    26.66
        + ID2= 2 (2102):     0.77   0.094     3.00    27.29
          ==========================================================
          ID = 3 (0009):     1.94   0.234     3.00    26.91
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005) IN= 2---> OUT= 1 DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.234	3.00	26.91
OUTFLOW: ID= 1 (0005)	1.940	0.010	4.57	26.91

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.22
TIME SHIFT OF PEAK FLOW (min)= 94.00
MAXIMUM STORAGE USED (ha.m.)= 0.0375

ADD HYD (0004) 1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2101):	0.39	0.004	3.08	3.27
+ ID2= 2 (0005):	1.94	0.010	4.57	26.91
ID = 3 (0004):	2.33	0.014	3.08	22.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0012) ID= 1 DT= 5.0 min | Area (ha)= 0.39 | Curve Number (CN)= 63.4 | Ia (mm)= 4.90 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 3.083
RUNOFF VOLUME (mm)= 3.272
TOTAL RAINFALL (mm)= 28.550

RUNOFF COEFFICIENT = 0.115

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

CALIB
STANDHYD (0013) ID= 1 DT= 5.0 min | Area (ha)= 1.17 | Total Imp(%)= 96.00 | Dir. Conn.(%)= 96.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.12	0.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.56	2.50
Length (m)=	88.32	4.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	44.60	********
over (min)	5.00	5.00
Storage Coeff. (min)=	2.87 (ii)	3.51 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.28	0.26

			TOTALS
PEAK FLOW (cms)=	0.14	0.00	0.140 (iii)
TIME TO PEAK (hrs)=	3.00	3.00	3.00
RUNOFF VOLUME (mm)=	27.55	5.32	26.66
TOTAL RAINFALL (mm)=	28.55	28.55	28.55
RUNOFF COEFFICIENT =	0.96	0.19	0.93

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (0018) ID= 1 DT= 5.0 min | Area (ha)= 0.77 | Total Imp(%)= 99.00 | Dir. Conn.(%)= 99.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	0.76	0.01
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.00	2.50
Length (m)=	71.65	4.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	44.60	********
over (min)	5.00	5.00
Storage Coeff. (min)=	2.89 (ii)	3.25 (ii)

```
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.28         0.27
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.00          0.094 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      27.55         1.82          27.29
     TOTAL RAINFALL   (mm)=      28.55        28.55          28.55
     RUNOFF COEFFICIENT   =       0.96         0.06           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    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.

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--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.140     3.00    26.66
        + ID2= 2 (0018):     0.77   0.094     3.00    27.29
          ================================================
          ID = 3 (0017):     1.94   0.234     3.00    26.91

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.004     3.08     3.27
        + ID2= 2 (0017):     1.94   0.234     3.00    26.91
          ================================================
          ID = 3 (0015):     2.33   0.239     3.00    22.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ****************************
  ** SIMULATION NUMBER:   8 **
  ****************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\8747078d
```



```
| Ptotal= 39.33 mm |    Comments: 5-Year, 6 hour SCS Type II, Ganaraska Re
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.60	1.75	3.90	3.25	8.60	4.75	2.40
0.50	1.60	2.00	3.90	3.50	8.60	5.00	2.40
0.75	2.40	2.25	4.70	3.75	3.90	5.25	1.60
1.00	2.40	2.50	4.70	4.00	3.90	5.50	1.60
1.25	2.40	2.75	23.60	4.25	3.10	5.75	1.60
1.50	2.40	3.00	61.30	4.50	3.10	6.00	1.60

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--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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	1.60	1.583	3.90	3.083	8.60	4.58	2.40
0.167	1.60	1.667	3.90	3.167	8.60	4.67	2.40
0.250	1.60	1.750	3.90	3.250	8.60	4.75	2.40
0.333	1.60	1.833	3.90	3.333	8.60	4.83	2.40
0.417	1.60	1.917	3.90	3.417	8.60	4.92	2.40
0.500	1.60	2.000	3.90	3.500	8.60	5.00	2.40
0.583	2.40	2.083	4.70	3.583	3.90	5.08	1.60
0.667	2.40	2.167	4.70	3.667	3.90	5.17	1.60
0.750	2.40	2.250	4.70	3.750	3.90	5.25	1.60
0.833	2.40	2.333	4.70	3.833	3.90	5.33	1.60
0.917	2.40	2.417	4.70	3.917	3.90	5.42	1.60
1.000	2.40	2.500	4.70	4.000	3.90	5.50	1.60
1.083	2.40	2.583	23.60	4.083	3.10	5.58	1.60
1.167	2.40	2.667	23.60	4.167	3.10	5.67	1.60
1.250	2.40	2.750	23.60	4.250	3.10	5.75	1.60
1.333	2.40	2.833	61.30	4.333	3.10	5.83	1.60
1.417	2.40	2.917	61.30	4.417	3.10	5.92	1.60
1.500	2.40	3.000	61.30	4.500	3.10	6.00	1.60

```
     Unit Hyd Qpeak  (cms)=   0.193

     PEAK FLOW       (cms)=   0.026 (i)
     TIME TO PEAK    (hrs)=   3.417
     RUNOFF VOLUME    (mm)=   6.354
     TOTAL RAINFALL   (mm)=  39.325
     RUNOFF COEFFICIENT   =   0.162

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   6.521
     TOTAL RAINFALL   (mm)=  39.325
     RUNOFF COEFFICIENT   =   0.166

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

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--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      61.30        20.73
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.52 (ii)    3.09 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.00          0.194 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      38.32        10.25          37.20
     TOTAL RAINFALL   (mm)=      39.33        39.33          39.33
     RUNOFF COEFFICIENT   =       0.97         0.26           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  75.9    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.

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| CALIB            |
| STANDHYD  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      61.30         7.37
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.54 (ii)    2.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.28
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.00          0.130 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      38.32         3.74          37.98
     TOTAL RAINFALL   (mm)=      39.33        39.33          39.33
     RUNOFF COEFFICIENT   =       0.97         0.10           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.194     3.00    37.20
        + ID2= 2 (2102):     0.77   0.130     3.00    37.98
          ================================================
          ID = 3 (0009):     1.94   0.324     3.00    37.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0107     0.0490
                         0.0068     0.0001   |   0.0177     0.0518
                         0.0073     0.0051   |   0.0365     0.0695
```

```
                        0.0077     0.0101   |   0.0514      0.0844
                        0.0081     0.0142   |   0.0624      0.0960
                        0.0090     0.0251   |   0.0751      0.1089
                        0.0097     0.0348   |   0.0768      0.1108
                        0.0104     0.0444   |   0.0808      0.1156

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)      1.940      0.324      3.00      37.51
     OUTFLOW: ID= 1 (0005)      1.940      0.018      4.05      37.50

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.68
                   TIME SHIFT OF PEAK FLOW         (min)= 63.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0525

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.009     3.08     6.52
        + ID2= 2 (0005):     1.94   0.018     4.05    37.50
          ================================================
          ID = 3 (0004):     2.33   0.021     3.55    32.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   6.521
     TOTAL RAINFALL   (mm)=  39.325
     RUNOFF COEFFICIENT   =   0.166

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
```



```
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      61.30     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.52 (ii)    3.09 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.00          0.194 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00          3.00
     RUNOFF VOLUME    (mm)=      38.32        10.25         37.20
     TOTAL RAINFALL   (mm)=      39.33        39.33         39.33
     RUNOFF COEFFICIENT   =       0.97         0.26          0.95

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      61.30     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.54 (ii)    2.86 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.28
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.00          0.130 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00          3.00
     RUNOFF VOLUME    (mm)=      38.32         3.74         37.98
     TOTAL RAINFALL   (mm)=      39.33        39.33         39.33
     RUNOFF COEFFICIENT   =       0.97         0.10          0.97

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

```
          CN*  =  47.5    Ia = Dep. Storage  (Above)
     (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
          THAN THE STORAGE COEFFICIENT.
    (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
```

```
--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.194     3.00    37.20
       + ID2= 2 (0018):     0.77   0.130     3.00    37.98
         ================================================
         ID = 3 (0017):     1.94   0.324     3.00    37.51

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

```
--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.009     3.08     6.52
       + ID2= 2 (0017):     1.94   0.324     3.00    37.51
         ================================================
         ID = 3 (0015):     2.33   0.332     3.00    32.32

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

```
  ***************************
  ** SIMULATION NUMBER:   9 **
  ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\6873567e
| Ptotal= 45.00 mm |    Comments: 10-Year, 6 hour SCS Type II, Ganaraska R
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    1.80 |  1.75    4.50 |  3.25    9.90 |  4.75    2.70
                0.50    1.80 |  2.00    4.50 |  3.50    9.90 |  5.00    2.70
                0.75    2.70 |  2.25    5.40 |  3.75    4.50 |  5.25    1.80
                1.00    2.70 |  2.50    5.40 |  4.00    4.50 |  5.50    1.80
                1.25    2.70 |  2.75   27.00 |  4.25    3.60 |  5.75    1.80
                1.50    2.70 |  3.00   70.20 |  4.50    3.60 |  6.00    1.80
```

```
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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    1.80 | 1.583    4.50 | 3.083    9.90 |  4.58    2.70
             0.167    1.80 | 1.667    4.50 | 3.167    9.90 |  4.67    2.70
             0.250    1.80 | 1.750    4.50 | 3.250    9.90 |  4.75    2.70
             0.333    1.80 | 1.833    4.50 | 3.333    9.90 |  4.83    2.70
             0.417    1.80 | 1.917    4.50 | 3.417    9.90 |  4.92    2.70
             0.500    1.80 | 2.000    4.50 | 3.500    9.90 |  5.00    2.70
             0.583    2.70 | 2.083    5.40 | 3.583    4.50 |  5.08    1.80
             0.667    2.70 | 2.167    5.40 | 3.667    4.50 |  5.17    1.80
             0.750    2.70 | 2.250    5.40 | 3.750    4.50 |  5.25    1.80
             0.833    2.70 | 2.333    5.40 | 3.833    4.50 |  5.33    1.80
             0.917    2.70 | 2.417    5.40 | 3.917    4.50 |  5.42    1.80
             1.000    2.70 | 2.500    5.40 | 4.000    4.50 |  5.50    1.80
             1.083    2.70 | 2.583   27.00 | 4.083    3.60 |  5.58    1.80
             1.167    2.70 | 2.667   27.00 | 4.167    3.60 |  5.67    1.80
             1.250    2.70 | 2.750   27.00 | 4.250    3.60 |  5.75    1.80
             1.333    2.70 | 2.833   70.20 | 4.333    3.60 |  5.83    1.80
             1.417    2.70 | 2.917   70.20 | 4.417    3.60 |  5.92    1.80
             1.500    2.70 | 3.000   70.20 | 4.500    3.60 |  6.00    1.80

    Unit Hyd Qpeak  (cms)=   0.193

    PEAK FLOW       (cms)=   0.036 (i)
    TIME TO PEAK    (hrs)=   3.417
    RUNOFF VOLUME    (mm)=   8.544
    TOTAL RAINFALL   (mm)=  45.000
    RUNOFF COEFFICIENT   =   0.190

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

```
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

    Unit Hyd Qpeak  (cms)=   0.088

    PEAK FLOW       (cms)=   0.012 (i)
    TIME TO PEAK    (hrs)=   3.083
```

```
     RUNOFF VOLUME    (mm)=   8.580
     TOTAL RAINFALL   (mm)=  45.000
     RUNOFF COEFFICIENT   =   0.191

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      70.20        26.72
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.39 (ii)    2.93 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.28
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.00          0.222 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      44.00        13.26          42.77
     TOTAL RAINFALL   (mm)=      45.00        45.00          45.00
     RUNOFF COEFFICIENT   =       0.98         0.29           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      70.20         9.81
```



```
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.41 (ii)    2.71 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.00          0.149 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      44.00         4.99          43.61
     TOTAL RAINFALL   (mm)=      45.00        45.00          45.00
     RUNOFF COEFFICIENT   =       0.98         0.11           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.222     3.00    42.77
        + ID2= 2 (2102):     0.77   0.149     3.00    43.61
          ================================================
          ID = 3 (0009):     1.94   0.371     3.00    43.10

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.371      3.00      43.10
     OUTFLOW: ID= 1 (0005)     1.940      0.025      3.63      43.09

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  6.83
```

```
                  TIME SHIFT OF PEAK FLOW         (min)= 38.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0590

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

--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (2101):     0.39   0.012     3.08     8.58
       + ID2= 2 (0005):     1.94   0.025     3.63    43.09
         ================================================
         ID = 3 (0004):     2.33   0.031     3.10    37.32

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.012 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=   8.580
     TOTAL RAINFALL   (mm)=  45.000
     RUNOFF COEFFICIENT   =   0.191

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      70.20     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.39 (ii)    2.93 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.28
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.00         0.222 (iii)
```



```
     TIME TO PEAK    (hrs)=       3.00         3.00          3.00
     RUNOFF VOLUME    (mm)=      44.00        13.26         42.77
     TOTAL RAINFALL   (mm)=      45.00        45.00         45.00
     RUNOFF COEFFICIENT   =       0.98         0.29          0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      70.20     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.41 (ii)    2.71 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.00         0.149 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00          3.00
     RUNOFF VOLUME    (mm)=      44.00         4.99         43.61
     TOTAL RAINFALL   (mm)=      45.00        45.00         45.00
     RUNOFF COEFFICIENT   =       0.98         0.11          0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.222     3.00    42.77
```

```
        + ID2= 2 (0018):     0.77   0.149     3.00    43.61
          ================================================
          ID = 3 (0017):     1.94   0.371     3.00    43.10

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

```
--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.012     3.08     8.58
        + ID2= 2 (0017):     1.94   0.371     3.00    43.10
          ================================================
          ID = 3 (0015):     2.33   0.383     3.00    37.32

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

```
  ***************************
  ** SIMULATION NUMBER:  10 **
  ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\c63a1b17
| Ptotal= 61.77 mm |    Comments: 25-Year, 6 hour SCS Type II, Ganaraska R
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    2.50 |  1.75    6.20 |  3.25   13.60 |  4.75    3.70
                0.50    2.50 |  2.00    6.20 |  3.50   13.60 |  5.00    3.70
                0.75    3.70 |  2.25    7.40 |  3.75    6.20 |  5.25    2.50
                1.00    3.70 |  2.50    7.40 |  4.00    6.20 |  5.50    2.50
                1.25    3.70 |  2.75   37.00 |  4.25    4.90 |  5.75    2.50
                1.50    3.70 |  3.00   96.30 |  4.50    4.90 |  6.00    2.50
```

```
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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    2.50 | 1.583    6.20 | 3.083   13.60 |  4.58    3.70
                0.167    2.50 | 1.667    6.20 | 3.167   13.60 |  4.67    3.70
                0.250    2.50 | 1.750    6.20 | 3.250   13.60 |  4.75    3.70
                0.333    2.50 | 1.833    6.20 | 3.333   13.60 |  4.83    3.70
                0.417    2.50 | 1.917    6.20 | 3.417   13.60 |  4.92    3.70
                0.500    2.50 | 2.000    6.20 | 3.500   13.60 |  5.00    3.70
                0.583    3.70 | 2.083    7.40 | 3.583    6.20 |  5.08    2.50
                0.667    3.70 | 2.167    7.40 | 3.667    6.20 |  5.17    2.50
                0.750    3.70 | 2.250    7.40 | 3.750    6.20 |  5.25    2.50
                0.833    3.70 | 2.333    7.40 | 3.833    6.20 |  5.33    2.50
                0.917    3.70 | 2.417    7.40 | 3.917    6.20 |  5.42    2.50
                1.000    3.70 | 2.500    7.40 | 4.000    6.20 |  5.50    2.50
                1.083    3.70 | 2.583   37.00 | 4.083    4.90 |  5.58    2.50
                1.167    3.70 | 2.667   37.00 | 4.167    4.90 |  5.67    2.50
                1.250    3.70 | 2.750   37.00 | 4.250    4.90 |  5.75    2.50
                1.333    3.70 | 2.833   96.30 | 4.333    4.90 |  5.83    2.50
                1.417    3.70 | 2.917   96.30 | 4.417    4.90 |  5.92    2.50
                1.500    3.70 | 3.000   96.30 | 4.500    4.90 |  6.00    2.50

     Unit Hyd Qpeak  (cms)=   0.193

     PEAK FLOW       (cms)=   0.071 (i)
     TIME TO PEAK    (hrs)=   3.417
     RUNOFF VOLUME    (mm)=  16.318
     TOTAL RAINFALL   (mm)=  61.775
     RUNOFF COEFFICIENT   =   0.264

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

```
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  15.838
     TOTAL RAINFALL   (mm)=  61.775
     RUNOFF COEFFICIENT   =   0.256

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

```
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	96.30	46.73	
over (min)		5.00	5.00	
Storage Coeff.	(min)=	2.11 (ii)	2.58 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.31	0.29	
				TOTALS
PEAK FLOW	(cms)=	0.30	0.01	0.307 (iii)
TIME TO PEAK	(hrs)=	3.00	3.00	3.00
RUNOFF VOLUME	(mm)=	60.77	23.46	59.28
TOTAL RAINFALL	(mm)=	61.78	61.78	61.78
RUNOFF COEFFICIENT	=	0.98	0.38	0.96

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)=	0.77	
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.76	0.01	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.50	
Length	(m)=	71.65	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	96.30	18.67	
over (min)		5.00	5.00	
Storage Coeff.	(min)=	2.12 (ii)	2.39 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.31	0.30	
				TOTALS
PEAK FLOW	(cms)=	0.20	0.00	0.204 (iii)
TIME TO PEAK	(hrs)=	3.00	3.00	3.00
RUNOFF VOLUME	(mm)=	60.78	9.55	60.26
TOTAL RAINFALL	(mm)=	61.78	61.78	61.78
RUNOFF COEFFICIENT	=	0.98	0.15	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0009)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2100):	1.17	0.307	3.00	59.28
	+ ID2= 2 (2102):	0.77	0.204	3.00	60.26
	ID = 3 (0009):	1.94	0.511	3.00	59.67

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)					
IN= 2---> OUT= 1					
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
	0.0000	0.0000	0.0107	0.0490	
	0.0068	0.0001	0.0177	0.0518	
	0.0073	0.0051	0.0365	0.0695	
	0.0077	0.0101	0.0514	0.0844	
	0.0081	0.0142	0.0624	0.0960	
	0.0090	0.0251	0.0751	0.1089	
	0.0097	0.0348	0.0768	0.1108	
	0.0104	0.0444	0.0808	0.1156	

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.511	3.00	59.67
OUTFLOW: ID= 1 (0005)	1.940	0.047	3.57	59.66

PEAK FLOW REDUCTION [Qout/Qin](%)= 9.25
TIME SHIFT OF PEAK FLOW (min)= 34.00
MAXIMUM STORAGE USED (ha.m.)= 0.0803

ADD HYD (0004)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2101):	0.39	0.022	3.08	15.84
	+ ID2= 2 (0005):	1.94	0.047	3.57	59.66

```
          ID = 3 (0004):     2.33   0.064     3.08    52.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.022 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  15.838
     TOTAL RAINFALL   (mm)=  61.775
     RUNOFF COEFFICIENT   =   0.256

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      96.30     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.11 (ii)    2.58 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.30         0.01          0.307 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      60.77        23.46          59.28
     TOTAL RAINFALL   (mm)=      61.78        61.78          61.78
     RUNOFF COEFFICIENT   =       0.98         0.38           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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.
```



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--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      96.30     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.12 (ii)    2.39 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.20         0.00          0.204 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      60.78         9.55          60.26
     TOTAL RAINFALL   (mm)=      61.78        61.78          61.78
     RUNOFF COEFFICIENT   =       0.98         0.15           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.307     3.00    59.28
        + ID2= 2 (0018):     0.77   0.204     3.00    60.26
          ================================================
          ID = 3 (0017):     1.94   0.511     3.00    59.67

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

```
  ID1= 1 (0012):     0.39   0.022     3.08    15.84
+ ID2= 2 (0017):     1.94   0.511     3.00    59.67
  ================================================
  ID = 3 (0015):     2.33   0.533     3.00    52.33

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

```
 ***************************
 ** SIMULATION NUMBER:  11 **
 ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\9a23b394
| Ptotal= 74.28 mm |    Comments: 50-Year, 6 hour SCS Type II, Ganaraska R
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    3.00 |  1.75    7.40 |  3.25   16.30 |  4.75    4.50
                0.50    3.00 |  2.00    7.40 |  3.50   16.30 |  5.00    4.50
                0.75    4.50 |  2.25    8.90 |  3.75    7.40 |  5.25    3.00
                1.00    4.50 |  2.50    8.90 |  4.00    7.40 |  5.50    3.00
                1.25    4.50 |  2.75   44.50 |  4.25    5.90 |  5.75    3.00
                1.50    4.50 |  3.00  115.80 |  4.50    5.90 |  6.00    3.00
```

```
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

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


                        ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    3.00 | 1.583    7.40 | 3.083   16.30 |  4.58    4.50
               0.167    3.00 | 1.667    7.40 | 3.167   16.30 |  4.67    4.50
               0.250    3.00 | 1.750    7.40 | 3.250   16.30 |  4.75    4.50
               0.333    3.00 | 1.833    7.40 | 3.333   16.30 |  4.83    4.50
               0.417    3.00 | 1.917    7.40 | 3.417   16.30 |  4.92    4.50
               0.500    3.00 | 2.000    7.40 | 3.500   16.30 |  5.00    4.50
               0.583    4.50 | 2.083    8.90 | 3.583    7.40 |  5.08    3.00
               0.667    4.50 | 2.167    8.90 | 3.667    7.40 |  5.17    3.00
               0.750    4.50 | 2.250    8.90 | 3.750    7.40 |  5.25    3.00
               0.833    4.50 | 2.333    8.90 | 3.833    7.40 |  5.33    3.00
               0.917    4.50 | 2.417    8.90 | 3.917    7.40 |  5.42    3.00
```



```
               1.000    4.50 | 2.500    8.90 | 4.000    7.40 |  5.50    3.00
               1.083    4.50 | 2.583   44.50 | 4.083    5.90 |  5.58    3.00
               1.167    4.50 | 2.667   44.50 | 4.167    5.90 |  5.67    3.00
               1.250    4.50 | 2.750   44.50 | 4.250    5.90 |  5.75    3.00
               1.333    4.50 | 2.833  115.80 | 4.333    5.90 |  5.83    3.00
               1.417    4.50 | 2.917  115.80 | 4.417    5.90 |  5.92    3.00
               1.500    4.50 | 3.000  115.80 | 4.500    5.90 |  6.00    3.00

     Unit Hyd Qpeak  (cms)=   0.193

     PEAK FLOW       (cms)=   0.101 (i)
     TIME TO PEAK    (hrs)=   3.417
     RUNOFF VOLUME    (mm)=  23.143
     TOTAL RAINFALL   (mm)=  74.275
     RUNOFF COEFFICIENT   =   0.312

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

```
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.031 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  22.201
     TOTAL RAINFALL   (mm)=  74.275
     RUNOFF COEFFICIENT   =   0.299

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

```
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12          0.05
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.56          2.50
     Length            (m)=      88.32          4.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     115.80         63.35
               over (min)        5.00          5.00
     Storage Coeff.  (min)=       1.96 (ii)     2.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00          5.00
     Unit Hyd. peak  (cms)=       0.31          0.30
```

```
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.36         0.01          0.370 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      73.28        32.01          71.62
     TOTAL RAINFALL   (mm)=      74.28        74.28          74.28
     RUNOFF COEFFICIENT   =       0.99         0.43           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     115.80        26.77
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.97 (ii)    2.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.25         0.00          0.246 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      73.27        13.71          72.68
     TOTAL RAINFALL   (mm)=      74.28        74.28          74.28
     RUNOFF COEFFICIENT   =       0.99         0.18           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```



```
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.370     3.00    71.62
        + ID2= 2 (2102):     0.77   0.246     3.00    72.68
          ================================================
          ID = 3 (0009):     1.94   0.616     3.00    72.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107     0.0490
                          0.0068     0.0001   |   0.0177     0.0518
                          0.0073     0.0051   |   0.0365     0.0695
                          0.0077     0.0101   |   0.0514     0.0844
                          0.0081     0.0142   |   0.0624     0.0960
                          0.0090     0.0251   |   0.0751     0.1089
                          0.0097     0.0348   |   0.0768     0.1108
                          0.0104     0.0444   |   0.0808     0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.616      3.00      72.04
     OUTFLOW: ID= 1 (0005)     1.940      0.063      3.55      72.03

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.17
                TIME SHIFT OF PEAK FLOW         (min)= 33.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0962

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.031     3.08    22.20
        + ID2= 2 (0005):     1.94   0.063     3.55    72.03
          ================================================
          ID = 3 (0004):     2.33   0.089     3.08    63.69

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088
```

```
     PEAK FLOW       (cms)=   0.031 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  22.201
     TOTAL RAINFALL   (mm)=  74.275
     RUNOFF COEFFICIENT   =   0.299

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     115.80     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.96 (ii)    2.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.36         0.01          0.370 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      73.28        32.01          71.62
     TOTAL RAINFALL   (mm)=      74.28        74.28          74.28
     RUNOFF COEFFICIENT   =       0.99         0.43           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
```



```
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     115.80     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.97 (ii)    2.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.25         0.00          0.246 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      73.27        13.71          72.68
     TOTAL RAINFALL   (mm)=      74.28        74.28          74.28
     RUNOFF COEFFICIENT   =       0.99         0.18           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.370     3.00    71.62
        + ID2= 2 (0018):     0.77   0.246     3.00    72.68
          ================================================
          ID = 3 (0017):     1.94   0.616     3.00    72.04

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.031     3.08    22.20
        + ID2= 2 (0017):     1.94   0.616     3.00    72.04
          ================================================
          ID = 3 (0015):     2.33   0.646     3.00    63.70

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ***************************
  ** SIMULATION NUMBER:  12 **
  ***************************
```

```
--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\b1dc7871
| Ptotal= 86.45 mm |    Comments: 100-Year, 6 hour SCS Type II, Ganaraska
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	3.50	1.75	8.60	3.25	19.00	4.75	5.20
0.50	3.50	2.00	8.60	3.50	19.00	5.00	5.20
0.75	5.20	2.25	10.40	3.75	8.60	5.25	3.50
1.00	5.20	2.50	10.40	4.00	8.60	5.50	3.50
1.25	5.20	2.75	51.80	4.25	6.90	5.75	3.50
1.50	5.20	3.00	134.80	4.50	6.90	6.00	3.50

```
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.50	1.583	8.60	3.083	19.00	4.58	5.20
0.167	3.50	1.667	8.60	3.167	19.00	4.67	5.20
0.250	3.50	1.750	8.60	3.250	19.00	4.75	5.20
0.333	3.50	1.833	8.60	3.333	19.00	4.83	5.20
0.417	3.50	1.917	8.60	3.417	19.00	4.92	5.20
0.500	3.50	2.000	8.60	3.500	19.00	5.00	5.20
0.583	5.20	2.083	10.40	3.583	8.60	5.08	3.50
0.667	5.20	2.167	10.40	3.667	8.60	5.17	3.50
0.750	5.20	2.250	10.40	3.750	8.60	5.25	3.50
0.833	5.20	2.333	10.40	3.833	8.60	5.33	3.50
0.917	5.20	2.417	10.40	3.917	8.60	5.42	3.50
1.000	5.20	2.500	10.40	4.000	8.60	5.50	3.50
1.083	5.20	2.583	51.80	4.083	6.90	5.58	3.50
1.167	5.20	2.667	51.80	4.167	6.90	5.67	3.50
1.250	5.20	2.750	51.80	4.250	6.90	5.75	3.50
1.333	5.20	2.833	134.80	4.333	6.90	5.83	3.50
1.417	5.20	2.917	134.80	4.417	6.90	5.92	3.50
1.500	5.20	3.000	134.80	4.500	6.90	6.00	3.50

```
    Unit Hyd Qpeak  (cms)=   0.193

    PEAK FLOW       (cms)=   0.135 (i)
    TIME TO PEAK    (hrs)=   3.417
```



```
    RUNOFF VOLUME    (mm)=  30.463
    TOTAL RAINFALL   (mm)=  86.450
    RUNOFF COEFFICIENT   =   0.352

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

    Unit Hyd Qpeak  (cms)=   0.088

    PEAK FLOW       (cms)=   0.041 (i)
    TIME TO PEAK    (hrs)=   3.083
    RUNOFF VOLUME    (mm)=  29.041
    TOTAL RAINFALL   (mm)=  86.450
    RUNOFF COEFFICIENT   =   0.336

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
    Surface Area     (ha)=        1.12          0.05
    Dep. Storage     (mm)=        1.00          5.00
    Average Slope     (%)=        1.56          2.50
    Length            (m)=       88.32          4.00
    Mannings n           =       0.013         0.250

    Max.Eff.Inten.(mm/hr)=      134.80         80.46
              over (min)          5.00          5.00
    Storage Coeff.  (min)=        1.84 (ii)     2.25 (ii)
    Unit Hyd. Tpeak (min)=        5.00          5.00
    Unit Hyd. peak  (cms)=        0.32          0.30
                                                          *TOTALS*
    PEAK FLOW       (cms)=        0.42          0.01          0.431 (iii)
    TIME TO PEAK    (hrs)=        3.00          3.00           3.00
    RUNOFF VOLUME    (mm)=       85.45         40.93          83.67
    TOTAL RAINFALL   (mm)=       86.45         86.45          86.45
    RUNOFF COEFFICIENT   =        0.99          0.47           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
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```
          THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     134.80        35.69
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       1.86 (ii)    2.09 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.32         0.31
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.29         0.00          0.286 (iii)
     TIME TO PEAK    (hrs)=       3.00         3.00           3.00
     RUNOFF VOLUME    (mm)=      85.45        18.32          84.78
     TOTAL RAINFALL   (mm)=      86.45        86.45          86.45
     RUNOFF COEFFICIENT   =       0.99         0.21           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.431     3.00    83.67
        + ID2= 2 (2102):     0.77   0.286     3.00    84.78
          ================================================
          ID = 3 (0009):     1.94   0.718     3.00    84.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
```



```
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)      1.940      0.718      3.00      84.11
     OUTFLOW: ID= 1 (0005)      1.940      0.078      3.53      84.10

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.81
                    TIME SHIFT OF PEAK FLOW         (min)= 32.00
                    MAXIMUM  STORAGE   USED       (ha.m.)=  0.1118

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.041     3.08    29.04
        + ID2= 2 (0005):     1.94   0.078     3.53    84.10
          ================================================
          ID = 3 (0004):     2.33   0.114     3.08    74.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.041 (i)
     TIME TO PEAK    (hrs)=   3.083
     RUNOFF VOLUME    (mm)=  29.041
     TOTAL RAINFALL   (mm)=  86.450
     RUNOFF COEFFICIENT   =   0.336

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

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--------------------
| CALIB            |
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| STANDHYD (0013) | Area (ha)= 1.17
|ID= 1 DT= 5.0 min | Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		134.80	********	
over (min)		5.00	5.00	
Storage Coeff. (min)=		1.84 (ii)	2.25 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.32	0.30	
				TOTALS
PEAK FLOW	(cms)=	0.42	0.01	0.431 (iii)
TIME TO PEAK	(hrs)=	3.00	3.00	3.00
RUNOFF VOLUME	(mm)=	85.45	40.93	83.67
TOTAL RAINFALL	(mm)=	86.45	86.45	86.45
RUNOFF COEFFICIENT	=	0.99	0.47	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (0018) | Area (ha)= 0.77
|ID= 1 DT= 5.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.76	0.01	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.50	
Length	(m)=	71.65	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		134.80	********	
over (min)		5.00	5.00	
Storage Coeff. (min)=		1.86 (ii)	2.09 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.32	0.31	
				TOTALS
PEAK FLOW	(cms)=	0.29	0.00	0.286 (iii)
TIME TO PEAK	(hrs)=	3.00	3.00	3.00
RUNOFF VOLUME	(mm)=	85.45	18.32	84.78
TOTAL RAINFALL	(mm)=	86.45	86.45	86.45

RUNOFF COEFFICIENT =	0.99	0.21	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

| ADD HYD (0017) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0013):	1.17	0.431	3.00	83.67
+ ID2= 2 (0018):	0.77	0.286	3.00	84.78
ID = 3 (0017):	1.94	0.718	3.00	84.11

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| ADD HYD (0015) |
| 1 + 2 = 3 |

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0012):	0.39	0.041	3.08	29.04
+ ID2= 2 (0017):	1.94	0.718	3.00	84.11
ID = 3 (0015):	2.33	0.758	3.00	74.89

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 13 **
****

| READ STORM | Filename: C:\Users\csokol\AppData\Local\Temp\27f1d0b1-c568-477a-8e6b-cf8f29233bf8\55c3ee2f
| Ptotal= 29.00 mm | Comments: 2-Year, 12 hour SCS Type II, Ganaraska R

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.70	3.25	1.20	6.25	5.20	9.25	1.00
0.50	0.70	3.50	1.20	6.50	5.20	9.50	1.00
0.75	0.70	3.75	1.20	6.75	2.30	9.75	1.00

1.00	0.70	4.00	1.20	7.00	2.30	10.00	1.00
1.25	0.70	4.25	1.70	7.25	1.70	10.25	0.60
1.50	0.70	4.50	1.70	7.50	1.70	10.50	0.60
1.75	0.70	4.75	2.30	7.75	1.70	10.75	0.60
2.00	0.70	5.00	2.30	8.00	1.70	11.00	0.60
2.25	0.90	5.25	3.50	8.25	1.00	11.25	0.60
2.50	0.90	5.50	3.50	8.50	1.00	11.50	0.60
2.75	0.90	5.75	14.00	8.75	1.00	11.75	0.60
3.00	0.90	6.00	38.40	9.00	1.00	12.00	0.60

CALIB			
NASHYD (1100)	Area (ha)=	2.33	Curve Number (CN)= 67.2
ID= 1 DT= 5.0 min	Ia (mm)=	7.90	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.46	

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	0.70	3.083	1.20	6.083	5.20	9.08	1.00
0.167	0.70	3.167	1.20	6.167	5.20	9.17	1.00
0.250	0.70	3.250	1.20	6.250	5.20	9.25	1.00
0.333	0.70	3.333	1.20	6.333	5.20	9.33	1.00
0.417	0.70	3.417	1.20	6.417	5.20	9.42	1.00
0.500	0.70	3.500	1.20	6.500	5.20	9.50	1.00
0.583	0.70	3.583	1.20	6.583	2.30	9.58	1.00
0.667	0.70	3.667	1.20	6.667	2.30	9.67	1.00
0.750	0.70	3.750	1.20	6.750	2.30	9.75	1.00
0.833	0.70	3.833	1.20	6.833	2.30	9.83	1.00
0.917	0.70	3.917	1.20	6.917	2.30	9.92	1.00
1.000	0.70	4.000	1.20	7.000	2.30	10.00	1.00
1.083	0.70	4.083	1.70	7.083	1.70	10.08	0.60
1.167	0.70	4.167	1.70	7.167	1.70	10.17	0.60
1.250	0.70	4.250	1.70	7.250	1.70	10.25	0.60
1.333	0.70	4.333	1.70	7.333	1.70	10.33	0.60
1.417	0.70	4.417	1.70	7.417	1.70	10.42	0.60
1.500	0.70	4.500	1.70	7.500	1.70	10.50	0.60
1.583	0.70	4.583	2.30	7.583	1.70	10.58	0.60
1.667	0.70	4.667	2.30	7.667	1.70	10.67	0.60
1.750	0.70	4.750	2.30	7.750	1.70	10.75	0.60
1.833	0.70	4.833	2.30	7.833	1.70	10.83	0.60
1.917	0.70	4.917	2.30	7.917	1.70	10.92	0.60
2.000	0.70	5.000	2.30	8.000	1.70	11.00	0.60
2.083	0.90	5.083	3.50	8.083	1.00	11.08	0.60
2.167	0.90	5.167	3.50	8.167	1.00	11.17	0.60
2.250	0.90	5.250	3.50	8.250	1.00	11.25	0.60
2.333	0.90	5.333	3.50	8.333	1.00	11.33	0.60
2.417	0.90	5.417	3.50	8.417	1.00	11.42	0.60

2.500	0.90	5.500	3.50	8.500	1.00	11.50	0.60
2.583	0.90	5.583	14.00	8.583	1.00	11.58	0.60
2.667	0.90	5.667	14.00	8.667	1.00	11.67	0.60
2.750	0.90	5.750	14.00	8.750	1.00	11.75	0.60
2.833	0.90	5.833	38.40	8.833	1.00	11.83	0.60
2.917	0.90	5.917	38.40	8.917	1.00	11.92	0.60
3.000	0.90	6.000	38.40	9.000	1.00	12.00	0.60

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.010 (i)
TIME TO PEAK (hrs)= 6.417
RUNOFF VOLUME (mm)= 3.068
TOTAL RAINFALL (mm)= 29.000
RUNOFF COEFFICIENT = 0.106

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

CALIB			
NASHYD (2101)	Area (ha)=	0.39	Curve Number (CN)= 63.4
ID= 1 DT= 5.0 min	Ia (mm)=	4.90	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.17	

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 6.083
RUNOFF VOLUME (mm)= 3.389
TOTAL RAINFALL (mm)= 29.000
RUNOFF COEFFICIENT = 0.117

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

CALIB			
STANDHYD (2100)	Area (ha)=	1.17	
ID= 1 DT= 5.0 min	Total Imp(%)=	96.00	Dir. Conn.(%)= 96.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	1.12	0.05
Dep. Storage (mm)=	1.00	5.00
Average Slope (%)=	1.56	2.50
Length (m)=	88.32	4.00
Mannings n =	0.013	0.250
Max.Eff.Inten.(mm/hr)=	38.40	9.36
over (min)	5.00	5.00
Storage Coeff. (min)=	3.04 (ii)	3.73 (ii)
Unit Hyd. Tpeak (min)=	5.00	5.00
Unit Hyd. peak (cms)=	0.27	0.25

				TOTALS	
PEAK FLOW	(cms)=	0.12	0.00	0.121	(iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00	
RUNOFF VOLUME	(mm)=	28.00	5.50	27.10	
TOTAL RAINFALL	(mm)=	29.00	29.00	29.00	
RUNOFF COEFFICIENT	=	0.97	0.19	0.93	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)=	0.77	
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.76	0.01
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.50
Length	(m)=	71.65	4.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		38.40	3.12
over (min)		5.00	5.00
Storage Coeff. (min)=		3.07 (ii)	3.45 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.27	0.26

				TOTALS	
PEAK FLOW	(cms)=	0.08	0.00	0.081	(iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00	
RUNOFF VOLUME	(mm)=	28.00	1.89	27.74	
TOTAL RAINFALL	(mm)=	29.00	29.00	29.00	
RUNOFF COEFFICIENT	=	0.97	0.07	0.96	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0009)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.

		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2100):		1.17	0.121	6.00	27.10
+ ID2= 2 (2102):		0.77	0.081	6.00	27.74
ID = 3 (0009):		1.94	0.201	6.00	27.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.201	6.00	27.35
OUTFLOW: ID= 1 (0005)	1.940	0.009	7.12	27.35

PEAK FLOW REDUCTION [Qout/Qin](%)= 4.66
TIME SHIFT OF PEAK FLOW (min)= 67.00
MAXIMUM STORAGE USED (ha.m.)= 0.0306

ADD HYD (0004)					
1 + 2 = 3	AREA	QPEAK	TPEAK	R.V.	
	(ha)	(cms)	(hrs)	(mm)	
ID1= 1 (2101):	0.39	0.004	6.08	3.39	
+ ID2= 2 (0005):	1.94	0.009	7.12	27.35	
ID = 3 (0004):	2.33	0.013	6.08	23.34	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB				
NASHYD (0012)	Area (ha)=	0.39	Curve Number (CN)=	63.4
ID= 1 DT= 5.0 min	Ia (mm)=	4.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.17		

Unit Hyd Qpeak (cms)= 0.088

```
     PEAK FLOW       (cms)=   0.004 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   3.389
     TOTAL RAINFALL   (mm)=  29.000
     RUNOFF COEFFICIENT   =   0.117

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

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--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      38.40     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.04 (ii)    3.73 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.27         0.25
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.00          0.121 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      28.00         5.50          27.10
     TOTAL RAINFALL   (mm)=      29.00        29.00          29.00
     RUNOFF COEFFICIENT   =       0.97         0.19           0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
```



```
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      38.40     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.07 (ii)    3.45 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.27         0.26
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.08         0.00          0.081 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      28.00         1.89          27.74
     TOTAL RAINFALL   (mm)=      29.00        29.00          29.00
     RUNOFF COEFFICIENT   =       0.97         0.07           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.121     6.00    27.10
        + ID2= 2 (0018):     0.77   0.081     6.00    27.74
          ================================================
          ID = 3 (0017):     1.94   0.201     6.00    27.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.004     6.08     3.39
        + ID2= 2 (0017):     1.94   0.201     6.00    27.35
          ================================================
          ID = 3 (0015):     2.33   0.205     6.00    23.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ***************************
  ** SIMULATION NUMBER:  14 **
  ***************************
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--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\4d1e55f1
| Ptotal= 40.10 mm |    Comments: 5-Year, 12 hour SCS Type II, Ganaraska R
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.00	3.25	1.60	6.25	7.20	9.25	1.40
0.50	1.00	3.50	1.60	6.50	7.20	9.50	1.40
0.75	1.00	3.75	1.60	6.75	3.20	9.75	1.40
1.00	1.00	4.00	1.60	7.00	3.20	10.00	1.40
1.25	1.00	4.25	2.40	7.25	2.40	10.25	0.80
1.50	1.00	4.50	2.40	7.50	2.40	10.50	0.80
1.75	1.00	4.75	3.20	7.75	2.40	10.75	0.80
2.00	1.00	5.00	3.20	8.00	2.40	11.00	0.80
2.25	1.20	5.25	4.80	8.25	1.40	11.25	0.80
2.50	1.20	5.50	4.80	8.50	1.40	11.50	0.80
2.75	1.20	5.75	19.30	8.75	1.40	11.75	0.80
3.00	1.20	6.00	53.10	9.00	1.40	12.00	0.80

```
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46
```

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	1.00	3.083	1.60	6.083	7.20	9.08	1.40
0.167	1.00	3.167	1.60	6.167	7.20	9.17	1.40
0.250	1.00	3.250	1.60	6.250	7.20	9.25	1.40
0.333	1.00	3.333	1.60	6.333	7.20	9.33	1.40
0.417	1.00	3.417	1.60	6.417	7.20	9.42	1.40
0.500	1.00	3.500	1.60	6.500	7.20	9.50	1.40
0.583	1.00	3.583	1.60	6.583	3.20	9.58	1.40
0.667	1.00	3.667	1.60	6.667	3.20	9.67	1.40
0.750	1.00	3.750	1.60	6.750	3.20	9.75	1.40
0.833	1.00	3.833	1.60	6.833	3.20	9.83	1.40
0.917	1.00	3.917	1.60	6.917	3.20	9.92	1.40
1.000	1.00	4.000	1.60	7.000	3.20	10.00	1.40
1.083	1.00	4.083	2.40	7.083	2.40	10.08	0.80
1.167	1.00	4.167	2.40	7.167	2.40	10.17	0.80
1.250	1.00	4.250	2.40	7.250	2.40	10.25	0.80
1.333	1.00	4.333	2.40	7.333	2.40	10.33	0.80
1.417	1.00	4.417	2.40	7.417	2.40	10.42	0.80

1.500	1.00	4.500	2.40	7.500	2.40	10.50	0.80
1.583	1.00	4.583	3.20	7.583	2.40	10.58	0.80
1.667	1.00	4.667	3.20	7.667	2.40	10.67	0.80
1.750	1.00	4.750	3.20	7.750	2.40	10.75	0.80
1.833	1.00	4.833	3.20	7.833	2.40	10.83	0.80
1.917	1.00	4.917	3.20	7.917	2.40	10.92	0.80
2.000	1.00	5.000	3.20	8.000	2.40	11.00	0.80
2.083	1.20	5.083	4.80	8.083	1.40	11.08	0.80
2.167	1.20	5.167	4.80	8.167	1.40	11.17	0.80
2.250	1.20	5.250	4.80	8.250	1.40	11.25	0.80
2.333	1.20	5.333	4.80	8.333	1.40	11.33	0.80
2.417	1.20	5.417	4.80	8.417	1.40	11.42	0.80
2.500	1.20	5.500	4.80	8.500	1.40	11.50	0.80
2.583	1.20	5.583	19.30	8.583	1.40	11.58	0.80
2.667	1.20	5.667	19.30	8.667	1.40	11.67	0.80
2.750	1.20	5.750	19.30	8.750	1.40	11.75	0.80
2.833	1.20	5.833	53.10	8.833	1.40	11.83	0.80
2.917	1.20	5.917	53.10	8.917	1.40	11.92	0.80
3.000	1.20	6.000	53.10	9.000	1.40	12.00	0.80

```
     Unit Hyd Qpeak  (cms)=   0.193

     PEAK FLOW       (cms)=   0.024 (i)
     TIME TO PEAK    (hrs)=   6.417
     RUNOFF VOLUME    (mm)=   6.638
     TOTAL RAINFALL   (mm)=  40.100
     RUNOFF COEFFICIENT   =   0.166

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

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--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   6.789
     TOTAL RAINFALL   (mm)=  40.100
     RUNOFF COEFFICIENT   =   0.169

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

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--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
```

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	53.10	18.02	
over (min)		5.00	5.00	
Storage Coeff.	(min)=	2.67 (ii)	3.27 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.29	0.27	
				TOTALS
PEAK FLOW	(cms)=	0.17	0.00	0.168 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	39.10	10.64	37.96
TOTAL RAINFALL	(mm)=	40.10	40.10	40.10
RUNOFF COEFFICIENT	=	0.98	0.27	0.95

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)=	0.77	
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.76	0.01	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.50	
Length	(m)=	71.65	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	53.10	6.41	
over (min)		5.00	5.00	
Storage Coeff.	(min)=	2.69 (ii)	3.03 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	5.00	
Unit Hyd. peak	(cms)=	0.29	0.27	
				TOTALS
PEAK FLOW	(cms)=	0.11	0.00	0.112 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	39.10	3.90	38.75
TOTAL RAINFALL	(mm)=	40.10	40.10	40.10
RUNOFF COEFFICIENT	=	0.98	0.10	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0009)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2100):	1.17	0.168	6.00	37.96
+ ID2= 2 (2102):	0.77	0.112	6.00	38.75
ID = 3 (0009):	1.94	0.280	6.00	38.27

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.280	6.00	38.27
OUTFLOW: ID= 1 (0005)	1.940	0.011	8.03	38.27

PEAK FLOW REDUCTION [Qout/Qin](%)= 3.76
TIME SHIFT OF PEAK FLOW (min)=122.00
MAXIMUM STORAGE USED (ha.m.)= 0.0465

ADD HYD (0004)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (2101):	0.39	0.008	6.08	6.79
+ ID2= 2 (0005):	1.94	0.011	8.03	38.27

```
          ID = 3 (0004):     2.33   0.018     6.08    33.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   6.789
     TOTAL RAINFALL   (mm)=  40.100
     RUNOFF COEFFICIENT   =   0.169

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      53.10     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.67 (ii)    3.27 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.00          0.168 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      39.10        10.64          37.96
     TOTAL RAINFALL   (mm)=      40.10        40.10          40.10
     RUNOFF COEFFICIENT   =       0.98         0.27           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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.
```



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--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      53.10     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.69 (ii)    3.03 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.00          0.112 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      39.10         3.90          38.75
     TOTAL RAINFALL   (mm)=      40.10        40.10          40.10
     RUNOFF COEFFICIENT   =       0.98         0.10           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.168     6.00    37.96
        + ID2= 2 (0018):     0.77   0.112     6.00    38.75
          ================================================
          ID = 3 (0017):     1.94   0.280     6.00    38.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```

ID1= 1 (0012):	0.39	0.008	6.08	6.79
+ ID2= 2 (0017):	1.94	0.280	6.00	38.27
ID = 3 (0015):	2.33	0.288	6.00	33.00

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 15 **
****

READ STORM | Filename: C:\Users\csokol\AppData\Local\Temp\27f1d0b1-c568-477a-8e6b-cf8f29233bf8\e46026cd
Ptotal= 46.00 mm | Comments: 10-Year, 12 hour SCS Type II, Ganaraska

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.20	3.25	1.80	6.25	8.30	9.25	1.60
0.50	1.20	3.50	1.80	6.50	8.30	9.50	1.60
0.75	1.20	3.75	1.80	6.75	3.70	9.75	1.60
1.00	1.10	4.00	1.80	7.00	3.70	10.00	1.60
1.25	1.10	4.25	2.80	7.25	2.80	10.25	0.90
1.50	1.20	4.50	2.80	7.50	2.80	10.50	0.90
1.75	1.10	4.75	3.70	7.75	2.80	10.75	0.90
2.00	1.10	5.00	3.70	8.00	2.80	11.00	0.90
2.25	1.40	5.25	5.50	8.25	1.60	11.25	0.90
2.50	1.40	5.50	5.50	8.50	1.60	11.50	0.90
2.75	1.40	5.75	22.10	8.75	1.60	11.75	0.90
3.00	1.40	6.00	60.70	9.00	1.60	12.00	0.90

CALIB | NASHYD (1100) | ID= 1 DT= 5.0 min | Area (ha)= 2.33 | Ia (mm)= 7.90 | U.H. Tp(hrs)= 0.46 | Curve Number (CN)= 67.2 | # of Linear Res.(N)= 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	1.20	3.083	1.80	6.083	8.30	9.08	1.60
0.167	1.20	3.167	1.80	6.167	8.30	9.17	1.60
0.250	1.20	3.250	1.80	6.250	8.30	9.25	1.60
0.333	1.20	3.333	1.80	6.333	8.30	9.33	1.60
0.417	1.20	3.417	1.80	6.417	8.30	9.42	1.60

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.500	1.20	3.500	1.80	6.500	8.30	9.50	1.60
0.583	1.20	3.583	1.80	6.583	3.70	9.58	1.60
0.667	1.20	3.667	1.80	6.667	3.70	9.67	1.60
0.750	1.20	3.750	1.80	6.750	3.70	9.75	1.60
0.833	1.10	3.833	1.80	6.833	3.70	9.83	1.60
0.917	1.10	3.917	1.80	6.917	3.70	9.92	1.60
1.000	1.10	4.000	1.80	7.000	3.70	10.00	1.60
1.083	1.10	4.083	2.80	7.083	2.80	10.08	0.90
1.167	1.10	4.167	2.80	7.167	2.80	10.17	0.90
1.250	1.10	4.250	2.80	7.250	2.80	10.25	0.90
1.333	1.20	4.333	2.80	7.333	2.80	10.33	0.90
1.417	1.20	4.417	2.80	7.417	2.80	10.42	0.90
1.500	1.20	4.500	2.80	7.500	2.80	10.50	0.90
1.583	1.10	4.583	3.70	7.583	2.80	10.58	0.90
1.667	1.10	4.667	3.70	7.667	2.80	10.67	0.90
1.750	1.10	4.750	3.70	7.750	2.80	10.75	0.90
1.833	1.10	4.833	3.70	7.833	2.80	10.83	0.90
1.917	1.10	4.917	3.70	7.917	2.80	10.92	0.90
2.000	1.10	5.000	3.70	8.000	2.80	11.00	0.90
2.083	1.40	5.083	5.50	8.083	1.60	11.08	0.90
2.167	1.40	5.167	5.50	8.167	1.60	11.17	0.90
2.250	1.40	5.250	5.50	8.250	1.60	11.25	0.90
2.333	1.40	5.333	5.50	8.333	1.60	11.33	0.90
2.417	1.40	5.417	5.50	8.417	1.60	11.42	0.90
2.500	1.40	5.500	5.50	8.500	1.60	11.50	0.90
2.583	1.40	5.583	22.10	8.583	1.60	11.58	0.90
2.667	1.40	5.667	22.10	8.667	1.60	11.67	0.90
2.750	1.40	5.750	22.10	8.750	1.60	11.75	0.90
2.833	1.40	5.833	60.70	8.833	1.60	11.83	0.90
2.917	1.40	5.917	60.70	8.917	1.60	11.92	0.90
3.000	1.40	6.000	60.70	9.000	1.60	12.00	0.90

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.032 (i)
TIME TO PEAK (hrs)= 6.417
RUNOFF VOLUME (mm)= 8.955
TOTAL RAINFALL (mm)= 46.000
RUNOFF COEFFICIENT = 0.195

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

CALIB | NASHYD (2101) | ID= 1 DT= 5.0 min | Area (ha)= 0.39 | Ia (mm)= 4.90 | U.H. Tp(hrs)= 0.17 | Curve Number (CN)= 63.4 | # of Linear Res.(N)= 3.00

