FUNCTIONAL SERVICING AND STORMWATER MANAGEMENT REPORT

RESIDENTIAL DEVELOPMENT

HILLSBURGH RESIDENTIAL SUBDIVISION

63 & 63A TRAFALGAR ROAD
TOWN OF ERIN

APPLICATION FILE NUMBERS:
OPA 23-01, Z23-02, & 23T-23003

Project No.: 22-0020ER **January 2024**

Revision	*Date*	*Description*
0	*March 2023*	*First Submission*
1	*January 2024*	*Second Submission*
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 covering a total area of approximately 52.3 ha. Currently the site is predominantly used for agricultural purposes. A single lot, referred to as the “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 of the site (furthest from Trafalgar Road) contains the highest elevations, sloping downwards toward the west. Existing access points include an entrance from the existing termination point of Curie Road to the north. The site also fronts the existing Ross R. Mackay Public School, as well as some commercial properties situated along Trafalgar Road. Existing detached homes are present just adjacent to the property and front Trafalgar Road. At the time of writing external lands to the south and east of the site consist entirely of farmland. Lastly, the Elora Cataract Trail straddles the southwest corner of the site, creating a physical separation from the Trafalgar Road right of way.

1.3 Proposed Development

The proposed development is to include a mix of residential townhouse blocks, single-detached homes, park land, retirement living (i.e., senior's homes) in the form of low density and mixed-use apartments, as well as dedicated stormwater management (SWM) blocks. The proposed subdivision lands will be provided transportation access via site entrances on Trafalgar Road, Spruce Street and Currie Road. Connectivity with potential future developments to the east and south will also be accommodated with proposed dead-end roads at the northeastern and southern site boundaries. The proposed site's development plan is shown in Figure 1-2.

1.4 Proposed Design Populations

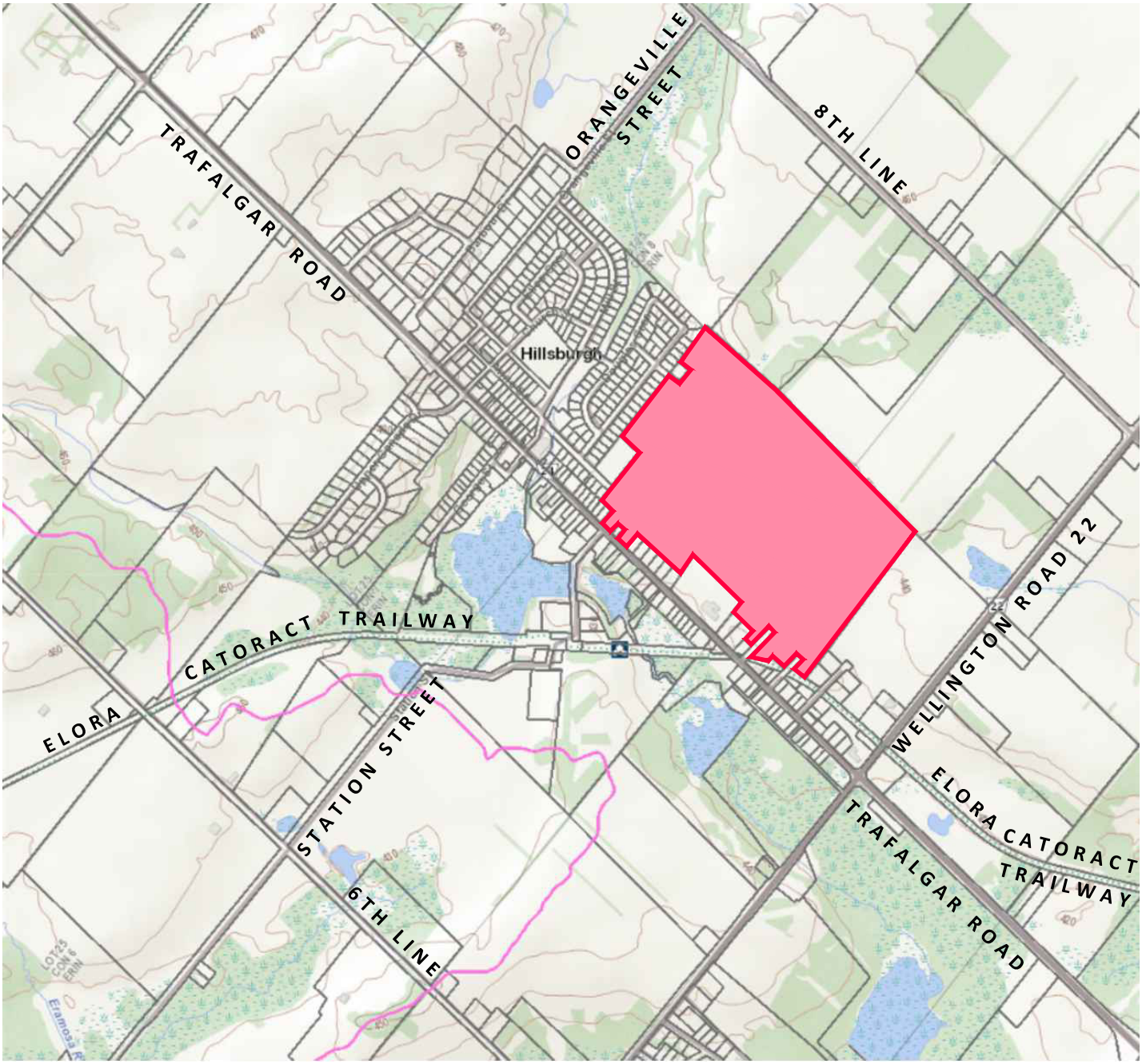
Based on the current development draft plan, a mix of unit densities are proposed. The following table summarizes the anticipated design populations for each land use and was estimated based on the Town of Erin's latest Engineering Design Criteria. Based on the estimate below, the total proposed design population considered for the Hillsburgh Subdivision is 2976 persons.

