FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

RESIDENTIAL DEVELOPMENT

HILLSBURGH RESIDENTIAL SUBDIVISION
TOWN OF ERIN

Project No.: 22-0022ER **March 2023**

Revision	*Date*	*Description*
0	*March 2023*	*First Submission*
1		
2		

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1.0 INTRODUCTION

1.1 Study Objectives and Location

This Functional Servicing and Stormwater Management Report has been prepared in support of a proposed residential subdivision development located east of Trafalgar Road in the Town of Erin (Formerly the Village of Hillsburgh), County of Wellington. The site can be legally described as being located within Concession 8, Registered Plan 95, with the following parts:

- Part of Lots 23 & 24 (Concession 8),
- Part of Lots 11& 12 (East of Market Street),
- Part of Lots 14, and all of Lots 15 & 16 (West of Market Street);
- Part of Lots 4 & 17, and all of Lots 18, 19, & 20 (East of Guelph Street);
- Part of Lots 21 & 22, and all of Lots 23 & 24 (West of Guelph Street).

The subject property is located within the boundaries of Douglas Crescent to the north, Trafalgar Road to the West (also known as Main Street and Wellington Road 24), 8th Line to the east and Wellington Road 22 to the south. A site location plan is provided in Figure 1-1.

The following report provides information regarding site servicing and stormwater management for the subject development while ensuring compatibility with surrounding lands. The report will also address concerns and comments raised by regulatory agencies (i.e., County of Wellington, Credit Valley Conservation Authority, and the Town of Erin).

1.2 Existing Conditions

The site is irregular in shape with a total area of approximately 52.3 ha. Currently the site is predominantly used for agricultural purposes. A single lot “Heritage house” (Block 504) is to remain untouched through the proposed development. In general, the site can predominantly be accessed via Trafalgar Road. The eastern side (away from existing major roadways) has the highest elevations sloping downwards towards additional site access points. Of note is an access point from Curie Road, at the northern end of the site, where Curie Road currently terminates. The site also fronts the existing Ross R. Mackay Public School, as well as some commercial properties situated along Trafalgar Road. The site is also adjacent to some existing detached homes on parts of the property fronting Trafalgar Road. External lands to the south and east of the site consist entirely of farmland. Lastly, the Elora Cataract Trail sits adjacent to the site’s southwest corner.

1.3 Proposed Development

The proposed development is to include a mix of residential townhouse blocks, single-detached homes, a future mixed-use block, as well as dedicated stormwater management (SWM) blocks. The proposed subdivision lands will be provided transportation access via proposed site entrances on Trafalgar Road and Douglas Crescent. Connectivity with potential future developments to the east and south will also be accommodated with proposed dead-end roads at the northeast and southern site boundaries. The proposed site's development plan is shown in Figure 1-2.

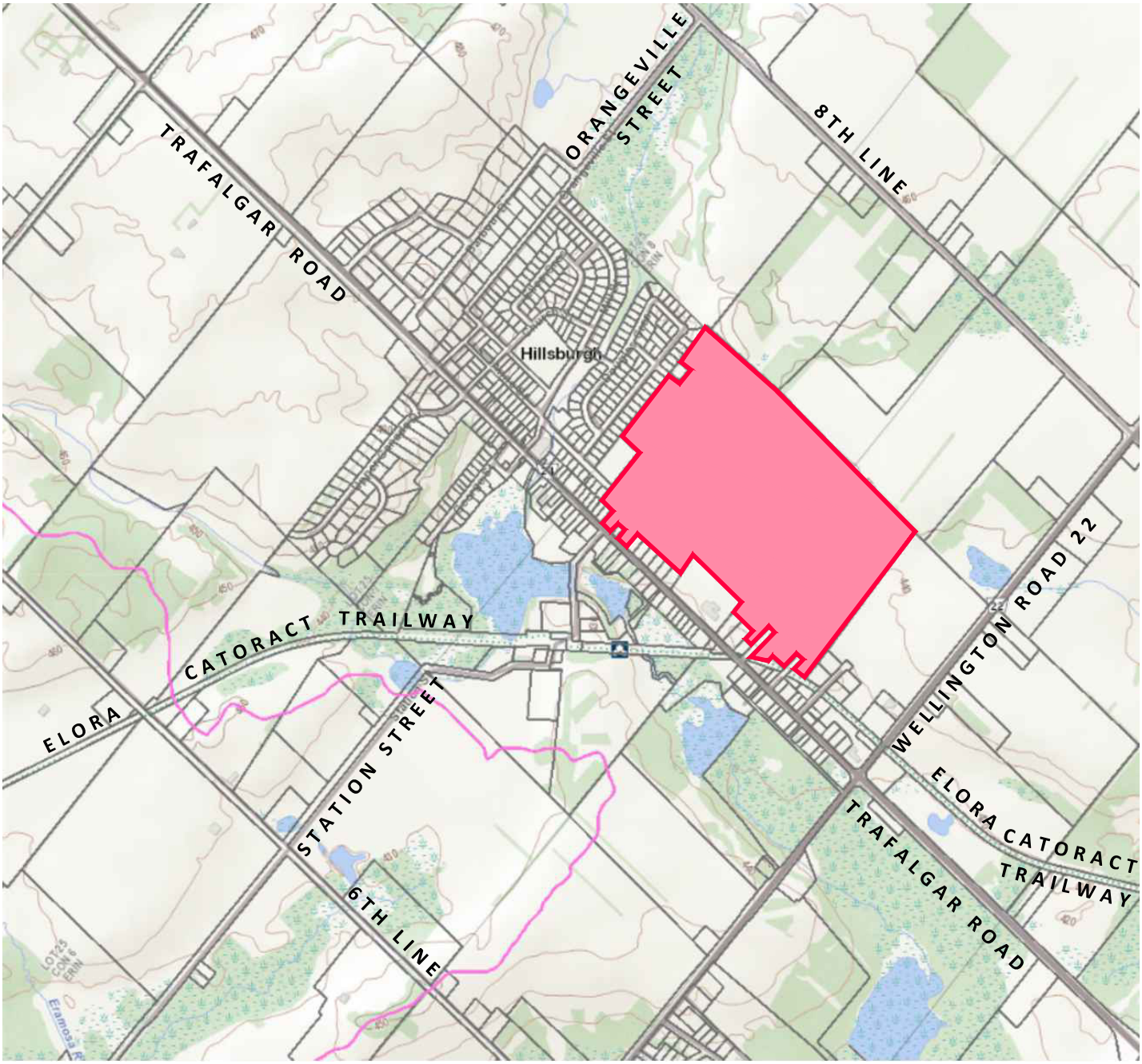
1.4 Proposed Design Populations

Based on the current development draft plan, a mix of development unit densities are proposed. The following table summarizes the expected design populations for each land use and was estimated based on the Town of Erin's latest Engineering Design Criteria. Based on the estimate below, the total proposed design population of the Hillsburgh Subdivision is 3093 persons.

Table 1-1: Population Estimate

Land Use	G.F.A (sqm) / Units	Population Density	Population*
Residential	446 units (Single-Detached & Heritage House)	2.8 persons / Unit	1249
Residential	353 units (Townhouse)	2.8 persons / Unit	989
Residential	0 units (Apartment)	2.65 persons / Unit	0
Mixed-Use	2.59 ha	330 persons / ha	855
Institutional (Schools)	0 m^2	60 persons / ha	0
Commercial (Retail)	0 m^2	100 persons / ha	0
Total	**799**	**-**	**3093**

*Population estimates based on the population densities set out by the Town of Erin Engineering design guidelines. The resulting populations have been used for engineering design capacity purposes only, and therefore may not be consistent with proposed planning populations for the development.



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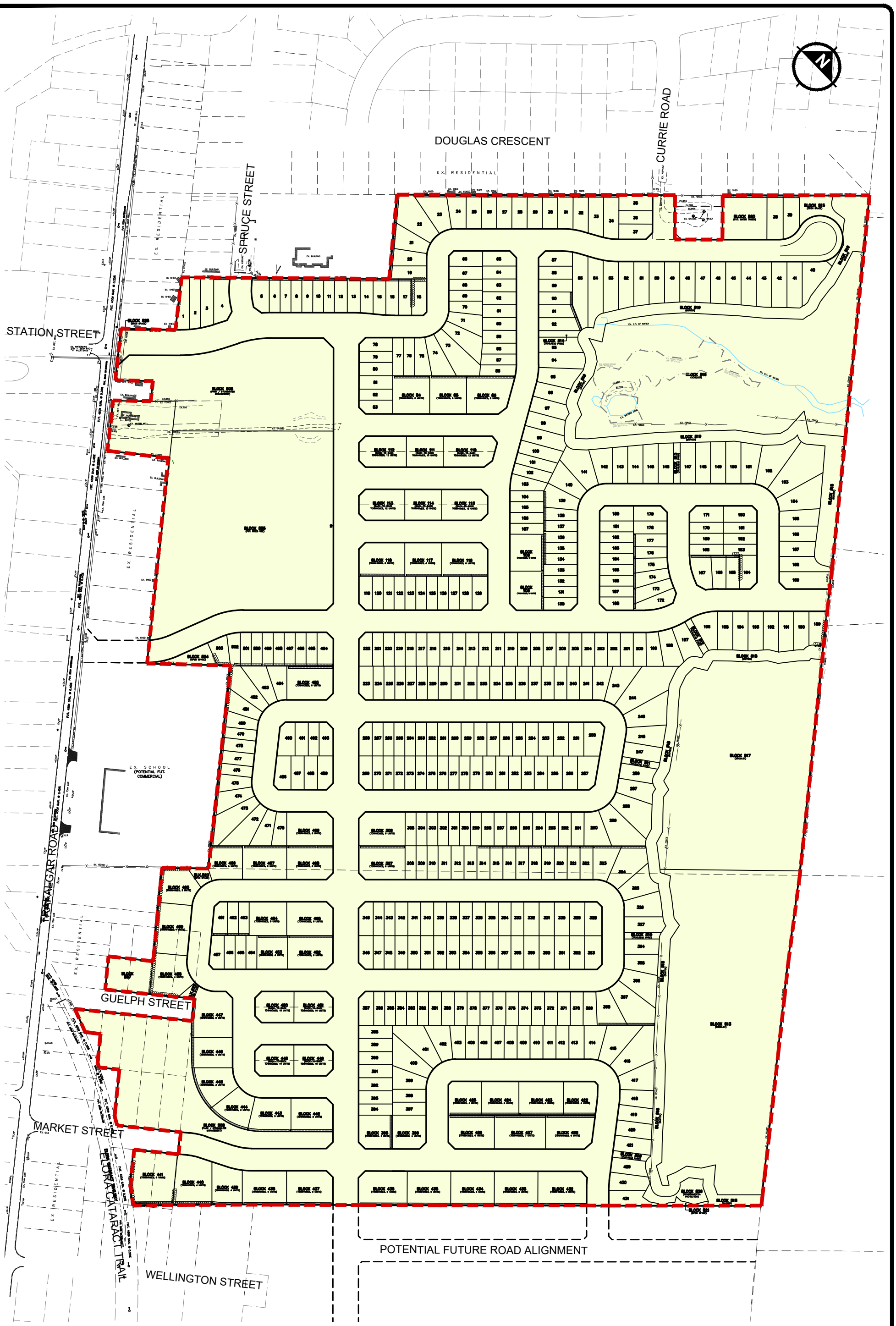
LEGEND

SITE BOUNDARY

FIGURE 1-1
SITE LOCATION PLAN

22-0020ER	March 2023	N.T.S.



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LEGEND

SUBJECT SITE

FIGURE 1-2
DEVELOPMENT PLAN
HILLSBURGH RESIDENTIAL SUBDIVISION
TOWN OF ERIN

22-0020ER	March 2023	SCALE: 1:3200

1.5 Background References

The following material has been reviewed during the preparation of this report:

- BSR&D., *Topographic Survey,* dated August 4th, 2021.
- Credit Valley Conservation (CVC), *Stormwater Management Criteria,* dated August 2012;
- CVC / TRCA, *Low Impact Development Stormwater Management Planning and Design Guide*, dated 2010.
- Ministry of the Environment, *Stormwater Management Planning and Design Manual*, dated March 2003.
- Soil Engineers Ltd., *A Preliminary Hydrogeological Assessment for Proposed Residential Development*, *63 and 63A Trafalgar Road, Town of Erin,* dated February 2023;
- Soil Engineers Ltd., *Pre- and Post-Development Water Balance Assessment, Proposed Residential Development, 63 and 63A Trafalgar Road, Town of Erin,* dated March 2023;
- Town of Erin*, Engineering Design Standards Manual,* dated May 2022;

2.0 Stormwater Management

2.1 Existing Conditions

2.1.1 Topography and Drainage

The subject development is part of the larger drainage area of the Credit River's Subwatershed 15, also known as the West Credit River Subwatershed, as identified within the CVCA's Design Criteria. In general, existing site grades indicate an east to west drainage pattern taking overland runoff from the east portion of the site towards Trafalgar Road. Existing site drainage which reaches Trafalgar Road is conveyed by a series of sewers and culvert crossings. These crossings carry runoff flows further west towards the existing ponds adjacent to Station Drive. In the site's southwest corner, a 600 mm diameter culvert crossing is present which allows for site drainage across the Elora Cataract Trailway, to the existing Trafalgar Road minor storm sewer system which drains to the existing watercourse to the west.

Existing topography indicates an existing grade differential in the order of 20 m across the site, with the highest point (451.63 masl) located at the eastern most corner. The lowest existing grades are present along the property's frontages to Trafalgar Road, as well as the along the Elora Cataract Trailway, located in the site's southernmost corner. The lowest point on site is 426.92 masl, measured adjacent to the existing Elora Cataract Trailway.

In addition to the site itself, an external drainage area of approximately 48 ha was identified which is currently draining to the site. This area is used for agricultural purposes and includes some wooded areas. Based on available topographic information, the external area was identified as having two (2) catchments and have been identified on Figure 2-1 (Part 2).

2.1.2 Existing Storm Drainage Infrastructure

Reference drawings provided by the County of Wellington, as well the Town of Erin were used to identify the following infrastructure in proximity to the site:

- A 250 mm diameter storm sewer running South along Trafalgar Road, connecting to the existing 300 mm diameter storm sewer on Jane Street, West of Trafalgar;
- A 250mm diameter storm sewer running North and South along Trafalgar Road, outleting to a 600 mm diameter storm sewer, and subsequent headwall within an easement just west of Ross R. McKay School;
- A 1.0 m by 1.8 m CSP culvert crossing beneath Trafalgar Road, from the subject site to an outlet located within a ditch along the south boulevard of Station Street.;

All the above infrastructure was identified to convey flows west to the existing watercourse, as part of the West Credit River watershed. No other storm infrastructure was identified on or near the site. This existing infrastructure in proximity to the site is shown schematically on Figure 2-1.

2.1.3 Soil Conditions

Subsurface conditions on the site were initially determined using the Ontario Soil Survey of Wellington County, Soil Survey Report No. 35, produced by the Canadian Department of Agriculture in 1962. Based on the soil map, the site soils can be defined as Hillsburgh Sandy Loam to Fine Sandy Loam. This soil typically has higher percolation rates which is often a good material to support infiltration-based LID techniques on-site, noted as having "Good" drainage characteristics. In-situ soil conditions (soil percolation and seasonal groundwater elevations) should be used to confirm this.

A Preliminary Hydrogeological Assessment of the site was produced by Soil Engineers Ltd., dated January 2023. As part of the investigation a series of boreholes and groundwater monitoring wells were installed on-site. Based on the results of the monitoring period, groundwater elevations were found to range between 2.75 to 6.1 mbgs, consistent with elevations of 423.70 to 440.74 masl. Based on the field investigations, soil types on-site ranged from Sand/gravely sand near surface to a Sandy Silt/Silty Sand Till at greater depths and are considered to be favourable for potential infiltration-based LIDs. The soil types found in this investigation are consistent with the expectations provided by the Ontario Soil Survey mappings of the area. Relevant excerpts from the site hydrogeological report are provided in Appendix A.

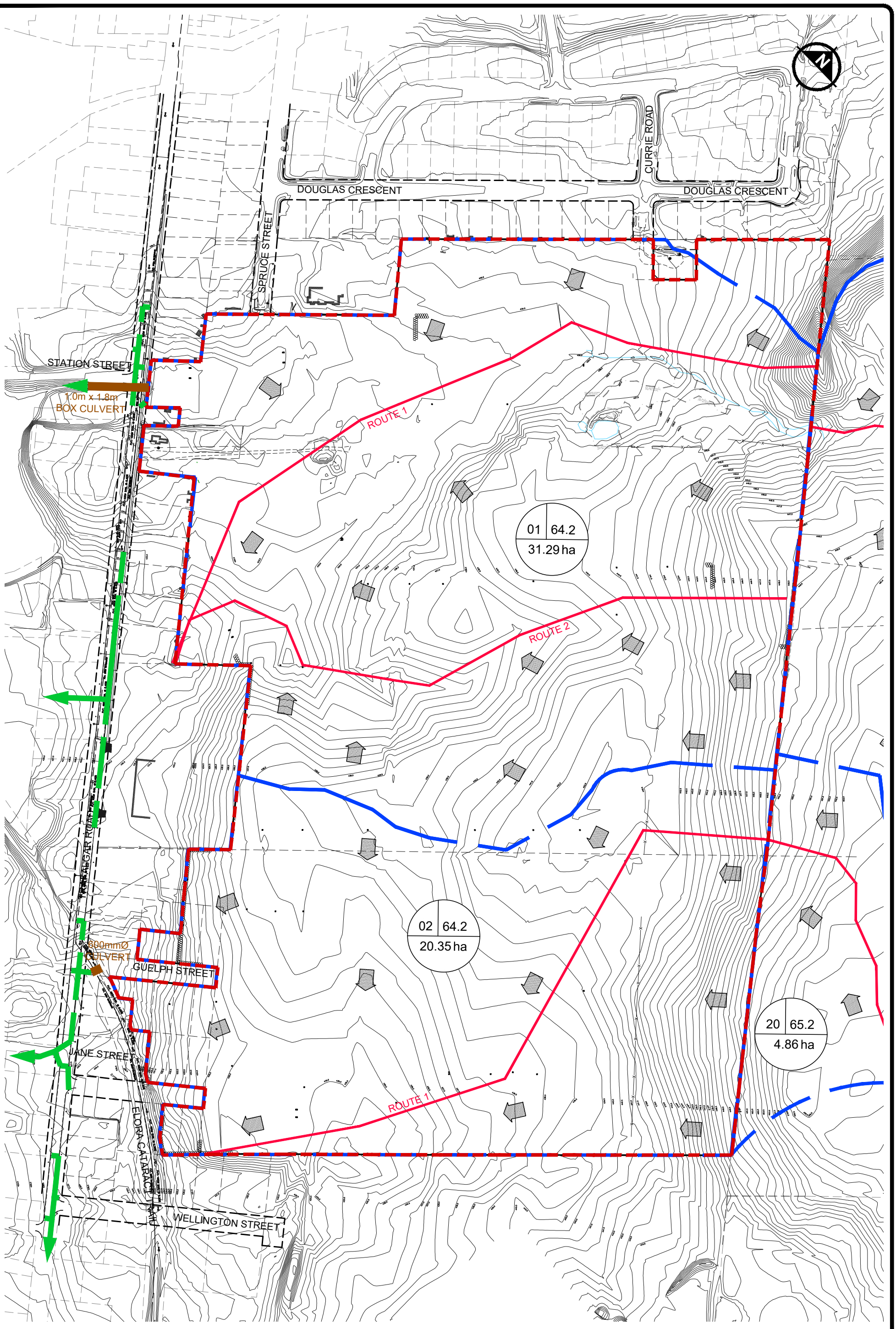
2.2 Stormwater Management Design Criteria

The stormwater management design criteria applicable to the proposed development was established through a review of regulatory agency design standards. The relevant stormwater management design criteria and regulatory bodies are summarized in this section.

Credit Valley Conservation Authority (CVCA) Criteria

- Quantity Control – Post to pre-development peak flow controls (2-year through 100-year return frequency) for proposed developments within Sub-watershed 15 of the Credit River.

- Quality Control - Enhanced (Level 1) water quality protection (80% TSS removal).



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LEGEND

- PROPERTY BOUNDARY
- DRAINAGE BOUNDARY
- EXISTING STM SEWER
- EXISTING CULVERT

DRAINAGE AREA

AREA I.D. | CN NUMBER
1.00 ha | DRAINAGE AREA

OVERLAND FLOW ROUTE

FIGURE 2-1 (PART 1)
PRE-DEVELOPMENT DRAINAGE PLAN
HILLSBURGH RESIDENTIAL SUBDIVISION
TOWN OF ERIN

22-0020ER	March 2023	SCALE: 1:2900

DOUGLAS CRESCENT

10 | 64.2
42.94 ha

20 | 65.2
4.86 ha

EIGTH LINE

LEGEND

- PROPERTY BOUNDARY
- DRAINAGE BOUNDARY
- EXISTING STM SEWER
- EXISTING CULVERT

DRAINAGE AREA

AREA I.D. 100 | 64 (CN NUMBER) / 1.00 ha (DRAINAGE AREA)

OVERLAND FLOW ROUTE

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FIGURE 2-1 (PART 2)
PRE-DEVELOPMENT DRAINAGE PLAN
HILLSBURGH RESIDENTIAL SUBDIVISION
TOWN OF ERIN

22-0020ER | March 2023 | SCALE: 1:3200

- Erosion Control - Minimum retention of the first 5mm of rainfall volume for erosion control and water balance mitigation.

- Water balance – A site specific water balance is required to identify pre-development groundwater recharge rates and distribution, as well as related hydrologic and ecologic functions. Pre-development groundwater recharge rates must be maintained, and appropriate mitigation measure put in place to ensure the protection of existing hydrological and ecological features.

Town of Erin

- Quantity Control - Post-development runoff at the proposed discharge location shall be limited to within the receiving sewer. The minor conveyance system shall be sized to convey a minimum 10-year return period event.

- Storm Distributions – SWM Facility volumes shall be estimated using the worse of the 24hr SCS Type II storm (required for sites within the West Credit River Subwatershed), and the 4hr Chicago design storm distribution.

- Rainfall intensities should be derived from the Town's IDF curve information as presented in the following table:

Table 2-1 Town of Erin IDF Curve Parameters

RETURN PERIOD	A	B	C
2-Year	566	1.77	0.730
5-Year	744	1.76	0.729
10-Year	869	1.79	0.730
25-Year	1011	1.75	0.728
50-Year	1126	1.76	0.729
100-Year	1248	1.83	0.732

**Values as per the Town of Erin 2022 Design guidelines.*

The average rainfall intensity shall be calculated using the equation:

$$\left(i = \frac{A}{(t \times B)^C}\right)$$

Where:

i = rainfall intensity (mm/hr)
t = Time of concentration (minutes)

2.3 Proposed Stormwater Management

The proposed stormwater management system will be designed in accordance with Town of Erin and CVCA guidelines. The intent of the design is to maintain existing drainage conditions to the extent possible, while adhering to quantity control criteria set out by both the Town of Erin and CVCA criteria.

In order to better mimic existing stormwater drainage patterns on-site, it is proposed to split site drainage into two catchments: North and South. Each of these catchments will be serviced by their own respective SWM facilities, located within each of the site's two (2) SWM Blocks. This will include both an underground SWM Tank and a downstream bioretention cell. Each Underground SWM tank will be sized and equipped with an outlet structure in order to control site post-development peak flows to pre-development levels for each storm event up to and including the 100-year event.

Drainage within each of the aforementioned catchments will be managed by a dual-drainage system. This system will consist of a minor storm sewer systems which will capture and convey minor storm events to the proposed SWM facilities on-site. In addition, the site's major system will consist of drainage provided by the overland flow routes provided by proposed roadways. The major system has been designed to direct overland flows to a couple of key full capture locations (see Figure 2-2) from which flows will be conveyed to the site's proposed underground storage tanks.

Water quality control is proposed via a treatment train approach sized to treat site runoff to an enhanced level of treatment (i.e., 80% TSS removal). On-site LIDs are proposed to the extent possible to meet site water balance, retention, erosion control and quality control targets. This includes the use of OGS treatment devices and de-centralized infiltration trenches. How the proposed SWM strategies will provide the aforementioned design objectives is further described in subsequent sections.

2.3.1 Proposed Site Grading and Drainage

In the site's existing conditions, a significant grade differential exists, in the order of 20 m from east to west. In order to mimic site pre-development drainage conditions, it is proposed to maintain positive drainage from east to west such that the proposed development grades towards Trafalgar Road.

Proposed grading for the site promotes sheet flow drainage away from the proposed townhomes and detached lots towards overland flow routes provided by internal roadways. The

maximum proposed paved surface grades have been held below 8%, and landscaped areas held at a minimum 2%.

Lastly, in existing conditions the site's drainage is divided roughly along the center of the site and is serviced by two separate drainage outlets to the existing municipal storm drainage system along Trafalgar Road. In order to support a drainage scheme which mimics the existing condition, a drainage divide is proposed to separate the development area's overland flow routes into two (2) areas. Proposed site drainage areas and overland flow routes are depicted in Figure 2-2. A functional site grading plan has been provided in Appendix E.

2.3.2 Quantity Control

In accordance with the Town of Erin and CVCA design criteria, it is proposed to control site post-development flows to match pre-development levels for all storm events up to and including the 100-year event. Storm events will be analysed for the 24 hour SCS and 4hr Chicago storm distributions in accordance with Town and CVC standards. In order to do so, pre-development flow rates have been estimated for each of the pre-development catchments depicted in Figure 2-1.

In addition to the subject site area, the pre-development estimates were also conducted for approximately 48 ha of external lands which drain from east of the subject development. Flow from these areas will be accepted and captured by the subject development's storm system in order to maintain existing drainage patterns. As such the proposed release rates will also incorporate the pre-development flows of the external catchments. External Catchments 10 and 20 are shown on Figure 2-1.

The pre-development flow rates for each catchment were determined within a pre-development hydrology model developed for the site using Visual OTTHYMO (VO) Version 6.2. In order to assess the flows for each catchment, a pre-development Nashyde node was created for each catchment with parameters including those describing soil type, landcover quality and time of concentration. Times of concentration were determined using the Bransby-William's method with flow paths depicted in Figure 2-1. Soil cover complex numbers (CN) were determined for each catchment based on land cover type. Determination of these values is provided and shown in Appendix B, alongside the associated VO model output. A summary of the pre-development peak flow results are provided in Table 2-2 and Table 2-3.

The peak flows presented in Table 2-2 represent the expected peak flows which occur to each of the two existing site outlets - the existing 1.0m x 1.8m CSP culvert which services Catchment

01, and the existing 600 mm diameter CSP culvert crossing the Elora Cataract Trailway, which services the southern Catchment 02. In this way the allowable release rates to the existing site outlets have been split between the northern and southern SWM blocks such that:

- Post-development peak flows from North SWM Block 506 = Pre-development flows from Predevelopment Catchment 01 + External Catchment 10
- Post-development peak flows from South SWM Block 508 = Pre-development flows from Pre-development Catchment 02 + External Catchment 20

As shown in the comparison of the pre-development flows in Table 2-2 and Table 2-3, between the 4-hour Chicago and 24-hour SCS it is estimated that peak flows from the 24-hour SCS storm are larger for the site. In order to ensure both storms are safely detained, the 2-year through 100-year events were simulated using VO in the post-development condition, and the underground storage tanks were sized to satisfy whichever event requires the largest detention volume.

The site area is proposed to be graded such that it forms two (2) post-development catchments (Catchments 01 and 02, as depicted in Figure 2-2) which will drain to their respective underground SWM tanks. The site's post-development land-use was then used to estimate the site's impervious levels needed to simulate the post-development peak flows produced for the subject site in the VO model. Imperviousness calculations are provided in Appendix B.

In addition, some portions of the site adjacent to Trafalgar Road were unable to be directed back towards the side due to grading constraints which required the site entrances to be compatible with the existing Trafalgar Road alignment. As a result, uncontrolled flows are also anticipated from Catchments 101 and 201, as shown in Figure 2-2. A summary of the uncontrolled flows from each catchment are summarized in Table 2-4 and Table 2-5.

The post-development VO model has been generated to account for external flows from the lands east of the subject site into the proposed SWM Tanks, with an allowance equal to the pre-development flows shown in Table 2-2 and Table 2-3. In addition, the controlled release rates were adjusted to account for uncontrolled flows. The adjusted rates are summarized in Table 2-4 and 2-5. A summary of the resulting required storage volumes for each SWM Block and storm distribution is provided in Table 2-6 and Table 2-7.

Table 2-2: Summary Pre-development Peak Flows (24-hour SCS)

Return Period	Pre-Development Peak Flow – 24-hour SCS					
	Catchment 01 Area = 31.29 ha	Catchment 10 Area = 42.94 ha	Total Catchment 01 + 10	Catchment 02 Area = 20.35 ha	Catchment 20 Area = 4.86 ha	Total Catchment 02 + 20
	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)
2-yr	0.677	0.681	**1.311**	0.440	0.141	**0.568**
5-yr	0.917	0.924	**1.777**	0.597	0.190	**0.767**
10-yr	1.530	1.566	**2.987**	0.997	0.310	**1.291**
25-yr	2.023	2.044	**3.922**	1.315	0.414	**1.686**
50-yr	2.430	2.477	**4.735**	1.580	0.491	**2.019**
100-yr	2.657	2.686	**5.152**	1.720	0.542	**2.211**

Table 2-3: Summary Pre-development Peak Flows (4-hour Chicago)

Return Period	Pre-Development Peak Flow – 4-hour Chicago					
	Catchment 01 Area = 31.29 ha	Catchment 10 Area = 42.94 ha	Total Catchment 01 + 10	Catchment 02 Area = 20.35 ha	Catchment 20 Area = 4.86 ha	Total Catchment 02 + 20
	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)
2-yr	0.478	0.496	**0.930**	0.311	0.098	**0.400**
5-yr	0.866	0.891	**1.672**	0.563	0.178	**0.720**
10-yr	1.174	1.202	**2.263**	0.763	0.242	**0.974**
25-yr	1.604	1.637	**3.090**	1.043	0.331	**1.328**
50-yr	1.948	1.983	**3.753**	1.267	0.403	**1.612**
100-yr	2.296	2.332	**4.420**	1.494	0.476	**1.903**

As presented in Table 2-4, the maximum storage volume requirement has been shown to occur during the 100-year 4-hour Chicago storm event. The provided stormwater management volumes for each tank are therefore proposed to provide at a minimum the storage requirement of this storm, as shown in the Functional Servicing Drawings provided in Appendix E. The final storage requirements will be confirmed at the detailed design stage.

Table 2-4: Summary of Uncontrolled Release Rates – North Tank

Storm Distribution	24-hour SCS			4-hour Chicago		
Return Period	Pre-Dev. Peak Flow	Node 101 Uncontrolled Release	Tank Controlled Release	Pre-Dev. Peak Flow	Node 101 Uncontrolled Release	Tank Controlled Release
	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)
2-yr	1.311	0.084	1.227	0.930	0.144	0.786
5-yr	1.777	0.100	1.677	1.672	0.200	1.472
10-yr	2.987	0.146	2.841	2.263	0.244	2.019
25-yr	3.922	0.181	3.741	3.090	0.294	2.796
50-yr	4.735	0.197	4.538	3.753	0.332	3.421
100-yr	5.152	0.218	4.934	4.420	0.368	4.051

Table 2-5: Summary of Uncontrolled Release Rates – South Tank

Storm Distribution	24-hour SCS			4-hour Chicago		
Return Period	Pre-Dev. Peak Flow	Node 201 Uncontrolled Release	Tank Controlled Release	Pre-Dev. Peak Flow	Node 201 Uncontrolled Release	Tank Controlled Release
	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)
2-yr	0.568	0.065	0.503	0.400	0.108	0.292
5-yr	0.767	0.078	0.689	0.720	0.157	0.563
10-yr	1.291	0.113	1.178	0.974	0.187	0.787
25-yr	1.686	0.140	1.546	1.328	0.229	1.099
50-yr	2.019	0.153	1.866	1.612	0.259	1.353
100-yr	2.211	0.170	2.041	1.903	0.287	1.616

Table 2-6: Summary of Required Storage Volumes – North SWM Block

Storm Distribution	24-hour SCS			4-hour Chicago		
Return Period	Pre-Dev. Peak Flow (m^3/s)	Total Post-Dev. Flow (m^3/s)	Required Storage (m^3)	Pre-Dev. Peak Flow (m^3/s)	Total Post-Dev. Flow (m^3/s)	Required Storage (m^3)
2-yr	1.311	1.311	4,905	0.930	0.930	**6,090**
5-yr	1.777	1.777	5,725	1.672	1.672	**8,130**
10-yr	2.987	2.987	7,675	2.263	2.263	**9,345**
25-yr	3.922	3.922	8,860	3.090	3.090	**10,790**
50-yr	4.735	4.735	9,850	3.753	3.753	**11,725**
100-yr	5.152	5.152	10,280	4.420	4.420	**12,580**

Table 2-7: Summary of Required Storage Volumes – South SWM Block

Storm Distribution	24-hour SCS			4-hour Chicago		
Return Period	Pre-Dev. Peak Flow (m^3/s)	Post-Dev. Flow (m^3/s)	Required Storage (m^3)	Pre-Dev. Peak Flow (m^3/s)	Post-Dev. Flow (m^3/s)	Required Storage (m^3)
2-yr	0.568	0.568	4,125	0.400	0.400	**4,913**
5-yr	0.767	0.767	4,830	0.720	0.720	**6,480**
10-yr	1.291	1.291	6,430	0.974	0.974	**7,480**
25-yr	1.686	1.686	7,540	1.328	1.328	**8,685**
50-yr	2.019	2.019	8,500	1.612	1.612	**9,575**
100-yr	2.211	2.211	8,910	1.903	1.903	**10,415**

2.3.3 Water Quality Control

As per the Town of Erin and CVCA design criteria, site runoff must be treated to meet an enhanced level of quality control (removal of 80% TSS). The proposed site will consist of both clean roof area and landscape area, as well as a drivable laneway area. In order to provide treatment to an enhanced level, a treatment train is proposed for each of the site's drainage areas. The proposed treatment train consists of the following components:

- **Lot Level Controls –** Reduction of lot slopes, and rear-yard infiltration trenches;
- **Conveyance Controls -** OGS units sized to provide a minimum 50% TSS removal to the site area in line with the site's conveyance system (i.e., storm sewers);
- **End of Pipe Controls -** Bioretention feature sized to provide a minimum 60% (Basic) TSS removal located directly upstream of the site's outlets;

The combination of the above LIDs is expected to provide a net 80% TSS removal to achieve the target enhanced level of water quality treatment. Bioretention cells are proposed to be sized such that the infiltration volumes provided by retaining storm flows within the bioretention area meet the minimum required water volume to achieve 60% TSS removal, based on MOE 2003 guidelines, Table 3.2 for infiltration-based methods.

The bioretention cells will be provided downstream of the proposed underground SWM tank outlets, acting as an infiltration basin, and will provide a meandering low flow channel to promote by-pass to the existing site outlet, in the event of larger storms. A preliminary bioretention sizing is provided in the following table.

Table 2-8: Summary of Preliminary Bioretention Sizing

Area ID	Incoming Area (ha)	Imperviousness (%)	Required Water Volume (m^3/ha) *	Required Bioretention Volume (m^3)	Provided Bioretention Volume (m^3)
01	29.61	60%	40	592	602
02	22.89	60%	40	458	467

Preliminary infiltration calculations were performed based on the anticipated soil performance (see Appendix B), as indicated by Soil Engineer's preliminary hydrogeological investigation, dated January 2023. The final LID design should be informed by in-situ site testing and confirm the design infiltration rate and depth of groundwater table, to achieve a maximum 48-hour drawdown time, and minimum 1 m spacing from the LID to the groundwater table.

Preliminary OGS treatment unit sizing reports have been provided in Appendix B, along side preliminary bioretention sizing calculations. The preliminary location of the aforementioned LIDs is shown on the preliminary engineering drawings provided in Appendix E and schematically in Figure 2-3. Locations and sizing of each LID will be confirmed at the detailed design stage.

2.3.4 Erosion Controls and Water Balance

Erosion Control

In accordance with the CVCA requirements, the implementation of LID practices within the development will provide on-site retention of the first 5 mm of rainfall from the future development's impervious surfaces. The runoff volume requirements for a 5 mm rainfall event within each post-development catchment was estimated and is summarized in Table 2-9 below.

Table 2-9: Summary of Site Retention Requirements

Area ID	Area (ha)	Imp. (%)	Required 5mm Retention Volume (m^3)*	Provided Infiltration Trench Vol. (m^3)	Provided Bioretention Cell Vol. (m^3)	Total Provided Retention Volume (m^3)
01	29.61	60%	890	316	602	918
02	22.89	60%	690	373	467	840
Total	52.50	60%	**1,580**	649	1069	**1758**

*Volume = Area(ha) x IMP (%) x 10 x 5mm
**Area includes New Well area of approximately 0.20 ha

The proposed site land cover will be a mix of paved and pervious surfaces as well as clean roof area. The pervious landscape areas, particularly within proposed pervious backyard areas, provide opportunity to promote infiltration. Furthermore, the on-site woodlots, Blocks 516 and 517, will continue to provide retention and abstraction of runoff as they will remain undisturbed by the development.

In order to meet the site 5 mm retention target, it is proposed to make use of infiltration within the rear-yard drainage swales wherever possible, through the use of infiltration trenches. Furthermore, providing trenches along side disconnected roof leaders, directed towards lawn areas and backyard swales will provide additional retention and infiltration opportunity at the individual lot level. Each infiltration trench will provide additional sub-surface infiltration volume via the installation of a linear gravel bed parallel to the length of rear-yard swales, allowing for flows to first infiltrate prior to running off to the storm sewer. This strategy will mitigate the overall runoff volume which will drain to the downstream SWM tanks during smaller storm events.

Additional retention will be provided via centralized bioretention features which have been strategically positioned downstream of each SWM Tank's outlet. This will provide a centralized infiltration feature for each drainage area which will act simultaneously as both an end-of-pipe

quality control feature, and erosion protection feature through the infiltration volumes they provide.

As shown by the provided volumes listed in Table 2-9, the above noted LID approaches will also assist in achieving the site's water balance, which is further explored in the following section. Preliminary sizing calculations for each LID feature are provided in Appendix B for reference. The final LID sizes will be confirmed and updated at the detailed design stage when additional in-situ information become available. The preliminary location and size of the above LID's is depicted in Figure 2-3, and are shown in the Functional Engineering drawings provided in Appendix E.

Water Balance and Groundwater Recharge

The subject site was reviewed using the Ontario Source Protection Information Atlas. Based on the results of this search, the site was identified as not being within any wellhead protection area. However, it was acknowledged that the site is situated within a Significant Groundwater Recharge Area (SGWRA), as well as an area tributary to a highly vulnerable aquifer.

In order to quantify the impact of the proposed development on site water balance, a Pre- and Post-Development Water Balance assessment was conducted by Soil Engineers Ltd, dated March 2023. Relevant excerpts from this analysis are provided in Appendix B.

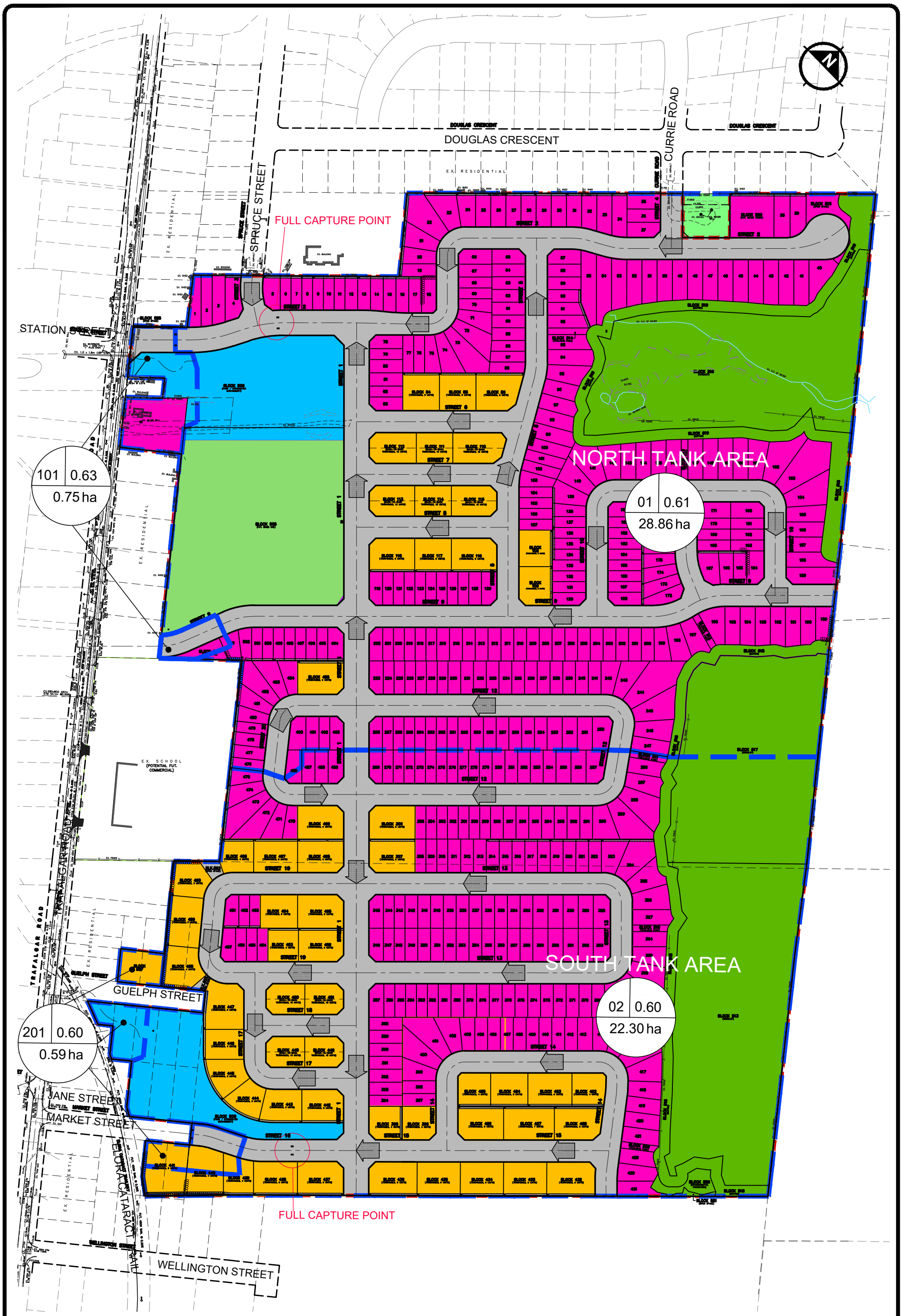
Based on Soil Engineers Ltd.'s assessment it is expected that the site's annual pre-development infiltration rate is 128,332.98 m^3/year. As a result of the proposed development, additional impervious areas are expected to reduce the site's infiltration rate and increase site runoff. Soil Engineers' assessment of the post-development condition anticipates a new site infiltration rate of 67,407.44 m^3/year, which translates to an expected 60,925.54 m^3/year post-development infiltration rate deficit once the site is developed.

As indicated by Soil Engineer's Hydrogeological Assessment, dated January 2023, the site soils are sandy loam and generally in favour of infiltration. In order to mitigate the above deficit, a series of LID's have been proposed including infiltration trenches and bioretention cells in order to achieve the 5mm erosion criteria through infiltration. By using the aforementioned mitigation measures, it is anticipated that the site can provide an infiltrate volume of approximately 1,758 m^3, equivalent to the infiltration of the first 5.60mm (i.e. 1,758 m^3 ÷ [52.3 ha x 60% IMP x 10]) of rainfall on site. With these measures it is anticipated that a significant amount of groundwater recharge will be provided by utilizing the aforementioned centralized and de-centralized LIDs.

It is further noted that if additional infiltration is found to be required, other LID options can also be employed. A full list of all measures which are suitable to meet on-site water balance include:

- **Back-yard Infiltration Trenches** - promote infiltration of roof water;
- **Bioretention Cells/Facilities** – promote infiltration at the site stormwater outlet as an end-of-pipe infiltration method;
- **Bio-swales, Enhanced Grass Swales, and Rain Gardens** – promote infiltration of runoff from roadways from landscape boulevards;
- **Clean-water-collector system** – perforated infiltration system to infiltrate clean roof water across the site;
- **Roof Top Disconnection** – promote infiltration/evapotranspiration of roof water within lawn areas;
- **Topsoil amendment** - to increase the abstraction of runoff within proposed sodded lawn areas.

It is anticipated that the above mitigation measures will enable the proposed development to obtain a post to pre-development water balance. A detailed assessment of the impact, sizing, and final selection of the proposed LID measures on the site water balance will be conducted at the detailed design stage when suitable locations and sizing's are confirmed.



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LEGEND

- PROPERTY BOUNDARY
- DRAINAGE BOUNDARY
- PARK & BUFFER
- SINGLE DETACHED
- TOWNHOUSES

DRAINAGE AREA
AREA I.D. | DESIGN RUNOFF COEFF. | DRAINAGE AREA

- SWM BLOCK
- RIGHT OF WAY
- MIXED-USE BLOCK
- OVERLAND FLOW ROUTE
- EXISTING WELL AREA

FIGURE 2-2
POST-DEVELOPMENT DRAINAGE PLAN
HILLSBURGH RESIDENTIAL SUBDIVISION
TOWN OF ERIN

22-0020ER	March 2023	SCALE: 1:3200

DOUGLAS CRESCENT

CURRIE ROAD

SPRUCE STREET

STATION STREET

FULL CAPTURE POINT

1.0m x 1.8m
BOX CULVERT

EX. RESIDENTIAL

EX. SCHOOL
(POTENTIAL FUT.
COMMERCIAL)

TRAFALGAR ROAD

600mmØ
CULVERT

GUELPH STREET

JANE STREET

MARKET STREET

ELORA CATARACT TRAIL

WELLINGTON STREET

FULL CAPTURE POINT

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LEGEND

- PROPERTY BOUNDARY
- INFILTRATION TRENCH
- PROP. STM. SERVICE
- EXISTING STM SEWER
- EXISTING CULVERT
- OVERLAND FLOW ROUTE
- SWM TANK
- BIORETENTION AREA

FIGURE 2-3
STORM SERVICING PLAN
HILLSBURGH RESIDENTIAL
SUBDIVISION
TOWN OF ERIN

22-0020ER	March 2023	SCALE: 1:3200

3.0 Sanitary Servicing

3.1 Existing Sanitary Sewers

Town records were used to identify any existing Town wastewater infrastructure in the area. Based on these records, no existing sanitary infrastructure was found to be located in proximity to the site.

In order to provide adequate servicing of future sanitary demands in this area, and for the proposed development, the WSP is currently working on the design of a sanitary trunk sewer on behalf of the Town of Erin. As per WSP's preliminary design, the new sanitary trunk sewer will be directed southwards along Trafalgar Road and will change alignment to follow the Elora Cataract Trailway at the trail's intersection with Trafalgar Road.

The future sanitary sewer system is depicted in Figure 3-1, as well as on the engineering drawings in Appendix E.

3.2 Design Criteria

The sanitary flow calculations are based on the following Town of Erin sanitary sewer design criteria:

- Domestic sewage flow rate for residential area is 290 L/cap/day.
- Infiltration rate is 0.29 L/s/ha of gross area.
- Harmon Peaking Factor, M is $1 + 14/(4 + P^{0.5})$, where P is population in thousands, where the maximum value of M is 4.0, and minimum is 2.0. The peaking factor for commercial areas is 1.0.
- Sewer flow velocities at full flow should be restricted to:
    - Minimum velocity of 0.6 m/s
    - Maximum velocity of 3.0 m/s
- Pipe capacity calculations should be based on the Manning's formula, where roughness coefficient of n = 0.013 for concrete and PVC pipes.
- Minimum pipe diameter shall be 150 mm for industrial, commercial or pipes servicing multiple residential services.

3.3 Proposed Sanitary Servicing

The proposed sanitary servicing layout includes a system of internal sanitary sewers which will be designed to drain via gravity from the north property boundary to the south. In order to better service the site, and prevent excessively deep sewers, the subject site is proposed to be split into two (2) sanitary catchment areas, each serviced by separate outlets. These outlets will drain to the future Trafalgar Road sanitary trunk sewer and will flow southwards. The site's outlets will be located at the two primary site access points located at Station Street and Market Street respectively.

At the time of writing WSP's design of the sanitary trunk sewer along Trafalgar Road is 450 mm diameter. Coordination and discussion with the Town will be held at future stages to ensure that WSP's design, and that of the internal sewers will be compatible with each other.

The proposed development design populations have been estimated and presented in Section 1.4. The total site sanitary peak flow anticipated to be generated by this development is summarized in Table 3-1. Detailed sanitary demand calculations are provided in Appendix C.

Table 3-1: Proposed Sanitary Flow Estimate

Land Use	Area (ha)	Population	Average Flow (L/s)	Peak Factor	Peak Flow (L/s)	Infiltration Flows (L/s)	Total Sanitary Peak Flow (L/s)
Residential	52.3	3093	10.38	3.43	35.62	13.59	**49.21**

In addition, consideration has been made to support potential gravity connections from future sanitary sewers which would be required to service future development lands to the south. Similarly, on the north side of the site consideration has been provided for future connection points from existing areas to the north along Currie Road and Spruce Street. The proposed sanitary sewer system is illustrated on Figure 3-1 as well as the Preliminary Engineering Drawings, provided in Appendix E.