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.011 (i)
TIME TO PEAK (hrs)= 6.083

```
     RUNOFF VOLUME    (mm)=   8.965
     TOTAL RAINFALL   (mm)=  46.000
     RUNOFF COEFFICIENT   =   0.195

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

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--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.70        23.24
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.53 (ii)    3.10 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.00          0.192 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      45.00        13.82          43.75
     TOTAL RAINFALL   (mm)=      46.00        46.00          46.00
     RUNOFF COEFFICIENT   =       0.98         0.30           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  75.9    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.

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--------------------
| CALIB            |
| STANDHYD  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.70         8.54
```



```
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.55 (ii)    2.88 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.28
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.00          0.128 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      45.00         5.22          44.60
     TOTAL RAINFALL   (mm)=      46.00        46.00          46.00
     RUNOFF COEFFICIENT   =       0.98         0.11           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.192     6.00    43.75
        + ID2= 2 (2102):     0.77   0.128     6.00    44.60
          ================================================
          ID = 3 (0009):     1.94   0.321     6.00    44.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.321      6.00      44.09
     OUTFLOW: ID= 1 (0005)     1.940      0.018      7.03      44.08

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  5.68
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                  TIME SHIFT OF PEAK FLOW         (min)= 62.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0523

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (2101):     0.39   0.011     6.08     8.96
       + ID2= 2 (0005):     1.94   0.018     7.03    44.08
         ================================================
         ID = 3 (0004):     2.33   0.021     6.08    38.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=   8.965
     TOTAL RAINFALL   (mm)=  46.000
     RUNOFF COEFFICIENT   =   0.195

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

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--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.70     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.53 (ii)    3.10 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.00          0.192 (iii)
```



```
     TIME TO PEAK    (hrs)=       6.00         6.00          6.00
     RUNOFF VOLUME    (mm)=      45.00        13.82         43.75
     TOTAL RAINFALL   (mm)=      46.00        46.00         46.00
     RUNOFF COEFFICIENT   =       0.98         0.30          0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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.

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--------------------
| CALIB            |
| STANDHYD  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      60.70     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.55 (ii)    2.88 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.28
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.00          0.128 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00          6.00
     RUNOFF VOLUME    (mm)=      45.00         5.22         44.60
     TOTAL RAINFALL   (mm)=      46.00        46.00         46.00
     RUNOFF COEFFICIENT   =       0.98         0.11          0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.192     6.00    43.75
```

```
        + ID2= 2 (0018):     0.77   0.128     6.00    44.60
          ================================================
          ID = 3 (0017):     1.94   0.321     6.00    44.09

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.011     6.08     8.96
        + ID2= 2 (0017):     1.94   0.321     6.00    44.09
          ================================================
          ID = 3 (0015):     2.33   0.331     6.00    38.21

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ***************************
  ** SIMULATION NUMBER:  16 **
  ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\f38d8703
| Ptotal= 63.33 mm |    Comments: 25-Year, 12 hour SCS Type II, Ganaraska
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    1.60 |  3.25    2.50 |  6.25   11.40 |  9.25    2.20
                0.50    1.60 |  3.50    2.50 |  6.50   11.40 |  9.50    2.20
                0.75    1.60 |  3.75    2.50 |  6.75    5.10 |  9.75    2.20
                1.00    1.60 |  4.00    2.50 |  7.00    5.10 | 10.00    2.20
                1.25    1.60 |  4.25    3.80 |  7.25    3.80 | 10.25    1.30
                1.50    1.60 |  4.50    3.80 |  7.50    3.80 | 10.50    1.30
                1.75    1.60 |  4.75    5.10 |  7.75    3.80 | 10.75    1.30
                2.00    1.60 |  5.00    5.10 |  8.00    3.80 | 11.00    1.30
                2.25    1.90 |  5.25    7.60 |  8.25    2.20 | 11.25    1.30
                2.50    1.90 |  5.50    7.60 |  8.50    2.20 | 11.50    1.30
                2.75    1.90 |  5.75   30.30 |  8.75    2.20 | 11.75    1.30
                3.00    1.90 |  6.00   83.40 |  9.00    2.20 | 12.00    1.30

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--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46
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     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    1.60 | 3.083    2.50 | 6.083   11.40 |  9.08    2.20
             0.167    1.60 | 3.167    2.50 | 6.167   11.40 |  9.17    2.20
             0.250    1.60 | 3.250    2.50 | 6.250   11.40 |  9.25    2.20
             0.333    1.60 | 3.333    2.50 | 6.333   11.40 |  9.33    2.20
             0.417    1.60 | 3.417    2.50 | 6.417   11.40 |  9.42    2.20
             0.500    1.60 | 3.500    2.50 | 6.500   11.40 |  9.50    2.20
             0.583    1.60 | 3.583    2.50 | 6.583    5.10 |  9.58    2.20
             0.667    1.60 | 3.667    2.50 | 6.667    5.10 |  9.67    2.20
             0.750    1.60 | 3.750    2.50 | 6.750    5.10 |  9.75    2.20
             0.833    1.60 | 3.833    2.50 | 6.833    5.10 |  9.83    2.20
             0.917    1.60 | 3.917    2.50 | 6.917    5.10 |  9.92    2.20
             1.000    1.60 | 4.000    2.50 | 7.000    5.10 | 10.00    2.20
             1.083    1.60 | 4.083    3.80 | 7.083    3.80 | 10.08    1.30
             1.167    1.60 | 4.167    3.80 | 7.167    3.80 | 10.17    1.30
             1.250    1.60 | 4.250    3.80 | 7.250    3.80 | 10.25    1.30
             1.333    1.60 | 4.333    3.80 | 7.333    3.80 | 10.33    1.30
             1.417    1.60 | 4.417    3.80 | 7.417    3.80 | 10.42    1.30
             1.500    1.60 | 4.500    3.80 | 7.500    3.80 | 10.50    1.30
             1.583    1.60 | 4.583    5.10 | 7.583    3.80 | 10.58    1.30
             1.667    1.60 | 4.667    5.10 | 7.667    3.80 | 10.67    1.30
             1.750    1.60 | 4.750    5.10 | 7.750    3.80 | 10.75    1.30
             1.833    1.60 | 4.833    5.10 | 7.833    3.80 | 10.83    1.30
             1.917    1.60 | 4.917    5.10 | 7.917    3.80 | 10.92    1.30
             2.000    1.60 | 5.000    5.10 | 8.000    3.80 | 11.00    1.30
             2.083    1.90 | 5.083    7.60 | 8.083    2.20 | 11.08    1.30
             2.167    1.90 | 5.167    7.60 | 8.167    2.20 | 11.17    1.30
             2.250    1.90 | 5.250    7.60 | 8.250    2.20 | 11.25    1.30
             2.333    1.90 | 5.333    7.60 | 8.333    2.20 | 11.33    1.30
             2.417    1.90 | 5.417    7.60 | 8.417    2.20 | 11.42    1.30
             2.500    1.90 | 5.500    7.60 | 8.500    2.20 | 11.50    1.30
             2.583    1.90 | 5.583   30.30 | 8.583    2.20 | 11.58    1.30
             2.667    1.90 | 5.667   30.30 | 8.667    2.20 | 11.67    1.30
             2.750    1.90 | 5.750   30.30 | 8.750    2.20 | 11.75    1.30
             2.833    1.90 | 5.833   83.40 | 8.833    2.20 | 11.83    1.30
             2.917    1.90 | 5.917   83.40 | 8.917    2.20 | 11.92    1.30
             3.000    1.90 | 6.000   83.40 | 9.000    2.20 | 12.00    1.30

   Unit Hyd Qpeak  (cms)=   0.193

   PEAK FLOW       (cms)=   0.064 (i)
   TIME TO PEAK    (hrs)=   6.333
   RUNOFF VOLUME    (mm)=  17.122
   TOTAL RAINFALL   (mm)=  63.325
   RUNOFF COEFFICIENT   =   0.270

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

CALIB					
NASHYD (2101)	Area (ha)= 0.39	Curve Number (CN)= 63.4			
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.17				

Unit Hyd Qpeak (cms)=	0.088	
PEAK FLOW (cms)=	0.020 (i)	
TIME TO PEAK (hrs)=	6.083	
RUNOFF VOLUME (mm)=	16.586	
TOTAL RAINFALL (mm)=	63.325	
RUNOFF COEFFICIENT =	0.262	

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

CALIB			
STANDHYD (2100)	Area (ha)= 1.17		
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		83.40	40.74	
over (min)		5.00	5.00	
Storage Coeff. (min)=		2.23 (ii)	2.73 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.30	0.29	
				TOTALS
PEAK FLOW	(cms)=	0.26	0.01	0.266 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	62.32	24.48	60.81
TOTAL RAINFALL	(mm)=	63.32	63.32	63.32
RUNOFF COEFFICIENT	=	0.98	0.39	0.96

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.76	0.01	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.50	
Length	(m)=	71.65	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		83.40	16.30	
over (min)		5.00	5.00	
Storage Coeff. (min)=		2.25 (ii)	2.53 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.30	0.29	
				TOTALS
PEAK FLOW	(cms)=	0.18	0.00	0.177 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	62.32	10.03	61.80
TOTAL RAINFALL	(mm)=	63.32	63.32	63.32
RUNOFF COEFFICIENT	=	0.98	0.16	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0009)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (2100):	1.17	0.266	6.00	60.81	
+ ID2= 2 (2102):	0.77	0.177	6.00	61.80	
ID = 3 (0009):	1.94	0.442	6.00	61.20	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695

```
                        0.0077     0.0101   |   0.0514      0.0844
                        0.0081     0.0142   |   0.0624      0.0960
                        0.0090     0.0251   |   0.0751      0.1089
                        0.0097     0.0348   |   0.0768      0.1108
                        0.0104     0.0444   |   0.0808      0.1156

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)      1.940      0.442      6.00      61.20
     OUTFLOW: ID= 1 (0005)      1.940      0.039      6.57      61.20

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.73
                   TIME SHIFT OF PEAK FLOW         (min)= 34.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0716

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

--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.020     6.08    16.59
        + ID2= 2 (0005):     1.94   0.039     6.57    61.20
          ================================================
          ID = 3 (0004):     2.33   0.054     6.08    53.73

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.020 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  16.586
     TOTAL RAINFALL   (mm)=  63.325
     RUNOFF COEFFICIENT   =   0.262

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
```



```
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      83.40     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.23 (ii)    2.73 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.01          0.266 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      62.32        24.48          60.81
     TOTAL RAINFALL   (mm)=      63.32        63.32          63.32
     RUNOFF COEFFICIENT   =       0.98         0.39           0.96

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      83.40     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.25 (ii)    2.53 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.00          0.177 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00           6.00
     RUNOFF VOLUME    (mm)=      62.32        10.03          61.80
     TOTAL RAINFALL   (mm)=      63.32        63.32          63.32
     RUNOFF COEFFICIENT   =       0.98         0.16           0.98

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
```

CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0017)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0013):	1.17	0.266	6.00	60.81
	+ ID2= 2 (0018):	0.77	0.177	6.00	61.80
	ID = 3 (0017):	1.94	0.442	6.00	61.20

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0015)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0012):	0.39	0.020	6.08	16.59
	+ ID2= 2 (0017):	1.94	0.442	6.00	61.20
	ID = 3 (0015):	2.33	0.462	6.00	53.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 17 **
****

READ STORM	Filename: C:\Users\csokol\AppData\Local\Temp\27f1d0b1-c568-477a-8e6b-cf8f29233bf8\ed9669f7
Ptotal= 76.58 mm	Comments: 50-Year, 12 hour SCS Type II, Ganaraska

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	1.90	3.25	3.10	6.25	13.80	9.25	2.70
0.50	1.90	3.50	3.10	6.50	13.80	9.50	2.70
0.75	1.90	3.75	3.10	6.75	6.10	9.75	2.70
1.00	1.90	4.00	3.10	7.00	6.10	10.00	2.70
1.25	1.90	4.25	4.60	7.25	4.60	10.25	1.50
1.50	1.90	4.50	4.60	7.50	4.60	10.50	1.50
1.75	1.90	4.75	6.10	7.75	4.60	10.75	1.50
2.00	1.90	5.00	6.10	8.00	4.60	11.00	1.50

2.25	2.30	5.25	9.20	8.25	2.70	11.25	1.50
2.50	2.30	5.50	9.20	8.50	2.70	11.50	1.50
2.75	2.30	5.75	36.80	8.75	2.70	11.75	1.50
3.00	2.30	6.00	101.10	9.00	2.70	12.00	1.50

CALIB					
NASHYD (1100)	Area	(ha)=	2.33	Curve Number	(CN)= 67.2
ID= 1 DT= 5.0 min	Ia	(mm)=	7.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.46		

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	1.90	3.083	3.10	6.083	13.80	9.08	2.70
0.167	1.90	3.167	3.10	6.167	13.80	9.17	2.70
0.250	1.90	3.250	3.10	6.250	13.80	9.25	2.70
0.333	1.90	3.333	3.10	6.333	13.80	9.33	2.70
0.417	1.90	3.417	3.10	6.417	13.80	9.42	2.70
0.500	1.90	3.500	3.10	6.500	13.80	9.50	2.70
0.583	1.90	3.583	3.10	6.583	6.10	9.58	2.70
0.667	1.90	3.667	3.10	6.667	6.10	9.67	2.70
0.750	1.90	3.750	3.10	6.750	6.10	9.75	2.70
0.833	1.90	3.833	3.10	6.833	6.10	9.83	2.70
0.917	1.90	3.917	3.10	6.917	6.10	9.92	2.70
1.000	1.90	4.000	3.10	7.000	6.10	10.00	2.70
1.083	1.90	4.083	4.60	7.083	4.60	10.08	1.50
1.167	1.90	4.167	4.60	7.167	4.60	10.17	1.50
1.250	1.90	4.250	4.60	7.250	4.60	10.25	1.50
1.333	1.90	4.333	4.60	7.333	4.60	10.33	1.50
1.417	1.90	4.417	4.60	7.417	4.60	10.42	1.50
1.500	1.90	4.500	4.60	7.500	4.60	10.50	1.50
1.583	1.90	4.583	6.10	7.583	4.60	10.58	1.50
1.667	1.90	4.667	6.10	7.667	4.60	10.67	1.50
1.750	1.90	4.750	6.10	7.750	4.60	10.75	1.50
1.833	1.90	4.833	6.10	7.833	4.60	10.83	1.50
1.917	1.90	4.917	6.10	7.917	4.60	10.92	1.50
2.000	1.90	5.000	6.10	8.000	4.60	11.00	1.50
2.083	2.30	5.083	9.20	8.083	2.70	11.08	1.50
2.167	2.30	5.167	9.20	8.167	2.70	11.17	1.50
2.250	2.30	5.250	9.20	8.250	2.70	11.25	1.50
2.333	2.30	5.333	9.20	8.333	2.70	11.33	1.50
2.417	2.30	5.417	9.20	8.417	2.70	11.42	1.50
2.500	2.30	5.500	9.20	8.500	2.70	11.50	1.50
2.583	2.30	5.583	36.80	8.583	2.70	11.58	1.50
2.667	2.30	5.667	36.80	8.667	2.70	11.67	1.50
2.750	2.30	5.750	36.80	8.750	2.70	11.75	1.50
2.833	2.30	5.833	101.10	8.833	2.70	11.83	1.50

```
             2.917    2.30 | 5.917  101.10 | 8.917    2.70 | 11.92    1.50
             3.000    2.30 | 6.000  101.10 | 9.000    2.70 | 12.00    1.50

     Unit Hyd Qpeak  (cms)=   0.193

     PEAK FLOW       (cms)=   0.093 (i)
     TIME TO PEAK    (hrs)=   6.333
     RUNOFF VOLUME    (mm)=  24.479
     TOTAL RAINFALL   (mm)=  76.575
     RUNOFF COEFFICIENT   =   0.320

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  23.447
     TOTAL RAINFALL   (mm)=  76.575
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.12         0.05
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.56         2.50
     Length            (m)=     88.32         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    101.10        55.85
                over (min)       5.00         5.00
     Storage Coeff.  (min)=      2.07 (ii)    2.53 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.31         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.32         0.01         0.323 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00          6.00
     RUNOFF VOLUME    (mm)=     75.57        33.65         73.90
     TOTAL RAINFALL   (mm)=     76.57        76.57         76.57
```



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     RUNOFF COEFFICIENT   =      0.99         0.44          0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.76         0.01
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.50
     Length            (m)=     71.65         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    101.10        23.69
                over (min)       5.00         5.00
     Storage Coeff.  (min)=      2.08 (ii)    2.35 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.21         0.00         0.215 (iii)
     TIME TO PEAK    (hrs)=      6.00         6.00          6.00
     RUNOFF VOLUME    (mm)=     75.58        14.54         74.96
     TOTAL RAINFALL   (mm)=     76.57        76.57         76.57
     RUNOFF COEFFICIENT   =      0.99         0.19          0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.323     6.00    73.90
        + ID2= 2 (2102):     0.77   0.215     6.00    74.96
          ================================================
          ID = 3 (0009):     1.94   0.537     6.00    74.32
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)      1.940      0.537      6.00      74.32
     OUTFLOW: ID= 1 (0005)      1.940      0.054      6.55      74.31

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.09
                  TIME SHIFT OF PEAK FLOW         (min)= 33.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0874

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

--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.028     6.08    23.45
        + ID2= 2 (0005):     1.94   0.054     6.55    74.31
          ================================================
          ID = 3 (0004):     2.33   0.078     6.08    65.80

     NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.028 (i)
     TIME TO PEAK    (hrs)=   6.083
     RUNOFF VOLUME    (mm)=  23.447
     TOTAL RAINFALL   (mm)=  76.575
```



```
     RUNOFF COEFFICIENT   =   0.306

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     101.10     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.07 (ii)    2.53 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.32         0.01          0.323 (iii)
     TIME TO PEAK    (hrs)=       6.00         6.00          6.00
     RUNOFF VOLUME    (mm)=      75.57        33.65         73.90
     TOTAL RAINFALL   (mm)=      76.57        76.57         76.57
     RUNOFF COEFFICIENT   =       0.99         0.44          0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     101.10     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.08 (ii)    2.35 (ii)
```

Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	0.31	0.30		
			TOTALS	
PEAK FLOW (cms)=	0.21	0.00	0.215 (iii)	
TIME TO PEAK (hrs)=	6.00	6.00	6.00	
RUNOFF VOLUME (mm)=	75.58	14.54	74.96	
TOTAL RAINFALL (mm)=	76.57	76.57	76.57	
RUNOFF COEFFICIENT =	0.99	0.19	0.98	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0017)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0013):		1.17	0.323	6.00	73.90
+ ID2= 2 (0018):		0.77	0.215	6.00	74.96
ID = 3 (0017):		1.94	0.537	6.00	74.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0015)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0012):		0.39	0.028	6.08	23.45
+ ID2= 2 (0017):		1.94	0.537	6.00	74.32
ID = 3 (0015):		2.33	0.565	6.00	65.81

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 18 **
****

READ STORM	Filename: C:\Users\csokol\AppData\Local\Temp\27f1d0b1-c568-477a-8e6b-cf8f29233bf8\ed4f52ca

Ptotal= 89.58 mm	Comments: 100-Year, 12 hour SCS Type II, Ganaraska

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	2.20	3.25	3.60	6.25	16.10	9.25	3.10
0.50	2.20	3.50	3.60	6.50	16.10	9.50	3.10
0.75	2.20	3.75	3.60	6.75	7.20	9.75	3.10
1.00	2.20	4.00	3.60	7.00	7.20	10.00	3.10
1.25	2.20	4.25	5.40	7.25	5.40	10.25	1.80
1.50	2.20	4.50	5.40	7.50	5.40	10.50	1.80
1.75	2.20	4.75	7.20	7.75	5.40	10.75	1.80
2.00	2.20	5.00	7.20	8.00	5.40	11.00	1.80
2.25	2.70	5.25	10.80	8.25	3.10	11.25	1.80
2.50	2.70	5.50	10.80	8.50	3.10	11.50	1.80
2.75	2.70	5.75	43.00	8.75	3.10	11.75	1.80
3.00	2.70	6.00	118.30	9.00	3.10	12.00	1.80

CALIB			
NASHYD (1100)	Area (ha)=	2.33	Curve Number (CN)= 67.2
ID= 1 DT= 5.0 min	Ia (mm)=	7.90	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.46	

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	2.20	3.083	3.60	6.083	16.10	9.08	3.10
0.167	2.20	3.167	3.60	6.167	16.10	9.17	3.10
0.250	2.20	3.250	3.60	6.250	16.10	9.25	3.10
0.333	2.20	3.333	3.60	6.333	16.10	9.33	3.10
0.417	2.20	3.417	3.60	6.417	16.10	9.42	3.10
0.500	2.20	3.500	3.60	6.500	16.10	9.50	3.10
0.583	2.20	3.583	3.60	6.583	7.20	9.58	3.10
0.667	2.20	3.667	3.60	6.667	7.20	9.67	3.10
0.750	2.20	3.750	3.60	6.750	7.20	9.75	3.10
0.833	2.20	3.833	3.60	6.833	7.20	9.83	3.10
0.917	2.20	3.917	3.60	6.917	7.20	9.92	3.10
1.000	2.20	4.000	3.60	7.000	7.20	10.00	3.10
1.083	2.20	4.083	5.40	7.083	5.40	10.08	1.80
1.167	2.20	4.167	5.40	7.167	5.40	10.17	1.80
1.250	2.20	4.250	5.40	7.250	5.40	10.25	1.80
1.333	2.20	4.333	5.40	7.333	5.40	10.33	1.80
1.417	2.20	4.417	5.40	7.417	5.40	10.42	1.80
1.500	2.20	4.500	5.40	7.500	5.40	10.50	1.80
1.583	2.20	4.583	7.20	7.583	5.40	10.58	1.80
1.667	2.20	4.667	7.20	7.667	5.40	10.67	1.80
1.750	2.20	4.750	7.20	7.750	5.40	10.75	1.80
1.833	2.20	4.833	7.20	7.833	5.40	10.83	1.80

1.917	2.20	4.917	7.20	7.917	5.40	10.92	1.80
2.000	2.20	5.000	7.20	8.000	5.40	11.00	1.80
2.083	2.70	5.083	10.80	8.083	3.10	11.08	1.80
2.167	2.70	5.167	10.80	8.167	3.10	11.17	1.80
2.250	2.70	5.250	10.80	8.250	3.10	11.25	1.80
2.333	2.70	5.333	10.80	8.333	3.10	11.33	1.80
2.417	2.70	5.417	10.80	8.417	3.10	11.42	1.80
2.500	2.70	5.500	10.80	8.500	3.10	11.50	1.80
2.583	2.70	5.583	43.00	8.583	3.10	11.58	1.80
2.667	2.70	5.667	43.00	8.667	3.10	11.67	1.80
2.750	2.70	5.750	43.00	8.750	3.10	11.75	1.80
2.833	2.70	5.833	118.30	8.833	3.10	11.83	1.80
2.917	2.70	5.917	118.30	8.917	3.10	11.92	1.80
3.000	2.70	6.000	118.30	9.000	3.10	12.00	1.80

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.124 (i)
TIME TO PEAK (hrs)= 6.333
RUNOFF VOLUME (mm)= 32.435
TOTAL RAINFALL (mm)= 89.575
RUNOFF COEFFICIENT = 0.362

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

CALIB	
NASHYD (2101)	Area (ha)= 0.39 Curve Number (CN)= 63.4
ID= 1 DT= 5.0 min	Ia (mm)= 4.90 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 30.886
TOTAL RAINFALL (mm)= 89.575
RUNOFF COEFFICIENT = 0.345

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

CALIB	
STANDHYD (2100)	Area (ha)= 1.17
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.12	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.56	2.50
Length	(m)=	88.32	4.00

Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	118.30	71.44
over (min)		5.00	5.00
Storage Coeff. (min)	=	1.94 (ii)	2.38 (ii)
Unit Hyd. Tpeak (min)	=	5.00	5.00
Unit Hyd. peak (cms)	=	0.31	0.30

				TOTALS
PEAK FLOW	(cms)=	0.37	0.01	0.379 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	88.57	43.29	86.76
TOTAL RAINFALL	(mm)=	89.57	89.57	89.57
RUNOFF COEFFICIENT	=	0.99	0.48	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.76	0.01
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.50
Length	(m)=	71.65	4.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	118.30	31.88
over (min)		5.00	5.00
Storage Coeff. (min)	=	1.96 (ii)	2.20 (ii)
Unit Hyd. Tpeak (min)	=	5.00	5.00
Unit Hyd. peak (cms)	=	0.31	0.30

				TOTALS
PEAK FLOW	(cms)=	0.25	0.00	0.251 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	88.58	19.58	87.88
TOTAL RAINFALL	(mm)=	89.57	89.57	89.57
RUNOFF COEFFICIENT	=	0.99	0.22	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

ADD HYD (0009)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2100):		1.17	0.379	6.00	86.76
+ ID2= 2 (2102):		0.77	0.251	6.00	87.88
ID = 3 (0009):		1.94	0.630	6.00	87.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.630	6.00	87.21
OUTFLOW: ID= 1 (0005)	1.940	0.069	6.53	87.20

PEAK FLOW REDUCTION [Qout/Qin](%)= 10.95
TIME SHIFT OF PEAK FLOW (min)= 32.00
MAXIMUM STORAGE USED (ha.m.)= 0.1027

ADD HYD (0004)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (2101):		0.39	0.037	6.00	30.89
+ ID2= 2 (0005):		1.94	0.069	6.53	87.20
ID = 3 (0004):		2.33	0.103	6.08	77.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0012)	Area (ha)= 0.39	Curve Number (CN)= 63.4	
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.17		

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.037 (i)
TIME TO PEAK (hrs)= 6.000
RUNOFF VOLUME (mm)= 30.886
TOTAL RAINFALL (mm)= 89.575
RUNOFF COEFFICIENT = 0.345

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

CALIB			
STANDHYD (0013)	Area (ha)= 1.17		
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.12	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.56	2.50
Length	(m)=	88.32	4.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		118.30	********
over (min)		5.00	5.00
Storage Coeff. (min)=		1.94 (ii)	2.38 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00
Unit Hyd. peak (cms)=		0.31	0.30

				TOTALS
PEAK FLOW	(cms)=	0.37	0.01	0.379 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	88.57	43.29	86.76
TOTAL RAINFALL	(mm)=	89.57	89.57	89.57
RUNOFF COEFFICIENT	=	0.99	0.48	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (0018)	Area (ha)=	0.77

|ID= 1 DT= 5.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.76	0.01	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.50	
Length	(m)=	71.65	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		118.30	********	
over (min)		5.00	5.00	
Storage Coeff. (min)=		1.96 (ii)	2.20 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.31	0.30	
				TOTALS
PEAK FLOW	(cms)=	0.25	0.00	0.251 (iii)
TIME TO PEAK	(hrs)=	6.00	6.00	6.00
RUNOFF VOLUME	(mm)=	88.58	19.58	87.88
TOTAL RAINFALL	(mm)=	89.57	89.57	89.57
RUNOFF COEFFICIENT	=	0.99	0.22	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0017)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0013):	1.17	0.379	6.00	86.76
+	ID2= 2 (0018):	0.77	0.251	6.00	87.88
	ID = 3 (0017):	1.94	0.630	6.00	87.21

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0015)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0012):	0.39	0.037	6.00	30.89
+	ID2= 2 (0017):	1.94	0.630	6.00	87.21
	ID = 3 (0015):	2.33	0.667	6.00	77.78

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION NUMBER: 19 **

READ STORM	Filename: C:\Users\csokol\AppData\Local\Temp\27f1d0b1-c568-477a-8e6b-cf8f29233bf8\d0111ced
Ptotal= 29.58 mm	Comments: 2-Year, 24 hour SCS Type II, Ganaraska R

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.30	6.25	0.60	12.25	4.20	18.25	0.50
0.50	0.30	6.50	0.60	12.50	4.20	18.50	0.50
0.75	0.30	6.75	0.60	12.75	2.20	18.75	0.50
1.00	0.30	7.00	0.60	13.00	2.20	19.00	0.50
1.25	0.30	7.25	0.60	13.25	0.40	19.25	0.50
1.50	0.30	7.50	0.60	13.50	0.40	19.50	0.50
1.75	0.30	7.75	0.60	13.75	2.40	19.75	0.50
2.00	0.30	8.00	0.60	14.00	2.40	20.00	0.50
2.25	0.40	8.25	0.80	14.25	0.90	20.25	0.40
2.50	0.40	8.50	0.80	14.50	0.90	20.50	0.40
2.75	0.40	8.75	0.80	14.75	0.90	20.75	0.40
3.00	0.40	9.00	0.80	15.00	0.90	21.00	0.40
3.25	0.40	9.25	0.90	15.25	0.90	21.25	0.40
3.50	0.40	9.50	0.90	15.50	0.90	21.50	0.40
3.75	0.40	9.75	1.10	15.75	0.90	21.75	0.40
4.00	0.40	10.00	1.10	16.00	0.90	22.00	0.40
4.25	0.50	10.25	1.40	16.25	0.50	22.25	0.40
4.50	0.50	10.50	1.40	16.50	0.50	22.50	0.40
4.75	0.50	10.75	1.80	16.75	0.50	22.75	0.40
5.00	0.50	11.00	1.80	17.00	0.50	23.00	0.40
5.25	0.50	11.25	2.80	17.25	0.50	23.25	0.40
5.50	0.50	11.50	2.80	17.50	0.50	23.50	0.40
5.75	0.50	11.75	12.20	17.75	0.50	23.75	0.40
6.00	0.50	12.00	32.50	18.00	0.50	24.00	0.40

CALIB					
NASHYD (1100)	Area	(ha)=	2.33	Curve Number	(CN)= 67.2
ID= 1 DT= 5.0 min	Ia	(mm)=	7.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.46		

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	0.30	6.083	0.60	12.083	4.20	18.08	0.50
0.167	0.30	6.167	0.60	12.167	4.20	18.17	0.50
0.250	0.30	6.250	0.60	12.250	4.20	18.25	0.50
0.333	0.30	6.333	0.60	12.333	4.20	18.33	0.50
0.417	0.30	6.417	0.60	12.417	4.20	18.42	0.50
0.500	0.30	6.500	0.60	12.500	4.20	18.50	0.50
0.583	0.30	6.583	0.60	12.583	2.20	18.58	0.50
0.667	0.30	6.667	0.60	12.667	2.20	18.67	0.50
0.750	0.30	6.750	0.60	12.750	2.20	18.75	0.50
0.833	0.30	6.833	0.60	12.833	2.20	18.83	0.50
0.917	0.30	6.917	0.60	12.917	2.20	18.92	0.50
1.000	0.30	7.000	0.60	13.000	2.20	19.00	0.50
1.083	0.30	7.083	0.60	13.083	0.40	19.08	0.50
1.167	0.30	7.167	0.60	13.167	0.40	19.17	0.50
1.250	0.30	7.250	0.60	13.250	0.40	19.25	0.50
1.333	0.30	7.333	0.60	13.333	0.40	19.33	0.50
1.417	0.30	7.417	0.60	13.417	0.40	19.42	0.50
1.500	0.30	7.500	0.60	13.500	0.40	19.50	0.50
1.583	0.30	7.583	0.60	13.583	2.40	19.58	0.50
1.667	0.30	7.667	0.60	13.667	2.40	19.67	0.50
1.750	0.30	7.750	0.60	13.750	2.40	19.75	0.50
1.833	0.30	7.833	0.60	13.833	2.40	19.83	0.50
1.917	0.30	7.917	0.60	13.917	2.40	19.92	0.50
2.000	0.30	8.000	0.60	14.000	2.40	20.00	0.50
2.083	0.40	8.083	0.80	14.083	0.90	20.08	0.40
2.167	0.40	8.167	0.80	14.167	0.90	20.17	0.40
2.250	0.40	8.250	0.80	14.250	0.90	20.25	0.40
2.333	0.40	8.333	0.80	14.333	0.90	20.33	0.40
2.417	0.40	8.417	0.80	14.417	0.90	20.42	0.40
2.500	0.40	8.500	0.80	14.500	0.90	20.50	0.40
2.583	0.40	8.583	0.80	14.583	0.90	20.58	0.40
2.667	0.40	8.667	0.80	14.667	0.90	20.67	0.40
2.750	0.40	8.750	0.80	14.750	0.90	20.75	0.40
2.833	0.40	8.833	0.80	14.833	0.90	20.83	0.40
2.917	0.40	8.917	0.80	14.917	0.90	20.92	0.40
3.000	0.40	9.000	0.80	15.000	0.90	21.00	0.40
3.083	0.40	9.083	0.90	15.083	0.90	21.08	0.40
3.167	0.40	9.167	0.90	15.167	0.90	21.17	0.40
3.250	0.40	9.250	0.90	15.250	0.90	21.25	0.40
3.333	0.40	9.333	0.90	15.333	0.90	21.33	0.40
3.417	0.40	9.417	0.90	15.417	0.90	21.42	0.40
3.500	0.40	9.500	0.90	15.500	0.90	21.50	0.40
3.583	0.40	9.583	1.10	15.583	0.90	21.58	0.40
3.667	0.40	9.667	1.10	15.667	0.90	21.67	0.40
3.750	0.40	9.750	1.10	15.750	0.90	21.75	0.40
3.833	0.40	9.833	1.10	15.833	0.90	21.83	0.40
3.917	0.40	9.917	1.10	15.917	0.90	21.92	0.40
4.000	0.40	10.000	1.10	16.000	0.90	22.00	0.40
4.083	0.50	10.083	1.40	16.083	0.50	22.08	0.40
4.167	0.50	10.167	1.40	16.167	0.50	22.17	0.40
4.250	0.50	10.250	1.40	16.250	0.50	22.25	0.40

4.333	0.50	10.333	1.40	16.333	0.50	22.33	0.40
4.417	0.50	10.417	1.40	16.417	0.50	22.42	0.40
4.500	0.50	10.500	1.40	16.500	0.50	22.50	0.40
4.583	0.50	10.583	1.80	16.583	0.50	22.58	0.40
4.667	0.50	10.667	1.80	16.667	0.50	22.67	0.40
4.750	0.50	10.750	1.80	16.750	0.50	22.75	0.40
4.833	0.50	10.833	1.80	16.833	0.50	22.83	0.40
4.917	0.50	10.917	1.80	16.917	0.50	22.92	0.40
5.000	0.50	11.000	1.80	17.000	0.50	23.00	0.40
5.083	0.50	11.083	2.80	17.083	0.50	23.08	0.40
5.167	0.50	11.167	2.80	17.167	0.50	23.17	0.40
5.250	0.50	11.250	2.80	17.250	0.50	23.25	0.40
5.333	0.50	11.333	2.80	17.333	0.50	23.33	0.40
5.417	0.50	11.417	2.80	17.417	0.50	23.42	0.40
5.500	0.50	11.500	2.80	17.500	0.50	23.50	0.40
5.583	0.50	11.583	12.20	17.583	0.50	23.58	0.40
5.667	0.50	11.667	12.20	17.667	0.50	23.67	0.40
5.750	0.50	11.750	12.20	17.750	0.50	23.75	0.40
5.833	0.50	11.833	32.50	17.833	0.50	23.83	0.40
5.917	0.50	11.917	32.50	17.917	0.50	23.92	0.40
6.000	0.50	12.000	32.50	18.000	0.50	24.00	0.40

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.009 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 3.225
TOTAL RAINFALL (mm)= 29.575
RUNOFF COEFFICIENT = 0.109

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

CALIB					
NASHYD (2101)	Area (ha)=	0.39	Curve Number (CN)=	63.4	
ID= 1 DT= 5.0 min	Ia (mm)=	4.90	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.17			

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.003 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 3.541
TOTAL RAINFALL (mm)= 29.575
RUNOFF COEFFICIENT = 0.120

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

CALIB		
STANDHYD (2100)	Area (ha)=	1.17

|ID= 1 DT= 5.0 min | Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	1.12	0.05	
Dep. Storage (mm)=	1.00	5.00	
Average Slope (%)=	1.56	2.50	
Length (m)=	88.32	4.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	32.50	7.78	
over (min)	5.00	5.00	
Storage Coeff. (min)=	3.25 (ii)	3.98 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.27	0.24	
			TOTALS
PEAK FLOW (cms)=	0.10	0.00	0.102 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	28.57	5.74	27.66
TOTAL RAINFALL (mm)=	29.58	29.58	29.58
RUNOFF COEFFICIENT =	0.97	0.19	0.94

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.76	0.01	
Dep. Storage (mm)=	1.00	5.00	
Average Slope (%)=	1.00	2.50	
Length (m)=	71.65	4.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	32.50	2.58	
over (min)	5.00	5.00	
Storage Coeff. (min)=	3.28 (ii)	3.69 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.27	0.25	
			TOTALS
PEAK FLOW (cms)=	0.07	0.00	0.068 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	28.57	1.98	28.31
TOTAL RAINFALL (mm)=	29.58	29.58	29.58
RUNOFF COEFFICIENT =	0.97	0.07	0.96

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0009)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2100):	1.17	0.102	12.00	27.66
	+ ID2= 2 (2102):	0.77	0.068	12.00	28.31
	ID = 3 (0009):	1.94	0.170	12.00	27.92

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.170	12.00	27.92
OUTFLOW: ID= 1 (0005)	1.940	0.009	13.03	27.91

PEAK FLOW REDUCTION [Qout/Qin](%)= 5.24
TIME SHIFT OF PEAK FLOW (min)= 62.00
MAXIMUM STORAGE USED (ha.m.)= 0.0247

ADD HYD (0004)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2101):	0.39	0.003	12.08	3.54

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        + ID2= 2 (0005):     1.94   0.009    13.03    27.91
          ================================================
          ID = 3 (0004):     2.33   0.012    12.08    23.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=   3.541
     TOTAL RAINFALL   (mm)=  29.575
     RUNOFF COEFFICIENT   =   0.120

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

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--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
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                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      32.50     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.25 (ii)    3.98 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.27         0.24
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.00          0.102 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      28.57         5.74          27.66
     TOTAL RAINFALL   (mm)=      29.58        29.58          29.58
     RUNOFF COEFFICIENT   =       0.97         0.19           0.94

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
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           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| CALIB            |
| STANDHYD  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
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                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      32.50     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.28 (ii)    3.69 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.27         0.25
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.00          0.068 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      28.57         1.98          28.31
     TOTAL RAINFALL   (mm)=      29.58        29.58          29.58
     RUNOFF COEFFICIENT   =       0.97         0.07           0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.102    12.00    27.66
       + ID2= 2 (0018):     0.77   0.068    12.00    28.31
         ================================================
         ID = 3 (0017):     1.94   0.170    12.00    27.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| ADD HYD   (0015) |
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1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0012):	0.39	0.003	12.08	3.54
+	ID2= 2 (0017):	1.94	0.170	12.00	27.92
	ID = 3 (0015):	2.33	0.173	12.00	23.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 20 **
****

READ STORM | Filename: C:\Users\csokol\AppData\Local\Temp\27f1d0b1-c568-477a-8e6b-cf8f29233bf8\bd07a197
Ptotal= 40.23 mm | Comments: 5-Year, 24 hour SCS Type II, Ganaraska R

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.40	6.25	0.80	12.25	5.80	18.25	0.70
0.50	0.40	6.50	0.80	12.50	5.80	18.50	0.70
0.75	0.40	6.75	0.80	12.75	3.00	18.75	0.70
1.00	0.40	7.00	0.80	13.00	3.00	19.00	0.70
1.25	0.40	7.25	0.80	13.25	0.60	19.25	0.70
1.50	0.40	7.50	0.80	13.50	0.60	19.50	0.70
1.75	0.40	7.75	0.80	13.75	3.30	19.75	0.70
2.00	0.40	8.00	0.80	14.00	3.30	20.00	0.70
2.25	0.50	8.25	1.10	14.25	1.20	20.25	0.50
2.50	0.50	8.50	1.10	14.50	1.20	20.50	0.50
2.75	0.50	8.75	1.10	14.75	1.20	20.75	0.50
3.00	0.50	9.00	1.10	15.00	1.20	21.00	0.50
3.25	0.50	9.25	1.30	15.25	1.20	21.25	0.50
3.50	0.50	9.50	1.30	15.50	1.20	21.50	0.50
3.75	0.50	9.75	1.50	15.75	1.20	21.75	0.50
4.00	0.50	10.00	1.50	16.00	1.20	22.00	0.50
4.25	0.60	10.25	1.90	16.25	0.70	22.25	0.50
4.50	0.60	10.50	1.90	16.50	0.70	22.50	0.50
4.75	0.60	10.75	2.50	16.75	0.70	22.75	0.50
5.00	0.60	11.00	2.50	17.00	0.70	23.00	0.50
5.25	0.60	11.25	3.90	17.25	0.70	23.25	0.50
5.50	0.60	11.50	3.90	17.50	0.70	23.50	0.50
5.75	0.60	11.75	16.90	17.75	0.70	23.75	0.50
6.00	0.60	12.00	44.80	18.00	0.70	24.00	0.50

CALIB NASHYD (1100) | Area (ha)= 2.33 Curve Number (CN)= 67.2

ID= 1 DT= 5.0 min | Ia (mm)= 7.90 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.46

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	0.40	6.083	0.80	12.083	5.80	18.08	0.70
0.167	0.40	6.167	0.80	12.167	5.80	18.17	0.70
0.250	0.40	6.250	0.80	12.250	5.80	18.25	0.70
0.333	0.40	6.333	0.80	12.333	5.80	18.33	0.70
0.417	0.40	6.417	0.80	12.417	5.80	18.42	0.70
0.500	0.40	6.500	0.80	12.500	5.80	18.50	0.70
0.583	0.40	6.583	0.80	12.583	3.00	18.58	0.70
0.667	0.40	6.667	0.80	12.667	3.00	18.67	0.70
0.750	0.40	6.750	0.80	12.750	3.00	18.75	0.70
0.833	0.40	6.833	0.80	12.833	3.00	18.83	0.70
0.917	0.40	6.917	0.80	12.917	3.00	18.92	0.70
1.000	0.40	7.000	0.80	13.000	3.00	19.00	0.70
1.083	0.40	7.083	0.80	13.083	0.60	19.08	0.70
1.167	0.40	7.167	0.80	13.167	0.60	19.17	0.70
1.250	0.40	7.250	0.80	13.250	0.60	19.25	0.70
1.333	0.40	7.333	0.80	13.333	0.60	19.33	0.70
1.417	0.40	7.417	0.80	13.417	0.60	19.42	0.70
1.500	0.40	7.500	0.80	13.500	0.60	19.50	0.70
1.583	0.40	7.583	0.80	13.583	3.30	19.58	0.70
1.667	0.40	7.667	0.80	13.667	3.30	19.67	0.70
1.750	0.40	7.750	0.80	13.750	3.30	19.75	0.70
1.833	0.40	7.833	0.80	13.833	3.30	19.83	0.70
1.917	0.40	7.917	0.80	13.917	3.30	19.92	0.70
2.000	0.40	8.000	0.80	14.000	3.30	20.00	0.70
2.083	0.50	8.083	1.10	14.083	1.20	20.08	0.50
2.167	0.50	8.167	1.10	14.167	1.20	20.17	0.50
2.250	0.50	8.250	1.10	14.250	1.20	20.25	0.50
2.333	0.50	8.333	1.10	14.333	1.20	20.33	0.50
2.417	0.50	8.417	1.10	14.417	1.20	20.42	0.50
2.500	0.50	8.500	1.10	14.500	1.20	20.50	0.50
2.583	0.50	8.583	1.10	14.583	1.20	20.58	0.50
2.667	0.50	8.667	1.10	14.667	1.20	20.67	0.50
2.750	0.50	8.750	1.10	14.750	1.20	20.75	0.50
2.833	0.50	8.833	1.10	14.833	1.20	20.83	0.50
2.917	0.50	8.917	1.10	14.917	1.20	20.92	0.50
3.000	0.50	9.000	1.10	15.000	1.20	21.00	0.50
3.083	0.50	9.083	1.30	15.083	1.20	21.08	0.50
3.167	0.50	9.167	1.30	15.167	1.20	21.17	0.50
3.250	0.50	9.250	1.30	15.250	1.20	21.25	0.50
3.333	0.50	9.333	1.30	15.333	1.20	21.33	0.50
3.417	0.50	9.417	1.30	15.417	1.20	21.42	0.50
3.500	0.50	9.500	1.30	15.500	1.20	21.50	0.50
3.583	0.50	9.583	1.50	15.583	1.20	21.58	0.50
3.667	0.50	9.667	1.50	15.667	1.20	21.67	0.50

3.750	0.50	9.750	1.50	15.750	1.20	21.75	0.50
3.833	0.50	9.833	1.50	15.833	1.20	21.83	0.50
3.917	0.50	9.917	1.50	15.917	1.20	21.92	0.50
4.000	0.50	10.000	1.50	16.000	1.20	22.00	0.50
4.083	0.60	10.083	1.90	16.083	0.70	22.08	0.50
4.167	0.60	10.167	1.90	16.167	0.70	22.17	0.50
4.250	0.60	10.250	1.90	16.250	0.70	22.25	0.50
4.333	0.60	10.333	1.90	16.333	0.70	22.33	0.50
4.417	0.60	10.417	1.90	16.417	0.70	22.42	0.50
4.500	0.60	10.500	1.90	16.500	0.70	22.50	0.50
4.583	0.60	10.583	2.50	16.583	0.70	22.58	0.50
4.667	0.60	10.667	2.50	16.667	0.70	22.67	0.50
4.750	0.60	10.750	2.50	16.750	0.70	22.75	0.50
4.833	0.60	10.833	2.50	16.833	0.70	22.83	0.50
4.917	0.60	10.917	2.50	16.917	0.70	22.92	0.50
5.000	0.60	11.000	2.50	17.000	0.70	23.00	0.50
5.083	0.60	11.083	3.90	17.083	0.70	23.08	0.50
5.167	0.60	11.167	3.90	17.167	0.70	23.17	0.50
5.250	0.60	11.250	3.90	17.250	0.70	23.25	0.50
5.333	0.60	11.333	3.90	17.333	0.70	23.33	0.50
5.417	0.60	11.417	3.90	17.417	0.70	23.42	0.50
5.500	0.60	11.500	3.90	17.500	0.70	23.50	0.50
5.583	0.60	11.583	16.90	17.583	0.70	23.58	0.50
5.667	0.60	11.667	16.90	17.667	0.70	23.67	0.50
5.750	0.60	11.750	16.90	17.750	0.70	23.75	0.50
5.833	0.60	11.833	44.80	17.833	0.70	23.83	0.50
5.917	0.60	11.917	44.80	17.917	0.70	23.92	0.50
6.000	0.60	12.000	44.80	18.000	0.70	24.00	0.50

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.020 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 6.684
TOTAL RAINFALL (mm)= 40.225
RUNOFF COEFFICIENT = 0.166

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

CALIB					
NASHYD (2101)	Area (ha)=	0.39	Curve Number (CN)=	63.4	
ID= 1 DT= 5.0 min	Ia (mm)=	4.90	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.17			

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.007 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 6.832
TOTAL RAINFALL (mm)= 40.225
RUNOFF COEFFICIENT = 0.170

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

CALIB					
STANDHYD (2100)	Area (ha)=	1.17			
ID= 1 DT= 5.0 min	Total Imp(%)=	96.00	Dir. Conn.(%)=	96.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		44.80	14.78	
over (min)		5.00	5.00	
Storage Coeff. (min)=		2.86 (ii)	3.50 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.28	0.26	
				TOTALS
PEAK FLOW	(cms)=	0.14	0.00	0.141 (iii)
TIME TO PEAK	(hrs)=	12.00	12.00	12.00
RUNOFF VOLUME	(mm)=	39.22	10.71	38.08
TOTAL RAINFALL	(mm)=	40.23	40.23	40.23
RUNOFF COEFFICIENT	=	0.98	0.27	0.95

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)=	0.77			
ID= 1 DT= 5.0 min	Total Imp(%)=	99.00	Dir. Conn.(%)=	99.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.76	0.01
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.50
Length	(m)=	71.65	4.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		44.80	5.21
over (min)		5.00	5.00
Storage Coeff. (min)=		2.88 (ii)	3.25 (ii)
Unit Hyd. Tpeak (min)=		5.00	5.00

```
     Unit Hyd. peak  (cms)=       0.28         0.27
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.00          0.095 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      39.22         3.93          38.87
     TOTAL RAINFALL   (mm)=      40.23        40.23          40.23
     RUNOFF COEFFICIENT   =       0.98         0.10           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.141    12.00    38.08
        + ID2= 2 (2102):     0.77   0.095    12.00    38.87
          ================================================
          ID = 3 (0009):     1.94   0.236    12.00    38.40

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.236     12.00      38.40
     OUTFLOW: ID= 1 (0005)     1.940      0.010     14.07      38.39

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)=  4.19
                    TIME SHIFT OF PEAK FLOW         (min)=124.00
                    MAXIMUM  STORAGE   USED      (ha.m.)=  0.0372
```



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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.007    12.08     6.83
        + ID2= 2 (0005):     1.94   0.010    14.07    38.39
          ================================================
          ID = 3 (0004):     2.33   0.016    12.08    33.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.007 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=   6.832
     TOTAL RAINFALL   (mm)=  40.225
     RUNOFF COEFFICIENT   =   0.170

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12          0.05
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.56          2.50
     Length            (m)=      88.32          4.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      44.80      ********
               over (min)         5.00          5.00
     Storage Coeff.  (min)=       2.86 (ii)     3.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00          5.00
     Unit Hyd. peak  (cms)=       0.28          0.26
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.14          0.00          0.141 (iii)
     TIME TO PEAK    (hrs)=      12.00         12.00          12.00
     RUNOFF VOLUME    (mm)=      39.22         10.71          38.08
     TOTAL RAINFALL   (mm)=      40.23         40.23          40.23
```

```
     RUNOFF COEFFICIENT   =       0.98         0.27          0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      44.80     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.88 (ii)    3.25 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.28         0.27
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.09         0.00          0.095 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      39.22         3.93          38.87
     TOTAL RAINFALL   (mm)=      40.23        40.23          40.23
     RUNOFF COEFFICIENT   =       0.98         0.10           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.141    12.00    38.08
        + ID2= 2 (0018):     0.77   0.095    12.00    38.87
          ================================================
          ID = 3 (0017):     1.94   0.236    12.00    38.40
```



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

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.007    12.08     6.83
        + ID2= 2 (0017):     1.94   0.236    12.00    38.40
          ================================================
          ID = 3 (0015):     2.33   0.243    12.00    33.11

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ***************************
  ** SIMULATION NUMBER:  21 **
  ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\7c22d694
| Ptotal= 46.40 mm |    Comments: 10-Year, 24 hour SCS Type II, Ganaraska
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    0.50 |  6.25    0.90 | 12.25    6.70 | 18.25    0.80
                0.50    0.50 |  6.50    0.90 | 12.50    6.70 | 18.50    0.80
                0.75    0.50 |  6.75    0.90 | 12.75    3.40 | 18.75    0.80
                1.00    0.50 |  7.00    0.90 | 13.00    3.40 | 19.00    0.80
                1.25    0.50 |  7.25    0.90 | 13.25    0.70 | 19.25    0.80
                1.50    0.50 |  7.50    0.90 | 13.50    0.70 | 19.50    0.80
                1.75    0.50 |  7.75    0.90 | 13.75    3.80 | 19.75    0.80
                2.00    0.50 |  8.00    0.90 | 14.00    3.80 | 20.00    0.80
                2.25    0.60 |  8.25    1.30 | 14.25    1.40 | 20.25    0.60
                2.50    0.60 |  8.50    1.30 | 14.50    1.40 | 20.50    0.60
                2.75    0.60 |  8.75    1.30 | 14.75    1.40 | 20.75    0.60
                3.00    0.60 |  9.00    1.30 | 15.00    1.40 | 21.00    0.60
                3.25    0.60 |  9.25    1.50 | 15.25    1.40 | 21.25    0.60
                3.50    0.60 |  9.50    1.50 | 15.50    1.40 | 21.50    0.60
                3.75    0.60 |  9.75    1.70 | 15.75    1.40 | 21.75    0.60
                4.00    0.60 | 10.00    1.70 | 16.00    1.40 | 22.00    0.60
                4.25    0.70 | 10.25    2.10 | 16.25    0.80 | 22.25    0.60
                4.50    0.70 | 10.50    2.10 | 16.50    0.80 | 22.50    0.60
                4.75    0.70 | 10.75    2.90 | 16.75    0.80 | 22.75    0.60
                5.00    0.70 | 11.00    2.90 | 17.00    0.80 | 23.00    0.60
                5.25    0.70 | 11.25    4.50 | 17.25    0.80 | 23.25    0.60
                5.50    0.70 | 11.50    4.50 | 17.50    0.80 | 23.50    0.60
                5.75    0.70 | 11.75   19.30 | 17.75    0.80 | 23.75    0.60
```

6.00	0.70	12.00	51.30	18.00	0.80	24.00	0.60

CALIB					
NASHYD (1100)	Area	(ha)=	2.33	Curve Number (CN)=	67.2
ID= 1 DT= 5.0 min	Ia	(mm)=	7.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.46		

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	0.50	6.083	0.90	12.083	6.71	18.08	0.80
0.167	0.50	6.167	0.90	12.167	6.70	18.17	0.80
0.250	0.50	6.250	0.90	12.250	6.70	18.25	0.80
0.333	0.50	6.333	0.90	12.333	6.70	18.33	0.80
0.417	0.50	6.417	0.90	12.417	6.70	18.42	0.80
0.500	0.50	6.500	0.90	12.500	6.70	18.50	0.80
0.583	0.50	6.583	0.90	12.583	3.40	18.58	0.80
0.667	0.50	6.667	0.90	12.667	3.40	18.67	0.80
0.750	0.50	6.750	0.90	12.750	3.40	18.75	0.80
0.833	0.50	6.833	0.90	12.833	3.40	18.83	0.80
0.917	0.50	6.917	0.90	12.917	3.40	18.92	0.80
1.000	0.50	7.000	0.90	13.000	3.40	19.00	0.80
1.083	0.50	7.083	0.90	13.083	0.70	19.08	0.80
1.167	0.50	7.167	0.90	13.167	0.70	19.17	0.80
1.250	0.50	7.250	0.90	13.250	0.70	19.25	0.80
1.333	0.50	7.333	0.90	13.333	0.70	19.33	0.80
1.417	0.50	7.417	0.90	13.417	0.70	19.42	0.80
1.500	0.50	7.500	0.90	13.500	0.70	19.50	0.80
1.583	0.50	7.583	0.90	13.583	3.80	19.58	0.80
1.667	0.50	7.667	0.90	13.667	3.80	19.67	0.80
1.750	0.50	7.750	0.90	13.750	3.80	19.75	0.80
1.833	0.50	7.833	0.90	13.833	3.80	19.83	0.80
1.917	0.50	7.917	0.90	13.917	3.80	19.92	0.80
2.000	0.50	8.000	0.90	14.000	3.80	20.00	0.80
2.083	0.60	8.083	1.30	14.083	1.40	20.08	0.60
2.167	0.60	8.167	1.30	14.167	1.40	20.17	0.60
2.250	0.60	8.250	1.30	14.250	1.40	20.25	0.60
2.333	0.60	8.333	1.30	14.333	1.40	20.33	0.60
2.417	0.60	8.417	1.30	14.417	1.40	20.42	0.60
2.500	0.60	8.500	1.30	14.500	1.40	20.50	0.60
2.583	0.60	8.583	1.30	14.583	1.40	20.58	0.60
2.667	0.60	8.667	1.30	14.667	1.40	20.67	0.60
2.750	0.60	8.750	1.30	14.750	1.40	20.75	0.60
2.833	0.60	8.833	1.30	14.833	1.40	20.83	0.60
2.917	0.60	8.917	1.30	14.917	1.40	20.92	0.60
3.000	0.60	9.000	1.30	15.000	1.40	21.00	0.60
3.083	0.60	9.083	1.50	15.083	1.40	21.08	0.60

3.167	0.60	9.167	1.50	15.167	1.40	21.17	0.60
3.250	0.60	9.250	1.50	15.250	1.40	21.25	0.60
3.333	0.60	9.333	1.50	15.333	1.40	21.33	0.60
3.417	0.60	9.417	1.50	15.417	1.40	21.42	0.60
3.500	0.60	9.500	1.50	15.500	1.40	21.50	0.60
3.583	0.60	9.583	1.70	15.583	1.40	21.58	0.60
3.667	0.60	9.667	1.70	15.667	1.40	21.67	0.60
3.750	0.60	9.750	1.70	15.750	1.40	21.75	0.60
3.833	0.60	9.833	1.70	15.833	1.40	21.83	0.60
3.917	0.60	9.917	1.70	15.917	1.40	21.92	0.60
4.000	0.60	10.000	1.70	16.000	1.40	22.00	0.60
4.083	0.70	10.083	2.10	16.083	0.80	22.08	0.60
4.167	0.70	10.167	2.10	16.167	0.80	22.17	0.60
4.250	0.70	10.250	2.10	16.250	0.80	22.25	0.60
4.333	0.70	10.333	2.10	16.333	0.80	22.33	0.60
4.417	0.70	10.417	2.10	16.417	0.80	22.42	0.60
4.500	0.70	10.500	2.10	16.500	0.80	22.50	0.60
4.583	0.70	10.583	2.90	16.583	0.80	22.58	0.60
4.667	0.70	10.667	2.90	16.667	0.80	22.67	0.60
4.750	0.70	10.750	2.90	16.750	0.80	22.75	0.60
4.833	0.70	10.833	2.90	16.833	0.80	22.83	0.60
4.917	0.70	10.917	2.90	16.917	0.80	22.92	0.60
5.000	0.70	11.000	2.90	17.000	0.80	23.00	0.60
5.083	0.70	11.083	4.50	17.083	0.80	23.08	0.60
5.167	0.70	11.167	4.50	17.167	0.80	23.17	0.60
5.250	0.70	11.250	4.50	17.250	0.80	23.25	0.60
5.333	0.70	11.333	4.50	17.333	0.80	23.33	0.60
5.417	0.70	11.417	4.50	17.417	0.80	23.42	0.60
5.500	0.70	11.500	4.50	17.500	0.80	23.50	0.60
5.583	0.70	11.583	19.30	17.583	0.80	23.58	0.60
5.667	0.70	11.667	19.30	17.667	0.80	23.67	0.60
5.750	0.70	11.750	19.30	17.750	0.80	23.75	0.60
5.833	0.70	11.833	51.30	17.833	0.80	23.83	0.60
5.917	0.70	11.917	51.30	17.917	0.80	23.92	0.60
6.000	0.70	12.000	51.30	18.000	0.80	24.00	0.60

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.027 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 9.122
TOTAL RAINFALL (mm)= 46.400
RUNOFF COEFFICIENT = 0.197

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

CALIB					
NASHYD (2101)	Area	(ha)=	0.39	Curve Number (CN)=	63.4
ID= 1 DT= 5.0 min	Ia	(mm)=	4.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.17		

```
     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=   9.121
     TOTAL RAINFALL   (mm)=  46.400
     RUNOFF COEFFICIENT   =   0.197

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      51.30        19.22
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.71 (ii)    3.32 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.26
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.00          0.162 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      45.40        14.04          44.14
     TOTAL RAINFALL   (mm)=      46.40        46.40          46.40
     RUNOFF COEFFICIENT   =       0.98         0.30           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
```



```
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      51.30         7.01
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.73 (ii)    3.08 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.00          0.109 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      45.40         5.32          45.00
     TOTAL RAINFALL   (mm)=      46.40        46.40          46.40
     RUNOFF COEFFICIENT   =       0.98         0.11           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.162    12.00    44.14
        + ID2= 2 (2102):     0.77   0.109    12.00    45.00
          ================================================
          ID = 3 (0009):     1.94   0.271    12.00    44.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0107     0.0490
                         0.0068     0.0001   |   0.0177     0.0518
                         0.0073     0.0051   |   0.0365     0.0695
                         0.0077     0.0101   |   0.0514     0.0844
                         0.0081     0.0142   |   0.0624     0.0960
                         0.0090     0.0251   |   0.0751     0.1089
                         0.0097     0.0348   |   0.0768     0.1108
                         0.0104     0.0444   |   0.0808     0.1156

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

```
     INFLOW : ID= 2 (0009)      1.940      0.271     12.00      44.48
     OUTFLOW: ID= 1 (0005)      1.940      0.010     14.08      44.48

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.84
                   TIME SHIFT OF PEAK FLOW         (min)=125.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0444

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.009    12.08     9.12
        + ID2= 2 (0005):     1.94   0.010    14.08    44.48
          ================================================
          ID = 3 (0004):     2.33   0.019    12.08    38.56

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.009 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=   9.121
     TOTAL RAINFALL   (mm)=  46.400
     RUNOFF COEFFICIENT   =   0.197

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

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--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      51.30      ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.71 (ii)    3.32 (ii)
```



```
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.26
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.00          0.162 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      45.40        14.04         44.14
     TOTAL RAINFALL   (mm)=      46.40        46.40         46.40
     RUNOFF COEFFICIENT   =       0.98         0.30          0.95

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  75.9    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.