Table 1-1: Population Estimate

Land Use	G.F.A (sqm) / Units	Population Density	Design Population*
Residential	376 units ** (Single-Detached & Heritage House)	2.8 persons / Unit	1053
Residential	286 units ** (Townhouse)	2.8 persons / Unit	801
Low-Rise Senior Housing Block 424	136 units * (Townhouse)	2.8 persons / Unit	381
Mixed-Use Senior Apartment Block 423	2.24 ha	330 persons / ha	741
Institutional (Schools)	0 m^2	60 persons / ha	0
Commercial (Retail)	0 m^2	100 persons / ha	0
Total Design Population	**798**	**-**	**2976**

*Population and unit estimates are 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.

**Unit Count based on the latest Draft Plan.



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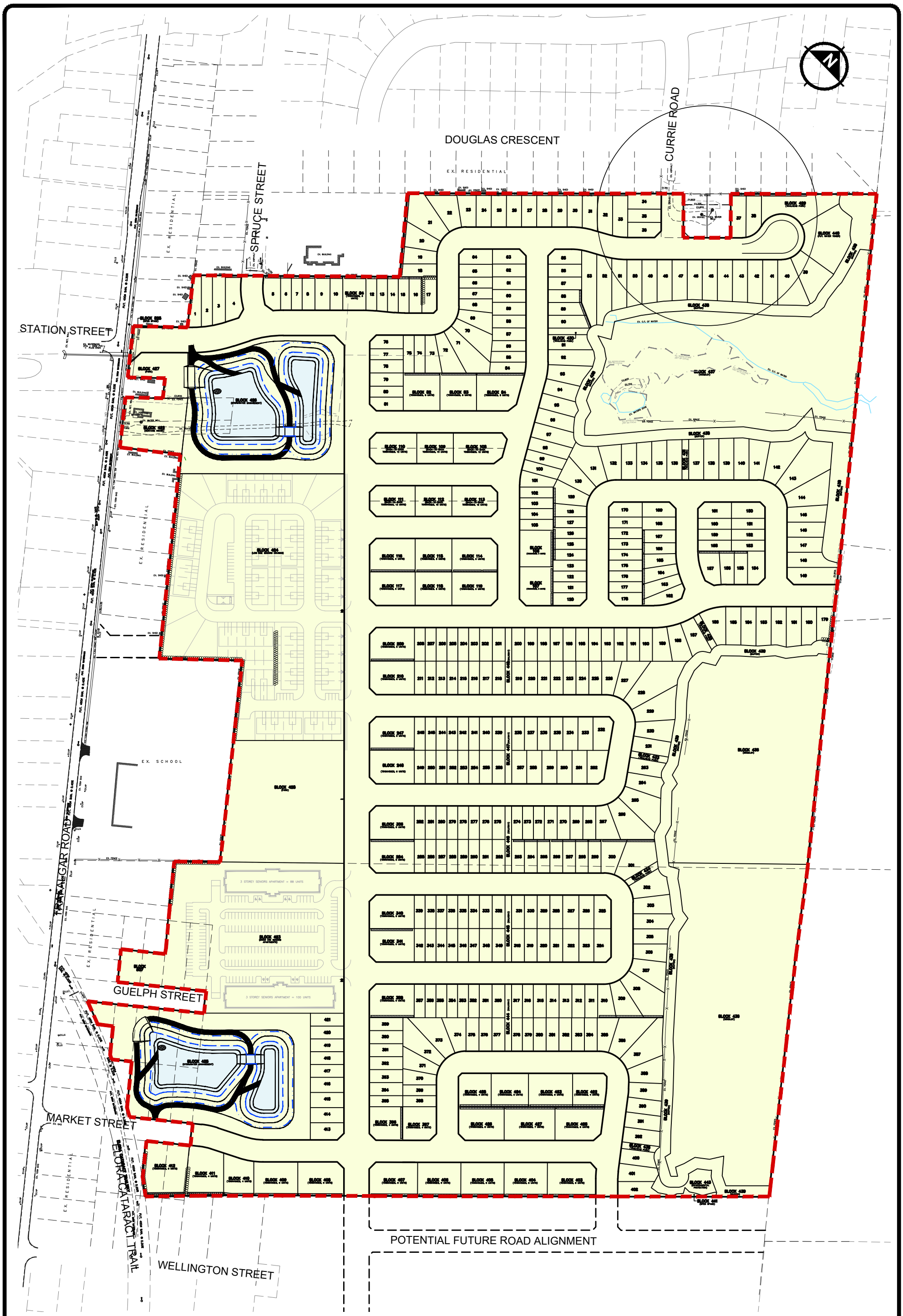
LEGEND

SITE BOUNDARY

FIGURE 1-1
SITE LOCATION PLAN

22-0020ER	January 2024	N.T.S.



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LEGEND

SUBJECT SITE

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

22-0020ER	January 2024	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 naturally occurring ponds north and south of 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, towards the existing Trafalgar Road minor storm sewer system. Flows from the minor system drain to the existing watercourse to the west via an existing outfall along Jane Street.

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

It should be noted that a total external drainage area of approximately 48 ha flows towards the site from the west. This area is currently used for agricultural purposes and includes some wooded areas. Based on available topographic information, the external area was characterized as two (2) distinct catchments and have been depicted on Figure 2-1 (Part 2).

2.1.2 Existing Storm Drainage Infrastructure

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

- A 250 mm diameter storm sewer runs South along Trafalgar Road, connecting to the existing 300 mm diameter storm sewer on Jane Street, terminating at an existing 525 mm diameter outfall West of Trafalgar;
- A 250mm diameter storm sewer runs 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 at the head of a ditch along the south boulevard of Station Street.;

All the above infrastructure was identified to ultimately convey flows west to the existing Credit River 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

Sub-surface 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) will be measured by the site soil engineer to confirm the properties of site soils once proposed LID locations and depths are finalized at the detailed design stage.