3.4 Servicing Allocation

As mentioned, the Town is currently undergoing improvements to the Town's sanitary sewerage system capacity. At the time of writing, the property owner has entered into both an *Allocation Agreement* and *Front Ending Agreement* with regards to the sanitary capacity of the new Town

Wastewater Treatment Plant. In exchange for these agreements, the Town has awarded an allocation of 700 Single-Detached Equivalents (SDE). The breakdown of the equivalent units in comparison to the proposed unit breakdown is shown in the table below.

Table 3-2: Proposed Single-detached Equivalents (SDE)

Unit Type	Proposed Unit Count	SDE Conversion Rate	Proposed SDE Units
Single-Detached	446*	1.0	446
Townhouse	353	0.72*	254
Total	799	-	**700**

*Conversion rate for “Muliples” dwellings to one (1) SDE.

Based on the table above, as per the current draft plan, the proposed development’s equivalent unit counts remain within the 700 single-detached equivalent (SDE) units allocated for the Town’s future sanitary design capacity. Based on the above breakdown, adequate sanitary capacity for the proposed Single-Detached homes and Townhouses is expected to be provided by the Town’s future wastewater treatment facilities. A summary of the anticipated peak flow capacity associated with the 700 SDE units is provided in Table 3-3.

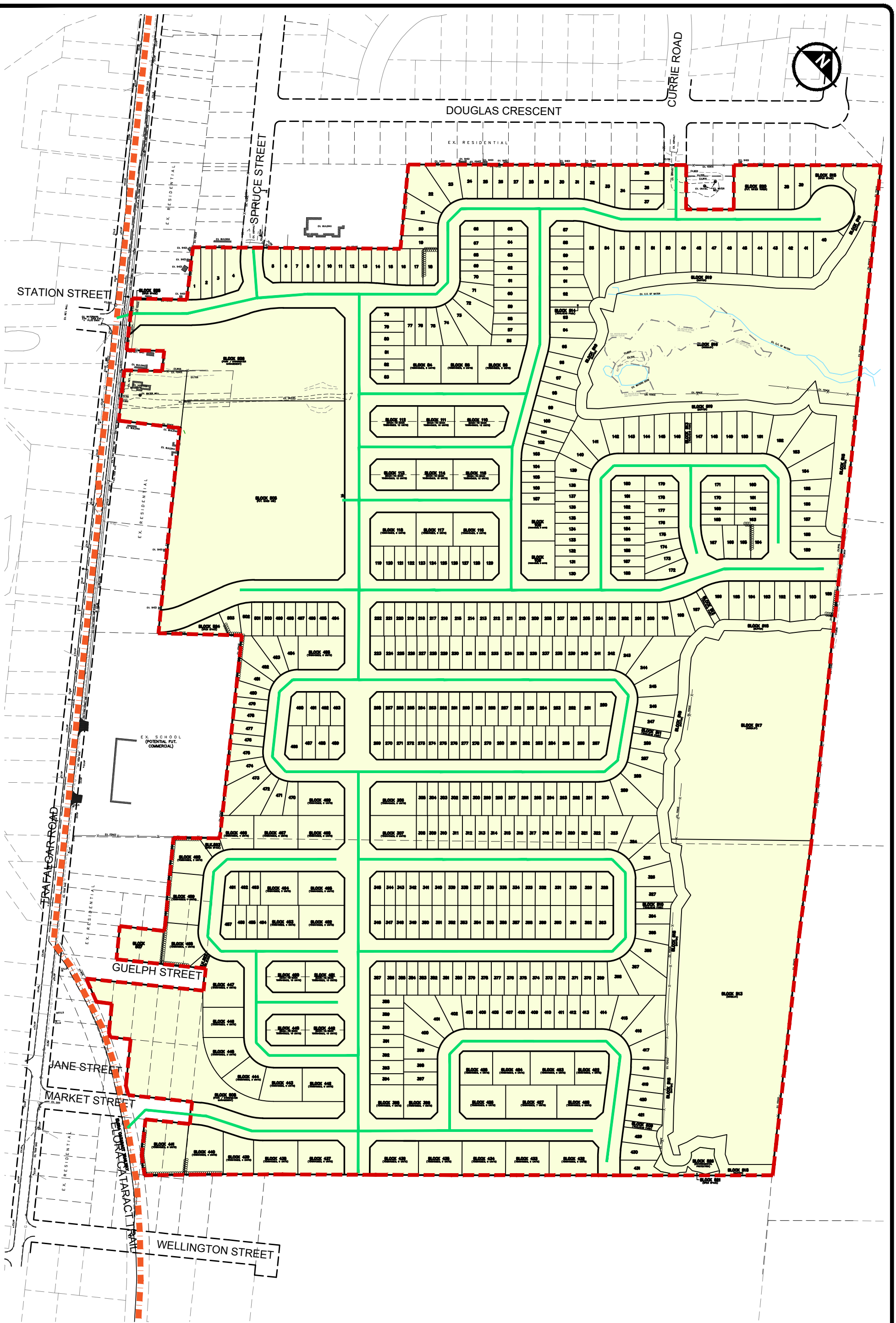
Table 3-3: SDE Allocation Sanitary Demand

Land Use	SDE Unit Count	Design Population (2.8 ppl/unit)*	Average Flow (L/s)	Peak Factor	Peak Flow (L/s)
Residential	700	1960	6.58	3.59	**23.63**

*As per the Town of Erin Engineering Design Guidelines.

**Estimate does not include infiltration peak flows.

Lastly, it should be noted that the capacity required to adequately service the proposed mixed-use block will be dependant on the proposed block design. At this time the proposed block design is still to be determined. As a result, the additional allocation required for the future mixed-use block (Block 505) will be handled in the future by a separate site plan application for this block.



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LEGEND

- PROPERTY BOUNDARY
- PROPOSED SANITARY SEWER
- EXISTING SANITARY SEWER
- FUTURE SANITARY TRUNK SEWER (TO BE DESIGNED BY WSP, ON BEHALF OF THE TOWN)

FIGURE 3-1
SANITARY SERVICING PLAN
HILLSBURGH RESIDENTIAL SUBDIVISION
TOWN OF ERIN

22-0020ER	March 2023	SCALE: 1:3200

4.0 Water Supply Servicing

4.1 Existing Water Supply Infrastructure

Based on existing municipal records, homes north of the proposed development are currently within serviced by the original Village of Hillsburgh' s water supply system. This system is serviced by the two existing municipal wells H2 and H3, north of the site, as indicated by the Town of Erin's Urban Centre Water Servicing Class EA (February 2020). Existing 150mm diameter watermains are present along Spruce Street, and Douglas Crescent, directly adjacent to the site's north boundary.

As per the Town of Erin's Urban Centre Water Servicing Class EA (February 2020), it is known that future expansions to the Town's water system are anticipated to be required to adequately service the township as further growth occurs. In particular relevance to the proposed development, the Class EA recommends the provision of a future water tower within the subject site area near the existing termination of Currie Drive. Furthermore, as per the Town's Pre-Consultation Response letter, dated March 30th, 2022, a sufficiently sized block should be provided within the subject development to provide an elevated water tower (storage reservoir) adjacent to the new water well block.

In addition, the Town has confirmed that a new watermain will be constructed along Trafalgar Road by the Town as part of the Town's sanitary servicing project along this road. As such the site will be required to provide connections to the future watermain to be constructed along Trafalgar Road.

As a result of the above, the Town's construction of the future elevated water tower and future watermain along Trafalgar Road is expected to be necessary to ensure that adequate water service capacities are available on-site.

4.2 Design Criteria

The following represents a brief summary of the Town of Erin's design criteria for water supply infrastructure.

Typical Water Demand Criteria:

- Average Daily Consumption Rate for Residential area is 290 L/cap/day
- Average Daily Consumption Rate for School area is 95 L/cap/day

- Average Daily Consumption Rate for Industrial area is 9 m^3/ha/day
- Average Daily Consumption Rate for Commercial area is 28 m^3/ha/day
- Minimum Day Demand Factor for Residential area is 0.40
- Maximum Day Demand Factor for Residential area is 2.75
- Maximum Hourly Demand Factor for Residential area is 4.13

Fire Flow Requirements:

- Minimum Allowable Flow Rate for Residential Area is 57 L/s at 138 kPa (20 psi), with a preferred rate of 76 L/s at 140 kPa (20 psi);
- Minimum Allowable Flow Rate for Institutional Area is 91 L/s at 138 kPa (20 psi) , with a preferred rate of 114 L/s at 140 kPa (20 psi);
- Minimum Allowable Flow Rate for Commercial / Industrial Area is 136 L/s at 138 kPa (20 psi), with a preferred rate of 152 L/s at 140 kPa (20 psi);

4.3 Proposed Water Supply Servicing

Water supply servicing for the subject site will be provided according to the Town of Erin design criteria. The proposed watermain system will be designed to provide water connections for each unit throughout the site. Looping will be provided internally for dead ends, as well as via multiple site connections to the existing Town water supply system in order to provide redundancy.

It is the intention of the proposed development to accommodate the recommendations of the Town of Erin's Urban Centre Water Servicing Class EA with the inclusion of a Future Water Tower (Block 516), as shown on the current draft plan (see Appendix A for reference). Watermain connections from the site to the existing Erin water supply system will be proposed via connections to existing watermains to the north. Connection points are proposed at both Currie Road and Spruce Street as well as to the future watermain to be constructed by the Town along Trafalgar Road. Two (2) connection points are proposed at the primary site access points at Station Street, and Market Street.

Furthermore, it is understood that the Town is currently in the process of completing a comprehensive water supply system model for the Town of Erin. The appropriate sizing of on-site watermains, future water towers, as well as the size of the existing Erin water supply network should be confirmed based on the final Town of Erin water supply model once it is completed. Details of the proposed water supply system will therefore be confirmed at later

design stages, and once the Town model is available.

In order to ensure adequate servicing capacity is provided for the subject site, the construction timing of the development will be coordinated with the Town regarding the construction timeline of the new municipal well, elevated water tower, and future watermain along Trafalgar Road.

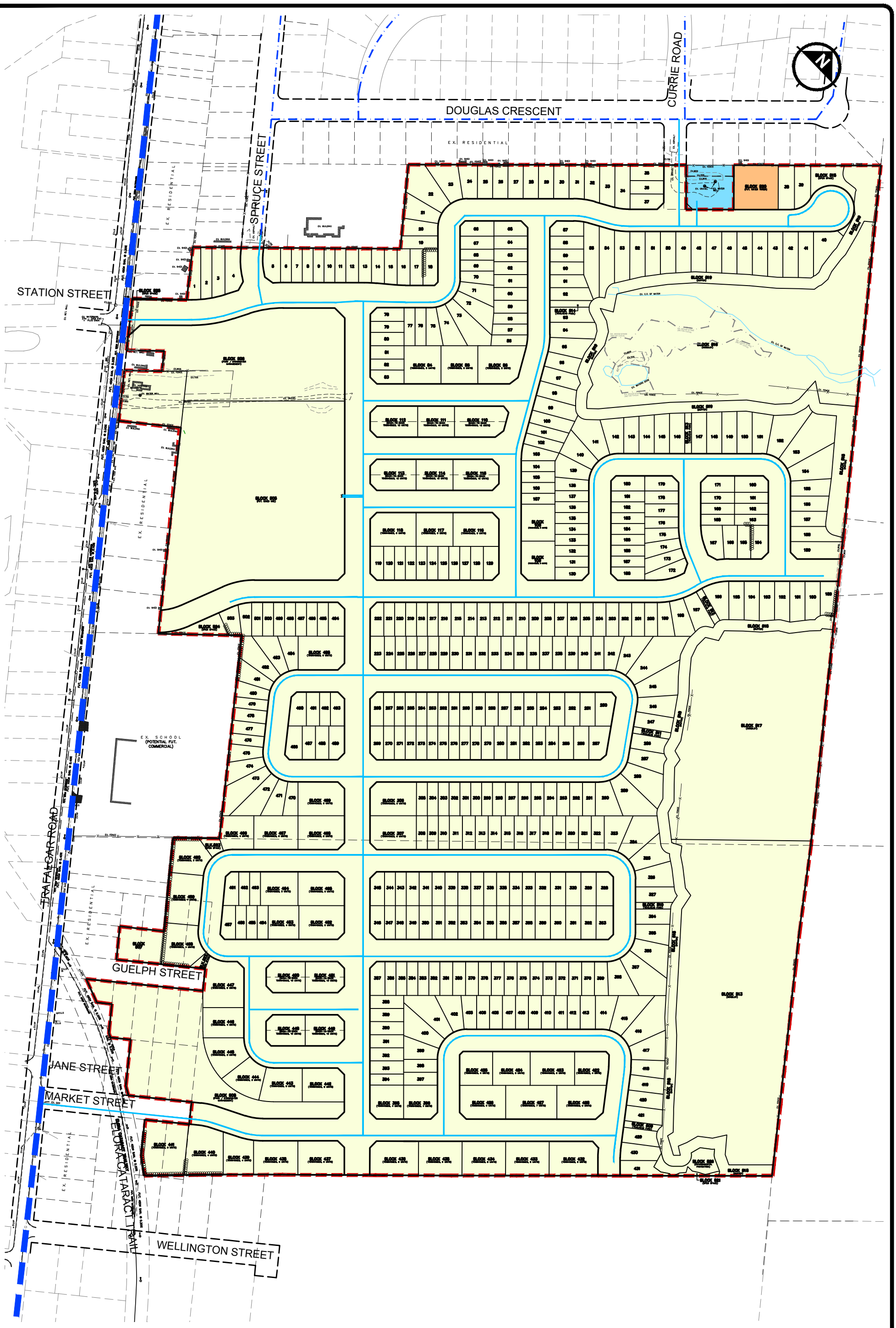
The minimum fire flow rate has been estimated based on the preferred fire flow rate, as indicated by the latest Town of Erin design guidelines. The estimated water supply demands for the proposed development are presented in Table 4-1. All detailed water supply calculations are provided in Appendix D, and the proposed water supply system is depicted schematically in Figure 4-1.

Table 4-1: Estimated Residential Water Supply Demands

Land Use	Expected Population [1,2]	Average Day Demand [3] (L/s)	Peak Hour Demand [4] (L/s)	Max. Day Demand [5] (L/s)	Fire Flow (L/s)	Max Day + Fire (L/s)
Residential & Commercial	3093	10.38	42.88	28.55	76.00	104.55

Note:

(1) Expected population based on population estimate in Section 1.4
(2) Expected Mixed-Use Population included in population estimate.
(3) Based on average day consumption rate as 290 l/cap/day
(4) Based on peak hour factor as 4.13
(5) Based on maximum day factor as 2.75



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LEGEND

- PROPERTY BOUNDARY
- PROP. WATERMAIN
- EX. WATERMAIN
- FUTURE TOWN WATERMAIN
- NEW WELL BLOCK
- FUTURE WATER TOWER BLOCK

FIGURE 4-1
WATER SUPPLY SERVICING PLAN
HILLSBURGH RESIDENTIAL SUBDIVISION
TOWN OF ERIN

22-0020ER	March 2023	SCALE: 1:3200

5.0 Erosion & Sediment Control Measures

A preliminary Erosion and Sediment Control (ESC) Plan for the proposed development has been prepared in accordance with the December 2006 Erosion and Sediment Control Guidelines for Urban Construction (Greater Golden Horseshoe Conservation Authorities) and as per the current Town of Erin standards and requirements.

The proposed erosion and sediment control works during construction will consist of the following:

- temporary silt fences;
- sediment traps;
- Two (2) sediment control ponds;
- sediment traps for the catchbasins and manholes;
- mud mats at the construction access; and
- Cut-off swales;

A functional Erosion and Sediment Control plan is provided in Appendix E which presents the above strategies. The final erosion and sediment control measures to be used, and their locations, on-site will be confirmed at the detailed design stage.

6.0 SUMMARY

This report outlines the desired stormwater management and servicing scheme for the proposed residential Hillsburgh Subdivision development east of Trafalgar Road, North of Wellington Road 22, in the Town of Erin. The following summarizes the conclusions and recommendations of this report:

Stormwater Management

- Post to pre-development peak flow matching is proposed to meet site quantity control criteria;
- Detention storage is required on site and will be provided using underground concrete storage tanks to enable the attenuation of flows to within the site's quantity control requirements;
- Retention of 5 mm of rainfall for erosion control and water balance mitigation is proposed to be achieved through infiltration trenches and centralized bioretention cells.
- Quality control is proposed via a treatment train of OGS units and downstream bioretention cells, to provide an enhanced level of treatment on aggregate.
- A site water balance assessment was conducted by Soil Engineers Ltd. Infiltration trenches, bioretention, rooftop lead disconnection and topsoil amendment are proposed as options to mitigate site water balance.

Sanitary Servicing

- Site sanitary flows are proposed to drain in a south westerly direction via a proposed internal sanitary sewer network.
- A future sanitary trunk sewer is currently planned to be constructed along Trafalgar Road and the Elora Cataract Trailway and is being designed by WSP on behalf of the Town. The site will be serviced to the future sanitary trunk sewer with two outlet locations at Station Street and Market Street.
- Sanitary capacity of the Trafalgar Sanitary trunk sewer should be confirmed and coordinated with the Town during later design stages to ensure compatibility with the proposed development.

Water Supply Servicing

- An Internal water supply network will be directly fed by a future proposed water tower and new well block on the site's northern boundary;
- Sizes of the future water tower and water will be established and designed by the Town as per the results of their upcoming Town water supply model.
- Connection points to the Town's water supply network will be provided to the future Town watermain extension along Trafalgar Road to the East.

Respectfully Submitted,

Urbanworks Engineering Corporation

Giancarlo Volpe, P.Eng., M.Eng.
Project Engineer

Michael Paulo, P.Eng.
Principal

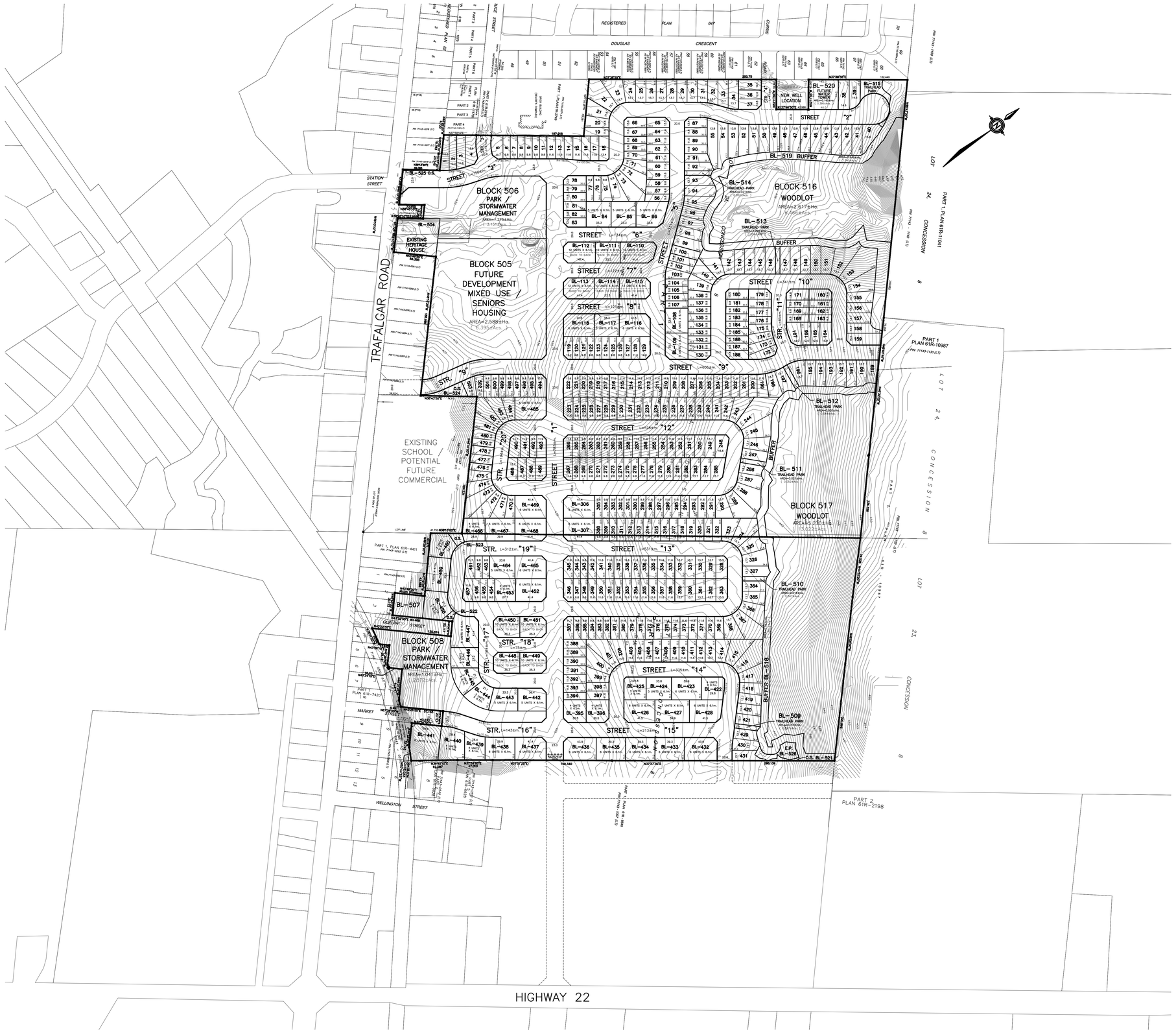
APPENDIX A

Background Information

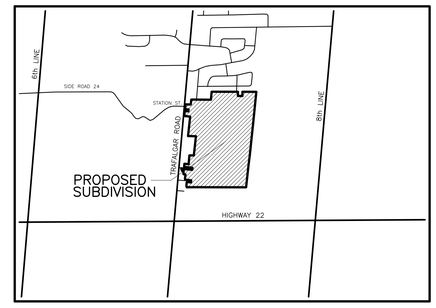
DRAFT PLAN

DRAFT PLAN OF SUBDIVISION
PART OF LOTS 23 AND 24, CONCESSION 8
(GEOGRAPHICAL TOWNSHIP OF ERIN)
PART OF LOTS 11 & 12 EAST OF MARKET STREET, PART OF LOT 14 ALL OF LOTS 15 & 16 WEST OF MARKET STREET, PART OF LOTS 4 AND 17, ALL OF LOTS 18, 19 AND 20, EAST OF GUELPH STREET, PART OF LOTS 21 & 22, ALL OF LOTS 23 & 24, WEST OF GUELPH STREET, REGISTERED PLAN 95
(FORMERLY VILLAGE OF HILLSBURGH)
NOW IN THE TOWN OF ERIN
COUNTY OF WELLINGTON

SCALE 1:2000



DRAFT PLAN 23T–



KEY PLAN

SECTION 51, PLANNING ACT, ADDITIONAL INFORMATION

A. AS SHOWN ON DRAFT PLAN
B. AS SHOWN ON DRAFT PLAN
C. AS SHOWN ON DRAFT PLAN
D. SEE SCHEDULE OF LAND USE
E. AS SHOWN ON DRAFT PLAN
F. AS SHOWN ON DRAFT PLAN
G. AS SHOWN ON DRAFT PLAN
H. MUNICIPAL PIPED WATER AVAILABLE AT TIME OF DEVELOPMENT
I. CLAY–LOAM
J. AS SHOWN ON DRAFT PLAN
K. SANITARY AND STORM SEWERS, GARBAGE COLLECTION, FIRE PROTECTION
L. AS SHOWN ON DRAFT PLAN

SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AS SHOWN ON THIS PLAN, AND THEIR RELATIONSHIP TO THE ADJACENT LAND ARE ACCURATELY AND CORRECTLY SHOWN.

DATE ----------, 2023

THOMAS J. SALB
OLS, OLIP, B.Sc

OWNER'S CERTIFICATE

I AUTHORIZE KLM PLANNING PARTNERS INC. TO PREPARE AND SUBMIT THIS DRAFT PLAN OF SUBDIVISION TO THE TOWN OF ERIN FOR APPROVAL.

OWNER

BEACHCROFT INVESTMENTS INC.
C/O
BALLANTRY HOMES
20 CACHET WOODS COURT
SUITE 6, MARKHAM ONTARIO
L6C 3G1

DAVID HILL
PRESIDENT

TOTAL AREA OF LAND TO BE SUBDIVIDED = 52.272±Ha. (129.166±Acs)

SCHEDULE OF LAND USE

	BLOCKS	LOTS	UNITS	±Ha.	±Acs.
DETACHED DWELLINGS					
LOTS 22–35, 38–55, 93–99, 141–159, 189–198, 244–251, 283–290, 323–332, 359–368, 413–421 and 429–431 MIN. LOT FRONTAGE=13.7m. MIN LOT AREA=417.8sq.m.		116	116	6.485	16.025
LOTS 3–4, 12–21, 36–37, 59–67, 80–81, 87–92, 100, 128–129, 139–140, 160, 164–167, 171, 177–180, 199–216, 230–243, 252–258, 277–282, 291–298, 311–322, 333–342, 349–358, 369–381, 388–393, 397–412, 477–478, 486–391 and 494 MIN. LOT FRONTAGE=11.6m. MIN LOT AREA=353.8sq.m.		174	174	6.627	16.376
LOTS 1–2, 5–11, 56–58, 68–79, 82–83, 101–107, 119–127, 130–138, 161–163, 168–170, 172–176, 181–188, 217–229. 259–276, 299–305, 308–310, 343–348, 382–387, 394, 454–457, 461–463, 470–476 479–484, 492–493 and 495–503 MIN. LOT FRONTAGE=9.8m. MIN LOT AREA=298.9sq.m.		155	155	5.116	12.641
STREET TOWNHOUSE DWELLINGS					
BLOCKS 84–86, 108–109, 116–118, 306–307, 395–396, 422–428, 432–447, 452–453, 458–460, 464–469 and 485 MIN. UNIT FRONTAGE = 6.1m.	47		245	5.567	13.756
BACK TO BACK TOWNHOUSE DWELLINGS					
BLOCKS 110–115 and 448–451 MIN. UNIT FRONTAGE = 6.1m.	10		108	1.029	2.543
EXISTING HERITAGE HOUSE					
LOT 504		1	1	0.276	0.682
SUBTOTAL	57	446	799	25.100	62.023
BLOCK 505 – FUTURE DEV. MIXED USE / SENIORS HOUSING	1			2.588	6.395
BLOCKS 506–508 – PARK / STORM WATER MANAGEMENT	3			2.436	6.020
BLOCKS 509–515 – TRAILHEAD PARK	7			0.200	0.494
BLOCKS 516–517 – WOODLOT	2			7.887	19.488
BLOCKS 518–519 – BUFFER	2			1.702	4.206
BLOCK 520 – FUTURE WATER TOWER	1			0.160	0.395
BLOCKS 521–525 – OPEN SPACE	5			0.107	0.264
BLOCK 526 – ENVIRONMENTAL PROTECTION	1			0.074	0.184
STREETS				12.018	29.697
23.0m. WIDE TOTAL LENGTH=1034±m. AREA= 2.378±Ha.					
20.0m. WIDE TOTAL LENGTH=4820±m. AREA= 9.640±Ha.					
TOTAL LENGTH=5854±m. AREA=12.018±Ha.					
TOTAL	79	446	799	52.272	129.166

NOTE – ELEVATIONS RELATED TO CANADIAN GEODETIC DATUM

NOTE – ⊛ SPECIAL DESIGN UNITS

KLM PLANNING PARTNERS INC.
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Planning ● Design ● Development

PROJECT No. P-3304

SCALE 1:2000 FEB 9, 2023

(3304-DES11) X-REF: (3304MAS & 3304MTOPO)

DWG. No. - 23:1

HYDROGEOLOGICAL INVESTIGATION

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
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BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	GRAVENHURST	HAMILTON
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A REPORT TO
BEACHCROFT INVESTMENTS INC. (BALLANTRY HOMES)

A PRELIMINARY HYDROGEOLOGICAL ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT

63 AND 63A TRAFALGAR ROAD
TOWN OF ERIN

REFERENCE NO. 2206-W054

FEBRUARY 2023

DISTRIBUTION

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5.0 SOIL LITHOLOGY

The investigation has revealed that beneath the topsoil and ploughed soil horizons at the ground surface, the subject site is underlain, predominantly by sand and gravelly sand deposits. Sandy silt to silty sand till or silt deposits were generally contacted within the lower stratigraphy in some of the boreholes. A localized sandy silt deposit was also contacted near the ground surface, below the ploughed soil layer in Borehole 6.

5.1 **Topsoil/Ploughed Soil** (All BH/MWs)

The thickness of the revealed topsoil horizon is approximately 36 cm where it extends to depths of 0.5 to 0.9 mbgs. The ploughed soil layer consists of dark brown sand with occasionally rootlets inclusions. The moisture contents for the retrieved subsoil samples ranges from 13.6 to 19.3%. High moisture contents are attributed to the topsoil and its organic inclusions.

5.2 **Sand** (All BH/MWs except BH/MWs 4, 6 and 8)

Sand was contacted below the ploughed soil layer within all the boreholes, except BH/MWs 4, 6 and 8. It extends to depths, ranging from 1.0 to 6.6 mbgs. Its relative density varies from very loose to very dense, being generally compact. It is mostly fine to medium grained with occasional gravel inclusions. The moisture contents for the retrieved subsoil samples ranges from 4.2 to 11.4%, indicating moist to very moist conditions. Its colour remains brown. Grain size analysis on one subsoil sample from BH/MW 7 at a depth of 4.8 mbgs indicates the estimated permeability is about 10^{-3} m/sec, with the soil gradation being plotted on Figure 12.

5.3 **Gravelly Sand/Sandy Gravel** (All BH/MWs except BH/MWs 7 and 11)

Gravelly sand/sandy gravel deposits were encountered in the lower soil stratigraphy, below the sand or sandy silt layer. The relative density for t he gravelly varies from compact to very dense. The soil colour remains brown and includes occasionally cobbles and boulders. The moisture contents for the retrieved subsoil samples ranges from 2.6 to 12.4%, indicating damp to saturated conditions. The saturated samples were found at lower depths, generally about 5 mbgs. Grain size analysis on one subsoil sample from BH/MW 1 at a depth of 3.3 mbgs indicates the estimated permeability is about 10^{-3} m/sec with the subsoil sample gradation being plotted on Figure 13.

5.4 **Silty Sand Till and Sandy Silt Till** (BH/MWs 1 and 5)

Silty sand till and sandy silt till deposits were contacted locally at the bottoms of BH/MWs 1 and 5 below gravelly sand deposit. The relative density varies from dense to very dense. They contain traces of gravel and clay, become gravelly in places with occasionally cobbles and boulders. The silty sand till becomes grey at a depth of 4.5 mbgs in BH/MW 1. Grain size analysis on four subsoil samples indicates the estimated permeability ranges from 10^{-4} m/sec to 10^{-5} m/sec with the subsoil sample gradation being plotted on Figures 14 to 16.

5.5 **Sandy Silt/Silt** (BH/MWs 6, 8 and 11)

A layer of sandy silt was encountered within the upper zone of BH/MW 6, where it extends to a depth of 2.2 m. The silt deposit was found at the bottom of BH/MWs 8 and 11. The sandy silt is compact and moist, and remains brown. The silt is dense to very dense and becomes grey at a depth of 6.4 mbgs within BH/MW 11.

6.0 GROUNDWATER STUDY

6.1 Review Summary of Concurrent Report

A review of the findings from the concurrent geotechnical soil investigation report (SEL Reference No. 2206-S054) has disclosed that beneath a layer of topsoil/ploughed soil horizons, the subject site is underlain, predominantly by sand and gravelly sand deposits. Sandy silt to silty sand till, or silt was contacted within the lower stratigraphy within some of the boreholes. A local sandy silt deposit was also encountered near the ground surface, below the ploughed soil horizon in BH/MW 6.

6.2 Review of Ontario Water Well Records

The Ministry of the Environment, Conservation and Parks (MECP) water well records for the subject site, and for the properties within a 500 m radius of the boundaries of the subject site (study area) were reviewed.

The records indicate that one hundred and forty (140) well records are located within the study area relative to the subject site boundaries. The locations of these well records, based on the UTM coordinates provided by the records, are shown on Drawing No. 3. Details for the MECP water well records that were reviewed are provided in Appendix A.

A review of the final status and of the well records within the study area reveals that ninety-six (96) are registered as water supply wells, two (2) are registered as test hole wells, one (1) well is registered as having other status, ten (10) are registered as observation wells, three (3) are registered as monitoring and test hole wells, two (2) are registered as abandoned-supply wells, twenty-one (21) are registered as abandoned-other wells, and five (5) wells are registered as having unknown statuses.

A review of the first use of the well records reveals that five (5) are registered as test hole wells, seven (7) are registered as public supply wells, six (6) wells are registered as not being used, one (1) is registered as a municipal well, eight (8) are registered as monitoring wells, one (1) is registered as a livestock well, eighty-two (82) are registered as domestic wells, two (2) are registered as commercial wells, and twenty-eight (28) wells are registered as having unknown statuses.

Should there be any water supply wells discovered during the future site grading operations, we recommend that they be properly decommissioned in accordance with the Ontario Water resources Act, Regulation 903.

6.3 **Groundwater Monitoring**

The groundwater levels in the monitoring wells were measured, manually on December 1, 2022, January 5 and February 8, 2023, to record the fluctuation of the shallow groundwater table beneath the site. The recorded groundwater levels and their corresponding elevations are given in Table 6-1.

Table 6-1 - Groundwater Level Measurements

Well ID		December 1, 2022	January 5, 2023	February 8, 2023	Fluctuation (m)
BH/MW 1	mbgs	3.91	5.47	5.84	1.9
	masl	435.72	434.16	433.79	
BH/MW 2	mbgs	DRY	DRY	DRY	-
	masl	<430.06	<430.06	<430.06	
BH/MW 3	mbgs	5.88	5.84	5.85	0.04
	masl	428.17	428.21	428.20	
BH/MW 4	mbgs	DRY	3.88	3.90	2.20
	masl	<421.51	423.73	423.71	
BH/MW 5	mbgs	4.94	4.90	4.80	0.14
	masl	428.89	428.93	429.03	
BH/MW 6	mbgs	3.17	2.75	2.96	0.42
	masl	440.32	440.74	440.53	
BH/MW 7	mbgs	DRY	DRY	6.17	0.03
	masl	<436.12	<436.12	436.15	
BH/MW 8	mbgs	DRY	5.54	5.93	0.66
	masl	<427.95	428.61	428.22	
BH/MW 9	mbgs	DRY	DRY	4.35	0.05
	masl	<433.31	<433.31	433.36	
BH/MW 10	mbgs	5.83	DRY	DRY	0.27
	masl	432.09	<431.82	<431.82	
BH/MW 11	mbgs	3.85	3.88	3.68	0.20
	masl	431.64	431.61	431.81	

Notes *mbgs -- metres below ground surface* *masl -- metres above sea level*

As shown above, the groundwater table levels are generally consistent with minor fluctuation. The groundwater level at BH/MW 2 was consistently below the bottom of the well, in which the well was interpreted as being dry, throughout the monitoring period. BH/MWs 4, 7 and 8 exhibited an increasing trend over the monitoring period. BH/MWs 1 and 10 exhibited a decreasing trend over the monitoring period.

groundwater level elevation of 428.6 masl at BH/MW 8 indicated that he lowest proposed excavation elevation is about 1.2 m above the groundwater table elevation. As such, it is not anticipated that construction dewatering for groundwater control will be required for the proposed SWM Detention Tank.

It is recommended to record the stabilized groundwater levels again over the spring season, from March to June, when groundwater levels are typically at their highest.

7.2 **Groundwater Control Methodology**

Groundwater seepage rates into open excavations below the groundwater table may be controllable by occasional pumping from sump pits when and where needed during earthworks. However due to the unstable nature of sand and gravelly sand below the water table, the shallow groundwater table should be lowered in advanced of excavations, if required. The final designs for the dewatering system will be the responsibility of the construction contractors.

Tables 7-1, which follows, summarizes dewatering flow estimates for the proposed residential structures and for the proposed the SWM area.

more detailed discussion for the groundwater function for the subject site will be provided in the final report once the monitoring program is completed.

7.4 **Low Impact Development**

The surficial shallow soil beneath the subject site consists, predominantly of sand and gravel. Opportunities may exist to infiltrate collected runoff to the subsurface at the developed subject site, using appropriate Low Impact Development Infrastructure, which might include infiltration galleries or underground storage/exfiltration tanks.

LID infrastructure can be implemented in areas where the shallow groundwater is deeper than 1.0 m below the ground surface and where it is possible to maintain a minimum of 1.0 m separation between the bases of any proposed LID stormwater management infiltration infrastructure and the high groundwater table.

8.0 CONCLUSIONS

1. The site lies within the Physiographic Region of Southern Ontario known as the Hillsburgh Sandhills and is within a former spillway.
2. Based on review of the surface geological map of Ontario, the subject site is underlain by the Glaciofluvial ice-contact deposits at the northwest portion and the Glaciofluvial outwash deposits within the southeast portion. The Glaciofluvial ice-contact deposits consist of gravel and sand, includes esker, kame, end moraine, ice-marginal delta and subaqueous fan deposits. The Glaciofluvial outwash deposits consist of gravel and sand, includes also proglacial river and deltaic deposits.
3. The subject site is located within the Credit River Watershed.
4. A review of the topography map for the area, and from review of the ground surface elevations at the borehole and monitoring well locations, indicates that the subject site is generally descending towards the southwest, towards Trafalgar Road.
5. The findings from the current study reveal that beneath the topsoil and ploughed soil horizons, beneath the ground surface, the subject site is underlain, predominantly by sand and gravelly sand deposits. Sandy silt to silty sand till or silt deposits were generally contacted in the lower stratigraphy in some of the boreholes. A localized sandy silt deposit was contacted near the ground surface below the ploughed soil in Borehole 6.
6. The findings of this study confirm that the groundwater table level elevations range from <421.51 to 440.74 masl, The measured groundwater levels at the BH/MWs indicate that shallow groundwater is interpreted to be flowing in southwesterly directions, away from interpreted, localized groundwater high areas, located beneath the northwestern and eastern portions of the subject site. Shallow groundwater is interpreted to flow in the direction of the tributary for Credit River that is located southwest of the subject site.
7. The monitoring wells with sufficient groundwater volumes within them underwent single well response tests (SWRTs) to estimate the hydraulic conductivity at the depths for the monitoring well screens. The results for the SWRT's will be presented in the final hydrogeological assessment report. The single well response tests yielded hydraulic conductivity (K estimate) for the underlying sub-soils for gravelly sand/sandy gravel unit ranges from 5.2×10^{-7} to 5.7×10^{-7} m/s, and the K estimate for the silt and sand unit is 3.6×10^{-6} m/s. The results of the SWRT provide an indication of the yield capacity for the groundwater-bearing subsoil strata at the depths of the monitoring well screens. The above results suggest that the K estimate for the groundwater-bearing subsoils at the depths of the well screen is low to moderate with corresponding low to moderate anticipated groundwater seepage rates

into open excavations, below the groundwater table.

8. Hazen Equation calculated permeability results indicate that the the K estimate for the sub-soil units beneath the subject site ranges from 5.63×10^{-5} to 1.22×10^{-5} m/sec. The results of the SWRT provide an indication of the yield capacity for the groundwater-bearing subsoil strata primarily above the depths of the monitoring wells screens. The above result suggests that the K estimate for the groundwater-bearing subsoils ranges from low to high with corresponding moderate anticipated groundwater seepage rates into open excavations, below the groundwater table.
9. The measured groundwater levels at the BH/MWs indicate that shallow groundwater is interpreted to be flowing in southwesterly directions, away from interpreted, localized groundwater high areas, located beneath the northwestern and eastern portions of the subject site. Shallow groundwater is interpreted to flow in the direction of the tributary for Credit River that is located southwest of the subject site.
10. The groundwater at the subject site is approximately 0.14 to 2.67 m below the base elevation for the proposed basement structures for portions of the residential housing buildings. It is therefore not anticipated that any construction dewatering will be required for earthworks and construction of the proposed houses.
11. The groundwater levels in the vicinity of Block 508, where the stormwater management detention tank is located is approximately 0.5 m below the estimated proposed bottom levels, and, as such, it is not anticipated that dewatering for groundwater control will be required for the construction of this stormwater management, within this area of the proposed development.
12. The dewatering flow estimates for construction of the proposed stormwater management detention tank located within the vicinity of Block 506 of the site, suggests that it could reach an estimated daily rate of 20,504.3 L/day; by applying a safety factor of three (3), it could reach a maximum of 61,512.8 L/day. This dewatering flow rate for excavation, is below the PTTW threshold limit of 400,000 L/day but is above 50,000 L/day threshold limit for requiring an approval, with the approval for the proposed groundwater takings for construction being required to be registered through an Environmental Activity and Sector Registry (EASR) with the EASR filing through the MECP.
13. The highest estimated temporary dewatering flow rates for installation of the underground services could reach a maximum daily rate of 131,806.1 L/day; by considering a 3x safety factor, it could reach an approximate daily maximum of 395,418.3 L/day. Since the estimated dewatering flow rate exceeds 50,000 L/day but is below the 400,000 L/day PTTW threshold limit, the approval for any proposed temporary groundwater-taking for construction is by means of applying for an EASR approval with the MECP.
14. The estimated zone of influence for any conceptual dewatering wells or dewatering array around excavation footprints could reach maximums of 47.0 m away from the

conceptual dewatering array around the servicing trenches.

15. The surficial shallow soil beneath the subject site consists, predominantly of sand and gravel. Opportunities may exist to infiltrate collected runoff to the subsurface at the developed subject site, using appropriate Low Impact Development Infrastructure, which could include infiltration galleries or underground storage/exfiltration tanks. LID infrastructure can be implemented in areas where the shallow groundwater is deeper than 1.0 m below the ground surface and where it is possible to maintain a minimum of 1.0 m separation between the bases of any proposed LID stormwater management infiltration infrastructure and the high groundwater table.

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FIGURES 1 to 16

BOREHOLE LOGS/MONITORING WELL LOGS
AND
GRAIN SIZE ANALYSIS

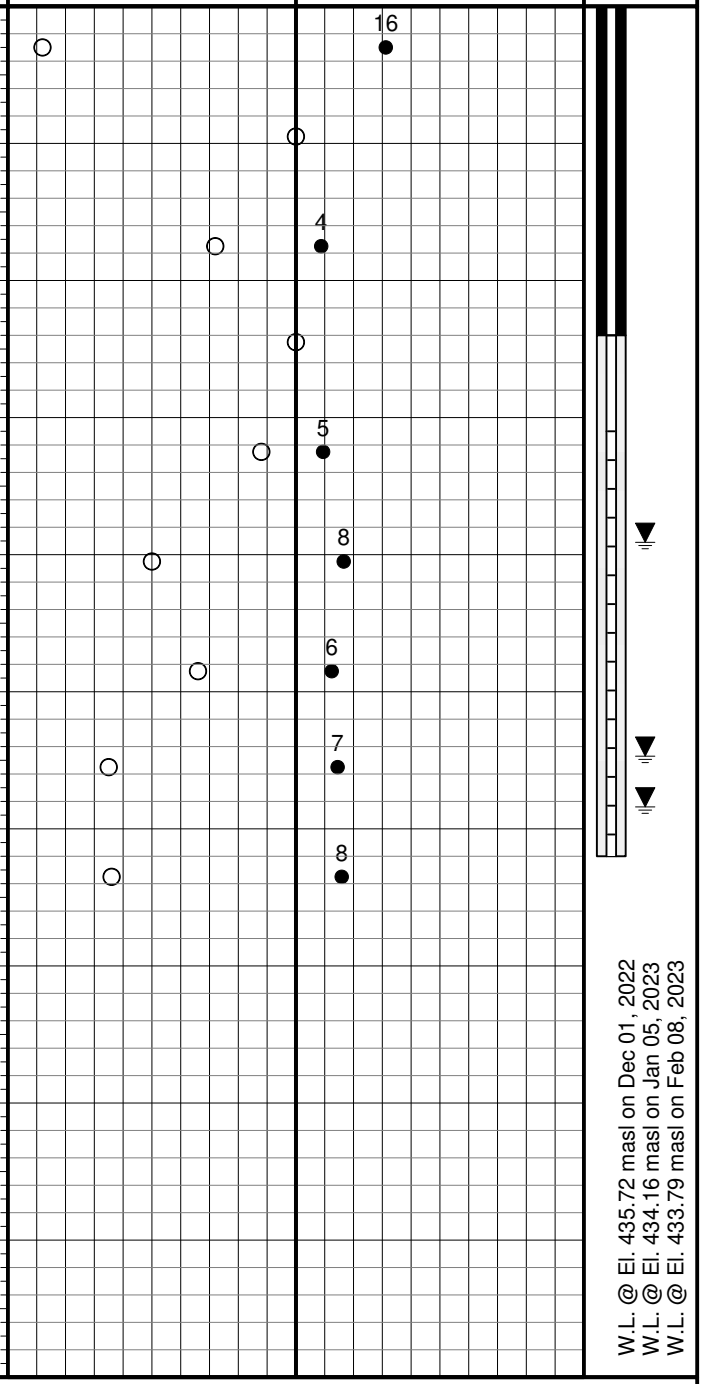
REFERENCE NO. 2206-W054

JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 1 *FIGURE NO.:* 1

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 23, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
439.6	Ground Surface				
0.0	36 cm Topsoil				0
	PLOUGHED SOIL	1	DO	12	
439.1	Dark brown sand, occ. rootlets				
0.5	Brown, compact				
	SAND	2	DO	50/15	1
438.6	fine to medium grained				
1.0	Brown, very dense				
	GRAVELLY SAND	3	DO	72	
	occ. cobbles and boulders				2
		4	DO	50/10	
		5	DO	88	3
435.9					
3.7	Very dense to dense				
	SILTY SAND TILL	6	DO	50	4
	some gravel to gravelly				
	a trace of clay — — brown / grey	7	DO	66	5
	occ. cobbles and boulders				
		8	DO	35	6
		9	DO	36	
433.0					
6.6	END OF BOREHOLE				7
	Installed 50 mm Ø monitoring well to 6.2 m				
	completed with 3.1 m screen				8
	Sand backfill from 2.4 to 6.2 m				
	Bentonite seal from 0.0 m to 2.4 m				9
	Provided with a monument casing				
					10



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JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 2 *FIGURE NO.:* 2

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 22, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
436.3	Ground Surface							
0.0	36 cm Topsoil				0			
	PLOUGHED SOIL Dark brown sand, occ. rootlets	1	DO	6			14	
435.6								
0.7	Brown, loose							
	SAND fine to medium grained	2	DO	5	1		6	
		3	DO	7	2		9	
433.9								
2.4	Brown, dense to very dense	4	DO	45			5	
	GRAVELLY SAND occ. cobbles and boulders	5	DO	50/15	3		4	
					4			
		6	DO	50/15			5	
					5			
		7	DO	60	6		3	
429.7								
6.6	END OF BOREHOLE Installed 50 mm Ø monitoring well to 6.2 m completed with 3.1 m screen Sand backfill from 2.4 to 6.2 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing				7			Dry on Dec 01, 2022 Dry on Jan 05, 2023 Dry on Feb 08, 2023
					8			
					9			
					10			

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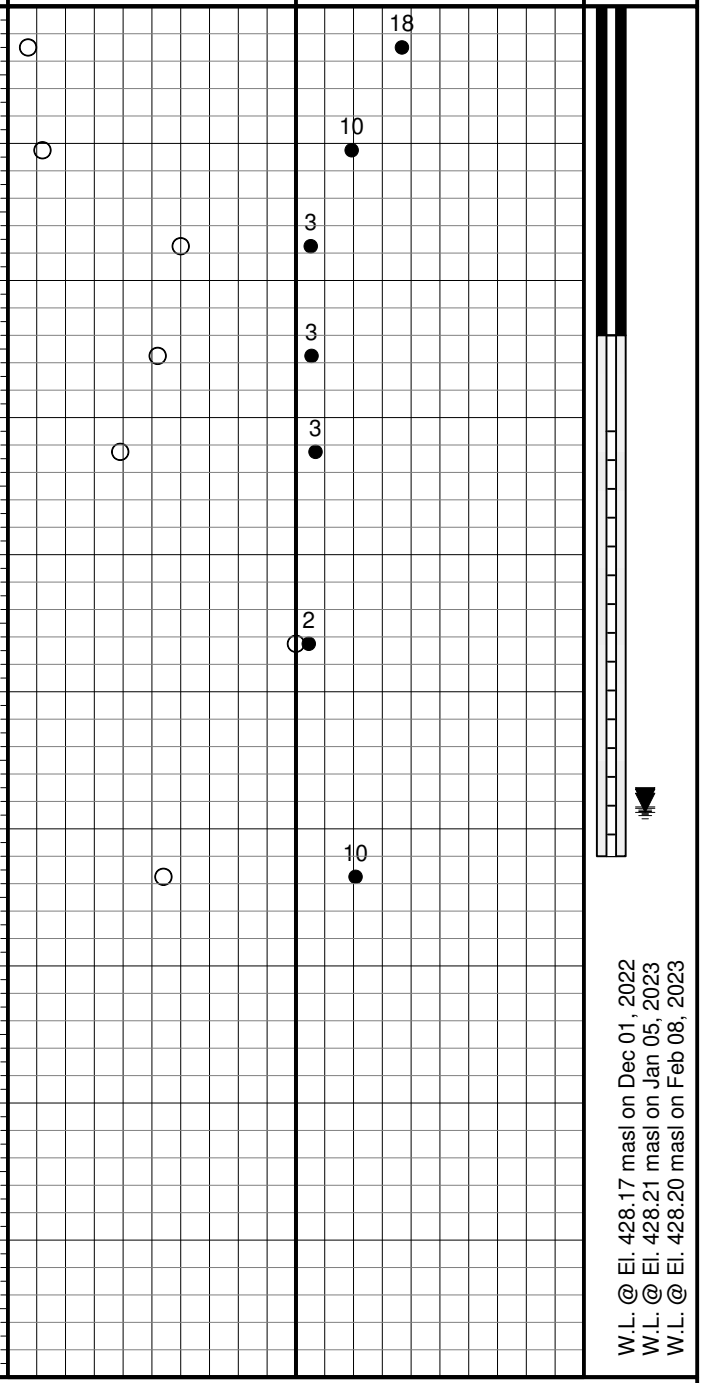
JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 3 *FIGURE NO.:* 3

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) / Shear Strength (kN/m²) / Penetration Resistance (blows/30 cm)	Atterberg Limits PL LL / Moisture Content (%)	WATER LEVEL
434.1	Ground Surface							
0.0	36 cm Topsoil							
	PLOUGHED SOIL Dark brown sand, occ. rootlets	1	DO	7				
433.4								
0.7	Brown, compact							
	SAND fine to medium grained	2	DO	12				
432.7								
1.4	Brown, dense to very dense							
	GRAVELLY SAND occ. cobbles and boulders wet below 5.5 m	3	DO	60				
		4	DO	52				
		5	DO	39				
		6	DO	50/15				
		7	DO	54				
427.5								
6.6	END OF BOREHOLE							
	Installed 50 mm Ø monitoring well to 6.2 m completed with 3.1 m screen Sand backfill from 2.4 to 6.2 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing							



W.L. @ El. 428.17 masl on Dec 01, 2022
W.L. @ El. 428.21 masl on Jan 05, 2023
W.L. @ El. 428.20 masl on Feb 08, 2023

Soil Engineers Ltd.

JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 4 *FIGURE NO.:* 4

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 18, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) / Shear Strength (kN/m²) / Penetration Resistance (blows/30 cm)	Atterberg Limits PL LL / Moisture Content (%)	WATER LEVEL
427.6	Ground Surface							
0.0	36 cm Topsoil	1	DO	11	0		16	
	PLOUGHED SOIL Dark brown sand, occ. rootlets							
426.7		2	DO	50/5	1		16	
0.9	Brown, dense to very dense							
	GRAVELLY SAND occ. cobbles and boulders	3	DO	50/15	2		4	
		4	DO	34			4	
		5	DO	38	3		2	
		6	DO	50/15	4		3	
					5			
421.2		7	DO	50/10	6		3	
6.4	END OF BOREHOLE							
	Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing				7			
					8			
					9			
					10			

Dry on Dec 01, 2022
W.L. @ El. 423.73 masl on Jan 05, 2023
W.L. @ El. 423.71 masl on Feb 08, 2023

Soil Engineers Ltd.

JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 5 *FIGURE NO.:* 5

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
433.8	Ground Surface							
0.0	36 cm Topsoil				0			
	PLOUGHED SOIL Dark brown sand, occ. rootlets	1	DO	4			16	
433.1								
0.7	Brown, compact							
	SAND fine grained some silt	2	DO	7	1		5	
		3	DO	4	2		6	
		4	DO	21			5	
		5	DO	27	3		11	
429.7					4			
4.1	Brown, dense							
	GRAVELLY SAND occ. cobbles and boulders	6	DO	42	5		9	
428.2								
5.6	Brown, dense				6			
	SANDY SILT TILL traces of gravel and clay occ. cobbles and boulders	7	DO	40			19	
427.2								
6.6	END OF BOREHOLE				7			
	Installed 50 mm Ø monitoring well to 6.2 m completed with 3.1 m screen Sand backfill from 2.4 to 6.2 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing				8			
					9			
					10			

W.L. @ El. 428.89 masl on Dec 01, 2022
W.L. @ El. 428.93 masl on Jan 05, 2023
W.L. @ El. 429.03 masl on Feb 08, 2023

JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 6 *FIGURE NO.:* 6

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 21, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
443.5	Ground Surface							
0.0	36 cm Topsoil				0			
	PLOUGHED SOIL Dark brown sand, occ. rootlets	1	DO	10			14	
442.8								
0.7	Brown, compact							
	SANDY SILT some gravel	2	DO	12	1		11	
		3	DO	10			12	
441.3					2			
2.2	Brown, compact to very dense							
	SANDY GRAVEL occ. cobbles and boulders	4	DO	25			12	
		5	DO	38	3		11	
		6	DO	24	4		12	
		7	DO	50/28			8	
438.5					5			
5.0	END OF BOREHOLE Installed 50 mm Ø monitoring well to 4.6 m completed with 3.1 m screen Sand backfill from 0.9 to 4.6 m Bentonite seal from 0.0 m to 0.9 m Provided with a monument casing				6			
					7			
					8			
					9			
					10			

W.L. @ El. 440.32 masl on Dec 01, 2022
W.L. @ El. 440.74 masl on Jan 05, 2023
W.L. @ El. 440.53 masl on Feb 08, 2023

Soil Engineers Ltd.

JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 7 *FIGURE NO.:* 7

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 23, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) / Shear Strength (kN/m²) / Penetration Resistance (blows/30 cm)	Atterberg Limits PL LL / Moisture Content (%)	WATER LEVEL
442.3	Ground Surface							
0.0	36 cm Topsoil				0			
	PLOUGHED SOIL Dark brown sand, occ. rootlets	1	DO	6			13	
441.6								
0.7	Brown, very loose to very dense							
	SAND fine to well graded a trace to some gravel	2	DO	3	1		12	
		3	DO	18	2		3	
		4	DO	48			3	
		5	DO	34	3		3	
		6	DO	50/23	4		3	
		7	DO	45	5		3	
435.7					6			
6.6	END OF BOREHOLE							
	Installed 50 mm Ø monitoring well to 6.2 m completed with 3.1 m screen Sand backfill from 2.4 to 6.2 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing				7			
					8			
					9			
					10			

Dry on Dec 01, 2022
Dry on Jan 05, 2023
W.L. @ El. 436.15 masl on Feb 08, 2023

Soil Engineers Ltd.

JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 8 *FIGURE NO.:* 8

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 22, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
434.3 / 0.0	Ground Surface				
	36 cm Topsoil	1	DO	9	0
433.8 / 0.5	PLOUGHED SOIL Dark brown sand, occ. rootlets Brown, dense to very dense				
	GRAVELLY SAND occ. cobbles and boulders	2	DO	37	1
		3	DO	58	2
		4	DO	50/10	
		5	DO	50/15	3
		6	DO	50/15	4
428.8 / 5.5	Brown, very dense SILT fine grained	7	DO	56	5
427.7 / 6.6	END OF BOREHOLE Installed 50 mm Ø monitoring well to 6.2 m completed with 3.1 m screen Sand backfill from 2.4 to 6.2 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing				6 7 8 9 10

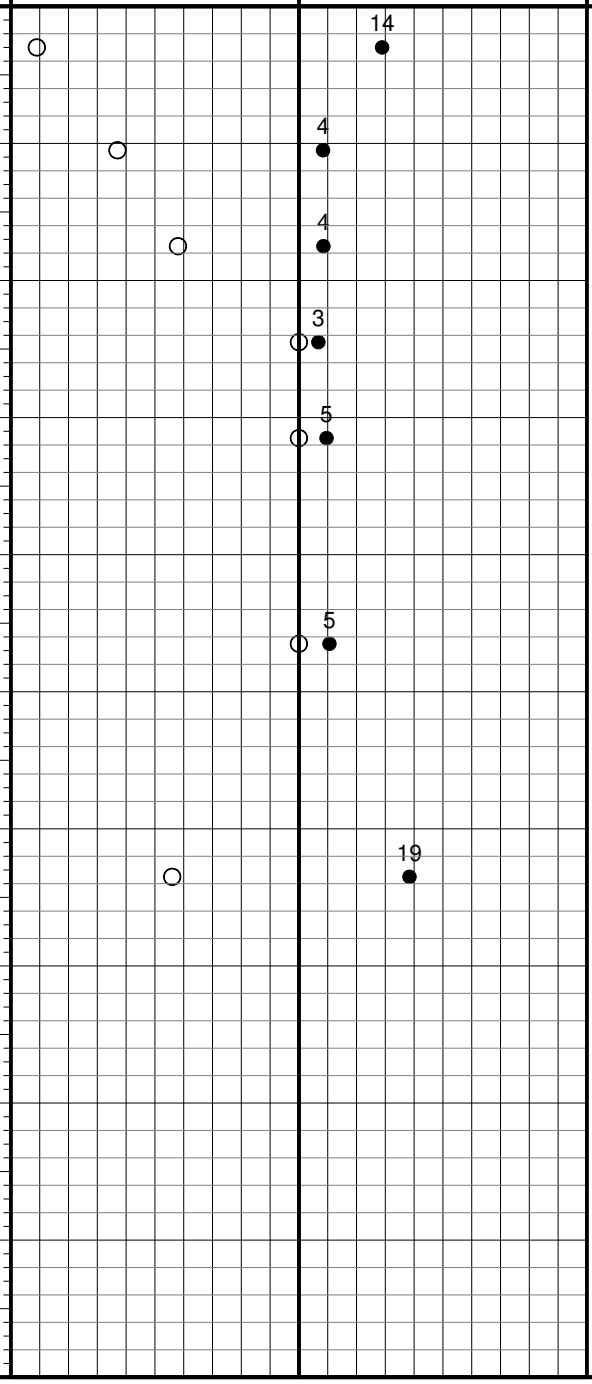
Dynamic Cone (blows/30 cm) 10 30 50 70 90

Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40



WATER LEVEL

Dry on Dec 01, 2022
W.L. @ El. 428.61 masl on Jan 05, 2023
W.L. @ El. 428.22 masl on Feb 08, 2023

Soil Engineers Ltd.

JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 9 *FIGURE NO.:* 9

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 24, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)	Dynamic Cone (blows/30 cm) 10 30 50 70 90 / Shear Strength (kN/m²) 50 100 150 200 / Penetration Resistance (blows/30 cm) 10 30 50 70 90	Atterberg Limits PL LL / Moisture Content (%) 10 20 30 40	WATER LEVEL
437.7	Ground Surface							
0.0	36 cm Topsoil				0			
	PLOUGHED SOIL Dark brown sand, occ. rootlets	1	DO	5			19	
437.0								
0.7	Brown, compact							
	SAND fine to medium grained	2	DO	4	1		15	
435.9								
1.8	Brown, dense to very dense	3	DO	31			9	
	GRAVELLY SAND occ. cobbles and boulders				2			
		4	DO	50/15			3	
					3			
		5	DO	50/10			5	
					4			
433.0		6	DO	50/3			5	
4.7	END OF BOREHOLE Installed 50 mm Ø monitoring well to 4.4 m completed with 3.1 m screen Sand backfill from 0.9 to 4.4 m Bentonite seal from 0.0 m to 0.9 m Provided with a monument casing				5			
					6			
					7			
					8			
					9			
					10			

Dry on Dec 01, 2022
Dry on Jan 05, 2023
W.L. @ El. 433.36 masl on Feb 08, 2023

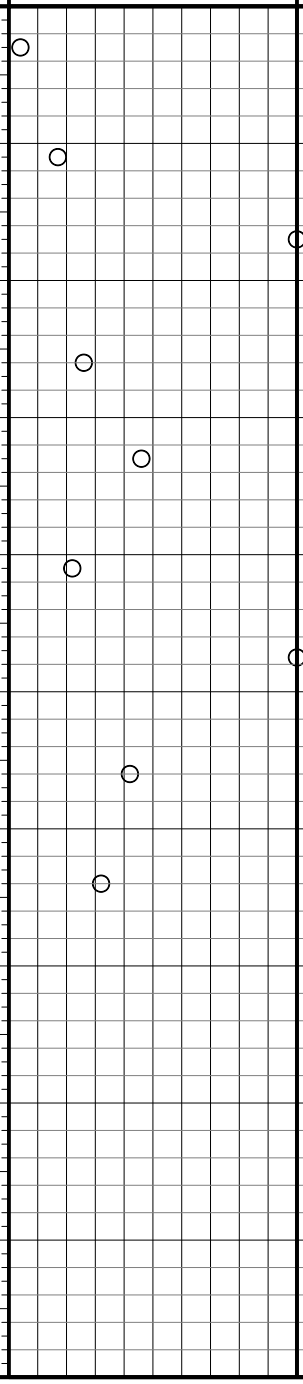
Soil Engineers Ltd.

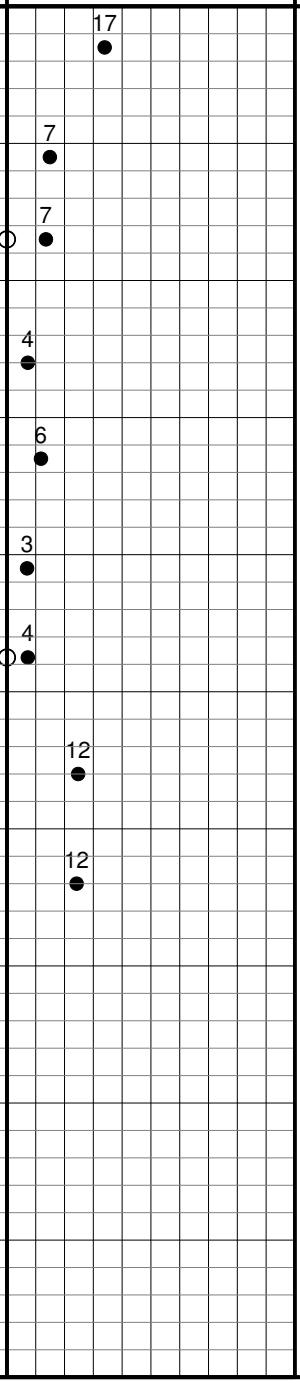
JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 10 *FIGURE NO.:* 10

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 25, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
437.9	Ground Surface				
0.0	36 cm Topsoil				0
	PLOUGHED SOIL Dark brown sand, occ. rootlets	1	DO	4	
437.2					
0.7	Brown, compact				
	SAND fine to medium grained	2	DO	17	1
436.4					
1.5	Brown, dense to very dense	3	DO	50/28	
	GRAVELLY SAND occ. cobbles and boulders wet below 5.1 m				2
		4	DO	26	
		5	DO	46	3
		6	DO	22	4
		7	DO	50/15	
					5
		8	DO	42	
					6
		9	DO	32	
431.2					
6.7	END OF BOREHOLE				7
	Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing				8
					9
					10





WATER LEVEL

W.L. @ El. 432.09 masl on Dec 01, 2022
Dry on Jan 05, 2023
Dry on Feb 08, 2023

Soil Engineers Ltd.

JOB NO.: 2206-W054 # LOG OF BOREHOLE: BH/MW 11 *FIGURE NO.:* 11

PROJECT DESCRIPTION: Proposed Residential Development *METHOD OF BORING:* Flight Auger

PROJECT LOCATION: 63 and 63A Trafalgar Road, Town of Erin *DRILLING DATE:* November 25, 2022

El. (m) / Depth (m)	SOIL DESCRIPTION	SAMPLES Number	Type	N-Value	Depth Scale (m)
435.5	Ground Surface				
0.0	36 cm Topsoil				0
	PLOUGHED SOIL Dark brown sand, occ. rootlets	1	DO	12	
434.8					
0.7	Brown, dense to very dense				
	SAND well graded trace to some gravel	2	DO	40	1
		3	DO	74	2
		4	DO	62	
		5	DO	46	3
431.4					4
4.1	Dense				
	SILT fine grained occ. clay seams	6	DO	38	5
					6
	brown / grey	7	DO	38	
428.9					
6.6	END OF BOREHOLE				7
	Installed 50 mm Ø monitoring well to 6.1 m completed with 3.1 m screen Sand backfill from 2.4 to 6.1 m Bentonite seal from 0.0 m to 2.4 m Provided with a monument casing				8
					9
					10

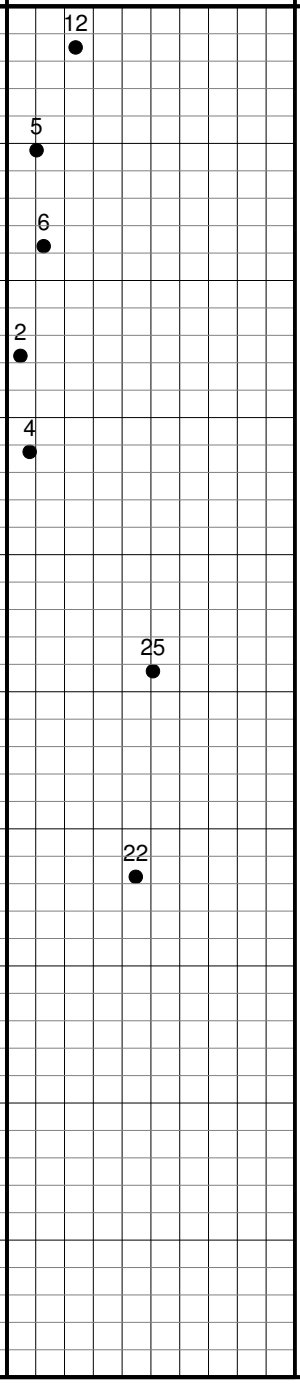
Dynamic Cone (blows/30 cm) 10 30 50 70 90

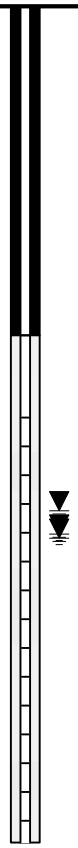
Shear Strength (kN/m²) 50 100 150 200

Penetration Resistance (blows/30 cm) 10 30 50 70 90

Atterberg Limits PL LL

Moisture Content (%) 10 20 30 40





W.L. @ El. 431.64 masl on Dec 01, 2022
W.L. @ El. 431.61 masl on Jan 05, 2023
W.L. @ El. 431.81 masl on Feb 08, 2023

Soil Engineers Ltd.
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DRAWINGS 1 to 9

REFERENCE NO. 2206-W054

N

Legend

- Approximate Boundary of Subject Site
- 500 metres from Subject Site Boundary
- Well Location from MECP Well Records (see Appendix 'A')
- Major Road
- Local Road
- Railway
- Waterbody
- Watercourse

Soil Engineers Ltd.

Title: MECP Well Location Plan

Project:

Hydrogeological Assessment
Proposed Residential Development
Address: 63 and 63A Trafalgar Road,
Town of Erin, ON

Reference No. 2206-W054

Date: December 21, 2022

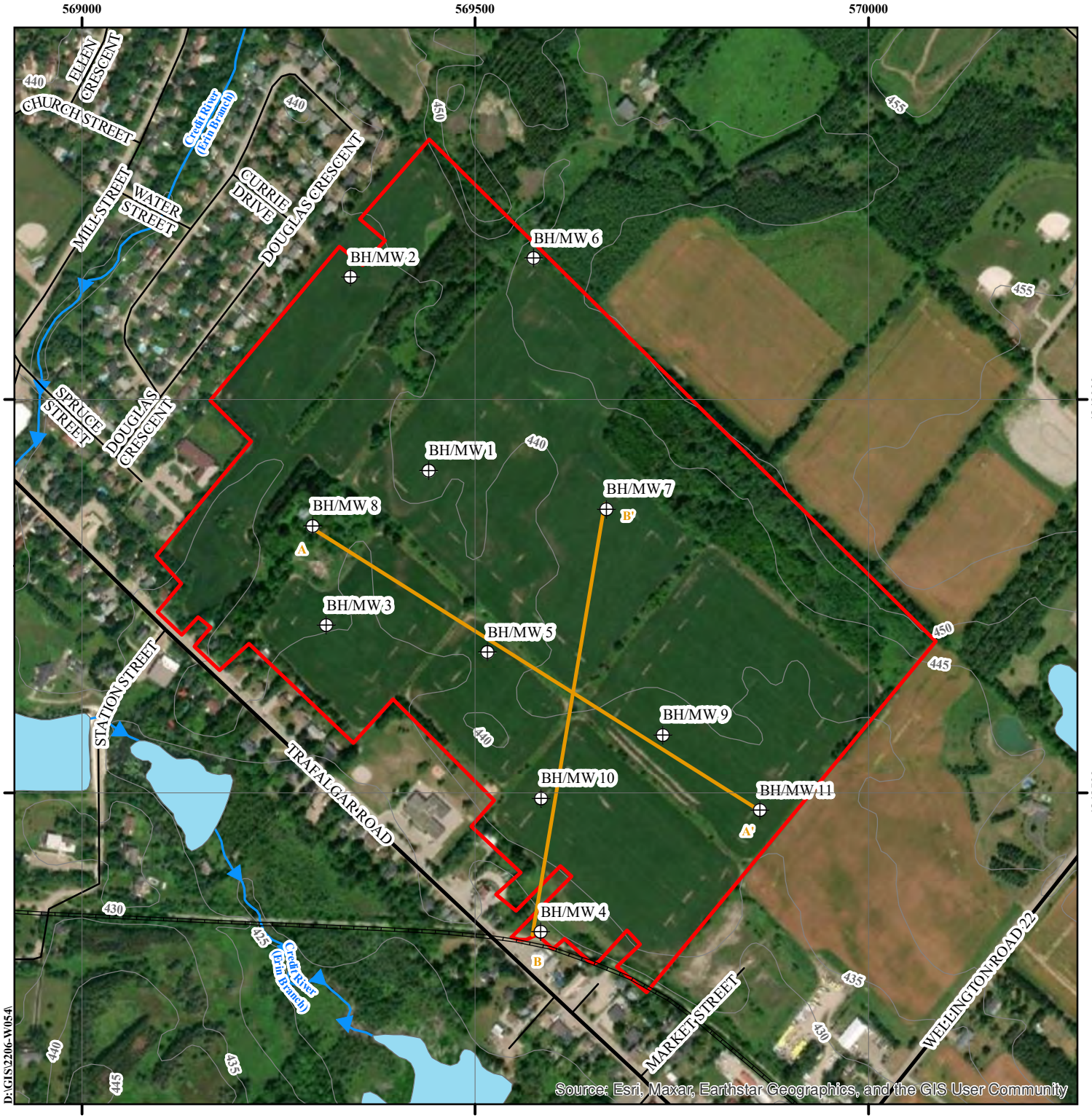
Scale:

0 55 110 220 330 440 550

Metres

Drawing No. 3

Source: Ontario Ministry of Natural Resources and Forestry



N

Legend

- Approximate Boundary of Subject Site
- Borehole with Monitoring Well
- Waterbody
- Watercourse
- Major Road
- Local Road
- Railway
- A A' Cross-Section Direction
- 100 Topographic Contour (masl)

Soil Engineers Ltd.

Title: Cross-Section Key Plan

Project:

Hydrogeological Assessment
Proposed Residential Development
Address: 63 and 63A Trafalgar Road,
Town of Erin, ON

Reference No. 2206-W054

Date: December 21, 2022

Scale:

0 35 70 140 210 280 350
Metres

Drawing No. 8-1

APPENDIX B

STORMWATER MANAGEMENT CALCULATIONS

SOIL COVER COMPLEX NUMBER
CALCULATION SHEET

PROJECT: **Hillsburgh**
Erin, wellingotn county

PROJECT #: **22-0020ER**

VO MODEL NODE: 01

BASIN ID: **15** West Credit River

AREA (ha): **31.29**

Soil Type: Hillsburgh Sandy loam (Hif/His)

SOIL SUMMARY

SOIL GROUP	AREA (ha)	% OF BASIN
A	31.29	100.0
AB	0.00	0.0
B	0.00	0.0
BC	0.00	0.0
C	0.00	0.0
CD	0.00	0.0
D	0.00	0.0
TOTAL	31.29	100.0

LAND USE SUMMARY

	LAND USE	AREA (ha)	% OF BASIN
1	RESIDENTIAL	0.0	0.0
2	CROP AND IMPROVED LAND	24.2	77.2
3	INDUSTRIAL	0.0	0.0
4	INDUSTRIAL/COMMERCIAL	0.0	0.0
5	VALLEY/WOODED/OPEN	7.1	22.8
6	4 LANE HIGHWAY	0.0	0.0
7	BUSINESS PARK	0.0	0.0
	TOTAL	31.3	100.0

WEIGHTED CN CALCULATION

SOIL GROUP	LAND USE 1	2	3	4	5	6	7	% AREA BY SOIL
A	77	66	81	86	58	83	94	100.0
AB	81	70	85	88	62	85	94	0.0
B	85	74	88	90	66	88	95	0.0
BC	88	78	90	91	71	89	96	0.0
C	90	82	91	92	76	90	96	0.0
CD	91	84	92	93	79	91	96	0.0
D	92	86	93	94	81	92	97	0.0

WEIGHTED CN CALCULATION

SOIL GROUP	WEIGHTED SOIL CONDITION 1	2	3	4	5	6	7
A	77.0	66.0	81.0	86.0	58.0	83.0	93.5
AB	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CD	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WEIGHTED SOIL COVER COMPLEX NUMBER

LAND USE	WEIGHTED SOIL CONDITION A	AB	B	BC	C	CD	D	% AREA BY LAND	WTD CN
1	77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	66.0	0.0	0.0	0.0	0.0	0.0	0.0	77.2	51.0
3	81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	58.0	0.0	0.0	0.0	0.0	0.0	0.0	22.8	13.2
6	83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	93.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
							WEIGHTED CN		**64.2**

Revised: 26-Jul-22
Printed: 13-Feb-23
Urbanworks Engineering

SOIL COVER COMPLEX NUMBER
CALCULATION SHEET

PROJECT: **Hillsburgh**
Erin, wellingotn county

PROJECT #: **22-0020ER**

VO MODEL NODE: 02

BASIN ID: **15** West Credit River

AREA (ha): **20.35**

Soil Type: Hillsburgh Sandy loam (Hif/His)

SOIL SUMMARY		
SOIL GROUP	AREA (ha)	**% OF BASIN**
A	20.35	100.0
AB	0.00	0.0
B	0.00	0.0
BC	0.00	0.0
C	0.00	0.0
CD	0.00	0.0
D	0.00	0.0
TOTAL	20.35	100.0

LAND USE SUMMARY			
	LAND USE	AREA (ha)	**% OF BASIN**
1	RESIDENTIAL	0.0	0.0
2	CROP AND IMPROVED LAND	15.8	77.4
3	INDUSTRIAL	0.0	0.0
4	INDUSTRIAL/COMMERCIAL	0.0	0.0
5	VALLEY/WOODED/OPEN	4.6	22.6
6	4 LANE HIGHWAY	0.0	0.0
7	BUSINESS PARK	0.0	0.0
	TOTAL	20.4	100.0

WEIGHTED CN CALCULATION								
SOIL GROUP	LAND USE 1	2	3	4	5	6	7	% AREA BY SOIL
A	77	66	81	86	58	83	94	100.0
AB	81	70	85	88	62	85	94	0.0
B	85	74	88	90	66	88	95	0.0
BC	88	78	90	91	71	89	96	0.0
C	90	82	91	92	76	90	96	0.0
CD	91	84	92	93	79	91	96	0.0
D	92	86	93	94	81	92	97	0.0

WEIGHTED CN CALCULATION							
SOIL GROUP	WEIGHTED SOIL CONDITION 1	2	3	4	5	6	7
A	77.0	66.0	81.0	86.0	58.0	83.0	93.5
AB	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CD	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WEIGHTED SOIL COVER COMPLEX NUMBER									
LAND USE	WEIGHTED SOIL CONDITION A	AB	B	BC	C	CD	D	% AREA BY LAND	WTD CN
1	77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	66.0	0.0	0.0	0.0	0.0	0.0	0.0	77.4	51.1
3	81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	58.0	0.0	0.0	0.0	0.0	0.0	0.0	22.6	13.1
6	83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	93.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
							WEIGHTED CN		**64.2**

Revised: 26-Jul-22
Printed: 13-Feb-23
Urbanworks Engineering

SOIL COVER COMPLEX NUMBER
CALCULATION SHEET

PROJECT: **Hillsburgh**
Erin, wellingotn county

PROJECT #: **22-0020ER**

VO MODEL NODE: 10

BASIN ID: **15** West Credit River

AREA (ha): **42.94**

Soil Type: Hillsburgh Sandy loam (Hif/His)

SOIL SUMMARY		
SOIL GROUP	AREA (ha)	**% OF BASIN**
A	42.94	100.0
AB	0.00	0.0
B	0.00	0.0
BC	0.00	0.0
C	0.00	0.0
CD	0.00	0.0
D	0.00	0.0
TOTAL	42.94	100.0

LAND USE SUMMARY			
	LAND USE	AREA (ha)	**% OF BASIN**
1	RESIDENTIAL	0.0	0.0
2	CROP AND IMPROVED LAND	33.2	77.4
3	INDUSTRIAL	0.0	0.0
4	INDUSTRIAL/COMMERCIAL	0.0	0.0
5	VALLEY/WOODED/OPEN	9.7	22.6
6	4 LANE HIGHWAY	0.0	0.0
7	BUSINESS PARK	0.0	0.0
	TOTAL	42.9	100.0

WEIGHTED CN CALCULATION								
SOIL GROUP	LAND USE 1	2	3	4	5	6	7	% AREA BY SOIL
A	77	66	81	86	58	83	94	100.0
AB	81	70	85	88	62	85	94	0.0
B	85	74	88	90	66	88	95	0.0
BC	88	78	90	91	71	89	96	0.0
C	90	82	91	92	76	90	96	0.0
CD	91	84	92	93	79	91	96	0.0
D	92	86	93	94	81	92	97	0.0

WEIGHTED CN CALCULATION							
SOIL GROUP	WEIGHTED SOIL CONDITION 1	2	3	4	5	6	7
A	77.0	66.0	81.0	86.0	58.0	83.0	93.5
AB	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CD	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WEIGHTED SOIL COVER COMPLEX NUMBER									
LAND USE	WEIGHTED SOIL CONDITION A	AB	B	BC	C	CD	D	% AREA BY LAND	WTD CN
1	77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	66.0	0.0	0.0	0.0	0.0	0.0	0.0	77.4	51.1
3	81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	58.0	0.0	0.0	0.0	0.0	0.0	0.0	22.6	13.1
6	83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	93.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
							WEIGHTED CN		**64.2**

Revised: 26-Jul-22
Printed: 13-Feb-23
Urbanworks Engineering

SOIL COVER COMPLEX NUMBER
CALCULATION SHEET

PROJECT: **Hillsburgh**
Erin, wellingotn county

PROJECT #: **22-0020ER**

VO MODEL NODE: 20

BASIN ID: **15** West Credit River

AREA (ha): **4.86**

Soil Type: Hillsburgh Sandy loam (Hif/His)

SOIL SUMMARY		
SOIL GROUP	AREA (ha)	**% OF BASIN**
A	4.86	100.0
AB	0.00	0.0
B	0.00	0.0
BC	0.00	0.0
C	0.00	0.0
CD	0.00	0.0
D	0.00	0.0
TOTAL	4.86	100.0

LAND USE SUMMARY			
	LAND USE	AREA (ha)	**% OF BASIN**
1	RESIDENTIAL	0.0	0.0
2	CROP AND IMPROVED LAND	4.4	90.0
3	INDUSTRIAL	0.0	0.0
4	INDUSTRIAL/COMMERCIAL	0.0	0.0
5	VALLEY/WOODED/OPEN	0.5	10.0
6	4 LANE HIGHWAY	0.0	0.0
7	BUSINESS PARK	0.0	0.0
	TOTAL	4.9	100.0

WEIGHTED CN CALCULATION								
SOIL GROUP	LAND USE 1	2	3	4	5	6	7	% AREA BY SOIL
A	77	66	81	86	58	83	94	100.0
AB	81	70	85	88	62	85	94	0.0
B	85	74	88	90	66	88	95	0.0
BC	88	78	90	91	71	89	96	0.0
C	90	82	91	92	76	90	96	0.0
CD	91	84	92	93	79	91	96	0.0
D	92	86	93	94	81	92	97	0.0

WEIGHTED CN CALCULATION							
SOIL GROUP	WEIGHTED SOIL CONDITION 1	2	3	4	5	6	7
A	77.0	66.0	81.0	86.0	58.0	83.0	93.5
AB	0.0	0.0	0.0	0.0	0.0	0.0	0.0
B	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
C	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CD	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D	0.0	0.0	0.0	0.0	0.0	0.0	0.0

WEIGHTED SOIL COVER COMPLEX NUMBER									
LAND USE	WEIGHTED SOIL CONDITION A	AB	B	BC	C	CD	D	% AREA BY LAND	WTD CN
1	77.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	66.0	0.0	0.0	0.0	0.0	0.0	0.0	90.0	59.4
3	81.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	86.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	58.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	5.8
6	83.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	93.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
							WEIGHTED CN		**65.2**

Revised: 26-Jul-22
Printed: 13-Feb-23
Urbanworks Engineering

Bransby-Williams Equation

Tc Calculation

DATE Created: February 2023
PREPARED BY: GV

Equation:

$$Tc = 0.057/(Sw^{0.2} * A^{0.1})$$

Enter the Length (L)
Enter the Average Slope (Sw)
Enter the Area in hectares (A)

Area ID / VO Node	Area Description	Length (m)	Average Slope (%)	Area (ha)	Tc (min)	Tp (min)	Tp (hours)	
Sample	Sample taken from MTO Drainage Manual	3100	0.015	620	216	144	2.40	
01	North Drainage Area - Route 1	802	2.60	31.29	27	18.0	0.30	**
01	North Drainage Area - Route 2	694	2.70	31.29	23	15.3	0.26	
02	South Drainage Area - Route 1	714	1.96	20.34	27	18.0	0.30	
10	North External Drainage	918	0.49	42.94	42	28	0.47	
20	South External Drainage	381	1.19	4.86	18	12	0.20	

*Tp = Time to Peak, located at approximately 2/3 x Tc.
**Greater of the two paths was used within VO Modeling.

POST-DEVELOPMENT POND DRAINAGE AREAS

Imperviousness Calculations

urbanworks ENGINEERING CORPORATION

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: January 2023
PREPARED BY: GV

TOTAL NORTH OUTLET IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
School	0.00	0.75	-	-	-
Woodlots and Buffers	4.91	0.25	1.23	7%	0.35
SWM Block	1.44	0.50	0.72	43%	0.62
Townhomes	1.70	0.75	1.27	79%	1.33
Single Detached	12.06	0.60	7.23	57%	6.89
Mixed-Use Block	2.44	0.85	2.07	93%	2.26
Right of Ways	6.90	0.80	5.52	86%	5.91
New Well Area	0.17	0.80	0.14	86%	0.15
			-	-	-
TOTAL	**29.61**	**0.61**	18.18	**59%**	17.51

TOTAL SOUTH OUTLET IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
Woodlots and Buffers	4.78	0.25	1.20	7%	0.34
SWM Block	1.04	0.50	0.52	43%	0.45
Townhomes	4.98	0.75	3.74	79%	3.91
Single Detached	6.92	0.60	4.15	57%	3.95
Right of Ways	5.17	0.80	4.14	86%	4.43
-			-	-	-
TOTAL	**22.89**	**0.60**	13.74	**57%**	13.09

Note: Total imperviousness less than 60% were considered as a minimum 60% within Pond performance models. All runoff coefficients are as per the latest minimum recommendations presented in the Town of Erin Engineering Design Standard Manual.

POST-DEVELOPMENT POND DRAINAGE AREAS

Imperviousness Calculations

urbanworks ENGINEERING CORPORATION

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: January 2023
PREPARED BY: GV

101 - NORTH OUTLET UNCONTROLLED IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
Woodlots and Buffers	0.00	0.25	-	-	-
SWM Block	0.21	0.50	0.11	43%	0.09
Townhomes	0.00	0.75	-	-	-
Single Detached	0.32	0.60	0.19	57%	0.18
Mixed-Use Block	0.00	0.85	-	-	-
Right of Ways	0.22	0.80	0.17	86%	0.19
New Well Area	0.00	0.80	-	-	-
			-	-	-
TOTAL	**0.75**	**0.63**	0.47	**61%**	0.46

202 - SOUTH OUTLET UNCONTROLLED IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
Woodlots and Buffers	0.00	0.25	-	-	-
SWM Block	0.19	0.50	0.09	43%	0.08
Townhomes	0.00	0.75	-	-	-
Single Detached	0.30	0.60	0.18	57%	0.17
Right of Ways	0.10	0.80	0.08	86%	0.08
-			-	-	-
TOTAL	**0.59**	**0.60**	0.36	**57%**	0.34

Note: Total imperviousness less than 60% were considered as a minimum 60% within Pond performance models. All runoff coefficients are as per the latest minimum recommendations presented in the Town of Erin Engineering Design Standard Manual.

POST-DEVELOPMENT POND DRAINAGE AREAS

Imperviousness Calculations

urbanworks ENGINEERING CORPORATION

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: January 2023
PREPARED BY: GV

01 - NORTH SWM TANK IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
Woodlots and Buffers	4.91	0.25	1.23	7%	0.35
SWM Block	1.22	0.50	0.61	43%	0.52
Townhomes	1.70	0.75	1.27	79%	1.33
Single Detached	11.74	0.60	7.04	57%	6.71
Mixed-Use Block	2.44	0.85	2.07	93%	2.26
Right of Ways	6.68	0.80	5.35	86%	5.73
New Well Area	0.17	0.80	0.14	86%	0.15
			-	-	-
TOTAL	**28.86**	**0.61**	17.71	**59%**	17.05

02 - SOUTH SWM TANK IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
Woodlots and Buffers	4.78	0.25	1.20	7%	0.34
SWM Block	0.85	0.50	0.43	43%	0.37
Townhomes	4.98	0.75	3.74	79%	3.91
Single Detached	6.62	0.60	3.97	57%	3.78
Right of Ways	5.07	0.80	4.06	86%	4.35
-			-	-	-
TOTAL	**22.30**	**0.60**	13.39	**57%**	12.75

Note: Total imperviousness less than 60% were considered as a minimum 60% within Pond performance models. All runoff coefficients are as per the latest minimum recommendations presented in the Town of Erin Engineering Design Standard Manual.

PRE-DEV. PEAK FLOW CALCULATION: VO MODELING

Bloor 24hr SCS Storm

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: January 2023
PREPARED BY: GV

STORM EVENT	North Pre-Dev Drainage = 31.29 ha External Drainage = 42.94 ha			South Pre-Dev. Drainage = 20.35 ha External Drainage = 4.86 ha		
	Node 01 Pre-Dev. Area (m3/s)	Node 10 External Area (m3/s)	Total (m3/s)	Node 02 Pre-Dev. Area (m3/s)	Node 20 External Area (m3/s)	Total (m3/s)
2 YR.	0.677	0.681	1.311	0.440	0.141	0.568
5 YR.	0.917	0.924	1.777	0.597	0.190	0.767
10 YR.	1.530	1.566	2.987	0.995	0.310	1.291
25 YR.	2.023	2.044	3.922	1.315	0.414	1.686
50 YR.	2.430	2.477	4.735	1.580	0.491	2.019
100 YR.	2.657	2.686	**5.152**	1.720	0.542	**2.211**

PRE-DEV. PEAK FLOW CALCULATION: VO MODELING

Bloor 4hr Chicago Storm

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: January 2023
PREPARED BY: GV

STORM EVENT	North Pre-Dev Drainage = 31.29 ha External Drainage = 42.94 ha			South Pre-Dev. Drainage = 20.35 ha External Drainage = 4.86 ha		
	Node 01 Pre-Dev. Area (m3/s)	Node 10 External Area (m3/s)	Total (m3/s)	Node 02 Pre-Dev. Area (m3/s)	Node 20 External Area (m3/s)	Total (m3/s)
2 YR.	0.478	0.496	0.930	0.311	0.098	0.400
5 YR.	0.866	0.891	1.672	0.563	0.178	0.720
10 YR.	1.174	1.202	2.263	0.763	0.242	0.974
25 YR.	1.604	1.637	3.090	1.043	0.331	1.328
50 YR.	1.948	1.983	3.753	1.267	0.403	1.612
100 YR.	2.296	2.332	**4.420**	1.494	0.476	**1.903**

STORAFE SUMMARY: VO MODELING

Bloor 24hr SCS Storm

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: February 2023
PREPARED BY: GV

STORM EVENT	North Tank Pre-Dev Drainage = 31.29 ha Post-Dev Drainage = 29.61 ha External Drainage = 42.94 ha				South Tank Pre-Dev. Drainage = 20.35 ha Post-Dev Drainage = 22.89 ha External Drainage = 4.86 ha			
	Pre-Development Release Rate (m^3/s)	Node 101 Uncontrolled Release Rate (m^3/s)	Node 01 Controlled Release Rate* (m^3/s)	Node 100 Required Storage (m^3)	Pre-Development Release Rate (m^3/s)	Node 201 Uncontrolled Release Rate (m^3/s)	Node 02 Controlled Release Rate* (m^3/s)	Node 200 Required Storage (m^3)
2 YR.	1.311	0.084	1.227	4905	0.568	0.065	0.503	4125
5 YR.	1.777	0.100	1.677	5725	0.767	0.078	0.689	4830
10 YR.	2.987	0.146	2.841	7675	1.291	0.113	1.178	6430
25 YR.	3.922	0.181	3.741	8860	1.686	0.140	1.546	7540
50 YR.	4.735	0.197	4.538	9850	2.019	0.153	1.866	8500
100 YR.	5.152	0.218	4.934	**10280**	2.211	0.170	2.041	**8910**

*Controlled Release = Pre-Dev Release less the associated uncontrolled release.

STORAFE SUMMARY: VO MODELING

Bloor 24hr SCS Storm

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: February 2023
PREPARED BY: GV

STORM EVENT	North Tank Pre-Dev Drainage = 31.29 ha Post-Dev Drainage = 29.61 ha External Drainage = 42.94 ha				South Tank Pre-Dev. Drainage = 20.35 ha Post-Dev Drainage = 22.89 ha External Drainage = 4.86 ha			
	Pre-Development Release Rate (m^3/s)	Node 101 Uncontrolled Release Rate (m^3/s)	Node 01 Controlled Release Rate* (m^3/s)	Node 100 Required Storage (m^3)	Pre-Development Release Rate (m^3/s)	Node 201 Uncontrolled Release Rate (m^3/s)	Node 02 Controlled Release Rate* (m^3/s)	Node 200 Required Storage (m^3)
2 YR.	0.930	0.144	0.786	6090	0.400	0.108	0.292	4913
5 YR.	1.672	0.200	1.472	8130	0.720	0.157	0.563	6480
10 YR.	2.263	0.244	2.019	9345	0.974	0.187	0.787	7465
25 YR.	3.090	0.294	2.796	10790	1.328	0.229	1.099	8685
50 YR.	3.753	0.332	3.421	11725	1.612	0.259	1.353	9575
100 YR.	4.420	0.368	4.052	**12580**	1.903	0.287	1.616	**10415**

*Controlled Release = Pre-Dev Release less the associated uncontrolled release.

Water Quality Storage Volume Requirement Calculation

North Bioretention

urbanworks ENGINEERING CORPORATION

PROJECT:	Hillsburgh Subdivision
FILE No.:	22-0020ER
DATE:	January 2023
PREPARED BY:	GV

Water Quality Infiltration Requirements

Parameter		Comments					
SWM Practice Type	**Infiltration**						
Protection Level	**1**	**(80% TSS Removal)**					
Area (ha)	**29.61**						
		Quantity Reference (MOE Table 3.2)					
(1) Impervious Level	**60%**	0%	35%	55%	70%	85%	100%
(2) Storage Volume Req. (m^3/ha)*	**20.00**	20	20	20	20	20	20

*Interpolated based on MOE 2003, Table 3.2

Water Volume Requirement

Parameter	Quantity	Calculation
(3) Required Volume (m^3)	**592.00**	**(3) = (1) x (2)**

INFILTRATION LID SIZING CALCULATION

North Bioretention

urbanworks
ENGINEERING CORPORATION

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: January 2023
PREPARED BY: GV

Required Infiltration Parameters			
Parameter	**Quantity**	**Unit**	**Comments**
Required Infiltration Volume	592	m^3	Minimum infiltration volum required to provide 60% TSS removal (MOE 2003)
Number of LID's	1		
Inillftration Volume Per LID	592	m^3	Volume per LIDs = (Required Infil. Vol.) / (Number of LID's)
Max. Drawdown time	48	hours	
Infiltration rate	45.0	mm/h	(*Minimum Infiltration Rate assumed for Gravely Sand, to be confirmed by In-situ testing)
Safety Factor	2.50		
Design Infiltration Rate	18.0	mm/h	MOE 2003 Criteria - Equation 4.3

Proposed Infiltration			
Parameter	**Quantity**	**Unit**	**Comments**
Provided Footprint Area	700	m^2	
Surface Ponding Depth	0.60	m	Maximum Depth of Ponding as recommened by MOE 2003, Section 4.6.6
Drawdown time of Ponding (Dtp)	33.3	hours	Dtp = (Ponding Depth) / (Design Infil. Rate / 1000)
Ponding Volume	420	m^3	Volume = (Area) x (Surface Ponding Depth)
Gravel Bed Depth	0.65	m	
Gravel Porosity	0.40		
Drawdown time of Gravel Bed (Dtg)	14.4	hours	Dtg = (Gravel Depth x Porosity) / (Design Infil. Rate / 1000)
Provided Volume	182.0	m^3	Volume = (Area) x (Depth) x (Porosity)
Drawdown time (Dt)	47.8	hours	Total Drawdown = Drawdown Time (Ponding) + Drawdown Time (Gravel Bed)
Total Volume Provided	602.0	m^3	Total Volume = (Provided Volume) x (Number of LIDs)

* As indicated by Soil Engineer's Preliminary Geotechnical Assessment for the site, Sand / Gravely Sand was found for the first 5.5 m at Boreholes 3 and 8. Sands/Gravel Sands typically exhibit infiltration rates in the range of 50mm/hr. This should be confirmed with in-situ testing at the detailed design stage by the site Soil's Engineer at the location of the proposed LID.

Water Quality Storage Volume Requirement Calculation

South Bioretention

urbanworks ENGINEERING CORPORATION

PROJECT:	Hillsburgh Subdivision
FILE No.:	22-0020ER
DATE:	January 2023
PREPARED BY:	GV

Water Quality Infiltration Requirements							
Parameter		**Comments**					
SWM Practice Type	**Infiltration**						
Protection Level	**1**	**(80% TSS Removal)**					
Area (ha)	**22.89**						
		Quantity Reference (MOE Table 3.2)					
(1) Impervious Level	**60%**	0%	35%	55%	70%	85%	100%
(2) Storage Volume Req. (m^3/ha)*	**20.00**	20	20	20	20	20	20

*Interpolated based on MOE 2003, Table 3.2

Water Volume Requirement		
Parameter	**Quantity**	**Calculation**
(3) Required Volume (m^3)	**458.00**	**(3) = (1) x (2)**

INFILTRATION LID SIZING CALCULATION

South Bioretention

urbanworks ENGINEERING CORPORATION

PROJECT:	Hillsburgh Subdivision
FILE No.:	22-0020ER
DATE:	January 2023
PREPARED BY:	GV

Required Infiltration Parameters

Parameter	Quantity	Unit	Comments
Infiltration Volume	458	m^3	Minimum infiltration volum required to provide 60% TSS removal (MOE 2003)
Number of LID's	1		
Inillftration Volume Per LID	458	m^3	Volume per LIDs = (Required Infil. Vol.) / (Number of LID's)
Max. Drawdown time	48	hours	
Infiltration rate	45.00	mm/h	(*Minimum Infiltration Rate assumed for Gravely Sand, to be confirmed by In-situ testing)
Safety Factor	2.50		
Design Infiltration Rate	18.00	mm/h	MOE 2003 Criteria - Equation 4.3

Proposed Infiltration

Parameter	Quantity	Unit	Comments
Provided Footprint Area	615	m^2	
Surface Ponding Depth	0.60	m	Maximum Depth of Ponding as recommened by MOE 2003, Section 4.6.6
Drawdown time of Ponding (Dtp)	33.3	hours	Dtp = (Ponding Depth) / (Design Infil. Rate / 1000)
Ponding Volume	369	m^3	Volume = (Area) x (Surface Ponding Depth)
Gravel Bed Depth	0.40	m	
Stone Porosity	0.40		
Drawdown time of Gravel Bed (Dtg)	8.9	hours	Dtg = (Gravel Depth x Porosity) / (Design Infil. Rate / 1000)
Provided Volume	98.4	m^3	Volume = (Area) x (Depth) x (Porosity)
Drawdown time (Dt)	42.2	hours	Total Drawdown = Drawdown Time (Ponding) + Drawdown Time (Gravel Bed)
Total Infiltration Volume Provided	467.4	m^3	Total Volume = (Provided Volume) x (Number of LIDs)

* As indicated by Soil Engineer's Preliminary Geotechnical Assessment for the site, Sand / Gravely Sand was found for the first 6.4 m at Borehole 10. Sands/Gravel Sands typically exhibit infiltration rates in the range of 50mm/hr. This should be confirmed with in-situ testing at the detailed design stage by the site Soil's Engineer at the location of the proposed LID.