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--------------------
| CALIB            |
| STANDHYD  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      51.30      ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.73 (ii)    3.08 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.00          0.109 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      45.40         5.32         45.00
     TOTAL RAINFALL   (mm)=      46.40        46.40         46.40
     RUNOFF COEFFICIENT   =       0.98         0.11          0.97

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

      (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    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.

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ADD HYD (0017)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0013):	1.17	0.162	12.00	44.14
+	ID2= 2 (0018):	0.77	0.109	12.00	45.00
	ID = 3 (0017):	1.94	0.271	12.00	44.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0015)					
1 + 2 = 3		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0012):	0.39	0.009	12.08	9.12
+	ID2= 2 (0017):	1.94	0.271	12.00	44.48
	ID = 3 (0015):	2.33	0.280	12.00	38.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION NUMBER: 22 **
****

READ STORM	Filename: C:\Users\csokol\AppData\Local\Temp\27f1d0b1-c568-477a-8e6b-cf8f29233bf8\097d8afd
Ptotal= 64.07 mm	Comments: 25-Year, 24 hour SCS Type II, Ganaraska

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.25	0.70	6.25	1.30	12.25	9.20	18.25	1.20
0.50	0.70	6.50	1.30	12.50	9.20	18.50	1.20
0.75	0.70	6.75	1.30	12.75	4.70	18.75	1.20
1.00	0.70	7.00	1.30	13.00	4.70	19.00	1.20
1.25	0.70	7.25	1.30	13.25	0.90	19.25	1.20
1.50	0.70	7.50	1.30	13.50	0.90	19.50	1.20
1.75	0.70	7.75	1.30	13.75	5.20	19.75	1.20
2.00	0.70	8.00	1.30	14.00	5.20	20.00	1.20
2.25	0.80	8.25	1.70	14.25	1.90	20.25	0.80
2.50	0.80	8.50	1.70	14.50	1.90	20.50	0.80
2.75	0.80	8.75	1.70	14.75	1.90	20.75	0.80
3.00	0.80	9.00	1.70	15.00	1.90	21.00	0.80
3.25	0.80	9.25	2.00	15.25	1.90	21.25	0.80
3.50	0.80	9.50	2.00	15.50	1.90	21.50	0.80
3.75	0.80	9.75	2.30	15.75	1.90	21.75	0.80
4.00	0.80	10.00	2.30	16.00	1.90	22.00	0.80

4.25	1.00	10.25	2.90	16.25	1.20	22.25	0.80
4.50	1.00	10.50	2.90	16.50	1.20	22.50	0.80
4.75	1.00	10.75	4.00	16.75	1.20	22.75	0.80
5.00	1.00	11.00	4.00	17.00	1.20	23.00	0.80
5.25	1.00	11.25	6.10	17.25	1.20	23.25	0.80
5.50	1.00	11.50	6.10	17.50	1.20	23.50	0.80
5.75	1.00	11.75	26.60	17.75	1.20	23.75	0.80
6.00	1.00	12.00	70.70	18.00	1.20	24.00	0.80

CALIB			
NASHYD (1100)	Area (ha)=	2.33	Curve Number (CN)= 67.2
ID= 1 DT= 5.0 min	Ia (mm)=	7.90	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.46	

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	0.70	6.083	1.30	12.083	9.21	18.08	1.20
0.167	0.70	6.167	1.30	12.167	9.20	18.17	1.20
0.250	0.70	6.250	1.30	12.250	9.20	18.25	1.20
0.333	0.70	6.333	1.30	12.333	9.20	18.33	1.20
0.417	0.70	6.417	1.30	12.417	9.20	18.42	1.20
0.500	0.70	6.500	1.30	12.500	9.20	18.50	1.20
0.583	0.70	6.583	1.30	12.583	4.70	18.58	1.20
0.667	0.70	6.667	1.30	12.667	4.70	18.67	1.20
0.750	0.70	6.750	1.30	12.750	4.70	18.75	1.20
0.833	0.70	6.833	1.30	12.833	4.70	18.83	1.20
0.917	0.70	6.917	1.30	12.917	4.70	18.92	1.20
1.000	0.70	7.000	1.30	13.000	4.70	19.00	1.20
1.083	0.70	7.083	1.30	13.083	0.90	19.08	1.20
1.167	0.70	7.167	1.30	13.167	0.90	19.17	1.20
1.250	0.70	7.250	1.30	13.250	0.90	19.25	1.20
1.333	0.70	7.333	1.30	13.333	0.90	19.33	1.20
1.417	0.70	7.417	1.30	13.417	0.90	19.42	1.20
1.500	0.70	7.500	1.30	13.500	0.90	19.50	1.20
1.583	0.70	7.583	1.30	13.583	5.20	19.58	1.20
1.667	0.70	7.667	1.30	13.667	5.20	19.67	1.20
1.750	0.70	7.750	1.30	13.750	5.20	19.75	1.20
1.833	0.70	7.833	1.30	13.833	5.20	19.83	1.20
1.917	0.70	7.917	1.30	13.917	5.20	19.92	1.20
2.000	0.70	8.000	1.30	14.000	5.20	20.00	1.20
2.083	0.80	8.083	1.70	14.083	1.90	20.08	0.80
2.167	0.80	8.167	1.70	14.167	1.90	20.17	0.80
2.250	0.80	8.250	1.70	14.250	1.90	20.25	0.80
2.333	0.80	8.333	1.70	14.333	1.90	20.33	0.80
2.417	0.80	8.417	1.70	14.417	1.90	20.42	0.80
2.500	0.80	8.500	1.70	14.500	1.90	20.50	0.80

2.583	0.80	8.583	1.70	14.583	1.90	20.58	0.80
2.667	0.80	8.667	1.70	14.667	1.90	20.67	0.80
2.750	0.80	8.750	1.70	14.750	1.90	20.75	0.80
2.833	0.80	8.833	1.70	14.833	1.90	20.83	0.80
2.917	0.80	8.917	1.70	14.917	1.90	20.92	0.80
3.000	0.80	9.000	1.70	15.000	1.90	21.00	0.80
3.083	0.80	9.083	2.00	15.083	1.90	21.08	0.80
3.167	0.80	9.167	2.00	15.167	1.90	21.17	0.80
3.250	0.80	9.250	2.00	15.250	1.90	21.25	0.80
3.333	0.80	9.333	2.00	15.333	1.90	21.33	0.80
3.417	0.80	9.417	2.00	15.417	1.90	21.42	0.80
3.500	0.80	9.500	2.00	15.500	1.90	21.50	0.80
3.583	0.80	9.583	2.30	15.583	1.90	21.58	0.80
3.667	0.80	9.667	2.30	15.667	1.90	21.67	0.80
3.750	0.80	9.750	2.30	15.750	1.90	21.75	0.80
3.833	0.80	9.833	2.30	15.833	1.90	21.83	0.80
3.917	0.80	9.917	2.30	15.917	1.90	21.92	0.80
4.000	0.80	10.000	2.30	16.000	1.90	22.00	0.80
4.083	1.00	10.083	2.90	16.083	1.20	22.08	0.80
4.167	1.00	10.167	2.90	16.167	1.20	22.17	0.80
4.250	1.00	10.250	2.90	16.250	1.20	22.25	0.80
4.333	1.00	10.333	2.90	16.333	1.20	22.33	0.80
4.417	1.00	10.417	2.90	16.417	1.20	22.42	0.80
4.500	1.00	10.500	2.90	16.500	1.20	22.50	0.80
4.583	1.00	10.583	4.00	16.583	1.20	22.58	0.80
4.667	1.00	10.667	4.00	16.667	1.20	22.67	0.80
4.750	1.00	10.750	4.00	16.750	1.20	22.75	0.80
4.833	1.00	10.833	4.00	16.833	1.20	22.83	0.80
4.917	1.00	10.917	4.00	16.917	1.20	22.92	0.80
5.000	1.00	11.000	4.00	17.000	1.20	23.00	0.80
5.083	1.00	11.083	6.10	17.083	1.20	23.08	0.80
5.167	1.00	11.167	6.10	17.167	1.20	23.17	0.80
5.250	1.00	11.250	6.10	17.250	1.20	23.25	0.80
5.333	1.00	11.333	6.10	17.333	1.20	23.33	0.80
5.417	1.00	11.417	6.10	17.417	1.20	23.42	0.80
5.500	1.00	11.500	6.10	17.500	1.20	23.50	0.80
5.583	1.00	11.583	26.60	17.583	1.20	23.58	0.80
5.667	1.00	11.667	26.60	17.667	1.20	23.67	0.80
5.750	1.00	11.750	26.60	17.750	1.20	23.75	0.80
5.833	1.00	11.833	70.70	17.833	1.20	23.83	0.80
5.917	1.00	11.917	70.70	17.917	1.20	23.92	0.80
6.000	1.00	12.000	70.70	18.000	1.20	24.00	0.80

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.054 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 17.515
TOTAL RAINFALL (mm)= 64.075
RUNOFF COEFFICIENT = 0.273

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

CALIB					
NASHYD (2101)	Area (ha)= 0.39	Curve Number (CN)= 63.4			
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.17				

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.017 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 16.953
TOTAL RAINFALL (mm)= 64.075
RUNOFF COEFFICIENT = 0.265

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

CALIB				
STANDHYD (2100)	Area (ha)= 1.17			
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00		
	IMPERVIOUS	PERVIOUS (i)		
Surface Area (ha)=	1.12	0.05		
Dep. Storage (mm)=	1.00	5.00		
Average Slope (%)=	1.56	2.50		
Length (m)=	88.32	4.00		
Mannings n =	0.013	0.250		
Max.Eff.Inten.(mm/hr)=	70.70	33.96		
over (min)	5.00	5.00		
Storage Coeff. (min)=	2.38 (ii)	2.92 (ii)		
Unit Hyd. Tpeak (min)=	5.00	5.00		
Unit Hyd. peak (cms)=	0.30	0.28		
			TOTALS	
PEAK FLOW (cms)=	0.22	0.00	0.225 (iii)	
TIME TO PEAK (hrs)=	12.00	12.00	12.00	
RUNOFF VOLUME (mm)=	63.07	24.98	61.55	
TOTAL RAINFALL (mm)=	64.08	64.08	64.08	
RUNOFF COEFFICIENT =	0.98	0.39	0.96	

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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

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| STANDHYD  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      70.70        13.48
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.40 (ii)    2.71 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.00          0.150 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      63.08        10.27          62.55
     TOTAL RAINFALL   (mm)=      64.08        64.08          64.08
     RUNOFF COEFFICIENT   =       0.98         0.16           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.225    12.00    61.55
        + ID2= 2 (2102):     0.77   0.150    12.00    62.55
          ================================================
          ID = 3 (0009):     1.94   0.375    12.00    61.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0107     0.0490
                         0.0068     0.0001   |   0.0177     0.0518
                         0.0073     0.0051   |   0.0365     0.0695
                         0.0077     0.0101   |   0.0514     0.0844
```



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                         0.0081     0.0142   |   0.0624     0.0960
                         0.0090     0.0251   |   0.0751     0.1089
                         0.0097     0.0348   |   0.0768     0.1108
                         0.0104     0.0444   |   0.0808     0.1156

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)       1.940     0.375     12.00      61.95
     OUTFLOW: ID= 1 (0005)       1.940     0.026     12.63      58.29

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.01
                   TIME SHIFT OF PEAK FLOW         (min)= 38.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0599

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.017    12.00    16.95
        + ID2= 2 (0005):     1.94   0.026    12.63    58.29
          ================================================
          ID = 3 (0004):     2.33   0.038    12.08    51.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.017 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  16.953
     TOTAL RAINFALL   (mm)=  64.075
     RUNOFF COEFFICIENT   =   0.265

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
```

```
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      70.70     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.38 (ii)    2.92 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.28
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.00          0.225 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      63.07        24.98         61.55
     TOTAL RAINFALL   (mm)=      64.08        64.08         64.08
     RUNOFF COEFFICIENT   =       0.98         0.39          0.96

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                         IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      70.70     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.40 (ii)    2.71 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.00          0.150 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00         12.00
     RUNOFF VOLUME    (mm)=      63.08        10.27         62.55
     TOTAL RAINFALL   (mm)=      64.08        64.08         64.08
     RUNOFF COEFFICIENT   =       0.98         0.16          0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.225    12.00    61.55
        + ID2= 2 (0018):     0.77   0.150    12.00    62.55
          ================================================
          ID = 3 (0017):     1.94   0.375    12.00    61.95

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.017    12.00    16.95
        + ID2= 2 (0017):     1.94   0.375    12.00    61.95
          ================================================
          ID = 3 (0015):     2.33   0.391    12.00    54.41

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ****************************
  ** SIMULATION NUMBER:  23 **
  ****************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\226e3dfa
| Ptotal= 77.75 mm |    Comments: 50-Year, 24 hour SCS Type II, Ganaraska
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    0.90 |  6.25    1.60 | 12.25   11.20 | 18.25    1.40
                0.50    0.90 |  6.50    1.60 | 12.50   11.20 | 18.50    1.40
                0.75    0.90 |  6.75    1.60 | 12.75    5.80 | 18.75    1.40
                1.00    0.90 |  7.00    1.60 | 13.00    5.80 | 19.00    1.40
                1.25    0.90 |  7.25    1.60 | 13.25    1.10 | 19.25    1.40
                1.50    0.90 |  7.50    1.60 | 13.50    1.10 | 19.50    1.40
                1.75    0.90 |  7.75    1.60 | 13.75    6.40 | 19.75    1.40
                2.00    0.90 |  8.00    1.60 | 14.00    6.40 | 20.00    1.40
                2.25    1.00 |  8.25    2.10 | 14.25    2.30 | 20.25    0.90
```

2.50	1.00	8.50	2.10	14.50	2.30	20.50	0.90
2.75	1.00	8.75	2.10	14.75	2.30	20.75	0.90
3.00	1.00	9.00	2.10	15.00	2.30	21.00	0.90
3.25	1.00	9.25	2.50	15.25	2.30	21.25	0.90
3.50	1.00	9.50	2.50	15.50	2.30	21.50	0.90
3.75	1.00	9.75	2.80	15.75	2.30	21.75	0.90
4.00	1.00	10.00	2.80	16.00	2.30	22.00	0.90
4.25	1.20	10.25	3.60	16.25	1.40	22.25	0.90
4.50	1.20	10.50	3.60	16.50	1.40	22.50	0.90
4.75	1.20	10.75	4.80	16.75	1.40	22.75	0.90
5.00	1.20	11.00	4.80	17.00	1.40	23.00	0.90
5.25	1.20	11.25	7.50	17.25	1.40	23.25	0.90
5.50	1.20	11.50	7.50	17.50	1.40	23.50	0.90
5.75	1.20	11.75	32.40	17.75	1.40	23.75	0.90
6.00	1.20	12.00	86.00	18.00	1.40	24.00	0.90

```
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46
```

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	0.90	6.083	1.60	12.083	11.21	18.08	1.40
0.167	0.90	6.167	1.60	12.167	11.20	18.17	1.40
0.250	0.90	6.250	1.60	12.250	11.20	18.25	1.40
0.333	0.90	6.333	1.60	12.333	11.20	18.33	1.40
0.417	0.90	6.417	1.60	12.417	11.20	18.42	1.40
0.500	0.90	6.500	1.60	12.500	11.20	18.50	1.40
0.583	0.90	6.583	1.60	12.583	5.80	18.58	1.40
0.667	0.90	6.667	1.60	12.667	5.80	18.67	1.40
0.750	0.90	6.750	1.60	12.750	5.80	18.75	1.40
0.833	0.90	6.833	1.60	12.833	5.80	18.83	1.40
0.917	0.90	6.917	1.60	12.917	5.80	18.92	1.40
1.000	0.90	7.000	1.60	13.000	5.80	19.00	1.40
1.083	0.90	7.083	1.60	13.083	1.10	19.08	1.40
1.167	0.90	7.167	1.60	13.167	1.10	19.17	1.40
1.250	0.90	7.250	1.60	13.250	1.10	19.25	1.40
1.333	0.90	7.333	1.60	13.333	1.10	19.33	1.40
1.417	0.90	7.417	1.60	13.417	1.10	19.42	1.40
1.500	0.90	7.500	1.60	13.500	1.10	19.50	1.40
1.583	0.90	7.583	1.60	13.583	6.40	19.58	1.40
1.667	0.90	7.667	1.60	13.667	6.40	19.67	1.40
1.750	0.90	7.750	1.60	13.750	6.40	19.75	1.40
1.833	0.90	7.833	1.60	13.833	6.40	19.83	1.40
1.917	0.90	7.917	1.60	13.917	6.40	19.92	1.40

2.000	0.90	8.000	1.60	14.000	6.40	20.00	1.40
2.083	1.00	8.083	2.10	14.083	2.30	20.08	0.90
2.167	1.00	8.167	2.10	14.167	2.30	20.17	0.90
2.250	1.00	8.250	2.10	14.250	2.30	20.25	0.90
2.333	1.00	8.333	2.10	14.333	2.30	20.33	0.90
2.417	1.00	8.417	2.10	14.417	2.30	20.42	0.90
2.500	1.00	8.500	2.10	14.500	2.30	20.50	0.90
2.583	1.00	8.583	2.10	14.583	2.30	20.58	0.90
2.667	1.00	8.667	2.10	14.667	2.30	20.67	0.90
2.750	1.00	8.750	2.10	14.750	2.30	20.75	0.90
2.833	1.00	8.833	2.10	14.833	2.30	20.83	0.90
2.917	1.00	8.917	2.10	14.917	2.30	20.92	0.90
3.000	1.00	9.000	2.10	15.000	2.30	21.00	0.90
3.083	1.00	9.083	2.50	15.083	2.30	21.08	0.90
3.167	1.00	9.167	2.50	15.167	2.30	21.17	0.90
3.250	1.00	9.250	2.50	15.250	2.30	21.25	0.90
3.333	1.00	9.333	2.50	15.333	2.30	21.33	0.90
3.417	1.00	9.417	2.50	15.417	2.30	21.42	0.90
3.500	1.00	9.500	2.50	15.500	2.30	21.50	0.90
3.583	1.00	9.583	2.80	15.583	2.30	21.58	0.90
3.667	1.00	9.667	2.80	15.667	2.30	21.67	0.90
3.750	1.00	9.750	2.80	15.750	2.30	21.75	0.90
3.833	1.00	9.833	2.80	15.833	2.30	21.83	0.90
3.917	1.00	9.917	2.80	15.917	2.30	21.92	0.90
4.000	1.00	10.000	2.80	16.000	2.30	22.00	0.90
4.083	1.20	10.083	3.60	16.083	1.40	22.08	0.90
4.167	1.20	10.167	3.60	16.167	1.40	22.17	0.90
4.250	1.20	10.250	3.60	16.250	1.40	22.25	0.90
4.333	1.20	10.333	3.60	16.333	1.40	22.33	0.90
4.417	1.20	10.417	3.60	16.417	1.40	22.42	0.90
4.500	1.20	10.500	3.60	16.500	1.40	22.50	0.90
4.583	1.20	10.583	4.80	16.583	1.40	22.58	0.90
4.667	1.20	10.667	4.80	16.667	1.40	22.67	0.90
4.750	1.20	10.750	4.80	16.750	1.40	22.75	0.90
4.833	1.20	10.833	4.80	16.833	1.40	22.83	0.90
4.917	1.20	10.917	4.80	16.917	1.40	22.92	0.90
5.000	1.20	11.000	4.80	17.000	1.40	23.00	0.90
5.083	1.20	11.083	7.50	17.083	1.40	23.08	0.90
5.167	1.20	11.167	7.50	17.167	1.40	23.17	0.90
5.250	1.20	11.250	7.50	17.250	1.40	23.25	0.90
5.333	1.20	11.333	7.50	17.333	1.40	23.33	0.90
5.417	1.20	11.417	7.50	17.417	1.40	23.42	0.90
5.500	1.20	11.500	7.50	17.500	1.40	23.50	0.90
5.583	1.20	11.583	32.40	17.583	1.40	23.58	0.90
5.667	1.20	11.667	32.40	17.667	1.40	23.67	0.90
5.750	1.20	11.750	32.40	17.750	1.40	23.75	0.90
5.833	1.20	11.833	85.99	17.833	1.40	23.83	0.90
5.917	1.20	11.917	86.00	17.917	1.40	23.92	0.90
6.000	1.20	12.000	86.00	18.000	1.40	24.00	0.90

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.081 (i)

```
     TIME TO PEAK    (hrs)=  12.333
     RUNOFF VOLUME    (mm)=  25.170
     TOTAL RAINFALL   (mm)=  77.750
     RUNOFF COEFFICIENT   =   0.324

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.024 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  24.093
     TOTAL RAINFALL   (mm)=  77.750
     RUNOFF COEFFICIENT   =   0.310

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      86.00        47.13
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.20 (ii)    2.70 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.01          0.274 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      76.75        34.50          75.06
     TOTAL RAINFALL   (mm)=      77.75        77.75          77.75
     RUNOFF COEFFICIENT   =       0.99         0.44           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      86.00        19.89
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.22 (ii)    2.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.00          0.182 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      76.75        14.97          76.13
     TOTAL RAINFALL   (mm)=      77.75        77.75          77.75
     RUNOFF COEFFICIENT   =       0.99         0.19           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.274    12.00    75.06
        + ID2= 2 (2102):     0.77   0.182    12.00    76.13
          ==========================================================
          ID = 3 (0009):     1.94   0.457    12.00    75.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| RESERVOIR (0005) |
```

```
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0107     0.0490
                         0.0068     0.0001   |   0.0177     0.0518
                         0.0073     0.0051   |   0.0365     0.0695
                         0.0077     0.0101   |   0.0514     0.0844
                         0.0081     0.0142   |   0.0624     0.0960
                         0.0090     0.0251   |   0.0751     0.1089
                         0.0097     0.0348   |   0.0768     0.1108
                         0.0104     0.0444   |   0.0808     0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.457     12.00      75.48
     OUTFLOW: ID= 1 (0005)     1.940      0.041     12.57      70.52

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  8.92
                   TIME SHIFT OF PEAK FLOW         (min)= 34.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0737

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-------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.024    12.00    24.09
        + ID2= 2 (0005):     1.94   0.041    12.57    70.52
          ================================================
          ID = 3 (0004):     2.33   0.061    12.08    62.75

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.024 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  24.093
     TOTAL RAINFALL   (mm)=  77.750
     RUNOFF COEFFICIENT   =   0.310

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

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```
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      86.00     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.20 (ii)    2.70 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.27         0.01          0.274 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      76.75        34.50          75.06
     TOTAL RAINFALL   (mm)=      77.75        77.75          77.75
     RUNOFF COEFFICIENT   =       0.99         0.44           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      86.00     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.22 (ii)    2.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.30         0.29
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.00          0.182 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      76.75        14.97          76.13
```

```
     TOTAL RAINFALL   (mm)=      77.75        77.75          77.75
     RUNOFF COEFFICIENT   =       0.99         0.19           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.274    12.00    75.06
       + ID2= 2 (0018):     0.77   0.182    12.00    76.13
         ================================================
         ID = 3 (0017):     1.94   0.457    12.00    75.48

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.024    12.00    24.09
       + ID2= 2 (0017):     1.94   0.457    12.00    75.48
         ================================================
         ID = 3 (0015):     2.33   0.481    12.00    66.88

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ***************************
  ** SIMULATION NUMBER:  24 **
  ***************************



--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\a91cbefe
| Ptotal= 91.28 mm |    Comments: 100-Year, 24 hour SCS Type II, Ganaraska
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.25    1.00 |  6.25    1.80 | 12.25   13.20 | 18.25    1.60
                0.50    1.00 |  6.50    1.80 | 12.50   13.20 | 18.50    1.60
```



```
                0.75    1.00 |  6.75    1.80 | 12.75    6.80 | 18.75    1.60
                1.00    1.00 |  7.00    1.80 | 13.00    6.80 | 19.00    1.60
                1.25    1.00 |  7.25    1.80 | 13.25    1.30 | 19.25    1.60
                1.50    1.00 |  7.50    1.80 | 13.50    1.30 | 19.50    1.60
                1.75    1.00 |  7.75    1.80 | 13.75    7.50 | 19.75    1.60
                2.00    1.00 |  8.00    1.80 | 14.00    7.50 | 20.00    1.60
                2.25    1.20 |  8.25    2.50 | 14.25    2.70 | 20.25    1.10
                2.50    1.20 |  8.50    2.50 | 14.50    2.70 | 20.50    1.10
                2.75    1.20 |  8.75    2.50 | 14.75    2.70 | 20.75    1.10
                3.00    1.20 |  9.00    2.50 | 15.00    2.70 | 21.00    1.10
                3.25    1.20 |  9.25    2.90 | 15.25    2.70 | 21.25    1.10
                3.50    1.20 |  9.50    2.90 | 15.50    2.70 | 21.50    1.10
                3.75    1.20 |  9.75    3.30 | 15.75    2.70 | 21.75    1.10
                4.00    1.20 | 10.00    3.30 | 16.00    2.70 | 22.00    1.10
                4.25    1.50 | 10.25    4.20 | 16.25    1.60 | 22.25    1.10
                4.50    1.50 | 10.50    4.20 | 16.50    1.60 | 22.50    1.10
                4.75    1.50 | 10.75    5.70 | 16.75    1.60 | 22.75    1.10
                5.00    1.50 | 11.00    5.70 | 17.00    1.60 | 23.00    1.10
                5.25    1.50 | 11.25    8.80 | 17.25    1.60 | 23.25    1.10
                5.50    1.50 | 11.50    8.80 | 17.50    1.60 | 23.50    1.10
                5.75    1.50 | 11.75   38.00 | 17.75    1.60 | 23.75    1.10
                6.00    1.50 | 12.00  100.90 | 18.00    1.60 | 24.00    1.10

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--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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    1.00 | 6.083    1.80 |12.083   13.21 | 18.08    1.60
             0.167    1.00 | 6.167    1.80 |12.167   13.20 | 18.17    1.60
             0.250    1.00 | 6.250    1.80 |12.250   13.20 | 18.25    1.60
             0.333    1.00 | 6.333    1.80 |12.333   13.20 | 18.33    1.60
             0.417    1.00 | 6.417    1.80 |12.417   13.20 | 18.42    1.60
             0.500    1.00 | 6.500    1.80 |12.500   13.20 | 18.50    1.60
             0.583    1.00 | 6.583    1.80 |12.583    6.80 | 18.58    1.60
             0.667    1.00 | 6.667    1.80 |12.667    6.80 | 18.67    1.60
             0.750    1.00 | 6.750    1.80 |12.750    6.80 | 18.75    1.60
             0.833    1.00 | 6.833    1.80 |12.833    6.80 | 18.83    1.60
             0.917    1.00 | 6.917    1.80 |12.917    6.80 | 18.92    1.60
             1.000    1.00 | 7.000    1.80 |13.000    6.80 | 19.00    1.60
             1.083    1.00 | 7.083    1.80 |13.083    1.30 | 19.08    1.60
             1.167    1.00 | 7.167    1.80 |13.167    1.30 | 19.17    1.60
             1.250    1.00 | 7.250    1.80 |13.250    1.30 | 19.25    1.60
             1.333    1.00 | 7.333    1.80 |13.333    1.30 | 19.33    1.60
```

1.417	1.00	7.417	1.80	13.417	1.30	19.42	1.60
1.500	1.00	7.500	1.80	13.500	1.30	19.50	1.60
1.583	1.00	7.583	1.80	13.583	7.50	19.58	1.60
1.667	1.00	7.667	1.80	13.667	7.50	19.67	1.60
1.750	1.00	7.750	1.80	13.750	7.50	19.75	1.60
1.833	1.00	7.833	1.80	13.833	7.50	19.83	1.60
1.917	1.00	7.917	1.80	13.917	7.50	19.92	1.60
2.000	1.00	8.000	1.80	14.000	7.50	20.00	1.60
2.083	1.20	8.083	2.50	14.083	2.70	20.08	1.10
2.167	1.20	8.167	2.50	14.167	2.70	20.17	1.10
2.250	1.20	8.250	2.50	14.250	2.70	20.25	1.10
2.333	1.20	8.333	2.50	14.333	2.70	20.33	1.10
2.417	1.20	8.417	2.50	14.417	2.70	20.42	1.10
2.500	1.20	8.500	2.50	14.500	2.70	20.50	1.10
2.583	1.20	8.583	2.50	14.583	2.70	20.58	1.10
2.667	1.20	8.667	2.50	14.667	2.70	20.67	1.10
2.750	1.20	8.750	2.50	14.750	2.70	20.75	1.10
2.833	1.20	8.833	2.50	14.833	2.70	20.83	1.10
2.917	1.20	8.917	2.50	14.917	2.70	20.92	1.10
3.000	1.20	9.000	2.50	15.000	2.70	21.00	1.10
3.083	1.20	9.083	2.90	15.083	2.70	21.08	1.10
3.167	1.20	9.167	2.90	15.167	2.70	21.17	1.10
3.250	1.20	9.250	2.90	15.250	2.70	21.25	1.10
3.333	1.20	9.333	2.90	15.333	2.70	21.33	1.10
3.417	1.20	9.417	2.90	15.417	2.70	21.42	1.10
3.500	1.20	9.500	2.90	15.500	2.70	21.50	1.10
3.583	1.20	9.583	3.30	15.583	2.70	21.58	1.10
3.667	1.20	9.667	3.30	15.667	2.70	21.67	1.10
3.750	1.20	9.750	3.30	15.750	2.70	21.75	1.10
3.833	1.20	9.833	3.30	15.833	2.70	21.83	1.10
3.917	1.20	9.917	3.30	15.917	2.70	21.92	1.10
4.000	1.20	10.000	3.30	16.000	2.70	22.00	1.10
4.083	1.50	10.083	4.20	16.083	1.60	22.08	1.10
4.167	1.50	10.167	4.20	16.167	1.60	22.17	1.10
4.250	1.50	10.250	4.20	16.250	1.60	22.25	1.10
4.333	1.50	10.333	4.20	16.333	1.60	22.33	1.10
4.417	1.50	10.417	4.20	16.417	1.60	22.42	1.10
4.500	1.50	10.500	4.20	16.500	1.60	22.50	1.10
4.583	1.50	10.583	5.70	16.583	1.60	22.58	1.10
4.667	1.50	10.667	5.70	16.667	1.60	22.67	1.10
4.750	1.50	10.750	5.70	16.750	1.60	22.75	1.10
4.833	1.50	10.833	5.70	16.833	1.60	22.83	1.10
4.917	1.50	10.917	5.70	16.917	1.60	22.92	1.10
5.000	1.50	11.000	5.70	17.000	1.60	23.00	1.10
5.083	1.50	11.083	8.80	17.083	1.60	23.08	1.10
5.167	1.50	11.167	8.80	17.167	1.60	23.17	1.10
5.250	1.50	11.250	8.80	17.250	1.60	23.25	1.10
5.333	1.50	11.333	8.80	17.333	1.60	23.33	1.10
5.417	1.50	11.417	8.80	17.417	1.60	23.42	1.10
5.500	1.50	11.500	8.80	17.500	1.60	23.50	1.10
5.583	1.50	11.583	38.00	17.583	1.60	23.58	1.10
5.667	1.50	11.667	38.00	17.667	1.60	23.67	1.10
5.750	1.50	11.750	38.00	17.750	1.60	23.75	1.10

5.833	1.50	11.833	100.89	17.833	1.60	23.83	1.10
5.917	1.50	11.917	100.90	17.917	1.60	23.92	1.10
6.000	1.50	12.000	100.90	18.000	1.60	24.00	1.10

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.109 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 33.522
TOTAL RAINFALL (mm)= 91.275
RUNOFF COEFFICIENT = 0.367

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

CALIB					
NASHYD (2101)	Area (ha)=	0.39	Curve Number (CN)=	63.4	
ID= 1 DT= 5.0 min	Ia (mm)=	4.90	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.17			

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.032 (i)
TIME TO PEAK (hrs)= 12.000
RUNOFF VOLUME (mm)= 31.904
TOTAL RAINFALL (mm)= 91.275
RUNOFF COEFFICIENT = 0.350

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

CALIB					
STANDHYD (2100)	Area (ha)=	1.17			
ID= 1 DT= 5.0 min	Total Imp(%)=	96.00	Dir. Conn.(%)=	96.00	

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	1.12	0.05	
Dep. Storage (mm)=	1.00	5.00	
Average Slope (%)=	1.56	2.50	
Length (m)=	88.32	4.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	100.90	60.62	
over (min)	5.00	5.00	
Storage Coeff. (min)=	2.07 (ii)	2.53 (ii)	
Unit Hyd. Tpeak (min)=	5.00	5.00	
Unit Hyd. peak (cms)=	0.31	0.29	
			TOTALS
PEAK FLOW (cms)=	0.31	0.01	0.323 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	90.27	44.59	88.45

```
     TOTAL RAINFALL   (mm)=      91.28        91.28          91.28
     RUNOFF COEFFICIENT   =       0.99         0.49           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     100.90        26.94
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.08 (ii)    2.35 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.00          0.214 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=      90.28        20.28          89.57
     TOTAL RAINFALL   (mm)=      91.28        91.28          91.28
     RUNOFF COEFFICIENT   =       0.99         0.22           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (2100):     1.17   0.323    12.00    88.45
       + ID2= 2 (2102):     0.77   0.214    12.00    89.57
         ================================================
```



```
         ID = 3 (0009):     1.94   0.537    12.00    88.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.537     12.00      88.89
     OUTFLOW: ID= 1 (0005)     1.940      0.054     12.55      82.74

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.12
                TIME SHIFT OF PEAK FLOW         (min)= 33.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0875

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (2101):     0.39   0.032    12.00    31.90
       + ID2= 2 (0005):     1.94   0.054    12.55    82.74
         ================================================
         ID = 3 (0004):     2.33   0.083    12.08    74.23

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.032 (i)
     TIME TO PEAK    (hrs)=  12.000
     RUNOFF VOLUME    (mm)=  31.904
```

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     TOTAL RAINFALL   (mm)=  91.275
     RUNOFF COEFFICIENT   =   0.350

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.12         0.05
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.56         2.50
     Length            (m)=     88.32         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    100.90     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      2.07 (ii)    2.53 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.31         0.29
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.31         0.01          0.323 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     90.27        44.59          88.45
     TOTAL RAINFALL   (mm)=     91.28        91.28          91.28
     RUNOFF COEFFICIENT   =      0.99         0.49           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.76         0.01
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.50
     Length            (m)=     71.65         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=    100.90     ********
               over (min)        5.00         5.00
```



```
     Storage Coeff.  (min)=      2.08 (ii)    2.35 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.31         0.30
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.21         0.00          0.214 (iii)
     TIME TO PEAK    (hrs)=     12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     90.28        20.28          89.57
     TOTAL RAINFALL   (mm)=     91.28        91.28          91.28
     RUNOFF COEFFICIENT   =      0.99         0.22           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.323    12.00    88.45
        + ID2= 2 (0018):     0.77   0.214    12.00    89.57
          ==================================================
          ID = 3 (0017):     1.94   0.537    12.00    88.89

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.032    12.00    31.90
        + ID2= 2 (0017):     1.94   0.537    12.00    88.89
          ==================================================
          ID = 3 (0015):     2.33   0.569    12.00    79.36

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ***************************
  ** SIMULATION NUMBER:  25 **
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|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
```

	27f1d0b1-c568-477a-8e6b-cf8f29233bf8\b5172c0e
Ptotal= 29.20 mm	Comments: 2-Year, 12 hour 30% AES, Ganaraska Regio

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	3.80	3.17	4.40	6.17	0.90	9.17	0.00
0.33	3.80	3.33	4.40	6.33	0.90	9.33	0.00
0.50	3.80	3.50	4.40	6.50	0.90	9.50	0.00
0.67	3.80	3.67	4.40	6.67	0.90	9.67	0.00
0.83	3.80	3.83	4.40	6.83	0.90	9.83	0.00
1.00	3.80	4.00	4.40	7.00	0.90	10.00	0.00
1.17	7.60	4.17	4.10	7.17	0.30	10.17	0.00
1.33	7.60	4.33	4.10	7.33	0.30	10.33	0.00
1.50	7.60	4.50	4.10	7.50	0.30	10.50	0.00
1.67	7.60	4.67	4.10	7.67	0.30	10.67	0.00
1.83	7.60	4.83	4.10	7.83	0.30	10.83	0.00
2.00	7.60	5.00	4.10	8.00	0.30	11.00	0.00
2.17	5.80	5.17	2.30	8.17	0.00	11.17	0.00
2.33	5.80	5.33	2.30	8.33	0.00	11.33	0.00
2.50	5.80	5.50	2.30	8.50	0.00	11.50	0.00
2.67	5.80	5.67	2.30	8.67	0.00	11.67	0.00
2.83	5.80	5.83	2.30	8.83	0.00	11.83	0.00
3.00	5.80	6.00	2.30	9.00	0.00	12.00	0.00

CALIB			
NASHYD (1100)	Area (ha)=	2.33	Curve Number (CN)= 67.2
ID= 1 DT= 5.0 min	Ia (mm)=	7.90	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.46	

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	3.80	3.083	4.40	6.083	0.90	9.08	0.00
0.167	3.80	3.167	4.40	6.167	0.90	9.17	0.00
0.250	3.80	3.250	4.40	6.250	0.90	9.25	0.00
0.333	3.80	3.333	4.40	6.333	0.90	9.33	0.00
0.417	3.80	3.417	4.40	6.417	0.90	9.42	0.00
0.500	3.80	3.500	4.40	6.500	0.90	9.50	0.00
0.583	3.80	3.583	4.40	6.583	0.90	9.58	0.00
0.667	3.80	3.667	4.40	6.667	0.90	9.67	0.00
0.750	3.80	3.750	4.40	6.750	0.90	9.75	0.00
0.833	3.80	3.833	4.40	6.833	0.90	9.83	0.00
0.917	3.80	3.917	4.40	6.917	0.90	9.92	0.00
1.000	3.80	4.000	4.40	7.000	0.90	10.00	0.00
1.083	7.60	4.083	4.10	7.083	0.30	10.08	0.00
1.167	7.60	4.167	4.10	7.167	0.30	10.17	0.00
1.250	7.60	4.250	4.10	7.250	0.30	10.25	0.00

1.333	7.60	4.333	4.10	7.333	0.30	10.33	0.00
1.417	7.60	4.417	4.10	7.417	0.30	10.42	0.00
1.500	7.60	4.500	4.10	7.500	0.30	10.50	0.00
1.583	7.60	4.583	4.10	7.583	0.30	10.58	0.00
1.667	7.60	4.667	4.10	7.667	0.30	10.67	0.00
1.750	7.60	4.750	4.10	7.750	0.30	10.75	0.00
1.833	7.60	4.833	4.10	7.833	0.30	10.83	0.00
1.917	7.60	4.917	4.10	7.917	0.30	10.92	0.00
2.000	7.60	5.000	4.10	8.000	0.30	11.00	0.00
2.083	5.80	5.083	2.30	8.083	0.00	11.08	0.00
2.167	5.80	5.167	2.30	8.167	0.00	11.17	0.00
2.250	5.80	5.250	2.30	8.250	0.00	11.25	0.00
2.333	5.80	5.333	2.30	8.333	0.00	11.33	0.00
2.417	5.80	5.417	2.30	8.417	0.00	11.42	0.00
2.500	5.80	5.500	2.30	8.500	0.00	11.50	0.00
2.583	5.80	5.583	2.30	8.583	0.00	11.58	0.00
2.667	5.80	5.667	2.30	8.667	0.00	11.67	0.00
2.750	5.80	5.750	2.30	8.750	0.00	11.75	0.00
2.833	5.80	5.833	2.30	8.833	0.00	11.83	0.00
2.917	5.80	5.917	2.30	8.917	0.00	11.92	0.00
3.000	5.80	6.000	2.30	9.000	0.00	12.00	0.00

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.006 (i)
TIME TO PEAK (hrs)= 5.083
RUNOFF VOLUME (mm)= 3.122
TOTAL RAINFALL (mm)= 29.200
RUNOFF COEFFICIENT = 0.107

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

CALIB			
NASHYD (2101)	Area (ha)=	0.39	Curve Number (CN)= 63.4
ID= 1 DT= 5.0 min	Ia (mm)=	4.90	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.17	

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.001 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 3.441
TOTAL RAINFALL (mm)= 29.200
RUNOFF COEFFICIENT = 0.118

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

CALIB		
STANDHYD (2100)	Area (ha)=	1.17

|ID= 1 DT= 5.0 min | Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	1.12	0.05	
Dep. Storage (mm)=	1.00	5.00	
Average Slope (%)=	1.56	2.50	
Length (m)=	88.32	4.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	7.60	1.49	
over (min)	5.00	10.00	
Storage Coeff. (min)=	5.82 (ii)	7.12 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.20	0.14	
			TOTALS
PEAK FLOW (cms)=	0.02	0.00	0.024 (iii)
TIME TO PEAK (hrs)=	2.00	5.00	2.00
RUNOFF VOLUME (mm)=	28.20	5.59	27.29
TOTAL RAINFALL (mm)=	29.20	29.20	29.20
RUNOFF COEFFICIENT =	0.97	0.19	0.93

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77

|ID= 1 DT= 5.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.76	0.01	
Dep. Storage (mm)=	1.00	5.00	
Average Slope (%)=	1.00	2.50	
Length (m)=	71.65	4.00	
Mannings n =	0.013	0.250	
Max.Eff.Inten.(mm/hr)=	7.60	0.54	
over (min)	5.00	10.00	
Storage Coeff. (min)=	5.86 (ii)	6.60 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.19	0.14	
			TOTALS
PEAK FLOW (cms)=	0.02	0.00	0.016 (iii)
TIME TO PEAK (hrs)=	2.00	5.00	2.00
RUNOFF VOLUME (mm)=	28.20	1.92	27.93
TOTAL RAINFALL (mm)=	29.20	29.20	29.20
RUNOFF COEFFICIENT =	0.97	0.07	0.96

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0009)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (2100):	1.17	0.024	2.00	27.29	
+ ID2= 2 (2102):	0.77	0.016	2.00	27.93	
ID = 3 (0009):	1.94	0.040	2.00	27.55	

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.040	2.00	27.55
OUTFLOW: ID= 1 (0005)	1.940	0.010	6.05	27.54

PEAK FLOW REDUCTION [Qout/Qin](%)= 24.01
TIME SHIFT OF PEAK FLOW (min)=243.00
MAXIMUM STORAGE USED (ha.m.)= 0.0333

ADD HYD (0004)					
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)	
ID1= 1 (2101):	0.39	0.001	5.00	3.44	
+ ID2= 2 (0005):	1.94	0.010	6.05	27.54	

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          ID = 3 (0004):     2.33   0.010     5.00    23.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.001 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=   3.441
     TOTAL RAINFALL   (mm)=  29.200
     RUNOFF COEFFICIENT   =   0.118

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

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--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=       7.60     ********
                 over (min)       5.00        10.00
     Storage Coeff.  (min)=       5.82 (ii)    7.12 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.20         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.00          0.024 (iii)
     TIME TO PEAK    (hrs)=       2.00         5.00           2.00
     RUNOFF VOLUME    (mm)=      28.20         5.59          27.29
     TOTAL RAINFALL   (mm)=      29.20        29.20          29.20
     RUNOFF COEFFICIENT   =       0.97         0.19           0.93


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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.
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| CALIB            |
| STANDHYD  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=       7.60     ********
                 over (min)       5.00        10.00
     Storage Coeff.  (min)=       5.86 (ii)    6.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.19         0.14
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.00          0.016 (iii)
     TIME TO PEAK    (hrs)=       2.00         5.00           2.00
     RUNOFF VOLUME    (mm)=      28.20         1.92          27.93
     TOTAL RAINFALL   (mm)=      29.20        29.20          29.20
     RUNOFF COEFFICIENT   =       0.97         0.07           0.96


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.024     2.00    27.29
        + ID2= 2 (0018):     0.77   0.016     2.00    27.93
          ================================================
          ID = 3 (0017):     1.94   0.040     2.00    27.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.001     5.00     3.44
        + ID2= 2 (0017):     1.94   0.040     2.00    27.55
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         ================================================
         ID = 3 (0015):     2.33   0.040     2.00    23.51

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ** SIMULATION NUMBER:  26 **
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|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\013a0af8
| Ptotal= 40.10 mm |    Comments: 5-Year, 12 hour 30% AES, Ganaraska Regio
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    5.20 |  3.17    6.00 |  6.17    1.20 |  9.17    0.00
                0.33    5.20 |  3.33    6.00 |  6.33    1.20 |  9.33    0.00
                0.50    5.20 |  3.50    6.00 |  6.50    1.20 |  9.50    0.00
                0.67    5.20 |  3.67    6.00 |  6.67    1.20 |  9.67    0.00
                0.83    5.20 |  3.83    6.00 |  6.83    1.20 |  9.83    0.00
                1.00    5.20 |  4.00    6.00 |  7.00    1.20 | 10.00    0.00
                1.17   10.50 |  4.17    5.60 |  7.17    0.40 | 10.17    0.00
                1.33   10.50 |  4.33    5.60 |  7.33    0.40 | 10.33    0.00
                1.50   10.50 |  4.50    5.60 |  7.50    0.40 | 10.50    0.00
                1.67   10.50 |  4.67    5.60 |  7.67    0.40 | 10.67    0.00
                1.83   10.50 |  4.83    5.60 |  7.83    0.40 | 10.83    0.00
                2.00   10.50 |  5.00    5.60 |  8.00    0.40 | 11.00    0.00
                2.17    8.00 |  5.17    3.20 |  8.17    0.00 | 11.17    0.00
                2.33    8.00 |  5.33    3.20 |  8.33    0.00 | 11.33    0.00
                2.50    8.00 |  5.50    3.20 |  8.50    0.00 | 11.50    0.00
                2.67    8.00 |  5.67    3.20 |  8.67    0.00 | 11.67    0.00
                2.83    8.00 |  5.83    3.20 |  8.83    0.00 | 11.83    0.00
                3.00    8.00 |  6.00    3.20 |  9.00    0.00 | 12.00    0.00

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| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

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


                          ---- TRANSFORMED HYETOGRAPH ----
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.083    5.20 | 3.083    6.00 | 6.083    1.20 |  9.08    0.00
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               0.167    5.20 | 3.167    6.00 | 6.167    1.20 |  9.17    0.00
               0.250    5.20 | 3.250    6.00 | 6.250    1.20 |  9.25    0.00
               0.333    5.20 | 3.333    6.00 | 6.333    1.20 |  9.33    0.00
               0.417    5.20 | 3.417    6.00 | 6.417    1.20 |  9.42    0.00
               0.500    5.20 | 3.500    6.00 | 6.500    1.20 |  9.50    0.00
               0.583    5.20 | 3.583    6.00 | 6.583    1.20 |  9.58    0.00
               0.667    5.20 | 3.667    6.00 | 6.667    1.20 |  9.67    0.00
               0.750    5.20 | 3.750    6.00 | 6.750    1.20 |  9.75    0.00
               0.833    5.20 | 3.833    6.00 | 6.833    1.20 |  9.83    0.00
               0.917    5.20 | 3.917    6.00 | 6.917    1.20 |  9.92    0.00
               1.000    5.20 | 4.000    6.00 | 7.000    1.20 | 10.00    0.00
               1.083   10.50 | 4.083    5.60 | 7.083    0.40 | 10.08    0.00
               1.167   10.50 | 4.167    5.60 | 7.167    0.40 | 10.17    0.00
               1.250   10.50 | 4.250    5.60 | 7.250    0.40 | 10.25    0.00
               1.333   10.50 | 4.333    5.60 | 7.333    0.40 | 10.33    0.00
               1.417   10.50 | 4.417    5.60 | 7.417    0.40 | 10.42    0.00
               1.500   10.50 | 4.500    5.60 | 7.500    0.40 | 10.50    0.00
               1.583   10.50 | 4.583    5.60 | 7.583    0.40 | 10.58    0.00
               1.667   10.50 | 4.667    5.60 | 7.667    0.40 | 10.67    0.00
               1.750   10.50 | 4.750    5.60 | 7.750    0.40 | 10.75    0.00
               1.833   10.50 | 4.833    5.60 | 7.833    0.40 | 10.83    0.00
               1.917   10.50 | 4.917    5.60 | 7.917    0.40 | 10.92    0.00
               2.000   10.50 | 5.000    5.60 | 8.000    0.40 | 11.00    0.00
               2.083    8.00 | 5.083    3.20 | 8.083    0.00 | 11.08    0.00
               2.167    8.00 | 5.167    3.20 | 8.167    0.00 | 11.17    0.00
               2.250    8.00 | 5.250    3.20 | 8.250    0.00 | 11.25    0.00
               2.333    8.00 | 5.333    3.20 | 8.333    0.00 | 11.33    0.00
               2.417    8.00 | 5.417    3.20 | 8.417    0.00 | 11.42    0.00
               2.500    8.00 | 5.500    3.20 | 8.500    0.00 | 11.50    0.00
               2.583    8.00 | 5.583    3.20 | 8.583    0.00 | 11.58    0.00
               2.667    8.00 | 5.667    3.20 | 8.667    0.00 | 11.67    0.00
               2.750    8.00 | 5.750    3.20 | 8.750    0.00 | 11.75    0.00
               2.833    8.00 | 5.833    3.20 | 8.833    0.00 | 11.83    0.00
               2.917    8.00 | 5.917    3.20 | 8.917    0.00 | 11.92    0.00
               3.000    8.00 | 6.000    3.20 | 9.000    0.00 | 12.00    0.00

     Unit Hyd Qpeak  (cms)=   0.193

     PEAK FLOW       (cms)=   0.011 (i)
     TIME TO PEAK    (hrs)=   5.083
     RUNOFF VOLUME    (mm)=   6.638
     TOTAL RAINFALL   (mm)=  40.100
     RUNOFF COEFFICIENT   =   0.166

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

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| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17
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```
     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=   6.789
     TOTAL RAINFALL   (mm)=  40.100
     RUNOFF COEFFICIENT   =   0.169

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      10.50         2.66
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       5.11 (ii)    6.26 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.21         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.00          0.033 (iii)
     TIME TO PEAK    (hrs)=       2.00         5.00           2.00
     RUNOFF VOLUME    (mm)=      39.10        10.64          37.96
     TOTAL RAINFALL   (mm)=      40.10        40.10          40.10
     RUNOFF COEFFICIENT   =       0.98         0.27           0.95


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
```



```
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      10.50         1.02
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       5.15 (ii)    5.80 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.21         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.00          0.022 (iii)
     TIME TO PEAK    (hrs)=       2.00         5.00           2.00
     RUNOFF VOLUME    (mm)=      39.10         3.90          38.74
     TOTAL RAINFALL   (mm)=      40.10        40.10          40.10
     RUNOFF COEFFICIENT   =       0.98         0.10           0.97


       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.033     2.00    37.96
        + ID2= 2 (2102):     0.77   0.022     2.00    38.74
          ================================================
          ID = 3 (0009):     1.94   0.055     2.00    38.27

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940     0.055     2.00       38.27
     OUTFLOW: ID= 1 (0005)     1.940     0.015     6.03       38.27
```

```
                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 26.33
                  TIME SHIFT OF PEAK FLOW         (min)=242.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0505

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

--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.002     5.00     6.79
        + ID2= 2 (0005):     1.94   0.015     6.03    38.27
          ================================================
          ID = 3 (0004):     2.33   0.016     6.02    33.00

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=   6.789
     TOTAL RAINFALL   (mm)=  40.100
     RUNOFF COEFFICIENT   =   0.169

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      10.50     ********
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       5.11 (ii)    6.26 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.21         0.15
```



```
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.00          0.033 (iii)
     TIME TO PEAK    (hrs)=       2.00         5.00           2.00
     RUNOFF VOLUME    (mm)=      39.10        10.64          37.96
     TOTAL RAINFALL   (mm)=      40.10        40.10          40.10
     RUNOFF COEFFICIENT   =       0.98         0.27           0.95

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      10.50     ********
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       5.15 (ii)    5.80 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.21         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.02         0.00          0.022 (iii)
     TIME TO PEAK    (hrs)=       2.00         5.00           2.00
     RUNOFF VOLUME    (mm)=      39.10         3.90          38.74
     TOTAL RAINFALL   (mm)=      40.10        40.10          40.10
     RUNOFF COEFFICIENT   =       0.98         0.10           0.97

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0013):     1.17   0.033     2.00    37.96
```

```
        + ID2= 2 (0018):     0.77   0.022     2.00    38.74
          ================================================
          ID = 3 (0017):     1.94   0.055     2.00    38.27

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

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (0012):     0.39   0.002     5.00     6.79
        + ID2= 2 (0017):     1.94   0.055     2.00    38.27
          ================================================
          ID = 3 (0015):     2.33   0.056     2.00    33.00

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