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).
- 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:

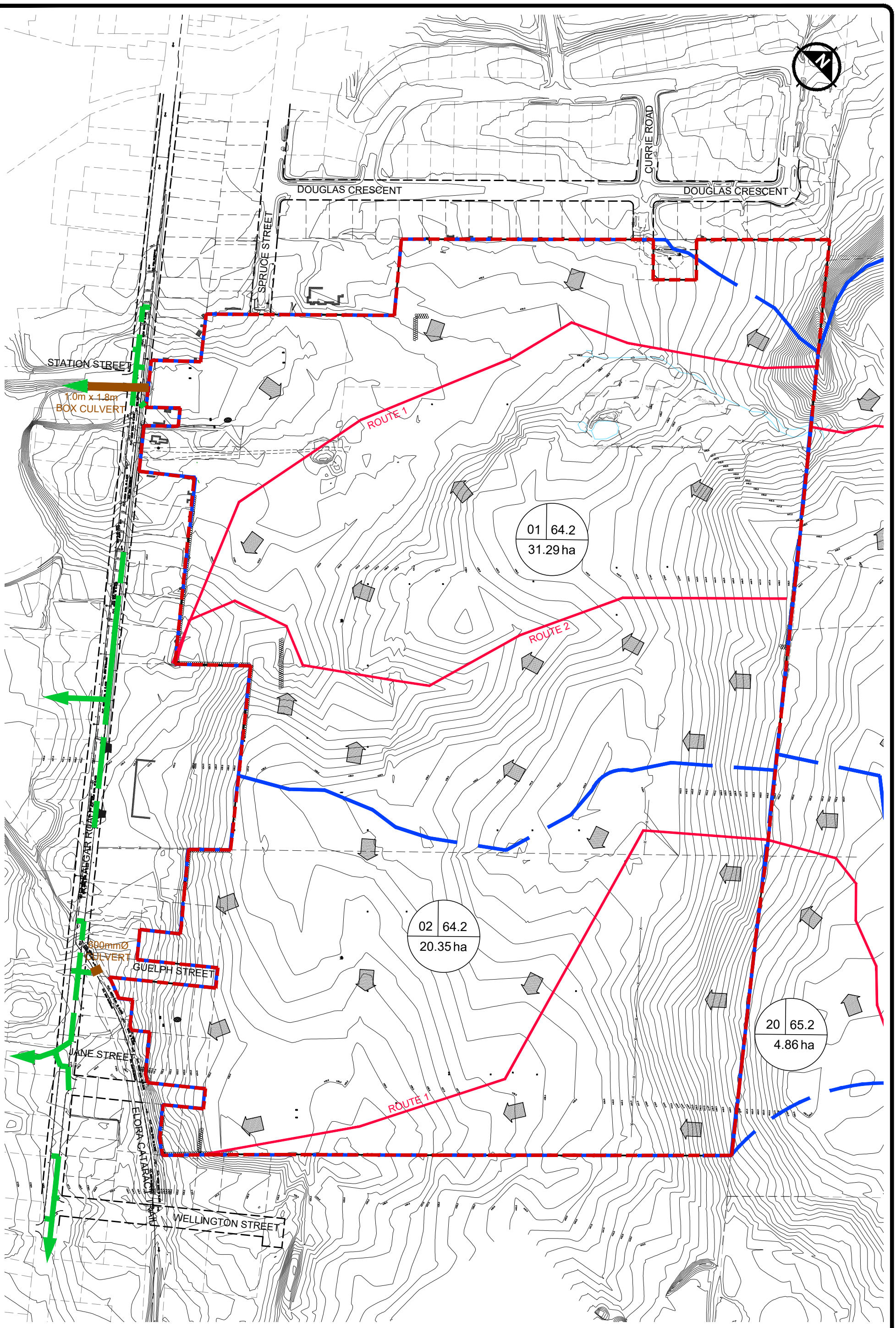
Table 2-1 Town of Erin IDF Curve Parameters

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:

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



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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 | January 2024 | SCALE: 1:2900

DOUGLAS CRESCENT

10 | 64.2
42.94 ha

20 | 65.2
4.86 ha

EIGTH L

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 | January 2024 | SCALE: 1:3200

Where:

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

Source Water Protection

In addition to the standards set out by the Town of Erin's design criteria and the CVCA, it is also known that a portion of the site will be located in a future Well Head Protection Area (WHPA). In accordance with comments received from Wellington Source Water Protection staff (WSWP), a WHPA-A will be designated in the future, corresponding with the location of the new drinking water well at the northeast limit of the development.