INFILTRATION LID SIZING CALCULATION

North Infiltration Trenches

urbanworks ENGINEERING CORPORATION

PROJECT:	Hillsburgh Subdivision
FILE No.:	22-0020ER
DATE:	January 2023
PREPARED BY:	GV

Required Infiltration Parameters

Parameter	Quantity	Unit	Comments
Infiltration Volume	286	m^3	Minimum infiltration volum required to provide 60% TSS removal (MOE 2003)
Inillftration Volume Per LID	286	m^3	Volume per LIDs = (Required Infil. Vol.) / (Number of LID's)
Max. Drawdown time	48	hours	
Infiltration rate	45.00	mm/h	(*Minimum Infiltration Rate assumed for Gravely Sand, to be confirmed by In-situ testing)
Safety Factor	2.50		
Design Infiltration Rate	18.00	mm/h	MOE 2003 Criteria - Equation 4.3

Proposed Infiltration

Parameter	Quantity	Unit	Comments
Length	988.00	m	Length of Infiltration Trenches proposed in Catchment 10
Width	1.00	m	
Area	988.00	m^2	
Surface Ponding Depth	0.00	m	Maximum Depth of Ponding as recommened by MOE 2003, Section 4.6.6
Drawdown time of Ponding (Dtp)	0.0	hours	Dtp = (Ponding Depth) / (Design Infil. Rate / 1000)
Ponding Volume	0	m^3	Volume = (Area) x (Surface Ponding Depth)
Gravel Bed Depth	0.80	m	
Stone Porosity	0.40		
Drawdown time of Gravel Bed (Dtg)	17.8	hours	Dtg = (Gravel Depth x Porosity) / (Design Infil. Rate / 1000)
Provided Volume	316	m^3	Volume = (Area) x (Depth) x (Porosity)
Drawdown time (Dt)	17.8	hours	Total Drawdown = Drawdown Time (Ponding) + Drawdown Time (Gravel Bed)
Total Infiltration Volume Provided	316	m^3	Total Volume = (Provided Volume) x (Number of LIDs)

* As indicated by Soil Engineer's Preliminary Geotechnical Assessment for the site, Sand / Gravely Sand was found for the first 5.5 m at Borehole 3 & 8. Sands/Gravel Sands typically exhibit infiltration rates in the range of 50mm/hr. This should be confirmed with in-situ testing at the detailed design stage by the site Soil's Engineer at the location of the proposed LID.

INFILTRATION LID SIZING CALCULATION

South Infiltration Trenches

urbanworks ENGINEERING CORPORATION

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: January 2023
PREPARED BY: GV

Required Infiltration Parameters			
Parameter	**Quantity**	**Unit**	**Comments**
Infiltration Volume	220	m^3	Minimum infiltration volum required to provide 60% TSS removal (MOE 2003)
Inillftration Volume Per LID	220	m^3	Volume per LIDs = (Required Infil. Vol.) / (Number of LID's)
Max. Drawdown time	48	hours	
Infiltration rate	45.00	mm/h	(*Minimum Infiltration Rate assumed for Gravely Sand, to be confirmed by In-situ testing)
Safety Factor	2.50		
Design Infiltration Rate	18.00	mm/h	MOE 2003 Criteria - Equation 4.3

Proposed Infiltration			
Parameter	**Quantity**	**Unit**	**Comments**
Length	1167.00	m	Length of Infiltration Trenches proposed in Catchment 20
Width	1.00	m	
Area	1167.00	m^2	
Surface Ponding Depth	0.00	m	Maximum Depth of Ponding as recommened by MOE 2003, Section 4.6.6
Drawdown time of Ponding (Dtp)	0.0	hours	Dtp = (Ponding Depth) / (Design Infil. Rate / 1000)
Ponding Volume	0	m^3	Volume = (Area) x (Surface Ponding Depth)
Gravel Bed Depth	0.80	m	
Stone Porosity	0.40		
Drawdown time of Gravel Bed (Dtg)	17.8	hours	Dtg = (Gravel Depth x Porosity) / (Design Infil. Rate / 1000)
Provided Volume	373	m^3	Volume = (Area) x (Depth) x (Porosity)
Drawdown time (Dt)	17.8	hours	Total Drawdown = Drawdown Time (Ponding) + Drawdown Time (Gravel Bed)
Total Infiltration Volume Provided	373	m^3	Total Volume = (Provided Volume) x (Number of LIDs)

* As indicated by Soil Engineer's Preliminary Geotechnical Assessment for the site, Sand / Gravely Sand was found for the first 6.4 m at Borehole 10. Sands/Gravel Sands typically exhibit infiltration rates in the range of 50mm/hr. This should be confirmed with in-situ testing at the detailed design stage by the site Soil's Engineer at the location of the proposed LID.

Oil-Grit Separator Sizings

Stormceptor®

FORTERRA

Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

02/24/2023

Province:	Ontario
City:	Erin
Nearest Rainfall Station:	WATERLOO WELLINGTON AP
NCDC Rainfall Station Id:	9387
Years of Rainfall Data:	34

Site Name:	Area 1 (Split 3)

Drainage Area (ha):	10.77
Runoff Coefficient 'c':	0.62

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	50.0
Required Water Quality Runoff Volume Capture (%):	85.0

Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	

Project Name:	Hillsburgh Subdivision
Project Number:	-
Designer Name:	Brandon O'Leary
Designer Company:	Forterra
Designer Email:	brandon.oleary@forterrabp.com
Designer Phone:	905-630-0359
EOR Name:	Giancarlo Volpe
EOR Company:	Urbanworks Engineering Corp.
EOR Email:	gvolpe@urbanworkseng.com
EOR Phone:	416-710-7476

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	25
EFO6	34
EFO8	41
EFO10	46
EFO12	51

Recommended Stormceptor EFO Model: EFO12

Estimated Net Annual Sediment (TSS) Load Reduction (%): 51

Water Quality Runoff Volume Capture (%): > 85

imbrium

THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

PARTICLE SIZE DISTRIBUTION (PSD)

► The **Canadian ETV PSD** shown in the table below was used, for this sizing. This is the identical PSD that is referenced in the Canadian ETV ***Procedure for Laboratory Testing of Oil-Grit Separators*** for both sediment removal testing and scour testing. The Canadian ETV PSD contains a wide range of particle sizes in the sand and silt fractions, and is considered reasonably representative of the particle size fractions found in typical urban stormwater runoff.

Particle Size (µm)	Percent Less Than	Particle Size Fraction (µm)	Percent
1000	100	500-1000	5
500	95	250-500	5
250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	49.9	49.9	18.56	1113.79	106.00	61.7	30.8	30.8
2	7.0	56.9	37.13	2227.58	212.01	53.5	3.7	34.5
3	7.0	63.9	55.69	3341.37	318.01	50.1	3.5	38.0
4	4.4	68.3	74.25	4455.16	424.01	46.8	2.1	40.1
5	3.2	71.5	92.82	5568.95	530.02	43.7	1.4	41.5
6	3.5	75.0	111.38	6682.74	636.02	41.5	1.5	42.9
7	3.1	78.1	129.94	7796.53	742.03	41.0	1.3	44.2
8	2.3	80.4	148.51	8910.32	848.03	40.5	0.9	45.1
9	1.9	82.3	167.07	10024.11	954.03	39.9	0.8	45.9
10	2.0	84.3	185.63	11137.90	1060.04	38.9	0.8	46.7
11	1.8	86.1	204.19	12251.69	1166.04	37.4	0.7	47.3
12	1.4	87.5	222.76	13365.48	1272.04	36.0	0.5	47.8
13	1.3	88.8	241.32	14479.27	1378.05	34.5	0.4	48.3
14	1.1	89.9	259.88	15593.06	1484.05	32.3	0.4	48.7
15	1.1	91.0	278.45	16706.85	1590.06	30.1	0.3	49.0
16	0.8	91.8	297.01	17820.65	1696.06	28.2	0.2	49.2
17	1.0	92.8	315.57	18934.44	1802.06	26.6	0.3	49.5
18	0.9	93.7	334.14	20048.23	1908.07	25.1	0.2	49.7
19	0.7	94.4	352.70	21162.02	2014.07	23.8	0.2	49.9
20	0.8	95.2	371.26	22275.81	2120.07	22.6	0.2	50.0
21	0.6	95.8	389.83	23389.60	2226.08	21.5	0.1	50.2
22	0.5	96.3	408.39	24503.39	2332.08	20.5	0.1	50.3
23	0.4	96.7	426.95	25617.18	2438.09	19.6	0.1	50.4
24	0.2	96.9	445.52	26730.97	2544.09	18.8	0.0	50.4
25	0.2	97.1	464.08	27844.76	2650.09	18.1	0.0	50.4

Stormceptor® EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
26	0.3	97.4	482.64	28958.55	2756.10	17.4	0.1	50.5
27	0.2	97.6	501.21	30072.34	2862.10	16.7	0.0	50.5
28	0.1	97.7	519.77	31186.13	2968.10	16.1	0.0	50.5
29	0.2	97.9	538.33	32299.92	3074.11	15.6	0.0	50.6
30	0.1	98.0	556.90	33413.71	3180.11	15.1	0.0	50.6
31	0.2	98.2	575.46	34527.50	3286.12	14.6	0.0	50.6
32	0.0	98.2	594.02	35641.29	3392.12	14.1	0.0	50.6
33	0.1	98.3	612.58	36755.08	3498.12	13.7	0.0	50.6
34	0.1	98.4	631.15	37868.87	3604.13	13.3	0.0	50.6
35	0.0	98.4	649.71	38982.66	3710.13	12.9	0.0	50.6
36	0.1	98.5	668.27	40096.45	3816.13	12.5	0.0	50.6
37	0.0	98.5	686.84	41210.24	3922.14	12.2	0.0	50.6
38	0.2	98.7	705.40	42324.03	4028.14	11.9	0.0	50.7
39	0.2	98.9	723.96	43437.82	4134.15	11.6	0.0	50.7
40	0.1	99.0	742.53	44551.61	4240.15	11.3	0.0	50.7
41	0.1	99.1	761.09	45665.40	4346.15	11.0	0.0	50.7
42	0.0	99.1	779.65	46779.19	4452.16	10.8	0.0	50.7
43	0.0	99.1	798.22	47892.98	4558.16	10.5	0.0	50.7
44	0.1	99.2	816.78	49006.77	4664.16	10.3	0.0	50.7
45	0.0	99.2	835.34	50120.56	4770.17	10.0	0.0	50.7
46	0.1	99.3	853.91	51234.35	4876.17	9.8	0.0	50.7
47	0.0	99.3	872.47	52348.15	4982.18	9.6	0.0	50.7
48	0.0	99.3	891.03	53461.94	5088.18	9.4	0.0	50.7
49	0.0	99.3	909.60	54575.73	5194.18	9.2	0.0	50.7
50	0.1	99.4	928.16	55689.52	5300.19	9.0	0.0	50.7
Estimated Net Annual Sediment (TSS) Load Reduction =								**51 %**

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Stormceptor®

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Stormceptor® EF Sizing Report

STORMCEPTOR®
ESTIMATED NET ANNUAL SEDIMENT (TSS) LOAD REDUCTION

02/24/2023

Province:	Ontario
City:	Erin
Nearest Rainfall Station:	WATERLOO WELLINGTON AP
NCDC Rainfall Station Id:	9387
Years of Rainfall Data:	34

Site Name:	Area 2 (Split 2)

Drainage Area (ha):	11.45
Runoff Coefficient 'c':	0.62

Particle Size Distribution:	CA ETV
Target TSS Removal (%):	50.0
Required Water Quality Runoff Volume Capture (%):	85.0

Oil / Fuel Spill Risk Site?	Yes
Upstream Flow Control?	No
Peak Conveyance (maximum) Flow Rate (L/s):	

Project Name:	Hillsburgh Subdivision
Project Number:	-
Designer Name:	Brandon O'Leary
Designer Company:	Forterra
Designer Email:	brandon.oleary@forterrabp.com
Designer Phone:	905-630-0359
EOR Name:	Giancarlo Volpe
EOR Company:	Urbanworks Engineering Corp.
EOR Email:	gvolpe@urbanworkseng.com
EOR Phone:	416-710-7476

Net Annual Sediment (TSS) Load Reduction Sizing Summary

Stormceptor Model	TSS Removal Provided (%)
EFO4	25
EFO6	33
EFO8	40
EFO10	46
EFO12	50

Recommended Stormceptor EFO Model: EFO12

Estimated Net Annual Sediment (TSS) Load Reduction (%): 50

Water Quality Runoff Volume Capture (%): > 85

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THIRD-PARTY TESTING AND VERIFICATION

►**Stormceptor® EF and Stormceptor® EFO** are the latest evolutions in the Stormceptor® oil-grit separator (OGS) technology series, and are designed to remove a wide variety of pollutants from stormwater and snowmelt runoff. These technologies have been third-party tested in accordance with the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators** and performance has been third-party verified in accordance with the **ISO 14034 Environmental Technology Verification (ETV)** protocol.

PERFORMANCE

►**Stormceptor® EF and EFO** remove stormwater pollutants through gravity separation and floatation, and feature a patent-pending design that generates positive removal of total suspended solids (TSS) throughout each storm event, including high-intensity storms. Captured pollutants include sediment, free oils, and sediment-bound pollutants such as nutrients, heavy metals, and petroleum hydrocarbons. Stormceptor is sized to remove a high level of TSS from the frequent rainfall events that contribute the vast majority of annual runoff volume and pollutant load. The technology incorporates an internal bypass to convey excessive stormwater flows from high-intensity storms through the device without resuspension and washout (scour) of previously captured pollutants. Proper routine maintenance ensures high pollutant removal performance and protection of downstream waterways.

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1000	100	500-1000	5
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250	90	150-250	15
150	75	100-150	15
100	60	75-100	10
75	50	50-75	5
50	45	20-50	10
20	35	8-20	15
8	20	5-8	10
5	10	2-5	5
2	5	<2	5

Stormceptor® EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
1	49.9	49.9	19.74	1184.11	112.70	61.1	30.5	30.5
2	7.0	56.9	39.47	2368.23	225.39	53.1	3.7	34.2
3	7.0	63.9	59.21	3552.34	338.09	49.5	3.5	37.7
4	4.4	68.3	78.94	4736.45	450.79	46.0	2.0	39.7
5	3.2	71.5	98.68	5920.57	563.48	42.8	1.4	41.1
6	3.5	75.0	118.41	7104.68	676.18	41.3	1.4	42.5
7	3.1	78.1	138.15	8288.79	788.88	40.8	1.3	43.8
8	2.3	80.4	157.88	9472.91	901.57	40.2	0.9	44.7
9	1.9	82.3	177.62	10657.02	1014.27	39.5	0.8	45.4
10	2.0	84.3	197.35	11841.13	1126.97	38.0	0.8	46.2
11	1.8	86.1	217.09	13025.25	1239.66	36.4	0.7	46.9
12	1.4	87.5	236.82	14209.36	1352.36	34.9	0.5	47.4
13	1.3	88.8	256.56	15393.47	1465.06	32.7	0.4	47.8
14	1.1	89.9	276.29	16577.58	1577.75	30.3	0.3	48.1
15	1.1	91.0	296.03	17761.70	1690.45	28.3	0.3	48.4
16	0.8	91.8	315.76	18945.81	1803.15	26.6	0.2	48.6
17	1.0	92.8	335.50	20129.92	1915.84	25.0	0.2	48.9
18	0.9	93.7	355.23	21314.04	2028.54	23.6	0.2	49.1
19	0.7	94.4	374.97	22498.15	2141.24	22.4	0.2	49.3
20	0.8	95.2	394.70	23682.26	2253.93	21.2	0.2	49.4
21	0.6	95.8	414.44	24866.38	2366.63	20.2	0.1	49.5
22	0.5	96.3	434.17	26050.49	2479.33	19.3	0.1	49.6
23	0.4	96.7	453.91	27234.60	2592.02	18.5	0.1	49.7
24	0.2	96.9	473.65	28418.72	2704.72	17.7	0.0	49.7
25	0.2	97.1	493.38	29602.83	2817.42	17.0	0.0	49.8

Stormceptor® EF Sizing Report

Rainfall Intensity (mm / hr)	Percent Rainfall Volume (%)	Cumulative Rainfall Volume (%)	Flow Rate (L/s)	Flow Rate (L/min)	Surface Loading Rate (L/min/m²)	Removal Efficiency (%)	Incremental Removal (%)	Cumulative Removal (%)
26	0.3	97.4	513.12	30786.94	2930.11	16.3	0.0	49.8
27	0.2	97.6	532.85	31971.06	3042.81	15.7	0.0	49.9
28	0.1	97.7	552.59	33155.17	3155.51	15.2	0.0	49.9
29	0.2	97.9	572.32	34339.28	3268.20	14.7	0.0	49.9
30	0.1	98.0	592.06	35523.40	3380.90	14.2	0.0	49.9
31	0.2	98.2	611.79	36707.51	3493.60	13.7	0.0	49.9
32	0.0	98.2	631.53	37891.62	3606.29	13.3	0.0	49.9
33	0.1	98.3	651.26	39075.74	3718.99	12.9	0.0	50.0
34	0.1	98.4	671.00	40259.85	3831.69	12.5	0.0	50.0
35	0.0	98.4	690.73	41443.96	3944.38	12.1	0.0	50.0
36	0.1	98.5	710.47	42628.08	4057.08	11.8	0.0	50.0
37	0.0	98.5	730.20	43812.19	4169.78	11.5	0.0	50.0
38	0.2	98.7	749.94	44996.30	4282.47	11.2	0.0	50.0
39	0.2	98.9	769.67	46180.41	4395.17	10.9	0.0	50.0
40	0.1	99.0	789.41	47364.53	4507.87	10.6	0.0	50.0
41	0.1	99.1	809.14	48548.64	4620.56	10.4	0.0	50.1
42	0.0	99.1	828.88	49732.75	4733.26	10.1	0.0	50.1
43	0.0	99.1	848.61	50916.87	4845.96	9.9	0.0	50.1
44	0.1	99.2	868.35	52100.98	4958.65	9.7	0.0	50.1
45	0.0	99.2	888.08	53285.09	5071.35	9.4	0.0	50.1
46	0.1	99.3	907.82	54469.21	5184.04	9.2	0.0	50.1
47	0.0	99.3	927.56	55653.32	5296.74	9.0	0.0	50.1
48	0.0	99.3	947.29	56837.43	5409.44	8.9	0.0	50.1
49	0.0	99.3	967.03	58021.55	5522.13	8.7	0.0	50.1
50	0.1	99.4	986.76	59205.66	5634.83	8.5	0.0	50.1
Estimated Net Annual Sediment (TSS) Load Reduction =								**50 %**

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Maximum Pipe Diameter / Peak Conveyance

Stormceptor EF / EFO	Model Diameter		Min Angle Inlet / Outlet Pipes	Max Inlet Pipe Diameter		Max Outlet Pipe Diameter		Peak Conveyance Flow Rate	
	(m)	(ft)		(mm)	(in)	(mm)	(in)	(L/s)	(cfs)
EF4 / EFO4	1.2	4	90	609	24	609	24	425	15
EF6 / EFO6	1.8	6	90	914	36	914	36	990	35
EF8 / EFO8	2.4	8	90	1219	48	1219	48	1700	60
EF10 / EFO10	3.0	10	90	1828	72	1828	72	2830	100
EF12 / EFO12	3.6	12	90	1828	72	1828	72	2830	100

SCOUR PREVENTION AND ONLINE CONFIGURATION

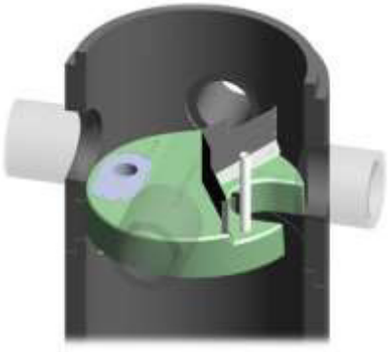
►**Stormceptor® EF and EFO** feature an internal bypass and superior scour prevention technology that have been demonstrated in third-party testing according to the scour testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**, and the exceptional scour test performance has been third-party verified in accordance with the ISO 14034 ETV protocol. As a result, Stormceptor EF and EFO are approved for online installation, eliminating the need for costly additional bypass structures, piping, and installation expense.

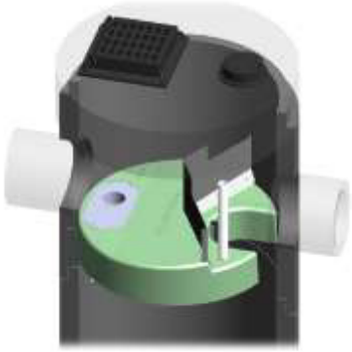
DESIGN FLEXIBILITY

►**Stormceptor® EF** and **EFO** offers design flexibility in one simplified platform, accepting stormwater flow from a single inlet pipe or multiple inlet pipes, and/or surface runoff through an inlet grate. The device can also serve as a junction structure, accommodate a 90-degree inlet-to-outlet bend angle, and can be modified to ensure performance in submerged conditions.

OIL CAPTURE AND RETENTION

►While Stormceptor® EF will capture and retain oil from dry weather spills and low intensity runoff, **Stormceptor® EFO** has demonstrated superior oil capture and greater than 99% oil retention in third-party testing according to the light liquid re-entrainment testing provisions of the Canadian ETV **Procedure for Laboratory Testing of Oil-Grit Separators**. Stormceptor EFO is recommended for sites where oil capture and retention is a requirement.





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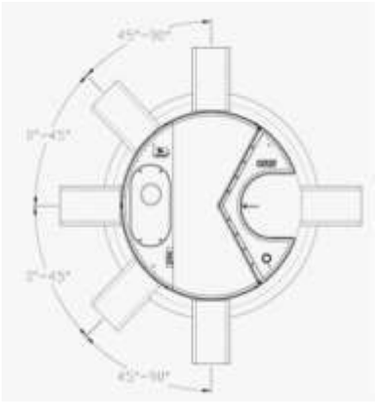

INLET-TO-OUTLET DROP

Elevation differential between inlet and outlet pipe inverts is dictated by the angle at which the inlet pipe(s) enters the unit.
0° - 45° : The inlet pipe is 1-inch (25mm) higher than the outlet pipe.
45° - 90° : The inlet pipe is 2-inches (50mm) higher than the outlet pipe.

HEAD LOSS

The head loss through Stormceptor EF is similar to that of a 60-degree bend structure. The applicable K value for calculating minor losses through the unit is 1.1. For submerged conditions the applicable K value is 3.0.

Pollutant Capacity

Stormceptor EF / EFO	Model Diameter		Depth (Outlet Pipe Invert to Sump Floor)		Oil Volume		Recommended Sediment Maintenance Depth *		Maximum Sediment Volume *		Maximum Sediment Mass **	
	(m)	(ft)	(m)	(ft)	(L)	(Gal)	(mm)	(in)	(L)	(ft^3)	(kg)	(lb)
EF4 / EFO4	1.2	4	1.52	5.0	265	70	203	8	1190	42	1904	5250
EF6 / EFO6	1.8	6	1.93	6.3	610	160	305	12	3470	123	5552	15375
EF8 / EFO8	2.4	8	2.59	8.5	1070	280	610	24	8780	310	14048	38750
EF10 / EFO10	3.0	10	3.25	10.7	1670	440	610	24	17790	628	28464	78500
EF12 / EFO12	3.6	12	3.89	12.8	2475	655	610	24	31220	1103	49952	137875

*Increased sump depth may be added to increase sediment storage capacity
** Average density of wet packed sediment in sump = 1.6 kg/L (100 lb/ft^3)

Feature	Benefit	Feature Appeals To
Patent-pending enhanced flow treatment and scour prevention technology	Superior, verified third-party performance	Regulator, Specifying & Design Engineer
Third-party verified light liquid capture and retention for EFO version	Proven performance for fuel/oil hotspot locations	Regulator, Specifying & Design Engineer, Site Owner
Functions as bend, junction or inlet structure	Design flexibility	Specifying & Design Engineer
Minimal drop between inlet and outlet	Site installation ease	Contractor
Large diameter outlet riser for inspection and maintenance	Easy maintenance access from grade	Maintenance Contractor & Site Owner

STANDARD STORMCEPTOR EF/EFO DRAWINGS

For standard details, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

STANDARD STORMCEPTOR EF/EFO SPECIFICATION

For specifications, please visit http://www.imbriumsystems.com/stormwater-treatment-solutions/stormceptor-ef

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STANDARD PERFORMANCE SPECIFICATION FOR "OIL GRIT SEPARATOR" (OGS) STORMWATER QUALITY TREATMENT DEVICE

PART 1 – GENERAL

1.1 WORK INCLUDED

This section specifies requirements for selecting, sizing, and designing an underground Oil Grit Separator (OGS) device for stormwater quality treatment, with third-party testing results and a Statement of Verification in accordance with ISO 14034 Environmental Management – Environmental Technology Verification (ETV).

1.2 REFERENCE STANDARDS & PROCEDURES

ISO 14034:2016 Environmental management – Environmental technology verification (ETV)

Canadian Environmental Technology Verification (ETV) Program's **Procedure for Laboratory Testing of Oil-Grit Separators**

1.3 SUBMITTALS

1.3.1 All submittals, including sizing reports & shop drawings, shall be submitted upon request with each order to the contractor then forwarded to the Engineer of Record for review and acceptance. Shop drawings shall detail all OGS components, elevations, and sequence of construction.

1.3.2 Alternative devices shall have features identical to or greater than the specified device, including: treatment chamber diameter, treatment chamber wet volume, sediment storage volume, and oil storage volume.

1.3.3 Unless directed otherwise by the Engineer of Record, OGS stormwater quality treatment product substitutions or alternatives submitted within ten days prior to project bid shall not be accepted. All alternatives or substitutions submitted shall be signed and sealed by a local registered Professional Engineer, based on the exact same criteria detailed in Section 3, in entirety, subject to review and approval by the Engineer of Record.

PART 2 – PRODUCTS

2.1 OGS POLLUTANT STORAGE

The OGS device shall include a sump for sediment storage, and a protected volume for the capture and storage of petroleum hydrocarbons and buoyant gross pollutants. The minimum sediment & petroleum hydrocarbon storage capacity shall be as follows:

2.1.1	4 ft (1219 mm) Diameter OGS Units:	1.19 m^3 sediment / 265 L oil
	6 ft (1829 mm) Diameter OGS Units:	3.48 m^3 sediment / 609 L oil
	8 ft (2438 mm) Diameter OGS Units:	8.78 m^3 sediment / 1,071 L oil
	10 ft (3048 mm) Diameter OGS Units:	17.78 m^3 sediment / 1,673 L oil
	12 ft (3657 mm) Diameter OGS Units:	31.23 m^3 sediment / 2,476 L oil

PART 3 – PERFORMANCE & DESIGN

3.1 GENERAL

The OGS stormwater quality treatment device shall be verified in accordance with ISO 14034:2016 Environmental management – Environmental technology verification (ETV). The OGS stormwater quality treatment device shall remove oil, sediment and gross pollutants from stormwater runoff during frequent wet weather events, and retain these pollutants during less frequent high flow wet weather events below the insert within the OGS for later removal during maintenance. The Manufacturer shall have at least ten (10) years of local experience, history and success in engineering design, manufacturing and production and supply of OGS stormwater quality treatment device systems, acceptable to the Engineer of Record.

3.2 SIZING METHODOLOGY

The OGS device shall be engineered, designed and sized to provide stormwater quality treatment based on treating a minimum of 90 percent of the average annual runoff volume and a minimum removal of an annual average 60% of the sediment (TSS) load based on the Particle Size Distribution (PSD) specified in the sizing report for the specified device. Sizing shall be determined using historical rainfall data and a sediment removal performance curve derived from the actual third-party verified laboratory testing data. The OGS device shall also have sufficient annual sediment storage capacity as specified and calculated in Section 2.1.

3.3 CANADIAN ETV or ISO 14034 ETV VERIFICATION OF SCOUR TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of third-party scour testing conducted in accordance with the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**

3.3.1 To be acceptable for on-line installation, the OGS device must demonstrate an average scour test effluent concentration less than 10 mg/L at each surface loading rate tested, up to and including 2600 L/min/m^2.

3.4 LIGHT LIQUID RE-ENTRAINMENT SIMULATION TESTING

The OGS device shall have Canadian ETV or ISO 14034 ETV Verification of completed third-party Light Liquid Re-entrainment Simulation Testing in accordance with the Canadian ETV **Program's Procedure for Laboratory Testing of Oil-Grit Separators,** with results reported within the Canadian ETV or ISO 14034 ETV verification. This re-entrainment testing is conducted with the device pre-loaded with low density polyethylene (LDPE) plastic beads as a surrogate for light liquids such as oil and fuel. Testing is conducted on the same OGS unit tested for sediment removal to assess whether light liquids captured after a spill are effectively retained at high flow rates.

3.4.1 For an OGS device to be an acceptable stormwater treatment device on a site where vehicular traffic occurs and the potential for an oil or fuel spill exists, the OGS device must have reported verified performance results of greater than 99% cumulative retention of LDPE plastic beads for the five specified surface loading rates (ranging 200 L/min/m2 to 2600 L/min/m2) in accordance with the Light Liquid Re-entrainment Simulation Testing within the Canadian ETV Program's **Procedure for Laboratory Testing of Oil-Grit Separators.**However, an OGS device shall not be allowed if the Light Liquid Re-entrainment Simulation Testing was performed with screening components within the OGS device that are effective at retaining the LDPE plastic beads, but would not be expected to retain light liquids such as oil and fuel.

WATER BALANCE ASSESSMENT

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE 100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL: (416) 754-8515 · FAX: (905) 881-8335

BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	GRAVENHURST	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

March 2, 2023 Reference No. 2206-W054

Beachcroft Investments Inc.
20 Cachet Woods Court, Suite 6
Markham, Ontario
L6C 3G1

Attention: Ms. Uzo Rossouw

Re: Pre- and Post-Development Water Balance Assessment
Proposed Residential Development
63 and 63A Trafalgar Road
Town of Erin

Dear Madam:

We have completed a pre- and post-development water balance assessment for a proposed residential development, at the captioned site in the Town of Erin, and our findings are presented in this Letter Report.

- **Introduction**

The proposed development site is located at 63 and 63A Trafalgar Road in the Town of Erin. Drawing No. 1, enclosed, shows the location of the subject site for which this water balance applies. The proposed development will involve construction of residential development consisting detached dwellings, townhouses, having basement structures, along with mixed-used senor housing, parks and stormwater management pond blocks. The proposed development footprint encompasses an area of approximately 523,350 square meters.

- **Background**

Soil Engineers Ltd. (SEL) previously completed a preliminary geotechnical soil assessment, for the subject site, dated February 3, 2023 (SEL Reference No. 2206-S054). The study revealed that beneath a veneer of topsoil and ploughed soil, the site is underlain by strata of sand and gravelly sand deposits. Sandy silt till and silt deposits were generally contacted within the lower stratigraphy in some boreholes.

Soil Engineers Ltd. (SEL) also completed a hydrogeological assessment for the site in February 2023 (SEL Reference No. 2206-W054). This study reveals that the measured groundwater level elevations ranged from 440.74 to <421.51 masl, or from the depths, ranging from 2.75 to <6.2 mbgs as recorded during the monitoring period encompassing the period from December 1, 2022 to February 8, 2023. From the recorded groundwater level measurements, the shallow groundwater flow pattern was interpreted to flow in southwesterly direction, towards the tributary of Credit River.

The results of the completed hydrogeological assessment, indicates that the estimated permeability for the gravelly sand is 5.2×10^{-7}, the K estimate for the sandy gravel is 5.7×10^{-7} m/sec, the K estimate for the silt and sand till is 3.6×10^{-6}m/sec and the K estimate for the silty sand is 2.10×10^{-6}m/sec. This confirms the presence of low to moderate permeability for the shallow native subsoil that would be considered for the proposed infiltration infrastructure to redirect the precipitation and runoff to the subsurface.

The subject site is located within the Credit River Watershed. The Credit River Watershed covers an area of approximately 1,000 km^2, extending from the Town of Orangeville in the north to the City of Mississauga and Lake Ontario in south. A review of the local topography and the ground surface elevations at the borehole and monitoring wells shows that the subject site descends towards Trafalgar Road, towards the southeast.

Runoff from the site is expected to drain in southerly and easterly directions. Based on review of the topographic map for the area, and from review of the ground surface elevations at the borehole and monitoring well locations, the elevation relief across the subject site is about 15.0 m.

- **Water Balance Assessment**

The water balance for this proposed infill development site is based on the following equation:

$$P = ET + R + I + \Delta S$$

Where:

P -- Average Annual Precipitation
ET -- Evapotranspiration
R -- Surface Water Runoff
I -- Infiltration
Δs -- Change in Groundwater Storage, taken as 0

- **Precipitation**

The long-term records (30-year average from 1981 to 2010) for monthly and annual precipitation depths received at the site were adopted from the Environment Canada's Orangeville Station (Climate ID. 6155790), located about 15 km north of the subject site. The 30-year, mean annual precipitation record of 901.50 mm/year was adopted from this station. The 30-year records for average annual, and monthly temperatures were also adopted from this station. The water balance calculations for the pre- and post-developed assessments for the subject site are summarized in the Appendix.

- **Interception**

Based on the review of the SWM Planning and Design Manual (MOECC, 2003), evapotranspiration includes the evaporation from all sources; including; precipitation, water, snow, vegetation and from water droplets on plant surfaces plus the transpiration from plants, not involving water droplets retained on leaves. As such, interception was not included for the current pre- and post-development water balance assessments as it is included in the estimate for evapotranspiration.

- **Groundwater Storage**

Although groundwater storage experiences gains and losses on a short-term basis, the net change in groundwater storage (Δs) over the long-term is generally zero. For this reason, the change in groundwater storage is shown as zero (0) which has not been included in the water balance calculations.

- **Evapotranspiration**

In general, evapotranspiration (ET) refers to the transfer of water from vegetation and from the soil surface to the atmosphere in the form of water vapour. The term considers evaporation from the soil surface, man-made infrastructure surfaces (asphaltic and concrete roads, and from building roofs), and from the transpiration from plants and trees together because of the difficulties in separating these processes. Potential evapotranspiration (PET) refers to the transfer/loss of water from vegetated surfaces to the atmosphere, under the condition of unlimited water supply.

The actual rate of evapotranspiration (AET) is generally less than PET, under dry conditions (i.e., during the summer season when there is a soil moisture deficit). Variation in water holding capacity, which affects ET, depends on the soil type and rooted vegetation. The

gravelly sand, sandy gravel, silt and sand till, and silty sand surface soil at the site, as revealed from the subsurface drilling program, has been assigned a water holding capacity of -150 mm (Soil and Water Conservation Table 18.2 PP 392 G. Schwab et. al.).

Chart 40 from the Climate of the Great Lakes Basin (Environment Canada 1972) suggests that the PET for the Orangeville EC Weather Station should ranges from about 558.8 to 609.6 mm/year (22 to 24 in/year). Simulations using Thornthwaite and Mather model developed by US Geological Survey (USGS) indicates that the amount of ET (PET) for the subject site ranges from about 526.60 to 530.20 mm/year, which agrees well with the mapped ET values for the general area; therefore, the average AET value of 528.4 mm/year has been applied to the pre- and post-water balance assessments for the subject site.

- **Infiltration and Runoff**

According to the Ministry of the Environment, Conservation and Parks (MECP) Guidance Manual (MECP 1995), a series of infiltration components can be applied to the subject site based on its slope, soil and vegetation coverage. The cumulative value of these sub-components is referred to as the infiltration factor, with the values ranging from 0 to 1. The difference between the value 1 and the infiltration factor is referred to as the runoff factor.

Slope has an influence on both infiltration and runoff. The topography for the subject site is considered flat to gently rolling land, based on its elevation relief, and from a review of available topographic mapping for the area. The elevation relief across the subject site is about 15.0 m.

Surficial soil and vegetation coverage and/or cropping practices also contribute to the infiltration and runoff factors. The subject site is primarily farm field, and is partially wooded and the surficial soil consists mainly of gravelly sand, sandy gravel, silt and sand till, and silty sand. The selected, cumulative infiltration and corresponding runoff factors for the subject site, based on its topography, predominant surface soil and vegetation coverage are provided in Table 1.

The difference between the average annual precipitation and actual evapo-transpiration is termed the water surplus. As mentioned, above, the long-term annual precipitation value of 878.78 mm/year has been adopted for the site. Subtracting the averaged, Thornthwaite and Mather derived AET estimate of 528.4 mm/year from the annual precipitation gives a water surplus estimate of 350.38 mm/year. The site's average annual infiltration depth estimate was calculated by multiplying the cumulative infiltration factor by the water surplus estimate, and the site's runoff was calculated by applying its difference from 1, or 1 minus the cumulative

infiltration factor multiplied by the water surplus estimate. Based on the MECP infiltration factors, a cumulative infiltration factor of 0.70 was considered for the water balance assessment. The average annual depth estimates for infiltration and runoff at the undeveloped site are given in Table 1.

Table 1 - Summary of Infiltration and Runoff Depth Estimates

Land Characteristics	MECP Infiltration Factors	Water Surplus Estimate (mm/yr.)	Infiltration Estimate (mm/yr.)	Runoff Estimate (mm/yr.)
Cover: (Grass, pavement)	0.15	**350.38**	I = 0.70×350.38	R = (1-0.70) ×350.38
Slope: (Rolling land)	0.25			
Soil: (gravelly sand, sandy gravel, silt and sand till, and silty sand)	0.3			
Cumulative Infiltration Factor	**0.7**		**245.27**	**105.11**

Runoff from impervious surfaces is calculated differently than for pervious soil/ vegetated covered surfaces. As a general rule, the ET for impervious surfaces on an average annualized basis is calculated by taking 10% of the average annual precipitation, while runoff is calculated by taking 90% of the average annual precipitation. There are existing impervious surfaces on the site, prior to site development, consisting of an existing car dealership and its associated paved, asphalt parking area. Based on this approach, the ET and runoff estimates for the site's impervious surfaces, on an average annualized depth basis are 87.88 mm/year and 790.90 mm/year, respectively.

- **Pre-Development Water Balance**

The pre-development water balance for the site is calculated by multiplying the existing site areas by the various, averaged annualized depth estimates for Precipitation, ET, Infiltration and Runoff. The average volumetric water balance estimates for each water balance component are given in Table 2.

Table 2 - Summary of Pre-Development Volumetric Water Balance Components

Pre-Development Site Areas	Approximate Area Coverage (m^2)	Precipitation (m^3/year)	AET (m^3/year)	Infiltration (m^3/year)	Runoff (Pervious) (m^3/year)
Existing Pervious Areas (Grass)	523,240.00	459,812.85	276,480.02	128,332.98	54,999.85
Existing Impervious Areas (Asphalt)	110.00	96.67	9.67	0.00	87.00
Total Area/Volume	**523,350.00**	**459,909.51**	**276.489.68**	**128,332.98**	**55,086.85**

The pre-development water balance for the subject site is calculated on an annualized depth basis by dividing the volumetric estimates for each water balance component from above by the total site area. Furthermore, there are existing impervious areas on site, including a commercial building, an associated parking lot and paved areas. The anticipated AET and runoff for the existing impervious areas were estimated by taking 10% of the average annual precipitation after correction for interception, while runoff is calculated by taking 90% of the average annual precipitation. Based on this approach, the depth-based water balance components for the pre-developed site are presented as follows:

$$P\ (878.78) = ET\ (528.31) + I\ (245.21) + R\ (105.26)$$

- **Post-Development Water Balance**

Based on the data provided by Urbanworks Engineering Corporation indicates that the subject site comprised a total area of 523,350 m². Of this, the developed impervious areas will include the building footprints and paved areas, covering about 47.49% of the developed site area, or an area of about 248,514 m². Pervious developed areas, including landscaped areas, will comprise the remaining 52.51% of the site, or an area of 274,835 m².

The post-development water balance was calculated using the same water balance depth estimate components that were used for the pre-development water balance calculations, i.e., average annual precipitation and average annual ET. After development, with no infiltration through the impervious areas, the depth estimates for runoff and become 90% and 10% of the corrected average annual precipitation, respectively. The estimated post-development water balance volumes are provided in Table 3:

Table 3 - Summary of Post-Development Volumetric Water Balance Components

Post-Development Site Areas	Area Coverage (m^2)	Precipitation (m^3/year)	AET (Pervious) (m^3/year)	AET (Impervious) (m^3/year)	Infiltration (m^3/year)	Runoff (Pervious) (m^3/year)	Runoff (Impervious) (m^3/year)
Pervious Area (505-Mixed Block)	1,705.0	1,498.32	900.92	0.00	418.18	179.22	0.00
Pervious Areas (Front Yard)	31,708.0	27,864.36	16,754.51	0.00	7,776.89	3,332.95	0.00
Pervious Areas (Rear Yards)	95,124.0	83,593.07	50,263.52	0.00	23,330.68	9,998.86	0.00
Pervious Areas (ROW)	24,600.0	21,617.99	12,998.64	0.00	6,033.54	2,585.80	0.00
Pervious Areas (Parks)	121,697.0	106,944.89	64,304.69	0.00	29,848.14	12,792.06	0.00
Impervious Area (Buildings)	110,889.2	97,447.21	0.00	9,744.72	0.00	0.00	87,702.49
Impervious Areas (Patios)	2,543.70	2,235.35	0.00	223.54	0.00	0.00	2,011.82
Impervious Ares (Driveways)	14,025.8	12,325.59	0.00	1,232.56	0.00	0.00	11,093.03
Impervious Areas (BROW Sidewalks)	18,450.0	16,213.49	0.00	1,621.35	0.00	0.00	14,592.14
Impervious Areas (Roads)	79,950.0	70,258.46	0.00	7,025.85	0.00	0.00	63,232.61
Impervious Area (Block 505-Mixed)	22,657.3	19,910.78	0.00	1,991.08	0.00	0.00	17,919.70
Total Area/Volume	**523,350.0**	**459,909.51**	**145,222.29**	**21,839.09**	**67,407.44**	**28,888.90**	**196,551.80**

Based on the volumetric water balance estimates shown in Table 3, the depth-based post-development water balance estimates are presented as follows:

$$P\ (878.78) = ET\ (319.22) + I\ (128.80) + R\ (430.76)$$

The volumetric comparisons for evapotranspiration, infiltration and runoff between the pre-developed and post-developed site are summarized in Table 4. A review of the findings indicates a decrease of 209.09 mm/year, or 39.58 %, in annual evapo-transpiration, a decrease of 116.41 mm/year, or 47.47 %, in annual infiltration, and a gain in runoff of 325.51 mm/year or 309.24 %.

Table 4 - Comparison Summary of Pre- and Post-Development Water Balance/ Budget Volumetric Components

	Precipitation (m^3/year)	ET (m^3/year)	Infiltration (m^3/year)	Runoff (m^3/year)
Pre-Development	459,909.51	276,489.68	128,332.98	55,086.85
Post- Development	459,909.51	167,061.37	67,407.44	225,440.70
Volumetric Change in Pre- and Post-Development Water Balance Parameters	0.0	-109,428.31	-60,925.54	+ 170,353.85

Notes: - -- loss -- gain

The volumetric comparisons in evapotranspiration, infiltration and runoff between the pre-developed and post-developed site are summarized in Table 4. A review of the findings indicates that decreases of 109,428.31 m^3/year and 60,925.54 m^3/year are anticipated for ET and infiltration, respectively. An increase of 170,353.85 m^3/year is expected for runoff at the post-developed site compared with the pre-developed site.

The pre- and post-development water balance calculations for the site are summarized in the attached Appendix.

We trust the above satisfies your present requirements. Should you have any further queries, please feel free to contact this office.

Yours truly,
SOIL ENGINEERS LTD.

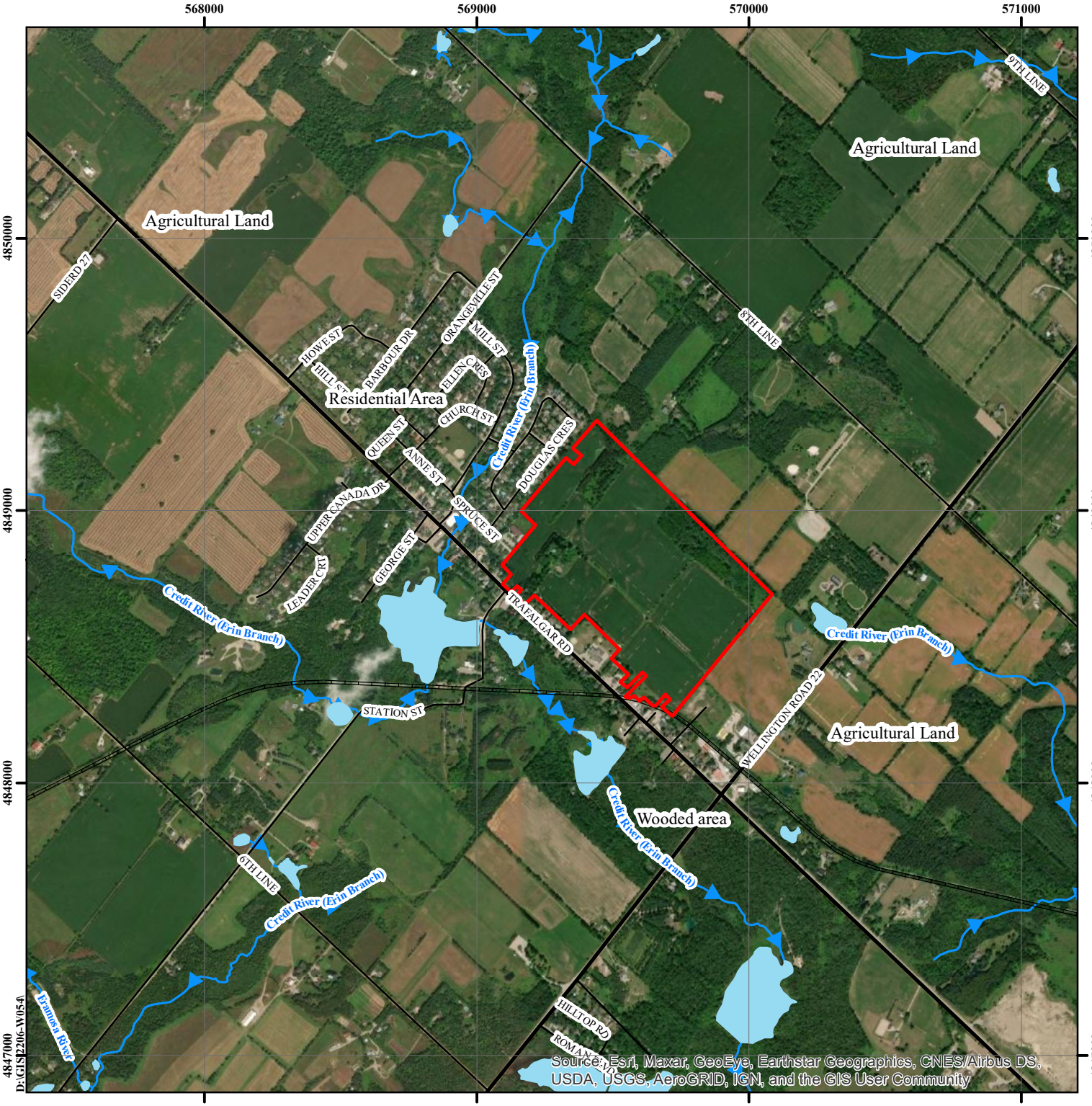
Bhawandeep Singh Brar
Bhawandeep Singh Brar, B.Sc.

GR O'Brien
Gavin O'Brien, M.Sc., P.Geo.
BB/GO

PROFESSIONAL GEOSCIENTIST
GAVIN R. O'BRIEN
PRACTISING MEMBER
1267
March 14, 2023
ONTARIO

ENCLOSURES

Site Location Plan..... Drawing No. 1
Pre- and Post-Development Water Balance Assessment ..... Appendix



N

Legend

- Approximate Boundary of Subject Site
- waterbody
- Watercourse
- Major Road
- Local Road
- Railway

Soil Engineers Ltd.