```
  ***************************
  ** SIMULATION NUMBER:  27 **
  ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\286694b6
| Ptotal= 46.10 mm |    Comments: 10-Year, 12 hour 30% AES, Ganaraska Regi
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	6.00	3.17	6.90	6.17	1.40	9.17	0.00
0.33	6.00	3.33	6.90	6.33	1.40	9.33	0.00
0.50	6.00	3.50	6.90	6.50	1.40	9.50	0.00
0.67	6.00	3.67	6.90	6.67	1.40	9.67	0.00
0.83	6.00	3.83	6.90	6.83	1.40	9.83	0.00
1.00	6.00	4.00	6.90	7.00	1.40	10.00	0.00
1.17	12.00	4.17	6.40	7.17	0.50	10.17	0.00
1.33	12.00	4.33	6.40	7.33	0.50	10.33	0.00
1.50	12.00	4.50	6.40	7.50	0.50	10.50	0.00
1.67	12.00	4.67	6.40	7.67	0.50	10.67	0.00
1.83	12.00	4.83	6.40	7.83	0.50	10.83	0.00
2.00	12.00	5.00	6.40	8.00	0.50	11.00	0.00
2.17	9.20	5.17	3.70	8.17	0.00	11.17	0.00
2.33	9.20	5.33	3.70	8.33	0.00	11.33	0.00
2.50	9.20	5.50	3.70	8.50	0.00	11.50	0.00
2.67	9.20	5.67	3.70	8.67	0.00	11.67	0.00
2.83	9.20	5.83	3.70	8.83	0.00	11.83	0.00
3.00	9.20	6.00	3.70	9.00	0.00	12.00	0.00

```
--------------------
| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	6.90	6.083	1.40	9.08	0.00
0.167	6.00	3.167	6.90	6.167	1.40	9.17	0.00
0.250	6.00	3.250	6.90	6.250	1.40	9.25	0.00
0.333	6.00	3.333	6.90	6.333	1.40	9.33	0.00
0.417	6.00	3.417	6.90	6.417	1.40	9.42	0.00
0.500	6.00	3.500	6.90	6.500	1.40	9.50	0.00
0.583	6.00	3.583	6.90	6.583	1.40	9.58	0.00
0.667	6.00	3.667	6.90	6.667	1.40	9.67	0.00
0.750	6.00	3.750	6.90	6.750	1.40	9.75	0.00
0.833	6.00	3.833	6.90	6.833	1.40	9.83	0.00
0.917	6.00	3.917	6.90	6.917	1.40	9.92	0.00
1.000	6.00	4.000	6.90	7.000	1.40	10.00	0.00
1.083	12.00	4.083	6.40	7.083	0.50	10.08	0.00
1.167	12.00	4.167	6.40	7.167	0.50	10.17	0.00
1.250	12.00	4.250	6.40	7.250	0.50	10.25	0.00
1.333	12.00	4.333	6.40	7.333	0.50	10.33	0.00
1.417	12.00	4.417	6.40	7.417	0.50	10.42	0.00
1.500	12.00	4.500	6.40	7.500	0.50	10.50	0.00
1.583	12.00	4.583	6.40	7.583	0.50	10.58	0.00
1.667	12.00	4.667	6.40	7.667	0.50	10.67	0.00
1.750	12.00	4.750	6.40	7.750	0.50	10.75	0.00
1.833	12.00	4.833	6.40	7.833	0.50	10.83	0.00
1.917	12.00	4.917	6.40	7.917	0.50	10.92	0.00
2.000	12.00	5.000	6.40	8.000	0.50	11.00	0.00
2.083	9.20	5.083	3.70	8.083	0.00	11.08	0.00
2.167	9.20	5.167	3.70	8.167	0.00	11.17	0.00
2.250	9.20	5.250	3.70	8.250	0.00	11.25	0.00
2.333	9.20	5.333	3.70	8.333	0.00	11.33	0.00
2.417	9.20	5.417	3.70	8.417	0.00	11.42	0.00
2.500	9.20	5.500	3.70	8.500	0.00	11.50	0.00
2.583	9.20	5.583	3.70	8.583	0.00	11.58	0.00
2.667	9.20	5.667	3.70	8.667	0.00	11.67	0.00
2.750	9.20	5.750	3.70	8.750	0.00	11.75	0.00
2.833	9.20	5.833	3.70	8.833	0.00	11.83	0.00
2.917	9.20	5.917	3.70	8.917	0.00	11.92	0.00
3.000	9.20	6.000	3.70	9.000	0.00	12.00	0.00

```
     Unit Hyd Qpeak  (cms)=   0.193

     PEAK FLOW       (cms)=   0.014 (i)
```

```
     TIME TO PEAK    (hrs)=   5.083
     RUNOFF VOLUME    (mm)=   8.997
     TOTAL RAINFALL   (mm)=  46.100
     RUNOFF COEFFICIENT   =   0.195

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (2101) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=   9.003
     TOTAL RAINFALL   (mm)=  46.100
     RUNOFF COEFFICIENT   =   0.195

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (2100) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      12.00         3.46
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       4.85 (ii)    5.93 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.22         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.00          0.038 (iii)
     TIME TO PEAK    (hrs)=       2.00         3.00           2.00
     RUNOFF VOLUME    (mm)=      45.10        13.87          43.85
     TOTAL RAINFALL   (mm)=      46.10        46.10          46.10
     RUNOFF COEFFICIENT   =       0.98         0.30           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      12.00         1.34
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       4.88 (ii)    5.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.22         0.16
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.00          0.025 (iii)
     TIME TO PEAK    (hrs)=       2.00         5.00           2.00
     RUNOFF VOLUME    (mm)=      45.10         5.25          44.70
     TOTAL RAINFALL   (mm)=      46.10        46.10          46.10
     RUNOFF COEFFICIENT   =       0.98         0.11           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.038     2.00    43.85
        + ID2= 2 (2102):     0.77   0.025     2.00    44.70
          ================================================
          ID = 3 (0009):     1.94   0.063     2.00    44.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
```

```
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0107     0.0490
                         0.0068     0.0001   |   0.0177     0.0518
                         0.0073     0.0051   |   0.0365     0.0695
                         0.0077     0.0101   |   0.0514     0.0844
                         0.0081     0.0142   |   0.0624     0.0960
                         0.0090     0.0251   |   0.0751     0.1089
                         0.0097     0.0348   |   0.0768     0.1108
                         0.0104     0.0444   |   0.0808     0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.063      2.00      44.19
     OUTFLOW: ID= 1 (0005)     1.940      0.022      5.17      44.18

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)= 34.26
                   TIME SHIFT OF PEAK FLOW         (min)=190.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0556

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

-------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.002     5.00     9.00
        + ID2= 2 (0005):     1.94   0.022     5.17    44.18
          ================================================
          ID = 3 (0004):     2.33   0.024     5.07    38.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
-------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.002 (i)
     TIME TO PEAK    (hrs)=   5.000
     RUNOFF VOLUME    (mm)=   9.003
     TOTAL RAINFALL   (mm)=  46.100
     RUNOFF COEFFICIENT   =   0.195

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

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```
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      12.00     ********
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       4.85 (ii)    5.93 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.22         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.00          0.038 (iii)
     TIME TO PEAK    (hrs)=       2.00         3.00          2.00
     RUNOFF VOLUME    (mm)=      45.10        13.87         43.85
     TOTAL RAINFALL   (mm)=      46.10        46.10         46.10
     RUNOFF COEFFICIENT   =       0.98         0.30          0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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.

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-------------------
| CALIB            |
| STANDHYD  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
-------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      12.00     ********
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       4.88 (ii)    5.50 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.22         0.16
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.03         0.00          0.025 (iii)
     TIME TO PEAK    (hrs)=       2.00         5.00          2.00
     RUNOFF VOLUME    (mm)=      45.10         5.25         44.70
```

```
     TOTAL RAINFALL   (mm)=      46.10        46.10          46.10
     RUNOFF COEFFICIENT   =       0.98         0.11           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    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.

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--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.038     2.00    43.85
       + ID2= 2 (0018):     0.77   0.025     2.00    44.70
         ================================================
         ID = 3 (0017):     1.94   0.063     2.00    44.19

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.002     5.00     9.00
       + ID2= 2 (0017):     1.94   0.063     2.00    44.19
         ================================================
         ID = 3 (0015):     2.33   0.065     2.00    38.30

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ****************************
  ** SIMULATION NUMBER:  28 **
  ****************************



--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\66a883d0
| Ptotal= 63.10 mm |    Comments: 25-Year, 12 hour 30% AES, Ganaraska Regi
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17    8.20 |  3.17    9.50 |  6.17    1.90 |  9.17    0.00
                0.33    8.20 |  3.33    9.50 |  6.33    1.90 |  9.33    0.00
```



```
                0.50    8.20 |  3.50    9.50 |  6.50    1.90 |  9.50    0.00
                0.67    8.20 |  3.67    9.50 |  6.67    1.90 |  9.67    0.00
                0.83    8.20 |  3.83    9.50 |  6.83    1.90 |  9.83    0.00
                1.00    8.20 |  4.00    9.50 |  7.00    1.90 | 10.00    0.00
                1.17   16.40 |  4.17    8.80 |  7.17    0.60 | 10.17    0.00
                1.33   16.40 |  4.33    8.80 |  7.33    0.60 | 10.33    0.00
                1.50   16.40 |  4.50    8.80 |  7.50    0.60 | 10.50    0.00
                1.67   16.40 |  4.67    8.80 |  7.67    0.60 | 10.67    0.00
                1.83   16.40 |  4.83    8.80 |  7.83    0.60 | 10.83    0.00
                2.00   16.40 |  5.00    8.80 |  8.00    0.60 | 11.00    0.00
                2.17   12.60 |  5.17    5.10 |  8.17    0.00 | 11.17    0.00
                2.33   12.60 |  5.33    5.10 |  8.33    0.00 | 11.33    0.00
                2.50   12.60 |  5.50    5.10 |  8.50    0.00 | 11.50    0.00
                2.67   12.60 |  5.67    5.10 |  8.67    0.00 | 11.67    0.00
                2.83   12.60 |  5.83    5.10 |  8.83    0.00 | 11.83    0.00
                3.00   12.60 |  6.00    5.10 |  9.00    0.00 | 12.00    0.00

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| CALIB            |
| NASHYD    (1100) |   Area    (ha)=   2.33   Curve Number   (CN)= 67.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   7.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.46

        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    8.20 | 3.083    9.50 | 6.083    1.90 |  9.08    0.00
     0.167    8.20 | 3.167    9.50 | 6.167    1.90 |  9.17    0.00
     0.250    8.20 | 3.250    9.50 | 6.250    1.90 |  9.25    0.00
     0.333    8.20 | 3.333    9.50 | 6.333    1.90 |  9.33    0.00
     0.417    8.20 | 3.417    9.50 | 6.417    1.90 |  9.42    0.00
     0.500    8.20 | 3.500    9.50 | 6.500    1.90 |  9.50    0.00
     0.583    8.20 | 3.583    9.50 | 6.583    1.90 |  9.58    0.00
     0.667    8.20 | 3.667    9.50 | 6.667    1.90 |  9.67    0.00
     0.750    8.20 | 3.750    9.50 | 6.750    1.90 |  9.75    0.00
     0.833    8.20 | 3.833    9.50 | 6.833    1.90 |  9.83    0.00
     0.917    8.20 | 3.917    9.50 | 6.917    1.90 |  9.92    0.00
     1.000    8.20 | 4.000    9.50 | 7.000    1.90 | 10.00    0.00
     1.083   16.40 | 4.083    8.80 | 7.083    0.60 | 10.08    0.00
     1.167   16.40 | 4.167    8.80 | 7.167    0.60 | 10.17    0.00
     1.250   16.40 | 4.250    8.80 | 7.250    0.60 | 10.25    0.00
     1.333   16.40 | 4.333    8.80 | 7.333    0.60 | 10.33    0.00
     1.417   16.40 | 4.417    8.80 | 7.417    0.60 | 10.42    0.00
     1.500   16.40 | 4.500    8.80 | 7.500    0.60 | 10.50    0.00
     1.583   16.40 | 4.583    8.80 | 7.583    0.60 | 10.58    0.00
     1.667   16.40 | 4.667    8.80 | 7.667    0.60 | 10.67    0.00
     1.750   16.40 | 4.750    8.80 | 7.750    0.60 | 10.75    0.00
     1.833   16.40 | 4.833    8.80 | 7.833    0.60 | 10.83    0.00
```

1.917	16.40	4.917	8.80	7.917	0.60	10.92	0.00
2.000	16.40	5.000	8.80	8.000	0.60	11.00	0.00
2.083	12.60	5.083	5.10	8.083	0.00	11.08	0.00
2.167	12.60	5.167	5.10	8.167	0.00	11.17	0.00
2.250	12.60	5.250	5.10	8.250	0.00	11.25	0.00
2.333	12.60	5.333	5.10	8.333	0.00	11.33	0.00
2.417	12.60	5.417	5.10	8.417	0.00	11.42	0.00
2.500	12.60	5.500	5.10	8.500	0.00	11.50	0.00
2.583	12.60	5.583	5.10	8.583	0.00	11.58	0.00
2.667	12.60	5.667	5.10	8.667	0.00	11.67	0.00
2.750	12.60	5.750	5.10	8.750	0.00	11.75	0.00
2.833	12.60	5.833	5.10	8.833	0.00	11.83	0.00
2.917	12.60	5.917	5.10	8.917	0.00	11.92	0.00
3.000	12.60	6.000	5.10	9.000	0.00	12.00	0.00

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.025 (i)
TIME TO PEAK (hrs)= 5.083
RUNOFF VOLUME (mm)= 17.004
TOTAL RAINFALL (mm)= 63.100
RUNOFF COEFFICIENT = 0.269

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

CALIB	
NASHYD (2101)	Area (ha)= 0.39 Curve Number (CN)= 63.4
ID= 1 DT= 5.0 min	Ia (mm)= 4.90 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.17

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 3.000
RUNOFF VOLUME (mm)= 16.477
TOTAL RAINFALL (mm)= 63.100
RUNOFF COEFFICIENT = 0.261

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

CALIB	
STANDHYD (2100)	Area (ha)= 1.17
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00 Dir. Conn.(%)= 96.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.12	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.56	2.50
Length	(m)=	88.32	4.00

Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	16.40	6.04
over (min)		5.00	10.00
Storage Coeff. (min)	=	4.28 (ii)	5.24 (ii)
Unit Hyd. Tpeak (min)	=	5.00	10.00
Unit Hyd. peak (cms)	=	0.23	0.16

				TOTALS
PEAK FLOW	(cms)=	0.05	0.00	0.052 (iii)
TIME TO PEAK	(hrs)=	2.00	3.00	2.00
RUNOFF VOLUME	(mm)=	62.10	24.33	60.59
TOTAL RAINFALL	(mm)=	63.10	63.10	63.10
RUNOFF COEFFICIENT	=	0.98	0.39	0.96

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.76	0.01
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.50
Length	(m)=	71.65	4.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)	=	16.40	2.45
over (min)		5.00	5.00
Storage Coeff. (min)	=	4.31 (ii)	4.85 (ii)
Unit Hyd. Tpeak (min)	=	5.00	5.00
Unit Hyd. peak (cms)	=	0.23	0.22

				TOTALS
PEAK FLOW	(cms)=	0.03	0.00	0.035 (iii)
TIME TO PEAK	(hrs)=	2.00	5.00	2.00
RUNOFF VOLUME	(mm)=	62.10	9.96	61.58
TOTAL RAINFALL	(mm)=	63.10	63.10	63.10
RUNOFF COEFFICIENT	=	0.98	0.16	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

ADD HYD (0009)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2100):	1.17	0.052	2.00	60.59
	+ ID2= 2 (2102):	0.77	0.035	2.00	61.58
	ID = 3 (0009):	1.94	0.087	2.00	60.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR (0005)				
IN= 2---> OUT= 1				
DT= 1.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	0.0107	0.0490
	0.0068	0.0001	0.0177	0.0518
	0.0073	0.0051	0.0365	0.0695
	0.0077	0.0101	0.0514	0.0844
	0.0081	0.0142	0.0624	0.0960
	0.0090	0.0251	0.0751	0.1089
	0.0097	0.0348	0.0768	0.1108
	0.0104	0.0444	0.0808	0.1156

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0009)	1.940	0.087	2.00	60.98
OUTFLOW: ID= 1 (0005)	1.940	0.037	5.07	60.98

PEAK FLOW REDUCTION [Qout/Qin](%)= 42.45
TIME SHIFT OF PEAK FLOW (min)=184.00
MAXIMUM STORAGE USED (ha.m.)= 0.0698

ADD HYD (0004)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (2101):	0.39	0.004	3.00	16.48
	+ ID2= 2 (0005):	1.94	0.037	5.07	60.98
	ID = 3 (0004):	2.33	0.041	5.00	53.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0012)	Area (ha)= 0.39	Curve Number (CN)= 63.4	
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.17		

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.004 (i)
TIME TO PEAK (hrs)= 3.000
RUNOFF VOLUME (mm)= 16.477
TOTAL RAINFALL (mm)= 63.100
RUNOFF COEFFICIENT = 0.261

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

CALIB			
STANDHYD (0013)	Area (ha)= 1.17		
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	1.12	0.05
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.56	2.50
Length	(m)=	88.32	4.00
Mannings n	=	0.013	0.250
Max.Eff.Inten.(mm/hr)=		16.40	********
over (min)		5.00	10.00
Storage Coeff. (min)=		4.28 (ii)	5.24 (ii)
Unit Hyd. Tpeak (min)=		5.00	10.00
Unit Hyd. peak (cms)=		0.23	0.16

				TOTALS
PEAK FLOW	(cms)=	0.05	0.00	0.052 (iii)
TIME TO PEAK	(hrs)=	2.00	3.00	2.00
RUNOFF VOLUME	(mm)=	62.10	24.33	60.59
TOTAL RAINFALL	(mm)=	63.10	63.10	63.10
RUNOFF COEFFICIENT	=	0.98	0.39	0.96

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (0018)	Area (ha)=	0.77

|ID= 1 DT= 5.0 min | Total Imp(%)= 99.00 Dir. Conn.(%)= 99.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.76	0.01	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.00	2.50	
Length	(m)=	71.65	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		16.40	********	
over (min)		5.00	5.00	
Storage Coeff. (min)=		4.31 (ii)	4.85 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.23	0.22	
				TOTALS
PEAK FLOW	(cms)=	0.03	0.00	0.035 (iii)
TIME TO PEAK	(hrs)=	2.00	5.00	2.00
RUNOFF VOLUME	(mm)=	62.10	9.96	61.58
TOTAL RAINFALL	(mm)=	63.10	63.10	63.10
RUNOFF COEFFICIENT	=	0.98	0.16	0.98

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 47.5 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0017)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0013):	1.17	0.052	2.00	60.59
+	ID2= 2 (0018):	0.77	0.035	2.00	61.58
	ID = 3 (0017):	1.94	0.087	2.00	60.98

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0015)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0012):	0.39	0.004	3.00	16.48
+	ID2= 2 (0017):	1.94	0.087	2.00	60.98
	ID = 3 (0015):	2.33	0.090	2.00	53.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

** SIMULATION NUMBER: 29 **

READ STORM	Filename: C:\Users\csokol\AppData\Local\Temp\27f1d0b1-c568-477a-8e6b-cf8f29233bf8\631f53e8
Ptotal= 76.60 mm	Comments: 50-Year, 12 hour 30% AES, Ganaraska Regi

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.17	10.00	3.17	11.50	6.17	2.30	9.17	0.00
0.33	10.00	3.33	11.50	6.33	2.30	9.33	0.00
0.50	10.00	3.50	11.50	6.50	2.30	9.50	0.00
0.67	10.00	3.67	11.50	6.67	2.30	9.67	0.00
0.83	10.00	3.83	11.50	6.83	2.30	9.83	0.00
1.00	10.00	4.00	11.50	7.00	2.30	10.00	0.00
1.17	19.90	4.17	10.70	7.17	0.80	10.17	0.00
1.33	19.90	4.33	10.70	7.33	0.80	10.33	0.00
1.50	19.90	4.50	10.70	7.50	0.80	10.50	0.00
1.67	19.90	4.67	10.70	7.67	0.80	10.67	0.00
1.83	19.90	4.83	10.70	7.83	0.80	10.83	0.00
2.00	19.90	5.00	10.70	8.00	0.80	11.00	0.00
2.17	15.30	5.17	6.10	8.17	0.00	11.17	0.00
2.33	15.30	5.33	6.10	8.33	0.00	11.33	0.00
2.50	15.30	5.50	6.10	8.50	0.00	11.50	0.00
2.67	15.30	5.67	6.10	8.67	0.00	11.67	0.00
2.83	15.30	5.83	6.10	8.83	0.00	11.83	0.00
3.00	15.30	6.00	6.10	9.00	0.00	12.00	0.00

CALIB NASHYD (1100)	Area (ha)= 2.33	Curve Number (CN)= 67.2
ID= 1 DT= 5.0 min	Ia (mm)= 7.90	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.46	

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	10.00	3.083	11.50	6.083	2.30	9.08	0.00
0.167	10.00	3.167	11.50	6.167	2.30	9.17	0.00
0.250	10.00	3.250	11.50	6.250	2.30	9.25	0.00
0.333	10.00	3.333	11.50	6.333	2.30	9.33	0.00

0.417	10.00	3.417	11.50	6.417	2.30	9.42	0.00
0.500	10.00	3.500	11.50	6.500	2.30	9.50	0.00
0.583	10.00	3.583	11.50	6.583	2.30	9.58	0.00
0.667	10.00	3.667	11.50	6.667	2.30	9.67	0.00
0.750	10.00	3.750	11.50	6.750	2.30	9.75	0.00
0.833	10.00	3.833	11.50	6.833	2.30	9.83	0.00
0.917	10.00	3.917	11.50	6.917	2.30	9.92	0.00
1.000	10.00	4.000	11.50	7.000	2.30	10.00	0.00
1.083	19.90	4.083	10.70	7.083	0.80	10.08	0.00
1.167	19.90	4.167	10.70	7.167	0.80	10.17	0.00
1.250	19.90	4.250	10.70	7.250	0.80	10.25	0.00
1.333	19.90	4.333	10.70	7.333	0.80	10.33	0.00
1.417	19.90	4.417	10.70	7.417	0.80	10.42	0.00
1.500	19.90	4.500	10.70	7.500	0.80	10.50	0.00
1.583	19.90	4.583	10.70	7.583	0.80	10.58	0.00
1.667	19.90	4.667	10.70	7.667	0.80	10.67	0.00
1.750	19.90	4.750	10.70	7.750	0.80	10.75	0.00
1.833	19.90	4.833	10.70	7.833	0.80	10.83	0.00
1.917	19.90	4.917	10.70	7.917	0.80	10.92	0.00
2.000	19.90	5.000	10.70	8.000	0.80	11.00	0.00
2.083	15.30	5.083	6.10	8.083	0.00	11.08	0.00
2.167	15.30	5.167	6.10	8.167	0.00	11.17	0.00
2.250	15.30	5.250	6.10	8.250	0.00	11.25	0.00
2.333	15.30	5.333	6.10	8.333	0.00	11.33	0.00
2.417	15.30	5.417	6.10	8.417	0.00	11.42	0.00
2.500	15.30	5.500	6.10	8.500	0.00	11.50	0.00
2.583	15.30	5.583	6.10	8.583	0.00	11.58	0.00
2.667	15.30	5.667	6.10	8.667	0.00	11.67	0.00
2.750	15.30	5.750	6.10	8.750	0.00	11.75	0.00
2.833	15.30	5.833	6.10	8.833	0.00	11.83	0.00
2.917	15.30	5.917	6.10	8.917	0.00	11.92	0.00
3.000	15.30	6.000	6.10	9.000	0.00	12.00	0.00

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.035 (i)
TIME TO PEAK (hrs)= 5.000
RUNOFF VOLUME (mm)= 24.493
TOTAL RAINFALL (mm)= 76.600
RUNOFF COEFFICIENT = 0.320

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

CALIB			
NASHYD (2101)	Area (ha)= 0.39	Curve Number (CN)= 63.4	
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.17		

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.006 (i)

TIME TO PEAK (hrs)= 3.000
RUNOFF VOLUME (mm)= 23.461
TOTAL RAINFALL (mm)= 76.600
RUNOFF COEFFICIENT = 0.306

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

CALIB			
STANDHYD (2100)	Area (ha)= 1.17		
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		19.90	8.34	
over (min)		5.00	5.00	
Storage Coeff. (min)=		3.96 (ii)	4.85 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.24	0.22	
				TOTALS
PEAK FLOW	(cms)=	0.06	0.00	0.063 (iii)
TIME TO PEAK	(hrs)=	1.92	3.00	2.00
RUNOFF VOLUME	(mm)=	75.60	33.67	73.92
TOTAL RAINFALL	(mm)=	76.60	76.60	76.60
RUNOFF COEFFICIENT	=	0.99	0.44	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.76	0.01
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.50
Length	(m)=	71.65	4.00
Mannings n	=	0.013	0.250

```
     Max.Eff.Inten.(mm/hr)=      19.90         3.50
                  over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.99 (ii)    4.49 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.24         0.23
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.00          0.042 (iii)
     TIME TO PEAK    (hrs)=       1.92         5.00          2.00
     RUNOFF VOLUME    (mm)=      75.60        14.55         74.99
     TOTAL RAINFALL   (mm)=      76.60        76.60         76.60
     RUNOFF COEFFICIENT   =       0.99         0.19          0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.063     2.00    73.92
        + ID2= 2 (2102):     0.77   0.042     2.00    74.99
          ================================================
          ID = 3 (0009):     1.94   0.105     2.00    74.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107     0.0490
                          0.0068     0.0001   |   0.0177     0.0518
                          0.0073     0.0051   |   0.0365     0.0695
                          0.0077     0.0101   |   0.0514     0.0844
                          0.0081     0.0142   |   0.0624     0.0960
                          0.0090     0.0251   |   0.0751     0.1089
                          0.0097     0.0348   |   0.0768     0.1108
                          0.0104     0.0444   |   0.0808     0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.105      2.00      74.34
     OUTFLOW: ID= 1 (0005)     1.940      0.047      5.05      74.34
```



```
                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 45.02
                  TIME SHIFT OF PEAK FLOW         (min)=183.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.0804

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.006     3.00    23.46
        + ID2= 2 (0005):     1.94   0.047     5.05    74.34
          ================================================
          ID = 3 (0004):     2.33   0.053     5.00    65.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.006 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  23.461
     TOTAL RAINFALL   (mm)=  76.600
     RUNOFF COEFFICIENT   =   0.306

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

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--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12          0.05
     Dep. Storage     (mm)=       1.00          5.00
     Average Slope     (%)=       1.56          2.50
     Length             (m)=     88.32          4.00
     Mannings n            =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=      19.90      ********
                  over (min)        5.00          5.00
     Storage Coeff.  (min)=       3.96 (ii)     4.85 (ii)
     Unit Hyd. Tpeak (min)=       5.00          5.00
     Unit Hyd. peak  (cms)=       0.24          0.22
                                                        *TOTALS*
```

```
     PEAK FLOW       (cms)=       0.06         0.00          0.063 (iii)
     TIME TO PEAK    (hrs)=       1.92         3.00           2.00
     RUNOFF VOLUME    (mm)=      75.60        33.67          73.92
     TOTAL RAINFALL   (mm)=      76.60        76.60          76.60
     RUNOFF COEFFICIENT   =       0.99         0.44           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n             =    0.013        0.250

     Max.Eff.Inten.(mm/hr)=      19.90     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       3.99 (ii)    4.49 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.24         0.23
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.04         0.00           0.042 (iii)
     TIME TO PEAK    (hrs)=       1.92         5.00           2.00
     RUNOFF VOLUME    (mm)=      75.60        14.55          74.99
     TOTAL RAINFALL   (mm)=      76.60        76.60          76.60
     RUNOFF COEFFICIENT   =       0.99         0.19           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
```



```
       ID1= 1 (0013):     1.17   0.063     2.00    73.92
     + ID2= 2 (0018):     0.77   0.042     2.00    74.99
       ================================================
       ID = 3 (0017):     1.94   0.105     2.00    74.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (0012):     0.39   0.006     3.00    23.46
     + ID2= 2 (0017):     1.94   0.105     2.00    74.34
       ================================================
       ID = 3 (0015):     2.33   0.110     2.00    65.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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  ***************************
  ** SIMULATION NUMBER:  30 **
  ***************************


--------------------
|    READ STORM    |    Filename: C:\Users\csokol\AppD
|                  |              ata\Local\Temp\
|                  |              27f1d0b1-c568-477a-8e6b-cf8f29233bf8\fe4c1352
| Ptotal= 89.50 mm |    Comments: 100-Year, 12 hour 30% AES, Ganaraska Reg
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.17   11.60 |  3.17   13.40 |  6.17    2.70 |  9.17    0.00
                0.33   11.60 |  3.33   13.40 |  6.33    2.70 |  9.33    0.00
                0.50   11.60 |  3.50   13.40 |  6.50    2.70 |  9.50    0.00
                0.67   11.60 |  3.67   13.40 |  6.67    2.70 |  9.67    0.00
                0.83   11.60 |  3.83   13.40 |  6.83    2.70 |  9.83    0.00
                1.00   11.60 |  4.00   13.40 |  7.00    2.70 | 10.00    0.00
                1.17   23.30 |  4.17   12.50 |  7.17    0.90 | 10.17    0.00
                1.33   23.30 |  4.33   12.50 |  7.33    0.90 | 10.33    0.00
                1.50   23.30 |  4.50   12.50 |  7.50    0.90 | 10.50    0.00
                1.67   23.30 |  4.67   12.50 |  7.67    0.90 | 10.67    0.00
                1.83   23.30 |  4.83   12.50 |  7.83    0.90 | 10.83    0.00
                2.00   23.30 |  5.00   12.50 |  8.00    0.90 | 11.00    0.00
                2.17   17.90 |  5.17    7.20 |  8.17    0.00 | 11.17    0.00
                2.33   17.90 |  5.33    7.20 |  8.33    0.00 | 11.33    0.00
                2.50   17.90 |  5.50    7.20 |  8.50    0.00 | 11.50    0.00
                2.67   17.90 |  5.67    7.20 |  8.67    0.00 | 11.67    0.00
                2.83   17.90 |  5.83    7.20 |  8.83    0.00 | 11.83    0.00
                3.00   17.90 |  6.00    7.20 |  9.00    0.00 | 12.00    0.00
```

CALIB					
NASHYD (1100)	Area	(ha)=	2.33	Curve Number (CN)=	67.2
ID= 1 DT= 5.0 min	Ia	(mm)=	7.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.46		

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	11.60	3.083	13.40	6.083	2.70	9.08	0.00
0.167	11.60	3.167	13.40	6.167	2.70	9.17	0.00
0.250	11.60	3.250	13.40	6.250	2.70	9.25	0.00
0.333	11.60	3.333	13.40	6.333	2.70	9.33	0.00
0.417	11.60	3.417	13.40	6.417	2.70	9.42	0.00
0.500	11.60	3.500	13.40	6.500	2.70	9.50	0.00
0.583	11.60	3.583	13.40	6.583	2.70	9.58	0.00
0.667	11.60	3.667	13.40	6.667	2.70	9.67	0.00
0.750	11.60	3.750	13.40	6.750	2.70	9.75	0.00
0.833	11.60	3.833	13.40	6.833	2.70	9.83	0.00
0.917	11.60	3.917	13.40	6.917	2.70	9.92	0.00
1.000	11.60	4.000	13.40	7.000	2.70	10.00	0.00
1.083	23.30	4.083	12.50	7.083	0.90	10.08	0.00
1.167	23.30	4.167	12.50	7.167	0.90	10.17	0.00
1.250	23.30	4.250	12.50	7.250	0.90	10.25	0.00
1.333	23.30	4.333	12.50	7.333	0.90	10.33	0.00
1.417	23.30	4.417	12.50	7.417	0.90	10.42	0.00
1.500	23.30	4.500	12.50	7.500	0.90	10.50	0.00
1.583	23.30	4.583	12.50	7.583	0.90	10.58	0.00
1.667	23.30	4.667	12.50	7.667	0.90	10.67	0.00
1.750	23.30	4.750	12.50	7.750	0.90	10.75	0.00
1.833	23.30	4.833	12.50	7.833	0.90	10.83	0.00
1.917	23.30	4.917	12.50	7.917	0.90	10.92	0.00
2.000	23.30	5.000	12.50	8.000	0.90	11.00	0.00
2.083	17.90	5.083	7.20	8.083	0.00	11.08	0.00
2.167	17.90	5.167	7.20	8.167	0.00	11.17	0.00
2.250	17.90	5.250	7.20	8.250	0.00	11.25	0.00
2.333	17.90	5.333	7.20	8.333	0.00	11.33	0.00
2.417	17.90	5.417	7.20	8.417	0.00	11.42	0.00
2.500	17.90	5.500	7.20	8.500	0.00	11.50	0.00
2.583	17.90	5.583	7.20	8.583	0.00	11.58	0.00
2.667	17.90	5.667	7.20	8.667	0.00	11.67	0.00
2.750	17.90	5.750	7.20	8.750	0.00	11.75	0.00
2.833	17.90	5.833	7.20	8.833	0.00	11.83	0.00
2.917	17.90	5.917	7.20	8.917	0.00	11.92	0.00
3.000	17.90	6.000	7.20	9.000	0.00	12.00	0.00

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.046 (i)
TIME TO PEAK (hrs)= 3.250
RUNOFF VOLUME (mm)= 32.387
TOTAL RAINFALL (mm)= 89.500
RUNOFF COEFFICIENT = 0.362

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

CALIB					
NASHYD (2101)	Area	(ha)=	0.39	Curve Number (CN)=	63.4
ID= 1 DT= 5.0 min	Ia	(mm)=	4.90	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.17		

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.008 (i)
TIME TO PEAK (hrs)= 3.000
RUNOFF VOLUME (mm)= 30.841
TOTAL RAINFALL (mm)= 89.500
RUNOFF COEFFICIENT = 0.345

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

CALIB					
STANDHYD (2100)	Area	(ha)=	1.17		
ID= 1 DT= 5.0 min	Total Imp(%)=		96.00	Dir. Conn.(%)=	96.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		23.30	10.68	
over (min)		5.00	5.00	
Storage Coeff. (min)=		3.72 (ii)	4.55 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.25	0.23	
				TOTALS
PEAK FLOW	(cms)=	0.07	0.00	0.074 (iii)
TIME TO PEAK	(hrs)=	1.92	3.00	2.00
RUNOFF VOLUME	(mm)=	88.50	43.23	86.69
TOTAL RAINFALL	(mm)=	89.50	89.50	89.50
RUNOFF COEFFICIENT	=	0.99	0.48	0.97

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:

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          CN*  =  75.9    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.

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| CALIB            |
| STANDHYD  (2102) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      23.30         4.71
                 over (min)       5.00         5.00
     Storage Coeff.  (min)=       3.75 (ii)    4.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.25         0.24
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.05         0.00          0.049 (iii)
     TIME TO PEAK    (hrs)=       1.92         3.00           2.00
     RUNOFF VOLUME    (mm)=      88.50        19.55          87.81
     TOTAL RAINFALL   (mm)=      89.50        89.50          89.50
     RUNOFF COEFFICIENT   =       0.99         0.22           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
           CN*  =  47.5    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.

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--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2100):     1.17   0.074     2.00    86.69
        + ID2= 2 (2102):     0.77   0.049     2.00    87.81
          ================================================
          ID = 3 (0009):     1.94   0.123     2.00    87.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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```



```
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   0.0107      0.0490
                          0.0068     0.0001   |   0.0177      0.0518
                          0.0073     0.0051   |   0.0365      0.0695
                          0.0077     0.0101   |   0.0514      0.0844
                          0.0081     0.0142   |   0.0624      0.0960
                          0.0090     0.0251   |   0.0751      0.1089
                          0.0097     0.0348   |   0.0768      0.1108
                          0.0104     0.0444   |   0.0808      0.1156

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
     INFLOW : ID= 2 (0009)     1.940      0.123      2.00      87.13
     OUTFLOW: ID= 1 (0005)     1.940      0.057      5.03      87.13

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 46.29
                TIME SHIFT OF PEAK FLOW         (min)=182.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.0905

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

--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
          ID1= 1 (2101):     0.39   0.008     3.00    30.84
        + ID2= 2 (0005):     1.94   0.057     5.03    87.13
          ================================================
          ID = 3 (0004):     2.33   0.064     5.00    77.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.008 (i)
     TIME TO PEAK    (hrs)=   3.000
     RUNOFF VOLUME    (mm)=  30.841
     TOTAL RAINFALL   (mm)=  89.500
     RUNOFF COEFFICIENT   =   0.345

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

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

```
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      1.12         0.05
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.56         2.50
     Length            (m)=     88.32         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     23.30     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      3.72 (ii)    4.55 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.25         0.23
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.07         0.00          0.074 (iii)
     TIME TO PEAK    (hrs)=      1.92         3.00           2.00
     RUNOFF VOLUME    (mm)=     88.50        43.23          86.69
     TOTAL RAINFALL   (mm)=     89.50        89.50          89.50
     RUNOFF COEFFICIENT   =      0.99         0.48           0.97

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.76         0.01
     Dep. Storage     (mm)=      1.00         5.00
     Average Slope     (%)=      1.00         2.50
     Length            (m)=     71.65         4.00
     Mannings n           =     0.013        0.250

     Max.Eff.Inten.(mm/hr)=     23.30     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=      3.75 (ii)    4.22 (ii)
     Unit Hyd. Tpeak (min)=      5.00         5.00
     Unit Hyd. peak  (cms)=      0.25         0.24
                                                      *TOTALS*
     PEAK FLOW       (cms)=      0.05         0.00          0.049 (iii)
     TIME TO PEAK    (hrs)=      1.92         3.00           2.00
```



```
     RUNOFF VOLUME    (mm)=     88.50        19.55          87.81
     TOTAL RAINFALL   (mm)=     89.50        89.50          89.50
     RUNOFF COEFFICIENT   =      0.99         0.22           0.98

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.074     2.00    86.69
       + ID2= 2 (0018):     0.77   0.049     2.00    87.81
         ================================================
         ID = 3 (0017):     1.94   0.123     2.00    87.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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

--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.008     3.00    30.84
       + ID2= 2 (0017):     1.94   0.123     2.00    87.13
         ================================================
         ID = 3 (0015):     2.33   0.130     2.00    77.71

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
  ***************************
  ** SIMULATION NUMBER:  31 **
  ***************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 405.000
| Ptotal= 24.91 mm |                          B=   3.000
--------------------                          C=   0.760
                         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
0.17	1.76	1.17	11.75	2.17	3.88	3.17	2.07
0.33	2.00	1.33	57.66	2.33	3.35	3.33	1.93
0.50	2.32	1.50	15.20	2.50	2.96	3.50	1.81
0.67	2.81	1.67	8.31	2.67	2.66	3.67	1.71
0.83	3.61	1.83	5.91	2.83	2.42	3.83	1.62
1.00	5.28	2.00	4.66	3.00	2.23	4.00	1.54

CALIB			
NASHYD (1100)	Area (ha)= 2.33	Curve Number (CN)= 67.2	
ID= 1 DT= 5.0 min	Ia (mm)= 7.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.46		

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	1.76	1.083	11.75	2.083	3.88	3.08	2.07
0.167	1.76	1.167	11.75	2.167	3.88	3.17	2.07
0.250	2.00	1.250	57.66	2.250	3.35	3.25	1.93
0.333	2.00	1.333	57.66	2.333	3.35	3.33	1.93
0.417	2.32	1.417	15.20	2.417	2.96	3.42	1.81
0.500	2.32	1.500	15.20	2.500	2.96	3.50	1.81
0.583	2.81	1.583	8.31	2.583	2.66	3.58	1.71
0.667	2.81	1.667	8.31	2.667	2.66	3.67	1.71
0.750	3.61	1.750	5.91	2.750	2.42	3.75	1.62
0.833	3.61	1.833	5.91	2.833	2.42	3.83	1.62
0.917	5.28	1.917	4.66	2.917	2.23	3.92	1.54
1.000	5.28	2.000	4.66	3.000	2.23	4.00	1.54

Unit Hyd Qpeak (cms)= 0.193

PEAK FLOW (cms)= 0.007 (i)
TIME TO PEAK (hrs)= 2.000
RUNOFF VOLUME (mm)= 2.051
TOTAL RAINFALL (mm)= 24.906
RUNOFF COEFFICIENT = 0.082

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

CALIB			
NASHYD (2101)	Area (ha)= 0.39	Curve Number (CN)= 63.4	
ID= 1 DT= 5.0 min	Ia (mm)= 4.90	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.17		

Unit Hyd Qpeak (cms)= 0.088

PEAK FLOW (cms)= 0.003 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 2.392
TOTAL RAINFALL (mm)= 24.906
RUNOFF COEFFICIENT = 0.096

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

CALIB			
STANDHYD (2100)	Area (ha)= 1.17		
ID= 1 DT= 5.0 min	Total Imp(%)= 96.00	Dir. Conn.(%)= 96.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	1.12	0.05	
Dep. Storage	(mm)=	1.00	5.00	
Average Slope	(%)=	1.56	2.50	
Length	(m)=	88.32	4.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)=		57.66	6.08	
over (min)		5.00	5.00	
Storage Coeff. (min)=		2.59 (ii)	3.17 (ii)	
Unit Hyd. Tpeak (min)=		5.00	5.00	
Unit Hyd. peak (cms)=		0.29	0.27	
				TOTALS
PEAK FLOW	(cms)=	0.18	0.00	0.178 (iii)
TIME TO PEAK	(hrs)=	1.33	1.33	1.33
RUNOFF VOLUME	(mm)=	23.91	3.94	23.11
TOTAL RAINFALL	(mm)=	24.91	24.91	24.91
RUNOFF COEFFICIENT	=	0.96	0.16	0.93

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 75.9 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 (2102)	Area (ha)= 0.77		
ID= 1 DT= 5.0 min	Total Imp(%)= 99.00	Dir. Conn.(%)= 99.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.76	0.01
Dep. Storage	(mm)=	1.00	5.00
Average Slope	(%)=	1.00	2.50

```
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      57.66         1.93
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.61 (ii)    2.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.28
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.00          0.120 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      23.91         1.32          23.68
     TOTAL RAINFALL   (mm)=      24.91        24.91          24.91
     RUNOFF COEFFICIENT   =       0.96         0.05           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
             CN*  =  47.5    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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

--------------------
| ADD HYD   (0009) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (2100):     1.17   0.178     1.33    23.11
        + ID2= 2 (2102):     0.77   0.120     1.33    23.68
          ================================================
          ID = 3 (0009):     1.94   0.298     1.33    23.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| RESERVOIR (0005) |
| IN= 2---> OUT= 1 |
| DT=  1.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   0.0107     0.0490
                         0.0068     0.0001   |   0.0177     0.0518
                         0.0073     0.0051   |   0.0365     0.0695
                         0.0077     0.0101   |   0.0514     0.0844
                         0.0081     0.0142   |   0.0624     0.0960
                         0.0090     0.0251   |   0.0751     0.1089
                         0.0097     0.0348   |   0.0768     0.1108
                         0.0104     0.0444   |   0.0808     0.1156