In accordance with Policy SWG-13 for WHPA-A's and correspondence with WSWP staff, no stormwater infrastructure which discharges or infiltrates into the ground should be located within a 100-meter radius of the future well (see Figure 2-3). As such no Low-Impact Developments or storm outlets will be proposed in this area.

Furthermore, all storm sewers located within this area shall follow higher construction standards and inspection protocols by the owner in order to minimize and eliminate leaks. The specific standards to be applied in this development will be confirmed with the Issuing Director of Environmental Compliance Approval for these sewers at a later stage of the project.

2.3 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 proposed townhomes and detached lots and towards overland flow routes provided by internal roadways. The maximum proposed paved surface grades have been held below 8%, with landscaped areas held at a minimum 2%. The site's grading in relation to the proposed SWM Plan is discussed in the following sections. A functional site grading plan has been provided in Appendix E for details.

2.4 Proposed Stormwater Management Plan

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 the 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 (01) and South (02). Each of these catchments will be serviced by their own respective SWM facilities, located within each of the site's two (2) SWM Blocks. These ponds have been identified as follows:

1. SWM Pond 1 – North Pond located in SWM Bock 426

2. SWM Pond 2 – South Pond located in SWM Bock 425

Each SWM Block will include both a SWM Pond and a downstream bioretention cell. SWM Pond 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.

Conveyance of stormwater to each pond will be managed by a dual-drainage system consisting of (1) a minor storm sewer system which will capture and convey minor storm events and (2) a major system consisting of overland flow routes along the proposed roadways. The major system has been designed to direct overland flows to a couple of key low points (see Figure 2-2) from which flows will be captured by catchbasins and conveyed to the nearest SWM Pond through the minor system.

Water quality control is proposed primarily via end-of-pipe permanent pools, or wet cells, provided within each of the two proposed SWM Pond facilities. Each pond's permanent pool has been sized to provide a minimum 80% TSS removal based on the MOE 2003 criteria, for each pond's incoming drainage area. Infiltration trenches are expected to provide additional water quality control and groundwater recharge at source. Lastly, bioretention swales downstream of each SWM pond will provide additional infiltration potential prior to discharging flows off-site. The following sections discuss the proposed SWM Plan in detail.

2.5 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.

2.5.1 Pre-development and External Flows

In addition to the subject site area, a pre-development flow estimate was conducted for the approximately 48 hectares of external lands which drain from east of the subject site. Flows from this area will be accepted and captured by the subject development's storm drainage system in order to maintain existing drainage patterns. As such the proposed SWM Pond controls have incorporated the pre-development flows of external areas. External Catchments 10 and 20 are shown on Figure 2-1 for reference.

It should be noted that when external lands are re-developed, future developments will need to provide site level controls such that they control runoff flows from storm events up to and including the 100-year storm event to pre-development levels. This will allow future developments to remain compatible with the proposed SWM Pond facilities.

The pre-development flow rates for each catchment were determined using a pre-development hydrology model developed 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 for the external area were determined using the Bransby-William's method with flow paths depicted in Figure 2-1. Soil covers complex numbers (i.e. CN numbers) were determined for each catchment based on land cover type. Detailed calculation of these input parameters is provided in Appendix B, alongside the associated VO model output. A summary of the pre-development peak flow rates is presented in Table 2-2 and Table 2-3.

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**

2.5.2 Post Development

The peak flows presented in Table 2-2 and 2-3 represent the expected peak flows draining to each of the two existing site outlets. This includes Catchment 01 draining to the 1.0 m x 1.8 m CSP culvert, and Catchment 02 draining to the existing 600 mm diameter CSP culvert. In summary the allowable release rate to each existing site outlet has been split between the northern and southern SWM blocks such that:

- Post-development peak flows from North SWM Block 426 = Pre-development flows from Predevelopment Catchment 01 + External Catchment 10
- Post-development peak flows from South SWM Block 425 = 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 greater for the site. In order to ensure both storm distributions are safely detained, the 2-year through 100-year events were simulated using VO in the post-development condition. Each SWM Pond has been sized to satisfy whichever event requires the largest detention volume.