Title: Site Location Plan

Project:

Pre-and-Post-Development Water Balance Assessment
Proposed Residential Development
Address: 63 and 63A Trafalgar Road, Town of Erin, ON

Reference No. 2206-W054

Date: March 2, 2023

Scale:

0 85 170 340 510 680 850
Metres

Drawing No. 1

Pre-Development Water Balance/Budget

ET Estimates

Average for 150 mm gravelly sand, sandy gravel, silt and sand till, and silty sand 43 and 44 deg N. lat from USGS model: **528.4 mm/yr**

Avg Annual Precipitation: **878.78 mm/yr** after removing 4% for interception; **901.60 mm/yr** prior to removal of 4% for interception

gravelly sand and siltysand 150 mm 44 lat
530.20 mm/yr ET

gravelly sand and silty sand 150 mm 43 lat
526.60 mm/yr

Site Area **523,350.00 m²**

ET	impervious surfaces	0.1	10%
R	impervious surfaces	0.9	90%

Type	MOE factors: Grass covered and wood Lot	
cover	0.15	grassland, woodlot
slope	0.25	Flat to Rolling land
soil texture	0.3	gravelly sand and silty sand
MOECC Inf. F.	0.70	

Site Areas	Areas m²	Impervious factor	Cum. Infilt	Assigned ET mm/yr	Water Surplus mm/yr	Infiltration mm/yr	Runoff mm/yr	precipitation m³/yr	Infilt Vol m³/yr	RO Vol m³/yr	ET Vol m³/yr	
Grass covered Area (Pervious)	**523,240.00**	**0**	**0.70**	**528.4**	**350.38**	**245.27**	**105.11**	**459,812.85**	**128,332.98**	**54,999.85**	**276,480.02**	
Road, Buildings (impervious)	**110.00**	**1**	**0.00**	**87.88**	**790.90**	**0.00**	**790.90**	**96.67**	**0.00**	**87.00**	**9.67**	
Total Area	**523,350.00**							**459,909.51**	**128,332.98**	**55,086.85**	**276,489.68**	check
							percentages	459,909.51	**0.28**	**0.12**	**0.60**	1.00

Parcel A: Pre Development Water Balance/Budget (mm/year)

P	=	ET	+	I	+	R	+	ΔS		Check
878.78	=	**528.31**	+	**245.21**	+	**105.26**	+	0.00		**878.78**

Total Area **523350.00 m²**

Post-Development Water Balance/Budget

Average for 150 mm gravelly sand, sandy gravel, silt and sand till, and silty sand 43 an from USGS model: **528.4 mm/yr**

Avg Annual Precipitation **878.78 mm/yr** after removing 4% for interception
901.60 mm/yr prior to removal of 4% for interception

gravely sand and silty sand 150 mm 44 lat
530.20 mm/yr ET

gravely sand and silty sand 150 mm 43 lat
526.60 mm/yr

Site Area **523,350.00 m²**

ET	impervious surfaces	0.1	10%
R	impervious surfaces	0.9	90%

Type	MOE factors: Grass covered and wood Lot	
cover	0.15	grassland, woodlot
slope	0.25	Flat to Rolling Land
soil texture	0.3	gravely sand and silty sand
MOECC Inf. F.	0.70	

Future Developed Site Areas	Areas	Impervious factor	Cum. Infiltration	Assigned ET Pervious Portion	Water Surplus	Infiltration - Pervious Portion	ET - Impervious Portion	Runoff - Impervious Areas	Runoff Pervious Portion	precipitation	Pervious Area: Infilt Vol. Pervious Areas	Pervious Area: RO Vol. Pervious Areas	Pervious Area: ET Vol Pervious Areas	Impervious Area: RO Vol. Impervious Areas	Impervious Area: ET Vol Imperv Areas	Total Et and Ro.: Total ET	Total Et and Ro.: Total RO
	m^2			mm/yr	mm/yr	mm/yr	mm/yr	mm/yr	mm/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr	m^3/yr
Pervious Areas (Block 505- Mixed Use)	1,705.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	1,498.32	418.18	179.22	900.92	0.00	0.00	900.92	179.22
Pervious Areas (Front yards)	31,708.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	27,864.36	7,776.89	3,332.95	16,754.51	0.00	0.00	16,754.51	3,332.95
Pervious Areas (Rear yards)	95,124.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	83,593.07	23,330.68	9,998.86	50,263.52	0.00	0.00	50,263.52	9,998.86
Perviosu Areas (ROW)	24,600.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	21,617.99	6,033.54	2,585.80	12,998.64	0.00	0.00	12,998.64	2,585.80
Pervious Areas (Parks)	121,697.00	0	0.70	528.40	350.38	245.27	0.00	0.00	105.11	106,944.89	29,848.14	12,792.06	64,304.69	0.00	0.00	64,304.69	12,792.06
Impervious Areas (Buildings)	110,889.20	1	0.00	0.00	790.90	0.00	87.88	790.90	0.00	97,447.21	0.00	0.00	0.00	87,702.49	9,744.72	9,744.72	87,702.49
Impervious Areas (Patios)	2,543.70	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	2,235.35	0.00	0.00	0.00	2,011.82	223.54	223.54	2,011.82
Impervious Areas (Driveways)	14,025.80	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	12,325.59	0.00	0.00	0.00	11,093.03	1,232.56	1,232.56	11,093.03
Impervious Areas (BROW Sidewalks)	18,450.00	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	16,213.49	0.00	0.00	0.00	14,592.14	1,621.35	1,621.35	14,592.14
Impervious Areas (roads)	79,950.00	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	70,258.46	0.00	0.00	0.00	63,232.61	7,025.85	7,025.85	63,232.61
Impervious Areas (Block 505-Mixed)	22,657.30	1	0.00	1.00	790.90	0.00	87.88	790.90	0.00	19,910.78	0.00	0.00	0.00	17,919.70	1,991.08	1,991.08	17,919.70
Total Area	523,350.00								Total	459,909.51	67,407.44	28,888.90	145,222.29	196,551.80	21,839.09	167,061.37	225,440.70
										Totals				Total RO	225,440.70	Total ET	167,061.37

Total Area **523,350.00 m²**

Post Development Water Balance/Budget (mm/year)

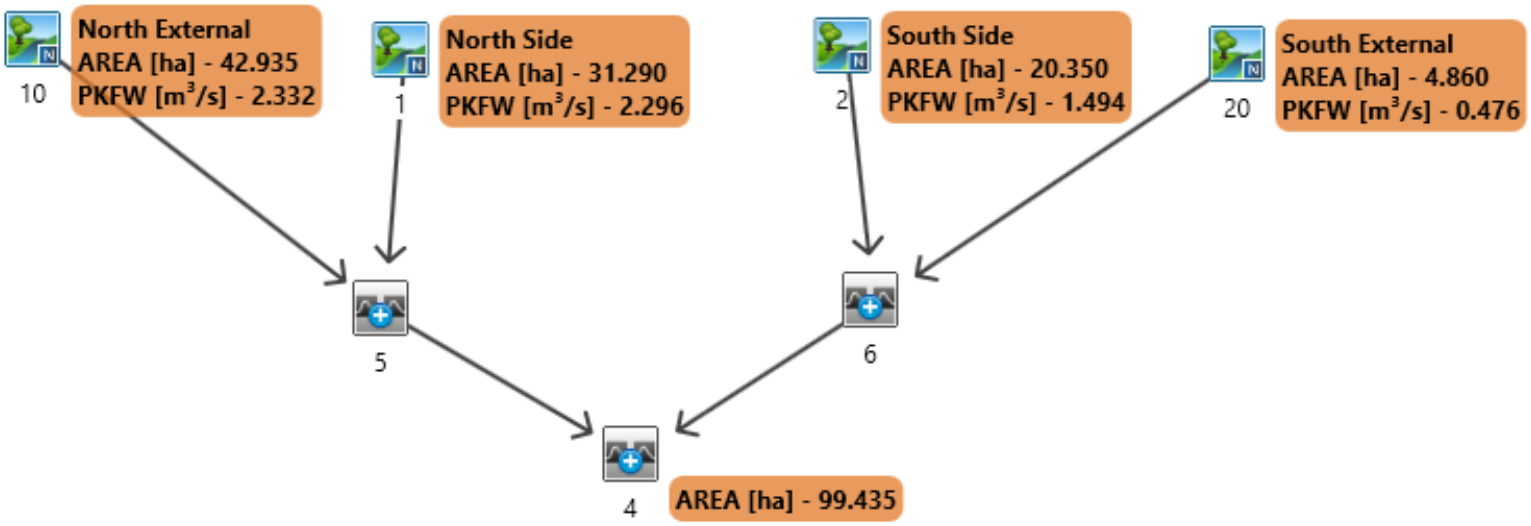
P	=	ET	+	I	+	R	+	ΔS		Check
878.78	=	**319.22**	+	**128.80**	+	**430.76**	+	0		**878.78**

Pre Development Water Balance/Budget (mm/year)

P	=	ET	+	I	+	R	+	ΔS		Check
878.78	=	**528.31**	+	**245.21**	+	**105.26**	+	**0**		**878.78**

	ET	I	R	DS
Loss/Gain in Post	loss: **209.09**	loss: **116.41**	gain: **325.51**	0
	% loss: **39.58**	%loss: **47.47**	%gain **309.246**	

Visual OTTHYMO Model Results



urbanworks
ENGINEERING CORPORATION

Visual OTTHYMO™ Schematic
PRE-DEVELOPMENT

HILLSBURGH SUBDIVISION
(4HR CHICAGO DESIGN STORM)

Job #: 22-0020ER	**Date: March 2023**

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       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\af4dcf75-bb16-4b9d-a32d-ca7cc08765b2\scena
  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\af4dcf75-bb16-4b9d-a32d-ca7cc08765b2\scena


DATE: 03-08-2023                          TIME: 05:43:44

USER:


COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
------------------------
  ***********************************************
  ** SIMULATION : 100yr 4hr 5min Chicago        **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1248.000
| Ptotal= 89.85 mm |                          B=   1.830
--------------------                          C=   0.732
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    6.50 |  1.00   23.36 |  2.00   15.90 |  3.00    8.38
                0.08    6.85 |  1.08   33.65 |  2.08   14.67 |  3.08    8.09
                0.17    7.24 |  1.17   72.21 |  2.17   13.64 |  3.17    7.83
                0.25    7.70 |  1.25  305.79 |  2.25   12.77 |  3.25    7.59
                0.33    8.23 |  1.33   92.43 |  2.33   12.02 |  3.33    7.36
                0.42    8.85 |  1.42   52.08 |  2.42   11.36 |  3.42    7.15
                0.50    9.60 |  1.50   37.52 |  2.50   10.79 |  3.50    6.95
                0.58   10.52 |  1.58   29.85 |  2.58   10.28 |  3.58    6.76
                0.67   11.68 |  1.67   25.04 |  2.67    9.82 |  3.67    6.59
                0.75   13.19 |  1.75   21.73 |  2.75    9.41 |  3.75    6.42
                0.83   15.27 |  1.83   19.28 |  2.83    9.03 |  3.83    6.27
                0.92   18.32 |  1.92   17.40 |  2.92    8.69 |  3.92    6.12

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=  31.29   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

     Unit Hyd Qpeak  (cms)=   3.984

     PEAK FLOW       (cms)=   2.296 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  31.774
     TOTAL RAINFALL   (mm)=  89.848
     RUNOFF COEFFICIENT   =   0.354

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area     (ha)=  42.94   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   2.332 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  31.784
     TOTAL RAINFALL   (mm)=  89.848
     RUNOFF COEFFICIENT   =   0.354

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

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

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0001):    31.29   2.296     1.67     31.77
     + ID2= 2 (  0010):    42.94   2.332     1.92     31.78
       ==========================================================
       ID = 3 (  0005):    74.22   4.420     1.75     31.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area     (ha)=  20.35   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30
```

```
     Unit Hyd Qpeak  (cms)=   2.591

     PEAK FLOW       (cms)=   1.494 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  31.774
     TOTAL RAINFALL   (mm)=  89.848
     RUNOFF COEFFICIENT   =   0.354

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0020)|   Area     (ha)=   4.86   Curve Number    (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.476 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  32.599
     TOTAL RAINFALL   (mm)=  89.848
     RUNOFF COEFFICIENT   =   0.363

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

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

--------------------
| ADD HYD  (  0006)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    20.35   1.494     1.67    31.77
      + ID2= 2 (  0020):     4.86   0.476     1.50    32.60
        ================================================
        ID = 3 (  0006):    25.21   1.903     1.58    31.93

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):    74.22   4.420     1.75    31.78
      + ID2= 2 (  0006):    25.21   1.903     1.58    31.93
        ================================================
        ID = 3 (  0004):    99.44   6.197     1.75    31.82

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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       V    V   I    SSSSS  U   U    A    L             (v 6.2.2011)
```

```
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
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  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\8ecae0e9-7beb-4dc6-ab2f-8be9a5ccd606\scena


DATE: 03-08-2023                          TIME: 05:43:44

USER:


COMMENTS: _____________________________________________________________
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--------------------------------------------------------------------------------
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  ***********************************************
  ** SIMULATION : 10yr 4hr 5min Chicago         **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 869.000
| Ptotal= 63.26 mm |                          B=   1.790
--------------------                          C=   0.730
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

   TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
    hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
   0.00    4.61 |  1.00   16.47 |  2.00   11.23 |  3.00    5.93
   0.08    4.85 |  1.08   23.68 |  2.08   10.36 |  3.08    5.73
   0.17    5.13 |  1.17   50.61 |  2.17    9.64 |  3.17    5.55
   0.25    5.45 |  1.25  214.66 |  2.25    9.03 |  3.25    5.37
   0.33    5.83 |  1.33   64.73 |  2.33    8.50 |  3.33    5.21
   0.42    6.27 |  1.42   36.56 |  2.42    8.04 |  3.42    5.06
   0.50    6.80 |  1.50   26.39 |  2.50    7.63 |  3.50    4.92
   0.58    7.44 |  1.58   21.02 |  2.58    7.27 |  3.58    4.79
   0.67    8.26 |  1.67   17.65 |  2.67    6.95 |  3.67    4.67
   0.75    9.32 |  1.75   15.32 |  2.75    6.66 |  3.75    4.55
```

```
                0.83   10.78 |  1.83   13.61 |  2.83    6.39 |  3.83    4.44
                0.92   12.93 |  1.92   12.28 |  2.92    6.15 |  3.92    4.34
```

```
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=  31.29   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

     Unit Hyd Qpeak  (cms)=   3.984

     PEAK FLOW       (cms)=   1.174 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  16.973
     TOTAL RAINFALL   (mm)=  63.260
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area     (ha)=  42.94   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   1.202 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  16.979
     TOTAL RAINFALL   (mm)=  63.260
     RUNOFF COEFFICIENT   =   0.268

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

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

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |         AREA     QPEAK     TPEAK      R.V.
--------------------         (ha)     (cms)     (hrs)       (mm)
        ID1= 1 (  0001):    31.29    1.174      1.67     16.97
      + ID2= 2 (  0010):    42.94    1.202      1.92     16.98
        ================================================
        ID = 3 (  0005):    74.22    2.263      1.75     16.98

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area     (ha)=  20.35   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

     Unit Hyd Qpeak  (cms)=   2.591

     PEAK FLOW       (cms)=   0.763 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  16.973
     TOTAL RAINFALL   (mm)=  63.260
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0020)|   Area     (ha)=   4.86   Curve Number    (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.242 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  17.478
     TOTAL RAINFALL   (mm)=  63.260
     RUNOFF COEFFICIENT   =   0.276

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

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

--------------------
| ADD HYD  (  0006)|
|   1 +  2 =  3    |         AREA     QPEAK     TPEAK      R.V.
--------------------         (ha)     (cms)     (hrs)       (mm)
        ID1= 1 (  0002):    20.35    0.763      1.67     16.97
      + ID2= 2 (  0020):     4.86    0.242      1.50     17.48
        ================================================
        ID = 3 (  0006):    25.21    0.974      1.67     17.07

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA     QPEAK     TPEAK      R.V.
--------------------         (ha)     (cms)     (hrs)       (mm)
        ID1= 1 (  0005):    74.22    2.263      1.75     16.98
      + ID2= 2 (  0006):    25.21    0.974      1.67     17.07
        ================================================
        ID = 3 (  0004):    99.44    3.185      1.75     17.00

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

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-8d27-4dd2e74404d1\6fc4213c-d7c1-4bfa-8a3c-5f76760c793e\scena
Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-8d27-4dd2e74404d1\6fc4213c-d7c1-4bfa-8a3c-5f76760c793e\scena

DATE: 03-08-2023 TIME: 05:43:44

USER:

COMMENTS: _____

**** SIMULATION : 25yr 4hr 5min Chicago ****

| CHICAGO STORM | IDF curve parameters: A=1011.000
| Ptotal= 74.42 mm | B= 1.750
C= 0.728
used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 5.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	5.45	1.00	19.40	2.00	13.25	3.00	7.02
0.08	5.75	1.08	27.84	2.08	12.23	3.08	6.78
0.17	6.08	1.17	59.28	2.17	11.39	3.17	6.56
0.25	6.45	1.25	251.78	2.25	10.66	3.25	6.36
0.33	6.89	1.33	75.73	2.33	10.04	3.33	6.17
0.42	7.41	1.42	42.89	2.42	9.50	3.42	5.99
0.50	8.04	1.50	31.02	2.50	9.02	3.50	5.83
0.58	8.80	1.58	24.73	2.58	8.60	3.58	5.67
0.67	9.76	1.67	20.79	2.67	8.22	3.67	5.53
0.75	11.01	1.75	18.06	2.75	7.87	3.75	5.39
0.83	12.73	1.83	16.04	2.83	7.56	3.83	5.26
0.92	15.25	1.92	14.49	2.92	7.28	3.92	5.14

| CALIB | NASHYD (0001) | ID= 1 DT= 5.0 min | Area (ha)= 31.29 | Ia (mm)= 5.00 | Curve Number (CN)= 64.2 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.30

Unit Hyd Qpeak (cms)= 3.984

PEAK FLOW (cms)= 1.604 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 22.824
TOTAL RAINFALL (mm)= 74.419
RUNOFF COEFFICIENT = 0.307

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

| CALIB | NASHYD (0010) | ID= 1 DT= 5.0 min | Area (ha)= 42.94 | Ia (mm)= 5.00 | Curve Number (CN)= 64.2 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.47

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 1.637 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 22.831
TOTAL RAINFALL (mm)= 74.419
RUNOFF COEFFICIENT = 0.307

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

ADD HYD (0005)	1 + 2 = 3		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
	ID1= 1 (0001):		31.29	1.604	1.67	22.82
	+ ID2= 2 (0010):		42.94	1.637	1.92	22.83
	ID = 3 (0005):		74.22	3.090	1.75	22.83

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

| CALIB | NASHYD (0002) | ID= 1 DT= 5.0 min | Area (ha)= 20.35 | Ia (mm)= 5.00 | Curve Number (CN)= 64.2 | # of Linear Res.(N)= 3.00 | U.H. Tp(hrs)= 0.30

Unit Hyd Qpeak (cms)= 2.591

PEAK FLOW (cms)= 1.043 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 22.824
TOTAL RAINFALL (mm)= 74.419
RUNOFF COEFFICIENT = 0.307

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

| CALIB

```
| NASHYD   (  0020)|   Area     (ha)=   4.86   Curve Number    (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.331 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  23.464
     TOTAL RAINFALL   (mm)=  74.419
     RUNOFF COEFFICIENT   =   0.315

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

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

--------------------
| ADD HYD  (  0006)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    20.35   1.043     1.67    22.82
      + ID2= 2 (  0020):     4.86   0.331     1.50    23.46
        ==========================================================
        ID = 3 (  0006):    25.21   1.328     1.67    22.95

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):    74.22   3.090     1.75    22.83
      + ID2= 2 (  0006):    25.21   1.328     1.67    22.95
        ==========================================================
        ID = 3 (  0004):    99.44   4.341     1.75    22.86

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

       V    V   I    SSSSS  U   U    A    L             (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
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DATE: 03-08-2023                          TIME: 05:43:44

USER:


COMMENTS: _____

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  ***********************************************
  ** SIMULATION : 2yr 4hr 5min Chicago          **
  ***********************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 566.000
| Ptotal= 41.21 mm |                          B=   1.770
--------------------                          C=   0.730
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  4.00 hrs
                        Storm time step    =  5.00 min
                        Time to peak ratio =  0.33

      TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
       hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
      0.00    3.00 |  1.00   10.72 |  2.00    7.31 |  3.00    3.86
      0.08    3.16 |  1.08   15.41 |  2.08    6.75 |  3.08    3.73
      0.17    3.34 |  1.17   32.92 |  2.17    6.28 |  3.17    3.61
      0.25    3.55 |  1.25  140.12 |  2.25    5.88 |  3.25    3.50
      0.33    3.79 |  1.33   42.09 |  2.33    5.53 |  3.33    3.39
      0.42    4.08 |  1.42   23.78 |  2.42    5.23 |  3.42    3.30
      0.50    4.43 |  1.50   17.17 |  2.50    4.97 |  3.50    3.21
      0.58    4.85 |  1.58   13.68 |  2.58    4.74 |  3.58    3.12
      0.67    5.38 |  1.67   11.49 |  2.67    4.52 |  3.67    3.04
      0.75    6.07 |  1.75    9.97 |  2.75    4.34 |  3.75    2.97
      0.83    7.02 |  1.83    8.86 |  2.83    4.16 |  3.83    2.89
      0.92    8.42 |  1.92    8.00 |  2.92    4.01 |  3.92    2.83

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=  31.29   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.30

     Unit Hyd Qpeak  (cms)=   3.984

     PEAK FLOW       (cms)=   0.478 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   7.368
     TOTAL RAINFALL   (mm)=  41.206
     RUNOFF COEFFICIENT   =   0.179
```

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area     (ha)=  42.94   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   0.496 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   7.370
     TOTAL RAINFALL   (mm)=  41.206
     RUNOFF COEFFICIENT   =   0.179

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

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

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0001):    31.29   0.478     1.67     7.37
      + ID2= 2 (  0010):    42.94   0.496     1.92     7.37
        ================================================
        ID = 3 (  0005):    74.22   0.930     1.83     7.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area     (ha)=  20.35   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

     Unit Hyd Qpeak  (cms)=   2.591

     PEAK FLOW       (cms)=   0.311 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=   7.368
     TOTAL RAINFALL   (mm)=  41.206
     RUNOFF COEFFICIENT   =   0.179

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0020)|   Area     (ha)=   4.86   Curve Number    (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.098 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   7.616
     TOTAL RAINFALL   (mm)=  41.206
     RUNOFF COEFFICIENT   =   0.185

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

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

--------------------
| ADD HYD  (  0006)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0002):    20.35   0.311     1.67     7.37
      + ID2= 2 (  0020):     4.86   0.098     1.58     7.62
        ================================================
        ID = 3 (  0006):    25.21   0.400     1.67     7.42

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0005):    74.22   0.930     1.83     7.37
      + ID2= 2 (  0006):    25.21   0.400     1.67     7.42
        ================================================
        ID = 3 (  0004):    99.44   1.310     1.75     7.38

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
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DATE: 03-08-2023                          TIME: 05:43:44

USER:
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COMMENTS: _____

****
**** SIMULATION : 50yr 4hr 5min Chicago ****
****

CHICAGO STORM	IDF curve parameters: A=1126.000
Ptotal= 82.43 mm	B= 1.760
	C= 0.729
	used in: INTENSITY = A / (t + B)^C

Duration of storm = 4.00 hrs
Storm time step = 5.00 min
Time to peak ratio = 0.33

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	6.02	1.00	21.47	2.00	14.65	3.00	7.75
0.08	6.34	1.08	30.83	2.08	13.52	3.08	7.49
0.17	6.71	1.17	65.75	2.17	12.58	3.17	7.25
0.25	7.13	1.25	279.58	2.25	11.79	3.25	7.02
0.33	7.61	1.33	84.04	2.33	11.10	3.33	6.81
0.42	8.19	1.42	47.54	2.42	10.50	3.42	6.62
0.50	8.88	1.50	34.35	2.50	9.97	3.50	6.43
0.58	9.72	1.58	27.38	2.58	9.50	3.58	6.26
0.67	10.78	1.67	23.00	2.67	9.08	3.67	6.10
0.75	12.17	1.75	19.98	2.75	8.70	3.75	5.95
0.83	14.07	1.83	17.74	2.83	8.35	3.83	5.81
0.92	16.87	1.92	16.02	2.92	8.04	3.92	5.67

CALIB	
NASHYD (0001)	Area (ha)= 31.29 Curve Number (CN)= 64.2
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.30

Unit Hyd Qpeak (cms)= 3.984

PEAK FLOW (cms)= 1.948 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 27.356
TOTAL RAINFALL (mm)= 82.428
RUNOFF COEFFICIENT = 0.332

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

CALIB	
NASHYD (0010)	Area (ha)= 42.94 Curve Number (CN)= 64.2
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.47

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 1.983 (i)
TIME TO PEAK (hrs)= 1.917
RUNOFF VOLUME (mm)= 27.365
TOTAL RAINFALL (mm)= 82.428
RUNOFF COEFFICIENT = 0.332

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

ADD HYD (0005)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0001):	31.29	1.948	1.67	27.36
	+ ID2= 2 (0010):	42.94	1.983	1.92	27.36
	ID = 3 (0005):	74.22	3.753	1.75	27.36

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB	
NASHYD (0002)	Area (ha)= 20.35 Curve Number (CN)= 64.2
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.30

Unit Hyd Qpeak (cms)= 2.591

PEAK FLOW (cms)= 1.267 (i)
TIME TO PEAK (hrs)= 1.667
RUNOFF VOLUME (mm)= 27.356
TOTAL RAINFALL (mm)= 82.428
RUNOFF COEFFICIENT = 0.332

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

CALIB	
NASHYD (0020)	Area (ha)= 4.86 Curve Number (CN)= 65.2
ID= 1 DT= 5.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.20

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.403 (i)
TIME TO PEAK (hrs)= 1.500
RUNOFF VOLUME (mm)= 28.092
TOTAL RAINFALL (mm)= 82.428
RUNOFF COEFFICIENT = 0.341

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

ADD HYD (0006)

```
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0002):    20.35   1.267     1.67    27.36
     + ID2= 2 (  0020):     4.86   0.403     1.50    28.09
       ================================================
       ID = 3 (  0006):    25.21   1.612     1.58    27.50

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0005):    74.22   3.753     1.75    27.36
     + ID2= 2 (  0006):    25.21   1.612     1.58    27.50
       ================================================
       ID = 3 (  0004):    99.44   5.266     1.75    27.40

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
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  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\c0fbb690-1937-4e13-bd17-141fa33177f4\scena


DATE: 03-08-2023                          TIME: 05:43:44

USER:


COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
------------------------
  ************************************************
```

```
  ** SIMULATION : 5yr 4hr 5min Chicago          **
  ************************************************

--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 744.000
| Ptotal= 54.46 mm |                          B=   1.760
--------------------                          C=   0.729
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  4.00 hrs
                         Storm time step    =  5.00 min
                         Time to peak ratio =  0.33

      TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
       hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
      0.00    3.98 |  1.00   14.18 |  2.00    9.68 |  3.00    5.12
      0.08    4.19 |  1.08   20.37 |  2.08    8.94 |  3.08    4.95
      0.17    4.43 |  1.17   43.45 |  2.17    8.32 |  3.17    4.79
      0.25    4.71 |  1.25  184.73 |  2.25    7.79 |  3.25    4.64
      0.33    5.03 |  1.33   55.53 |  2.33    7.33 |  3.33    4.50
      0.42    5.41 |  1.42   31.41 |  2.42    6.94 |  3.42    4.37
      0.50    5.87 |  1.50   22.70 |  2.50    6.59 |  3.50    4.25
      0.58    6.42 |  1.58   18.09 |  2.58    6.28 |  3.58    4.14
      0.67    7.13 |  1.67   15.20 |  2.67    6.00 |  3.67    4.03
      0.75    8.04 |  1.75   13.20 |  2.75    5.75 |  3.75    3.93
      0.83    9.30 |  1.83   11.72 |  2.83    5.52 |  3.83    3.84
      0.92   11.14 |  1.92   10.59 |  2.92    5.31 |  3.92    3.75


--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=  31.29   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

     Unit Hyd Qpeak  (cms)=   3.984

     PEAK FLOW       (cms)=   0.866 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  12.798
     TOTAL RAINFALL   (mm)=  54.464
     RUNOFF COEFFICIENT   =   0.235

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area     (ha)=  42.94   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   0.891 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  12.802
     TOTAL RAINFALL   (mm)=  54.464
     RUNOFF COEFFICIENT   =   0.235
```

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

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

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    31.29   0.866     1.67    12.80
      + ID2= 2 (  0010):    42.94   0.891     1.92    12.80
        ================================================
        ID = 3 (  0005):    74.22   1.672     1.75    12.80

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=  20.35   Curve Number   (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

     Unit Hyd Qpeak  (cms)=   2.591

     PEAK FLOW       (cms)=   0.563 (i)
     TIME TO PEAK    (hrs)=   1.667
     RUNOFF VOLUME    (mm)=  12.798
     TOTAL RAINFALL   (mm)=  54.464
     RUNOFF COEFFICIENT   =   0.235

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0020)|   Area    (ha)=   4.86   Curve Number   (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.178 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  13.198
     TOTAL RAINFALL   (mm)=  54.464
     RUNOFF COEFFICIENT   =   0.242

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

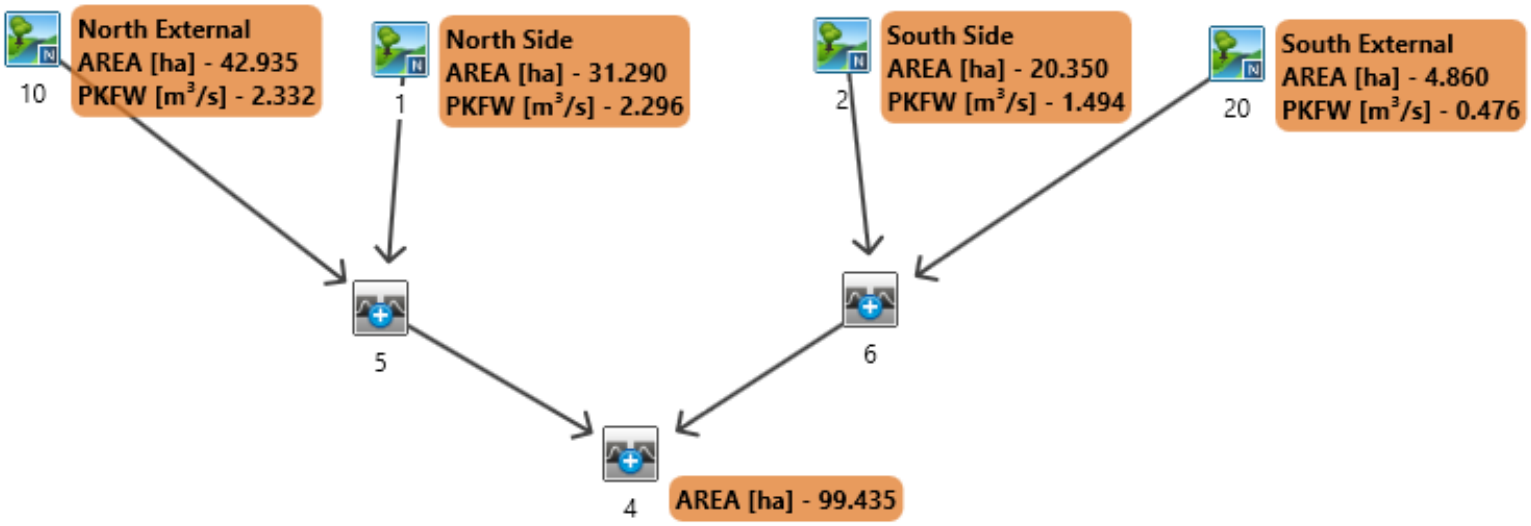
--------------------------------------------------------------------------------

--------------------
| ADD HYD  (  0006)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    20.35   0.563     1.67    12.80
      + ID2= 2 (  0020):     4.86   0.178     1.50    13.20
        ================================================
        ID = 3 (  0006):    25.21   0.720     1.67    12.87

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
        ID1= 1 (  0005):    74.22   1.672     1.75    12.80
      + ID2= 2 (  0006):    25.21   0.720     1.67    12.87
        ================================================
        ID = 3 (  0004):    99.44   2.357     1.75    12.82

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



urbanworks
ENGINEERING CORPORATION

Visual OTTHYMO™ Schematic
PRE-DEVELOPMENT

HILLSBURGH SUBDIVISION
(24HR SCS DESIGN STORM)

Job #: 5061	**Date: March 2023**

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
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DATE: 03-08-2023                          TIME: 05:49:05

USER:


COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
------------------------
  ***********************************************
  ** SIMULATION : bloor 24SCS002               **
  ***********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\gvolpe\AppD
|                  |              ata\Local\Temp\
|                  |              e2889a38-c6ae-423a-9084-dcbf24ecb02b\ef9addd1
| Ptotal= 52.12 mm |    Comments: bloor 24SCS002
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.51	6.00	1.02	12.00	10.67	18.00	0.76
0.20	0.51	6.20	1.02	12.20	6.60	18.20	0.76
0.40	0.51	6.40	1.02	12.40	4.83	18.40	0.76
0.60	0.51	6.60	1.02	12.60	4.57	18.60	0.76
0.80	0.51	6.80	1.02	12.80	3.30	18.80	0.76
1.00	0.51	7.00	1.02	13.00	2.79	19.00	0.76
1.20	0.51	7.20	1.02	13.20	2.79	19.20	0.76
1.40	0.51	7.40	1.02	13.40	2.79	19.40	0.76
1.60	0.51	7.60	1.02	13.60	2.79	19.60	0.76
1.80	0.51	7.80	1.02	13.80	2.79	19.80	0.76
2.00	0.51	8.00	1.52	14.00	1.52	20.00	0.51
2.20	0.51	8.20	1.52	14.20	1.52	20.20	0.51
2.40	0.51	8.40	1.52	14.40	1.52	20.40	0.51
2.60	0.51	8.60	1.52	14.60	1.52	20.60	0.51
2.80	0.51	8.80	1.52	14.80	1.52	20.80	0.51
3.00	0.51	9.00	1.52	15.00	1.52	21.00	0.51
3.20	0.51	9.20	1.52	15.20	1.52	21.20	0.51
3.40	0.51	9.40	1.52	15.40	1.52	21.40	0.51
3.60	0.51	9.60	1.52	15.60	1.52	21.60	0.51
3.80	0.51	9.80	1.52	15.80	1.52	21.80	0.51
4.00	1.02	10.00	3.05	16.00	1.02	22.00	0.51
4.20	1.02	10.20	3.05	16.20	1.02	22.20	0.51
4.40	1.02	10.40	3.05	16.40	1.02	22.40	0.51
4.60	1.02	10.60	3.05	16.60	1.02	22.60	0.51
4.80	1.02	10.80	3.05	16.80	1.02	22.80	0.51
5.00	1.02	11.00	4.06	17.00	1.02	23.00	0.51
5.20	1.02	11.20	5.84	17.20	1.02	23.20	0.51
5.40	1.02	11.40	13.21	17.40	1.02	23.40	0.51
5.60	1.02	11.60	28.96	17.60	1.02	23.60	0.51
5.80	1.02	11.80	60.45	17.80	1.02	23.80	0.51

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| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=  31.29   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51

2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Unit Hyd Qpeak (cms)= 3.984

PEAK FLOW (cms)= 0.677 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 11.758
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.226

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

CALIB

NASHYD (0010)	Area (ha)= 42.94	Curve Number (CN)= 64.2
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.47	

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	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51

4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 0.681 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 11.762
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.226

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

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
		(ha)	(cms)	(hrs)	(mm)
1 + 2 = 3	ID1= 1 (0001):	31.29	0.677	12.17	11.76
	+ ID2= 2 (0010):	42.94	0.681	12.33	11.76
	ID = 3 (0005):	74.22	1.311	12.25	11.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB
NASHYD (0002) | Area (ha)= 20.35 Curve Number (CN)= 64.2
ID= 1 DT= 5.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
U.H. Tp(hrs)= 0.30

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	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51

5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Unit Hyd Qpeak (cms)= 2.591

PEAK FLOW (cms)= 0.440 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 11.758
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.226

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

CALIB					
NASHYD (0020)	Area (ha)=	4.86	Curve Number (CN)=	65.2	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.141 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 12.131
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.233

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

ADD HYD (0006)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	20.35	0.440	12.17	11.76
+ ID2= 2 (0020):	4.86	0.141	12.08	12.13

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       ================================================
       ID = 3 (  0006):    25.21   0.568    12.17    11.83

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| ADD HYD  (  0004)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0005):    74.22   1.311    12.25    11.76
     + ID2= 2 (  0006):    25.21   0.568    12.17    11.83
       ================================================
       ID = 3 (  0004):    99.44   1.844    12.25    11.78

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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 FINISH
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       V    V   I    SSSSS  U   U    A    L             (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\82b706ab-ad93-42fe-9d4f-068d65d2d2e4\scena
  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\82b706ab-ad93-42fe-9d4f-068d65d2d2e4\scena


DATE: 03-08-2023                          TIME: 05:49:05

USER:


COMMENTS: _____________________________________________________________


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  ********************************************
  ** SIMULATION : bloor 24SCS005             **
  ********************************************


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|    READ STORM    |    Filename: C:\Users\gvolpe\AppD
|                  |              ata\Local\Temp\
|                  |              e2889a38-c6ae-423a-9084-dcbf24ecb02b\e7da6db1
| Ptotal= 62.43 mm |    Comments: bloor 24SCS005
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TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.76	6.00	1.27	12.00	12.19	18.00	1.27
0.20	0.76	6.20	1.27	12.20	7.62	18.20	1.27
0.40	0.76	6.40	1.27	12.40	5.59	18.40	1.27
0.60	0.76	6.60	1.27	12.60	5.08	18.60	1.27
0.80	0.76	6.80	1.27	12.80	3.81	18.80	1.27
1.00	0.76	7.00	1.27	13.00	3.05	19.00	1.02
1.20	0.76	7.20	1.27	13.20	3.05	19.20	1.02
1.40	0.76	7.40	1.27	13.40	3.05	19.40	1.02
1.60	0.76	7.60	1.27	13.60	3.05	19.60	1.02
1.80	0.76	7.80	1.27	13.80	3.05	19.80	1.02
2.00	0.76	8.00	1.78	14.00	1.78	20.00	1.02
2.20	0.76	8.20	1.78	14.20	1.78	20.20	1.02
2.40	0.76	8.40	1.78	14.40	1.78	20.40	1.02
2.60	0.76	8.60	1.78	14.60	1.78	20.60	1.02
2.80	0.76	8.80	1.78	14.80	1.78	20.80	1.02
3.00	0.76	9.00	1.78	15.00	1.78	21.00	0.76
3.20	0.76	9.20	1.78	15.20	1.78	21.20	0.76
3.40	0.76	9.40	1.78	15.40	1.78	21.40	0.76
3.60	0.76	9.60	1.78	15.60	1.78	21.60	0.76
3.80	0.76	9.80	1.78	15.80	1.78	21.80	0.76
4.00	1.27	10.00	3.30	16.00	1.27	22.00	0.76
4.20	1.27	10.20	3.30	16.20	1.27	22.20	0.76
4.40	1.27	10.40	3.30	16.40	1.27	22.40	0.76
4.60	1.27	10.60	3.30	16.60	1.27	22.60	0.76
4.80	1.27	10.80	3.30	16.80	1.27	22.80	0.76
5.00	1.27	11.00	4.57	17.00	1.27	23.00	0.76
5.20	1.27	11.20	6.60	17.20	1.27	23.20	0.76
5.40	1.27	11.40	15.24	17.40	1.27	23.40	0.76
5.60	1.27	11.60	33.27	17.60	1.27	23.60	0.76
5.80	1.27	11.80	69.60	17.80	1.27	23.80	0.76

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| CALIB            |
| NASHYD   (  0001)|   Area     (ha)=  31.29   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27

0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

Unit Hyd Qpeak (cms)= 3.984

PEAK FLOW (cms)= 0.917 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 16.563
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.265

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

CALIB			
NASHYD (0010)	Area (ha)= 42.94	Curve Number (CN)= 64.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.47		

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	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02

2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 0.924 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 16.569
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.265

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

ADD HYD (0005)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):		31.29	0.917	12.17	16.56
+ ID2= 2 (0010):		42.94	0.924	12.33	16.57
ID = 3 (0005):		74.22	1.777	12.25	16.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0002)	Area (ha)= 20.35	Curve Number (CN)= 64.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.30		

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	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76

3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

Unit Hyd Qpeak (cms)= 2.591

PEAK FLOW (cms)= 0.597 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 16.563
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.265

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

CALIB					
NASHYD (0020)	Area	(ha)=	4.86	Curve Number (CN)=	65.2
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.20		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76

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                5.833    1.27 |11.833   47.80 |17.833    1.27 | 23.83    0.76
                5.917    1.27 |11.917   69.60 |17.917    1.27 | 23.92    0.76
                6.000    1.27 |12.000   69.60 |18.000    1.27 | 24.00    0.76

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.190 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  17.058
     TOTAL RAINFALL   (mm)=  62.433
     RUNOFF COEFFICIENT   =   0.273

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

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| ADD HYD  (  0006)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    20.35   0.597    12.17    16.56
      + ID2= 2 (  0020):     4.86   0.190    12.08    17.06
        ==========================================================
        ID = 3 (  0006):    25.21   0.767    12.17    16.66

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):    74.22   1.777    12.25    16.57
      + ID2= 2 (  0006):    25.21   0.767    12.17    16.66
        ==========================================================
        ID = 3 (  0004):    99.44   2.494    12.25    16.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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       V    V   I    SSSSS  U   U    A    L             (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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

  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\5f84437a-acdf-49e9-9b0d-f5603e1b6bdd\scena
  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\5f84437a-acdf-49e9-9b0d-f5603e1b6bdd\scena

DATE: 03-08-2023                          TIME: 05:49:05

USER:


COMMENTS: _____________________________________________________

--------------------------------------------------------------------------------
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  ********************************************
  ** SIMULATION : bloor 24SCS010               **
  ********************************************


--------------------
|    READ STORM    |    Filename: C:\Users\gvolpe\AppD
|                  |              ata\Local\Temp\
|                  |              e2889a38-c6ae-423a-9084-dcbf24ecb02b\239459ae
| Ptotal= 82.45 mm |    Comments: bloor 24SCS010
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
                0.00    0.76 |  6.00    1.78 | 12.00   92.20 | 18.00    1.78
                0.20    0.76 |  6.20    1.78 | 12.20   16.00 | 18.20    1.78
                0.40    0.76 |  6.40    1.78 | 12.40   10.16 | 18.40    1.78
                0.60    0.76 |  6.60    1.78 | 12.60    7.37 | 18.60    1.78
                0.80    0.76 |  6.80    1.78 | 12.80    6.86 | 18.80    1.78
                1.00    0.76 |  7.00    1.78 | 13.00    4.83 | 19.00    1.78
                1.20    0.76 |  7.20    1.78 | 13.20    4.06 | 19.20    1.27
                1.40    0.76 |  7.40    1.78 | 13.40    4.06 | 19.40    1.27
                1.60    0.76 |  7.60    1.78 | 13.60    4.06 | 19.60    1.27
                1.80    0.76 |  7.80    1.78 | 13.80    4.06 | 19.80    1.27
                2.00    0.76 |  8.00    1.78 | 14.00    4.06 | 20.00    1.27
                2.20    0.76 |  8.20    2.54 | 14.20    2.54 | 20.20    1.27
                2.40    0.76 |  8.40    2.54 | 14.40    2.54 | 20.40    1.27
                2.60    0.76 |  8.60    2.54 | 14.60    2.54 | 20.60    1.27
                2.80    0.76 |  8.80    2.54 | 14.80    2.54 | 20.80    1.27
                3.00    0.76 |  9.00    2.54 | 15.00    2.54 | 21.00    1.27
                3.20    0.76 |  9.20    2.54 | 15.20    2.54 | 21.20    0.76
                3.40    0.76 |  9.40    2.54 | 15.40    2.54 | 21.40    0.76
                3.60    0.76 |  9.60    2.54 | 15.60    2.54 | 21.60    0.76
                3.80    0.76 |  9.80    2.54 | 15.80    2.54 | 21.80    0.76
                4.00    0.76 | 10.00    2.54 | 16.00    2.54 | 22.00    0.76
                4.20    1.78 | 10.20    4.57 | 16.20    1.78 | 22.20    0.76
                4.40    1.78 | 10.40    4.57 | 16.40    1.78 | 22.40    0.76
                4.60    1.78 | 10.60    4.57 | 16.60    1.78 | 22.60    0.76
                4.80    1.78 | 10.80    4.57 | 16.80    1.78 | 22.80    0.76
                5.00    1.78 | 11.00    4.57 | 17.00    1.78 | 23.00    0.76
                5.20    1.78 | 11.20    6.10 | 17.20    1.78 | 23.20    0.76
                5.40    1.78 | 11.40    8.89 | 17.40    1.78 | 23.40    0.76
                5.60    1.78 | 11.60   20.07 | 17.60    1.78 | 23.60    0.76
                5.80    1.78 | 11.80   44.20 | 17.80    1.78 | 23.80    0.76
```

CALIB					
NASHYD (0001)	Area (ha)= 31.29	Curve Number (CN)= 64.2			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.30				

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	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

Unit Hyd Qpeak (cms)= 3.984

PEAK FLOW (cms)= 1.530 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 27.366
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.332

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

CALIB					
NASHYD (0010)	Area (ha)= 42.94	Curve Number (CN)= 64.2			
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00			
	U.H. Tp(hrs)= 0.47				

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	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78

1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

```
     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   1.566 (i)
     TIME TO PEAK    (hrs)=  12.583
     RUNOFF VOLUME    (mm)=  27.375
     TOTAL RAINFALL   (mm)=  82.446
     RUNOFF COEFFICIENT   =   0.332

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

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

--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    31.29   1.530    12.42    27.37
      + ID2= 2 (  0010):    42.94   1.566    12.58    27.38
        ==========================================================
        ID = 3 (  0005):    74.22   2.987    12.42    27.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0002)|   Area     (ha)=  20.35   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

         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	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27

2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

Unit Hyd Qpeak (cms)= 2.591

PEAK FLOW (cms)= 0.995 (i)
TIME TO PEAK (hrs)= 12.417
RUNOFF VOLUME (mm)= 27.366
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.332

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

CALIB					
NASHYD (0020)	Area (ha)=	4.86	Curve Number (CN)=	65.2	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76

4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.310 (i)
TIME TO PEAK (hrs)= 12.250
RUNOFF VOLUME (mm)= 28.103
TOTAL RAINFALL (mm)= 82.446
RUNOFF COEFFICIENT = 0.341

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

ADD HYD (0006)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0002):	20.35	0.995	12.42	27.37
	+ ID2= 2 (0020):	4.86	0.310	12.25	28.10
	ID = 3 (0006):	25.21	1.291	12.33	27.51

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0005):	74.22	2.987	12.42	27.37
	+ ID2= 2 (0006):	25.21	1.291	12.33	27.51
	ID = 3 (0004):	99.44	4.239	12.42	27.41

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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V V    I     SS    U   U  AAAAA  L
V V    I      SS   U   U  A   A  L
 VV    I    SSSSS  UUUUU  A   A  LLLLL

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-8d27-4dd2e74404d1\bc5ca341-739b-454e-968d-d4e0e1eef940\scena
Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-8d27-4dd2e74404d1\bc5ca341-739b-454e-968d-d4e0e1eef940\scena

DATE: 03-08-2023 TIME: 05:49:05

USER:

COMMENTS: _____

```
V    V    I    SSSSS  U   U    A    L             (v 6.2.2011)
V    V    I    SS     U   U   A A   L
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****
** SIMULATION : bloor 24SCS025 **
****

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\e2889a38-c6ae-423a-9084-dcbf24ecb02b\5b1a359d
Ptotal= 95.96 mm	Comments: bloor 24SCS025

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.02	6.00	2.03	12.00	18.80	18.00	2.03
0.20	1.02	6.20	2.03	12.20	11.68	18.20	2.03
0.40	1.02	6.40	2.03	12.40	8.38	18.40	2.03
0.60	1.02	6.60	2.03	12.60	8.13	18.60	2.03
0.80	1.02	6.80	2.03	12.80	5.59	18.80	2.03
1.00	1.02	7.00	2.03	13.00	4.83	19.00	1.52
1.20	1.02	7.20	2.03	13.20	4.83	19.20	1.52
1.40	1.02	7.40	2.03	13.40	4.83	19.40	1.52
1.60	1.02	7.60	2.03	13.60	4.83	19.60	1.52
1.80	1.02	7.80	2.03	13.80	4.83	19.80	1.52
2.00	1.02	8.00	2.79	14.00	2.79	20.00	1.52
2.20	1.02	8.20	2.79	14.20	2.79	20.20	1.52
2.40	1.02	8.40	2.79	14.40	2.79	20.40	1.52
2.60	1.02	8.60	2.79	14.60	2.79	20.60	1.52

2.80	1.02	8.80	2.79	14.80	2.79	20.80	1.52
3.00	1.02	9.00	2.79	15.00	2.79	21.00	1.02
3.20	1.02	9.20	2.79	15.20	2.79	21.20	1.02
3.40	1.02	9.40	2.79	15.40	2.79	21.40	1.02
3.60	1.02	9.60	2.79	15.60	2.79	21.60	1.02
3.80	1.02	9.80	2.79	15.80	2.79	21.80	1.02
4.00	2.03	10.00	5.08	16.00	2.03	22.00	1.02
4.20	2.03	10.20	5.08	16.20	2.03	22.20	1.02
4.40	2.03	10.40	5.08	16.40	2.03	22.40	1.02
4.60	2.03	10.60	5.08	16.60	2.03	22.60	1.02
4.80	2.03	10.80	5.08	16.80	2.03	22.80	1.02
5.00	2.03	11.00	7.11	17.00	2.03	23.00	1.02
5.20	2.03	11.20	10.41	17.20	2.03	23.20	1.02
5.40	2.03	11.40	23.37	17.40	2.03	23.40	1.02
5.60	2.03	11.60	51.56	17.60	2.03	23.60	1.02
5.80	2.03	11.80	107.44	17.80	2.03	23.80	1.02

CALIB			
NASHYD (0001)	Area (ha)= 31.29	Curve Number (CN)= 64.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.30		

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	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

Unit Hyd Qpeak (cms)= 3.984

PEAK FLOW (cms)= 2.023 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 35.558
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.371

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

CALIB			
NASHYD (0010)	Area (ha)= 42.94	Curve Number (CN)= 64.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.47		

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	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 2.044 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 35.569
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.371

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

ADD HYD (0005)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0001):	31.29	2.023	12.17	35.56
	+ ID2= 2 (0010):	42.94	2.044	12.33	35.57
	ID = 3 (0005):	74.22	3.922	12.25	35.56

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0002)	Area (ha)= 20.35	Curve Number (CN)= 64.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.30		

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	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03

0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

Unit Hyd Qpeak (cms)= 2.591

PEAK FLOW (cms)= 1.315 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 35.558
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.371

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

CALIB					
NASHYD (0020)	Area (ha)=	4.86	Curve Number (CN)=	65.2
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=	0.20		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52

3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.414 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 36.455
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.380

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

ADD HYD (0006)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	20.35	1.315	12.17	35.56
+ ID2= 2 (0020):	4.86	0.414	12.08	36.45
ID = 3 (0006):	25.21	1.686	12.17	35.73

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0005):	74.22	3.922	12.25	35.56
+ ID2= 2 (0006):	25.21	1.686	12.17	35.73
ID = 3 (0004):	99.44	5.507	12.17	35.61

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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

Developed and Distributed by Smart City Water Inc

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

Input filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
Output filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-8d27-4dd2e74404d1\3de14669-975a-4d9a-939b-55cabbc1c98a\scena
Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-8d27-4dd2e74404d1\3de14669-975a-4d9a-939b-55cabbc1c98a\scena

DATE: 03-08-2023 TIME: 05:49:05

USER:

COMMENTS: _____