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



```
     INFLOW : ID= 2 (0009)      1.940      0.298      1.33      23.33
     OUTFLOW: ID= 1 (0005)      1.940      0.010      3.45      23.33

                   PEAK   FLOW   REDUCTION [Qout/Qin](%)=  3.24
                   TIME SHIFT OF PEAK FLOW         (min)=127.00
                   MAXIMUM  STORAGE   USED       (ha.m.)=  0.0341

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--------------------
| ADD HYD   (0004) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (2101):     0.39   0.003     1.50     2.39
        + ID2= 2 (0005):     1.94   0.010     3.45    23.33
          ================================================
          ID = 3 (0004):     2.33   0.012     1.50    19.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD    (0012) |   Area    (ha)=   0.39   Curve Number   (CN)= 63.4
|ID= 1 DT= 5.0 min |   Ia      (mm)=   4.90   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.17

     Unit Hyd Qpeak  (cms)=   0.088

     PEAK FLOW       (cms)=   0.003 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=   2.392
     TOTAL RAINFALL   (mm)=  24.906
     RUNOFF COEFFICIENT   =   0.096

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD  (0013) |   Area    (ha)=   1.17
|ID= 1 DT= 5.0 min |   Total Imp(%)=  96.00   Dir. Conn.(%)=  96.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       1.12         0.05
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.56         2.50
     Length            (m)=      88.32         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      57.66      ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.59 (ii)    3.17 (ii)
```

```
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.27
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.00          0.178 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      23.91         3.94          23.11
     TOTAL RAINFALL   (mm)=      24.91        24.91          24.91
     RUNOFF COEFFICIENT   =       0.96         0.16           0.93

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  75.9    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  (0018) |   Area    (ha)=   0.77
|ID= 1 DT= 5.0 min |   Total Imp(%)=  99.00   Dir. Conn.(%)=  99.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.76         0.01
     Dep. Storage     (mm)=       1.00         5.00
     Average Slope     (%)=       1.00         2.50
     Length            (m)=      71.65         4.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=      57.66     ********
               over (min)        5.00         5.00
     Storage Coeff.  (min)=       2.61 (ii)    2.94 (ii)
     Unit Hyd. Tpeak (min)=       5.00         5.00
     Unit Hyd. peak  (cms)=       0.29         0.28
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.00          0.120 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.33           1.33
     RUNOFF VOLUME    (mm)=      23.91         1.32          23.68
     TOTAL RAINFALL   (mm)=      24.91        24.91          24.91
     RUNOFF COEFFICIENT   =       0.96         0.05           0.95

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  47.5    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.

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```
| ADD HYD   (0017) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0013):     1.17   0.178     1.33    23.11
       + ID2= 2 (0018):     0.77   0.120     1.33    23.68
         ================================================
         ID = 3 (0017):     1.94   0.298     1.33    23.33

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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--------------------
| ADD HYD   (0015) |
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------         (ha)    (cms)    (hrs)     (mm)
         ID1= 1 (0012):     0.39   0.003     1.50     2.39
       + ID2= 2 (0017):     1.94   0.298     1.33    23.33
         ================================================
         ID = 3 (0015):     2.33   0.299     1.33    19.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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 FINISH
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Appendix C

Quantity Control

Stage-Storage-Discharge: West - Parking Lot & Underground Storage

Project No: Goldmanco
Project Name: 10846
Designed/Checked By: CS / CPB
Date: November 7, 2018

Storage Summary		
Top of Permanent Pool:	86.08	m
Permanent Pool Volume:	0.0	m^3
Active Storage Volume:	1157.7	m^3

Outlet Capacity Summary				
Type	Diameter	Slope	Peak Flow	% Full

Discharge Summary			
Stage	Type	Invert Elev (m)	Diameter / Width (mm) (m)
1	Orifice Plate: Vertical	86.08	75
2	Orifice Plate: Vertical	86.96	180

Stage-Storage-Discharge Summary Table

Elevation	Stage	Stage 1 Orifice Plate	Stage 2 Orifice Plate					Active Storage	Total Discharge	Notes
m	m	m^3/s						ha*m	m^3/s	
86.08	0.00	0.000	0.000					**0.0000**	**0.000**	
86.18	0.10	**0.003**	0.000					**0.0000**	**0.003**	
86.28	0.20	**0.005**	0.000					**0.0000**	**0.005**	
86.38	0.30	**0.006**	0.000					**0.0000**	**0.006**	
86.48	0.40	**0.007**	0.000					**0.0031**	**0.007**	
86.58	0.50	**0.008**	0.000					**0.0132**	**0.008**	
86.68	0.60	**0.009**	0.000					**0.0231**	**0.009**	
86.78	0.70	**0.010**	0.000					**0.0329**	**0.010**	
86.85	0.77	**0.010**	0.000					**0.0396**	**0.010**	
86.86	0.78	**0.010**	0.000					**0.0406**	**0.010**	
86.87	0.79	**0.010**	0.000					**0.0415**	**0.010**	
86.88	0.80	**0.010**	0.000					**0.0425**	**0.010**	
86.89	0.81	**0.010**	0.000					**0.0434**	**0.010**	
86.90	0.82	**0.010**	0.000					**0.0444**	**0.010**	<= 2 Yr: 438 m³ (86.9m)
86.91	0.83	**0.010**	0.000					**0.0453**	**0.010**	
86.92	0.84	**0.011**	0.000					**0.0462**	**0.011**	
86.93	0.85	**0.011**	0.000					**0.0472**	**0.011**	
86.94	0.86	**0.011**	0.000					**0.0481**	**0.011**	
86.95	0.87	**0.011**	0.000					**0.0490**	**0.011**	
86.96	0.88	**0.011**	**0.000**					**0.0500**	**0.011**	
86.97	0.89	**0.011**	**0.005**					**0.0509**	**0.016**	
86.98	0.90	**0.011**	**0.007**					**0.0518**	**0.018**	
86.99	0.91	**0.011**	**0.008**					**0.0527**	**0.019**	
87.00	0.92	**0.011**	**0.010**					**0.0536**	**0.021**	
87.01	0.93	**0.011**	**0.011**					**0.0546**	**0.022**	
87.02	0.94	**0.011**	**0.012**					**0.0555**	**0.023**	
87.03	0.95	**0.011**	**0.013**					**0.0564**	**0.024**	
87.04	0.96	**0.011**	**0.014**					**0.0573**	**0.025**	
87.05	0.97	**0.011**	**0.014**					**0.0582**	**0.026**	<= 5 Yr: 581.1 m³ (87.05m)
87.06	0.98	**0.011**	**0.015**					**0.0591**	**0.027**	
87.07	0.99	**0.011**	**0.016**					**0.0599**	**0.027**	
87.08	1.00	**0.012**	**0.017**					**0.0608**	**0.028**	
87.09	1.01	**0.012**	**0.017**					**0.0617**	**0.029**	
87.10	1.02	**0.012**	**0.018**					**0.0626**	**0.030**	
87.11	1.03	**0.012**	**0.019**					**0.0635**	**0.030**	
87.12	1.04	**0.012**	**0.019**					**0.0643**	**0.031**	
87.13	1.05	**0.012**	**0.020**					**0.0652**	**0.032**	
87.14	1.06	**0.012**	**0.020**					**0.0661**	**0.032**	<= 10 Yr: 657 m³ (87.14m)
87.15	1.07	**0.012**	**0.021**					**0.0669**	**0.033**	
87.16	1.08	**0.012**	**0.022**					**0.0678**	**0.034**	
87.17	1.09	**0.012**	**0.023**					**0.0686**	**0.035**	
87.18	1.10	**0.012**	**0.024**					**0.0695**	**0.036**	
87.19	1.11	**0.012**	**0.025**					**0.0703**	**0.037**	
87.20	1.12	**0.012**	**0.026**					**0.0711**	**0.038**	
87.21	1.13	**0.012**	**0.027**					**0.0720**	**0.039**	
87.22	1.14	**0.012**	**0.028**					**0.0728**	**0.040**	
87.23	1.15	**0.012**	**0.029**					**0.0736**	**0.041**	
87.24	1.16	**0.012**	**0.029**					**0.0744**	**0.042**	
87.25	1.17	**0.012**	**0.030**					**0.0752**	**0.043**	

Stage-Storage-Discharge Summary Table										
Elevation	Stage	Stage 1 Orifice Plate	Stage 2 Orifice Plate					Active Storage	Total Discharge	Notes
m	m	m^3/s						ha*m	m^3/s	
87.26	1.18	0.013	0.031					0.0760	0.044	
87.27	1.19	0.013	0.032					0.0768	0.044	
87.28	1.20	0.013	0.032					0.0776	0.045	
87.29	1.21	0.013	0.033					0.0784	0.046	
87.30	1.22	0.013	0.034					0.0792	0.047	
87.31	1.23	0.013	0.034					0.0800	0.047	
87.32	1.24	0.013	0.035					0.0807	0.048	
87.33	1.25	0.013	0.036					0.0815	0.049	
87.34	1.26	0.013	0.036					0.0822	0.049	
87.35	1.27	0.013	0.037					0.0830	0.050	
87.36	1.28	0.013	0.038					0.0837	0.051	
87.37	1.29	0.013	0.038					0.0844	0.051	
87.38	1.30	0.013	0.039					0.0852	0.052	
87.39	1.31	0.013	0.039					0.0859	0.053	
87.40	1.32	0.013	0.040					0.0866	0.053	
87.41	1.33	0.013	0.041					0.0873	0.054	<= 25 Yr: 872 m³ (87.41m)
87.42	1.34	0.013	0.041					0.0879	0.055	
87.43	1.35	0.013	0.042					0.0886	0.055	
87.44	1.36	0.014	0.042					0.0893	0.056	
87.45	1.37	0.014	0.043					0.0899	0.056	
87.46	1.38	0.014	0.043					0.0906	0.057	
87.47	1.39	0.014	0.044					0.0912	0.057	
87.48	1.40	0.014	0.044					0.0918	0.058	
87.49	1.41	0.014	0.045					0.0923	0.059	
87.50	1.42	0.014	0.045					0.0929	0.059	
87.51	1.43	0.014	0.046					0.0934	0.060	
87.52	1.44	0.014	0.046					0.0939	0.060	
87.53	1.45	0.014	0.047					0.0945	0.061	
87.54	1.46	0.014	0.047					0.0950	0.061	
87.55	1.47	0.014	0.048					0.0955	0.062	
87.56	1.48	0.014	0.048					0.0960	0.062	
87.57	1.49	0.014	0.049					0.0965	0.063	
87.58	1.50	0.014	0.049					0.0970	0.063	
87.59	1.51	0.014	0.050					0.0975	0.064	
87.60	1.52	0.014	0.050					0.0980	0.064	
87.61	1.53	0.014	0.051					0.0984	0.065	
87.62	1.54	0.014	0.051					0.0989	0.065	
87.63	1.55	0.014	0.052					0.0994	0.066	
87.64	1.56	0.014	0.052					0.0999	0.066	
87.65	1.57	0.015	0.052					0.1003	0.067	
87.66	1.58	0.015	0.053					0.1008	0.067	<= 50 Yr: 1008 m³ (87.66m)
87.67	1.59	0.015	0.053					0.1013	0.068	
87.68	1.60	0.015	0.054					0.1018	0.068	
87.69	1.61	0.015	0.054					0.1022	0.069	
87.70	1.62	0.015	0.055					0.1027	0.069	
87.71	1.63	0.015	0.055					0.1032	0.070	
87.72	1.64	0.015	0.055					0.1037	0.070	
87.73	1.65	0.015	0.056					0.1041	0.071	
87.74	1.66	0.015	0.056					0.1046	0.071	
87.75	1.67	0.015	0.057					0.1051	0.072	
87.76	1.68	0.015	0.057					0.1056	0.072	
87.77	1.69	0.015	0.057					0.1061	0.072	
87.78	1.70	0.015	0.058					0.1065	0.073	
87.79	1.71	0.015	0.058					0.1070	0.073	
87.80	1.72	0.015	0.059					0.1075	0.074	
87.81	1.73	0.015	0.059					0.1080	0.074	
87.82	1.74	0.015	0.059					0.1084	0.075	
87.83	1.75	0.015	0.060					0.1089	0.075	
87.84	1.76	0.015	0.060					0.1094	0.076	
87.85	1.77	0.015	0.060					0.1099	0.076	
87.86	1.78	0.015	0.061					0.1103	0.076	
87.87	1.79	0.016	0.061					0.1108	0.077	
87.88	1.80	0.016	0.062					0.1113	0.077	
87.89	1.81	0.016	0.062					0.1118	0.078	
87.90	1.82	0.016	0.062					0.1122	0.078	
87.91	1.83	0.016	0.063					0.1127	0.078	
87.92	1.84	0.016	0.063					0.1132	0.079	
87.93	1.85	0.016	0.063					0.1137	0.079	
87.94	1.86	0.016	0.064					0.1141	0.080	
87.95	1.87	0.016	0.064					0.1146	0.080	<= 100 Yr: 1144 m³ (87.95m)
87.96	1.88	0.016	0.065					0.1151	0.080	
87.97	1.89	0.016	0.065					0.1156	0.081	

Project: Goldmanco (With Lower Stone Storage)

Chamber Model -	MC-3500	
Units -	**Metric**	Click Here for Imperial
Number of Chambers -	228	
Number of End Caps -	24	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	86.45	m
Amount of Stone Above Chambers -	375	mm
Amount of Stone Below Chambers -	230	mm
Area of system -	1191	sq.meters

☑ Include Perimeter Stone in Calculations

Min. Area - 1130.239 sq.meters

Height of System *(mm)*	Incremental Single Chamber *(cubic meters)*	Incremental Single End Cap *(cubic meters)*	Incremental Chambers *(cubic meters)*	Incremental End Cap *(cubic meters)*	Incremental Stone *(cubic meters)*	Incremental Chamber, End Cap and Stone *(cubic meters)*	Cumulative System *(cubic meters)*	Elevation *(meters)*
1753	0.00	0.00	0.00	0.00	12.094	12.09	1266.53	88.20
1727	0.00	0.00	0.00	0.00	12.094	12.09	1254.43	88.18
1702	0.00	0.00	0.00	0.00	12.094	12.09	1242.34	88.15
1676	0.00	0.00	0.00	0.00	12.094	12.09	1230.25	88.13
1651	0.00	0.00	0.00	0.00	12.094	12.09	1218.15	88.10
1626	0.00	0.00	0.00	0.00	12.094	12.09	1206.06	88.08
1600	0.00	0.00	0.00	0.00	12.094	12.09	1193.96	88.05
1575	0.00	0.00	0.00	0.00	12.094	12.09	1181.87	88.02
1549	0.00	0.00	0.00	0.00	12.094	12.09	1169.77	88.00
1524	0.00	0.00	0.00	0.00	12.094	12.09	1157.68	87.97
1499	0.00	0.00	0.00	0.00	12.094	12.09	1145.58	87.95
1473	0.00	0.00	0.00	0.00	12.094	12.09	1133.49	87.92
1448	0.00	0.00	0.00	0.00	12.094	12.09	1121.39	87.90
1422	0.00	0.00	0.00	0.00	12.094	12.09	1109.30	87.87
1397	0.00	0.00	0.00	0.00	12.094	12.09	1097.21	87.85
1372	0.00	0.00	0.38	0.00	11.944	12.32	1085.11	87.82
1346	0.01	0.00	1.25	0.02	11.587	12.86	1072.79	87.80
1321	0.01	0.00	1.90	0.03	11.325	13.25	1059.94	87.77
1295	0.01	0.00	2.61	0.04	11.038	13.68	1046.69	87.75
1270	0.02	0.00	4.44	0.05	10.301	14.78	1033.01	87.72
1245	0.03	0.00	6.64	0.06	9.415	16.11	1018.22	87.69
1219	0.04	0.00	8.07	0.07	8.838	16.98	1002.11	87.67
1194	0.04	0.00	9.18	0.09	8.387	17.66	985.13	87.64
1168	0.04	0.00	10.16	0.10	7.993	18.25	967.48	87.62
1143	0.05	0.00	11.02	0.11	7.641	18.77	949.23	87.59
1118	0.05	0.01	11.81	0.12	7.323	19.25	930.45	87.57
1092	0.05	0.01	12.51	0.14	7.036	19.68	911.20	87.54
1067	0.06	0.01	13.18	0.15	6.765	20.09	891.52	87.52
1041	0.06	0.01	13.78	0.16	6.518	20.46	871.43	87.49
1016	0.06	0.01	14.36	0.17	6.282	20.81	850.97	87.47
991	0.07	0.01	14.89	0.18	6.065	21.14	830.16	87.44
965	0.07	0.01	15.40	0.19	5.860	21.45	809.02	87.42
940	0.07	0.01	15.88	0.20	5.664	21.74	787.57	87.39
914	0.07	0.01	16.32	0.21	5.482	22.01	765.83	87.36
889	0.07	0.01	16.75	0.22	5.309	22.27	743.82	87.34
864	0.08	0.01	17.15	0.23	5.144	22.52	721.55	87.31
838	0.08	0.01	17.53	0.24	4.988	22.75	699.03	87.29
813	0.08	0.01	17.89	0.24	4.840	22.98	676.27	87.26
787	0.08	0.01	18.24	0.25	4.699	23.19	653.30	87.24
762	0.08	0.01	18.56	0.26	4.564	23.39	630.11	87.21
737	0.08	0.01	18.88	0.27	4.435	23.58	606.72	87.19
711	0.08	0.01	19.17	0.28	4.314	23.77	583.13	87.16
686	0.09	0.01	19.45	0.28	4.201	23.93	559.37	87.14
660	0.09	0.01	19.71	0.29	4.093	24.10	535.43	87.11
635	0.09	0.01	19.98	0.30	3.984	24.26	511.34	87.09
610	0.09	0.01	20.21	0.31	3.887	24.41	487.08	87.06
584	0.09	0.01	20.44	0.31	3.794	24.55	462.67	87.03
559	0.09	0.01	20.66	0.32	3.704	24.68	438.13	87.01
533	0.09	0.01	20.86	0.33	3.620	24.81	413.45	86.98
508	0.09	0.01	21.06	0.33	3.539	24.93	388.64	86.96
483	0.09	0.01	21.24	0.34	3.462	25.04	363.71	86.93
457	0.09	0.01	21.42	0.34	3.388	25.15	338.67	86.91
432	0.09	0.01	21.59	0.35	3.318	25.26	313.51	86.88
406	0.10	0.01	21.75	0.35	3.253	25.36	288.25	86.86
381	0.10	0.01	21.90	0.36	3.189	25.45	262.90	86.83
356	0.10	0.02	22.05	0.36	3.130	25.54	237.45	86.81
330	0.10	0.02	22.19	0.37	3.071	25.63	211.90	86.78
305	0.10	0.02	22.32	0.37	3.016	25.71	186.27	86.75
279	0.10	0.02	22.46	0.38	2.960	25.80	160.56	86.73
254	0.10	0.02	22.63	0.40	2.881	25.92	134.77	86.70
229	0.00	0.00	0.00	0.00	12.094	12.09	108.85	86.68
203	0.00	0.00	0.00	0.00	12.094	12.09	96.76	86.65
178	0.00	0.00	0.00	0.00	12.094	12.09	84.66	86.63
152	0.00	0.00	0.00	0.00	12.094	12.09	72.57	86.60
127	0.00	0.00	0.00	0.00	12.094	12.09	60.47	86.58
102	0.00	0.00	0.00	0.00	12.094	12.09	48.38	86.55
76	0.00	0.00	0.00	0.00	12.094	12.09	36.28	86.53
51	0.00	0.00	0.00	0.00	12.094	12.09	24.19	86.50
25	0.00	0.00	0.00	0.00	12.094	12.09	12.09	86.48

Project: Goldmanco (No Lower Stone Storage)

Chamber Model -	MC-3500		
Units -	**Metric**	Click Here for Imperial	
Number of Chambers -	228		
Number of End Caps -	24		
Voids in the stone (porosity) -	40	%	
Base of Storage Elevation	86.45	m	☑ Include Perimeter Stone in Calculations
Amount of Stone Above Chambers -	375	mm	
Amount of Stone Below Chambers -	0	mm	
Area of system -	1191	sq.meters	Min. Area - 1130.239 sq.meters

StormTech requires a minimum of 229 mm of stone below the chambers. This table is for modeling purposes only. Please see the engineer's drawings for the actual amount of stone under the chambers.

Height of System *(mm)*	Incremental Single Chamber *(cubic meters)*	Incremental Single End Cap *(cubic meters)*	Incremental Chambers *(cubic meters)*	Incremental End Cap *(cubic meters)*	Incremental Stone *(cubic meters)*	Incremental Chamber, End Cap and Stone *(cubic meters)*	Cumulative System *(cubic meters)*	Elevation *(meters)*
1524	0.00	0.00	0.00	0.00	12.094	12.09	1157.68	87.97
1499	0.00	0.00	0.00	0.00	12.094	12.09	1145.58	87.95
1473	0.00	0.00	0.00	0.00	12.094	12.09	1133.49	87.92
1448	0.00	0.00	0.00	0.00	12.094	12.09	1121.39	87.90
1422	0.00	0.00	0.00	0.00	12.094	12.09	1109.30	87.87
1397	0.00	0.00	0.00	0.00	12.094	12.09	1097.21	87.85
1372	0.00	0.00	0.00	0.00	12.094	12.09	1085.11	87.82
1346	0.00	0.00	0.00	0.00	12.094	12.09	1073.02	87.80
1321	0.00	0.00	0.00	0.00	12.094	12.09	1060.92	87.77
1295	0.00	0.00	0.00	0.00	12.094	12.09	1048.83	87.75
1270	0.00	0.00	0.00	0.00	12.094	12.09	1036.73	87.72
1245	0.00	0.00	0.00	0.00	12.094	12.09	1024.64	87.69
1219	0.00	0.00	0.00	0.00	12.094	12.09	1012.54	87.67
1194	0.00	0.00	0.00	0.00	12.094	12.09	1000.45	87.64
1168	0.00	0.00	0.00	0.00	12.094	12.09	988.36	87.62
1143	0.00	0.00	0.38	0.00	11.944	12.32	976.26	87.59
1118	0.01	0.00	1.25	0.02	11.587	12.86	963.94	87.57
1092	0.01	0.00	1.90	0.03	11.325	13.25	951.09	87.54
1067	0.01	0.00	2.61	0.04	11.038	13.68	937.84	87.52
1041	0.02	0.00	4.44	0.05	10.301	14.78	924.16	87.49
1016	0.03	0.00	6.64	0.06	9.415	16.11	909.37	87.47
991	0.04	0.00	8.07	0.07	8.838	16.98	893.26	87.44
965	0.04	0.00	9.18	0.09	8.387	17.66	876.28	87.42
940	0.04	0.00	10.16	0.10	7.993	18.25	858.63	87.39
914	0.05	0.00	11.02	0.11	7.641	18.77	840.38	87.36
889	0.05	0.01	11.81	0.12	7.323	19.25	821.60	87.34
864	0.05	0.01	12.51	0.14	7.036	19.68	802.35	87.31
838	0.06	0.01	13.18	0.15	6.765	20.09	782.67	87.29
813	0.06	0.01	13.78	0.16	6.518	20.46	762.58	87.26
787	0.06	0.01	14.36	0.17	6.282	20.81	742.12	87.24
762	0.07	0.01	14.89	0.18	6.065	21.14	721.31	87.21
737	0.07	0.01	15.40	0.19	5.860	21.45	700.17	87.19
711	0.07	0.01	15.88	0.20	5.664	21.74	678.72	87.16
686	0.07	0.01	16.32	0.21	5.482	22.01	656.98	87.14
660	0.07	0.01	16.75	0.22	5.309	22.27	634.97	87.11
635	0.08	0.01	17.15	0.23	5.144	22.52	612.70	87.09
610	0.08	0.01	17.53	0.24	4.988	22.75	590.18	87.06
584	0.08	0.01	17.89	0.24	4.840	22.98	567.42	87.03
559	0.08	0.01	18.24	0.25	4.699	23.19	544.45	87.01
533	0.08	0.01	18.56	0.26	4.564	23.39	521.26	86.98
508	0.08	0.01	18.88	0.27	4.435	23.58	497.87	86.96
483	0.08	0.01	19.17	0.28	4.314	23.77	474.28	86.93
457	0.09	0.01	19.45	0.28	4.201	23.93	450.52	86.91
432	0.09	0.01	19.71	0.29	4.093	24.10	426.58	86.88
406	0.09	0.01	19.98	0.30	3.984	24.26	402.49	86.86
381	0.09	0.01	20.21	0.31	3.887	24.41	378.23	86.83
356	0.09	0.01	20.44	0.31	3.794	24.55	353.82	86.81
330	0.09	0.01	20.66	0.32	3.704	24.68	329.28	86.78
305	0.09	0.01	20.86	0.33	3.620	24.81	304.59	86.75
279	0.09	0.01	21.06	0.33	3.539	24.93	279.79	86.73
254	0.09	0.01	21.24	0.34	3.462	25.04	254.86	86.70
229	0.09	0.01	21.42	0.34	3.388	25.15	229.82	86.68
203	0.09	0.01	21.59	0.35	3.318	25.26	204.66	86.65
178	0.10	0.01	21.75	0.35	3.253	25.36	179.40	86.63
152	0.10	0.01	21.90	0.36	3.189	25.45	154.05	86.60
127	0.10	0.02	22.05	0.36	3.130	25.54	128.60	86.58
102	0.10	0.02	22.19	0.37	3.071	25.63	103.05	86.55
76	0.10	0.02	22.32	0.37	3.016	25.71	77.42	86.53
51	0.10	0.02	22.46	0.38	2.960	25.80	51.71	86.50
25	0.10	0.02	22.63	0.40	2.881	25.92	25.92	86.48

ADVANCED DRAINAGE SYSTEMS, INC.

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STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH MC-3500 OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MADE FROM VIRGIN, IMPACT-MODIFIED POLYPROPYLENE COPOLYMERS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF MC-3500 CHAMBER SYSTEM

1. STORMTECH MC-3500 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 9" (230 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. INLET AND OUTLET MANIFOLDS MUST BE INSERTED A MINIMUM OF 12" (300 mm) INTO CHAMBER END CAPS.
8. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm) MEETING THE AASHTO M43 DESIGNATION OF #3 OR #4.
9. STONE MUST BE PLACED ON THE TOP CENTER OF THE CHAMBER TO ANCHOR THE CHAMBERS IN PLACE AND PRESERVE ROW SPACING..
10. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH MC-3500 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
2. THE USE OF EQUIPMENT OVER MC-3500 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADER, DUMP TRUCK, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH MC-3500/MC-4500 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

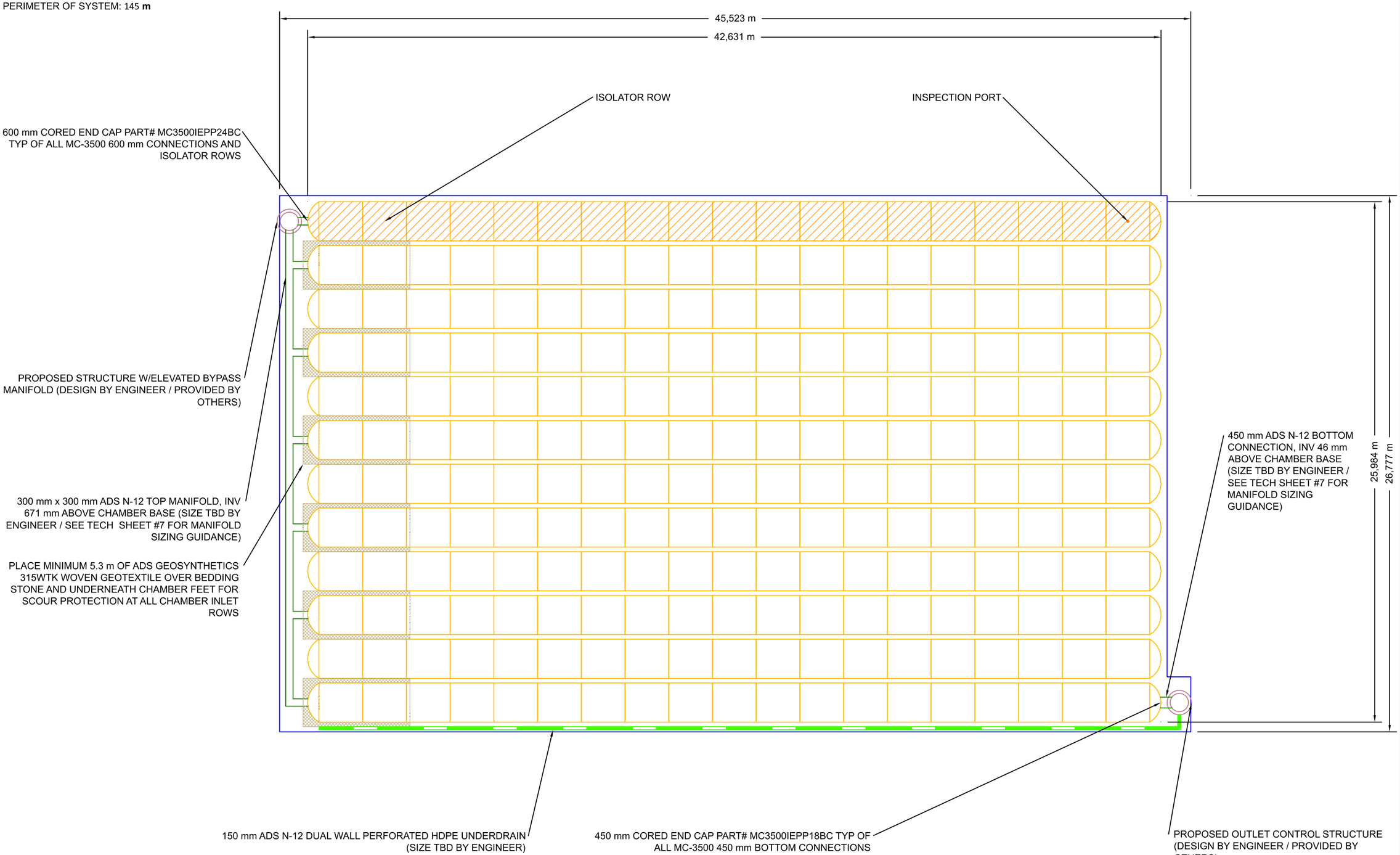
USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY USING THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

CONCEPTUAL LAYOUT

(228) STORMTECH MC-3500 CHAMBERS
(24) STORMTECH MC-3500 END CAPS
INSTALLED WITH 375 mm COVER STONE, 230 mm BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 1264 m³
AREA OF SYSTEM: 1191 **m²**
PERIMETER OF SYSTEM: 145 **m**

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION



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PROJECT #: Tool | CHECKED: ---

REV	DRW	CHK	DESCRIPTION

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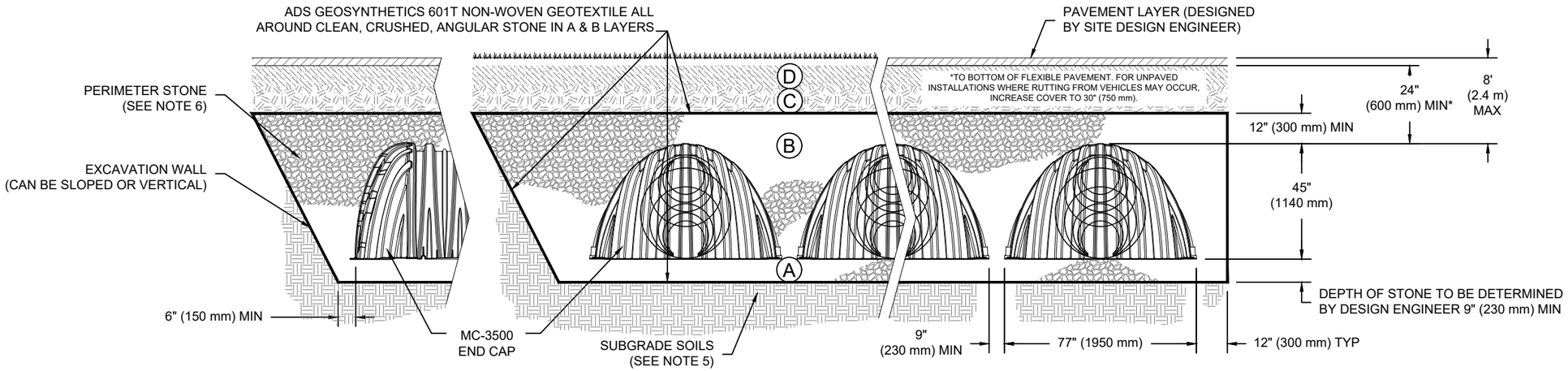
NOT TO SCALE

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2] [3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
5. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
7. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

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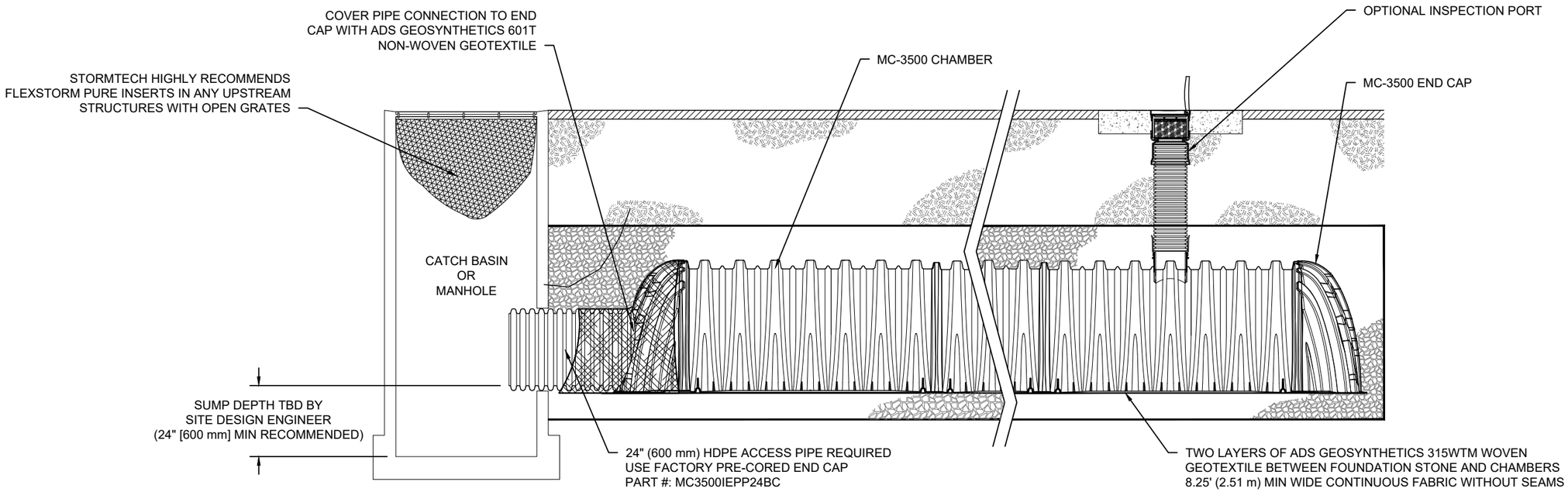


MC-3500 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

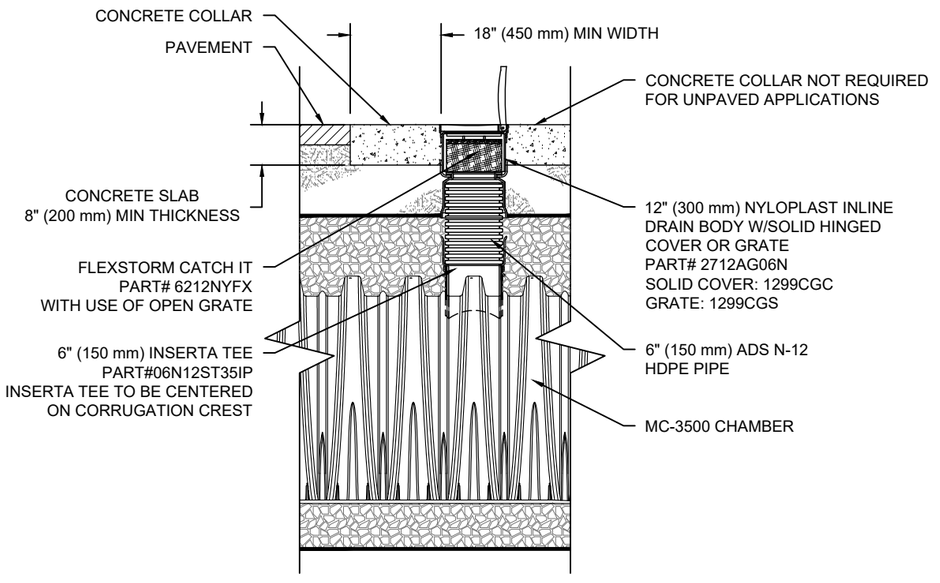
STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.

2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



MC-3500 6" INSPECTION PORT DETAIL
NTS

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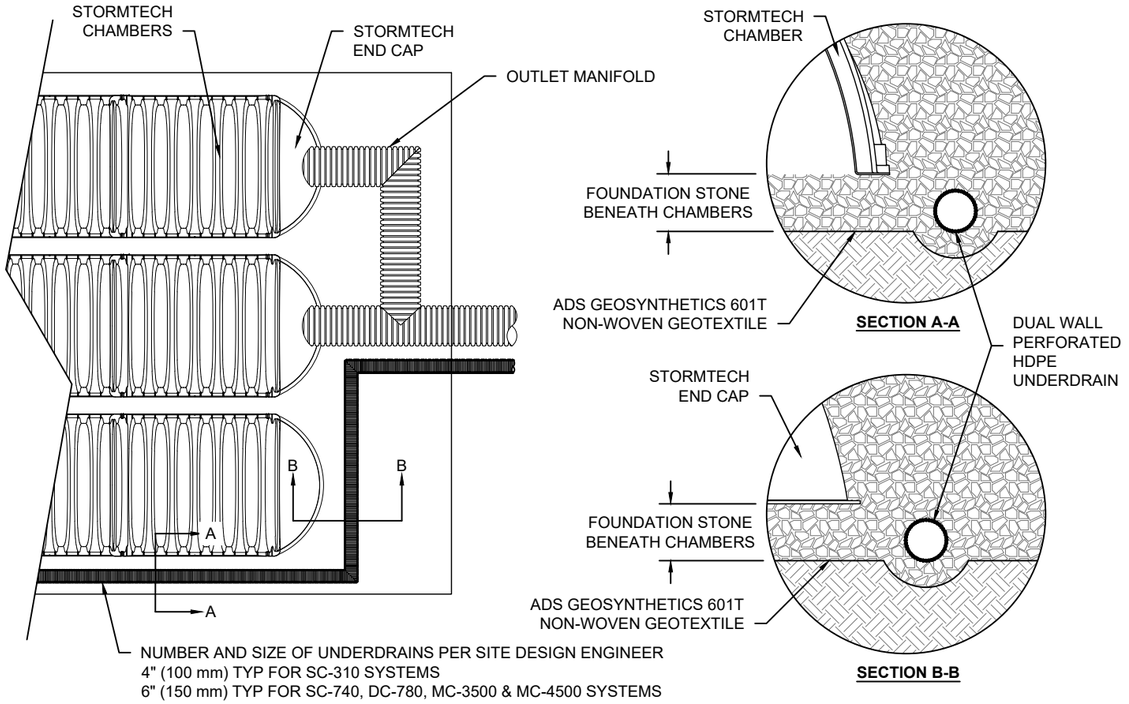
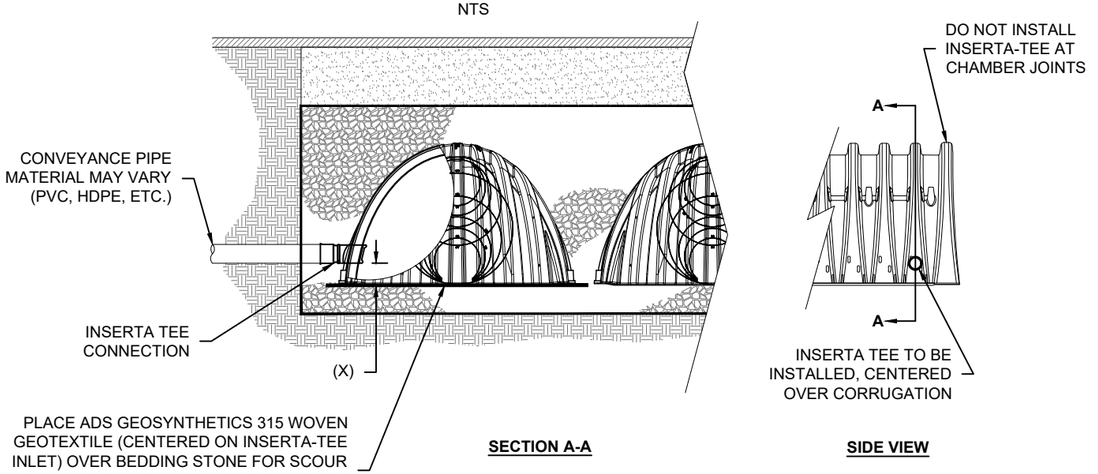
UNDERDRAIN DETAIL

NTS



INSERTA TEE DETAIL

NTS

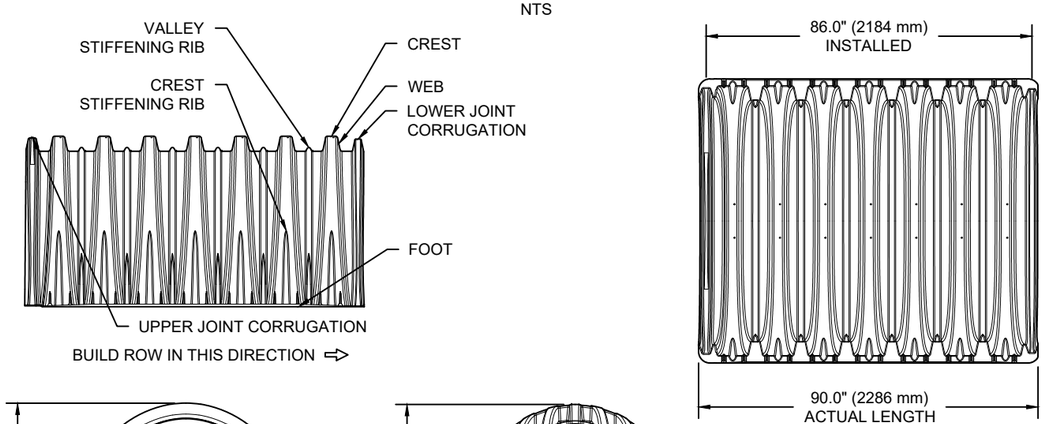


NOTE:
PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS.
CONTACT STORMTECH FOR MORE INFORMATION.

CHAMBER	MAX DIAMETER OF INSERTA TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	8" (200 mm)
INSERTA TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON		

MC-3500 TECHNICAL SPECIFICATION

NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 86.0"	(1956 mm X 1143 mm X 2184 mm)
CHAMBER STORAGE	109.9 CUBIC FEET	(3.11 m³)
MINIMUM INSTALLED STORAGE*	178.9 CUBIC FEET	(5.06 m³)
WEIGHT	135.0 lbs.	(61.2 kg)

NOMINAL END CAP SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	77.0" X 45.0" X 22.5"	(1956 mm X 1143 mm X 571 mm)
END CAP STORAGE	14.9 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	46.0 CUBIC FEET	(1.30 m³)
WEIGHT	50.0 lbs.	(22.7 kg)

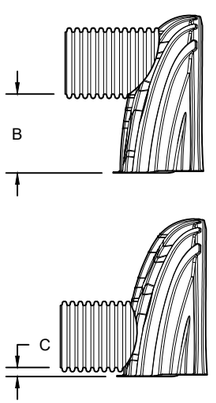
*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION AND BETWEEN CHAMBERS,
12" (305 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY

STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B		---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B		---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B		---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B		---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B		---	1.50" (38 mm)
MC3500IEPP18TC	18" (450 mm)	20.03" (509 mm)	---
MC3500IEPP18BC		---	1.77" (45 mm)
MC3500IEPP24TC	24" (600 mm)	14.48" (368 mm)	---
MC3500IEPP24BC		---	2.06" (52 mm)
MC3500IEPP30BC	30" (750 mm)	---	

NOTE: ALL DIMENSIONS ARE NOMINAL

CUSTOM PRECORED INVERTS ARE AVAILABLE UPON REQUEST. INVENTORIED MANIFOLDS INCLUDE 12-24" (300-600 mm) SIZE ON SIZE AND 15-48" (375-1200 mm) ECCENTRIC MANIFOLDS.
CUSTOM INVERT LOCATIONS ON THE MC-3500 END CAP CUT IN THE FIELD ARE NOT RECOMMENDED FOR PIPE SIZES GREATER THAN 10" (250 mm)
THE INVERT LOCATION IN COLUMN 'B' ARE THE HIGHTEST POSSIBLE FOR THE PIPE SIZE.



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MC-SERIES END CAP INSERTION DETAIL

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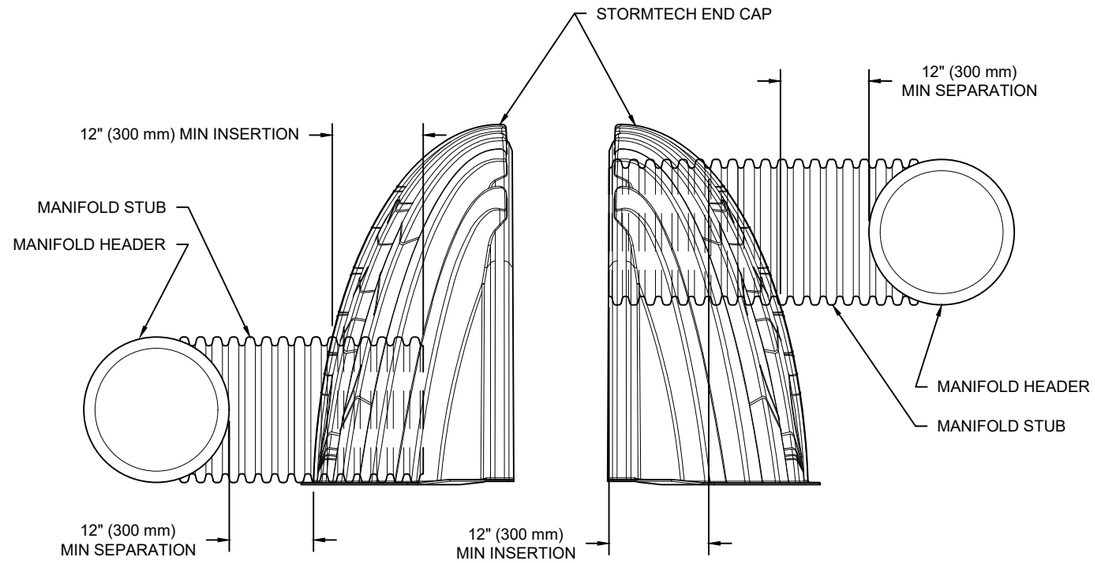

NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL
FOR A PROPER FIT IN END CAP OPENING.

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Appendix D

Quality Control

Brief Stormceptor Sizing Report - Goldmanco

Project Information & Location			
Project Name	GoldmanCo	**Project Number**	10846
City	Cobourg	**State/ Province**	Ontario
Country	Canada	**Date**	12/10/2018
Designer Information		**EOR Information (optional)**	
Name	Christopher Sokol	**Name**	
Company	D.M. Wills	**Company**	
Phone #	705-742-2297	**Phone #**	
Email	csokol@dmwills.com	**Email**	

Stormwater Treatment Recommendation

The recommended Stormceptor Model(s) which achieve or exceed the user defined water quality objective for each site within the project are listed in the below Sizing Summary table.

Site Name	Goldmanco
Target TSS Removal (%)	80
TSS Removal (%) Provided	80
Recommended Stormceptor Model	STC 6000

The recommended Stormceptor Model achieves the water quality objectives based on the selected inputs, historical rainfall records and selected particle size distribution.

Stormceptor Sizing Summary		
Stormceptor Model	**% TSS Removal Provided**	**% Runoff Volume Captured Provided**
STC 300	50	59
STC 750	63	79
STC 1000	65	79
STC 1500	65	79
STC 2000	70	89
STC 3000	72	89
STC 4000	77	95
STC 5000	77	95
STC 6000	80	97
STC 9000	84	99
STC 10000	84	99
STC 14000	87	99
StormceptorMAX	Custom	Custom

Sizing Details

Drainage Area	
Total Area (ha)	1.94
Imperviousness %	98.0

Rainfall	
Station Name	TRENTON A
State/Province	Ontario
Station ID #	8875
Years of Records	34
Latitude	44°7'N
Longitude	77°32'W

Water Quality Objective	
TSS Removal (%)	80.0
Runoff Volume Capture (%)	90.00
Oil Spill Capture Volume (L)	
Peak Conveyed Flow Rate (L/s)	510.00
Water Quality Flow Rate (L/s)	340.00

Up Stream Storage	
Storage (ha-m)	Discharge (cms)
0.000	0.000

Up Stream Flow Diversion	
Max. Flow to Stormceptor (cms)	

Particle Size Distribution (PSD)
The selected PSD defines TSS removal

Fine Distribution

Particle Diameter (microns)	Distribution %	Specific Gravity
20.0	20.0	1.30
60.0	20.0	1.80
150.0	20.0	2.20
400.0	20.0	2.65
2000.0	20.0	2.65

Notes

• Stormceptor performance estimates are based on simulations using PCSWMM for Stormceptor, which uses the EPA Rainfall and Runoff modules.
• Design estimates listed are only representative of specific project requirements based on total suspended solids (TSS) removal defined by the selected PSD, and based on stable site conditions only, after construction is completed.
• For submerged applications or sites specific to spill control, please contact your local Stormceptor representative for further design assistance.

For Stormceptor Specifications and Drawings Please Visit:
http://www.imbriumsystems.com/technical-specifications

Appendix E

Hydraulic Grade Line Analysis

STORM SEWER HYDRAULIC GRADE LINE DESIGN SHEET

Rain Station:	MTO IDF Lookup
Design Storm:	5 Year
Intensity-Duration-Frequency Parameters	a = 28.3
	b = -0.699
	c = 0.00
Minimum Time of Concentration:	15 min

Design Consideration: Overland Flow Route

Project Information			
Project Name	Goldmanco-Cobourg	**Project No.**	10846
Project Location	545 King Street	**Designed by**	RC
Municipality	Cobourg	**Checked by**	CPB
Design Standards	Cobourg Design Guidelines (2005)	**Date**	October 24, 2019

D.M. Wills Associates Ltd.
150 Jameson Drive
Peterborough, ON · K9J 0B9
Tel: (705) 742-2297 ext. 250
Fax: (705) 741-3568

LOCATION					TIME OF CONCENTRATION (MIN)			CATCHMENT			STRUCTURE INLET PROPERTIES							PIPE PROPERTIES								FLOW REGIME				LOSSES			HGL					
								Multiplation Factor for 5 Year Storm: 1.00																														
STREET	CATCHMENT ID	FROM	TO	TO (OVERLAND FLOW ROUTE)	TO UPPER END	IN REACH	INTENSITY (mm/hr)	AREA (ha)	5 YR RUNOFF COEFFICIENT, C	AC (x FACTOR)	EXTRANEOUS **SURFACE** FLOWS (m^3/s)	CUMULATIVE AC TO STRUCTURE	CUMULATIVE EXTRANEOUS FLOWS TO STRUCTURE (m^3/s)	CATCH BASIN GRATE TYPE	CATCHBASIN ON GRADE OR IN SAG	GRADE OF ROAD (%)	MAX PONDING DEPTH (m)	% FLOW CAPTURED	EXTRANEOUS **SEWER** FLOWS (m^3/s)	PIPE FLOW (m^3/s)	PIPE MATERIAL	LENGTH (m)	GRADE (%)	PIPE DIA. (mm)	BEND AT D/S STRUCTURE (0-90°)	UPSTREAM INVERT (m)	CAPACITY (m^3/s)	% FULL	PARTIAL FLOW VELOCITY (m/s)	FLOW REGIME	FRICTION LOSS (m)	STRUCTURE LOSSES (m)	CONFLUENCE LOSSES (m)	U/S HGL ELEVATION (m)	D/S HGL ELEVATION (m)	D/S HGL OVERRIDE	TOP OF GRATE ELEVATION (m)	SURFACE PONDING DEPTH (m)	NOTES
		CB-15	MH-14	MH-14	15.0	0.6	74.6	0.05	0.80	0.04	0.000	0.04	0.00	Single	In Sag	0.00	0.14	100	0.000	0.008	PVC	26.0	0.50	200	0	87.68	0.023	35.8%	0.68	Sub-Crit	0.13	0.00	0.00	87.93	87.80		88.77	-0.84	
		TD-23	MH-14	MH-14	15.0	0.2	74.6	0.03	0.90	0.03	0.000	0.03	0.00	Open	In Sag	0.00	0.90	100	0.000	0.006	PVC	7.4	0.50	200	90	87.63	0.023	24.1%	0.62	Sub-Crit	0.04	0.00	0.03	87.84	87.80		88.03	-0.19	
		MH-14	MH-13	MH-13	15.6	1.2	72.6	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.014	PVC	51.5	0.50	200	90	87.53	0.023	58.3%	0.77	Sub-Crit	0.26	0.04	0.04	87.80	87.54		89.22	-1.42	
		MH-13	TEE-12	TEE-12	16.8	0.2	68.9	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.013	PVC	12.0	0.50	450	0	87.21	0.202	6.4%	0.71	Sub-Crit	0.06	0.00	0.00	87.50	87.44		88.80	-1.30	
		CB-12A	TEE-12	TEE-12	15.0	0.2	74.6	0.09	0.90	0.08	0.000	0.08	0.00	Single	In Sag	0.00	0.15	100	0.000	0.017	PVC	11.7	1.00	200	90	87.27	0.033	51.2%	1.04	Spr-Crit	0.12	0.00	0.07	87.44	87.44		88.50	-1.06	
		CB-12B	TEE-12	TEE-12	15.0	0.2	74.6	0.05	0.90	0.05	0.000	0.05	0.00	Single	In Sag	0.00	0.15	100	0.000	0.009	PVC	8.8	0.50	200	90	87.20	0.023	40.2%	0.70	Sub-Crit	0.01	0.00	0.01	87.45	87.44		88.42	-0.97	
		TEE-12	TEE-11	TEE-11	17.0	0.4	68.3	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.037	PVC	29.5	0.50	450	0	87.15	0.202	18.2%	0.96	Spr-Crit	0.15	0.00	0.00	87.44	87.44		88.80	-1.36	
		CB-11A	TEE-11	TEE-11	15.0	0.3	74.6	0.07	0.90	0.06	0.000	0.06	0.00	Single	In Sag	0.00	0.15	100	0.000	0.013	PVC	11.7	0.50	200	90	87.06	0.023	56.3%	0.76	Sub-Crit	0.02	0.00	0.01	87.46	87.44		88.50	-1.04	
		CB-11B	TEE-11	TEE-11	15.0	0.2	74.6	0.05	0.90	0.05	0.000	0.05	0.00	Single	In Sag	0.00	0.14	100	0.000	0.009	PVC	8.8	0.50	200	90	87.05	0.023	40.2%	0.70	Sub-Crit	0.01	0.00	0.01	87.45	87.44		88.42	-0.97	
		TEE-11	TEE-10	TEE-10	17.4	0.4	67.2	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.056	PVC	29.1	0.50	450	0	87.00	0.202	27.9%	1.09	Spr-Crit	0.15	0.00	0.00	87.44	87.44		88.80	-1.36	
		CB-10A	TEE-10	TEE-10	15.0	0.1	74.6	0.08	0.90	0.07	0.000	0.07	0.00	Single	In Sag	0.00	0.11	100	0.000	0.015	PVC	11.7	2.00	200	90	87.09	0.046	32.2%	1.32	Spr-Crit	0.03	0.00	0.02	87.47	87.44		88.50	-1.03	
		CB-10B	TEE-10	TEE-10	15.0	0.1	74.6	0.06	0.90	0.05	0.000	0.05	0.00	Single	In Sag	0.00	0.19	100	0.000	0.011	PVC	8.8	2.00	200	90	87.04	0.046	24.1%	1.24	Spr-Crit	0.01	0.00	0.01	87.45	87.44		88.42	-0.97	
		TEE-10	MH-09	MH-09	17.8	0.2	66.2	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.079	PVC	14.6	0.50	450	0	86.85	0.202	39.0%	1.19	Sub-Crit	0.01	0.00	0.00	87.44	87.42		88.80	-1.36	
		MH-09	CBMH-08	CBMH-08	18.0	0.2	65.7	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.078	PVC	16.0	0.50	450	30	86.75	0.202	38.7%	1.19	Sub-Crit	0.01	0.10	0.00	87.42	87.41		88.80	-1.38	
		BLDG A	MH-24	MH-24	15.0	0.1	74.6	0.33	0.90	0.30	0.000	0.30	0.00	Open	In Sag	0.00	0.00	100	0.000	0.062	PVC	13.7	2.70	300	0	87.83	0.159	38.8%	2.11	Spr-Crit	0.37	0.01	0.01	88.02	87.65		89.08	-1.06	
		MH-24	CBMH-08	CBMH-08	15.1	0.2	74.2	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.061	PVC	28.0	2.70	300	0	87.44	0.159	38.6%	2.10	Spr-Crit	0.76	0.10	0.10	87.64	87.41		88.67	-1.03	
		CBMH-08	CBMH-07	CBMH-07	18.2	0.2	65.2	0.01	0.87	0.01	0.000	0.01	0.00	Single	In Sag	0.00	0.07	100	0.000	0.133	PVC	14.0	0.50	450	0	86.66	0.202	65.8%	1.35	Sub-Crit	0.03	0.00	0.00	87.30	87.28		88.72	-1.42	
		CBMH-07	CBMH-06	CBMH-06	18.4	0.2	64.7	0.02	0.87	0.02	0.000	0.02	0.00	Single	In Sag	0.00	0.07	100	0.000	0.135	PVC	14.0	0.50	450	0	86.58	0.202	66.9%	1.36	Sub-Crit	0.03	0.10	0.10	87.28	87.25		88.72	-1.44	
		CB-22	CBMH-21	CBMH-21	15.0	0.5	74.6	0.19	0.87	0.17	0.000	0.17	0.00	Single	In Sag	0.00	0.15	100	0.000	0.034	PVC	30.3	0.50	300	90	87.08	0.068	50.1%	0.97	Sub-Crit	0.04	0.06	0.02	87.48	87.44		88.50	-1.02	
		CBMH-21	CBMH-19	CBMH-19	15.5	0.6	72.9	0.15	0.87	0.13	0.000	0.13	0.00	Single	In Sag	0.00	0.15	100	0.000	0.060	PVC	37.6	0.50	375	0	86.87	0.124	48.3%	1.12	Sub-Crit	0.04	0.05	0.05	87.38	87.33		88.50	-1.12	
		CB-20	CBMH-19	CBMH-19	15.0	0.4	74.6	0.16	0.89	0.14	0.000	0.14	0.00	Single	In Sag	0.00	0.15	100	0.000	0.030	PVC	30.3	1.00	250	90	87.03	0.059	49.6%	1.21	Spr-Crit	0.07	0.05	0.20	87.41	87.33		88.50	-1.09	
		CBMH-19	CBMH-06	CBMH-06	16.1	0.3	71.0	0.14	0.89	0.12	0.000	0.12	0.00	Single	In Sag	0.00	0.15	100	0.000	0.111	PVC	23.6	0.50	450	90	86.66	0.202	55.1%	1.30	Sub-Crit	0.03	0.10	0.15	87.28	87.25		88.50	-1.22	
		CBMH-06	CBMH-05	CBMH-05	18.6	0.2	64.2	0.02	0.87	0.02	0.000	0.02	0.00	Single	In Sag	0.00	0.07	100	0.000	0.237	Concrete	14.0	0.50	600	0	86.49	0.434	54.7%	1.57	Sub-Crit	0.07	0.01	0.01	87.15	87.08		88.72	-1.57	