In the post-development condition, 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 SWM Pond 1 and 2 respectively. The site's post-development land-use was then used to

estimate the site's impervious levels and used as input to simulate the post-development peak flows. Post-development imperviousness estimates are provided in Appendix B.

In addition, a portion of the site adjacent to Trafalgar Road was unable to be directed back to the SWM Ponds due to site grading constraints. As a result, uncontrolled flows are also anticipated from Catchments 101 and 201, which drain to the North and South outlet respectively. These catchments are depicted in Figure 2-2. A summary of the uncontrolled flows from each catchment are summarized in Table 2-4 and Table 2-5.

Each pond's target release rate was established by taking the pre-development flows presented in Table 2-2 and Table 2-3, and reducing them by the estimated uncontrolled flows from catchments 101 and 201. This ensures that the total uncontrolled and controlled flows from the site do not exceed the pre-development flow level to each outlet. The adjusted target 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 2-4: Summary of Release Rates – Pond 1 (North)

Storm Distribution	24-hour SCS			4-hour Chicago		
Return Period	Pre-Dev. Peak Flow	Node 101 Uncontrolled Release	Controlled Release	Pre-Dev. Peak Flow	Node 101 Uncontrolled Release	Controlled Release
	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)	(m^3/s)
2-yr	1.311	0.104	1.207	0.930	0.169	0.761
5-yr	1.777	0.124	1.653	1.672	0.247	1.425
10-yr	2.987	0.180	2.807	2.263	0.300	1.963
25-yr	3.922	0.224	3.698	3.090	0.362	2.728
50-yr	4.735	0.244	4.491	3.753	0.409	3.344
100-yr	5.152	0.277	4.882	4.420	0.454	3.966

As per Table 2-6 and Table 2-7, the maximum storage volume requirement for each SWM Pond is expected to occur during the 100-year, 4-hour Chicago storm event. As such, each facility has been sized to accommodate the event which requires the greatest storage volume to detain; the 100-year 4-hour Chicago Storm.

Furthermore, it should be noted that during the 24-hour SCS storm, flows are anticipated to be

much greater than during the 4hour Chicago event. Due to the quantity of these flows, care was taken to ensure that existing downstream infrastructure has capacity to safely convey runoff flows from the site. The findings of this investigation are discussed in detail within Section 2.3.5 of this report.

Table 2-5: Summary of Release Rates – Pond 2 (South)

Storm Distribution	24-hour SCS			4-hour Chicago		
Return Period	Pre-Dev. Peak Flow (m^3/s)	Node 201 Uncontrolled Release (m^3/s)	Controlled Release (m^3/s)	Pre-Dev. Peak Flow (m^3/s)	Node 201 Uncontrolled Release (m^3/s)	Controlled Release (m^3/s)
2-yr	0.568	0.056	0.512	0.400	0.097	0.303
5-yr	0.767	0.067	0.700	0.720	0.135	0.585
10-yr	1.291	0.097	1.194	0.974	0.164	0.810
25-yr	1.686	0.121	1.565	1.328	0.197	1.131
50-yr	2.019	0.131	1.888	1.612	0.222	1.390
100-yr	2.211	0.146	2.065	1.903	0.246	1.657

It was found that controlling to pre-development flow rates for SWM Pond 1 during the 24-hour SCS distribution results in capacity exceedances in the 50-year and 100-year event. To avoid this issue, it is proposed to overcontrol these two events to within the capacity of the downstream storm sewer system. This is reflected in the 50-year and 100-year storage estimates in Table 2-6.

Table 2-6: Summary of Required Storage Volumes – SWM Pond 1 (North)

Storm Distribution	24-hour SCS			4-hour Chicago		
Return Period	Pre-Dev. Peak Flow (m^3/s)	Controlled Flow (m^3/s)	Required Storage (m^3)	Pre-Dev. Peak Flow (m^3/s)	Controlled Flow (m^3/s)	Required Storage (m^3)
2-yr	1.311	1.207	4935	0.930	0.761	**6160**
5-yr	1.777	1.653	5765	1.672	1.425	**8240**
10-yr	2.987	2.807	7720	2.263	1.963	**9475**
25-yr	3.922	3.698	8910	3.090	2.728	**10900**
50-yr*	4.735	3.849	10470	3.753	3.344	**11870**
100-yr*	5.152	4.000	11220	4.420	3.966	**12760**

*Controlled Flow Rate set based on downstream sewer capacity, see Section 2.3.5 for details.