```
  ************************************************
  ** SIMULATION : bloor 24SCS050                **
  ************************************************
```

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\e2889a38-c6ae-423a-9084-dcbf24ecb02b\b731117d
Ptotal=108.06 mm	Comments: bloor 24SCS050

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.10	6.00	2.20	12.00	22.04	18.00	2.20
0.20	1.10	6.20	2.20	12.20	13.78	18.20	2.20
0.40	1.10	6.40	2.20	12.40	9.92	18.40	2.20
0.60	1.10	6.60	2.20	12.60	9.37	18.60	2.20
0.80	1.10	6.80	2.20	12.80	6.61	18.80	2.20
1.00	1.10	7.00	2.20	13.00	5.51	19.00	1.65
1.20	1.10	7.20	2.20	13.20	5.51	19.20	1.65
1.40	1.10	7.40	2.20	13.40	5.51	19.40	1.65
1.60	1.10	7.60	2.20	13.60	5.51	19.60	1.65
1.80	1.10	7.80	2.20	13.80	5.51	19.80	1.65
2.00	1.10	8.00	3.31	14.00	3.31	20.00	1.65
2.20	1.10	8.20	3.31	14.20	3.31	20.20	1.65
2.40	1.10	8.40	3.31	14.40	3.31	20.40	1.65
2.60	1.10	8.60	3.31	14.60	3.31	20.60	1.65
2.80	1.10	8.80	3.31	14.80	3.31	20.80	1.65
3.00	1.10	9.00	3.31	15.00	3.31	21.00	1.10
3.20	1.10	9.20	3.31	15.20	3.31	21.20	1.10
3.40	1.10	9.40	3.31	15.40	3.31	21.40	1.10
3.60	1.10	9.60	3.31	15.60	3.31	21.60	1.10
3.80	1.10	9.80	3.31	15.80	3.31	21.80	1.10
4.00	2.20	10.00	6.05	16.00	2.20	22.00	1.10
4.20	2.20	10.20	6.05	16.20	2.20	22.20	1.10
4.40	2.20	10.40	6.05	16.40	2.20	22.40	1.10
4.60	2.20	10.60	6.05	16.60	2.20	22.60	1.10
4.80	2.20	10.80	6.05	16.80	2.20	22.80	1.10
5.00	2.20	11.00	8.26	17.00	2.20	23.00	1.10
5.20	2.20	11.20	12.12	17.20	2.20	23.20	1.10
5.40	2.20	11.40	27.55	17.40	2.20	23.40	1.10
5.60	2.20	11.60	60.61	17.60	2.20	23.60	1.10
5.80	2.20	11.80	114.06	17.80	2.20	23.80	1.10

CALIB			
NASHYD (0001)	Area (ha)=	31.29	Curve Number (CN)= 64.2
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	0.30	

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	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

Unit Hyd Qpeak (cms)= 3.984

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     PEAK FLOW       (cms)=   2.430 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  43.392
     TOTAL RAINFALL   (mm)= 108.064
     RUNOFF COEFFICIENT   =   0.402

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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CALIB													
NASHYD (0010)	Area (ha)= 42.94	Curve Number (CN)= 64.2
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 0.47	

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	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

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     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   2.477 (i)
     TIME TO PEAK    (hrs)=  12.333
     RUNOFF VOLUME    (mm)=  43.406
     TOTAL RAINFALL   (mm)= 108.064
     RUNOFF COEFFICIENT   =   0.402

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

ADD HYD (0005)			
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	31.29	2.430	12.17	43.39
+ ID2= 2 (0010):	42.94	2.477	12.33	43.41
ID = 3 (0005):	74.22	4.735	12.25	43.40

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB													
NASHYD (0002)	Area (ha)= 20.35	Curve Number (CN)= 64.2
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00

---------- U.H. Tp(hrs)= 0.30

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	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

Unit Hyd Qpeak (cms)= 2.591

PEAK FLOW (cms)= 1.580 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 43.392
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.402

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

---------- CALIB
| NASHYD (0020)| ID= 1 DT= 5.0 min

Area (ha)= 4.86 Curve Number (CN)= 65.2
Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
---------- U.H. Tp(hrs)= 0.20

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65

1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

```
 Unit Hyd Qpeak  (cms)=   0.928

 PEAK FLOW       (cms)=   0.491 (i)
 TIME TO PEAK    (hrs)=  12.083
 RUNOFF VOLUME    (mm)=  44.428
 TOTAL RAINFALL   (mm)= 108.064

      RUNOFF COEFFICIENT   =   0.411

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

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

--------------------
| ADD HYD  (  0006)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    20.35   1.580    12.17    43.39
      + ID2= 2 (  0020):     4.86   0.491    12.08    44.43
        ================================================
        ID = 3 (  0006):    25.21   2.019    12.17    43.59

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

--------------------
| ADD HYD  (  0004)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0005):    74.22   4.735    12.25    43.40
      + ID2= 2 (  0006):    25.21   2.019    12.17    43.59
        ================================================
        ID = 3 (  0004):    99.44   6.646    12.17    43.45

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

       V    V   I    SSSSS  U   U    A    L              (v 6.2.2011)
       V    V   I    SS     U   U   A A   L
        V  V    I     SS    U   U  AAAAA  L
        V  V    I      SS   U   U  A   A  L
         VV     I    SSSSS  UUUUU  A   A  LLLLL

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


  Input   filename: C:\Program Files (x86)\Visual OTTHYMO 6.2\VO2\voin.dat
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\b9ba6962-5b47-422d-9105-024ab270ae55\scena
  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\b9ba6962-5b47-422d-9105-024ab270ae55\scena

DATE: 03-08-2023                          TIME: 05:49:05

USER:
```

COMMENTS: _____

```
  **********************************************
  ** SIMULATION : bloor 24SCS100               **
  **********************************************
```

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\e2889a38-c6ae-423a-9084-dcbf24ecb02b\c047ab91
Ptotal=112.42 mm	Comments: bloor 24SCS100

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.27	6.00	2.29	12.00	21.84	18.00	2.29
0.20	1.27	6.20	2.29	12.20	13.72	18.20	2.29
0.40	1.27	6.40	2.29	12.40	9.91	18.40	2.29
0.60	1.27	6.60	2.29	12.60	9.40	18.60	2.29
0.80	1.27	6.80	2.29	12.80	6.60	18.80	2.29
1.00	1.27	7.00	2.29	13.00	5.59	19.00	1.78
1.20	1.27	7.20	2.29	13.20	5.59	19.20	1.78
1.40	1.27	7.40	2.29	13.40	5.59	19.40	1.78
1.60	1.27	7.60	2.29	13.60	5.59	19.60	1.78
1.80	1.27	7.80	2.29	13.80	5.59	19.80	1.78
2.00	1.27	8.00	3.30	14.00	3.30	20.00	1.78
2.20	1.27	8.20	3.30	14.20	3.30	20.20	1.78
2.40	1.27	8.40	3.30	14.40	3.30	20.40	1.78
2.60	1.27	8.60	3.30	14.60	3.30	20.60	1.78
2.80	1.27	8.80	3.30	14.80	3.30	20.80	1.78
3.00	1.27	9.00	3.30	15.00	3.30	21.00	1.27
3.20	1.27	9.20	3.30	15.20	3.30	21.20	1.27
3.40	1.27	9.40	3.30	15.40	3.30	21.40	1.27
3.60	1.27	9.60	3.30	15.60	3.30	21.60	1.27
3.80	1.27	9.80	3.30	15.80	3.30	21.80	1.27
4.00	2.29	10.00	6.10	16.00	2.29	22.00	1.27
4.20	2.29	10.20	6.10	16.20	2.29	22.20	1.27
4.40	2.29	10.40	6.10	16.40	2.29	22.40	1.27
4.60	2.29	10.60	6.10	16.60	2.29	22.60	1.27
4.80	2.29	10.80	6.10	16.80	2.29	22.80	1.27
5.00	2.29	11.00	8.13	17.00	2.29	23.00	1.27
5.20	2.29	11.20	11.94	17.20	2.29	23.20	1.27
5.40	2.29	11.40	27.43	17.40	2.29	23.40	1.27
5.60	2.29	11.60	59.94	17.60	2.29	23.60	1.27
5.80	2.29	11.80	126.49	17.80	2.29	23.80	1.27

CALIB			
NASHYD (0001)	Area (ha)= 31.29	Curve Number (CN)= 64.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.30		

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	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27

4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

Unit Hyd Qpeak (cms)= 3.984

PEAK FLOW (cms)= 2.657 (i)
TIME TO PEAK (hrs)= 12.167
RUNOFF VOLUME (mm)= 46.313
TOTAL RAINFALL (mm)= 112.421
RUNOFF COEFFICIENT = 0.412

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

CALIB					
NASHYD (0010)	Area (ha)=	42.94	Curve Number (CN)=	64.2	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.47			

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	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 2.686 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 46.328
TOTAL RAINFALL (mm)= 112.421
RUNOFF COEFFICIENT = 0.412

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

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| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0001):     31.29    2.657     12.17     46.31
     + ID2= 2 (  0010):     42.94    2.686     12.33     46.33
       ================================================
       ID = 3 (  0005):     74.22    5.152     12.25     46.32

    NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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| CALIB            |
| NASHYD   (  0002)|   Area    (ha)=  20.35   Curve Number   (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.30

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

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     Unit Hyd Qpeak  (cms)=   2.591

     PEAK FLOW       (cms)=   1.728 (i)
     TIME TO PEAK    (hrs)=  12.167
     RUNOFF VOLUME    (mm)=  46.313
     TOTAL RAINFALL   (mm)= 112.421
     RUNOFF COEFFICIENT   =   0.412

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

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| CALIB            |
| NASHYD   (  0020)|   Area    (ha)=   4.86   Curve Number   (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.27	6.083	2.29	12.083	21.86	18.08	2.29

0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.542 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 47.398
TOTAL RAINFALL (mm)= 112.421
RUNOFF COEFFICIENT = 0.422

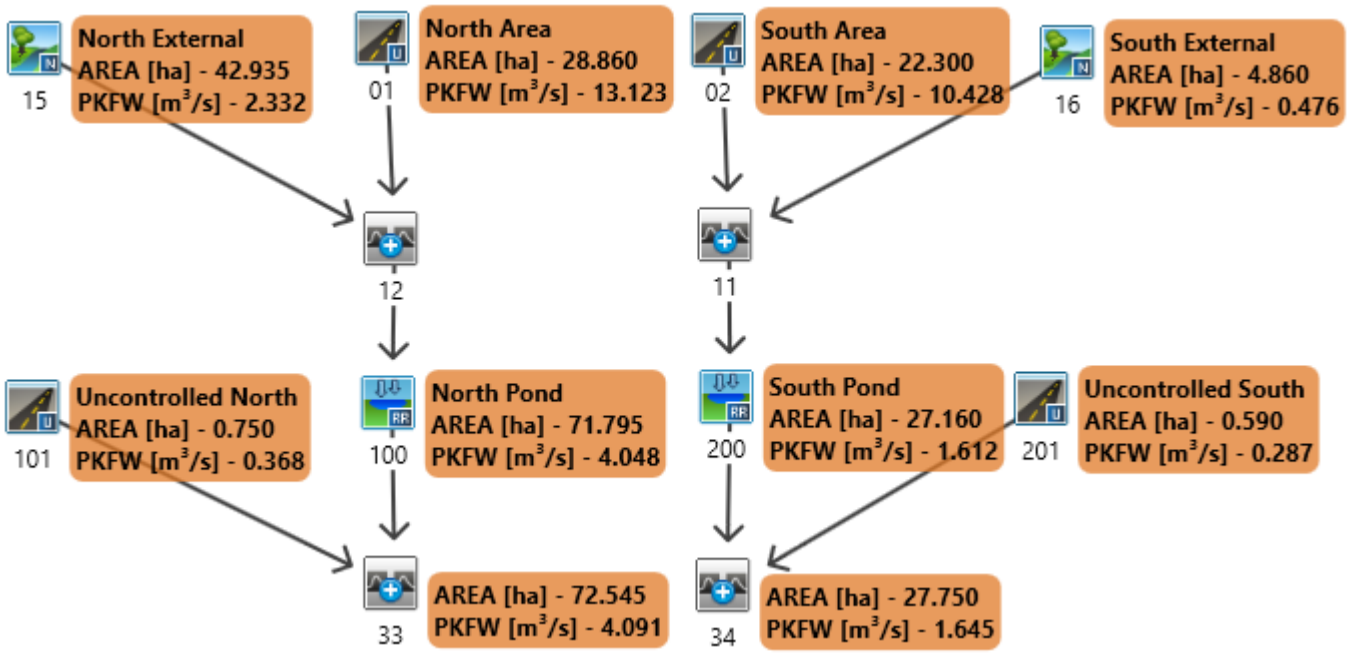
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0006)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	20.35	1.728	12.17	46.31
+ ID2= 2 (0020):	4.86	0.542	12.08	47.40
ID = 3 (0006):	25.21	2.211	12.17	46.52

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

ADD HYD (0004)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0005):	74.22	5.152	12.25	46.32
+ ID2= 2 (0006):	25.21	2.211	12.17	46.52
ID = 3 (0004):	99.44	7.243	12.17	46.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.



urbanworks
ENGINEERING CORPORATION

Visual OTTHYMO™ Schematic
POST-DEVELOPMENT

HILLSBURGH SUBDIVISION
(4HR CHICAGO DESIGN STORM)

Job #: 22-0020ER	**Date: March 2023**

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**************************************
** SIMULATION:0. 2yr 4hr 5min Chicago **
**************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 566.000
| Ptotal= 41.21 mm |                          B=   1.770
--------------------                          C=   0.730
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.00    3.00 |  1.00   10.72 |  2.00    7.31 |  3.00    3.86
               0.08    3.16 |  1.08   15.41 |  2.08    6.75 |  3.08    3.73
               0.17    3.34 |  1.17   32.92 |  2.17    6.28 |  3.17    3.61
               0.25    3.55 |  1.25  140.12 |  2.25    5.88 |  3.25    3.50
               0.33    3.79 |  1.33   42.09 |  2.33    5.53 |  3.33    3.39
               0.42    4.08 |  1.42   23.78 |  2.42    5.23 |  3.42    3.30
               0.50    4.43 |  1.50   17.17 |  2.50    4.97 |  3.50    3.21
               0.58    4.85 |  1.58   13.68 |  2.58    4.74 |  3.58    3.12
               0.67    5.38 |  1.67   11.49 |  2.67    4.52 |  3.67    3.04
               0.75    6.07 |  1.75    9.97 |  2.75    4.34 |  3.75    2.97
               0.83    7.02 |  1.83    8.86 |  2.83    4.16 |  3.83    2.89
               0.92    8.42 |  1.92    8.00 |  2.92    4.01 |  3.92    2.83

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   4.86   Curve Number    (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.098 (i)
     TIME TO PEAK    (hrs)=   1.583
     RUNOFF VOLUME    (mm)=   7.616
     TOTAL RAINFALL   (mm)=  41.206
     RUNOFF COEFFICIENT   =   0.185

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=  22.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.38         8.92
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     385.57        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     140.12        31.57
               over (min)         5.00        20.00

     Storage Coeff.  (min)=       5.02 (ii)   16.21 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.21         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       3.64         0.44        3.749 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58         1.33
     RUNOFF VOLUME    (mm)=      40.21        18.65        31.58
     TOTAL RAINFALL   (mm)=      41.21        41.21        41.21
     RUNOFF COEFFICIENT   =       0.98         0.45         0.77

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

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--------------------
| ADD HYD  (  0011)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0002):     22.30    3.749     1.33    31.58
     + ID2= 2 (  0016):      4.86    0.098     1.58     7.62
       ================================================
       ID = 3 (  0011):     27.16    3.787     1.33    27.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |   1.0990     0.8685
                         0.2920     0.4915    |   1.3530     0.9575
                         0.5630     0.6480    |   1.6160     1.0415
                         0.7870     0.7465    |   0.0000     0.0000

                                   AREA     QPEAK     TPEAK      R.V.
                                   (ha)     (cms)     (hrs)      (mm)
   INFLOW : ID= 2 (  0011)     27.160      3.787      1.33      27.29
   OUTFLOW: ID= 1 (  0200)     27.160      0.292      2.83      27.28

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.71
                  TIME SHIFT OF PEAK FLOW          (min)= 90.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4913

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250
```

```
     Max.Eff.Inten.(mm/hr)=     140.12        60.58
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       1.69 (ii)   10.31 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.32         0.09
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.10         0.02          0.108 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           1.33
     RUNOFF VOLUME    (mm)=      40.21        21.35          29.82
     TOTAL RAINFALL   (mm)=      41.21        41.21          41.21
     RUNOFF COEFFICIENT   =       0.98         0.52           0.72

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

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

```
--------------------
| ADD HYD  (  0034)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0200):    27.16   0.292     2.83    27.28
     + ID2= 2 (  0201):     0.59   0.108     1.33    29.82
       ================================================
       ID = 3 (  0034):    27.75   0.299     2.67    27.33

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

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--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=  42.94   Curve Number   (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   0.496 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=   7.370
     TOTAL RAINFALL   (mm)=  41.206
     RUNOFF COEFFICIENT   =   0.179

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

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--------------------
| CALIB            |
| STANDHYD (  0001)|   Area    (ha)=  28.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.32         11.54
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     438.63         40.00
     Mannings n            =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     140.12        31.57
               over (min)         5.00        20.00
     Storage Coeff.  (min)=       5.42 (ii)   16.61 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.20         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       4.54         0.56          4.681 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.58           1.33
     RUNOFF VOLUME    (mm)=      40.21        18.65          31.58
     TOTAL RAINFALL   (mm)=      41.21        41.21          41.21
     RUNOFF COEFFICIENT   =       0.98         0.45           0.77

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

```
--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    28.86   4.681     1.33    31.58
     + ID2= 2 (  0015):    42.94   0.496     1.92     7.37
       ================================================
       ID = 3 (  0012):    71.79   4.726     1.33    17.10

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

```
--------------------
| RESERVOIR(  0100)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)      (ha.m.)   |   (cms)      (ha.m.)
                          0.0000     0.0000    |   2.7960      1.0790
                          0.7860     0.6090    |   3.4210      1.1725
                          1.4720     0.8130    |   4.0520      1.2584
                          2.0190     0.9345    |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.795     4.726      1.33      17.10
   OUTFLOW: ID= 1 (  0100)     71.795     0.785      2.50      17.10

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 16.62
                  TIME SHIFT OF PEAK FLOW          (min)= 70.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.6087
```

```
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.46          0.29
```

```
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      70.71        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     140.12        70.68
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.81 (ii)    9.92 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.11
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.04          0.144 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      40.21        22.40          30.41
     TOTAL RAINFALL   (mm)=      41.21        41.21          41.21
     RUNOFF COEFFICIENT   =       0.98         0.54           0.74

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

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

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

--------------------
| ADD HYD  (  0033)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):    71.79   0.785     2.50    17.10
     + ID2= 2 (  0101):     0.75   0.144     1.33    30.41
       ================================================
       ID = 3 (  0033):    72.55   0.796     2.50    17.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:1. 5yr 4hr 5min Chicago **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A= 744.000
| Ptotal= 54.46 mm |                          B=   1.760
--------------------                          C=   0.729
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

    TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
     hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
    0.00    3.98 |  1.00   14.18 |  2.00    9.68 |  3.00    5.12
    0.08    4.19 |  1.08   20.37 |  2.08    8.94 |  3.08    4.95
    0.17    4.43 |  1.17   43.45 |  2.17    8.32 |  3.17    4.79
    0.25    4.71 |  1.25  184.73 |  2.25    7.79 |  3.25    4.64
    0.33    5.03 |  1.33   55.53 |  2.33    7.33 |  3.33    4.50
    0.42    5.41 |  1.42   31.41 |  2.42    6.94 |  3.42    4.37
    0.50    5.87 |  1.50   22.70 |  2.50    6.59 |  3.50    4.25
    0.58    6.42 |  1.58   18.09 |  2.58    6.28 |  3.58    4.14
    0.67    7.13 |  1.67   15.20 |  2.67    6.00 |  3.67    4.03
    0.75    8.04 |  1.75   13.20 |  2.75    5.75 |  3.75    3.93
    0.83    9.30 |  1.83   11.72 |  2.83    5.52 |  3.83    3.84
    0.92   11.14 |  1.92   10.59 |  2.92    5.31 |  3.92    3.75

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area     (ha)=   4.86   Curve Number   (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.178 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  13.198
     TOTAL RAINFALL   (mm)=  54.464
     RUNOFF COEFFICIENT   =   0.242

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

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--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.38          8.92
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     385.57         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     184.73         63.66
               over (min)         5.00         10.00
     Storage Coeff.  (min)=       4.49 (ii)     9.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=       0.23          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       5.04          1.04          5.593 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.42           1.33
     RUNOFF VOLUME    (mm)=      53.46         28.69          43.55
     TOTAL RAINFALL   (mm)=      54.46         54.46          54.46
     RUNOFF COEFFICIENT   =       0.98          0.53           0.80

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

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

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

--------------------
| ADD HYD  (  0011)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
```

```
--------------------          (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0002):     22.30    5.593     1.33     43.55
     + ID2= 2 (  0016):      4.86    0.178     1.50     13.20
       ================================================
       ID = 3 (  0011):     27.16    5.668     1.33     38.12

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |  1.0990      0.8685
                          0.2920     0.4915   |  1.3530      0.9575
                          0.5630     0.6480   |  1.6160      1.0415
                          0.7870     0.7465   |  0.0000      0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.160     5.668      1.33      38.12
   OUTFLOW: ID= 1 (  0200)     27.160     0.563      2.25      38.11

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)=  9.93
                  TIME SHIFT OF PEAK FLOW          (min)= 55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.6478

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     184.73        93.04
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       1.51 (ii)    8.77 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.04          0.157 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      53.46        32.15          41.73
     TOTAL RAINFALL   (mm)=      54.46        54.46          54.46
     RUNOFF COEFFICIENT   =       0.98         0.59           0.77

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

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

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

```
--------------------
| ADD HYD  (  0034)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
       ID1= 1 (  0200):     27.16    0.563     2.25     38.11
     + ID2= 2 (  0201):      0.59    0.157     1.33     41.73
       ================================================
       ID = 3 (  0034):     27.75    0.576     2.25     38.18

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area     (ha)=  42.94   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   0.891 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  12.802
     TOTAL RAINFALL   (mm)=  54.464
     RUNOFF COEFFICIENT   =   0.235

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area    (ha)=  28.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.32        11.54
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     438.63        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     184.73        63.66
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       4.85 (ii)    9.55 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.22         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       6.30         1.31          7.004 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      53.46        28.69          43.55
     TOTAL RAINFALL   (mm)=      54.46        54.46          54.46
     RUNOFF COEFFICIENT   =       0.98         0.53           0.80

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

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

```
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    28.86   7.004     1.33    43.55
     + ID2= 2 (  0015):    42.94   0.891     1.92    12.80
       ================================================
       ID = 3 (  0012):    71.79   7.099     1.33    25.16
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
| RESERVOIR(  0100)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
-------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   2.7960     1.0790
                          0.7860     0.6090   |   3.4210     1.1725
                          1.4720     0.8130   |   4.0520     1.2584
                          2.0190     0.9345   |   0.0000     0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)    71.795     7.099      1.33      25.16
   OUTFLOW: ID= 1 (  0100)    71.795     1.470      2.25      25.16

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.71
                  TIME SHIFT OF PEAK FLOW         (min)= 55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.8130
```

```
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
-------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.46         0.29
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      70.71        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     184.73       107.54
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.62 (ii)    8.48 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.17         0.06        0.200 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42         1.33
     RUNOFF VOLUME    (mm)=      53.46        33.48        42.46
     TOTAL RAINFALL   (mm)=      54.46        54.46        54.46
     RUNOFF COEFFICIENT   =       0.98         0.61         0.78
```

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

```
| ADD HYD  (  0033)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
-------------------           (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):    71.79   1.470     2.25    25.16
     + ID2= 2 (  0101):     0.75   0.200     1.33    42.46
       ================================================
       ID = 3 (  0033):    72.55   1.487     2.17    25.34
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

```
****************************************
** SIMULATION:2. 10yr 4hr 5min Chicago **
****************************************
-------------------
| CHICAGO STORM    |    IDF curve parameters: A= 869.000
| Ptotal= 63.26 mm |                          B=   1.790
-------------------                          C=   0.730
                        used in:   INTENSITY =  A / (t + B)^C

                        Duration of storm  =  4.00 hrs
                        Storm time step    =  5.00 min
                        Time to peak ratio =  0.33

     TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
      hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
     0.00    4.61 |  1.00   16.47 |  2.00   11.23 |  3.00    5.93
     0.08    4.85 |  1.08   23.68 |  2.08   10.36 |  3.08    5.73
     0.17    5.13 |  1.17   50.61 |  2.17    9.64 |  3.17    5.55
     0.25    5.45 |  1.25  214.66 |  2.25    9.03 |  3.25    5.37
     0.33    5.83 |  1.33   64.73 |  2.33    8.50 |  3.33    5.21
     0.42    6.27 |  1.42   36.56 |  2.42    8.04 |  3.42    5.06
     0.50    6.80 |  1.50   26.39 |  2.50    7.63 |  3.50    4.92
     0.58    7.44 |  1.58   21.02 |  2.58    7.27 |  3.58    4.79
     0.67    8.26 |  1.67   17.65 |  2.67    6.95 |  3.67    4.67
     0.75    9.32 |  1.75   15.32 |  2.75    6.66 |  3.75    4.55
     0.83   10.78 |  1.83   13.61 |  2.83    6.39 |  3.83    4.44
     0.92   12.93 |  1.92   12.28 |  2.92    6.15 |  3.92    4.34
```

```
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   4.86   Curve Number   (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.242 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  17.478
     TOTAL RAINFALL   (mm)=  63.260
     RUNOFF COEFFICIENT   =   0.276
```

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.38         8.92
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     385.57        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     214.66        80.50
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       4.23 (ii)    8.65 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.24         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       6.01         1.36          6.742 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      62.26        35.79          51.67
     TOTAL RAINFALL   (mm)=      63.26        63.26          63.26
     RUNOFF COEFFICIENT   =       0.98         0.57           0.82

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

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

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

--------------------
| ADD HYD  (  0011)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    22.30   6.742     1.33    51.67
      + ID2= 2 (  0016):     4.86   0.242     1.50    17.48
        ================================================
        ID = 3 (  0011):    27.16   6.847     1.33    45.55

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |  1.0990      0.8685
                         0.2920     0.4915    |  1.3530      0.9575
                         0.5630     0.6480    |  1.6160      1.0415
                         0.7870     0.7465    |  0.0000      0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)    27.160     6.847      1.33      45.55

   OUTFLOW: ID= 1 (  0200)    27.160     0.786      2.08      45.54

                 PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.48
                 TIME SHIFT OF PEAK FLOW         (min)= 45.00
                 MAXIMUM  STORAGE   USED       (ha.m.)=  0.7463

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     214.66       116.17
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.42 (ii)    8.07 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.06          0.187 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      62.26        39.69          49.84
     TOTAL RAINFALL   (mm)=      63.26        63.26          63.26
     RUNOFF COEFFICIENT   =       0.98         0.63           0.79

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

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

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

--------------------
| ADD HYD  (  0034)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0200):    27.16   0.786     2.08    45.54
      + ID2= 2 (  0201):     0.59   0.187     1.33    49.84
        ================================================
        ID = 3 (  0034):    27.75   0.805     2.08    45.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area     (ha)=  42.94   Curve Number   (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   1.202 (i)
```

```
     TIME TO PEAK     (hrs)=   1.917
     RUNOFF VOLUME     (mm)=  16.979
     TOTAL RAINFALL    (mm)=  63.260
     RUNOFF COEFFICIENT   =   0.268

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area     (ha)=  28.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=       17.32         11.54
     Dep. Storage      (mm)=        1.00          1.50
     Average Slope      (%)=        1.00          2.00
     Length             (m)=      438.63         40.00
     Mannings n            =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      214.66         80.50
               over (min)          5.00         10.00
     Storage Coeff.  (min)=        4.57 (ii)     8.99 (ii)
     Unit Hyd. Tpeak (min)=        5.00         10.00
     Unit Hyd. peak  (cms)=        0.23          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=        7.52          1.72          8.456 (iii)
     TIME TO PEAK    (hrs)=        1.33          1.42           1.33
     RUNOFF VOLUME    (mm)=       62.26         35.79          51.67
     TOTAL RAINFALL   (mm)=       63.26         63.26          63.26
     RUNOFF COEFFICIENT   =        0.98          0.57           0.82

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

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

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

--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0001):    28.86   8.456     1.33    51.67
      + ID2= 2 (  0015):    42.94   1.202     1.92    16.98
        ================================================
        ID = 3 (  0012):    71.79   8.594     1.33    30.92

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0100)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   2.7960     1.0790
                         0.7860     0.6090   |   3.4210     1.1725
                         1.4720     0.8130   |   4.0520     1.2584
                         2.0190     0.9345   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.795     8.594      1.33      30.92
   OUTFLOW: ID= 1 (  0100)     71.795     2.014      2.08      30.92

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 23.43
                  TIME SHIFT OF PEAK FLOW          (min)= 45.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.9344

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area     (ha)=   0.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area      (ha)=        0.46          0.29
     Dep. Storage      (mm)=        1.00          1.50
     Average Slope      (%)=        1.00          2.00
     Length             (m)=       70.71         40.00
     Mannings n            =       0.013         0.250

     Max.Eff.Inten.(mm/hr)=      214.66        133.62
               over (min)          5.00         10.00
     Storage Coeff.  (min)=        1.53 (ii)     6.44 (ii)
     Unit Hyd. Tpeak (min)=        5.00         10.00
     Unit Hyd. peak  (cms)=        0.33          0.14
                                                          *TOTALS*
     PEAK FLOW       (cms)=        0.20          0.09          0.244 (iii)
     TIME TO PEAK    (hrs)=        1.33          1.42           1.33
     RUNOFF VOLUME    (mm)=       62.26         41.16          50.65
     TOTAL RAINFALL   (mm)=       63.26         63.26          63.26
     RUNOFF COEFFICIENT   =        0.98          0.65           0.80

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

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

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

--------------------
| ADD HYD  (  0033)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0100):    71.79   2.014     2.08    30.92
      + ID2= 2 (  0101):     0.75   0.244     1.33    50.65
        ================================================
        ID = 3 (  0033):    72.55   2.038     2.08    31.13

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:3. 25yr 4hr 5min Chicago **
****************************************
--------------------
```

```
| CHICAGO STORM    |    IDF curve parameters: A=1011.000
| Ptotal= 74.42 mm |                          B=   1.750
--------------------                          C=   0.728
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	5.45	1.00	19.40	2.00	13.25	3.00	7.02
0.08	5.75	1.08	27.84	2.08	12.23	3.08	6.78
0.17	6.08	1.17	59.28	2.17	11.39	3.17	6.56
0.25	6.45	1.25	251.78	2.25	10.66	3.25	6.36
0.33	6.89	1.33	75.73	2.33	10.04	3.33	6.17
0.42	7.41	1.42	42.89	2.42	9.50	3.42	5.99
0.50	8.04	1.50	31.02	2.50	9.02	3.50	5.83
0.58	8.80	1.58	24.73	2.58	8.60	3.58	5.67
0.67	9.76	1.67	20.79	2.67	8.22	3.67	5.53
0.75	11.01	1.75	18.06	2.75	7.87	3.75	5.39
0.83	12.73	1.83	16.04	2.83	7.56	3.83	5.26
0.92	15.25	1.92	14.49	2.92	7.28	3.92	5.14

```
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area     (ha)=   4.86   Curve Number    (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.331 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  23.464
     TOTAL RAINFALL   (mm)=  74.419
     RUNOFF COEFFICIENT   =   0.315

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

--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.38         8.92
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     385.57        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     251.78       102.39
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       3.97 (ii)    8.12 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.24         0.13
                                                      *TOTALS*
     PEAK FLOW       (cms)=       7.23         1.80          8.215 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      73.42        45.16          62.11
     TOTAL RAINFALL   (mm)=      74.42        74.42          74.42
     RUNOFF COEFFICIENT   =       0.99         0.61           0.83

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

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

--------------------
| ADD HYD  (  0011)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0002):     22.30    8.215     1.33    62.11
     + ID2= 2 (  0016):      4.86    0.331     1.50    23.46
       ==========================================================
       ID = 3 (  0011):     27.16    8.363     1.33    55.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000    |   1.0990      0.8685
                         0.2920     0.4915    |   1.3530      0.9575
                         0.5630     0.6480    |   1.6160      1.0415
                         0.7870     0.7465    |   0.0000      0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.160     8.363      1.33      55.20
   OUTFLOW: ID= 1 (  0200)     27.160     1.098      2.00      55.18

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.13
                TIME SHIFT OF PEAK FLOW          (min)= 40.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.8683

--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     251.78       145.83
               over (min)         5.00        10.00
```

```
     Storage Coeff.  (min)=       1.33 (ii)    6.12 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.18         0.08          0.229 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      73.42        49.54          60.28
     TOTAL RAINFALL   (mm)=      74.42        74.42          74.42
     RUNOFF COEFFICIENT   =       0.99         0.67           0.81

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

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

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

--------------------
| ADD HYD  (  0034)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0200):    27.16   1.098     2.00    55.18
      + ID2= 2 (  0201):     0.59   0.229     1.33    60.28
        ================================================
        ID = 3 (  0034):    27.75   1.122     2.00    55.29

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area     (ha)=  42.94   Curve Number   (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   1.637 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  22.831
     TOTAL RAINFALL   (mm)=  74.419
     RUNOFF COEFFICIENT   =   0.307

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area     (ha)=  28.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.32         11.54
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     438.63         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     251.78        102.39
```

```
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       4.29 (ii)    8.44 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.23         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       9.06         2.29          10.319 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      73.42        45.16          62.11
     TOTAL RAINFALL   (mm)=      74.42        74.42          74.42
     RUNOFF COEFFICIENT   =       0.99         0.61           0.83

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

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

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

--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    28.86  10.319     1.33    62.11
      + ID2= 2 (  0015):    42.94   1.637     1.92    22.83
        ================================================
        ID = 3 (  0012):    71.79  10.523     1.33    38.62

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0100)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   2.7960     1.0790
                          0.7860     0.6090   |   3.4210     1.1725
                          1.4720     0.8130   |   4.0520     1.2584
                          2.0190     0.9345   |   0.0000     0.0000

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.795    10.523      1.33      38.62
   OUTFLOW: ID= 1 (  0100)     71.795     2.777      2.00      38.62

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 26.39
                TIME SHIFT OF PEAK FLOW          (min)= 40.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  1.0766

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area     (ha)=   0.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.46          0.29
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
```

```
     Length            (m)=      70.71        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     251.78       166.89
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.43 (ii)    6.04 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.23         0.11          0.294 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      73.42        51.18          61.18
     TOTAL RAINFALL   (mm)=      74.42        74.42          74.42
     RUNOFF COEFFICIENT   =       0.99         0.69           0.82

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

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

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

--------------------
| ADD HYD  (  0033)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):    71.79   2.777     2.00    38.62
     + ID2= 2 (  0101):     0.75   0.294     1.33    61.18
       ================================================
       ID = 3 (  0033):    72.55   2.808     2.00    38.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:4. 50yr 4hr 5min Chicago **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1126.000
| Ptotal= 82.43 mm |                          B=   1.760
--------------------                          C=   0.729
                       used in:   INTENSITY =  A / (t + B)^C

                       Duration of storm  =  4.00 hrs
                       Storm time step    =  5.00 min
                       Time to peak ratio =  0.33

               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
               0.00    6.02 |  1.00   21.47 |  2.00   14.65 |  3.00    7.75
               0.08    6.34 |  1.08   30.83 |  2.08   13.52 |  3.08    7.49
               0.17    6.71 |  1.17   65.75 |  2.17   12.58 |  3.17    7.25
               0.25    7.13 |  1.25  279.58 |  2.25   11.79 |  3.25    7.02
               0.33    7.61 |  1.33   84.04 |  2.33   11.10 |  3.33    6.81
               0.42    8.19 |  1.42   47.54 |  2.42   10.50 |  3.42    6.62
               0.50    8.88 |  1.50   34.35 |  2.50    9.97 |  3.50    6.43
               0.58    9.72 |  1.58   27.38 |  2.58    9.50 |  3.58    6.26
               0.67   10.78 |  1.67   23.00 |  2.67    9.08 |  3.67    6.10
               0.75   12.17 |  1.75   19.98 |  2.75    8.70 |  3.75    5.95
               0.83   14.07 |  1.83   17.74 |  2.83    8.35 |  3.83    5.81
               0.92   16.87 |  1.92   16.02 |  2.92    8.04 |  3.92    5.67

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area     (ha)=   4.86   Curve Number    (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.403 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  28.092
     TOTAL RAINFALL   (mm)=  82.428
     RUNOFF COEFFICIENT   =   0.341

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.38         8.92
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     385.57        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     279.58       119.17
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       3.81 (ii)    7.78 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.25         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       8.15         2.15          9.343 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      81.43        52.08          69.69
     TOTAL RAINFALL   (mm)=      82.43        82.43          82.43
     RUNOFF COEFFICIENT   =       0.99         0.63           0.85

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

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

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

--------------------
| ADD HYD  (  0011)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0002):    22.30   9.343     1.33    69.69
```

```
      + ID2= 2 (  0016):     4.86   0.403     1.50    28.09
        ================================================
        ID = 3 (  0011):    27.16   9.526     1.33    62.25

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   1.0990     0.8685
                          0.2920     0.4915   |   1.3530     0.9575
                          0.5630     0.6480   |   1.6160     1.0415
                          0.7870     0.7465   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.160     9.526      1.33      62.25
   OUTFLOW: ID= 1 (  0200)     27.160     1.351      1.92      62.23

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 14.18
                  TIME SHIFT OF PEAK FLOW          (min)= 35.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.9574

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     279.58       168.36
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       1.28 (ii)    5.87 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.20         0.10          0.259 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      81.43        56.77          67.86
     TOTAL RAINFALL   (mm)=      82.43        82.43          82.43
     RUNOFF COEFFICIENT   =       0.99         0.69           0.82

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

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

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```
| ADD HYD  (  0034)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
-------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0200):    27.16   1.351     1.92    62.23
      + ID2= 2 (  0201):     0.59   0.259     1.33    67.86
        ================================================
        ID = 3 (  0034):    27.75   1.381     1.92    62.35

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=  42.94   Curve Number   (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   1.983 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  27.365
     TOTAL RAINFALL   (mm)=  82.428
     RUNOFF COEFFICIENT   =   0.332

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area    (ha)=  28.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.32        11.54
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     438.63        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     279.58       119.17
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       4.11 (ii)    8.09 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.24         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=      10.24         2.73         11.747 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      81.43        52.08          69.69
     TOTAL RAINFALL   (mm)=      82.43        82.43          82.43
     RUNOFF COEFFICIENT   =       0.99         0.63           0.85

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

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

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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    28.86  11.747     1.33    69.69
      + ID2= 2 (  0015):    42.94   1.983     1.92    27.36
        ====================================================
        ID = 3 (  0012):    71.79  12.005     1.33    44.38

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0100)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   2.7960     1.0790
                          0.7860     0.6090   |   3.4210     1.1725
                          1.4720     0.8130   |   4.0520     1.2584
                          2.0190     0.9345   |   0.0000     0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.795    12.005      1.33      44.38
   OUTFLOW: ID= 1 (  0100)     71.795     3.411      2.00      44.38

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 28.41
                  TIME SHIFT OF PEAK FLOW          (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.1723

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.46         0.29
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      70.71        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     279.58       192.10
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       1.38 (ii)    5.79 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.26         0.13          0.332 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      81.43        58.51          68.82
     TOTAL RAINFALL   (mm)=      82.43        82.43          82.43
     RUNOFF COEFFICIENT   =       0.99         0.71           0.83

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

       (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
            CN*  =  85.0    Ia = Dep. Storage  (Above)
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.

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

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

--------------------
| ADD HYD  (  0033)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0100):    71.79   3.411     2.00    44.38
      + ID2= 2 (  0101):     0.75   0.332     1.33    68.82
        ====================================================
        ID = 3 (  0033):    72.55   3.445     2.00    44.63

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
****************************************
** SIMULATION:5. 100yr 4hr 5min Chicago **
****************************************
--------------------
| CHICAGO STORM    |    IDF curve parameters: A=1248.000
| Ptotal= 89.85 mm |                          B=   1.830
--------------------                          C=   0.732
                         used in:   INTENSITY =  A / (t + B)^C

                         Duration of storm  =  4.00 hrs
                         Storm time step    =  5.00 min
                         Time to peak ratio =  0.33

          TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
           hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
          0.00    6.50 |  1.00   23.36 |'  2.00   15.90 |  3.00    8.38
          0.08    6.85 |  1.08   33.65 |'  2.08   14.67 |  3.08    8.09
          0.17    7.24 |  1.17   72.21 |'  2.17   13.64 |  3.17    7.83
          0.25    7.70 |  1.25  305.79 |'  2.25   12.77 |  3.25    7.59
          0.33    8.23 |  1.33   92.43 |'  2.33   12.02 |  3.33    7.36
          0.42    8.85 |  1.42   52.08 |'  2.42   11.36 |  3.42    7.15
          0.50    9.60 |  1.50   37.52 |'  2.50   10.79 |  3.50    6.95
          0.58   10.52 |  1.58   29.85 |'  2.58   10.28 |  3.58    6.76
          0.67   11.68 |  1.67   25.04 |'  2.67    9.82 |  3.67    6.59
          0.75   13.19 |  1.75   21.73 |'  2.75    9.41 |  3.75    6.42
          0.83   15.27 |  1.83   19.28 |'  2.83    9.03 |  3.83    6.27
          0.92   18.32 |  1.92   17.40 |'  2.92    8.69 |  3.92    6.12

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0016)|   Area    (ha)=   4.86   Curve Number   (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.476 (i)
     TIME TO PEAK    (hrs)=   1.500
     RUNOFF VOLUME    (mm)=  32.599
     TOTAL RAINFALL   (mm)=  89.848
     RUNOFF COEFFICIENT   =   0.363

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

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--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=  22.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.38         8.92
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     385.57        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     305.79       135.49
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       3.67 (ii)    7.51 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.25         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       9.04         2.50       10.428 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42         1.33
     RUNOFF VOLUME    (mm)=      88.85        58.61        76.75
     TOTAL RAINFALL   (mm)=      89.85        89.85        89.85
     RUNOFF COEFFICIENT   =       0.99         0.65         0.85

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

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

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

--------------------
| ADD HYD  (  0011)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0002):    22.30  10.428     1.33    76.75
     + ID2= 2 (  0016):     4.86   0.476     1.50    32.60
       ================================================
       ID = 3 (  0011):    27.16  10.646     1.33    68.85

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   1.0990     0.8685
                          0.2920     0.4915   |   1.3530     0.9575
                          0.5630     0.6480   |   1.6160     1.0415
                          0.7870     0.7465   |   0.0000     0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.160    10.646      1.33      68.85
   OUTFLOW: ID= 1 (  0200)     27.160     1.612      1.92      68.84

                    PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.14
                    TIME SHIFT OF PEAK FLOW          (min)= 35.00
                    MAXIMUM  STORAGE   USED        (ha.m.)=  1.0412

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     305.79       190.13
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.23 (ii)    5.67 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.22         0.11         0.287 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42         1.33
     RUNOFF VOLUME    (mm)=      88.85        63.56        74.93
     TOTAL RAINFALL   (mm)=      89.85        89.85        89.85
     RUNOFF COEFFICIENT   =       0.99         0.71         0.83

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

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

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

--------------------
| ADD HYD  (  0034)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0200):    27.16   1.612     1.92    68.84
     + ID2= 2 (  0201):     0.59   0.287     1.33    74.93
       ================================================
       ID = 3 (  0034):    27.75   1.645     1.92    68.97

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0015)|   Area    (ha)=  42.94   Curve Number   (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   2.332 (i)
     TIME TO PEAK    (hrs)=   1.917
     RUNOFF VOLUME    (mm)=  31.784
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```
     TOTAL RAINFALL   (mm)=  89.848
     RUNOFF COEFFICIENT   =   0.354

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

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area    (ha)=  28.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.32         11.54
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     438.63         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     305.79        135.49
               over (min)         5.00         10.00
     Storage Coeff.  (min)=       3.97 (ii)     7.80 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=       0.24          0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=      11.36          3.17         13.123 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.42           1.33
     RUNOFF VOLUME    (mm)=      88.85         58.61          76.75
     TOTAL RAINFALL   (mm)=      89.85         89.85          89.85
     RUNOFF COEFFICIENT   =       0.99          0.65           0.85

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

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

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

--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    28.86  13.123     1.33    76.75
      + ID2= 2 (  0015):    42.94   2.332     1.92    31.78
        ================================================
        ID = 3 (  0012):    71.79  13.435     1.33    49.86

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0100)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   2.7960     1.0790
                         0.7860     0.6090   |   3.4210     1.1725
                         1.4720     0.8130   |   4.0520     1.2584
                         2.0190     0.9345   |   0.0000     0.0000

                                   AREA     QPEAK     TPEAK       R.V.
                                   (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)      71.795    13.435      1.33       49.86
   OUTFLOW: ID= 1 (  0100)      71.795     4.048      1.92       49.86

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 30.13
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.2580

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.46          0.29
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      70.71         40.00
     Mannings n           =      0.013         0.250

     Max.Eff.Inten.(mm/hr)=     305.79        216.39
               over (min)         5.00         10.00
     Storage Coeff.  (min)=       1.33 (ii)     5.59 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=       0.33          0.16
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.28          0.15           0.368 (iii)
     TIME TO PEAK    (hrs)=       1.33          1.42           1.33
     RUNOFF VOLUME    (mm)=      88.85         65.38          75.94
     TOTAL RAINFALL   (mm)=      89.85         89.85          89.85
     RUNOFF COEFFICIENT   =       0.99          0.73           0.85

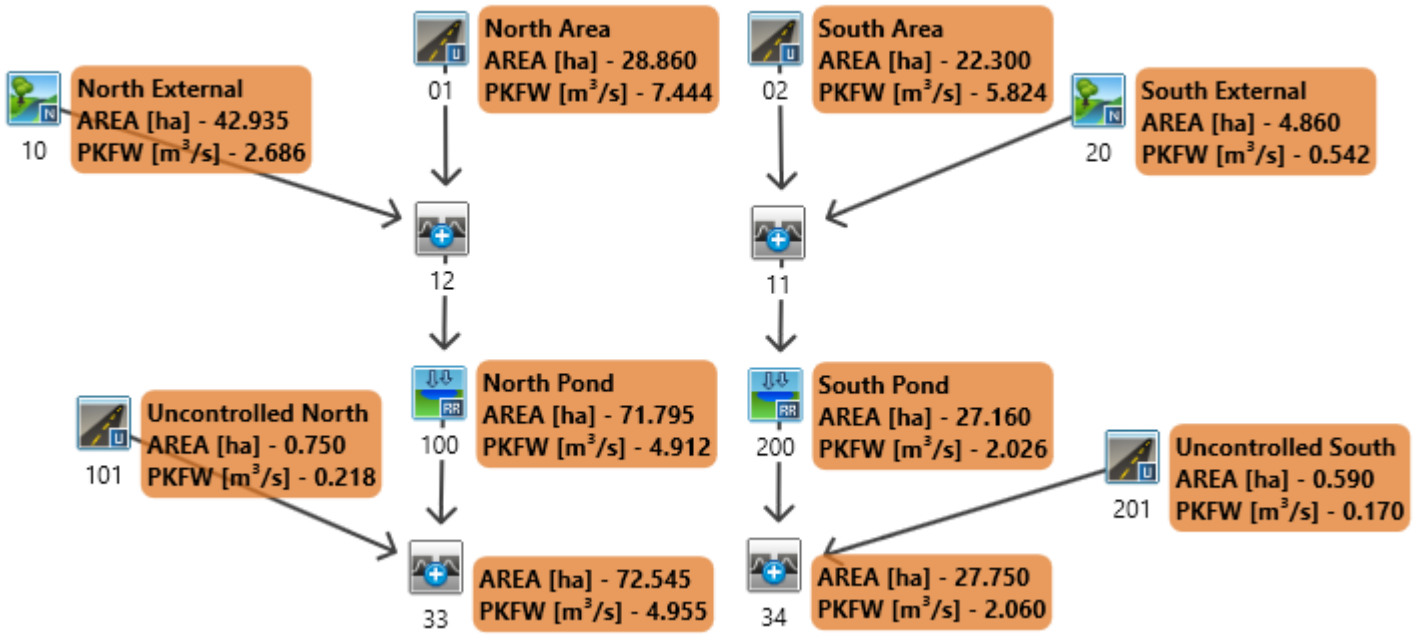
***** WARNING: STORAGE COEFF. IS SMALLER THAN TIME STEP!

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

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

--------------------
| ADD HYD  (  0033)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0100):    71.79   4.048     1.92    49.86
      + ID2= 2 (  0101):     0.75   0.368     1.33    75.94
        ================================================
        ID = 3 (  0033):    72.55   4.091     1.92    50.13

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



urbanworks
ENGINEERING CORPORATION

Visual OTTHYMO™ Schematic
POST-DEVELOPMENT

HILLSBURGH SUBDIVISION
(24HR SCS DESIGN STORM)

Job #: 22-0020ER	**Date: March 2023**

```
********************************
** SIMULATION:bloor 24SCS002  **
********************************