		BLDG-C	MH-25	MH-25	15.0	0.1	74.6	0.02	0.90	0.02	0.000	0.02	0.00	Open	In Sag	0.00	0.00	100	0.000	0.004	PVC	9.2	2.00	200	90	88.10	0.046	8.0%	0.91	Spr-Crit	0.18	0.06	0.06	88.15	87.05	87.05	89.17	-1.02	5-Year WS Elev in U/G Facility
		MH-25	CBMH-05	MH-25	15.1	0.5	74.2	0.00	0.90	0.00	0.000	0.00	0.00	None	On Grade	0.00	0.00	0	0.000	0.004	PVC	12.5	0.10	300	0	86.45	0.031	12.1%	0.31	Sub-Crit	0.00	0.01	0.00	87.05	87.05	87.05	88.92	-1.87	5-Year WS Elev in U/G Facility
		BLDG-B	CBMH-05	CBMH-05	15.0	0.1	74.6	0.17	0.90	0.15	0.000	0.15	0.00	Open	In Sag	0.00	0.00	100	0.000	0.032	PVC	5.5	2.00	250	90	86.73	0.084	37.7%	1.59	Spr-Crit	0.02	0.01	0.03	87.07	87.05	87.05	89.00	-1.93	5-Year WS Elev in U/G Facility
		CBMH-05	CBMH-04	CBMH-04	18.8	0.2	63.7	0.02	0.87	0.02	0.000	0.02	0.00	Single	In Sag	0.00	0.07	100	0.000	0.269	Concrete	14.0	0.50	600	0	86.40	0.434	61.9%	1.62	Sub-Crit	0.02	0.00	0.00	87.07	87.05	87.05	88.72	-1.65	5-Year WS Elev in U/G Facility
		CBMH-04	OGS-03	OGS-03	19.0	0.1	63.2	0.02	0.87	0.02	0.000	0.02	0.00	Single	In Sag	0.00	0.07	100	0.000	0.270	Concrete	13.5	0.50	600	0	86.31	0.434	62.2%	1.62	Sub-Crit	0.02	0.00	0.00	87.07	87.05	87.05	88.72	-1.65	5-Year WS Elev in U/G Facility
		CB-18	CB-17	CB-17	15.0	0.2	74.6	0.10	0.87	0.09	0.000	0.09	0.00	Single	In Sag	0.00	0.20	100	0.000	0.018	PVC	17.5	1.70	200	0	87.06	0.043	42.2%	1.30	Spr-Crit	0.30	0.00	0.00	87.17	87.11		88.50	-1.33	
		CB-17	MH-16	MH-16	15.2	0.1	73.9	0.11	0.87	0.10	0.000	0.10	0.00	Single	In Sag	0.00	0.20	100	0.000	0.038	PVC	13.4	1.70	250	0	86.74	0.078	48.4%	1.57	Spr-Crit	0.05	0.00	0.00	87.10	87.05	87.05	88.50	-1.40	5-Year WS Elev in U/G Facility
		MH-16	OGS-03	OGS-03	15.3	0.1	73.6	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.037	PVC	12.7	2.00	250	90	86.49	0.084	44.4%	1.66	Spr-Crit	0.05	0.00	0.04	87.10	87.05	87.05	88.84	-1.74	5-Year WS Elev in U/G Facility

Rain Station:	MTO IDF Lookup
Design Storm:	5 Year
Intensity-Duration-Frequency Parameters	a = 28.3
	b = -0.699
	c = 0.00
Minimum Time of Concentration:	15 min

Design Consideration:	Overland Flow Route

Project Information			
Project Name	Goldmanco-Cobourg	**Project No.**	10846
Project Location	545 King Street	**Designed by**	RC
Municipality	Cobourg	**Checked by**	CPB
Design Standards	Cobourg Design Guidelines (2005)	**Date**	October 24, 2019

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LOCATION					TIME OF CONCENTRATION (MIN)			CATCHMENT			STRUCTURE INLET PROPERTIES								PIPE PROPERTIES								FLOW REGIME				LOSSES			HGL					
								Multiplation Factor for 5 Year Storm: 1.00																															
STREET	CATCHMENT ID	FROM	TO	TO (OVERLAND FLOW ROUTE)	TO UPPER END	IN REACH	INTENSITY (mm/hr)	AREA (ha)	5 YR RUNOFF COEFFICIENT, C	AC (x FACTOR)	EXTRANEOUS **SURFACE** FLOWS (m^3/s)	CUMULATIVE AC TO STRUCTURE	CUMULATIVE EXTRANEOUS FLOWS TO STRUCTURE (m^3/s)	CATCH BASIN GRATE TYPE	CATCHBASIN ON GRADE OR IN SAG	GRADE OF ROAD (%)	MAX PONDING DEPTH (m)	% FLOW CAPTURED	EXTRANEOUS **SEWER** FLOWS (m^3/s)	PIPE FLOW (m^3/s)	PIPE MATERIAL	LENGTH (m)	GRADE (%)	PIPE DIA. (mm)	BEND AT D/S STRUCTURE (0-90°)	UPSTREAM INVERT (m)	CAPACITY (m^3/s)	% FULL	PARTIAL FLOW VELOCITY (m/s)	FLOW REGIME	FRICTION LOSS (m)	STRUCTURE LOSSES (m)	CONFLUENCE LOSSES (m)	U/S HGL ELEVATION (m)	D/S HGL ELEVATION (m)	D/S HGL OVERRIDE	TOP OF GRATE ELEVATION (m)	SURFACE PONDING DEPTH (m)	NOTES
		OGS-03	CBMH-02-IN	CBMH-02-IN	19.1	0.1	63.0	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.301	Concrete	11.9	0.50	600	0	86.16	0.434	69.3%	1.66	Sub-Crit	0.02	0.00	0.00	87.07	87.05	87.05	88.59	-1.52	75 mm Orifice
		CBMH-02-OUT	MH-02	MH-02	15.0	0.3	74.6	0.02	0.87	0.02	0.000	0.02	0.00	Single	On Grade	4.10	0.00	100	0.081	0.085	PVC	17.6	0.50	300	0	86.08	0.068	123.7%	0.97	Sub-Crit	0.13	0.00	0.00	86.43	86.29		88.10	-1.67	

Input Column

Formulated Column

U/S End of Pipe Run

D/S End of Pipe Run

Exceeds Allowable Surface Ponding Depth

Data from Another Analysis

Manning's n Values

HDPE	0.010
PVC	0.013
Concrete	0.013
Clay	0.014
Brick	0.015

STORM SEWER HYDRAULIC GRADE LINE DESIGN SHEET

Rain Station:	MTO IDF Lookup
Design Storm:	100 Year
Intensity-Duration-Frequency Parameters	a = 46.9
	b = -0.699
	c = 0.00
Minimum Time of Concentration:	15 min

Design Consideration: Overland Flow Route

Project Information			
Project Name	Goldmanco-Cobourg	**Project No.**	10846
Project Location	545 King Street	**Designed by**	RC
Municipality	Cobourg	**Checked by**	CPB
Design Standards	Cobourg Design Guidelines (2005)	**Date**	October 24, 2019

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LOCATION					TIME OF CONCENTRATION (MIN)			CATCHMENT			STRUCTURE INLET PROPERTIES							PIPE PROPERTIES								FLOW REGIME				LOSSES			HGL					
								Multiplation Factor for 100 Year Storm: 1.25																														
STREET	CATCHMENT ID	FROM	TO	TO (OVERLAND FLOW ROUTE)	TO UPPER END	IN REACH	INTENSITY (mm/hr)	AREA (ha)	5 YR RUNOFF COEFFICIENT, C	AC (x FACTOR)	EXTRANEOUS **SURFACE** FLOWS (m^3/s)	CUMULATIVE AC TO STRUCTURE	CUMULATIVE EXTRANEOUS FLOWS TO STRUCTURE (m^3/s)	CATCH BASIN GRATE TYPE	CATCHBASIN ON GRADE OR IN SAG	GRADE OF ROAD (%)	MAX PONDING DEPTH (m)	% FLOW CAPTURED	EXTRANEOUS **SEWER** FLOWS (m^3/s)	PIPE FLOW (m^3/s)	PIPE MATERIAL	LENGTH (m)	GRADE (%)	PIPE DIA. (mm)	BEND AT D/S STRUCTURE (0-90°)	UPSTREAM INVERT (m)	CAPACITY (m^3/s)	% FULL	PARTIAL FLOW VELOCITY (m/s)	FLOW REGIME	FRICTION LOSS (m)	STRUCTURE LOSSES (m)	CONFLUENCE LOSSES (m)	U/S HGL ELEVATION (m)	D/S HGL ELEVATION (m)	D/S HGL OVERRIDE	TOP OF GRATE ELEVATION (m)	SURFACE PONDING DEPTH (m)	NOTES
		CB-15	MH-14	MH-14	15.0	0.6	123.6	0.05	0.80	0.05	0.000	0.05	0.00	Single	In Sag	0.00	0.14	100	0.000	0.016	PVC	26.0	0.50	200	0	87.68	0.023	70.4%	0.80	Sub-Crit	0.05	0.00	0.00	88.85	88.79		88.77	0.08	
		TD-23	MH-14	MH-14	15.0	0.2	123.6	0.03	0.90	0.03	0.000	0.03	0.00	Open	In Sag	0.00	0.90	100	0.000	0.010	PVC	7.4	0.50	200	90	87.63	0.023	42.2%	0.71	Sub-Crit	0.01	0.00	0.01	88.80	88.79		88.03	0.77	
		MH-14	MH-13	MH-13	15.6	1.2	120.3	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.025	PVC	51.5	0.50	200	90	87.53	0.023	109.6%	0.74	Sub-Crit	0.31	0.04	0.04	88.79	88.48		89.22	-0.43	
		MH-13	TEE-12	TEE-12	16.8	0.2	114.2	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.024	PVC	12.0	0.50	450	0	87.21	0.202	12.0%	0.86	Spr-Crit	0.00	0.00	0.00	88.44	88.44		88.80	-0.36	
		CB-12A	TEE-12	TEE-12	15.0	0.2	123.6	0.09	0.90	0.09	0.000	0.09	0.00	Single	In Sag	0.00	0.15	100	0.000	0.029	PVC	11.7	1.00	200	90	87.27	0.033	89.6%	1.05	Sub-Crit	0.09	0.00	0.06	88.53	88.44		88.50	0.03	
		CB-12B	TEE-12	TEE-12	15.0	0.2	123.6	0.05	0.90	0.05	0.000	0.05	0.00	Single	In Sag	0.00	0.15	100	0.000	0.016	PVC	8.8	0.50	200	90	87.20	0.023	70.4%	0.80	Sub-Crit	0.02	0.00	0.02	88.45	88.44		88.42	0.03	
		TEE-12	TEE-11	TEE-11	17.0	0.4	113.2	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.066	PVC	29.5	0.50	450	0	87.15	0.202	32.6%	1.14	Spr-Crit	0.02	0.00	0.00	88.44	88.42		88.80	-0.36	
		CB-11A	TEE-11	TEE-11	15.0	0.3	123.6	0.07	0.90	0.07	0.000	0.07	0.00	Single	In Sag	0.00	0.15	100	0.000	0.023	PVC	11.7	0.50	200	90	87.06	0.023	98.5%	0.74	Sub-Crit	0.06	0.00	0.04	88.47	88.42		88.50	-0.03	
		CB-11B	TEE-11	TEE-11	15.0	0.2	123.6	0.05	0.90	0.05	0.000	0.05	0.00	Single	In Sag	0.00	0.14	100	0.000	0.016	PVC	8.8	0.50	200	90	87.05	0.023	70.4%	0.80	Sub-Crit	0.02	0.00	0.02	88.43	88.42		88.42	0.01	
		TEE-11	TEE-10	TEE-10	17.4	0.4	111.4	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.100	PVC	29.1	0.50	450	0	87.00	0.202	49.6%	1.27	Sub-Crit	0.04	0.00	0.00	88.42	88.38		88.80	-0.38	
		CB-10A	TEE-10	TEE-10	15.0	0.1	123.6	0.08	0.90	0.08	0.000	0.08	0.00	Single	In Sag	0.00	0.11	100	0.000	0.026	PVC	11.7	2.00	200	90	87.09	0.046	56.3%	1.52	Spr-Crit	0.07	0.00	0.05	88.45	88.38		88.50	-0.05	
		CB-10B	TEE-10	TEE-10	15.0	0.1	123.6	0.06	0.90	0.06	0.000	0.06	0.00	Single	In Sag	0.00	0.19	100	0.000	0.020	PVC	8.8	2.00	200	90	87.04	0.046	42.2%	1.42	Spr-Crit	0.03	0.00	0.03	88.41	88.38		88.42	-0.01	
		TEE-10	MH-09	MH-09	17.8	0.2	109.7	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.139	PVC	14.6	0.50	450	0	86.85	0.202	69.0%	1.37	Sub-Crit	0.03	0.00	0.00	88.38	88.35		88.80	-0.42	
		MH-09	CBMH-08	CBMH-08	18.0	0.2	108.8	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.138	PVC	16.0	0.50	450	30	86.75	0.202	68.4%	1.36	Sub-Crit	0.03	0.01	0.01	88.35	88.31		88.80	-0.45	
		BLDG A	MH-24	MH-24	15.0	0.1	123.6	0.33	0.90	0.31	0.000	0.31	0.00	Open	In Sag	0.00	0.00	100	0.000	0.108	PVC	13.7	2.70	300	0	87.83	0.159	67.8%	2.42	Spr-Crit	0.15	0.01	0.01	88.77	88.62		89.08	-0.31	
		MH-24	CBMH-08	CBMH-08	15.1	0.2	123.0	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.107	PVC	28.0	2.70	300	0	87.44	0.159	67.5%	2.41	Spr-Crit	0.30	0.01	0.01	88.61	88.31		88.67	-0.06	
		CBMH-08	CBMH-07	CBMH-07	18.2	0.2	108.0	0.01	0.87	0.01	0.000	0.01	0.00	Single	In Sag	0.00	0.07	100	0.000	0.234	PVC	14.0	0.50	450	0	86.66	0.202	116.0%	1.27	Sub-Crit	0.09	0.01	0.01	88.31	88.21		88.72	-0.41	
		CBMH-07	CBMH-06	CBMH-06	18.4	0.2	107.2	0.02	0.87	0.02	0.000	0.02	0.00	Single	In Sag	0.00	0.07	100	0.000	0.238	PVC	14.0	0.50	450	0	86.58	0.202	117.9%	1.27	Sub-Crit	0.10	0.01	0.01	88.21	88.11		88.72	-0.51	
		CB-22	CBMH-21	CBMH-21	15.0	0.5	123.6	0.19	0.87	0.18	0.000	0.18	0.00	Single	In Sag	0.00	0.15	100	0.000	0.062	PVC	30.3	0.50	300	90	87.08	0.068	90.7%	0.97	Sub-Crit	0.12	0.05	0.05	88.55	88.42		88.50	0.05	
		CBMH-21	CBMH-19	CBMH-19	15.5	0.6	120.8	0.15	0.87	0.14	0.000	0.14	0.00	Single	In Sag	0.00	0.15	100	0.000	0.108	PVC	37.6	0.50	375	0	86.87	0.124	87.5%	1.12	Sub-Crit	0.14	0.00	0.00	88.37	88.23		88.50	-0.13	
		CB-20	CBMH-19	CBMH-19	15.0	0.4	123.6	0.16	0.89	0.15	0.000	0.15	0.00	Single	In Sag	0.00	0.15	100	0.000	0.052	PVC	30.3	1.00	250	90	87.03	0.059	87.8%	1.21	Sub-Crit	0.23	0.00	0.20	88.46	88.23		88.50	-0.04	
		CBMH-19	CBMH-06	CBMH-06	16.1	0.3	117.6	0.14	0.89	0.13	0.000	0.13	0.00	Single	In Sag	0.00	0.15	100	0.000	0.199	PVC	23.6	0.50	450	90	86.66	0.202	98.6%	1.27	Sub-Crit	0.11	0.01	0.15	88.23	88.11		88.50	-0.27	
		CBMH-06	CBMH-05	CBMH-05	18.6	0.2	106.3	0.02	0.87	0.02	0.000	0.02	0.00	Single	In Sag	0.00	0.07	100	0.000	0.421	Concrete	14.0	0.50	600	0	86.49	0.434	97.0%	1.54	Sub-Crit	0.07	0.01	0.01	88.11	88.04		88.72	-0.61	
		BLDG-C	MH-25	MH-25	15.0	0.1	123.6	0.02	0.90	0.02	0.000	0.02	0.00	Open	In Sag	0.00	0.00	100	0.000	0.007	PVC	9.2	2.00	200	90	88.10	0.046	14.1%	1.08	Spr-Crit	0.18	0.08	0.08	88.17	87.95	87.95	89.17	-1.00	100-Year WS Elev in U/G Facility
		MH-25	CBMH-05	MH-25	15.1	0.5	123.0	0.00	0.90	0.00	0.000	0.00	0.00	None	On Grade	0.00	0.00	0	0.000	0.006	PVC	12.5	0.10	300	0	86.45	0.031	21.3%	0.35	Sub-Crit	0.00	0.01	0.00	87.95	87.95	87.95	88.92	-0.97	100-Year WS Elev in U/G Facility
		BLDG-B	CBMH-05	CBMH-05	15.0	0.1	123.6	0.17	0.90	0.16	0.000	0.16	0.00	Open	In Sag	0.00	0.00	100	0.000	0.055	PVC	5.5	2.00	250	90	86.73	0.084	66.0%	1.83	Spr-Crit	0.04	0.01	0.09	87.99	87.95	87.95	89.00	-1.01	100-Year WS Elev in U/G Facility
		CBMH-05	CBMH-04	CBMH-04	18.8	0.2	105.6	0.02	0.87	0.02	0.000	0.02	0.00	Single	In Sag	0.00	0.07	100	0.000	0.477	Concrete	14.0	0.50	600	0	86.40	0.434	109.8%	1.54	Sub-Crit	0.08	0.01	0.01	88.03	87.95	87.95	88.72	-0.69	100-Year WS Elev in U/G Facility
		CBMH-04	OGS-03	OGS-03	19.0	0.1	104.8	0.02	0.87	0.02	0.000	0.02	0.00	Single	In Sag	0.00	0.07	100	0.000	0.479	Concrete	13.5	0.50	600	0	86.31	0.434	110.3%	1.54	Sub-Crit	0.08	0.01	0.01	88.03	87.95	87.95	88.72	-0.69	100-Year WS Elev in U/G Facility
		CB-18	CB-17	CB-17	15.0	0.2	123.6	0.10	0.87	0.10	0.000	0.10	0.00	Single	In Sag	0.00	0.20	100	0.000	0.033	PVC	17.5	1.70	200	0	87.06	0.043	76.3%	1.50	Spr-Crit	0.14	0.00	0.00	88.27	88.13		88.50	-0.23	
		CB-17	MH-16	MH-16	15.2	0.1	122.5	0.11	0.87	0.10	0.000	0.10	0.00	Single	In Sag	0.00	0.20	100	0.000	0.068	PVC	13.4	1.70	250	0	86.74	0.078	87.6%	1.58	Sub-Crit	0.17	0.00	0.00	88.12	87.95	87.95	88.50	-0.38	100-Year WS Elev in U/G Facility
		MH-16	OGS-03	OGS-03	15.3	0.1	121.9	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.068	PVC	12.7	2.00	250	90	86.49	0.084	80.4%	1.90	Spr-Crit	0.13	0.01	0.13	88.08	87.95	87.95	88.84	-0.76	100-Year WS Elev in U/G Facility

Rain Station:	MTO IDF Lookup
Design Storm:	100 Year
Intensity-Duration-Frequency Parameters	a = 46.9
	b = -0.699
	c = 0.00
Minimum Time of Concentration:	15 min

Design Consideration:	Overland Flow Route

Project Information			
Project Name	Goldmanco-Cobourg	**Project No.**	10846
Project Location	545 King Street	**Designed by**	RC
Municipality	Cobourg	**Checked by**	CPB
Design Standards	Cobourg Design Guidelines (2005)	**Date**	October 24, 2019

D.M. Wills Associates Ltd.
150 Jameson Drive
Peterborough, ON · K9J 0B9
Tel: (705) 742-2297 ext. 250
Fax: (705) 741-3568

LOCATION					TIME OF CONCENTRATION (MIN)			CATCHMENT			STRUCTURE INLET PROPERTIES								PIPE PROPERTIES								FLOW REGIME				LOSSES			HGL					
								Multiplation Factor for 100 Year Storm: 1.25																															
STREET	CATCHMENT ID	FROM	TO	TO (OVERLAND FLOW ROUTE)	TO UPPER END	IN REACH	INTENSITY (mm/hr)	AREA (ha)	5 YR RUNOFF COEFFICIENT, C	AC (x FACTOR)	EXTRANEOUS **SURFACE** FLOWS (m^3/s)	CUMULATIVE AC TO STRUCTURE	CUMULATIVE EXTRANEOUS FLOWS TO STRUCTURE (m^3/s)	CATCH BASIN GRATE TYPE	CATCHBASIN ON GRADE OR IN SAG	GRADE OF ROAD (%)	MAX PONDING DEPTH (m)	% FLOW CAPTURED	EXTRANEOUS **SEWER** FLOWS (m^3/s)	PIPE FLOW (m^3/s)	PIPE MATERIAL	LENGTH (m)	GRADE (%)	PIPE DIA. (mm)	BEND AT D/S STRUCTURE (0-90°)	UPSTREAM INVERT (m)	CAPACITY (m^3/s)	% FULL	PARTIAL FLOW VELOCITY (m/s)	FLOW REGIME	FRICTION LOSS (m)	STRUCTURE LOSSES (m)	CONFLUENCE LOSSES (m)	U/S HGL ELEVATION (m)	D/S HGL ELEVATION (m)	D/S HGL OVERRIDE	TOP OF GRATE ELEVATION (m)	SURFACE PONDING DEPTH (m)	NOTES
		OGS-03	CBMH-02-IN	CBMH-02-IN	19.1	0.1	104.4	0.00	0.90	0.00	0.000	0.00	0.00	None	In Sag	0.00	0.00	0	0.000	0.535	Concrete	11.9	0.50	600	0	86.16	0.434	123.2%	1.54	Sub-Crit	0.09	0.01	0.01	88.04	87.95	87.95	88.59	-0.55	75 mm Orifice
		CBMH-02-OUT	MH-02	MH-02	15.0	0.3	123.6	0.02	0.87	0.02	0.000	0.02	0.00	Single	On Grade	4.10	0.00	100	0.081	0.088	PVC	17.6	0.50	300	0	86.08	0.068	128.0%	0.97	Sub-Crit	0.14	0.00	0.00	86.44	86.29		88.10	-1.66	

Input Column
Formulated Column
U/S End of Pipe Run
D/S End of Pipe Run
Exceeds Allowable Surface Ponding Depth
Data from Another Analysis

Manning's n Values

HDPE	0.010
PVC	0.013
Concrete	0.013
Clay	0.014
Brick	0.015

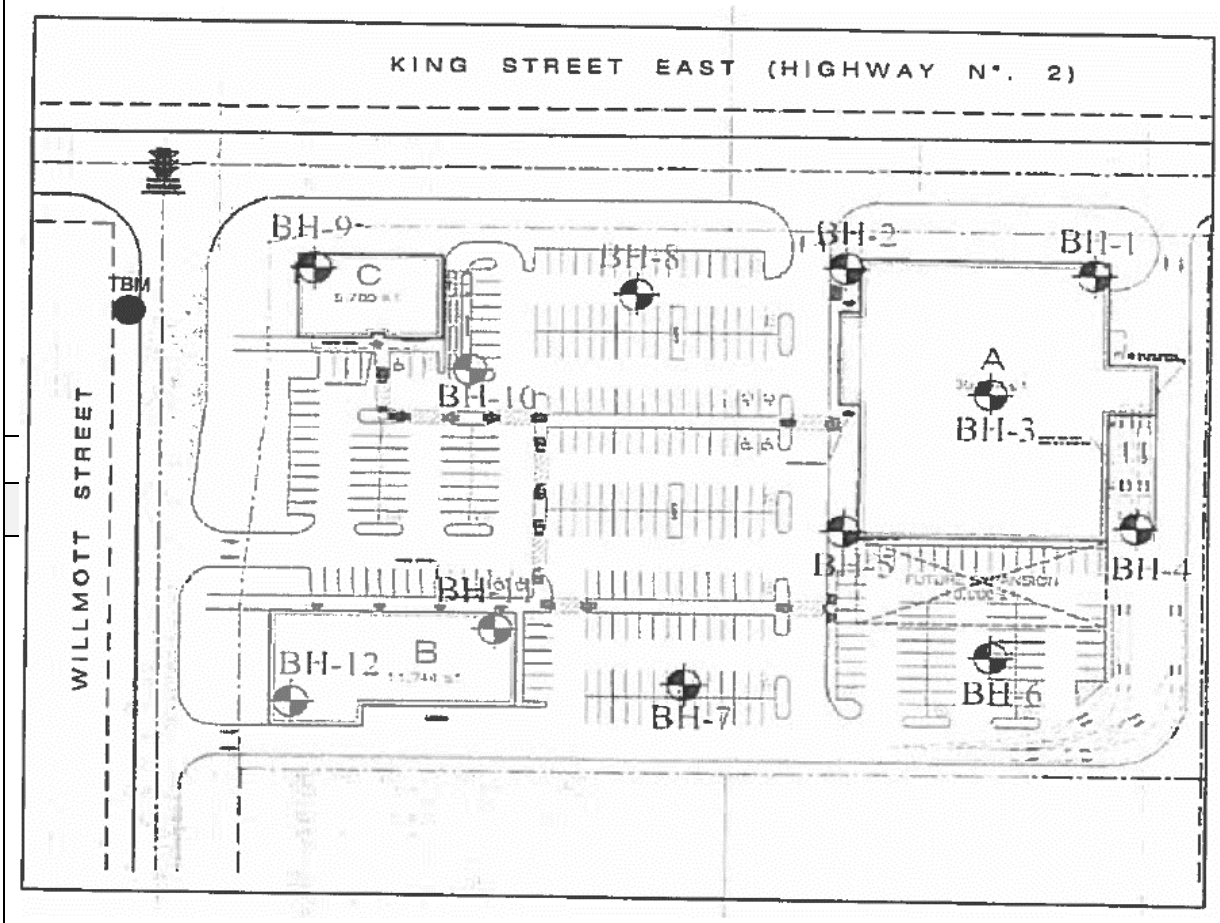
Appendix F

Soils Investigation Summary Report

Borehole Analysis

Project No: 10864
Project Name: Goldmanco
Designed/Checked By: CS / CPB
Date: November 7 2018

			Actual Elevation (m)		
Borehole ID	Ground Water Elevation (mbeg)	Termination (mbeg)	Ground	Termination	Groundwater
BH-1		5.03	100.53	95.50	
BH-2	2.1	5.03	100.28	95.25	98.18
BH-3	0.6	5.03	100.35	95.32	99.75
BH-4	0.9	5.03	100.13	95.10	99.23
BH-5		4.72	99.97	95.25	
BH-6		1.98	99.75	97.77	
BH-7		1.98	100.54	98.56	
BH-8	1.5	1.98	100.22	98.24	98.72
BH-9	2.6	5.04	100.23	95.19	97.63
BH-10		1.98	100.22	98.24	
BH-11		5.03	99.54	94.51	
BH-12		4.62	99.61	94.99	



TL TorontoInspection LTD.
GEO-ENVIRONMENTAL CONSULTANTS

REPORT ON
GEOTECHNICAL INVESTIGATION
KING STREET EAST AND WILLMOTT STREET
COBOURG, ONTARIO

REPORT NO.: 1879-07-G-PE-A
REPORT DATE: FEBRUARY 07, 2007

PREPARED FOR

PINCHIN ENVIRONMENTAL LTD
2470 MILLTOWER COURT
MISSISSAUGA, ONTARIO
L5N 7W5

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Toronto Inspection Ltd.

TABLE OF CONTENTS

DRAWINGS

APPENDICES

INTRODUCTION

Toronto Inspection Ltd. (TIL) was retained by Pinchin Environmental to carry out a Site Investigation of a property located at Highway No.2 and Willmott Street in Cobourg, Ontario (hereinafter referred as "the Site"). The purpose of the investigation was to delineate the subsoil and groundwater conditions from boreholes, for the design and construction of the proposed retail buildings at the site. Geotechnical data was to be provided for:

- General founding conditions
- Foundation design bearing pressures
- Construction recommendations
- Excavation recommendations

This report is provided on the basis of the above terms of reference and on an assumption that the design of the structures will be in accordance with the applicable guidelines, building codes and standards. If there are any changes in the design features relevant to the geotechnical analyses, our office should be consulted to review the design and to confirm the recommendations and comments provided in the report.

SITE CONDITION

The Site is located at the southeast intersection of Highway No.2 (King Street East) and Willmott Street in Cobourg, Ontario. At the time of investigation, the site was a vacant field, generally snow covered, with scattered trees and bushes. At the east portion of the site, a metal shed, appeared to be vacant, was present. The topography of the site was almost flat, having a grade difference within 1m between the boreholes.

3.0 INVESTIGATION PROCEDURE

The field work for the investigation, carried out on January 29, 2007, consisted of drilling twelve sampled boreholes (BH-1 to BH-12), at locations shown on Drawing No. 1. Eight of the boreholes, located in the proposed building areas, extended to depths of 4.6m to 5.0m from the existing ground level. The remaining boreholes, in the area of the proposed parking lot, were terminated at depths of 2.0m from grade.

The boreholes were advanced using a track mounted drill rig, equipped with continuous flight solid stem augers and sampling rods, supplied by a specialist drilling contractor. Soil samples were retrieved from the boreholes at regular intervals, using a split spoon sampler in conjunction with Standard Penetration Tests using a driving energy of 475 joules (350 ft-lbs). The soil samples were identified and logged in the field and were carefully bagged for later visual identification. Groundwater observations were made in the boreholes during and upon the completion of drilling.

The borehole locations, established in the field by our field personnel, are shown on the appended Borehole Location Plan (Drawing No.1). The ground elevations of boreholes were established in the field using "Top of Fire Hydrant", located on the west side of Willmott Street, near the northwest corner of the site, as a temporary benchmark (TBM).

The assumed elevation of 100.00m for the TBM does not represent the geodetic elevation.

4.0 SUMMARISED SUBSURFACE CONDITIONS

Reference is made to the appended Borehole Location Plan (Drawing No. 1) and Logs of Borehole sheets (Drawing Nos. 2 to 13) for details of field work, including soil classification, inferred stratigraphy and groundwater observations carried out during and on completion of drilling of the boreholes.

The simplified soil profile, at the borehole locations, below the surficial topsoil or fill at the ground surface, consisted of sand, clayey silt, sandy silt, clayey silt till or sandy silt till deposits. Brief descriptions of the subsoils, encountered at the borehole locations, were as follows:

4.1 Topsoil / Fill

Topsoil, 150mm to 450mm in thickness, was contacted at the surface of the boreholes.

A layer of fill was contacted below the topsoil, at the locations of BH-10 and BH-12. The fill, consisting of clayey silt with topsoil, sand and gravel, extended to depths of 0.6m to 0.8m from grade.

4.2 Sand

A sand deposit was contacted at the locations of the boreholes, except BH-11, below the topsoil or fill at depths of 0.2m to 0.8m from grade. The deposit was fine or fine to medium grained. At BH-8 location, a thin layer of organic peat was contacted within the sand at a depth of 1.5m from grade. Based on the Standard Penetration N-value of 5 to 26 blows per 0.3m penetration, the deposit was compact with isolated loose spots below the fill or topsoil at the upper level.

Boreholes BH-6, BH-7 and BH-8 were terminated in the sand deposit at a depth of 2.0m from grade. At the remaining borehole locations (except BH-11), the sand deposit extended to depths of 1.4m to 2.1m from grade.

The in-situ moisture contents of a soil sample, retrieved from this deposit, varied from 12% to more than 20%, indicating damp to wet conditions.

4.3 Clayey Silt

Underlying the topsoil at the location of BH-11 and below the sand deposit at the remaining borehole locations (except BH-6, BH-7 & BH-8), a clayey silt deposit was contacted. The deposit consisted of a mixture of silt and clay of low plasticity, and contained seams of silty sand. At the location of BH-3 and BH-5, thin layers of organic peat were contacted within the deposit at a depth of 1.8m from grade. Based on the Standard Penetration N-values of 3 to 27 blows per 0.3m penetration, the consistency of the deposit was firm to very stiff, with a soft zone in the vicinity of the peat layers.

Borehole BH-10 was terminated in the clayey silt deposit at a depth of 2.0m from grade. At the location of the remaining boreholes, the clayey silt extended to depths of 3.1m to 4.3m from grade.

The in-situ moisture contents of the soil samples, retrieved from this deposit, varied from 18% to 40%, indicating moist to wet conditions. The relatively high moisture content of 78% at BH-5 location might represent the moisture content in the organic peat layer.

4.4 Sandy Silt

A sandy silt deposit was contacted at the location of BH-1, below the clayey silt, at a depth of 4.0m from grade. The deposit was fine grained, with trace of clay and pockets of coarse sand and gravel. This borehole was terminated in the sandy silt deposit at a depth of 5.0m and the lower limit of the deposit was not established.

Based on the Standard Penetration N-value of 8 blows per 0.3m penetration, the relative density of the deposit was loose. The in-situ moisture content of a soil sample, retrieved from this deposit, was 10%, indicating wet conditions.

4.5 Clayey Silt Till

At the location of BH-2, BH-3 and BH-4, a clayey silt till deposit was contacted below the clayey silt at depths of 4.0m to 4.1m from grade. The deposit consisted of a heterogenous mixture of clay and silt, with some sand and gravel. Based on the Standard Penetration N-value of 8 to 30 blows per 0.3m penetration, the consistency of the deposit was stiff to hard. The in-situ moisture contents of the soil samples, retrieved from this deposit, varied from 8% to 17 %, indicating moist to damp conditions.

Boreholes BH-2, BH-3 and BH-4 were terminated in the clayey silt till deposit at depths of 5.0m from grade. The lower limit of the till deposit was not established.

4.6 Sandy Silt Till

At the location of Boreholes BH-5, BH-9, BH-11 and BH-12, a sandy silt till deposit was contacted below the clayey silt at depths of 3.1m to 4.3m from the existing ground level. The deposit consisted of a heterogeneous mixture of sand and silt with gravel and occasional cobbles and boulders. Based on the Standard Penetration N-values of 62 to more than 100 blows per 0.3m penetration, the relative density of the deposit was very dense.

The boreholes were terminated in the till deposit at depths of 4.6m to 5.0m from grade . The in-situ moisture content of the soil samples, retrieved from this deposit, ranged from 5% to 6%, indicating moist conditions.

4.7 Groundwater

Upon the completion of drilling, free water was recorded in the open boreholes BH-2, BH-3, BH-4, BH-8 and BH-9 at depths of between 0.6m to 2.1m from grade. In addition, cave-in of borehole, probably due to the groundwater seepage in the saturated non-plastic strata, was recorded at a depth of 1.8m from grade at BH-1 location. No free water was recorded at the remaining borehole locations throughout the investigation process.

Based on the moisture content profile of the retrieved soil samples and the field documentation of groundwater, it is our opinion that the free water in the open boreholes probably represents perched water conditions in the wet sand layer and/or lenses within the clayey silt, above the almost impermeable clayey silt and till deposits. The free water level may be subject to seasonal fluctuation.

5.0 RECOMMENDATIONS

We understand that the site will be developed for three commercial retails (Buildings A, B and C) with paved parking lot and driveways as shown in Drawing No.1. Details of the building loads and the final site grading, however, were not known at the time of preparation of this report.

The existing ground level is very close to the street level and we have assumed that there will be no extensive filling/uplifting of the site. Based on the subsoils encountered at the borehole locations, our recommendations for the proposed development are provided.

5.1 Site Preparation

During the site preparation, the contractor must allow for the removal of topsoil, deleterious fill and material with high moisture and/or organic content prior to site grading in the areas of development. The soil description and depths of fill/topsoil, shown on the Borehole Logs, are specific depths at the borehole locations only. Since the depth of fill, organic peat layers and topsoil can vary considerably at the site, the contractor bidding for the project must determine the depths and the profile of the fill material by test pits to accurately define the volume of fill to be removed for construction.

Any compressible fill material, with relatively high organic content, will not be suitable for reuse in areas where future settlement cannot be tolerated. This material will have to be disposed off-site or reused in landscaped areas, subject to approval by the landscape architect.

Any new fill to be used for backfilling or uplifting the site should consist of organic free material, placed in lifts of 200mm and compacted to at least 98% of its Standard Proctor maximum dry density. Any saturated on-site material to be reused for backfilling should be allowed to dry to its optimum moisture content prior to placement and compaction.

5.2 Foundation Design

The foundations for Retail Buildings B & C can be constructed on conventional spread/strip footings, founded in the native sand or clayey silt deposits at depths of 1.0m to 1.2m from the existing ground level. Footings, founded in the undisturbed native deposits, should be designed for an allowable bearing pressure of 150 kPa.

In the area of Building A, the presence of an organic peat layer, at depths of 1.5m to 1.8m at the location of BH-3, BH-5 and BH-8, may generate methane and endanger the occupants. We recommend that the organic peat layers and any other less competent soils, within the proposed building pad of Retail A, should be removed and replaced with an engineered fill. The aerial extent of the peat layers should be further investigated by test pits and/or additional boreholes.

The engineered fill should consist of organic free material and compacted to 100% of its Standard Proctor maximum dry density. "Guidelines for Engineered Fill" is attached in Appendix A. Footings, founded in the undisturbed native deposit or in engineered fill should be designed for an allowable bearing pressure of 150 kPa.

The final site grading and foundation plans should be reviewed by this office to confirm the recommended design bearing pressures for the proposed footings.

Due to the possible saturated subsoil conditions at the footing level, the footings should be excavated, cleaned out and poured without delay to prevent softening of the founding soil due to the ingress of water from the excavation. If the footings are to be left open for some time for forming and placement of reinforcement, a skim

coat of lean mix concrete, 100mm to 150mm in thickness, should be placed on the bearing surface immediately after the base is inspected and approved by the soils engineer. Temporary dewatering of the site using sump pumps will be required at footing locations where excessive seepage water is encountered.

The total and differential settlement of foundations, designed and constructed using the above recommended bearing pressures, should not exceed 25 and 20mm respectively.

The estimated frost penetration depth in the area, based on the subsoil conditions, is 1.2m. All the perimeter footings should be placed below a frost penetration depth of 1.2m below the proposed outside grades.

It should be noted that the above recommendations for the foundations have been analysed by ***Toronto Inspection Ltd.*** from the subsoil information obtained at the borehole locations. The interpretation between the boreholes and the recommendations of this report must therefore be checked through field inspection provided by ***Toronto Inspection Ltd.*** to validate the information for use during the construction stage.

5.3 Floor Slab Construction

We understand that the site will be rough graded with the placement of compacted fill. The building floor can be designed and constructed as conventional slab-on-grade, subject to the site being prepared as recommended in Sections 5.1 and 5.2.

After fine grading, the subgrade should be proof-rolled, under the supervision of a soils engineer from ***Toronto Inspection Ltd.***, prior to placement of the granular base. Any compressible, loose, or weak spots, identified in the subgrade during proof-rolling, should be subexcavated to the competent soil strata. Fill to the subgrade, above the footing elevations, should consist of organic free soils, approved by the geotechnical engineer, and compacted in lifts not exceeding 200mm to a minimum of 98% of their Standard Proctor maximum dry density (SPMDD).

A granular base course, consisting of at least 150 mm of OPSS Granular A, or equivalent, compacted to 98% SPMDD, should be provided below the concrete floor as a moisture barrier.

5.4 Earthquake Consideration

The Ontario Building Code requires that all buildings be designed to resist a minimum earthquake force V, as given in the following expression:

$$V = v.S.I.F.W$$

In accordance with the Ontario Building Code, the zonal velocity factor, v, for the site is 0.05 (Table 2.5.1A) and the Foundation Factor, F, for the subsoil conditions is 1.0 (Table 4.1.9C). These values should be reviewed by the Structural Engineer.

5.5 Excavation and Backfilling

Excavations should comply with the Ontario Occupational Health and Safety Act. All excavation in soils deeper than 1.2 m, should be sloped back to a safe angle of less than 45°. A slope of 3 horizontal to 1 vertical or flatter would be required in excavation of the soft or saturated soils.

Major groundwater problem is not anticipated for excavations on site. Seepage of water from saturated sand layers or lenses may be encountered from the subsoil. It is our opinion that the amount of water will not be great and can be handled by installing filtered sumps and any accumulated water can be removed by pumping.

The on-site excavated soils may contain organic peat which should be stockpiled separately on site. Organic free material can be reused for backfilling trenches and site grading if the material is maintained on the dry side of the optimum moisture content prior to placement and compaction. Organic containing material and soft/wet clay material should be stockpiled separately for disposal off-site or re-use in landscaped areas or in areas where the degree of compaction and the ultimate settlement will be of little consequence.

Bedding for the underground services, including catch basins and manholes, within the silt or clay deposits, should consist of OPSS Granular A, 20mm crusher run limestone, or equivalent. If the subsoil at the bottom of trench excavation consists of saturated sand, the bedding in the service trenches may consist of 20mm clear limestone. However, a geotextile filter fabric will have to be used to separate the

clear stone bedding from the base and the sides of the excavation. The geotextile filter fabric must surround the clear stone bedding completely.

Backfill around catch basins, manholes, and narrow trenches should consist of imported granular material. The backfill should be compacted using a smaller vibratory equipment. Catch basins should be perforated just above the drain level and the holes should be screened with a filter fabric. This will help in draining the pavement structure as well as alleviate the problem of differential movement of catch basins or manholes due to frost action.

5.6 Pavement Design and Construction

The subgrade soils of the proposed driveways and parking lot is anticipated to consist of silt and clay mixture. These materials with the current moisture content, of more than 20%, are highly frost susceptible. For long term satisfactory performance of the driveway, access routes and the parking lot, the following minimum pavement thicknesses are recommended:

	Light Duty Parking	**Heavy Duty Driveways**
Topping, Asphaltic Concrete HL-3	30mm	40mm
Base course, Asphaltic Concrete HL-8	50mm	50mm
Base, OPSS Granular A or equivalent	150mm	150mm
Sub-base, OPSS Granular B or equivalent	200mm	300mm