Table 2-7: Summary of Required Storage Volumes – SWM Pond 2 (South)

Storm Distribution	24-hour SCS			4-hour Chicago		
Return Period	Pre-Dev. Peak Flow (m^3/s)	Controlled Flow (m^3/s)	Required Storage (m^3)	Pre-Dev. Peak Flow (m^3/s)	Controlled Flow (m^3/s)	Required Storage (m^3)
2-yr	0.568	0.512	4100	0.400	0.303	**4880**
5-yr	0.767	0.700	4800	0.720	0.585	**6440**
10-yr	1.291	1.194	6510	0.974	0.810	**7425**
25-yr	1.686	1.565	7575	1.328	1.131	**8650**
50-yr	2.019	1.888	8520	1.612	1.390	**9530**
100-yr	2.211	2.065	8920	1.903	1.657	**10380**

Note that the final storage volume requirements for each SWM Pond will be further refined and confirmed at the detailed design stage. The preliminary design of each SWM Pond is shown in the Functional Servicing and Grading Drawings provided in Appendix E.

2.6 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:

- **End of Pipe Controls –** SWM Pond Wet Cells sized to provide 80% (Enhanced) TSS removal, and Bioretention feature sized to provide a minimum 60% (Basic) TSS removal located directly upstream of the site's outlets;
- **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);

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.

2.6.1 SWM Pond Wet Cell

The primary mechanism for providing quality treatment on-site will be through the use of centralized wet cells (or permanent pools) within each of the two (2) proposed SWM Ponds. These permanent pools have been sized to provide an enhanced level of quality controls (80% TSS removal) on their own to incoming flows based on MOE 2003 guidelines, Table 3.2 for wet ponds. The preliminary sizing of each SWM Pond's permanent pool is summarised in Table 2-8 below. Required volumes will be refined and confirmed at the detailed design stage.

Table 2-8: Summary of Permanent Pool Sizing's

Area ID	Incoming Area (ha)	Imp. (%)	Required Water Volume (m^3/ha) *	Required Permanent Pool Volume (m^3)	Provided Permanent Pool Volume (m^3)
01 + 10	71.83	28%	130	6446	6500
02 + 20	27.25	51%	180	3815	4390

*Calculations provided in Appendix B, determined for Wet Ponds as per MOE 2003 Table 3.2, with a 40 m^3 / ha reduction for extended detention storage.

2.6.2 Bioretention Cell and Infiltration Trenches

Unconventional mechanisms of quality treatment, such as the Bioretention cells and infiltration trenches are considered to provide additional quality treatment above the Town's requirements, although for the purposes of the proposed design, these methods are proposed more for their ability to provide on-site infiltration. As such the function of these auxiliary measures are proposed more as a method of providing water balance and erosion control on-site.

The bioretention cells will be provided downstream of the proposed SWM Pond outlets, acting as an infiltration basin, and will provide a meandering low flow channel to allow for a by-pass to the existing site outlet, in the event of larger storm events. A preliminary bioretention sizing is provided in Appendix B.

Furthermore, 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 will be informed by in-situ site testing to confirm a suitable design infiltration rate, and depth of the groundwater table, in order to achieve a maximum 48-hour drawdown time, and minimum 1.0 m spacing from the LID to the groundwater table. This will be done at the detailed design stage once proposed LID locations and depths are confirmed.

2.6.3 OGS Unit

Lastly, due to grading constraints along Street '1', a stretch of roadway near the site's connection to Trafalgar Road will be unable to be directed to proposed SWM Pond 1. As a best effort, as much area as possible has been proposed to be captured within storm sewers and directed to an OGS unit located within the SWM Block, and discharge flows just downstream of SWM Pond 1.