--------------------
|    READ STORM    |    Filename: C:\Users\gvolpe\AppD
|                  |              ata\Local\Temp\
|                  |              b20a7e23-c0fc-442b-a399-0c055f5c1e41\ef9addd1
| Ptotal= 52.12 mm |    Comments: bloor 24SCS002
--------------------
```

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.51	6.00	1.02	12.00	10.67	18.00	0.76
0.20	0.51	6.20	1.02	12.20	6.60	18.20	0.76
0.40	0.51	6.40	1.02	12.40	4.83	18.40	0.76
0.60	0.51	6.60	1.02	12.60	4.57	18.60	0.76
0.80	0.51	6.80	1.02	12.80	3.30	18.80	0.76
1.00	0.51	7.00	1.02	13.00	2.79	19.00	0.76
1.20	0.51	7.20	1.02	13.20	2.79	19.20	0.76
1.40	0.51	7.40	1.02	13.40	2.79	19.40	0.76
1.60	0.51	7.60	1.02	13.60	2.79	19.60	0.76
1.80	0.51	7.80	1.02	13.80	2.79	19.80	0.76
2.00	0.51	8.00	1.52	14.00	1.52	20.00	0.51
2.20	0.51	8.20	1.52	14.20	1.52	20.20	0.51
2.40	0.51	8.40	1.52	14.40	1.52	20.40	0.51
2.60	0.51	8.60	1.52	14.60	1.52	20.60	0.51
2.80	0.51	8.80	1.52	14.80	1.52	20.80	0.51
3.00	0.51	9.00	1.52	15.00	1.52	21.00	0.51
3.20	0.51	9.20	1.52	15.20	1.52	21.20	0.51
3.40	0.51	9.40	1.52	15.40	1.52	21.40	0.51
3.60	0.51	9.60	1.52	15.60	1.52	21.60	0.51
3.80	0.51	9.80	1.52	15.80	1.52	21.80	0.51
4.00	1.02	10.00	3.05	16.00	1.02	22.00	0.51
4.20	1.02	10.20	3.05	16.20	1.02	22.20	0.51
4.40	1.02	10.40	3.05	16.40	1.02	22.40	0.51
4.60	1.02	10.60	3.05	16.60	1.02	22.60	0.51
4.80	1.02	10.80	3.05	16.80	1.02	22.80	0.51
5.00	1.02	11.00	4.06	17.00	1.02	23.00	0.51
5.20	1.02	11.20	5.84	17.20	1.02	23.20	0.51
5.40	1.02	11.40	13.21	17.40	1.02	23.40	0.51
5.60	1.02	11.60	28.96	17.60	1.02	23.60	0.51
5.80	1.02	11.80	60.45	17.80	1.02	23.80	0.51

```
--------------------
| CALIB            |
| NASHYD   (  0010)|   Area     (ha)=  42.94   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

        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	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51

5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 0.681 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 11.762
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.226

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

CALIB	
STANDHYD (0001)	Area (ha)= 28.86
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.32	11.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	438.63	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Max.Eff.Inten.(mm/hr)=	60.45	32.53		
over (min)	10.00	20.00		
Storage Coeff. (min)=	7.59 (ii)	18.65 (ii)		
Unit Hyd. Tpeak (min)=	10.00	20.00		
Unit Hyd. peak (cms)=	0.13	0.06		
			TOTALS	
PEAK FLOW (cms)=	2.34	0.59	2.768 (iii)	
TIME TO PEAK (hrs)=	12.00	12.17	12.00	
RUNOFF VOLUME (mm)=	51.12	26.85	41.41	
TOTAL RAINFALL (mm)=	52.12	52.12	52.12	
RUNOFF COEFFICIENT =	0.98	0.52	0.79	

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

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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    28.86   2.768    12.00    41.41
      + ID2= 2 (  0010):    42.94   0.681    12.33    11.76
        ================================================
        ID = 3 (  0012):    71.79   3.163    12.08    23.68

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| RESERVOIR(  0100)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   3.7410     0.8860
                          1.2270     0.4905   |   4.5380     0.9850
                          1.6770     0.5725   |   4.9340     1.0280
                          2.8410     0.7675   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.795     3.163     12.08      23.68
   OUTFLOW: ID= 1 (  0100)     71.795     1.226     12.58      23.68

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 38.77
                  TIME SHIFT OF PEAK FLOW          (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4903

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--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.46         0.29
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      70.71        40.00
     Mannings n           =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
              TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
               hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
             0.083    0.51 | 6.083    1.02 |12.083   10.67 | 18.08    0.76
             0.167    0.51 | 6.167    1.02 |12.167   10.67 | 18.17    0.76
             0.250    0.51 | 6.250    1.02 |12.250    8.23 | 18.25    0.76
             0.333    0.51 | 6.333    1.02 |12.333    6.60 | 18.33    0.76
             0.417    0.51 | 6.417    1.02 |12.417    6.25 | 18.42    0.76
             0.500    0.51 | 6.500    1.02 |12.500    4.83 | 18.50    0.76
             0.583    0.51 | 6.583    1.02 |12.583    4.83 | 18.58    0.76
             0.667    0.51 | 6.667    1.02 |12.667    4.62 | 18.67    0.76
             0.750    0.51 | 6.750    1.02 |12.750    4.57 | 18.75    0.76
             0.833    0.51 | 6.833    1.02 |12.833    4.06 | 18.83    0.76
             0.917    0.51 | 6.917    1.02 |12.917    3.30 | 18.92    0.76
             1.000    0.51 | 7.000    1.02 |13.000    3.30 | 19.00    0.76
             1.083    0.51 | 7.083    1.02 |13.083    2.79 | 19.08    0.76
             1.167    0.51 | 7.167    1.02 |13.167    2.79 | 19.17    0.76
             1.250    0.51 | 7.250    1.02 |13.250    2.79 | 19.25    0.76
             1.333    0.51 | 7.333    1.02 |13.333    2.79 | 19.33    0.76
             1.417    0.51 | 7.417    1.02 |13.417    2.79 | 19.42    0.76
             1.500    0.51 | 7.500    1.02 |13.500    2.79 | 19.50    0.76
             1.583    0.51 | 7.583    1.02 |13.583    2.79 | 19.58    0.76
             1.667    0.51 | 7.667    1.02 |13.667    2.79 | 19.67    0.76
             1.750    0.51 | 7.750    1.02 |13.750    2.79 | 19.75    0.76
             1.833    0.51 | 7.833    1.02 |13.833    2.79 | 19.83    0.76
             1.917    0.51 | 7.917    1.02 |13.917    2.79 | 19.92    0.76
             2.000    0.51 | 8.000    1.02 |14.000    2.79 | 20.00    0.76
             2.083    0.51 | 8.083    1.52 |14.083    1.52 | 20.08    0.51
             2.167    0.51 | 8.167    1.52 |14.167    1.52 | 20.17    0.51
             2.250    0.51 | 8.250    1.52 |14.250    1.52 | 20.25    0.51
             2.333    0.51 | 8.333    1.52 |14.333    1.52 | 20.33    0.51
             2.417    0.51 | 8.417    1.52 |14.417    1.52 | 20.42    0.51
             2.500    0.51 | 8.500    1.52 |14.500    1.52 | 20.50    0.51
             2.583    0.51 | 8.583    1.52 |14.583    1.52 | 20.58    0.51
             2.667    0.51 | 8.667    1.52 |14.667    1.52 | 20.67    0.51
             2.750    0.51 | 8.750    1.52 |14.750    1.52 | 20.75    0.51
             2.833    0.51 | 8.833    1.52 |14.833    1.52 | 20.83    0.51
             2.917    0.51 | 8.917    1.52 |14.917    1.52 | 20.92    0.51
             3.000    0.51 | 9.000    1.52 |15.000    1.52 | 21.00    0.51
             3.083    0.51 | 9.083    1.52 |15.083    1.52 | 21.08    0.51
             3.167    0.51 | 9.167    1.52 |15.167    1.52 | 21.17    0.51
             3.250    0.51 | 9.250    1.52 |15.250    1.52 | 21.25    0.51
             3.333    0.51 | 9.333    1.52 |15.333    1.52 | 21.33    0.51
             3.417    0.51 | 9.417    1.52 |15.417    1.52 | 21.42    0.51
             3.500    0.51 | 9.500    1.52 |15.500    1.52 | 21.50    0.51
             3.583    0.51 | 9.583    1.52 |15.583    1.52 | 21.58    0.51
             3.667    0.51 | 9.667    1.52 |15.667    1.52 | 21.67    0.51
             3.750    0.51 | 9.750    1.52 |15.750    1.52 | 21.75    0.51
             3.833    0.51 | 9.833    1.52 |15.833    1.52 | 21.83    0.51
             3.917    0.51 | 9.917    1.52 |15.917    1.52 | 21.92    0.51
             4.000    0.51 |10.000    1.52 |16.000    1.52 | 22.00    0.51
             4.083    1.02 |10.083    3.05 |16.083    1.02 | 22.08    0.51
             4.167    1.02 |10.167    3.05 |16.167    1.02 | 22.17    0.51
             4.250    1.02 |10.250    3.05 |16.250    1.02 | 22.25    0.51
             4.333    1.02 |10.333    3.05 |16.333    1.02 | 22.33    0.51
             4.417    1.02 |10.417    3.05 |16.417    1.02 | 22.42    0.51
             4.500    1.02 |10.500    3.05 |16.500    1.02 | 22.50    0.51
             4.583    1.02 |10.583    3.05 |16.583    1.02 | 22.58    0.51
             4.667    1.02 |10.667    3.05 |16.667    1.02 | 22.67    0.51
             4.750    1.02 |10.750    3.05 |16.750    1.02 | 22.75    0.51
             4.833    1.02 |10.833    3.05 |16.833    1.02 | 22.83    0.51
             4.917    1.02 |10.917    3.05 |16.917    1.02 | 22.92    0.51
             5.000    1.02 |11.000    3.05 |17.000    1.02 | 23.00    0.51
             5.083    1.02 |11.083    4.06 |17.083    1.02 | 23.08    0.51
             5.167    1.02 |11.167    4.06 |17.167    1.02 | 23.17    0.51
             5.250    1.02 |11.250    5.13 |17.250    1.02 | 23.25    0.51
             5.333    1.02 |11.333    5.84 |17.333    1.02 | 23.33    0.51
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5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

			TOTALS
Max.Eff.Inten.(mm/hr)=	60.45	61.46	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.54 (ii)	11.11 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.29	0.09	
PEAK FLOW (cms)=	0.06	0.03	0.084 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	51.12	31.47	40.30
TOTAL RAINFALL (mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT =	0.98	0.60	0.77

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

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

ADD HYD (0033)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0100):		71.79	1.226	12.58	23.68
+ ID2= 2 (0101):		0.75	0.084	12.00	40.30
ID = 3 (0033):		72.55	1.239	12.58	23.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0020)	Area	(ha)=	4.86	Curve Number	(CN)= 65.2
ID= 1 DT= 5.0 min	Ia	(mm)=	5.00	# of Linear Res.(N)=	3.00
	U.H. Tp(hrs)=		0.20		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51

5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.141 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 12.131
TOTAL RAINFALL (mm)= 52.121
RUNOFF COEFFICIENT = 0.233

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

CALIB	
STANDHYD (0002)	Area (ha)= 22.30
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.38	8.92
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	385.57	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.51	6.083	1.02	12.083	10.67	18.08	0.76
0.167	0.51	6.167	1.02	12.167	10.67	18.17	0.76
0.250	0.51	6.250	1.02	12.250	8.23	18.25	0.76
0.333	0.51	6.333	1.02	12.333	6.60	18.33	0.76
0.417	0.51	6.417	1.02	12.417	6.25	18.42	0.76
0.500	0.51	6.500	1.02	12.500	4.83	18.50	0.76
0.583	0.51	6.583	1.02	12.583	4.83	18.58	0.76
0.667	0.51	6.667	1.02	12.667	4.62	18.67	0.76
0.750	0.51	6.750	1.02	12.750	4.57	18.75	0.76
0.833	0.51	6.833	1.02	12.833	4.06	18.83	0.76
0.917	0.51	6.917	1.02	12.917	3.30	18.92	0.76
1.000	0.51	7.000	1.02	13.000	3.30	19.00	0.76
1.083	0.51	7.083	1.02	13.083	2.79	19.08	0.76
1.167	0.51	7.167	1.02	13.167	2.79	19.17	0.76
1.250	0.51	7.250	1.02	13.250	2.79	19.25	0.76
1.333	0.51	7.333	1.02	13.333	2.79	19.33	0.76
1.417	0.51	7.417	1.02	13.417	2.79	19.42	0.76
1.500	0.51	7.500	1.02	13.500	2.79	19.50	0.76
1.583	0.51	7.583	1.02	13.583	2.79	19.58	0.76
1.667	0.51	7.667	1.02	13.667	2.79	19.67	0.76
1.750	0.51	7.750	1.02	13.750	2.79	19.75	0.76
1.833	0.51	7.833	1.02	13.833	2.79	19.83	0.76
1.917	0.51	7.917	1.02	13.917	2.79	19.92	0.76
2.000	0.51	8.000	1.02	14.000	2.79	20.00	0.76
2.083	0.51	8.083	1.52	14.083	1.52	20.08	0.51
2.167	0.51	8.167	1.52	14.167	1.52	20.17	0.51
2.250	0.51	8.250	1.52	14.250	1.52	20.25	0.51
2.333	0.51	8.333	1.52	14.333	1.52	20.33	0.51
2.417	0.51	8.417	1.52	14.417	1.52	20.42	0.51
2.500	0.51	8.500	1.52	14.500	1.52	20.50	0.51
2.583	0.51	8.583	1.52	14.583	1.52	20.58	0.51
2.667	0.51	8.667	1.52	14.667	1.52	20.67	0.51
2.750	0.51	8.750	1.52	14.750	1.52	20.75	0.51
2.833	0.51	8.833	1.52	14.833	1.52	20.83	0.51
2.917	0.51	8.917	1.52	14.917	1.52	20.92	0.51
3.000	0.51	9.000	1.52	15.000	1.52	21.00	0.51
3.083	0.51	9.083	1.52	15.083	1.52	21.08	0.51
3.167	0.51	9.167	1.52	15.167	1.52	21.17	0.51
3.250	0.51	9.250	1.52	15.250	1.52	21.25	0.51
3.333	0.51	9.333	1.52	15.333	1.52	21.33	0.51
3.417	0.51	9.417	1.52	15.417	1.52	21.42	0.51
3.500	0.51	9.500	1.52	15.500	1.52	21.50	0.51
3.583	0.51	9.583	1.52	15.583	1.52	21.58	0.51
3.667	0.51	9.667	1.52	15.667	1.52	21.67	0.51
3.750	0.51	9.750	1.52	15.750	1.52	21.75	0.51
3.833	0.51	9.833	1.52	15.833	1.52	21.83	0.51
3.917	0.51	9.917	1.52	15.917	1.52	21.92	0.51
4.000	0.51	10.000	1.52	16.000	1.52	22.00	0.51
4.083	1.02	10.083	3.05	16.083	1.02	22.08	0.51
4.167	1.02	10.167	3.05	16.167	1.02	22.17	0.51
4.250	1.02	10.250	3.05	16.250	1.02	22.25	0.51
4.333	1.02	10.333	3.05	16.333	1.02	22.33	0.51
4.417	1.02	10.417	3.05	16.417	1.02	22.42	0.51
4.500	1.02	10.500	3.05	16.500	1.02	22.50	0.51
4.583	1.02	10.583	3.05	16.583	1.02	22.58	0.51
4.667	1.02	10.667	3.05	16.667	1.02	22.67	0.51
4.750	1.02	10.750	3.05	16.750	1.02	22.75	0.51
4.833	1.02	10.833	3.05	16.833	1.02	22.83	0.51
4.917	1.02	10.917	3.05	16.917	1.02	22.92	0.51
5.000	1.02	11.000	3.05	17.000	1.02	23.00	0.51
5.083	1.02	11.083	4.06	17.083	1.02	23.08	0.51
5.167	1.02	11.167	4.06	17.167	1.02	23.17	0.51
5.250	1.02	11.250	5.13	17.250	1.02	23.25	0.51
5.333	1.02	11.333	5.84	17.333	1.02	23.33	0.51
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

Max.Eff.Inten.(mm/hr)=	60.45	32.53		
over (min)	5.00	20.00		
Storage Coeff. (min)=	7.02 (ii)	18.08 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.17	0.06		
				TOTALS
PEAK FLOW (cms)=	2.00	0.47		2.336 (iii)
TIME TO PEAK (hrs)=	12.00	12.17		12.00
RUNOFF VOLUME (mm)=	51.12	26.85		41.41
TOTAL RAINFALL (mm)=	52.12	52.12		52.12
RUNOFF COEFFICIENT =	0.98	0.52		0.79

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

```
      (ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
           THAN THE STORAGE COEFFICIENT.
     (iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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--------------------
| ADD HYD  (  0011)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    22.30    2.336    12.00    41.41
      + ID2= 2 (  0020):     4.86    0.141    12.08    12.13
        ================================================
        ID = 3 (  0011):    27.16    2.462    12.00    36.17

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)  |    (cms)     (ha.m.)
                           0.0000     0.0000  |   1.5430      0.7540
                           0.4990     0.4125  |   1.8630      0.8500
                           0.6850     0.4830  |   2.0380      0.8910
                           1.2910     0.6430  |   0.0000      0.0000

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.160     2.462     12.00      36.17
   OUTFLOW: ID= 1 (  0200)     27.160     0.499     12.58      36.16

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.25
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4124

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--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n             =    0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME     RAIN |  TIME     RAIN |'  TIME     RAIN |  TIME     RAIN
                hrs    mm/hr |   hrs    mm/hr |'   hrs    mm/hr |   hrs    mm/hr
              0.083     0.51 | 6.083     1.02 |12.083    10.67 | 18.08     0.76
              0.167     0.51 | 6.167     1.02 |12.167    10.67 | 18.17     0.76
              0.250     0.51 | 6.250     1.02 |12.250     8.23 | 18.25     0.76
              0.333     0.51 | 6.333     1.02 |12.333     6.60 | 18.33     0.76
              0.417     0.51 | 6.417     1.02 |12.417     6.25 | 18.42     0.76
              0.500     0.51 | 6.500     1.02 |12.500     4.83 | 18.50     0.76
              0.583     0.51 | 6.583     1.02 |12.583     4.83 | 18.58     0.76
              0.667     0.51 | 6.667     1.02 |12.667     4.62 | 18.67     0.76
              0.750     0.51 | 6.750     1.02 |12.750     4.57 | 18.75     0.76
              0.833     0.51 | 6.833     1.02 |12.833     4.06 | 18.83     0.76
              0.917     0.51 | 6.917     1.02 |12.917     3.30 | 18.92     0.76
              1.000     0.51 | 7.000     1.02 |13.000     3.30 | 19.00     0.76
              1.083     0.51 | 7.083     1.02 |13.083     2.79 | 19.08     0.76
              1.167     0.51 | 7.167     1.02 |13.167     2.79 | 19.17     0.76
              1.250     0.51 | 7.250     1.02 |13.250     2.79 | 19.25     0.76
              1.333     0.51 | 7.333     1.02 |13.333     2.79 | 19.33     0.76
              1.417     0.51 | 7.417     1.02 |13.417     2.79 | 19.42     0.76
              1.500     0.51 | 7.500     1.02 |13.500     2.79 | 19.50     0.76
              1.583     0.51 | 7.583     1.02 |13.583     2.79 | 19.58     0.76
              1.667     0.51 | 7.667     1.02 |13.667     2.79 | 19.67     0.76
              1.750     0.51 | 7.750     1.02 |13.750     2.79 | 19.75     0.76
              1.833     0.51 | 7.833     1.02 |13.833     2.79 | 19.83     0.76
              1.917     0.51 | 7.917     1.02 |13.917     2.79 | 19.92     0.76
              2.000     0.51 | 8.000     1.02 |14.000     2.79 | 20.00     0.76
              2.083     0.51 | 8.083     1.52 |14.083     1.52 | 20.08     0.51
              2.167     0.51 | 8.167     1.52 |14.167     1.52 | 20.17     0.51
              2.250     0.51 | 8.250     1.52 |14.250     1.52 | 20.25     0.51
              2.333     0.51 | 8.333     1.52 |14.333     1.52 | 20.33     0.51
              2.417     0.51 | 8.417     1.52 |14.417     1.52 | 20.42     0.51
              2.500     0.51 | 8.500     1.52 |14.500     1.52 | 20.50     0.51
              2.583     0.51 | 8.583     1.52 |14.583     1.52 | 20.58     0.51
              2.667     0.51 | 8.667     1.52 |14.667     1.52 | 20.67     0.51
              2.750     0.51 | 8.750     1.52 |14.750     1.52 | 20.75     0.51
              2.833     0.51 | 8.833     1.52 |14.833     1.52 | 20.83     0.51
              2.917     0.51 | 8.917     1.52 |14.917     1.52 | 20.92     0.51
              3.000     0.51 | 9.000     1.52 |15.000     1.52 | 21.00     0.51
              3.083     0.51 | 9.083     1.52 |15.083     1.52 | 21.08     0.51
              3.167     0.51 | 9.167     1.52 |15.167     1.52 | 21.17     0.51
              3.250     0.51 | 9.250     1.52 |15.250     1.52 | 21.25     0.51
              3.333     0.51 | 9.333     1.52 |15.333     1.52 | 21.33     0.51
              3.417     0.51 | 9.417     1.52 |15.417     1.52 | 21.42     0.51
              3.500     0.51 | 9.500     1.52 |15.500     1.52 | 21.50     0.51
              3.583     0.51 | 9.583     1.52 |15.583     1.52 | 21.58     0.51
              3.667     0.51 | 9.667     1.52 |15.667     1.52 | 21.67     0.51
              3.750     0.51 | 9.750     1.52 |15.750     1.52 | 21.75     0.51
              3.833     0.51 | 9.833     1.52 |15.833     1.52 | 21.83     0.51
              3.917     0.51 | 9.917     1.52 |15.917     1.52 | 21.92     0.51
              4.000     0.51 |10.000     1.52 |16.000     1.52 | 22.00     0.51
              4.083     1.02 |10.083     3.05 |16.083     1.02 | 22.08     0.51
              4.167     1.02 |10.167     3.05 |16.167     1.02 | 22.17     0.51
              4.250     1.02 |10.250     3.05 |16.250     1.02 | 22.25     0.51
              4.333     1.02 |10.333     3.05 |16.333     1.02 | 22.33     0.51
              4.417     1.02 |10.417     3.05 |16.417     1.02 | 22.42     0.51
              4.500     1.02 |10.500     3.05 |16.500     1.02 | 22.50     0.51
              4.583     1.02 |10.583     3.05 |16.583     1.02 | 22.58     0.51
              4.667     1.02 |10.667     3.05 |16.667     1.02 | 22.67     0.51
              4.750     1.02 |10.750     3.05 |16.750     1.02 | 22.75     0.51
              4.833     1.02 |10.833     3.05 |16.833     1.02 | 22.83     0.51
              4.917     1.02 |10.917     3.05 |16.917     1.02 | 22.92     0.51
              5.000     1.02 |11.000     3.05 |17.000     1.02 | 23.00     0.51
              5.083     1.02 |11.083     4.06 |17.083     1.02 | 23.08     0.51
              5.167     1.02 |11.167     4.06 |17.167     1.02 | 23.17     0.51
              5.250     1.02 |11.250     5.13 |17.250     1.02 | 23.25     0.51
              5.333     1.02 |11.333     5.84 |17.333     1.02 | 23.33     0.51
              5.417     1.02 |11.417     7.31 |17.417     1.02 | 23.42     0.51
              5.500     1.02 |11.500    13.21 |17.500     1.02 | 23.50     0.51
              5.583     1.02 |11.583    13.21 |17.583     1.02 | 23.58     0.51
```

5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51

			TOTALS
Max.Eff.Inten.(mm/hr)=	60.45	53.65	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.36 (ii)	11.42 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.30	0.09	
PEAK FLOW (cms)=	0.04	0.02	0.065 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	51.12	30.19	39.60
TOTAL RAINFALL (mm)=	52.12	52.12	52.12
RUNOFF COEFFICIENT =	0.98	0.58	0.76

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

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

ADD HYD (0034)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0200):		27.16	0.499	12.58	36.16
+ ID2= 2 (0201):		0.59	0.065	12.00	39.60
ID = 3 (0034):		27.75	0.509	12.50	36.24

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:bloor 24SCS005 **
****

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\b20a7e23-c0fc-442b-a399-0c055f5c1e41\e7da6db1
Ptotal= 62.43 mm	Comments: bloor 24SCS005

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.76	6.00	1.27	12.00	12.19	18.00	1.27
0.20	0.76	6.20	1.27	12.20	7.62	18.20	1.27
0.40	0.76	6.40	1.27	12.40	5.59	18.40	1.27
0.60	0.76	6.60	1.27	12.60	5.08	18.60	1.27
0.80	0.76	6.80	1.27	12.80	3.81	18.80	1.27
1.00	0.76	7.00	1.27	13.00	3.05	19.00	1.02
1.20	0.76	7.20	1.27	13.20	3.05	19.20	1.02
1.40	0.76	7.40	1.27	13.40	3.05	19.40	1.02
1.60	0.76	7.60	1.27	13.60	3.05	19.60	1.02
1.80	0.76	7.80	1.27	13.80	3.05	19.80	1.02
2.00	0.76	8.00	1.78	14.00	1.78	20.00	1.02
2.20	0.76	8.20	1.78	14.20	1.78	20.20	1.02
2.40	0.76	8.40	1.78	14.40	1.78	20.40	1.02
2.60	0.76	8.60	1.78	14.60	1.78	20.60	1.02
2.80	0.76	8.80	1.78	14.80	1.78	20.80	1.02
3.00	0.76	9.00	1.78	15.00	1.78	21.00	0.76
3.20	0.76	9.20	1.78	15.20	1.78	21.20	0.76
3.40	0.76	9.40	1.78	15.40	1.78	21.40	0.76
3.60	0.76	9.60	1.78	15.60	1.78	21.60	0.76
3.80	0.76	9.80	1.78	15.80	1.78	21.80	0.76
4.00	1.27	10.00	3.30	16.00	1.27	22.00	0.76
4.20	1.27	10.20	3.30	16.20	1.27	22.20	0.76
4.40	1.27	10.40	3.30	16.40	1.27	22.40	0.76
4.60	1.27	10.60	3.30	16.60	1.27	22.60	0.76
4.80	1.27	10.80	3.30	16.80	1.27	22.80	0.76
5.00	1.27	11.00	4.57	17.00	1.27	23.00	0.76
5.20	1.27	11.20	6.60	17.20	1.27	23.20	0.76
5.40	1.27	11.40	15.24	17.40	1.27	23.40	0.76
5.60	1.27	11.60	33.27	17.60	1.27	23.60	0.76
5.80	1.27	11.80	69.60	17.80	1.27	23.80	0.76

CALIB			
NASHYD (0010)	Area (ha)= 42.94	Curve Number (CN)= 64.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.47		

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	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02

2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 0.924 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 16.569
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.265

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

CALIB	
STANDHYD (0001)	Area (ha)= 28.86

|ID= 1 DT= 5.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.32	11.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	438.63	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76

3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

Max.Eff.Inten.(mm/hr)=	69.60	46.70		
over (min)	5.00	20.00		
Storage Coeff. (min)=	7.17 (ii)	16.74 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.17	0.06		
			TOTALS	
PEAK FLOW (cms)=	2.97	0.78	3.538 (iii)	
TIME TO PEAK (hrs)=	12.00	12.17	12.00	
RUNOFF VOLUME (mm)=	61.43	35.11	50.90	
TOTAL RAINFALL (mm)=	62.43	62.43	62.43	
RUNOFF COEFFICIENT =	0.98	0.56	0.82	

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

ADD HYD (0012)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0001):	28.86	3.538	12.00	50.90
+	ID2= 2 (0010):	42.94	0.924	12.33	16.57
	ID = 3 (0012):	71.79	4.031	12.00	30.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0100)	OVERFLOW IS OFF

IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	3.7410	0.8860
	1.2270	0.4905	4.5380	0.9850
	1.6770	0.5725	4.9340	1.0280
	2.8410	0.7675	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0012)	71.795	4.031	12.00	30.37
OUTFLOW: ID= 1 (0100)	71.795	1.675	12.50	30.37

PEAK FLOW REDUCTION [Qout/Qin](%)= 41.55
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.5723

CALIB	
STANDHYD (0101)	Area (ha)= 0.75
ID= 1 DT= 5.0 min	Total Imp(%)= 61.00 Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.46	0.29
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02

2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

Max.Eff.Inten.(mm/hr)=	69.60	75.04	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.40 (ii)	10.32 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.30	0.09	
			TOTALS
PEAK FLOW (cms)=	0.06	0.04	0.100 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	61.43	40.43	49.87
TOTAL RAINFALL (mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT =	0.98	0.65	0.80

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

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

ADD HYD (0033)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0100):	71.79	1.675	12.50	30.37
	+ ID2= 2 (0101):	0.75	0.100	12.00	49.87
	ID = 3 (0033):	72.55	1.693	12.50	30.57

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0020)	Area (ha)=	4.86	Curve Number (CN)=	65.2	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02

2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02				
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02				
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02				
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02				
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02				
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02				
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02				
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76				
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76				
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76				
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76				
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76				
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76				
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76				
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76				
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76				
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76				
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76				
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76				
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76				
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76				
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76				
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76				
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76				
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76				
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76				
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76				
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76				
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76				
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76				
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76				
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76				
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76				
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76				
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76				
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76				
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76				
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76				
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76				
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76				
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76				
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76				
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76				

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.190 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 17.058
TOTAL RAINFALL (mm)= 62.433
RUNOFF COEFFICIENT = 0.273

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

CALIB	
STANDHYD (0002)	Area (ha)= 22.30
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

	IMPERVIOUS	PERVIOUS (i)
Surface Area (ha)=	13.38	8.92
Dep. Storage (mm)=	1.00	1.50
Average Slope (%)=	1.00	2.00
Length (m)=	385.57	40.00
Mannings n =	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02
2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76

4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

				TOTALS
Max.Eff.Inten.(mm/hr)=	69.60	46.70		
over (min)	5.00	20.00		
Storage Coeff. (min)=	6.64 (ii)	16.21 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.18	0.06		
PEAK FLOW (cms)=	2.33	0.61		2.779 (iii)
TIME TO PEAK (hrs)=	12.00	12.17		12.00
RUNOFF VOLUME (mm)=	61.43	35.11		50.90
TOTAL RAINFALL (mm)=	62.43	62.43		62.43
RUNOFF COEFFICIENT =	0.98	0.56		0.82

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

ADD HYD (0011)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	22.30	2.779	12.00	50.90
+ ID2= 2 (0020):	4.86	0.190	12.08	17.06
ID = 3 (0011):	27.16	2.950	12.00	44.85

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0200)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.5430	0.7540
	0.4990	0.4125	1.8630	0.8500
	0.6850	0.4830	2.0380	0.8910
	1.2910	0.6430	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	27.160	2.950	12.00	44.85
OUTFLOW: ID= 1 (0200)	27.160	0.684	12.50	44.84

PEAK FLOW REDUCTION [Qout/Qin](%)= 23.19
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.4829

CALIB		
STANDHYD (0201)	Area (ha)= 0.59	
ID= 1 DT= 5.0 min	Total Imp(%)= 57.00	Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.34	0.25
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	62.72	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.27	12.083	12.20	18.08	1.27
0.167	0.76	6.167	1.27	12.167	12.19	18.17	1.27
0.250	0.76	6.250	1.27	12.250	9.45	18.25	1.27
0.333	0.76	6.333	1.27	12.333	7.62	18.33	1.27
0.417	0.76	6.417	1.27	12.417	7.21	18.42	1.27
0.500	0.76	6.500	1.27	12.500	5.59	18.50	1.27
0.583	0.76	6.583	1.27	12.583	5.59	18.58	1.27
0.667	0.76	6.667	1.27	12.667	5.18	18.67	1.27
0.750	0.76	6.750	1.27	12.750	5.08	18.75	1.27
0.833	0.76	6.833	1.27	12.833	4.57	18.83	1.27
0.917	0.76	6.917	1.27	12.917	3.81	18.92	1.27
1.000	0.76	7.000	1.27	13.000	3.81	19.00	1.27
1.083	0.76	7.083	1.27	13.083	3.05	19.08	1.02
1.167	0.76	7.167	1.27	13.167	3.05	19.17	1.02
1.250	0.76	7.250	1.27	13.250	3.05	19.25	1.02
1.333	0.76	7.333	1.27	13.333	3.05	19.33	1.02
1.417	0.76	7.417	1.27	13.417	3.05	19.42	1.02
1.500	0.76	7.500	1.27	13.500	3.05	19.50	1.02
1.583	0.76	7.583	1.27	13.583	3.05	19.58	1.02
1.667	0.76	7.667	1.27	13.667	3.05	19.67	1.02
1.750	0.76	7.750	1.27	13.750	3.05	19.75	1.02
1.833	0.76	7.833	1.27	13.833	3.05	19.83	1.02
1.917	0.76	7.917	1.27	13.917	3.05	19.92	1.02
2.000	0.76	8.000	1.27	14.000	3.05	20.00	1.02
2.083	0.76	8.083	1.78	14.083	1.78	20.08	1.02
2.167	0.76	8.167	1.78	14.167	1.78	20.17	1.02
2.250	0.76	8.250	1.78	14.250	1.78	20.25	1.02
2.333	0.76	8.333	1.78	14.333	1.78	20.33	1.02

2.417	0.76	8.417	1.78	14.417	1.78	20.42	1.02
2.500	0.76	8.500	1.78	14.500	1.78	20.50	1.02
2.583	0.76	8.583	1.78	14.583	1.78	20.58	1.02
2.667	0.76	8.667	1.78	14.667	1.78	20.67	1.02
2.750	0.76	8.750	1.78	14.750	1.78	20.75	1.02
2.833	0.76	8.833	1.78	14.833	1.78	20.83	1.02
2.917	0.76	8.917	1.78	14.917	1.78	20.92	1.02
3.000	0.76	9.000	1.78	15.000	1.78	21.00	1.02
3.083	0.76	9.083	1.78	15.083	1.78	21.08	0.76
3.167	0.76	9.167	1.78	15.167	1.78	21.17	0.76
3.250	0.76	9.250	1.78	15.250	1.78	21.25	0.76
3.333	0.76	9.333	1.78	15.333	1.78	21.33	0.76
3.417	0.76	9.417	1.78	15.417	1.78	21.42	0.76
3.500	0.76	9.500	1.78	15.500	1.78	21.50	0.76
3.583	0.76	9.583	1.78	15.583	1.78	21.58	0.76
3.667	0.76	9.667	1.78	15.667	1.78	21.67	0.76
3.750	0.76	9.750	1.78	15.750	1.78	21.75	0.76
3.833	0.76	9.833	1.78	15.833	1.78	21.83	0.76
3.917	0.76	9.917	1.78	15.917	1.78	21.92	0.76
4.000	0.76	10.000	1.78	16.000	1.78	22.00	0.76
4.083	1.27	10.083	3.30	16.083	1.27	22.08	0.76
4.167	1.27	10.167	3.30	16.167	1.27	22.17	0.76
4.250	1.27	10.250	3.30	16.250	1.27	22.25	0.76
4.333	1.27	10.333	3.30	16.333	1.27	22.33	0.76
4.417	1.27	10.417	3.30	16.417	1.27	22.42	0.76
4.500	1.27	10.500	3.30	16.500	1.27	22.50	0.76
4.583	1.27	10.583	3.30	16.583	1.27	22.58	0.76
4.667	1.27	10.667	3.30	16.667	1.27	22.67	0.76
4.750	1.27	10.750	3.30	16.750	1.27	22.75	0.76
4.833	1.27	10.833	3.30	16.833	1.27	22.83	0.76
4.917	1.27	10.917	3.30	16.917	1.27	22.92	0.76
5.000	1.27	11.000	3.30	17.000	1.27	23.00	0.76
5.083	1.27	11.083	4.57	17.083	1.27	23.08	0.76
5.167	1.27	11.167	4.57	17.167	1.27	23.17	0.76
5.250	1.27	11.250	5.79	17.250	1.27	23.25	0.76
5.333	1.27	11.333	6.60	17.333	1.27	23.33	0.76
5.417	1.27	11.417	8.33	17.417	1.27	23.42	0.76
5.500	1.27	11.500	15.24	17.500	1.27	23.50	0.76
5.583	1.27	11.583	15.24	17.583	1.27	23.58	0.76
5.667	1.27	11.667	29.67	17.667	1.27	23.67	0.76
5.750	1.27	11.750	33.27	17.750	1.27	23.75	0.76
5.833	1.27	11.833	47.80	17.833	1.27	23.83	0.76
5.917	1.27	11.917	69.60	17.917	1.27	23.92	0.76
6.000	1.27	12.000	69.60	18.000	1.27	24.00	0.76

			TOTALS
Max.Eff.Inten.(mm/hr)=	69.60	65.83	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.23 (ii)	10.57 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.30	0.09	
PEAK FLOW (cms)=	0.05	0.03	0.078 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	61.43	38.97	49.07
TOTAL RAINFALL (mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT =	0.98	0.62	0.79

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)

(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0034)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0200):	27.16	0.684	12.50	44.84
	+ ID2= 2 (0201):	0.59	0.078	12.00	49.07
	ID = 3 (0034):	27.75	0.698	12.50	44.93

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:bloor 24SCS010 **
****

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\b20a7e23-c0fc-442b-a399-0c055f5c1e41\239459ae
Ptotal= 82.45 mm	Comments: bloor 24SCS010

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	0.76	6.00	1.78	12.00	92.20	18.00	1.78
0.20	0.76	6.20	1.78	12.20	16.00	18.20	1.78
0.40	0.76	6.40	1.78	12.40	10.16	18.40	1.78
0.60	0.76	6.60	1.78	12.60	7.37	18.60	1.78
0.80	0.76	6.80	1.78	12.80	6.86	18.80	1.78
1.00	0.76	7.00	1.78	13.00	4.83	19.00	1.78
1.20	0.76	7.20	1.78	13.20	4.06	19.20	1.27
1.40	0.76	7.40	1.78	13.40	4.06	19.40	1.27
1.60	0.76	7.60	1.78	13.60	4.06	19.60	1.27
1.80	0.76	7.80	1.78	13.80	4.06	19.80	1.27
2.00	0.76	8.00	1.78	14.00	4.06	20.00	1.27
2.20	0.76	8.20	2.54	14.20	2.54	20.20	1.27
2.40	0.76	8.40	2.54	14.40	2.54	20.40	1.27
2.60	0.76	8.60	2.54	14.60	2.54	20.60	1.27
2.80	0.76	8.80	2.54	14.80	2.54	20.80	1.27
3.00	0.76	9.00	2.54	15.00	2.54	21.00	1.27
3.20	0.76	9.20	2.54	15.20	2.54	21.20	0.76
3.40	0.76	9.40	2.54	15.40	2.54	21.40	0.76
3.60	0.76	9.60	2.54	15.60	2.54	21.60	0.76
3.80	0.76	9.80	2.54	15.80	2.54	21.80	0.76
4.00	0.76	10.00	2.54	16.00	2.54	22.00	0.76
4.20	1.78	10.20	4.57	16.20	1.78	22.20	0.76
4.40	1.78	10.40	4.57	16.40	1.78	22.40	0.76
4.60	1.78	10.60	4.57	16.60	1.78	22.60	0.76
4.80	1.78	10.80	4.57	16.80	1.78	22.80	0.76
5.00	1.78	11.00	4.57	17.00	1.78	23.00	0.76
5.20	1.78	11.20	6.10	17.20	1.78	23.20	0.76
5.40	1.78	11.40	8.89	17.40	1.78	23.40	0.76
5.60	1.78	11.60	20.07	17.60	1.78	23.60	0.76
5.80	1.78	11.80	44.20	17.80	1.78	23.80	0.76

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| CALIB            |
| NASHYD   (  0010)|   Area     (ha)=  42.94   Curve Number    (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47
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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	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

```
     Unit Hyd Qpeak  (cms)=   3.489

     PEAK FLOW       (cms)=   1.566 (i)
     TIME TO PEAK    (hrs)=  12.583
     RUNOFF VOLUME    (mm)=  27.375
     TOTAL RAINFALL   (mm)=  82.446
     RUNOFF COEFFICIENT   =   0.332

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| CALIB            |
| STANDHYD (  0001)|   Area     (ha)=  28.86
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.32         11.54
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     438.63         40.00
     Mannings n           =      0.013         0.250
```

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78

0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

Max.Eff.Inten.(mm/hr)=	92.20	67.43	
over (min)	5.00	15.00	
Storage Coeff. (min)=	6.41 (ii)	14.67 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.18	0.08	
			TOTALS
PEAK FLOW (cms)=	3.91	1.28	4.868 (iii)
TIME TO PEAK (hrs)=	12.17	12.33	12.17
RUNOFF VOLUME (mm)=	81.45	52.10	69.71
TOTAL RAINFALL (mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT =	0.99	0.63	0.85

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

ADD HYD (0012)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	28.86	4.868	12.17	69.71
+ ID2= 2 (0010):	42.94	1.566	12.58	27.38
ID = 3 (0012):	71.79	5.603	12.17	44.39

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0100)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	3.7410	0.8860
	1.2270	0.4905	4.5380	0.9850
	1.6770	0.5725	4.9340	1.0280
	2.8410	0.7675	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0012)	71.795	5.603	12.17	44.39
OUTFLOW: ID= 1 (0100)	71.795	2.831	12.58	44.39

PEAK FLOW REDUCTION [Qout/Qin](%)= 50.52
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 0.7674

CALIB			
STANDHYD (0101)	Area (ha)=	0.75	
ID= 1 DT= 5.0 min	Total Imp(%)=	61.00	Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.46	0.29
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

				TOTALS
Max.Eff.Inten.	(mm/hr)=	92.20	105.92	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	2.14 (ii)	9.04 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	10.00	
Unit Hyd. peak	(cms)=	0.31	0.12	
PEAK FLOW	(cms)=	0.09	0.06	0.146 (iii)
TIME TO PEAK	(hrs)=	12.17	12.25	12.17
RUNOFF VOLUME	(mm)=	81.45	58.53	68.83
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.71	0.83

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

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

ADD HYD (0033)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0100):		71.79	2.831	12.58	44.39
+ ID2= 2 (0101):		0.75	0.146	12.17	68.83
ID = 3 (0033):		72.55	2.860	12.58	44.64

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB

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| NASHYD   (  0020)|   Area     (ha)=   4.86   Curve Number    (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
-------------------   U.H. Tp(hrs)=   0.20
```

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

```
     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.310 (i)
     TIME TO PEAK    (hrs)=  12.250
     RUNOFF VOLUME    (mm)=  28.103
     TOTAL RAINFALL   (mm)=  82.446
     RUNOFF COEFFICIENT   =   0.341

     (i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.38          8.92
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     385.57         40.00
     Mannings n             =     0.013         0.250
```

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78

0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

```
     Max.Eff.Inten.(mm/hr)=      92.20        67.43
               over (min)        5.00        15.00
     Storage Coeff.  (min)=      5.93 (ii)   14.19 (ii)
     Unit Hyd. Tpeak (min)=      5.00        15.00
     Unit Hyd. peak  (cms)=      0.19         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=      3.07         1.00         3.825 (iii)
     TIME TO PEAK    (hrs)=     12.17        12.33        12.17
     RUNOFF VOLUME    (mm)=     81.45        52.10        69.71
     TOTAL RAINFALL   (mm)=     82.45        82.45        82.45
     RUNOFF COEFFICIENT   =      0.99         0.63         0.85


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

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--------------------
| ADD HYD  (  0011)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0002):    22.30   3.825    12.17    69.71
     + ID2= 2 (  0020):     4.86   0.310    12.25    28.10
       ================================================
       ID = 3 (  0011):    27.16   4.079    12.17    62.26

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                         0.0000     0.0000   |   1.5430      0.7540
                         0.4990     0.4125   |   1.8630      0.8500
                         0.6850     0.4830   |   2.0380      0.8910
                         1.2910     0.6430   |   0.0000      0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.160      4.079     12.17      62.26
   OUTFLOW: ID= 1 (  0200)     27.160      1.285     12.58      62.25

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 31.50
                  TIME SHIFT OF PEAK FLOW          (min)= 25.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.6429

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--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
```

Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	62.72	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	0.76	6.083	1.78	12.083	92.19	18.08	1.78
0.167	0.76	6.167	1.78	12.167	92.20	18.17	1.78
0.250	0.76	6.250	1.78	12.250	46.49	18.25	1.78
0.333	0.76	6.333	1.78	12.333	16.00	18.33	1.78
0.417	0.76	6.417	1.78	12.417	14.83	18.42	1.78
0.500	0.76	6.500	1.78	12.500	10.16	18.50	1.78
0.583	0.76	6.583	1.78	12.583	10.16	18.58	1.78
0.667	0.76	6.667	1.78	12.667	7.93	18.67	1.78
0.750	0.76	6.750	1.78	12.750	7.37	18.75	1.78
0.833	0.76	6.833	1.78	12.833	7.17	18.83	1.78
0.917	0.76	6.917	1.78	12.917	6.86	18.92	1.78
1.000	0.76	7.000	1.78	13.000	6.86	19.00	1.78
1.083	0.76	7.083	1.78	13.083	4.83	19.08	1.78
1.167	0.76	7.167	1.78	13.167	4.83	19.17	1.78
1.250	0.76	7.250	1.78	13.250	4.37	19.25	1.47
1.333	0.76	7.333	1.78	13.333	4.06	19.33	1.27
1.417	0.76	7.417	1.78	13.417	4.06	19.42	1.27
1.500	0.76	7.500	1.78	13.500	4.06	19.50	1.27
1.583	0.76	7.583	1.78	13.583	4.06	19.58	1.27
1.667	0.76	7.667	1.78	13.667	4.06	19.67	1.27
1.750	0.76	7.750	1.78	13.750	4.06	19.75	1.27
1.833	0.76	7.833	1.78	13.833	4.06	19.83	1.27
1.917	0.76	7.917	1.78	13.917	4.06	19.92	1.27
2.000	0.76	8.000	1.78	14.000	4.06	20.00	1.27
2.083	0.76	8.083	1.78	14.083	4.06	20.08	1.27
2.167	0.76	8.167	1.78	14.167	4.06	20.17	1.27
2.250	0.76	8.250	2.24	14.250	3.15	20.25	1.27
2.333	0.76	8.333	2.54	14.333	2.54	20.33	1.27
2.417	0.76	8.417	2.54	14.417	2.54	20.42	1.27
2.500	0.76	8.500	2.54	14.500	2.54	20.50	1.27
2.583	0.76	8.583	2.54	14.583	2.54	20.58	1.27
2.667	0.76	8.667	2.54	14.667	2.54	20.67	1.27
2.750	0.76	8.750	2.54	14.750	2.54	20.75	1.27
2.833	0.76	8.833	2.54	14.833	2.54	20.83	1.27
2.917	0.76	8.917	2.54	14.917	2.54	20.92	1.27
3.000	0.76	9.000	2.54	15.000	2.54	21.00	1.27
3.083	0.76	9.083	2.54	15.083	2.54	21.08	1.27
3.167	0.76	9.167	2.54	15.167	2.54	21.17	1.27
3.250	0.76	9.250	2.54	15.250	2.54	21.25	0.96
3.333	0.76	9.333	2.54	15.333	2.54	21.33	0.76
3.417	0.76	9.417	2.54	15.417	2.54	21.42	0.76
3.500	0.76	9.500	2.54	15.500	2.54	21.50	0.76
3.583	0.76	9.583	2.54	15.583	2.54	21.58	0.76
3.667	0.76	9.667	2.54	15.667	2.54	21.67	0.76
3.750	0.76	9.750	2.54	15.750	2.54	21.75	0.76
3.833	0.76	9.833	2.54	15.833	2.54	21.83	0.76
3.917	0.76	9.917	2.54	15.917	2.54	21.92	0.76
4.000	0.76	10.000	2.54	16.000	2.54	22.00	0.76
4.083	0.76	10.083	2.54	16.083	2.54	22.08	0.76
4.167	0.76	10.167	2.54	16.167	2.54	22.17	0.76
4.250	1.37	10.250	3.76	16.250	2.08	22.25	0.76
4.333	1.78	10.333	4.57	16.333	1.78	22.33	0.76
4.417	1.78	10.417	4.57	16.417	1.78	22.42	0.76
4.500	1.78	10.500	4.57	16.500	1.78	22.50	0.76
4.583	1.78	10.583	4.57	16.583	1.78	22.58	0.76
4.667	1.78	10.667	4.57	16.667	1.78	22.67	0.76
4.750	1.78	10.750	4.57	16.750	1.78	22.75	0.76
4.833	1.78	10.833	4.57	16.833	1.78	22.83	0.76
4.917	1.78	10.917	4.57	16.917	1.78	22.92	0.76
5.000	1.78	11.000	4.57	17.000	1.78	23.00	0.76
5.083	1.78	11.083	4.57	17.083	1.78	23.08	0.76
5.167	1.78	11.167	4.57	17.167	1.78	23.17	0.76
5.250	1.78	11.250	5.49	17.250	1.78	23.25	0.76
5.333	1.78	11.333	6.10	17.333	1.78	23.33	0.76
5.417	1.78	11.417	6.66	17.417	1.78	23.42	0.76
5.500	1.78	11.500	8.89	17.500	1.78	23.50	0.76
5.583	1.78	11.583	8.89	17.583	1.78	23.58	0.76
5.667	1.78	11.667	17.83	17.667	1.78	23.67	0.76
5.750	1.78	11.750	20.07	17.750	1.78	23.75	0.76
5.833	1.78	11.833	29.72	17.833	1.78	23.83	0.76
5.917	1.78	11.917	44.20	17.917	1.78	23.92	0.76
6.000	1.78	12.000	44.20	18.000	1.78	24.00	0.76

Max.Eff.Inten.	(mm/hr)=	92.20	93.49	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	1.99 (ii)	9.25 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	10.00	
Unit Hyd. peak	(cms)=	0.31	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.07	0.05	0.113 (iii)
TIME TO PEAK	(hrs)=	12.17	12.25	12.17
RUNOFF VOLUME	(mm)=	81.45	56.79	67.88
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.69	0.82

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

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

ADD HYD (0034)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0200):		27.16	1.285	12.58	62.25
+ ID2= 2 (0201):		0.59	0.113	12.17	67.88
ID = 3 (0034):		27.75	1.308	12.58	62.37

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:bloor 24SCS025 **
****