In addition, the following items should be taken into consideration for the design and construction of the driveways and parking lot:

- The pavement design, with the above recommended minimum thicknesses, is based on an assumption that the roads/parking lots are constructed in the dry season and that the subgrade is generally stable, without excessive movement during proofrolling. If excessive movement are noticed, additional granular sub-base thickness will be necessary.
- Subsurface drains are installed within the roads and the parking lot subgrades to lower/reduce the in-situ moisture content of the silt deposit. The sub-drains should be installed at least 850 mm below the road pavement level in all four directions around the catch basins, at least 6m in length. Backfill above the drain should comprise of free draining Granular B material or equivalent. The sub-drains should be on a positive grade leading to frost-free sump or catch basins.

The subgrade should be sloped to the subdrains to prevent accumulation of water in the granular bases and subbases.

Following site grading, the subgrade should be proof rolled using heavy vibrating construction equipment. Any soft spots revealed by this process should be sub-excavated and replaced with approved local or imported fill. The degree of compaction of the backfill should be a minimum of 95% of the standard Proctor maximum dry density (SPMDD) to 300 mm below the subgrade level. The upper 300 mm of the subgrade should be compacted to 98% of SPMDD.

If the weather condition is not favourable and the subgrade soils appeared to contain excessive moisture at the time of construction, additional sub-base, approximately 150mm in thickness, might have to be added to stabilize the subgrade soils for pavement construction.

Catch basins and manholes should be backfilled with compacted OPSS Granular B material. Catch basins should be perforated just above the drain level and the holes should be screened with a filter fabric. This will help drain the pavement structure as well as alleviate the problem of differential movement of catch basins or manholes due to frost action.

6.0 GENERAL STATEMENT OF LIMITATION

The comments and recommendations presented in this report are based on the subsoil and ground water conditions encountered at the borehole locations, indicated in the borehole location plan, and are intended for the guidance of the design engineer. Although we consider this report to be representative of the subsurface conditions at the subject property, the soil and the ground water conditions between and beyond the borehole locations may differ from those encountered at the time of our investigation and may become apparent during construction. Any contractor bidding on, or undertaking the works, should decide on their own investigation and interpretations of the groundwater and the soil conditions between the borehole locations.

Any use and / or the interpretation of the data presented in this report, and any decisions made on it by the third party are responsibility of the third parties. The responsibility of ***Toronto Inspection Ltd.*** is limited to the accurate interpretation of the soil and ground water conditions prevailing in the locations investigated and accepts no responsibility for the loss of time and damages, if any, suffered by the third party as a result of decisions or actions based on this report.

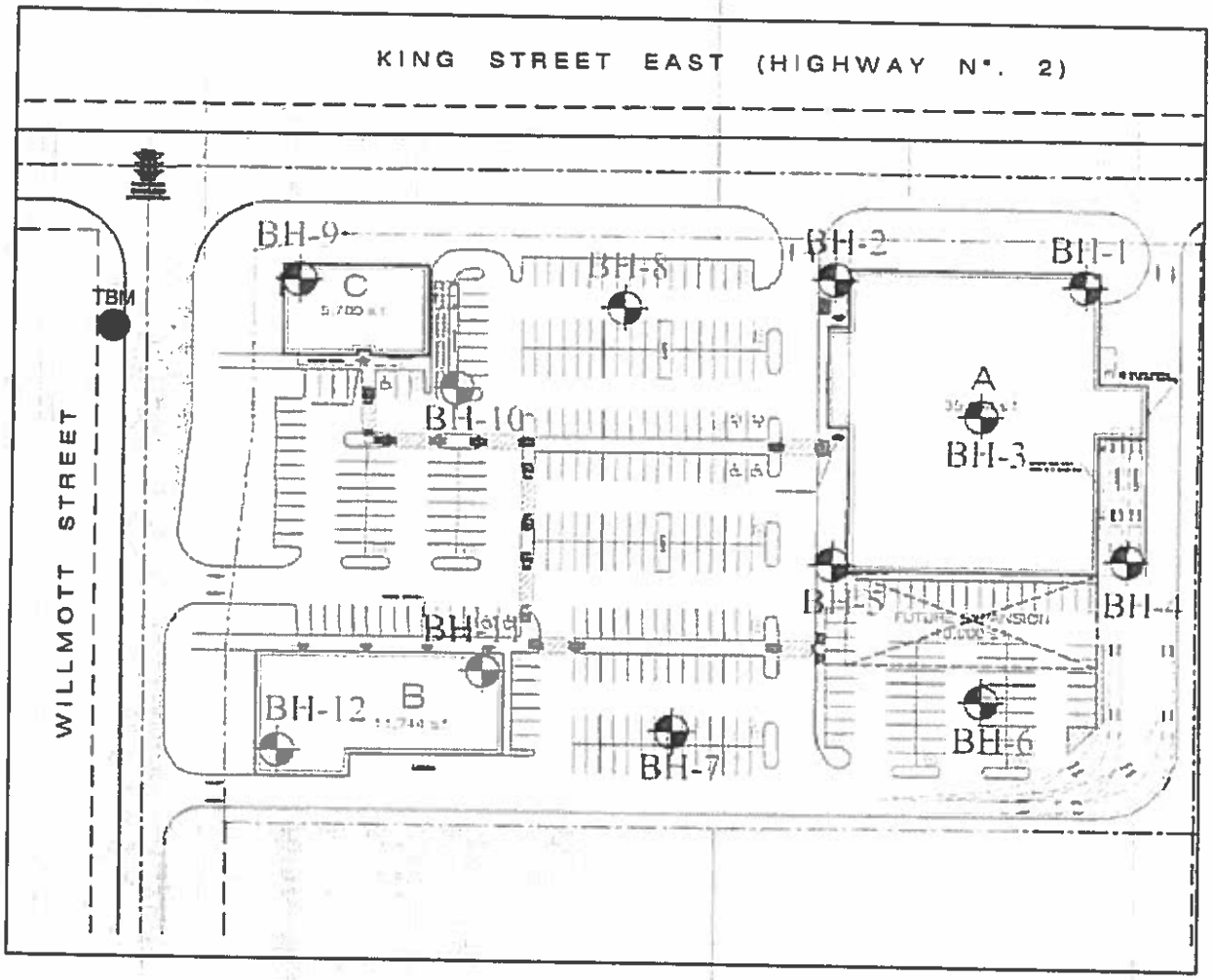
Any legal actions arising directly or indirectly from this work and/or ***Toronto Inspection Ltd.'s*** performance of the services shall be filed no longer than two years from the date of ***Toronto Inspection Ltd.'s*** substantial completion of the services. ***Toronto Inspection Ltd.*** shall not be responsible to the client for lost revenues, lost of profits, cost of content, claims of customers, or other special indirect, consequential or punitive damages.

To the fullest extent permitted by law, the client's maximum aggregate recovery against ***Toronto Inspection Ltd.***, its directors, employees, sub-contractors and representatives, for any and all claims by clients for all causes including, but not limited to, claims of breach of contract, breach of warranty and /or negligence, shall be the amount of the fee paid to ***Toronto Inspection Ltd.*** for its professional services rendered under the agreement with respect to the particular site which is the subject of the claim by the client.

Yours very truly,
TORONTO INSPECTION LTD.

Bennett C. Sun, P.Eng.
Senior Engineer

Upkar S. Sappal, P.Eng.
Principal Engineer



LEGEND:

Borehole Location

Temporary Benchmark Location

NOT TO SCALE

TorontoInspection GEO-ENVIRONMENTAL CONSULTANTS	TITLE: Proposed Commercial Development
110 Konrad Crescent, Unit 16, Markham, Ontario L3R 9X2 Tel: 905-940 8509 Fax: 905-940 8192	LOCATION: King St East & Willmott St, Cobourg, Ontario
	PROJECT NO. 1879-07-G-PEL-A / DRAWING NO. 1

Project No. 1879-07-G-PEL-A

Log of Borehole BH-1

Dwg No. 2

Project: Proposed Commercial Development

Sheet No. 1 of 1

Location: King St. East and Willmott Street, Cobourg, ON

Date Drilled: 01/29/07

Drill Type: Track Mounted Drill Rig

Datum: Assumed

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH m
		Ground Surface	100.53	
		TOPSOIL	100.22	
		SAND - loose to compact, - brown, grey below 1.4m, - fine grained, silty, - layers of coarse sand and gravel at 1.8m, - damp to wet	98.40	
		CLAYEY SILT - very stiff, grey to greyish brown, - thin layers of silty clay, - trace of fine gravel at 2.4 m, - moist.	96.57	
		SANDY SILT - loose, grey, - fine grained, - some coarse sand and gravel, - trace of clay, - wet	95.50	
		END OF BOREHOLE NOTE: - upon completion, borehole caved in at 1.8m.		

N Value
20 40 60 80
Shear Strength kPa
100 200

Headspace Reading (ppm)
100 200 300
Natural Moisture Content % Atterberg Limits (% Dry Weight)
10 20 30

Natural Unit Weight kN/m3

TEST PIT LOG COBOURG - KING ST E & WILLMOTT ST.GPJ 02/07/07

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PEL-A

Log of Borehole BH-3

Dwg No. 4

Project: Proposed Commercial Development

Sheet No. 1 1

King St. East and Willmott Street, Cobourg, ON

Date Drilled 01/23/07

Type Track Mounted Drill Rig

Datum Assumed

SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH m	N Value 20 40 60 80 / Shear Strength 100 200 kPa	Headspace Reading (ppm) 100 200 300 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Natural Unit Weight kN/m3
		Ground Surface	100.35	0			
		TOPSOIL	99.97				
▼		SAND - loose to compact, - brown, - fine to medium grained, - damp.	99.75				
			98.98	1			
		CLAYEY SILT - firm to soft, stiff to very stiff below 2.2m, - grey, layers of silty clay, low plasticity, - trace of organic peat at 1.8m, - wet, moist below 3.0m.		2			
				3			
			96.39	4			
		CLAYEY SILT TILL - hard, grey, - thin layers of silty sand, - some gravel, - moist to damp.	95.32				
		END OF BOREHOLE NOTE: - upon completion, water level in borehole was at 0.6m.		5			

TEST PIT LOG COBOURG - KING ST E & WILLMOTT ST.GPJ 02/07/07

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PEL-A

Log of Borehole BH-2

Dwg No. 3

Project Proposed Commercial Development

No. 1 1

Location King St. East and Willmott Street, Cobourg, ON

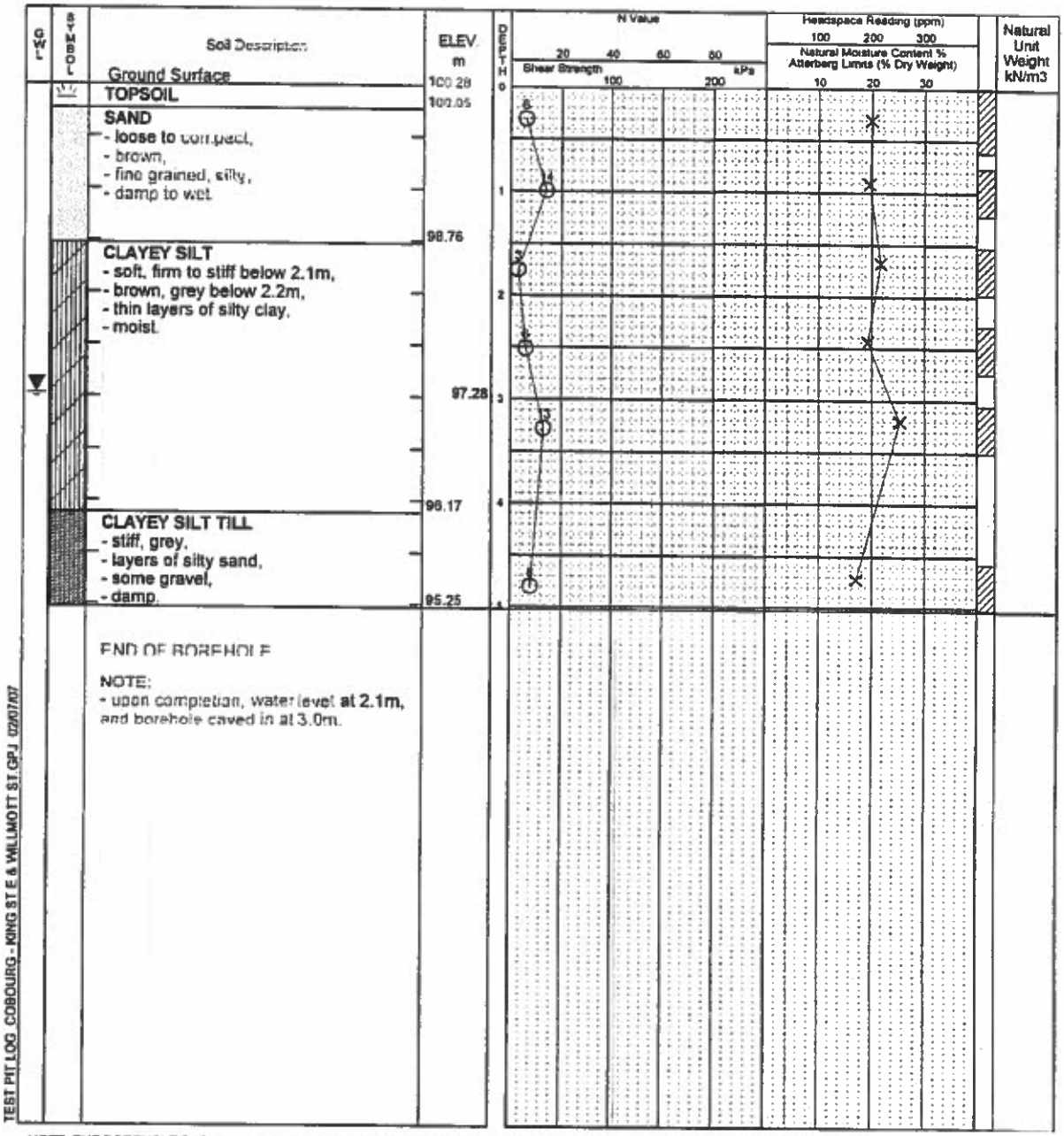
Date Drilled 01/29/07

Drill Type Track Mounted Drill Rig

Datum Assumed

SPT (N) Value
Dynamic Cone Test
Tube
Field Vane Test

Natural Moisture
and Liquid Limit
Unconfined Compression
% Strain at Failure



TEST PIT LOG COBOURG - KING ST E & WILLMOTT ST.GPJ 02/07/07

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION .TD. BEFORE USE BY OTHERS

Toronto n pection Ltd

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PI -A

Log o Bo ehoe BH-4

Dwg 5

Project: Proposed Commercial Development

Sheet No 1 of 1

Location King St. East and Willmott Street, Cobourg, ON

Date Drilled 01/23/07

Drill Type Track Mounted Drill Rig

Datum Assumed

SPT (N) Value
Dynamic Cone
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH
		Ground Surface	100.13	0
		TOPSOIL	99.67	
▼		**SAND** - loose to compact, brown, - fine to medium grained, - damp to moist.	99.23	1
			98.00	2
		CLAYEY SILT - stiff to very stiff, - grey, thin layers of silty clay, - seams of sandy silt, - moist.		3
			96.17	4
		CLAYEY SILT TILL - hard, grey, - thin layers of silty sand, - moist to damp.	95.10	5
		END OF BOREHOLE NOTE: - upon completion, water level at 0.9m, and borehole caved in at 1.2m		

N Value
20 40 60 80
Shear Strength kPa
100 200

Headspace Reading (ppm)
100 200 300
Natural Moisture Content % Atterberg Limits (% Dry Weight)
10 20 30

Natural Unit Weight kN/m3

TEST PIT LOG COBOURG - KING ST E & WILLMOTT ST.GPJ 02/07/07

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE

Toronto nspect on Ltd

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PEL-A

Log of Borehole BH-5

Dwg No. 6

Project: Proposed Commercial Development

Sheet No. 1 of 1

Location: King St. East and Willmott Street, Cobourg, ON

Date Drilled: 01/29/07

Drill Type: Track Mounted Drill Rig

Datum: Assumed

Auger Sample

SPT (N) Value

Dynamic Cone Test

Shelby Tube

Field Vane Test

Headspace Reading (ppm)

Natural Moisture

Plastic and Liquid Limit

Unconfined Compression or Shear at Failure

Penetrometer

Soil Description	ELEV m	Depth (m)	Natural Unit Weight kN/m3
Ground Surface	99.97		
TOPSOIL	99.77		
SAND - loose to compact, - brown, fine to medium grained, - silty, damp	98.60	0	
CLAYEY SILT - stiff to firm, very stiff to stiff below 2.1m, - grey, - thin layers of organic peat at 1.8m, - wet, moist below 2.1m	95.70	1 2 3	
SANDY SILT TILL - very dense, grey, - thin layers of silty sand, - some gravel, - moist,	95.25	4	
END OF BOREHOLE NOTE: - upon completion, no free water in borehole.			

TEST PIT LOG COBOURG - KING ST E & WILLMOTT ST.GPJ GAL.GDT

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PEL-A

Log of Borehole BH-6

Dwg No. 7

Project: Proposed Commercial Development

Sheet No 1 of 1

Location: King St. East and Willmott Street, Cobourg, ON

Date Drilled: 01/29/07

Drill Type: Track Mounted Drill Rig

Datum: Assumed

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test (S)

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression % Strain at Failure
Penetrometer

SYMBOL	Soil Description	ELEV. m	DEPTH 0	N Value: Shear Strength 20 40 60 80 / 100 200 kPa	Headspace Reading (ppm) 100 200 300 / Natural Moisture Content % Atterberg Limits (% Dry Weight) 10 20 30	Natural Unit Weight kN/m3
	Ground Surface	99.75				
	TOPSOIL	99.44				
	SAND - loose to compact, - brown to greyish brown, - fine to medium grained, - silty, - damp to wet.			9 13 14		
		97.77				
	END OF BOREHOLE **NOTE:** - upon completion, no free water in borehole.					

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PEL-A

Log of Borehole BH-7

Dwg No. 8

Project: Proposed Commercial Development

Sheet No. 1 of 1

Location: King St. East and Willmott Street, Cobourg, ON

Date Drilled: 01/29/07

Drill Type: Track Mounted Drill Rig

Datum: Assumed

Auger Sample ⊠
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test S

Headspace Reading (ppm) •
Natural Moisture ×
Plastic and Liquid Limit ⊢—⊣
Unconfined Compression % Strain at Failure ⊗
Penetrometer ▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH m	N Value / Shear Strength kPa	Headspace Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m3
		Ground Surface	100.54	0	20 40 60 80 / 100 200	100 200 300 / 10 20 30	
		TOPSOIL	100.34				
		SAND - loose to compact, - brown, grey at 1.6m, - fine to medium grained, - some coarse sand and gravel at 1.8m. - damp to wet.		1			
			98.56				
		END OF BOREHOLE **NOTE:** - upon completion, no free water in borehole.					

TEST P T LOG COBOURG - KING ST E & WILLMOTT ST GPJ 02/07/0

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PEL-A

Log of Borehole BH-8

Dwg No. 9

Project: Proposed Commercial Development

Sheet No. 1 of 1

Location: King St. East and Willmott Street, Cobourg, ON

Date Drilled: 01/29/07

Drill Type: Track Mounted Drill Rig

Datum: Assumed

Auger Sample ⊠
SPT (N) Value ○ ▨
Dynamic Cone Test
Shelby Tube ■
Field Vane Test +S

Headspace Reading (ppm) •
Natural Moisture ×
Plastic and Liquid Limit ⊢—⊣
Unconfined Compression ⊗
% Strain at Failure
Penetrometer ▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH	N Value / Shear Strength (kPa)	Headspace Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m3
		Ground Surface	100.22	0	20 40 60 80 / 100 200	100 200 300 / 10 20 30	
		TOPSOIL	100.07				
▼		SAND - loose to compact, - brown, - fine to medium grained, - silty - thin layers of organic peat at 1.5m, - damp to wet.	98.72	1			
		END OF BOREHOLE NOTE: - upon completion, water level at 1.5m.	98.24				

TEST PIT LOG COBOURG KING S E & WILLMOTT ST GPJ 02/07/07

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No 1879-07-G-PEL-A

Log of Borehole BH-9

Dwg No 10

Project Proposed Commercial Development

Sheet No 1 of 1

Location King St. East and Willmott Street, Cobourg, ON

Date Drilled 01/29/07

Drill Type Track Mounted Drill Rig

Datum Assumed

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer

SOIL PROFILE	Soil Description	ELEV m	Depth m	N Value / Shear Strength kPa	Headspace Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m3
	Ground Surface	100.22				
	TOPSOIL	99.84				
	SAND - loose to compact, brown to greyish brown - fine grained, silty, - wet	99.85				
	CLAYEY SILT - very stiff - brown, grey below 2.2m - thin layers of silty clay, - seams of silty sand below 3.0m, - moist, wet at 3.0m	97.62	2			
	SANDY SILT TILL - very dense, grey, - seams of silty sand - some gravel, trace of clay, - moist	96.26	4			
	END OF BOREHOLE NOTE - upon completion, water level at 2.6m	95.19	5			

TEST PIT LOG COBOURG - KING ST E & WILLMOTT ST.GPJ GINT.GDT

Project No. 1879-07-G-PEL-A

Log of Borehole BH-10

Dwg No. 11

Project: Proposed Commercial Development

Sheet No. 1 of 1

Location: King St. East and Willmott Street, Cobourg, ON

Date Drilled 01/29/07

Drill Type:

Datum:

Headspace Reading (ppm) •
Natural Moisture ×
Plastic and Liquid Limit ⊢—⊣
Unconfined Compression % Strain at Failure ⊗
Penetrometer ▲

GWL	SYMBOL	Soil Description	ELEV. m	DEPTH m	N Value / Shear Strength kPa	Headspace Reading (ppm) / Natural Moisture Content % / Atterberg Limits (% Dry Weight)	Natural Unit Weight kN/m3
		Ground Surface	100.22	0	20 40 60 80 / 100 200	100 200 300 / 10 20 30	
		TOPSOIL	99.99	0.23			
		FILL - grey clayey silt, - pockets of topsoil, moist.	99.46	0.76			
		SAND - loose to compact, - brown, fine to medium grained, - silty, damp.	98.70	1.52			
		CLAYEY SILT - very stiff, brown, - seams of silty clay and silty sand, - moist.	98.24	1.98			
		END OF BOREHOLE					

NOTE:
- upon completion, no free water in borehole.

TEST PIT LOG COBOURG KING ST E & WILLMOTT ST GPJ 2/20/07

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PEL-A

Log of Borehole BH-11

Dwg No. 12

Project: Proposed Commercial Development

Sheet No. 1 of 1

Location: King St. East and Willmott Street, Cobourg, ON

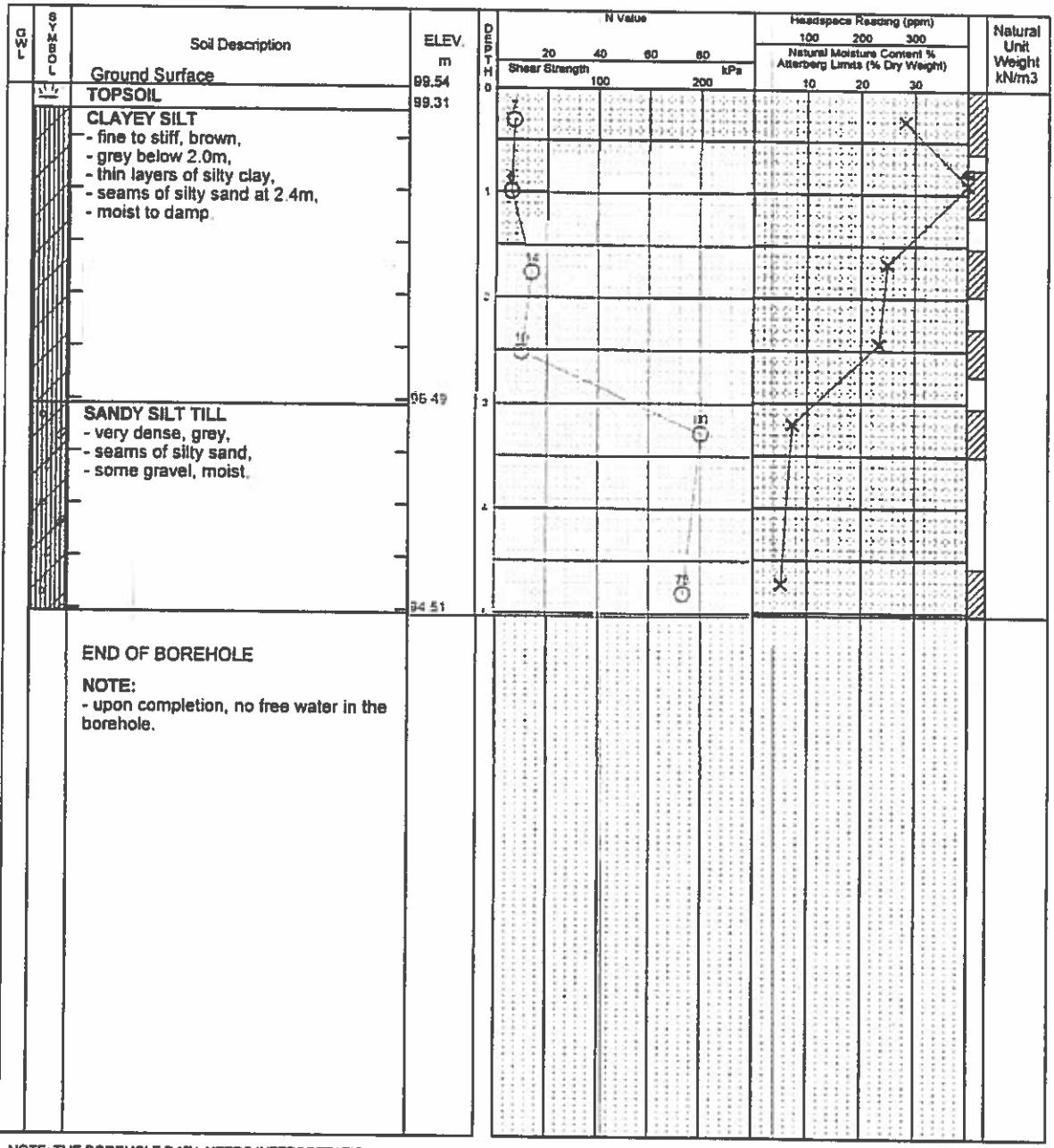
Date Drilled: 01/29/07

Drill Type: Track Mounted Drill Rig

Datum: Assumed

Auger Sample
SPT (N) Value
Dynamic Cone Test
Shelby Tube
Field Vane Test

Headspace Reading (ppm)
Natural Moisture
Plastic and Liquid Limit
Unconfined Compression
% Strain at Failure
Penetrometer



TEST PIT LOG COBOURG - KING ST E & WILLMOTT ST.GPJ 02/07/07

NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Project No. 1879-07-G-PEL-A

Log of Borehole BH-12

Dwg No. 13

Project: Proposed Commercial Development

Sheet No. 1 of 1

Location: King St. East and Willmott Street, Cobourg, ON

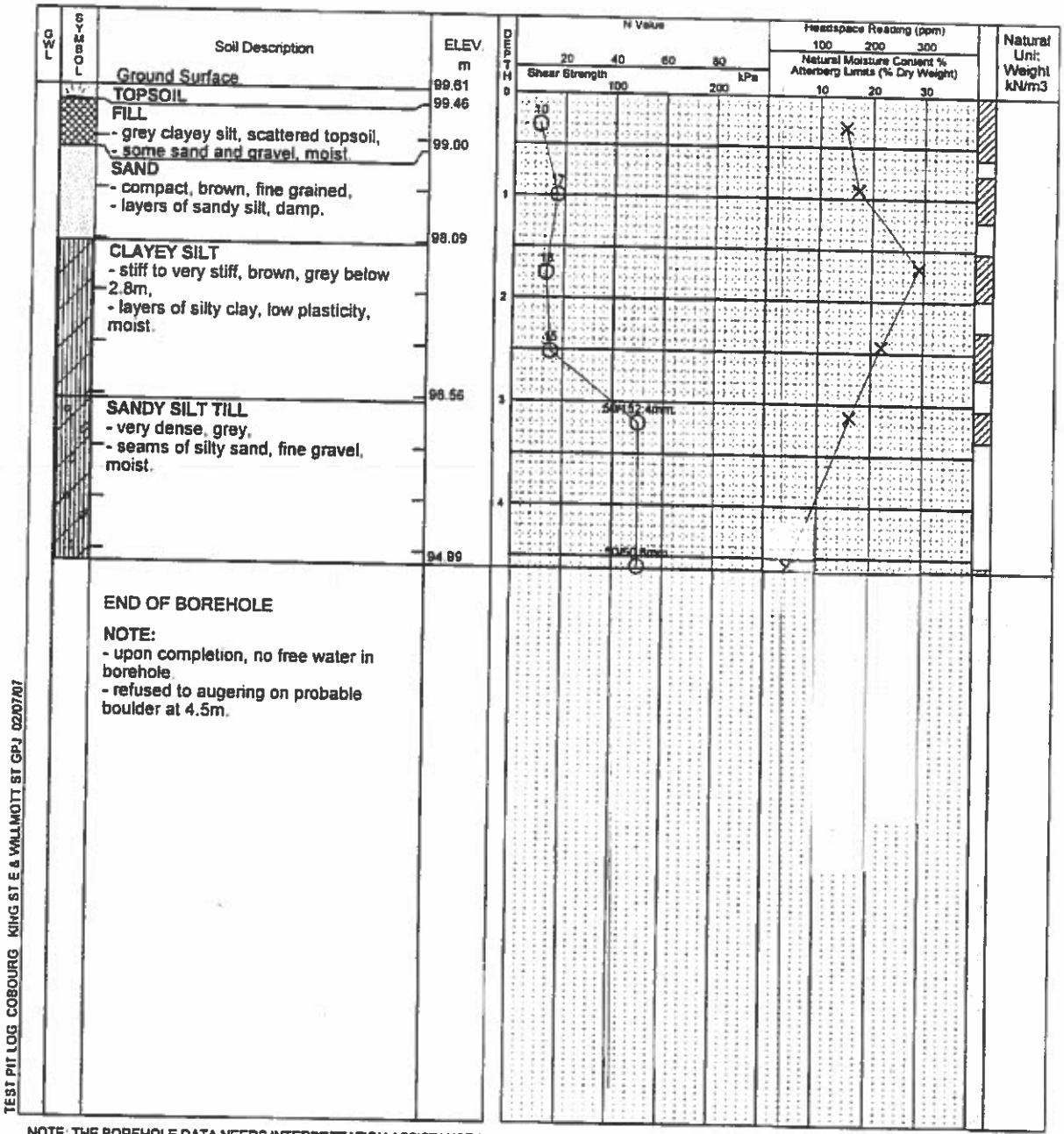
Date Drilled: 01/29/07

Drill Type: Track Mounted Drill Rig

Datum: Assumed

Auger Sample ⊠
SPT (N) Value ○ ▨
Dynamic Cone Test ——
Shelby Tube ■
Field Vane Test S

Headspace Reading (ppm)
Natural Moisture ×
Plastic and Liquid Limit ⊢—⊣
Unconfined Compression % Strain at Failure ⊗
Penetrometer ▲



NOTE: THE BOREHOLE DATA NEEDS INTERPRETATION ASSISTANCE BY TORONTO INSPECTION LTD. BEFORE USE BY OTHERS

Toronto Inspection Ltd.

Time	Water Level (m)	Depth to Cave (m)

Toronto Inspection Ltd.

APPENDIX A

GUIDELINES FOR ENGINEERED FILL

TIL

Toronto Inspection Ltd.

GUIDELINES FOR ENGINEERED FILL

The information presented in this guideline is intended for general guidance only. Site specific and prevailing weather conditions may require modification of the material(s) to be used and the compaction standards or procedures changed. The site preparation and the material(s) to be used must be discussed and procedures agreed with ***Toronto Inspection Ltd.*** prior to the start of the earthworks and must be subjected to on going review during construction.

For fill to be classified as engineered fill, suitable for supporting structural loads, a number of conditions must be satisfied, including but not necessarily limited to the following:

1. Areal Extent

The engineered fill must extend beyond the envelope of the structure to be supported. The minimum extent should be 1.0m beyond the envelope in all directions at the foundation level and sloping downwards to the sub-grade at 45°. Once the envelope is set, the structure cannot be moved out of the envelope without consultation with ***Toronto Inspection Ltd.*** Similarly, no excavation should encroach on the engineered fill envelope without consultation with ***Toronto Inspection Ltd.***

2. Survey Control

Accurate survey control is essential to the success of an engineered fill project. The boundaries of the engineered fill must be laid out by a surveyor. During construction. it is necessary to have qualified surveyors providing control stations on the three-dimensional extent of the engineered fill.

3. Subsurface Preparation

Prior to placement of the engineered fill, the sub-grade must be prepared to the satisfaction of ***Toronto Inspection Ltd.*** All deleterious material must be removed and in some cases excavation of native mineral soils may also be required. Particular attention must be paid to wet sub-grade and possible additional measures required to achieve sufficient compaction. Where fill is placed against a slope, benching will be necessary and natural drainage paths must not be blocked.

4. Suitable Fill Material

All material to be used as fill must be approved by ***Toronto Inspection Ltd.*** Such approval will be influenced by weather factors. External sources of fill material must be sampled, tested and approved prior to material being hauled to the job site.

5. Trial Test Section

In advance of the construction of the engineered fill pad, the contractor should conduct a trial test section. The compaction criterion will be assessed for the backfill material to be used, using specified lift thicknesses and number of passes for the compaction equipment proposed by the

contractor. To achieve a uniform degree of compaction of each layer, the lift thickness of loose material, prior to start of compaction, must not exceed 200mm (8 inches). Additional trial test section(s) may be required throughout the course of the project to reflect changes in material sources, the moisture content of the material and the weather conditions.

6. Degree of Compaction

The minimum degree of compaction for the engineered fill should not be less than 100% of the Standard Proctor maximum dry density, or 95% of the Modified Proctor maximum dry density. Each layer must be tested and approved by this office before the next layer is placed.

7. Inspection and Testing

Uniform and thorough compaction is crucial to the performance of the fill and the supported structure. Hence, all subgrade preparation, filling and compacting must be done with full time inspection and to the satisfaction of ***Toronto Inspection Ltd.*** All founding surfaces must be inspected and approved by ***Toronto Inspection Ltd.*** prior to placement of concrete.

8. Protection of Fill

Fills are generally more susceptible to the effects of weather than are natural soils. Fill placed and approved to the level at which structural support is required must be protected from excessive wetting, drying, erosion or freezing. Where inadequate protection had been provided, it may be necessary to provide deeper founding level for footings or to strip and recompact some of the filled layers.

9. Limitations

The engineered fill is subjected to the following limitations:

i. Proper drainage must be maintained at all times within the engineered fill pad.
ii. If the engineered fill is left in place during the winter months, adequate protection must be provided against frost penetration to the proposed footing depths.
iii. If the engineered fill depth exceeds 5m below the foundation depth, the construction of the foundations might have to be delayed for a period of 1 year after placement, depending on the type of fill material used.
iv. Strip footings and foundation walls founded on engineered fill must be reinforced continuously with a minimum of two 15M steel bars with at least 1m of overlap.

January 2007

Appendix G

Design Drawings

NOTES:

EROSION SEDIMENT CONTROL NOTES:

1. CONTRACTOR TO PLACE A "MUDMAT" AS PER DETAIL 01, AT THE CONSTRUCTION ENTRANCE IDENTIFIED ON SHEET 03. IF THE CONTRACTOR UTILIZES ANY OTHER ENTRANCES AS A CONSTRUCTION ENTRANCE, IT IS THE CONTRACTORS RESPONSIBILITY TO CONSTRUCT A MUD MAT, AS PER DETAIL 01, AT EACH ENTRANCE AND MAINTAIN THE MUD MAT THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND CLEANING THE MUD MAT TO ENSURE NO DEBRIS IS TRACKED ONTO THE TOWN STREETS. ANY DEBRIS TRACKED ONTO TOWN STREETS SHALL BE POWER SWEPT AT THE END OF EACH DAY.
2. CONTRACTOR TO MINIMIZE THE IMPACTS ASSOCIATED WITH SEDIMENT TRANSFER BY COMPLETING THE FOLLOWING MEASURES IN ORDER:
   - a PLACE SILT FENCE IN THE LOCATIONS INDICATED ON SHEET 02 – EROSION SEDIMENT CONTROL;
   - b STRIP TOPSOIL FROM SITE AND STOCKPILE AWAY FROM DRAINAGE SWALES AND SURROUNDING STOCKPILES WITH TEMPORARY SILT FENCE, OR REMOVE FROM SITE TO AN APPROVED DISPOSAL SITE;
   - c INSPECT SILT FENCE AFTER EVERY SIGNIFICANT RAINFALL EVENT AND MAINTAIN AS REQUIRED, OR AT THE DIRECTION OF THE ENGINEER.
3. ALL CATCH BASINS SHALL HAVE FILTER FABRIC PLACED UNDER THE LID, IMMEDIATELY AFTER INSTALLATION, TO CONTROL ANY SILT THAT MAY ENTER THE STORM SEWER, REFER TO DETAIL 02. THE CONTRACTOR SHALL ENSURE THE FILTER FABRIC IS NOT 'SEALED' IN PLACE DURING THE PLACEMENT OF ASPHALT. ALL FILTER FABRIC IS TO BE MAINTAINED BY THE CONTRACTOR. THE CONTRACTOR SHALL REMOVE ALL FILTER FABRIC UPON COMPLETION OF THE PROJECT OR AFTER BEING NOTIFIED BY THE ENGINEER.
4. ALL TEMPORARY SILTATION CONTROL DEVICES ARE TO BE PLACED AND MAINTAINED BEFORE CONSTRUCTION STARTS. CONTROL DEVICES SHALL BE REMOVED ONCE ALL CONSTRUCTION HAS BEEN COMPLETED, ALL VEGETATION HAS BEEN ESTABLISHED, AND AT THE DIRECTIONS OF THE ENGINEER (D.M.WILLS).

GENERAL:

1. THE LOCATION OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS IS APPROXIMATE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ARRANGE FOR THE FIELD LOCATION OF ALL UTILITIES PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR IS TO CONFIRM THE LOCATION OF EXISTING UTILITIES AND ANY DISCREPANCIES ARE TO REPORTED TO THE ENGINEER.
2. GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND HAVING ON SITE, A COPY OF THE MOST RECENT ONTARIO PROVINCIAL STANDARDS AND SPECIFICATIONS RELEVANT TO THIS CONTRACT.
3. GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND PAYING FOR ALL PERMITS RELATED TO SERVICE CONNECTIONS INCLUDING THIRD PART UTILITY COSTS.
4. ALL ELEVATIONS ARE RELATIVE TO BENCHMARKS NOTED ON THE DRAWINGS AND UTILIZE METRIC UNITS.
5. PROJECT BENCH MARK – CONTRACTOR TO PROVIDE THE ENGINEER WITH SURVEY DATA TO CONFIRM SITE BENCH MARK PRIOR TO UTILIZATION.
6. GENERAL CONTRACTOR IS RESPONSIBLE FOR ALL LAYOUT FOR CONSTRUCTION PURPOSES.
7. REFER TO ARCHITECT'S SITE PLAN FOR BUILDING DIMENSIONS AND SITE LAYOUT. DIMENSIONS AND LAYOUT INFORMATION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF CONSTRUCTION BY THE CONTRACTOR.
8. TOWN OF COBOURG STANDARDS SHALL TAKE PRECEDENCE OVER OPSD. THE DETAILS ON THESE DRAWINGS SHALL TAKE PRECEDENCE OVER THE LATEST OPSD DETAILS WHERE APPLICABLE.
9. CONTRACTOR TO UNCOVER EXISTING UTILITIES WELL IN ADVANCE OF PIPE LAYING IN ORDER TO CORRECT GRADE PROBLEMS AS REQUIRED, IF REQUIRED.
10. THE CONTRACTOR MUST CHECK AND VERIFY ALL DIMENSIONS ON THE SITE AND REPORT ANY DISCREPANCY TO THE ENGINEER BEFORE PROCEEDING WITH THE WORKS.
11. THE APPROVAL OF THE PLANS DOES NOT EXEMPT THE OWNER'S CONTRACTOR FROM OBTAINING, BUT NOT LIMITED TO THE FOLLOWING PERMITS: ROAD CUT, SEWER PERMIT, RELOCATION OF SERVICES, ENCROACHMENT AGREEMENTS, APPROACH PERMITS, ETC...
12. ALL CONSTRUCTION WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS FOR CONSTRUCTION PROJECTS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL AND SAFETY MEASURES DURING THE CONSTRUCTION PERIOD, INCLUDING THE SUPPLY, INSTALLATION AND REMOVAL OF ALL NECESSARY SIGNAGE, DELINEATORS, MARKERS AND BARRIERS. ALL SIGNS SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS IN THE LATEST VERSION ONTARIO TRAFFIC MANUAL, BOOK 7, TEMPORARY CONDITIONS.
14. LIMITS OF GRADING MAY VARY FROM THAT INDICATED, DEPENDING ON THE FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
15. TOPOGRAPHICAL INFORMATION PROVIDED BY IVAN B. WALLACE DATED FEBRUARY 8, 2007 JOB NUMBER 5–7672.
16. LEGAL BOUNDARY INFORMATION PROVIDED BY IVAN B. WALLACE DATED FEBRUARY 8, 2007 JOB NUMBER 5–7672.
17. ANY HYDRO POLE OR BELL POLES OR OTHER POLES THAT ARE IN DANGER OF BEING UNDERMINES ARE TO BE BRACED. THE CONTRACTOR SHALL BE RESPONSIBLE TO HAVE POLES BRACED TO THE SATISFACTION OF THE APPROPRIATE UTILITY. ALL COSTS ASSOCIATED WITH THE BRACING OF POLES SHALL BE CARRIED BY THE CONTRACTOR.
18. ALL TREES AND ROOTS DESIGNATED FOR REMOVAL ARE TO BE COMPLETELY REMOVED AND DISPOSED OF OFF SITE.
19. GEOTECHNICAL REPORT PROVIDED BY TORONTO INSPECTION INC. DATED FEBRUARY 7, 2007 PROJECT NUMBER 1879–07–G–PE–A.

SITE:

20. ALL MATERIALS (CONCRETE, SURPLUS FILL, ASPHALT, CSP, ETC.) THAT ARE TO REMOVED MUST BE DISPOSED OF IN ACCORDANCE WITH THE LATEST MOECP GUIDELINES, LOCAL MUNICIPAL BYLAWS, AND OPSS 180.
21. REFER TO MECHANICAL DRAWINGS FOR CONTINUATION OF SANITARY AND WATERMAIN SERVICED INSIDE BUILDING(S).
22. THE CONTRACTOR SHALL CARRY ALL COSTS ASSOCIATED WITH CONSTRUCTION WITHIN THE TOWN R.O.W. WHETHER IT IS PREFORMED BY THE CONTRACTOR OR IS TO BE PREFORMED BY PUBLIC WORKS DEPARTMENT. CONTRACTOR TO MAKE ALL NECESSARY ARRANGEMENTS FOR COORDINATION WITH THE TOWN AND/OR LOCAL UTILITY.
23. THE CONTRACTOR MUST REINSTATE ALL EXISTING SURVEY BARS (SIB/IB) THAT ARE DISTURBED DURING CONSTRUCTION TO THE PROPER LOCATION. THIS PROCESS MUST BE COORDINATED WITH AN ONTARIO LAND SURVEYOR, ALL COSTS ASSOCIATED WITH THIS ARE TO BE CARRIED BY THE CONTRACTOR.
24. ALL LANDSCAPE AREAS DISTURBED BY CONSTRUCTION SHALL HAVE 150mm TOPSOIL AND NURSERY SO UNLESS OTHERWISE NOTED. ALL SLOPES GREATER THAN 4:1 REQUIRE THE SOD TO BE STAKED.
25. ALL AREAS DISTURBED BY THE CONTRACTOR'S CONSTRUCTION SHALL BE RESTORED TO EXISTING CONDITIONS AS INDICATED ON THE OWNER'S CONTRACT DRAWINGS AND IN ACCORDANCE WITH OPSS 492.
26. ALL SERVICES AND UTILITIES ARE TO BE SUPPORTED AS PER OPSS 491.
27. ALL BARRIER FREE WALKWAYS ARE TO BE CONSTRUCTED TO MEET THE REQUIREMENTS OF THE OBC SECTIONS 3.8.3.2.
28. ALL BARRIER FREE RAMPS ARE TO BE CONSTRUCTED TO MEET REQUIREMENTS OF THE OBC SECTION 3.8.3.4.
29. ALL ACCESSIBILITY SIGNS ARE TO MEET THE REQUIREMENTS OF THE OBC SECTION 3.8.3.1.
30. ALL BARRIER FREE ENTRANCES SHALL HAVE A MINIMUM 1.67m X 1.67m LEVEL AREA ADJACENT TO THE ENTRANCE AS PER THE OBC SECTION 3.8.3.2(1)(g)

WATERMAIN:

31. ALL WATERMAIN AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH THE LUSI WATERMAIN AND APPURTENANCES POLICY & PROCEDURE
32. ALL WATERMAIN AND WATER SERVICES, INCLUDING APPURTENANCES ARE TO BE INSTALLED AS PER OPSS MUNI 441.
33. CONTRACTOR TO INSTALL TRACER WIRE ON ALL NEW PVC WATERMAIN INSTALLATIONS.
34. ALL WATER SERVICE FITTINGS AND CONNECTIONS REQUIRE RETAINING GLAD RINGS WHERE THRUST BLOCKS CANNOT BE CONSTRUCTED ON SOLID GROUND.
35. MINIMUM COVER ON THE WATER SERVICE SHALL BE 1.85m, PROPOSED FINISH GRADE TO THE TOP OF PIPE.
36. BEDDING AND BACKFILL FOR WATER SERVICE SHALL BE AS PER OPSD 802.010 (MODIFIED).
37. THE MINIMUM VERTICAL DISTANCE BETWEEN THE WATER SERVICE AND EITHER A STORM SEWER OR SANITARY SEWER IS 500mm.
38. ALL WATER SERVICES REQUIRE 3.0m SEPARATION FROM SANITARY PIPES AND STRUCTURES, STORM PIPES AND STRUCTURES WHERE POSSIBLE.
39. ALL WATER SERVICES SHALL BE INSTALLED AT RIGHT ANGLES TO THE WATERMAIN.
40. ALL WATER SERVICES TO HAVE ANODE PROTECTION INCLUDING FITTINGS, VALVES, HYDRANTS, ETC.
41. ALL WATERMAIN THAT IS CONNECTED TO A FIRE PROTECTION SPRINKLER SYSTEM SHALL MEET THE N.F.P.A. 13.
42. THE WATER SERVICE SHALL TERMINATE 0.6m INSIDE THE PROPOSED BUILDING FOUNDATION WALL AND SHALL BE MARKED WITH A 2 x 4 PAINTED BLUE. THE 2 x 4 SHALL EXTEND 0.6m ABOVE FISHED GRADE AND SHALL BE CLEARLY LABELED "WATER".

SEWERS:

43. LASER ALIGNMENT CONTROL TO BE UTILIZED ON ALL SEWER INSTALLATIONS.
44. ALL BUILDING FOUNDATIONS DRAINS ARE TO BE CONNECTED TO THE PROPOSED STORM SEWER STRUCTURES.
45. THE SITE SERVICING CONTRACTOR IS TO TERMINATE THE SANITARY SEWER 1.0m OUTSIDE THE PROPOSED FOUNDATION WALL. THE SANITARY SERVICE TO THE PROPOSED BUILDING SHALL BE MARKED WITH A 2 x 4 PAINTED GREEN. THE 2 x 4 SHALL EXTEND 0.6m ABOVE FINISHED GRADE. THE 2 x 4 SHALL BE CLEARLY LABELED "SANITARY".
46. THE SITE SERVICING CONTRACTOR IS TO TERMINATE THE STORM SEWER 1.0m OUTSIDE THE PROPOSED FOUNDATION WALL. THE STORM SERVICE TO THE PROPOSED BUILDING SHALL BE MARKED WITH A NON–PAINTED 2 x 4. THE 2 x 4 SHALL EXTEND 0.6m ABOVE FINISHED GRADE. THE 2 x 4 SHALL BE CLEARLY LABELED "STORM".
47. BEDDING AND BACKFILL FOR STORM AND SANITARY SEWERS SHALL BE AS PER OPSD 802.010 (MODIFIED).

SITE (CIVIL) INSPECTION & TESTING SCHEDULE/REQUIREMENTS:

48. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING THE ENGINEER A MINIMUM OF 48 HOURS (2 BUSINESS DAYS) IN ADVANCE OF THE FOLLOWING ACTIVITIES IN ORDER FOR THE ENGINEER TO ARRANGE FOR THE PROPER INSPECTION OF THE RELATED CONSTRUCTION ACTIVITIES. IF THE CONTRACTOR DOES NOT PROVIDE THE REQUIRED NOTICE THE CONTRACTOR MAY BE REQUIRED TO UNDERTAKE ADDITIONAL WORKS AND/OR VERIFY THAT THE WORKS HAVE BEEN PROPERLY EMPLACES AT THE SOLE COST TO THE CONTRACTOR.
   - a PROVIDE ADVANCE NOTIFICATION OF THE SERVICING CONTRACTOR'S MOBILIZATION DATE ON SITE AND PROPOSED CONSTRUCTION SCHEDULE.
   - b PROVIDE CONTACT INFORMATION FOR THE SERVICING CONTRACTOR'S SITE REPRESENTATIVE.
   - c PROVIDE NOTIFICATION OF DELIVERY OF ALL SEWER PIPE, MANHOLES, WATERMAIN PIPE, AND ANY OTHER SEWER OR WATERMAIN APPURTENANCES.
   - d AT THE PLACEMENT OF THE FIRST STORM AND SANITARY MANHOLES.
   - e PRIOR TO THE CONNECTION OF NEW WORKS TO EXISTING WORKS (STORM, SANITARY AND WATERMAIN).
   - f PRIOR TO TESTING OF THE WATERMAIN / WATER SERVICE.
   - g PRIOR TO CCTV OF ANY AND ALL SEWERS.
   - h PRIOR TO AIR TESTING THE STORM AND SANITARY SEWERS.
   - i AT THE COMPLETION OF THE PARKING LOT / DRIVEWAY SUBGRADE BUT PRIOR TO THE PLACEMENT OF ANY GRANULAR MATERIAL.
   - j AT THE COMPLETION OF GRANULAR 'A' PLACEMENT.
   - k PRIOR TO ASPHALT PLACEMENT.
   - l PRIOR TO ANY CONCRETE POUR.
   - m PRIOR TO THE DEMOBILIZATION OF THE SERVICING CONTRACTOR FROM THE SITE.
49. THE CONTRACTOR SHALL SUPPLY THE ENGINEER WITH ALL MATERIAL TESTING AND INSPECTION REPORTS RELATED TO CONSTRUCTION / INSTALLATION OF PARKING LOTS, SIDEWALK, STORM SEWERS, SANITARY SEWERS AND WATERMAINS.
50. ALL CIVIL SHOP DRAWINGS ARE TO BE SUBMITTED TO THE ENGINEER A MINIMUM OF 72 HOURS IN ADVANCE. IF THE CONTRACTOR IS REQUESTING A SUBSTITUTION OF A PRODUCT SPECIFIED ON THE CIVIL DRAWINGS, THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE REVIEW AND APPROVAL OF THE SUBSTITUTION.
51. ALL WATERMAIN TESTING INCLUDING CHLORINATION AND BACTERIOLOGICAL IS TO BE IN ACCORDANCE WITH OPSS 441. THE CONTRACTOR IS TO SUPPLY THE ENGINEER WITH TWO COPIES OF ALL TEST RESULTS. THE WATERMAIN TESTING CONTRACTOR(S) MUST BE APPROVED BY THE ENGINEER PRIOR TO THE TESTING OF THE WATERMAIN. THE SITE SERVICING CONTRACTOR OR GENERAL CONTRACTOR INFORMATION FOR THE TESTING CONTRATOR(S) A MINIMUM OF TWO WEEKS PRIOR TO TESTING.
52. ALL SANITARY AND STORM SEWERS, BOTH EXISTING AND NEW, ARE TO BE FLUSHED UPON COMPLETION OF ALL SITE WORKS. ALL CATCH BASINS AND MANHOLES ARE TO BE CLEANED AND VACUUMED OUT. THE SITE SERVICING CONTRACTOR OR GENERAL CONTRACTOR IS TO SUPPLY THE ENGINEER WITH A DETAILED REPORT FROM THE FLUSHING CONTRACTOR OF ALL SEWERS CLEANED.
53. ALL NEW SANITARY AND STORM SEWERS SHALL BE CCTV INSPECTED. IN ADDITION WHERE THE NEW SEWERS TIE INTO EXISTING STRUCTURES ON ADDITIONAL LENGTH, TO THE NEXT STRUCTURE DOWNSTREAM, OF THE EXISTING SEWER SHALL BE CCTV INSPECTED. CCTV INSPECTION SHALL BE CONDUCTED AFTER ALL MATERIAL HAS BEEN POWER CLEANED FROM THE DOWNSTREAM MANHOLE AND PRIOR TO THE PLACEMENT OF ASPHALT, CURB OR CONCRETE SIDEWALK. CCTV CONTRACTORS SHALL BE PACP 6.0, OR ABOVE, CERTIFIED PER OPS.MUNI 406 AND PROVIDE THREE (3) COPIES OF THE VIDEOS AND REPORTS IN DIGITAL VIDEO AND PDF FORMATS TO THE ENGINEER PRIOR TO THE RELEASE OF SITE SECURITIES. ALL TIPPING FEES SHALL BE CARRIED BY THE CONTRACTOR.
54. UPON REVIEW OF THE CCTV REPORTS THE CONTRACTOR MAY BE REQUESTED TO PERFORM AN AIR TEST ON ALL STORM AND SANITARY SEWERS IN ACCORDANCE WITH OPSS MUNI 441. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS PRIOR TO CONDUCTING THE AIR TEST. THE AIR TEST SHALL NOT BE INITIATED WITHOUT THE ENGINEER ON SITE. THE AIR TEST PLACEMENT SHALL BE CONDUCTED PRIOR TO THE PLACEMENT OF ASPHALT, CURB OR CONCRETE SIDEWALKS AND PRIOR TO THE RELEASE OF SITE SECURITIES.
55. UPON REVIEW OF THE CCTV REPORTS THE CONTRACTOR MAY BE REQUIRED TO PERFORM A DEFLECTION TEST ON THE STORM AND SANITARY SEWERS. THE DEFLECTION TEST IS TO BE IN ACCORDANCE WITH OPSS 410. THE CONTRACTOR SHALL NOTIFY THE ENGINEER A MINIMUM OF 48 HOURS PRIOR TO CONDUCTING THE DEFLECTION TEST. THE DEFLECTION TEST SHALL NOT BE INITIATED WITHOUT THE ENGINEER ON SITE. THE CONTRACTOR SHALL SUBMIT THREE (3) COPIES OF THE REPORTS TO THE ENGINEER.
56. GENERAL CONTRACTOR TO PROVIDE AS CONSTRUCTED DRAWINGS OF ALL SITE SERVICE INSTALLATION WORKS INCLUDING STRUCTURE LOCATIONS, PIPE LENGTH, DIAMETER, PIPE MATERIAL, ALL PIPE AND STRUCTURE INVERTS AND AN AS–BUILT DRAWING OF ALL PROPOSED ELEVATIONS ON THE DRAWING TO THE ENGINEER.

OPSS LIST

No.	DESCRIPTION	REVISION DATE
201	CONSTRUCTION SPECIFICATION FOR CLEARING GRUBBING AND REMOVAL OF SURFACE AND PILED BOULDERS	NOVEMBER 2011
206	CONSTRUCTION SPECIFICATION FOR GRADING	NOVEMBER 2013
310	CONSTRUCTION SPECIFICATION FOR HOT MIX ASPHALT	NOVEMBER 2017
314	CONSTRUCTION SPECIFICATION FOR UNTREATED GRANULAR SUB–BASE, SURFACE, SHOULDER, AND STOCK PILING	NOVEMBER 2015
351	CONSTRUCTION SPECIFICATION FOR CONCRETE SIDEWALK	NOVEMBER 2015
401	TRENCHING BACKFILL AND COMPACTING	NOVEMBER 2015
410	PIPE SEWER INSTALLATION IN OPEN CUT	NOVEMBER 2015
441	WATER MAIN INSTALLATION IN OPEN CUT	NOVEMBER 2016
442	CORROSION PROTECTION FOR BOTH NEW AND EXISTING WATER MAIN	NOVEMBER 2016
492	CONSTRUCTION SPECIFICATION FOR SITE RESTORATION FOLLOWING INSTALLATION OF PIPELINES, UTILITIES, AND ASSOCIATED STRUCTURES.	NOVEMBER 2018
501	COMPACTING	NOVEMBER 2014
532/710	PAVEMENT MARKING	NOVEMBER 2010
543/706	TRAFFIC CONTROL AND SIGNING	NOVEMBER 2016
802	TOPSOIL	NOVEMBER 2010
803	SODDING	APRIL 2018
805	TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES	NOVEMBER 2018

OPSD LIST

No.	REV.	DESCRIPTION	REVISION DATE
219.110	2	LIGHT DUTY SILT FENCE	NOVEMBER 2015
401.010	4	MAINTENANCE HOLE FRAME AND GRATE (TYPE 'A')	NOVEMBER 2018
401.081	1	CATCH BASIN FRAME AND GRATE (FISH TYPE)	NOVEMBER 2015
405.010	3	MAINTENANCE HOLE STEPS	NOVEMBER 2018
600.110 (MODIFIED)	1	CONCRETE BARRIER CURB	NOVEMBER 2012
608.010	2	CURB TRANSITION	NOVEMBER 2012
701.010	5	PRECAST CONCRETE MAINTENANCE HOLE – 1200mm	NOVEMBER 2014
701.021	4	MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES	NOVEMBER 2014
701.030	4	PRECAST CONCRETE MANHOLE COMPONENTS – 1200mm	NOVEMBER 2014
705.010	3	600x600 PRECAST CONCRETE CATCH BASIN	NOVEMBER 2014
802.010 (MODIFIED)	3	FLEXIBLE PIPE EMBEDMENT MODIFICATION AND BACKFILL, EARTH EXCAVATION	APRIL 2015
809.010	4	PERFORATED PIPE SUBDRAIN INSTALLATION	NOVEMBER 2018
1109.011	2	CATHODIC PROTECTION FOR PVC WATER MAIN SYSTEMS	NOVEMBER 2015

KEY PLAN

LEGEND

- ASPHALT TO BE REMOVED
- GRAVEL TO BE REMOVED
- CONCRETE TO BE REMOVED
- TYPICAL ILLUSTRATION FOR REMOVAL
- TYPICAL ILLUSTRATION FOR REMOVAL
- PROPOSED HEAVY DUTY ASPHALT
- PROPOSED MEDIUM DUTY ASPHALT
- PROPOSED LIGHT DUTY ASPHALT
- PROPOSED CONCRETE
- PROPOSED GRAVEL/RIP–RAP
- PROPOSED GRASS/LANDSCAPED
- EX./PR. SIDEWALK
- EX./PR. BUILDING
- EX./PR. EDGE OF PAVEMENT
- EX./PR. CURB
- EX./PR. ROAD CENTERLINE
- EX./PR. EDGE OF SHOULDER/GRAVEL
- EX./PR. SANITARY MANHOLE
- EX./PR. CATCH BASIN MANHOLE
- EX./PR. STORM MANHOLE
- EX./PR. CATCH BASIN
- EX./PR. DOUBLE CATCH BASIN
- EX./PR. FIRE HYDRANT
- EX./PR. WATER VALVE
- EX./PR. LIGHT STANDARD
- EXISTING HYDRO POLE
- EXISTING BELL POLE
- EXISTING POLE ANCHOR
- EX. BELL/CABLE PEDESTAL
- EX./PR. ELEVATION
- PROPOSED GRADE
- EXISTING GASMAIN
- EX. OVERHEAD BELL
- EX. UNDERGROUND BELL
- EX. OVERHEAD HYDRO
- EX. UNDERGROUND HYDRO
- EX. UNDERGROUND CABLE
- EX. HYDRO MH
- EX. BELL MH
- EX. GAS VALVE
- EX./PR. CULVERT
- EX./PR. DITCH
- EX./PR. STORM SEWER
- EX./PR. SANITARY SEWER
- EX./PR. WATERMAIN
- EX./PR. STORM SERVICE
- EX./PR. SANITARY SERVICE
- EX./PR. WATER SERVICE
- EX./PR. FENCE
- R.O.W
- PROPERTY LINE
- EXISTING VEGETATION
- EX./PR. CONTOUR
- EXISTING RAILWAY
- EX./PR. GUIDERAIL
- EXISTING EDGE OF WATER/STREAM
- EX./PR. SIGN
- EXISTING SHRUB
- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- BENCHMARK
- PROPOSED RETAINING WALL
- DEVELOPMENT BOUNDARY
- LOT DIMENSIONS(m)
- PROPOSED SANITARY DRAINAGE BOUNDARY
- PROPOSED DRAINAGE AREA IN HECTARES
- No. OF UNITS
- PROPOSED STORM DRAINAGE BOUNDARY
- PROPOSED DRAINAGE AREA IN HECTARES
- RUNOFF CO–EFFICIENT
- PROPOSED SILT FENCE
- PROPOSED CONSTRUCTION FENCE
- TOPSOIL STOCKPILE AREA
- PROPOSED MUD MAT
- PROPOSED ROCK CHECK DAM
- PROPOSED TURBIDITY CURTAIN
- PROPOSED STRAW BALE CHECK DAM
- EXISTING BOREHOLE
- LIMIT OF ENGINEERED FILL
- PROPOSED PIPE INSULATION
- OVERLAND FLOW ROUTE
- 5 YEAR PONDING
- 100 YEAR PONDING
- PROPOSED FISH SCREEN
- PROPOSED PUMP
- PROPOSED COFFERDAM
- EXISTING FLOOD LINE
- PROPOSED FLOODLINE
- EXISTING REGULATORY FLOODPLAIN
- PROPOSED FLOOD LINE AREA

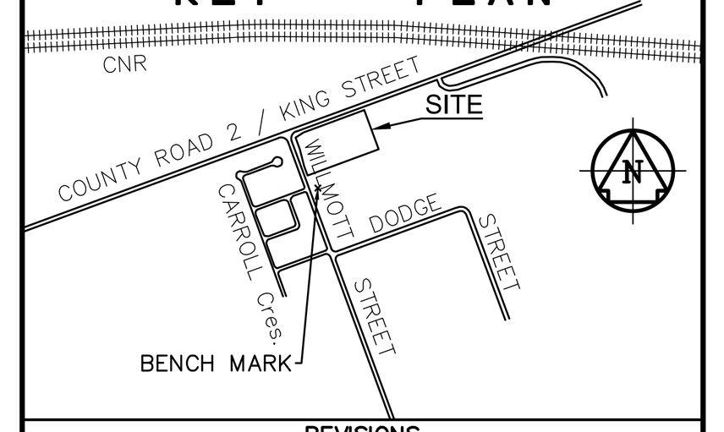
CIVIL DRAWING LIST

SHT #	DRAWING TITLE	REV.	REV. DATE
1	LOCATION, GENERAL NOTES AND LEGEND	2	19/11/2019
2	EROSION AND SEDIMENT CONTROL PLAN	2	19/11/2019
3	SITE GRADING PLAN	2	19/11/2019
4	SITE SERVICING PLAN	2	19/11/2019
5	DETAILS	2	19/11/2019
6	STORM WATER MANAGEMENT DETAILS	2	19/11/2019

BM1 – 88.044
BENCHMARK No. 30, COBOURG. CROSS CUT ON DIAMOND HEAD SIGN BASE AT 210 WILLMOTT STREET

TRUE NORTH

KEY PLAN



REVISIONS

No.	Description	Date
2	SPA 2nd SUBMISSION	13/12/19
1	SPA 1st SUBMISSION	18/11/18

METRIC Dimensions are in METRES and/or MILLIMETRES unless otherwise shown

LEGEND TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

LICENSED PROFESSIONAL ENGINEER
D.A. KEAY
90446865
12/13/19
PROVINCE OF ONTARIO

WILLS
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Project Name/Location

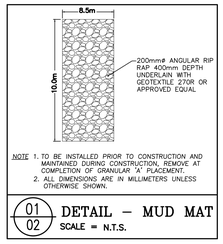
545 KING STREET EAST GOLDMANCO

COBOURG, ONTARIO

Drawing Title

LOCATION, GENERAL NOTES AND LEGEND

Drawn By: K.W.P.	SCALE: Horz. – Vert. –		
Designed By: K.W.P.	Plot Date: 12/13/2019		
Checked By: J.D.F.	Project No.: 18–10846	Sht. No.:	
Engineer: D.A.K.	Dwg File No.: 10846 – GNDT	01	



NOTE 1. TO BE INSTALLED PRIOR TO CONSTRUCTION AND MAINTAINED DURING CONSTRUCTION, REMOVE AT COMPLETION OF GRANULAR 'A' PLACEMENT.
2. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

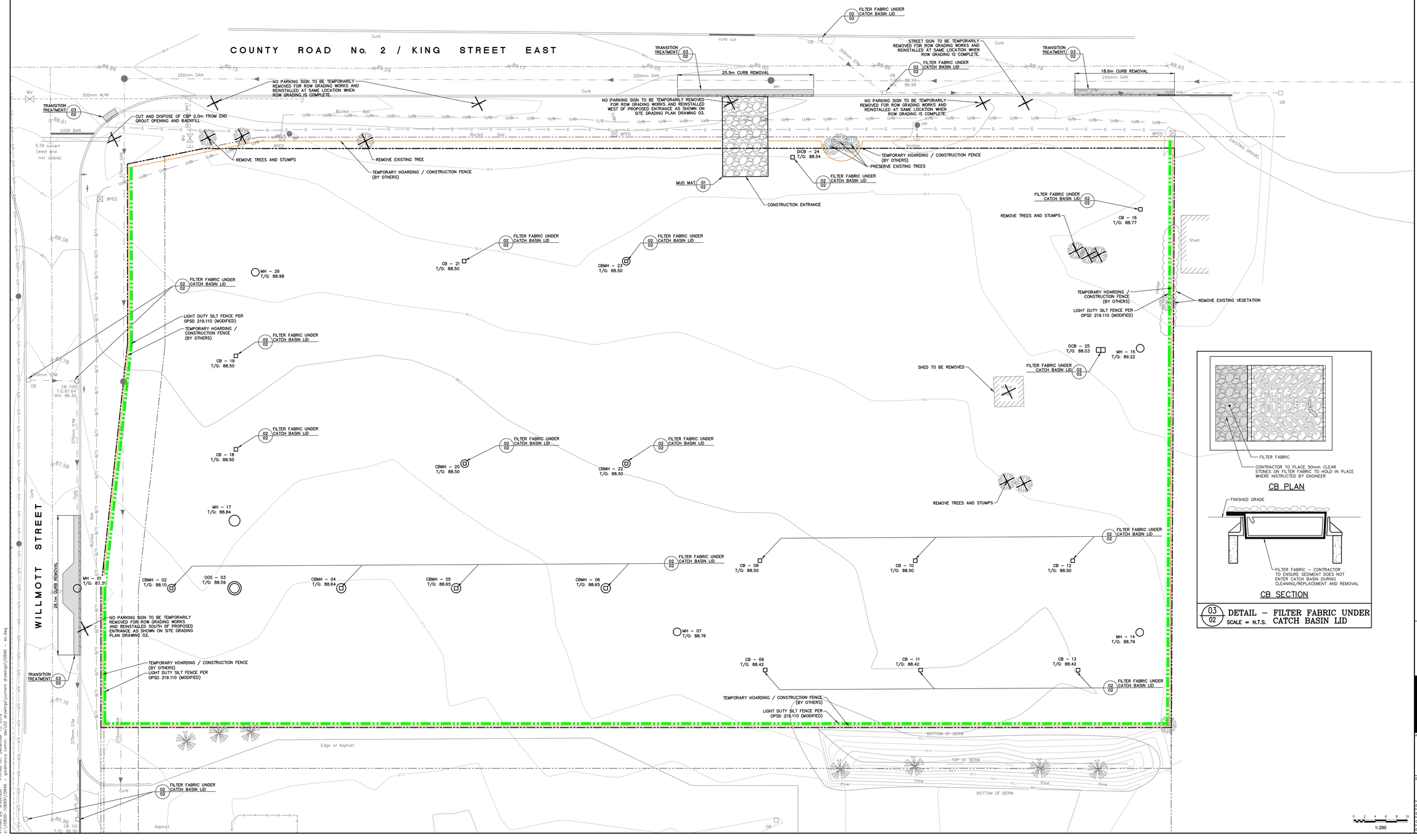
01/02 DETAIL – MUD MAT
SCALE = N.T.S.

NOTES:

1. ALL COSTS IN RELATION TO THE RESTORATION OF THE RIGHT OF WAY SHALL BE THAT OF THE APPLICANT.
2. RESPECTING ALL WORK WITHIN THE MUNICIPAL RIGHT OF WAY, THE CONTRACTOR IS TO PROVIDE AT LEAST 48 HOURS PRIOR NOTICE TO THE PUBLIC WORKS DEPARTMENT.
3. ALL WORK COMPLETED IN THE ROAD ALLOWANCE, INCLUDING RESTORATION, MUST BE PERFORMED UNDER TOWN OF COBOURG FIELD STAFF DIRECTION.
4. ALL WORKS WITHIN THE TOWN RIGHT-OF-WAY REQUIRE FULL TIME INSPECTION BY THE DEVELOPER'S ENGINEER (D.M. WILLS). THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 48 HOURS PRIOR TO WORK ON THE RIGHT-OF-WAY.

EROSION AND SEDIMENT CONTROL

1. ALL NEW CATCHBASINS ON SITE SHALL HAVE FILTER FABRIC PLACED UNDER THE LID, IMMEDIATELY AFTER INSTALLATION, TO CONTROL ANY SILT THAT MAY ENTER THE STORM SEWER – REFER TO DETAIL 02 ON SHEET 04. THE CONTRACTOR SHALL ENSURE THE FILTER FABRIC IS NOT 'SEALED' IN PLACE DURING THE PLACEMENT OF ASPHALT. ALL FILTER FABRIC IS TO BE MAINTAINED BY THE CONTRACTOR. THE CONTRACTOR SHALL REMOVE ALL FILTER FABRIC UPON COMPLETION OF THE PROJECT OR AFTER BEING NOTIFIED BY THE ENGINEER (D.M. WILLS).
2. ALL TEMPORARY SILTATION CONTROL DEVICES ARE TO BE PLACED BEFORE CONSTRUCTION STARTS AND MAINTAINED THROUGHOUT CONSTRUCTION. CONTROL DEVICES SHALL BE REMOVED ONCE ALL CONSTRUCTION HAS BEEN COMPLETED, ALL VEGETATION HAS BEEN ESTABLISHED AND AT THE DIRECTION OF THE ENGINEER (D.M. WILLS).
3. CONTRACTOR TO PLACE A "MUDMAT" AS INDICATED ON THE SEDIMENT AND EROSION CONTROL PLAN, AT THE CONSTRUCTION ENTRANCE IDENTIFIED. IF THE CONTRACTOR UTILIZES ANY OTHER ENTRANCES AS A CONSTRUCTION ENTRANCE, IT IS THE CONTRACTORS RESPONSIBILITY TO CONSTRUCT A MUD MAT, AS PER MUD-MAT DETAIL 01 ON SHEET 02, AT EACH ENTRANCE AND MAINTAIN THE MUD MAT THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING AND CLEANING THE MUD MAT TO ENSURE NO DEBRIS IS TRACKED ONTO THE TOWN STREETS. ANY DEBRIS TRACKED ONTO CITY STREETS SHALL BE POWER SWEPT AT THE END OF EACH DAY. AT THE END OF EACH WORK WEEK (FRIDAYS), IN ADDITION TO THE POWER SWEEPING THE CONTRACTOR SHALL POWER WASH THE TOWN STREET AND CLEAN THE CONSTRUCTION ACCESS (RIP RAP) ON SITE PROPERTY.
4. LIGHT-DUTY SILT FENCING WILL BE AS PER OPSD 219.110 (MODIFIED). THE PROPOSED SILT FENCE MUST BE INSPECTED AFTER EVERY RAINFALL TO IDENTIFY FAILED SECTIONS. ANY FAILURES MUST BE REPAIRED IMMEDIATELY. WHEN SEDIMENT ACCUMULATES TO HALF THE HEIGHT OF THE GEOTEXTILE IT IS TO BE REMOVED AND DISPOSED OF IN A CONTROLLED AREA. A SUPPLY OF SILT FENCE IS TO BE KEPT ON SITE TO PROVIDE FOR QUICK REPAIRS OR THE INSTALLATION OF ADDITIONAL FENCE IF REQUIRED.



03/02 DETAIL – FILTER FABRIC UNDER CATCH BASIN LID
SCALE = N.T.S.

BM1 – 88.044
BENCHMARK No. 55, COBOURG, BENCH CUT ON DIAMOND HEAD SIGN BASE AT 210 WILLMOTT STREET

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
2	SPA 2nd SUBMISSION	13/12/19
1	SPA 1st SUBMISSION	18/11/18

METRIC Dimensions are in METRES and/or MILLIMETRES unless otherwise shown.
LEGEND TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

REFER TO SHEET 01

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Project Name/Location
545 KING STREET EAST
GOLDMANCO
COBOURG, ONTARIO

Drawing Title
EROSION AND SEDIMENT CONTROL PLAN

Drawn By: K.W.P.	SCALE: Horz. 1:250 Vert. –		
Designed By: K.W.P.	Plot Date: 12/13/2019		
Checked By: J.D.F.	Project No.: 18-10846	Sht. No.:	
Engineer: D.A.K.	Dwg File No.: 10846 – EC	02	

1:250

Printed By: srobinson Printed On: December 13, 2019
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NOTES:

1. ALL COSTS IN RELATION TO THE RESTORATION OF THE RIGHT OF WAY SHALL BE THAT OF THE APPLICANT.
2. RESPECTING ALL WORK WITHIN THE MUNICIPAL RIGHT OF WAY, THE CONTRACTOR IS TO PROVIDE AT LEAST 48 HOURS PRIOR NOTICE TO THE UTILITY SERVICES DEPARTMENT.
3. THE CONTRACTOR MUST OBTAIN A ROAD OCCUPANCY AND/OR CUT PERMIT FOR ANY WORK BEING UNDERTAKEN IN THE MUNICIPAL ROAD ALLOWANCE.
4. ALL WORK COMPLETED IN THE ROAD ALLOWANCE, INCLUDING RESTORATION, MUST BE PERFORMED UNDER CITY OF PETERBOROUGH FIELD STAFF DIRECTION.

BM1 – 88.044
BENCHMARK No. 55 COBOURG, BENCH CUT ON DIAMOND HEAD SIGN BASE AT 210 WILLMOTT STREET

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
2	SPA 2nd SUBMISSION	13/12/19
1	SPA 1st SUBMISSION	18/11/18

METRIC — Dimensions are in METRES and/or MILLIMETRES unless otherwise shown

LEGEND — TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

COUNTY ROAD No. 2 / KING STREET EAST

WILLMOTT STREET

BLDG 'C'
1 STOREY
FFE: 89.30

BLDG 'A'
1 STOREY RETAIL
GFA: 3,520m²
FFE: 89.23

BLDG 'B1'
1 STOREY RETAIL
GFA: 840.0m²
FFE: STEPPED

BLDG 'B2'
1 STOREY RETAIL
GFA: 840.m²
FFE: 89.00

FUTURE BLDG EXPANSION

LOADING

Metal Shed

Shed

Pine

Hydrant

Asphalt

Curb

Edge of Asphalt

BOTTOM OF BERM

TOP OF BERM

EXISTING GRAVEL

EXPOSED FOUNDATION WALL – STRUCTURAL ENGINEER TO INCREASE DEPTH OF FOOTING TO PROVIDE ADEQUATE FROST PROTECTION

LIMIT OF BLACK VINYL CHAINLINK FENCE.

GARBAGE ENCLOSURE (REFER TO ARCHITECTURAL DRAWINGS)

1.20m BLACK VINYL CHAIN LINK FENCE

NEW BLACK VINYL CHAINLINK FENCE TO TERMINATE IMMEDIATELY ADJACENT TO EXISTING FENCE.

LIMIT OF RETAINING WALL

LIMIT OF GRADING

0 2 4 6 8 10
1:250

LICENSED PROFESSIONAL ENGINEER
D.A. KAY
90566566
12/13/19
PROVINCE OF ONTARIO

WILLS
D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Project Name/Location

545 KING STREET EAST
GOLDMANCO
COBOURG, ONTARIO

Drawing Title

SITE GRADING PLAN

Drawn By: K.W.P.	SCALE: Horz. 1:250	Vert. –	
Designed By: K.W.P.	Plot Date: 12/13/2019		
Checked By: J.D.F.	Project No.: 18-10846	Sht. No.:	
Engineer: D.A.K.	Dwg File No.: 10846 – GP	03	

Printed By: srobinson
Printed On: December 13, 2019
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NOTES:

1. ALL COSTS IN RELATION TO THE RESTORATION OF THE RIGHT OF WAY SHALL BE THAT OF THE APPLICANT.
2. RESPECTING ALL WORK WITHIN THE MUNICIPAL RIGHT OF WAY, THE CONTRACTOR IS TO PROVIDE AT LEAST 48 HOURS PRIOR NOTICE TO THE UTILITY SERVICES DEPARTMENT.
3. THE CONTRACTOR MUST OBTAIN A ROAD OCCUPANCY AND/OR CUT PERMIT FOR ANY WORK BEING UNDERTAKEN IN THE MUNICIPAL ROAD ALLOWANCE.
4. ALL WORK COMPLETED IN THE ROAD ALLOWANCE, INCLUDING RESTORATION, MUST BE PERFORMED UNDER CITY OF PETERBOROUGH FIELD STAFF DIRECTION.

COUNTY ROAD No. 2 / KING STREET EAST

CONTRACTOR TO UNCOVER EXISTING WATER STUB AND CONFIRM SIZE WITH THE ENGINEERING PRIOR TO COMMENCEMENT OF CONSTRUCTION

WILLMOTT STREET

BLDG 'C'
1 STOREY
FFE: 89.30

BLDG 'A'
1 STOREY RETAIL
GFA: 3,520m²
FFE: 89.23

BLDG 'B1'
1 STOREY RETAIL
GFA: 840.0m²
FFE: STEPPED

BLDG 'B2'
1 STOREY RETAIL
GFA: 840.m²
FFE: 89.00

FUTURE BLDG EXPANSION

LOADING

INSPECTION ACCESS POINT INTO UNDERGROUND STORAGE SYSTEM

MC-3500 UNDERGROUND STORAGE

PYLON SIGN

TRANSFORMER (REFER TO ELECTRICAL DRAWINGS)

FIRE DEPARTMENT CONNECTION

FORCEMAIN REFER TO MECHANICAL

DOUBLE CATCH BASIN TO BE CONNECTED INTO BUILDING MECHANICAL ENGINEER TO SPEC PUMP AND CHAMBERS

WATERMAIN CONNECTION TO BUILDING 04 05 INV. = 87.40

INSTALL SANITARY MH – 202 ON EXISTING 375mm⌀ SANITARY SEWER AND REBENCH

CONNECT TO EXISTING WATERMAIN USING A 200mm⌀ TAPPING SLEEVE AND VALVE

INSTALL STORM MH – 01 ON EXISTING 375mm⌀ STORM SEWER

INSTALL SANITARY MH – 200 ON EXISTING 375mm⌀ SANITARY SEWER AND RE-BENCH

WATERMAIN CONNECTION TO BUILDING 04 05 INV. = 86.40

WATERMAIN CONNECTION TO BUILDING 04 05 INV. = 86.83

ORIFICE PLATE/ 13 180mm – INV. 86.90 06

ORIFICE PLATE/ 13 75mm – INV. 88.08 06

HYDRANT VALVE SET
150mm WAT
150mm VALVE
200x150mm REDUCER
200x200x 200mm TEE
200mm VALVE

MH – 01 T/G: 87.31
MH – 200 T/G: 87.70
MH – 201 T/G: 88.37
MH – 202 T/G: 88.79
MH – 203 T/G: 88.70
MH – 26 T/G: 88.98
MH – 17 T/G: 88.84
MH – 07 T/G: 88.76
MH – 14 T/G: 88.79
MH – 15 T/G: 89.22

CB – 19 T/G: 88.50
CB – 18 T/G: 88.50
CB – 21 T/G: 88.50
CBMH – 23 T/G: 88.50
CBMH – 20 T/G: 88.50
CBMH – 22 T/G: 88.50
CBMH – 02 T/G: 88.10
CBMH – 04 T/G: 88.64
CBMH – 05 T/G: 88.65
CBMH – 06 T/G: 88.65
DCB – 24 T/G: 88.54
DCB – 25 T/G: 88.03
DCB – 03 T/G: 88.59
CB – 08 T/G: 88.50
CB – 10 T/G: 88.50
CB – 12 T/G: 88.50
CB – 16 T/G: 88.77
CB – 09 T/G: 88.42
CB – 11 T/G: 88.42
CB – 13 T/G: 88.42
CB 100 T/G:87.64 INV. 86.30
CB 101 T/G: 86.90 INV. 85.42

STRUCTURE SUBDRAIN 11 05

PIPE INSULATION 10 05

STOP BAR

Edge of Asphalt
BOTTOM OF BERM
TOP OF BERM
BOTTOM OF BERM
Pine
Pine
Pine
Pine
Asphalt
Asphalt
EXISTING GRAVEL
Shed
Hydrant
Hydrant
Curb
Buried Gas
Buried Rail
Anchor

0 2 4 6 8 10
1:250

BM1 – 88.044
BENCHMARK No. 30, COBOURG, CROSS CUT ON DIAMOND HEAD SIGN BASE AT 210 WILLMOTT STREET

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
2	SPA 2nd SUBMISSION	13/12/19
1	SPA 1st SUBMISSION	18/11/18

METRIC — Dimensions are in METRES and/or MILLIMETRES unless otherwise shown

LEGEND — TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

REFER TO SHEET 01

LICENSED PROFESSIONAL ENGINEER
D.A. McKAY
90439566
12/13/19
PROVINCE OF ONTARIO

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Canada K9J 0B9
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F. 705.741.3568
E. wills@dmwills.com

Project Name/Location

545 KING STREET EAST
GOLDMANCO
COBOURG, ONTARIO

Drawing Title

SITE SERVICING PLAN

Drawn By: K.W.P.	SCALE: Horz. 1: 250	Vert. –	
Designed By: K.W.P.	Plot Date: 12/13/2019		
Checked By: J.D.F.	Project No.: 18–10846	Sht. No.:	
Engineer: D.A.K.	Dwg File No.: 10846 – SS	04	

Printed By: srobinson Printed On: December 13, 2019
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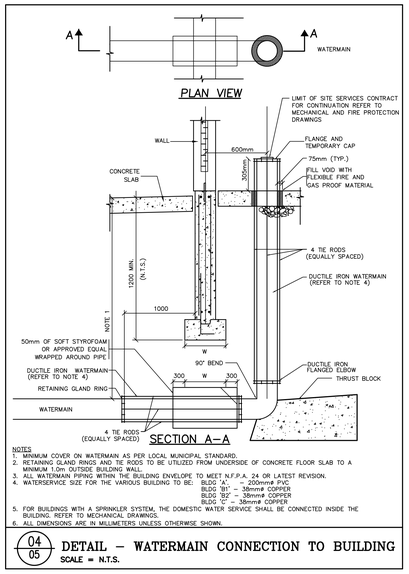
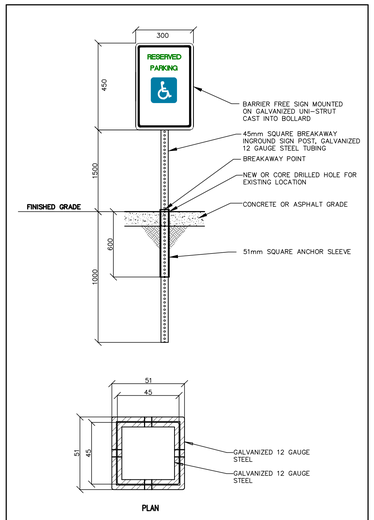
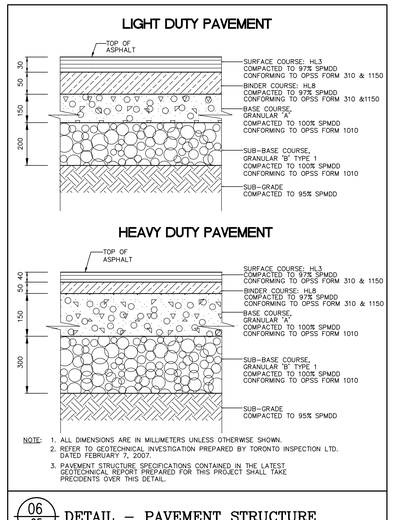


NOTES
1. MINIMUM COVER ON WATERMAIN AS PER LOCAL MUNICIPAL STANDARD.
2. RETAINING GLAND RINGS AND TIE RODS TO BE UTILIZED FROM UNDERSIDE OF CONCRETE FLOOR SLAB TO A MINIMUM 1.0m OUTSIDE BUILDING WALL.
3. ALL WATERMAIN PIPING WITHIN THE BUILDING ENVELOPE TO MEET N.F.P.A. 24 OR LATEST REVISION.
4. WATERSERVICE SIZE FOR THE VARIOUS BUILDING TO BE:
   BLDG 'A' – 200mm# PVC
   BLDG 'B1' – 38mm# COPPER
   BLDG 'B2' – 38mm# COPPER
   BLDG 'C' – 38mm# COPPER
5. FOR BUILDINGS WITH A SPRINKLER SYSTEM, THE DOMESTIC WATER SERVICE SHALL BE CONNECTED INSIDE THE BUILDING. REFER TO MECHANICAL DRAWINGS.
6. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

04/05 DETAIL – WATERMAIN CONNECTION TO BUILDING
SCALE = N.T.S.

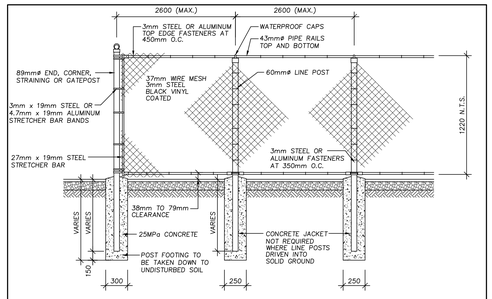


05/05 DETAIL – SIGN INSTALLATION IN ASPHALT OR CONCRETE
SCALE = N.T.S.



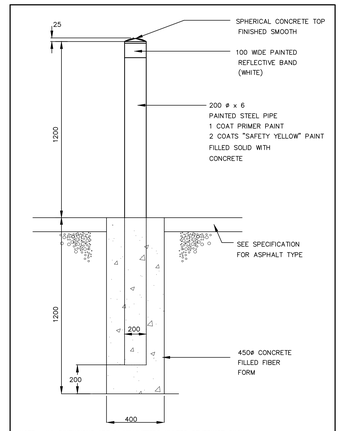
NOTE:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
2. REFER TO GEOTECHNICAL INVESTIGATION PREPARED BY TORONTO INSPECTION LTD. DATED FEBRUARY 7, 2007.
3. PAVEMENT STRUCTURE SPECIFICATIONS CONTAINED IN THE LATEST GEOTECHNICAL REPORT PREPARED FOR THIS PROJECT SHALL TAKE PRECEDENTS OVER THIS DETAIL.

06/05 DETAIL – PAVEMENT STRUCTURE
SCALE = N.T.S.



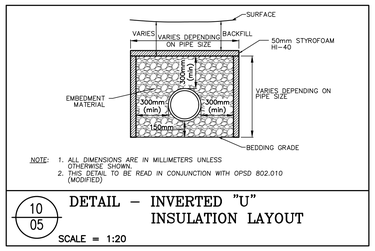
NOTES:
1. ALL FABRIC SHALL BE 3mm KNUCKLED AT TOP AND BOTTOM AND BLACK VINYL COATED
2. ALL POSTS AND RAILS SHALL BE GALVANIZED STEEL PIPE "STANDARD WEIGHT" CONFORMING TO CURRENT SPECIFICATIONS FOR BLACK AND HOT DIPPED ZINC COATED (GALVANIZED) WELDED AND SEAMLESS PIPE FOR ORDINARY USES, ASTM DESIGNATION A120.
3. ALL REQUIRED FITTINGS AND HARDWARE SHALL BE OF A SUITABLE ALUMINUM ALLOY OR OF A STEEL DUCTILE IRON TO ASTM SPECIFICATION A152.
4. MINIMUM REQUIREMENTS FOR ZINC COATING:
   WIRE 0.5 kg/m²
   POSTS AND RAIL 0.5 kg/m²
   FRAME AND BRACES 0.5 kg/m²
   CAST FITTINGS 0.6 kg/m
   OTHER FITTINGS 0.6 kg/m
5. POSTS TO BE SET IN CONCRETE TO 1200mm DEPTH MIN.
6. AS AN ALTERNATIVE , THE POSTS MAY BE CORE DRILLED INTO THE TOP OF THE PRECAST RETAINING WALL. REFER TO PRECAST WALL MANUFACTURER'S SPECIFICATION.

07/05 DETAIL – BLACK VINYL COATED CHAIN LINK FENCE
SCALE = N.T.S.



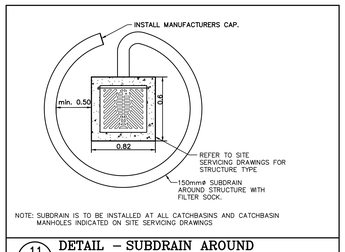
NOTE: ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

08/05 DETAIL – BOLLARD
SCALE = N.T.S.



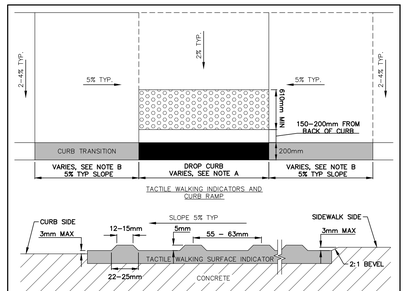
NOTE: 1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN
2. THIS DETAIL TO BE READ IN CONJUNCTION WITH OPSD 802.010 (MODIFIED)

10/05 DETAIL – INVERTED "U" INSULATION LAYOUT
SCALE = 1:20



NOTE: SUBDRAIN IS TO BE INSTALLED AT ALL CATCHBASINS AND CATCHBASIN MANHOLES INDICATED ON SITE SERVICING DRAWINGS

11/05 DETAIL – SUBDRAIN AROUND STORM STRUCTURES
SCALE = N.T.S.



NOTES:
A. 1.5m MINIMUM WIDTH AND AS INDICATED ON DRAWING.
B. 1.2m MINIMUM TRANSITIONS BETWEEN FULL HEIGHT CURB AND 120mm DROPPED CURB, 0.45m MINIMUM FOR TRANSITIONS BETWEEN 120mm DROPPED CURB AND 75mm DROPPED CURB

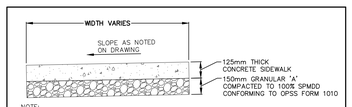
09/05 DETAIL – TACKTILE WALKING SURFACE INDICATOR AND DEPRESSED SIDEWALK
SCALE = N.T.S.

NOTES:
1 Where sidewalk is continuously adjacent, the dropped curb at entrances shall be reduced to 75mm.
2 For slipforming procedure, a 5% batter is acceptable.
A Treatment at entrances shall be according to OPSD 351.010.
B Outlet treatment shall be according to the OPSD 610 Series.
C The transition from one curb type to another shall be a minimum length of 3.0m, except in conjunction with guide rail where it shall be according to the OPSD 900 Series.
D All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2012	Rev 2
CONCRETE BARRIER CURB (PRIVATE SITES)	MODIFIED (WILLS) OCTOBER 01, 2017	
	OPSD 600.110	

NOTE:
A All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 2
LIGHT-DUTY SILT FENCE BARRIER	MODIFIED FEBRUARY 01, 2016	
	OPSD 219.110	



NOTE:
1. SIDEWALK CONCRETE SHALL BE NORMAL PORTLAND GU, 32 MPa, C-2

12/05 DETAIL – CONCRETE SIDEWALK
SCALE = 1:20

STORM SEWER INVERTS						
STRUCTURE NAME:	TYPE	T/G	INVERTS	OPSD # STRUCTURE	OPSD # GRATE	COMMENT
MH – 01	STM	87.31	INV IN = N 85.88 INV IN = E 85.90 INV OUT = S 85.88	701.010	401.010(A)	BENCHED
CBMH – 02	STM	88.10	INV IN = E 86.10 INV IN = NE 86.10 INV OUT = W 86.08	701.010	401.081	75mm ORIFICE ON EAST INLET 300mm SUMP
OGS – 03	STM	88.59	INV IN = E 86.24 INV IN = N 86.24 INV OUT = W 86.16	MANUF.	401.010(A)	STC 6000 75mm ORIFICE PLATE ON OUTLET PIPE
CBMH – 04	STM	88.64	INV IN = E 86.36 INV IN = S 86.40 INV OUT = N 86.45 INV OUT = W 86.34	701.011	401.081	300mm SUMP 1500 MANHOLE
CBMH – 05	STM	88.65	INV IN = E 86.49 INV IN = N 86.52 INV OUT = W 86.47	701.011	401.081	600mm SUMP 1500 MANHOLE
CBMH – 06	STM	88.65	INV IN = E 86.67 INV IN = N 86.69 INV IN = S 86.69 INV OUT = W 86.63	701.011	401.081	300mm SUMP 1500 MANHOLE
MH – 07	STM	88.76	INV IN = E 86.77 INV OUT = W 86.75	701.010	401.081	BENCHED
TEE – 08	STM	–	INV IN = E 86.84 INV IN = N 86.84 INV OUT = W 86.84	701.010	401.081	
CB – 08	STM	88.50	INV OUT = S 87.11	705.010	401.081	
TEE – 09	STM	–	INV IN = E 86.85 INV IN = S 86.85 INV OUT = W 86.85	–	–	
CB – 09	STM	88.42	INV OUT = N 87.02	705.010	401.081	
TEE – 10	STM	–	INV IN = E 86.99 INV IN = N 86.99 INV OUT = W 86.99	–	–	
CB – 10	STM	88.50	INV OUT = S 87.12	705.010	401.081	
TEE – 11	STM	–	INV IN = E 87.00 INV IN = S 87.00 INV OUT = W 87.00	–	–	
CB – 11	STM	88.42	INV OUT = N 87.06	705.010	701.081	
TEE – 12	STM	–	INV IN = N 87.13 INV IN = E 87.13 INV OUT = W 87.13	–	–	
CB – 12	STM	88.50	INV OUT = S 87.27	705.010	401.081	
TEE – 13	STM	–	INV IN = E 87.14 INV IN = S 87.14 INV OUT = W 87.14	–	–	
CB – 13	STM	88.42	INV OUT = N 87.21	705.010	401.081	
MH – 14	STM	88.79	INV IN = N 87.26 INV OUT = W 87.20	701.010	401.010(A)	BENCHED
MH – 15	STM	89.22	INV IN = N 87.54 INV IN = NW 87.56 INV OUT = S 87.52	701.010	401.010(A)	BENCHED
CB – 16	STM	88.77	INV OUT = S 87.67	705.010	701.081	
MH – 17	STM	88.84	INV IN = N 86.51 INV IN = E 86.90 INV OUT = W 86.96 INV OUT = S 86.49	705.010	401.010(A)	BENCHED 180mm ORIFICE PLATE ON W OUTLET
CB – 18	STM	88.50	INV IN = N 86.76 INV OUT = S 86.74	705.010	401.081	
CB – 19	STM	88.50	INV OUT = S 87.08	705.010	401.081	
CBMH – 20	STM	88.50	INV IN = N 86.66 INV OUT = W 86.63	701.010	401.081	300mm SUMP
CB – 21	STM	88.50	INV OUT = S 86.84	705.010	401.081	
CBMH – 22	STM	88.50	INV IN = E 86.87 INV IN = N 86.83 INV OUT = S 86.81	701.010	401.081	300mm SUMP
CBMH – 23	STM	88.50	INV IN = N 87.05 INV OUT = W 87.01	701.010	401.081	300mm SUMP
DICB – 24	STM	88.54	INV OUT = S 87.24	705.030	403.010	6:1 GRATE
DCB – 25	STM	88.03	INV OUT = SW 87.63	705.020	401.081	
MH – 26	STM	88.98	INV IN = N 87.24 INV OUT = S 86.45	701.010	401.010(A)	
MC – 3500	STM	–	INV IN = N 86.45 INV IN = S 86.45 INV OUT = W 86.90	MANUF.	MANUF.	MC-3500 UNDERGROUND STORAGE SEE SHEET 08

SANITARY SEWER INVERTS					
STRUCTURE NAME:	TYPE	T/G	INVERTS	OPSD # STRUCTURE	OPSD # GRATE	COMMENT
MH – 200	SAN	87.70	INV IN = E 82.55 INV IN = SE 86.14 INV IN = DS 82.75 INV IN = N 82.49 INV OUT = S 82.46	701.010	401.010(A)	DROP STRUCTURE (DS) ON SOUTH EAST INLET PER OPSD 1003.020
MH – 201	SAN	88.37	INV IN = E 87.74 INV IN = DS 82.66 INV IN = N 82.64 INV OUT = S 82.62	701.011	401.010(A)	DROP STRUCTURE (DS) ON EAST INVERT PER OPSD 1003.020 1500mm MANHOLE
MH – 202	SAN	88.79	INV IN = E 85.55 INV IN = S 86.37 INV IN = DS 85.59 INV OUT = W 85.53	701.010	401.010(A)	DROP STRUCTURE (DS) ON SOUTH INVERT PER OPSD 1003.020
MH – 203	SAN	88.70	INV IN = W 86.51 INV OUT = W 86.45	701.010	401.010(A)	
MH – 300	SAN	87.92	INV IN = N 82.63 INV OUT = S 82.61	–	–	
MH – 301	SAN	88.93	INV IN = N 82.92 INV IN = E 83.92 INV IN = DS 82.97 INV OUT = S 82.91	–	–	

PIPE CROSSINGS				
CROSSING	INVERT	TYPE	OBVERT	TYPE
C–01	85.92	STM	85.34	WAT
C–02	85.23	WAT	82.67	SAN
C–03	85.99	STM	82.68	SAN
C–04	86.02	STM	85.19	WAT
C–05	84.99	WAT	82.86	SAN
C–06	86.53	SAN	84.92	WAT
C–07	86.30	STM	85.79	WAT
C–08	86.30	STM	85.72	WAT
C–09	86.45	STM	85.59	WAT
C–10	86.55	STM	84.24	SAN
C–11	86.53	STM	86.03	WAT
C–12	86.61	STM	85.66	WAT
C–13	87.00	WAT	85.79	SAN
C–14	86.70	STM	85.59	WAT
C–15	86.76	STM	85.74	SAN
C–16	86.69	STM	85.79	SAN
C–17	86.02	SAN	85.11	WAT
C–18	86.95	STM	86.12	SAN
C–19	86.90	STM	84.90	WAT
C–20	87.04	STM	86.41	SAN
C–21	87.02	STM	84.19	WAT

SANITARY SEWER PIPE IDENTIFICATION									
FROM	TO	SEWER TYPE	LENGTH	SLOPE	DIA. (MM)	MATERIAL	CLASS	DETAIL NO. BACKFILL AND BEDDING	COMMENT
MH – 203	MH – 202	SAN	90.0 m	1.00%	200	PVC	DR–35	802.010 (MODIFIED)	
MH – 202	MH – 200	SAN	82.8 m	3.60%	200	PVC	DR–35	802.010 (MODIFIED)	
BLDG A	MH – 203	SAN	20.0 m	1.00%	200	PVC	DR–35	802.010 (MODIFIED)	
BLDG B1	MH – 200	SAN	6.1 m	4.20%	200	PVC	DR–35	802.010 (MODIFIED)	
BDG B2	MH – 202	SAN	3.0 m	4.00%	200	PVC	DR–35	802.010 (MODIFIED)	
BLDG C	MH – 201	SAN	11.5 m	1.40%	200	PVC	DR–35	802.010 (MODIFIED)	

STORM PIPE IDENTIFICATION								
FROM	TO	SEWER TYPE	LENGTH	SLOPE	DIA. (MM)	MATERIAL	CLASS	DETAIL NO. BACKFILL AND BEDDING	COMMENT
CB – 16	MH – 15	STM	26.1 m	0.50%	200	PVC	DR–35	802.010 (MODIFIED)	PARTIALLY INSULATE PER DETAIL 10
MH – 15	MH – 14	STM	53.2 m	0.50%	200	PVC	DR–35	802.010 (MODIFIED)	
MH – 14	MH – 07	STM	87.0 m	0.50%	450	PVC	DR–35	802.010 (MODIFIED)	
CB – 13	TEE – 13	STM	7.1 m	1.00%	200	PVC	DR–35	802.010 (MODIFIED)	PARTIALLY INSULATE PER DETAIL 10
CB – 12	TEE – 12	STM	13.5 m	1.00%	200	PVC	DR–35	802.010 (MODIFIED)	PARTIALLY INSULATE PER DETAIL 10
CB – 11	TEE – 11	STM	7.1 m	1.00%	200	PVC	DR–35	802.010 (MODIFIED)	
CB – 10	TEE – 10	STM	13.5 m	1.00%	200	PVC	DR–35	802.010 (MODIFIED)	
CB – 09	TEE – 09	STM	7.1 m	2.40%	200	PVC	DR–35	802.010 (MODIFIED)	
CB – 08	TEE – 08	STM	13.5 m	2.00%	200	PVC	DR–35	802.010 (MODIFIED)	
MH – 07	CBMH – 06	STM	15.7 m	0.50%	450	PVC	DR–35	802.010 (MODIFIED)	
CBMH – 06	CBMH – 05	STM	28.0 m	0.50%	600	CONC.	65–D	802.030	
CBMH – 05	CBMH – 04	STM	21.6 m	0.50%	600	CONC.	65–D	802.030	
CBMH – 04	OGS – 03	STM	20.0 m	0.50%	600	CONC.	65–D	802.030	
OGS – 03	CBMH – 02	STM	11.9 m	0.50%	600	CONC.	65–D	802.030	
CBMH – 02	MH – 01	STM	17.7 m	1.00%	300	PVC	DR–35	802.010 (MODIFIED)	
CB– 100	MH – 01	STM	38.9 m	1.10%	375	CONC.	–	–	
MH – 01	CB – 101	STM	43.3 m	1.10%	375	CONC.	–	–	
CB – 19	CB – 18	STM	17.5 m	1.70%	200	PVC	DR–35	802.010 (MODIFIED)	
CB – 18	MH – 17	STM	13.4 m	1.70%	250	PVC	DR–35	802.010 (MODIFIED)	
MH – 17	OGS – 03	STM	12.7 m	2.00%	250	PVC	DR–35	802.010 (MODIFIED)	
CB – 21	CBMH – 20	STM	37.7 m	0.50%	375	PVC	DR–35	802.010 (MODIFIED)	
CBMH – 20	CBMH – 05	STM	23.6 m	0.50%	450	PVC	DR–35	802.010 (MODIFIED)	
CB – 24	CBMH – 23	STM	36.8 m	0.50%	200	PVC	DR–35	802.010 (MODIFIED)	
CBMH – 23	CBMH – 22	STM	37.7 m	0.50%	300	PVC	DR–35	802.010 (MODIFIED)	
CBMH – 22	CBMH – 06	STM	23.9 m	0.50%	450	PVC	DR–35	802.010 (MODIFIED)	
DCB – 25	BLDG A	STM	1.1 m	2.00%	200	PVC	DR–35	802.010 (MODIFIED)	
CBMH – 04	MC–3500	STM	12.5 m	0.00%	300	PVC	DR–35	802.010 (MODIFIED)	
MC–3500	MH – 17	STM	3.2 m	0.00%	250	PVC	DR–35	802.010 (MODIFIED)	
MH – 17	CBMH – 02	STM	17.4 m	4.90%	375	PVC	DR–35	802.010 (MODIFIED)	
BLDG A	CBMH – 22	STM	32.9 m	2.60%	300	PVC	DR–35	802.010 (MODIFIED)	
BLDG B1	CBMH – 04	STM	5.7 m	5.80%	250	PVC	DR–35	802.010 (MODIFIED)	
BLDG B2	CBMH – 06	STM	5.7 m	2.60%	250	PVC	DR–35	802.010 (MODIFIED)	
BLDG C	MH – 26	STM	7.2 m	6.40%	200	PVC	DR–35	802.010 (MODIFIED)	
MH – 26	MC–3500	STM	2.0 m	0.00%	200	PVC	DR–35	802.010 (MODIFIED)	

NOTE:
A THIS OPSD SHALL BE READ IN CONJUNCTION WITH OPSD 400.020
B ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2015	Rev 1
CAST IRON, SQUARE FRAME FISH TYPE COVER		
	OPSD – 401.081	

NOTES:
1 Walls shall be founded on undisturbed soil having a minimum bearing capacity at ultimate limit states of 200kPa for Type I and 300kPa for Type II and Type III.
2 Excavation for toe walls shall be backfilled with free draining granular material.
3 10mm preformed joint filler, Type A, non-extruding and resilient bituminous type as specified.
4 Cold applied rubber asphalt joint sealing compound.
5 Where specified, wall drains shall be installed as per OPSD 3190.100.
6 150mm dia perforated pipe subdrain wrapped in geotextile.
A Maximum height of slope above top of wall is 4m.
B Concrete for toe walls shall be 30MPa.
C All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2010	Rev 2
WALLS RETAINING CONCRETE TOE WALL		
	OPSD 3120.100	

BM1 – 88.044
BENCHMARK No. 55, COBOURG
ELEVATION CUT ON DIAMOND HEAD SIGN BASE AT 210 WILLMOTT STREET

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
2	SPA 2nd SUBMISSION	13/12/19
1	SPA 1st SUBMISSION	18/11/18

METRIC	Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND	TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

I CERTIFY THAT: PROFESSIONAL ENGINEER
DK KEAY 100256
12/13/19
PROVINCE OF ONTARIO

WILLS

D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Project Name/Location

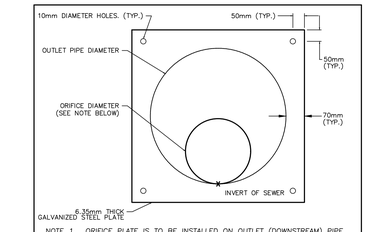
545 KING STREET EAST GOLDMANCO

COBOURG, ONTARIO

Drawing Title

DETAILS

Drawn By: K.W.P.	SCALE: Horz. –	Vert. –	
Designed By: K.W.P.	Plot Date: 12/13/2019		
Checked By: J.D.F.	Project No.: 18–10846		Sht. No.:
Engineer: D.A.K.	Dwg File No.: 10846 – GNDT		05



NOTE 1. *ORIFICE PLATE IS TO BE INSTALLED ON OUTLET (DOWNSTREAM) PIPE IN DESIGNATED STORM SEWER STRUCTURE.*
2. *ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.*
3. *PROVIDE A NEOPRENE GASKET BETWEEN ORIFICE PLATE AND STRUCTURE WALL FOR A WATERTIGHT SEAL.*

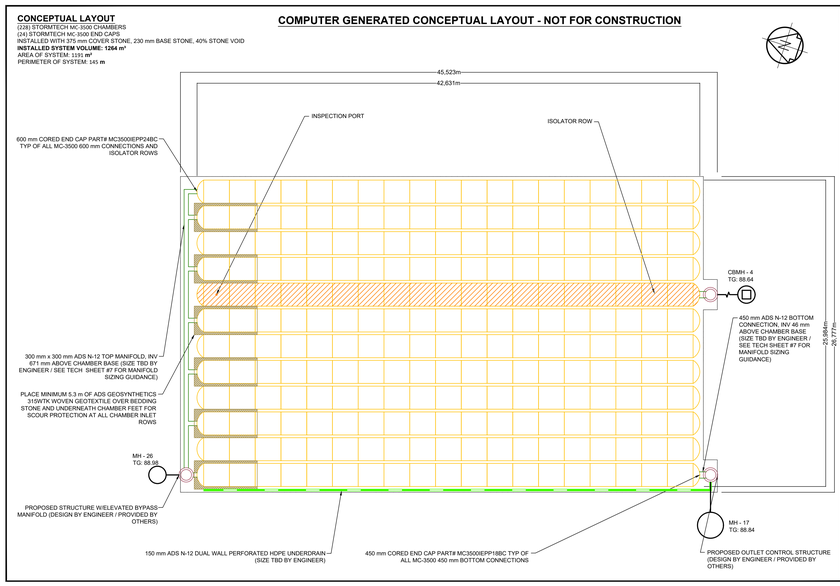
CBMH – 02 – 75mm DIA. ORIFICE
MH – 16 – 180mm DIA. ORIFICE

13/06 DETAIL – ORIFICE PLATE
SCALE = N.T.S.

CONCEPTUAL LAYOUT

(228) STORMTECH MC-3500 CHAMBERS
(24) STORMTECH MC-3500 END CAPS
INSTALLED WITH 375 mm COVER STONE, 230 mm BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 1264 m³
AREA OF SYSTEM: 1191 **m²**
PERIMETER OF SYSTEM: 145 **m**

COMPUTER GENERATED CONCEPTUAL LAYOUT - NOT FOR CONSTRUCTION

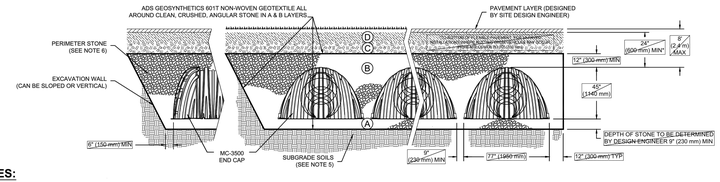


GoldsmanCo Cobourg — DATE: 02/14/2019 — DRAWN: CS — CHECKED: — — PROJECT #: Tool
REV | DRWN | CHK | DESCRIPTION
Stormtech — 70 MACKENZIE WAY S | SUITE 140 | CAT | 2007
ADS TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473
NOT TO SCALE
SHEET 2 OF 6

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145* A-1, A-2-4, A-3 OR AASHTO M43* 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43* 3, 4	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43* 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. * *

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (230 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. MC-3500 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
5. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
7. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

GoldsmanCo Cobourg — DATE: 02/14/2019 — DRAWN: CS — CHECKED: — — PROJECT #: Tool
REV | DRWN | CHK | DESCRIPTION
Stormtech — 70 MACKENZIE WAY S | SUITE 140 | CAT | 2007
ADS TRUEMAN BLVD HILLIARD, OH 43026 1-800-733-7473
NOT TO SCALE
SHEET 3 OF 6

NOTE:

1. STORMTECH CHAMBER DETAILS HAVE BEEN PROVIDED FOR ILLUSTRATION PURPOSES ONLY. THE CONTRACTOR WILL BE RESPONSIBLE FOR SECURING DETAILED SHOP DRAWINGS FROM THE SUPPLIER PRIOR TO CONSTRUCTION. SHOP DRAWINGS ARE TO BE SUBMITTED TO, REVIEWED AND APPROVED BY THE STORMWATER ENGINEER PRIOR TO INSTALLATION.

BM1 – 88.044
BENCHMARK No. 30, COBOURG, CROSS CUT ON DIAMOND HEAD SIGN BASE AT 210 WILLMOTT STREET

TRUE NORTH

KEY PLAN

REVISIONS

No.	Description	Date
2	SPA 2nd SUBMISSION	13/12/19
1	SPA 1st SUBMISSION	18/11/18

METRIC — Dimensions are in METRES and/or MILLIMETRES unless otherwise shown
LEGEND — TO BE READ IN CONJUNCTION WITH OPSD 100 SERIES

WILLS
D.M. Wills Associates Limited
150 Jameson Drive
Peterborough, Ontario
Canada K9J 0B9
P. 705.742.2297
F. 705.741.3568
E. wills@dmwills.com

Project Name/Location
545 KING STREET EAST
GOLDMANCO
COBOURG, ONTARIO

Drawing Title
STORM WATER MANAGEMENT DETAILS

Drawn By: K.W.P.	SCALE: Horz. –	Vert. –	
Designed By: K.W.P.	Plot Date: 12/13/19		
Checked By: C.P.B.	Project No.: 18–10846	Sht. No.:	
Engineer: C.P.B.	Dwg File No.: 10846 – GNDT	06	