```
|    READ STORM    |    Filename: C:\Users\gvolpe\AppD
|                  |              ata\Local\Temp\
|                  |              b20a7e23-c0fc-442b-a399-0c055f5c1e41\5b1a359d
| Ptotal= 95.96 mm |    Comments: bloor 24SCS025
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TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.02	6.00	2.03	12.00	18.80	18.00	2.03
0.20	1.02	6.20	2.03	12.20	11.68	18.20	2.03
0.40	1.02	6.40	2.03	12.40	8.38	18.40	2.03
0.60	1.02	6.60	2.03	12.60	8.13	18.60	2.03
0.80	1.02	6.80	2.03	12.80	5.59	18.80	2.03
1.00	1.02	7.00	2.03	13.00	4.83	19.00	1.52
1.20	1.02	7.20	2.03	13.20	4.83	19.20	1.52
1.40	1.02	7.40	2.03	13.40	4.83	19.40	1.52
1.60	1.02	7.60	2.03	13.60	4.83	19.60	1.52
1.80	1.02	7.80	2.03	13.80	4.83	19.80	1.52
2.00	1.02	8.00	2.79	14.00	2.79	20.00	1.52
2.20	1.02	8.20	2.79	14.20	2.79	20.20	1.52
2.40	1.02	8.40	2.79	14.40	2.79	20.40	1.52
2.60	1.02	8.60	2.79	14.60	2.79	20.60	1.52
2.80	1.02	8.80	2.79	14.80	2.79	20.80	1.52
3.00	1.02	9.00	2.79	15.00	2.79	21.00	1.02
3.20	1.02	9.20	2.79	15.20	2.79	21.20	1.02
3.40	1.02	9.40	2.79	15.40	2.79	21.40	1.02
3.60	1.02	9.60	2.79	15.60	2.79	21.60	1.02
3.80	1.02	9.80	2.79	15.80	2.79	21.80	1.02
4.00	2.03	10.00	5.08	16.00	2.03	22.00	1.02
4.20	2.03	10.20	5.08	16.20	2.03	22.20	1.02
4.40	2.03	10.40	5.08	16.40	2.03	22.40	1.02
4.60	2.03	10.60	5.08	16.60	2.03	22.60	1.02
4.80	2.03	10.80	5.08	16.80	2.03	22.80	1.02
5.00	2.03	11.00	7.11	17.00	2.03	23.00	1.02
5.20	2.03	11.20	10.41	17.20	2.03	23.20	1.02
5.40	2.03	11.40	23.37	17.40	2.03	23.40	1.02
5.60	2.03	11.60	51.56	17.60	2.03	23.60	1.02
5.80	2.03	11.80	107.44	17.80	2.03	23.80	1.02

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--------------------
| CALIB            |
| NASHYD   (  0010)|   Area    (ha)=  42.94   Curve Number   (CN)= 64.2
|ID= 1 DT= 5.0 min |   Ia      (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.47

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02

5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 2.044 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 35.569
TOTAL RAINFALL (mm)= 95.961
RUNOFF COEFFICIENT = 0.371

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

CALIB	
STANDHYD (0001)	Area (ha)= 28.86
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.32	11.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	438.63	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

Max.Eff.Inten.(mm/hr)=		107.44	84.40	
over (min)		5.00	15.00	
Storage Coeff. (min)=		6.03 (ii)	13.58 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.19	0.08	
				TOTALS
PEAK FLOW	(cms)=	4.74	1.63	6.153 (iii)
TIME TO PEAK	(hrs)=	12.00	12.08	12.00
RUNOFF VOLUME	(mm)=	94.96	64.06	82.60
TOTAL RAINFALL	(mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT	=	0.99	0.67	0.86

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

ADD HYD (0012)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0001):	28.86	6.153	12.00	82.60
	+ ID2= 2 (0010):	42.94	2.044	12.33	35.57
	ID = 3 (0012):	71.79	7.288	12.00	54.48

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0100)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	3.7410	0.8860
	1.2270	0.4905	4.5380	0.9850
	1.6770	0.5725	4.9340	1.0280
	2.8410	0.7675	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0012)	71.795	7.288	12.00	54.48
OUTFLOW: ID= 1 (0100)	71.795	3.728	12.33	54.47

PEAK FLOW REDUCTION [Qout/Qin](%)= 51.15
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.8857

CALIB			
STANDHYD (0101)	Area (ha)=	0.75	
ID= 1 DT= 5.0 min	Total Imp(%)=	61.00	Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.46	0.29
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02

5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

			TOTALS
Max.Eff.Inten.(mm/hr)=	107.44	129.89	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.02 (ii)	8.37 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.31	0.12	
PEAK FLOW (cms)=	0.10	0.08	0.181 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	94.96	71.09	81.82
TOTAL RAINFALL (mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT =	0.99	0.74	0.85

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

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

ADD HYD (0033)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0100):		71.79	3.728	12.33	54.47
+ ID2= 2 (0101):		0.75	0.181	12.00	81.82
ID = 3 (0033):		72.55	3.765	12.33	54.76

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB					
NASHYD (0020)	Area (ha)=	4.86	Curve Number (CN)=	65.2	
ID= 1 DT= 5.0 min	Ia (mm)=	5.00	# of Linear Res.(N)=	3.00	
	U.H. Tp(hrs)=	0.20			

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

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     Unit Hyd Qpeak  (cms)=   0.928

     PEAK FLOW       (cms)=   0.414 (i)
     TIME TO PEAK    (hrs)=  12.083
     RUNOFF VOLUME    (mm)=  36.455
     TOTAL RAINFALL   (mm)=  95.961
     RUNOFF COEFFICIENT   =   0.380

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

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| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=  22.30
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
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                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.38         8.92
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     385.57        40.00
     Mannings n           =      0.013        0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.02	6.083	2.03	12.083	18.81	18.08	2.03
0.167	1.02	6.167	2.03	12.167	18.80	18.17	2.03
0.250	1.02	6.250	2.03	12.250	14.53	18.25	2.03
0.333	1.02	6.333	2.03	12.333	11.68	18.33	2.03
0.417	1.02	6.417	2.03	12.417	11.02	18.42	2.03
0.500	1.02	6.500	2.03	12.500	8.38	18.50	2.03
0.583	1.02	6.583	2.03	12.583	8.38	18.58	2.03
0.667	1.02	6.667	2.03	12.667	8.18	18.67	2.03
0.750	1.02	6.750	2.03	12.750	8.13	18.75	2.03
0.833	1.02	6.833	2.03	12.833	7.11	18.83	2.03
0.917	1.02	6.917	2.03	12.917	5.59	18.92	2.03
1.000	1.02	7.000	2.03	13.000	5.59	19.00	2.03
1.083	1.02	7.083	2.03	13.083	4.83	19.08	1.52
1.167	1.02	7.167	2.03	13.167	4.83	19.17	1.52
1.250	1.02	7.250	2.03	13.250	4.83	19.25	1.52
1.333	1.02	7.333	2.03	13.333	4.83	19.33	1.52
1.417	1.02	7.417	2.03	13.417	4.83	19.42	1.52
1.500	1.02	7.500	2.03	13.500	4.83	19.50	1.52
1.583	1.02	7.583	2.03	13.583	4.83	19.58	1.52
1.667	1.02	7.667	2.03	13.667	4.83	19.67	1.52
1.750	1.02	7.750	2.03	13.750	4.83	19.75	1.52
1.833	1.02	7.833	2.03	13.833	4.83	19.83	1.52
1.917	1.02	7.917	2.03	13.917	4.83	19.92	1.52
2.000	1.02	8.000	2.03	14.000	4.83	20.00	1.52
2.083	1.02	8.083	2.79	14.083	2.79	20.08	1.52
2.167	1.02	8.167	2.79	14.167	2.79	20.17	1.52
2.250	1.02	8.250	2.79	14.250	2.79	20.25	1.52
2.333	1.02	8.333	2.79	14.333	2.79	20.33	1.52
2.417	1.02	8.417	2.79	14.417	2.79	20.42	1.52
2.500	1.02	8.500	2.79	14.500	2.79	20.50	1.52
2.583	1.02	8.583	2.79	14.583	2.79	20.58	1.52
2.667	1.02	8.667	2.79	14.667	2.79	20.67	1.52
2.750	1.02	8.750	2.79	14.750	2.79	20.75	1.52
2.833	1.02	8.833	2.79	14.833	2.79	20.83	1.52
2.917	1.02	8.917	2.79	14.917	2.79	20.92	1.52
3.000	1.02	9.000	2.79	15.000	2.79	21.00	1.52
3.083	1.02	9.083	2.79	15.083	2.79	21.08	1.02
3.167	1.02	9.167	2.79	15.167	2.79	21.17	1.02
3.250	1.02	9.250	2.79	15.250	2.79	21.25	1.02
3.333	1.02	9.333	2.79	15.333	2.79	21.33	1.02
3.417	1.02	9.417	2.79	15.417	2.79	21.42	1.02
3.500	1.02	9.500	2.79	15.500	2.79	21.50	1.02
3.583	1.02	9.583	2.79	15.583	2.79	21.58	1.02
3.667	1.02	9.667	2.79	15.667	2.79	21.67	1.02
3.750	1.02	9.750	2.79	15.750	2.79	21.75	1.02
3.833	1.02	9.833	2.79	15.833	2.79	21.83	1.02
3.917	1.02	9.917	2.79	15.917	2.79	21.92	1.02
4.000	1.02	10.000	2.79	16.000	2.79	22.00	1.02
4.083	2.03	10.083	5.08	16.083	2.03	22.08	1.02
4.167	2.03	10.167	5.08	16.167	2.03	22.17	1.02
4.250	2.03	10.250	5.08	16.250	2.03	22.25	1.02
4.333	2.03	10.333	5.08	16.333	2.03	22.33	1.02
4.417	2.03	10.417	5.08	16.417	2.03	22.42	1.02
4.500	2.03	10.500	5.08	16.500	2.03	22.50	1.02
4.583	2.03	10.583	5.08	16.583	2.03	22.58	1.02
4.667	2.03	10.667	5.08	16.667	2.03	22.67	1.02
4.750	2.03	10.750	5.08	16.750	2.03	22.75	1.02
4.833	2.03	10.833	5.08	16.833	2.03	22.83	1.02
4.917	2.03	10.917	5.08	16.917	2.03	22.92	1.02
5.000	2.03	11.000	5.08	17.000	2.03	23.00	1.02
5.083	2.03	11.083	7.11	17.083	2.03	23.08	1.02
5.167	2.03	11.167	7.11	17.167	2.03	23.17	1.02
5.250	2.03	11.250	9.09	17.250	2.03	23.25	1.02
5.333	2.03	11.333	10.41	17.333	2.03	23.33	1.02
5.417	2.03	11.417	13.00	17.417	2.03	23.42	1.02
5.500	2.03	11.500	23.37	17.500	2.03	23.50	1.02
5.583	2.03	11.583	23.37	17.583	2.03	23.58	1.02
5.667	2.03	11.667	45.92	17.667	2.03	23.67	1.02
5.750	2.03	11.750	51.56	17.750	2.03	23.75	1.02
5.833	2.03	11.833	73.91	17.833	2.03	23.83	1.02
5.917	2.03	11.917	107.44	17.917	2.03	23.92	1.02
6.000	2.03	12.000	107.44	18.000	2.03	24.00	1.02

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Max.Eff.Inten.(mm/hr)=     107.44        84.40
          over (min)          5.00        15.00
Storage Coeff.  (min)=       5.58 (ii)   13.13 (ii)
Unit Hyd. Tpeak (min)=       5.00        15.00
Unit Hyd. peak  (cms)=       0.20         0.08
                                                    *TOTALS*
PEAK FLOW       (cms)=       3.71         1.28        4.819 (iii)
TIME TO PEAK    (hrs)=      12.00        12.08          12.00
RUNOFF VOLUME    (mm)=      94.96        64.06          82.60
TOTAL RAINFALL   (mm)=      95.96        95.96          95.96
RUNOFF COEFFICIENT   =        0.99         0.67           0.86


  (i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
      CN*  =  85.0    Ia = Dep. Storage  (Above)
 (ii) TIME STEP (DT)  SHOULD BE SMALLER OR EQUAL
      THAN THE STORAGE COEFFICIENT.
(iii) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.
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| ADD HYD  (  0011)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    22.30   4.819    12.00    82.60
      + ID2= 2 (  0020):     4.86   0.414    12.08    36.45
        ================================================
        ID = 3 (  0011):    27.16   5.198    12.00    74.34

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |   1.5430     0.7540
                          0.4990     0.4125   |   1.8630     0.8500
                          0.6850     0.4830   |   2.0380     0.8910
                          1.2910     0.6430   |   0.0000     0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.160     5.198     12.00      74.34
   OUTFLOW: ID= 1 (  0200)     27.160     1.541     12.33      74.34

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 29.65
                  TIME SHIFT OF PEAK FLOW          (min)= 20.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.7537

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.59
|ID= 1 DT= 5.0 min |   Total Imp(%)=  57.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.34         0.25
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      62.72        40.00
     Mannings n           =      0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
               TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
              0.083    1.02 | 6.083    2.03 |12.083   18.81 | 18.08    2.03
              0.167    1.02 | 6.167    2.03 |12.167   18.80 | 18.17    2.03
              0.250    1.02 | 6.250    2.03 |12.250   14.53 | 18.25    2.03
              0.333    1.02 | 6.333    2.03 |12.333   11.68 | 18.33    2.03
              0.417    1.02 | 6.417    2.03 |12.417   11.02 | 18.42    2.03
              0.500    1.02 | 6.500    2.03 |12.500    8.38 | 18.50    2.03
              0.583    1.02 | 6.583    2.03 |12.583    8.38 | 18.58    2.03
              0.667    1.02 | 6.667    2.03 |12.667    8.18 | 18.67    2.03
              0.750    1.02 | 6.750    2.03 |12.750    8.13 | 18.75    2.03
              0.833    1.02 | 6.833    2.03 |12.833    7.11 | 18.83    2.03
              0.917    1.02 | 6.917    2.03 |12.917    5.59 | 18.92    2.03
              1.000    1.02 | 7.000    2.03 |13.000    5.59 | 19.00    2.03
              1.083    1.02 | 7.083    2.03 |13.083    4.83 | 19.08    1.52
              1.167    1.02 | 7.167    2.03 |13.167    4.83 | 19.17    1.52
              1.250    1.02 | 7.250    2.03 |13.250    4.83 | 19.25    1.52
              1.333    1.02 | 7.333    2.03 |13.333    4.83 | 19.33    1.52
              1.417    1.02 | 7.417    2.03 |13.417    4.83 | 19.42    1.52
              1.500    1.02 | 7.500    2.03 |13.500    4.83 | 19.50    1.52
              1.583    1.02 | 7.583    2.03 |13.583    4.83 | 19.58    1.52
              1.667    1.02 | 7.667    2.03 |13.667    4.83 | 19.67    1.52
              1.750    1.02 | 7.750    2.03 |13.750    4.83 | 19.75    1.52
              1.833    1.02 | 7.833    2.03 |13.833    4.83 | 19.83    1.52
              1.917    1.02 | 7.917    2.03 |13.917    4.83 | 19.92    1.52
              2.000    1.02 | 8.000    2.03 |14.000    4.83 | 20.00    1.52
              2.083    1.02 | 8.083    2.79 |14.083    2.79 | 20.08    1.52
              2.167    1.02 | 8.167    2.79 |14.167    2.79 | 20.17    1.52
              2.250    1.02 | 8.250    2.79 |14.250    2.79 | 20.25    1.52
              2.333    1.02 | 8.333    2.79 |14.333    2.79 | 20.33    1.52
              2.417    1.02 | 8.417    2.79 |14.417    2.79 | 20.42    1.52
              2.500    1.02 | 8.500    2.79 |14.500    2.79 | 20.50    1.52
              2.583    1.02 | 8.583    2.79 |14.583    2.79 | 20.58    1.52
              2.667    1.02 | 8.667    2.79 |14.667    2.79 | 20.67    1.52
              2.750    1.02 | 8.750    2.79 |14.750    2.79 | 20.75    1.52
              2.833    1.02 | 8.833    2.79 |14.833    2.79 | 20.83    1.52
              2.917    1.02 | 8.917    2.79 |14.917    2.79 | 20.92    1.52
              3.000    1.02 | 9.000    2.79 |15.000    2.79 | 21.00    1.52
              3.083    1.02 | 9.083    2.79 |15.083    2.79 | 21.08    1.02
              3.167    1.02 | 9.167    2.79 |15.167    2.79 | 21.17    1.02
              3.250    1.02 | 9.250    2.79 |15.250    2.79 | 21.25    1.02
              3.333    1.02 | 9.333    2.79 |15.333    2.79 | 21.33    1.02
              3.417    1.02 | 9.417    2.79 |15.417    2.79 | 21.42    1.02
              3.500    1.02 | 9.500    2.79 |15.500    2.79 | 21.50    1.02
              3.583    1.02 | 9.583    2.79 |15.583    2.79 | 21.58    1.02
              3.667    1.02 | 9.667    2.79 |15.667    2.79 | 21.67    1.02
              3.750    1.02 | 9.750    2.79 |15.750    2.79 | 21.75    1.02
              3.833    1.02 | 9.833    2.79 |15.833    2.79 | 21.83    1.02
              3.917    1.02 | 9.917    2.79 |15.917    2.79 | 21.92    1.02
              4.000    1.02 |10.000    2.79 |16.000    2.79 | 22.00    1.02
              4.083    2.03 |10.083    5.08 |16.083    2.03 | 22.08    1.02
              4.167    2.03 |10.167    5.08 |16.167    2.03 | 22.17    1.02
              4.250    2.03 |10.250    5.08 |16.250    2.03 | 22.25    1.02
              4.333    2.03 |10.333    5.08 |16.333    2.03 | 22.33    1.02
              4.417    2.03 |10.417    5.08 |16.417    2.03 | 22.42    1.02
              4.500    2.03 |10.500    5.08 |16.500    2.03 | 22.50    1.02
              4.583    2.03 |10.583    5.08 |16.583    2.03 | 22.58    1.02
              4.667    2.03 |10.667    5.08 |16.667    2.03 | 22.67    1.02
              4.750    2.03 |10.750    5.08 |16.750    2.03 | 22.75    1.02
              4.833    2.03 |10.833    5.08 |16.833    2.03 | 22.83    1.02
              4.917    2.03 |10.917    5.08 |16.917    2.03 | 22.92    1.02
              5.000    2.03 |11.000    5.08 |17.000    2.03 | 23.00    1.02
              5.083    2.03 |11.083    7.11 |17.083    2.03 | 23.08    1.02
              5.167    2.03 |11.167    7.11 |17.167    2.03 | 23.17    1.02
              5.250    2.03 |11.250    9.09 |17.250    2.03 | 23.25    1.02
              5.333    2.03 |11.333   10.41 |17.333    2.03 | 23.33    1.02
              5.417    2.03 |11.417   13.00 |17.417    2.03 | 23.42    1.02
              5.500    2.03 |11.500   23.37 |17.500    2.03 | 23.50    1.02
              5.583    2.03 |11.583   23.37 |17.583    2.03 | 23.58    1.02
              5.667    2.03 |11.667   45.92 |17.667    2.03 | 23.67    1.02
              5.750    2.03 |11.750   51.56 |17.750    2.03 | 23.75    1.02
              5.833    2.03 |11.833   73.91 |17.833    2.03 | 23.83    1.02
              5.917    2.03 |11.917  107.44 |17.917    2.03 | 23.92    1.02
              6.000    2.03 |12.000  107.44 |18.000    2.03 | 24.00    1.02
```

Max.Eff.Inten.(mm/hr)=	107.44	115.28	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.88 (ii)	8.54 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.32	0.12	
			TOTALS
PEAK FLOW (cms)=	0.08	0.06	0.140 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	94.96	69.20	80.79
TOTAL RAINFALL (mm)=	95.96	95.96	95.96
RUNOFF COEFFICIENT =	0.99	0.72	0.84

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

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

ADD HYD (0034)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0200):	27.16	1.541	12.33	74.34
	+ ID2= 2 (0201):	0.59	0.140	12.00	80.79
	ID = 3 (0034):	27.75	1.570	12.33	74.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:bloor 24SCS050 **
****

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\b20a7e23-c0fc-442b-a399-0c055f5c1e41\b731117d
Ptotal=108.06 mm	Comments: bloor 24SCS050

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.10	6.00	2.20	12.00	22.04	18.00	2.20
0.20	1.10	6.20	2.20	12.20	13.78	18.20	2.20
0.40	1.10	6.40	2.20	12.40	9.92	18.40	2.20
0.60	1.10	6.60	2.20	12.60	9.37	18.60	2.20
0.80	1.10	6.80	2.20	12.80	6.61	18.80	2.20
1.00	1.10	7.00	2.20	13.00	5.51	19.00	1.65
1.20	1.10	7.20	2.20	13.20	5.51	19.20	1.65
1.40	1.10	7.40	2.20	13.40	5.51	19.40	1.65
1.60	1.10	7.60	2.20	13.60	5.51	19.60	1.65
1.80	1.10	7.80	2.20	13.80	5.51	19.80	1.65
2.00	1.10	8.00	3.31	14.00	3.31	20.00	1.65
2.20	1.10	8.20	3.31	14.20	3.31	20.20	1.65
2.40	1.10	8.40	3.31	14.40	3.31	20.40	1.65
2.60	1.10	8.60	3.31	14.60	3.31	20.60	1.65
2.80	1.10	8.80	3.31	14.80	3.31	20.80	1.65
3.00	1.10	9.00	3.31	15.00	3.31	21.00	1.10
3.20	1.10	9.20	3.31	15.20	3.31	21.20	1.10
3.40	1.10	9.40	3.31	15.40	3.31	21.40	1.10
3.60	1.10	9.60	3.31	15.60	3.31	21.60	1.10
3.80	1.10	9.80	3.31	15.80	3.31	21.80	1.10
4.00	2.20	10.00	6.05	16.00	2.20	22.00	1.10
4.20	2.20	10.20	6.05	16.20	2.20	22.20	1.10
4.40	2.20	10.40	6.05	16.40	2.20	22.40	1.10
4.60	2.20	10.60	6.05	16.60	2.20	22.60	1.10
4.80	2.20	10.80	6.05	16.80	2.20	22.80	1.10
5.00	2.20	11.00	8.26	17.00	2.20	23.00	1.10
5.20	2.20	11.20	12.12	17.20	2.20	23.20	1.10
5.40	2.20	11.40	27.55	17.40	2.20	23.40	1.10
5.60	2.20	11.60	60.61	17.60	2.20	23.60	1.10
5.80	2.20	11.80	114.06	17.80	2.20	23.80	1.10

CALIB			
NASHYD (0010)	Area (ha)= 42.94	Curve Number (CN)= 64.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.47		

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	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65

2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 2.477 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 43.406
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.402

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

CALIB			
STANDHYD (0001)	Area (ha)=	28.86	
ID= 1 DT= 5.0 min	Total Imp(%)=	60.00	Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.32	11.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	438.63	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10

4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

				TOTALS
Max.Eff.Inten.(mm/hr)=		114.06	92.78	
over (min)		5.00	15.00	
Storage Coeff. (min)=		5.88 (ii)	13.16 (ii)	
Unit Hyd. Tpeak (min)=		5.00	15.00	
Unit Hyd. peak (cms)=		0.19	0.08	
PEAK FLOW	(cms)=	5.09	1.88	6.747 (iii)
TIME TO PEAK	(hrs)=	12.00	12.08	12.00
RUNOFF VOLUME	(mm)=	107.06	75.01	94.24
TOTAL RAINFALL	(mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT	=	0.99	0.69	0.87

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

ADD HYD (0012)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0001):	28.86	6.747	12.00	94.24
	+ ID2= 2 (0010):	42.94	2.477	12.33	43.41
	ID = 3 (0012):	71.79	8.174	12.00	63.84

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0100)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	3.7410	0.8860
	1.2270	0.4905	4.5380	0.9850
	1.6770	0.5725	4.9340	1.0280
	2.8410	0.7675	0.0000	0.0000

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (	0012)	71.795	8.174	12.00	63.84
OUTFLOW: ID= 1 (	0100)	71.795	4.535	12.33	63.84

PEAK FLOW REDUCTION [Qout/Qin](%)= 55.48
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.9850

CALIB	
STANDHYD (0101)	Area (ha)= 0.75
ID= 1 DT= 5.0 min	Total Imp(%)= 61.00 Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.46	0.29
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	70.71	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65

2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

			TOTALS
Max.Eff.Inten.(mm/hr)=	114.06	141.28	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.97 (ii)	8.12 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.31	0.13	
PEAK FLOW (cms)=	0.11	0.09	0.197 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	82.49	93.54
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.76	0.87

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

(i) CN PROCEDURE SELECTED FOR PERVIOUS LOSSES:
CN* = 85.0 Ia = Dep. Storage (Above)
(ii) TIME STEP (DT) SHOULD BE SMALLER OR EQUAL
THAN THE STORAGE COEFFICIENT.

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

ADD HYD (0033)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0100):	71.79	4.535	12.33	63.84
	+ ID2= 2 (0101):	0.75	0.197	12.00	93.54
	ID = 3 (0033):	72.55	4.577	12.33	64.15

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

CALIB			
NASHYD (0020)	Area (ha)= 4.86	Curve Number (CN)= 65.2	
ID= 1 DT= 5.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 0.20		

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65

2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.491 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 44.428
TOTAL RAINFALL (mm)= 108.064
RUNOFF COEFFICIENT = 0.411

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

CALIB			
STANDHYD (0002)	Area (ha)= 22.30		
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 60.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.38	8.92
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	385.57	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
0.083	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65
2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10

4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

Max.Eff.Inten.(mm/hr)=	114.06	92.78		
over (min)	5.00	15.00		
Storage Coeff. (min)=	5.45 (ii)	12.72 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.20	0.08		
			TOTALS	
PEAK FLOW (cms)=	3.98	1.47	5.277 (iii)	
TIME TO PEAK (hrs)=	12.00	12.08	12.00	
RUNOFF VOLUME (mm)=	107.06	75.01	94.24	
TOTAL RAINFALL (mm)=	108.06	108.06	108.06	
RUNOFF COEFFICIENT =	0.99	0.69	0.87	

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

ADD HYD (0011)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0002):		22.30	5.277	12.00	94.24
+ ID2= 2 (0020):		4.86	0.491	12.08	44.43
ID = 3 (0011):		27.16	5.733	12.00	85.33

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0200)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.5430	0.7540
	0.4990	0.4125	1.8630	0.8500
	0.6850	0.4830	2.0380	0.8910
	1.2910	0.6430	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	27.160	5.733	12.00	85.33
OUTFLOW: ID= 1 (0200)	27.160	1.860	12.33	85.32

PEAK FLOW REDUCTION [Qout/Qin](%)= 32.45
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.8500

CALIB	
STANDHYD (0201)	Area (ha)= 0.59
ID= 1 DT= 5.0 min	Total Imp(%)= 57.00 Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.34	0.25
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	62.72	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.10	6.083	2.20	12.083	22.05	18.08	2.20
0.167	1.10	6.167	2.20	12.167	22.04	18.17	2.20
0.250	1.10	6.250	2.20	12.250	17.08	18.25	2.20
0.333	1.10	6.333	2.20	12.333	13.78	18.33	2.20
0.417	1.10	6.417	2.20	12.417	13.01	18.42	2.20
0.500	1.10	6.500	2.20	12.500	9.92	18.50	2.20
0.583	1.10	6.583	2.20	12.583	9.92	18.58	2.20
0.667	1.10	6.667	2.20	12.667	9.48	18.67	2.20
0.750	1.10	6.750	2.20	12.750	9.37	18.75	2.20
0.833	1.10	6.833	2.20	12.833	8.27	18.83	2.20
0.917	1.10	6.917	2.20	12.917	6.61	18.92	2.20
1.000	1.10	7.000	2.20	13.000	6.61	19.00	2.20
1.083	1.10	7.083	2.20	13.083	5.51	19.08	1.65
1.167	1.10	7.167	2.20	13.167	5.51	19.17	1.65
1.250	1.10	7.250	2.20	13.250	5.51	19.25	1.65
1.333	1.10	7.333	2.20	13.333	5.51	19.33	1.65
1.417	1.10	7.417	2.20	13.417	5.51	19.42	1.65
1.500	1.10	7.500	2.20	13.500	5.51	19.50	1.65
1.583	1.10	7.583	2.20	13.583	5.51	19.58	1.65
1.667	1.10	7.667	2.20	13.667	5.51	19.67	1.65
1.750	1.10	7.750	2.20	13.750	5.51	19.75	1.65
1.833	1.10	7.833	2.20	13.833	5.51	19.83	1.65
1.917	1.10	7.917	2.20	13.917	5.51	19.92	1.65
2.000	1.10	8.000	2.20	14.000	5.51	20.00	1.65
2.083	1.10	8.083	3.31	14.083	3.31	20.08	1.65
2.167	1.10	8.167	3.31	14.167	3.31	20.17	1.65
2.250	1.10	8.250	3.31	14.250	3.31	20.25	1.65
2.333	1.10	8.333	3.31	14.333	3.31	20.33	1.65
2.417	1.10	8.417	3.31	14.417	3.31	20.42	1.65
2.500	1.10	8.500	3.31	14.500	3.31	20.50	1.65
2.583	1.10	8.583	3.31	14.583	3.31	20.58	1.65
2.667	1.10	8.667	3.31	14.667	3.31	20.67	1.65
2.750	1.10	8.750	3.31	14.750	3.31	20.75	1.65

2.833	1.10	8.833	3.31	14.833	3.31	20.83	1.65
2.917	1.10	8.917	3.31	14.917	3.31	20.92	1.65
3.000	1.10	9.000	3.31	15.000	3.31	21.00	1.65
3.083	1.10	9.083	3.31	15.083	3.31	21.08	1.10
3.167	1.10	9.167	3.31	15.167	3.31	21.17	1.10
3.250	1.10	9.250	3.31	15.250	3.31	21.25	1.10
3.333	1.10	9.333	3.31	15.333	3.31	21.33	1.10
3.417	1.10	9.417	3.31	15.417	3.31	21.42	1.10
3.500	1.10	9.500	3.31	15.500	3.31	21.50	1.10
3.583	1.10	9.583	3.31	15.583	3.31	21.58	1.10
3.667	1.10	9.667	3.31	15.667	3.31	21.67	1.10
3.750	1.10	9.750	3.31	15.750	3.31	21.75	1.10
3.833	1.10	9.833	3.31	15.833	3.31	21.83	1.10
3.917	1.10	9.917	3.31	15.917	3.31	21.92	1.10
4.000	1.10	10.000	3.31	16.000	3.31	22.00	1.10
4.083	2.20	10.083	6.05	16.083	2.20	22.08	1.10
4.167	2.20	10.167	6.05	16.167	2.20	22.17	1.10
4.250	2.20	10.250	6.05	16.250	2.20	22.25	1.10
4.333	2.20	10.333	6.05	16.333	2.20	22.33	1.10
4.417	2.20	10.417	6.05	16.417	2.20	22.42	1.10
4.500	2.20	10.500	6.05	16.500	2.20	22.50	1.10
4.583	2.20	10.583	6.05	16.583	2.20	22.58	1.10
4.667	2.20	10.667	6.05	16.667	2.20	22.67	1.10
4.750	2.20	10.750	6.05	16.750	2.20	22.75	1.10
4.833	2.20	10.833	6.05	16.833	2.20	22.83	1.10
4.917	2.20	10.917	6.05	16.917	2.20	22.92	1.10
5.000	2.20	11.000	6.05	17.000	2.20	23.00	1.10
5.083	2.20	11.083	8.26	17.083	2.20	23.08	1.10
5.167	2.20	11.167	8.26	17.167	2.20	23.17	1.10
5.250	2.20	11.250	10.58	17.250	2.20	23.25	1.10
5.333	2.20	11.333	12.12	17.333	2.20	23.33	1.10
5.417	2.20	11.417	15.20	17.417	2.20	23.42	1.10
5.500	2.20	11.500	27.55	17.500	2.20	23.50	1.10
5.583	2.20	11.583	27.55	17.583	2.20	23.58	1.10
5.667	2.20	11.667	53.99	17.667	2.20	23.67	1.10
5.750	2.20	11.750	60.61	17.750	2.20	23.75	1.10
5.833	2.20	11.833	81.98	17.833	2.20	23.83	1.10
5.917	2.20	11.917	114.06	17.917	2.20	23.92	1.10
6.000	2.20	12.000	114.06	18.000	2.20	24.00	1.10

			TOTALS
Max.Eff.Inten.(mm/hr)=	114.06	125.73	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.83 (ii)	8.27 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.32	0.13	
PEAK FLOW (cms)=	0.08	0.07	0.153 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	80.50	92.45
TOTAL RAINFALL (mm)=	108.06	108.06	108.06
RUNOFF COEFFICIENT =	0.99	0.74	0.86

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

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

ADD HYD (0034)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0200):	27.16	1.860	12.33	85.32
	+ ID2= 2 (0201):	0.59	0.153	12.00	92.45
	ID = 3 (0034):	27.75	1.894	12.33	85.47

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** SIMULATION:bloor 24SCS100 **
****

READ STORM | Filename: C:\Users\gvolpe\AppData\Local\Temp\b20a7e23-c0fc-442b-a399-0c055f5c1e41\c047ab91
Ptotal=112.42 mm | Comments: bloor 24SCS100

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	1.27	6.00	2.29	12.00	21.84	18.00	2.29
0.20	1.27	6.20	2.29	12.20	13.72	18.20	2.29
0.40	1.27	6.40	2.29	12.40	9.91	18.40	2.29
0.60	1.27	6.60	2.29	12.60	9.40	18.60	2.29
0.80	1.27	6.80	2.29	12.80	6.60	18.80	2.29
1.00	1.27	7.00	2.29	13.00	5.59	19.00	1.78
1.20	1.27	7.20	2.29	13.20	5.59	19.20	1.78
1.40	1.27	7.40	2.29	13.40	5.59	19.40	1.78
1.60	1.27	7.60	2.29	13.60	5.59	19.60	1.78
1.80	1.27	7.80	2.29	13.80	5.59	19.80	1.78
2.00	1.27	8.00	3.30	14.00	3.30	20.00	1.78
2.20	1.27	8.20	3.30	14.20	3.30	20.20	1.78
2.40	1.27	8.40	3.30	14.40	3.30	20.40	1.78
2.60	1.27	8.60	3.30	14.60	3.30	20.60	1.78
2.80	1.27	8.80	3.30	14.80	3.30	20.80	1.78
3.00	1.27	9.00	3.30	15.00	3.30	21.00	1.27
3.20	1.27	9.20	3.30	15.20	3.30	21.20	1.27
3.40	1.27	9.40	3.30	15.40	3.30	21.40	1.27
3.60	1.27	9.60	3.30	15.60	3.30	21.60	1.27
3.80	1.27	9.80	3.30	15.80	3.30	21.80	1.27
4.00	2.29	10.00	6.10	16.00	2.29	22.00	1.27
4.20	2.29	10.20	6.10	16.20	2.29	22.20	1.27
4.40	2.29	10.40	6.10	16.40	2.29	22.40	1.27
4.60	2.29	10.60	6.10	16.60	2.29	22.60	1.27
4.80	2.29	10.80	6.10	16.80	2.29	22.80	1.27
5.00	2.29	11.00	8.13	17.00	2.29	23.00	1.27
5.20	2.29	11.20	11.94	17.20	2.29	23.20	1.27
5.40	2.29	11.40	27.43	17.40	2.29	23.40	1.27
5.60	2.29	11.60	59.94	17.60	2.29	23.60	1.27
5.80	2.29	11.80	126.49	17.80	2.29	23.80	1.27

CALIB | NASHYD (0010) | ID= 1 DT= 5.0 min | Area (ha)= 42.94 Curve Number (CN)= 64.2 | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00

---------- U.H. Tp(hrs)= 0.47

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	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 2.686 (i)
TIME TO PEAK (hrs)= 12.333
RUNOFF VOLUME (mm)= 46.328
TOTAL RAINFALL (mm)= 112.421
RUNOFF COEFFICIENT = 0.412

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

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

Area (ha)= 28.86
Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.32	11.54
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	438.63	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29

1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

```
     Max.Eff.Inten.(mm/hr)=     126.49       103.86
               over (min)          5.00        15.00
     Storage Coeff.  (min)=       5.65 (ii)   12.60 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.20         0.08
                                                          *TOTALS*
     PEAK FLOW       (cms)=       5.64         2.08          7.444 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.08          12.00
     RUNOFF VOLUME    (mm)=     111.42        79.00          98.45
     TOTAL RAINFALL   (mm)=     112.42       112.42         112.42
     RUNOFF COEFFICIENT   =       0.99         0.70           0.88


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

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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    28.86    7.444    12.00    98.45
      + ID2= 2 (  0010):    42.94    2.686    12.33    46.33
        ================================================
        ID = 3 (  0012):    71.79    8.953    12.00    67.28

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| RESERVOIR(  0100)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE    |  OUTFLOW    STORAGE
--------------------       (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000    |   3.7410      0.8860
                          1.2270     0.4905    |   4.5380      0.9850
                          1.6770     0.5725    |   4.9340      1.0280
                          2.8410     0.7675    |   0.0000      0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.795      8.953     12.00      67.28
   OUTFLOW: ID= 1 (  0100)     71.795      4.912     12.33      67.28

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 54.87
                  TIME SHIFT OF PEAK FLOW          (min)= 20.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.0279

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--------------------
| CALIB            |
| STANDHYD (  0101)|   Area     (ha)=   0.75
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.46         0.29
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
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Length            (m)=      70.71        40.00
Mannings n           =      0.013        0.250

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

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

```
     Max.Eff.Inten.(mm/hr)=     126.49       157.68
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.89 (ii)    7.77 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.12         0.10          0.218 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     111.42        86.63          97.78
     TOTAL RAINFALL   (mm)=     112.42       112.42         112.42
     RUNOFF COEFFICIENT   =       0.99         0.77           0.87

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

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

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

--------------------
| ADD HYD  (  0033)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):    71.79   4.912    12.33    67.28
     + ID2= 2 (  0101):     0.75   0.218    12.00    97.78
       ================================================
       ID = 3 (  0033):    72.55   4.955    12.33    67.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
--------------------------------------------------------------------------------
--------------------
| CALIB            |
| NASHYD   (  0020)|   Area     (ha)=   4.86   Curve Number   (CN)= 65.2
|ID= 1 DT= 5.0 min |   Ia       (mm)=   5.00   # of Linear Res.(N)= 3.00
--------------------   U.H. Tp(hrs)=   0.20

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.542 (i)
TIME TO PEAK (hrs)= 12.083
RUNOFF VOLUME (mm)= 47.398
TOTAL RAINFALL (mm)= 112.421
RUNOFF COEFFICIENT = 0.422

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

CALIB	
STANDHYD (0002)	Area (ha)= 22.30
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.38	8.92
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	385.57	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78

1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

Max.Eff.Inten.(mm/hr)=	126.49	103.86	
over (min)	5.00	15.00	
Storage Coeff. (min)=	5.23 (ii)	12.18 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.21	0.09	
			TOTALS
PEAK FLOW (cms)=	4.41	1.62	5.824 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	111.42	79.00	98.45
TOTAL RAINFALL (mm)=	112.42	112.42	112.42
RUNOFF COEFFICIENT =	0.99	0.70	0.88

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

ADD HYD (0011)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	22.30	5.824	12.00	98.45
+ ID2= 2 (0020):	4.86	0.542	12.08	47.40
ID = 3 (0011):	27.16	6.323	12.00	89.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0200)	OVERFLOW IS OFF			
IN= 2---> OUT= 1				
DT= 5.0 min	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	1.5430	0.7540
	0.4990	0.4125	1.8630	0.8500
	0.6850	0.4830	2.0380	0.8910
	1.2910	0.6430	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	27.160	6.323	12.00	89.32
OUTFLOW: ID= 1 (0200)	27.160	2.026	12.33	89.31

PEAK FLOW REDUCTION [Qout/Qin](%)= 32.05
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.8907

CALIB			
STANDHYD (0201)	Area (ha)= 0.59		
ID= 1 DT= 5.0 min	Total Imp(%)= 57.00	Dir. Conn.(%)= 45.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.34	0.25
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	62.72	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	1.27	6.083	2.29	12.083	21.86	18.08	2.29
0.167	1.27	6.167	2.29	12.167	21.84	18.17	2.29
0.250	1.27	6.250	2.29	12.250	16.97	18.25	2.29
0.333	1.27	6.333	2.29	12.333	13.72	18.33	2.29
0.417	1.27	6.417	2.29	12.417	12.95	18.42	2.29
0.500	1.27	6.500	2.29	12.500	9.91	18.50	2.29
0.583	1.27	6.583	2.29	12.583	9.91	18.58	2.29
0.667	1.27	6.667	2.29	12.667	9.50	18.67	2.29
0.750	1.27	6.750	2.29	12.750	9.40	18.75	2.29
0.833	1.27	6.833	2.29	12.833	8.28	18.83	2.29
0.917	1.27	6.917	2.29	12.917	6.60	18.92	2.29
1.000	1.27	7.000	2.29	13.000	6.60	19.00	2.29
1.083	1.27	7.083	2.29	13.083	5.59	19.08	1.78
1.167	1.27	7.167	2.29	13.167	5.59	19.17	1.78
1.250	1.27	7.250	2.29	13.250	5.59	19.25	1.78
1.333	1.27	7.333	2.29	13.333	5.59	19.33	1.78
1.417	1.27	7.417	2.29	13.417	5.59	19.42	1.78
1.500	1.27	7.500	2.29	13.500	5.59	19.50	1.78
1.583	1.27	7.583	2.29	13.583	5.59	19.58	1.78
1.667	1.27	7.667	2.29	13.667	5.59	19.67	1.78
1.750	1.27	7.750	2.29	13.750	5.59	19.75	1.78
1.833	1.27	7.833	2.29	13.833	5.59	19.83	1.78
1.917	1.27	7.917	2.29	13.917	5.59	19.92	1.78
2.000	1.27	8.000	2.29	14.000	5.59	20.00	1.78
2.083	1.27	8.083	3.30	14.083	3.30	20.08	1.78
2.167	1.27	8.167	3.30	14.167	3.30	20.17	1.78
2.250	1.27	8.250	3.30	14.250	3.30	20.25	1.78
2.333	1.27	8.333	3.30	14.333	3.30	20.33	1.78
2.417	1.27	8.417	3.30	14.417	3.30	20.42	1.78
2.500	1.27	8.500	3.30	14.500	3.30	20.50	1.78
2.583	1.27	8.583	3.30	14.583	3.30	20.58	1.78
2.667	1.27	8.667	3.30	14.667	3.30	20.67	1.78
2.750	1.27	8.750	3.30	14.750	3.30	20.75	1.78
2.833	1.27	8.833	3.30	14.833	3.30	20.83	1.78
2.917	1.27	8.917	3.30	14.917	3.30	20.92	1.78
3.000	1.27	9.000	3.30	15.000	3.30	21.00	1.78
3.083	1.27	9.083	3.30	15.083	3.30	21.08	1.27
3.167	1.27	9.167	3.30	15.167	3.30	21.17	1.27
3.250	1.27	9.250	3.30	15.250	3.30	21.25	1.27
3.333	1.27	9.333	3.30	15.333	3.30	21.33	1.27
3.417	1.27	9.417	3.30	15.417	3.30	21.42	1.27
3.500	1.27	9.500	3.30	15.500	3.30	21.50	1.27
3.583	1.27	9.583	3.30	15.583	3.30	21.58	1.27
3.667	1.27	9.667	3.30	15.667	3.30	21.67	1.27
3.750	1.27	9.750	3.30	15.750	3.30	21.75	1.27
3.833	1.27	9.833	3.30	15.833	3.30	21.83	1.27
3.917	1.27	9.917	3.30	15.917	3.30	21.92	1.27
4.000	1.27	10.000	3.30	16.000	3.30	22.00	1.27
4.083	2.29	10.083	6.10	16.083	2.29	22.08	1.27
4.167	2.29	10.167	6.10	16.167	2.29	22.17	1.27
4.250	2.29	10.250	6.10	16.250	2.29	22.25	1.27
4.333	2.29	10.333	6.10	16.333	2.29	22.33	1.27
4.417	2.29	10.417	6.10	16.417	2.29	22.42	1.27
4.500	2.29	10.500	6.10	16.500	2.29	22.50	1.27
4.583	2.29	10.583	6.10	16.583	2.29	22.58	1.27
4.667	2.29	10.667	6.10	16.667	2.29	22.67	1.27
4.750	2.29	10.750	6.10	16.750	2.29	22.75	1.27
4.833	2.29	10.833	6.10	16.833	2.29	22.83	1.27
4.917	2.29	10.917	6.10	16.917	2.29	22.92	1.27
5.000	2.29	11.000	6.10	17.000	2.29	23.00	1.27
5.083	2.29	11.083	8.13	17.083	2.29	23.08	1.27
5.167	2.29	11.167	8.13	17.167	2.29	23.17	1.27
5.250	2.29	11.250	10.41	17.250	2.29	23.25	1.27
5.333	2.29	11.333	11.94	17.333	2.29	23.33	1.27
5.417	2.29	11.417	15.04	17.417	2.29	23.42	1.27
5.500	2.29	11.500	27.43	17.500	2.29	23.50	1.27
5.583	2.29	11.583	27.43	17.583	2.29	23.58	1.27
5.667	2.29	11.667	53.44	17.667	2.29	23.67	1.27
5.750	2.29	11.750	59.94	17.750	2.29	23.75	1.27
5.833	2.29	11.833	86.56	17.833	2.29	23.83	1.27
5.917	2.29	11.917	126.49	17.917	2.29	23.92	1.27
6.000	2.29	12.000	126.49	18.000	2.29	24.00	1.27

			TOTALS
Max.Eff.Inten.(mm/hr)=	126.49	140.44	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.76 (ii)	7.92 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.32	0.13	
PEAK FLOW (cms)=	0.09	0.08	0.170 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	111.42	84.60	96.66
TOTAL RAINFALL (mm)=	112.42	112.42	112.42
RUNOFF COEFFICIENT =	0.99	0.75	0.86

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

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

ADD HYD (0034)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0200):	27.16	2.026	12.33	89.31
	+ ID2= 2 (0201):	0.59	0.170	12.00	96.66
	ID = 3 (0034):	27.75	2.060	12.33	89.46

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

APPENDIX C

SANITARY SEWER CALCULATIONS

Sanitary Flow Calculation

Project No.: 22-0020ER

Proposed Subdivision: Hillsburgh

Site Area:	52.27	ha
Infiltration Rate:	0.26	l/ha/sec
Generation Rate:	**290**	l/person/day†

Harmon Peaking Factor	
Max Peaking Factor	4.00
Minimum Peaking Factor	2.00

Estimated Site Discharge

Building Type	Area or Unit Count	Pop. Density†	Population	Ave. Flow (L/s)	Harmon's Peaking Factor	Peak Flow (L/s)	Infiltration* (L/s)	Total Flow (L/s)
Residential (Single Detached + Heritage House)	446 units	2.80 p.p.u.	1249	4.19	3.74	15.66	13.59	29.25
Residential (Townhouse)	353 units	2.80 p.p.u.	989	3.32	3.80	12.62	0.00	12.62
Residential (Apartment)	0 units	2.65 p.p.u.	0	0.00	4.00	0.00	0.00	0.00
Mixed-Use	2.59 ha	330 p.p.ha	855	2.87	3.84	11.03	0.00	11.03
Institutional	0.00 ha	60 p.p.ha	0	0.00	4.00	0.00	0.00	0.00
Commercial	0.00 ha	100 p.p.ha	0	0.00	4.00	0.00	0.00	0.00
Total	N/A	NA	3093	10.38	3.43	35.62	13.59	**49.21**

† As per Town of Erin Design Criteria
*Factors in total site area

APPENDIX D

WATER SUPPLY CALCULATIONS

Water Supply Calculation

Project No.: 22-0020ER

Proposed Subdivision: Hillsburgh

Fire Flow:	**76**	L/s	
Fire Flow:	**4560**	L/min	(As per FUS calculation)
Water Supply Demand:	**290**	l/capita/day	
Commercial Demand:	**28**	m3/area(ha)/day	

Building Type	Units or Area (sqm)	Population	Average Day Demand (l/s)
Residential	799 units	3093	10.38
Commercial	0 sq.m.	-	0.00
Total		3093	10.38

Notes:

Residential Population incorporates population estimates for Mixed-use lands

Building	Average Day Demand (l/s)	Min. Hour Demand Peaking Factor †	Min. Hour Demand (l/s)	Max. Hour Demand Peaking Factor †	Max. Hour Demand (l/s)	Max. Day Demand Peaking Factor †	Max. Day Demand (l/s)	Max. Demand + Fire Flow (l/s)
Total	10.38	0.40	4.15	4.13	42.88	2.75	28.55	**104.55**

Notes:

† As per Town of Erin Design Guidelines

APPENDIX E

ENGINEERING DRAWINGS
(See Submission Package)