At the time of writing the anticipated service area of this OGS is approximately 0.30ha. This unit will be sized to provide a minimum 60% TSS removal to incoming flows. Flows directed to this unit will be able to be conveyed to the proposed bioretention cell, where they will receive additional treatment. It is anticipated that the proposed treatment train of an OGS units and downstream bioretention cell will provide an enhanced level of treatment to these uncontrolled flows prior to being discharged off-site. Sizing of the OGS unit, and the expected feasible treatment rate of the uncontrolled area will be confirmed at the detailed design stage.

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.

2.7 Erosion Controls and Water Balance

2.7.1 Erosion Control

In accordance with the CVCA requirements, the implementation of LID practices within the development should 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.

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 those within proposed pervious backyard areas, provide opportunity to promote infiltration. Furthermore, the on-site woodlots, blocks 436 and 437, will continue to provide retention and abstraction of runoff as they will remain undisturbed by the development, and therefore limit the impact on infiltration volumes.

In order to meet the site's 5 mm retention target, it is proposed to make use of infiltration within the rear-yard infiltration trenches wherever possible. Providing infiltration trenches and disconnected roof leaders directed towards lawn areas will provide lot level mitigation. To further maximize infiltration 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 percolate into underlying gravel storage and 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.

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 + 101	29.61	60%	890	533	409	942
02 + 201	22.89	60%	690	378	347	725
Total	52.50	60%	**1,580**	911	756	**1667**

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

However, due to the configuration of the site, not all lots can provide lot level retention measures. As such, end-of-pipe infiltration is also proposed, which will be provided via centralized bioretention features strategically placed downstream of each SWM Tank's outlet. This will ensure that all flows to these bioretention cells are first treated via the proposed SWM Pond Wet Cells.

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. The preliminary location and size of the above LID's are depicted in Figure 2-3, and are shown in the Functional Engineering drawings provided in Appendix E.

2.7.2 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 is not within any current 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. Furthermore, a future Town Drinking water well is to be located adjacent to the site and will therefore place the site within a future well head protection area (WHPA).

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 post-development 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 March 2023, the site soils consist of sandy loam and are 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.

Using the proposed Bioretention Cells and Infiltration Trenches as mitigation measures, it is anticipated that the site can provide an infiltrate volume of approximately 1,667 m^3, equivalent to the infiltration of the first 5.29mm of rainfall on site (i.e. 1,667 m^3 ÷ [52.5 ha x 60% IMP x 10] = 5.29 mm). 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.

Preliminary sizing's of the bioretention cell and infiltration trenches have been performed and have been designed such that a maximum drawdown time of 48-hours is achieved. These sizing calculations are provided in Appendix B for reference. The final infiltration volumes, LID sizing's and locations will be refined and confirmed at the detailed design stage.

It is lastly noted that no LID measures are proposed to be located within 100-meters of the future Town drinking water well (see extent on Figure 2-3) as per SWG policy 11.

2.7.3 Wetland Assessment

As identified by the CVCA, a wetland is present within the Block 437 Woodlot. As per the CVCA's design criteria, the amount of flow draining towards the existing wetland should be maintained to ensure the future viability of the wetland.

In order to mitigate the potential for increased flows to the existing wetland, a series of design approaches have been considered for implementation in the final site design. Each solution aims to increase runoff travel times or reduce developed drainage area to the wetland in an effort to reduce flows. These mitigation measures include:

- Rooftop Redirection – Roofs from lots adjacent to Block 437 will be directed towards the front of the house (i.e. towards the right of way), minimizing the increase in drainage area to the wetland;
- Downspout Disconnections – Where roof drainage cannot be directed to the front, downspouts can drain towards backyard lawns, increasing the travel time of roof runoff over pervious surfaces;
- Rear-yard Swales – Implementation of rear-yard swales or level spreaders run along the back of lots to encourage infiltration of lot level flows. This will also increase travel times for flows as runoff during small storm events will first fill the swale and percolate into the ground, before larger flows run off the properties.

It should also be noted that the use of rear-lot catchbasins was also considered, as an effective way to reduce the contributing area draining towards the wetland, by conveying runoff flows towards the site's minor system. However as per the Town's request, the use of rear-lot catchbasins is to be minimized due to maintenance concerns within private properties. If this position should change, rear-lot catchbasins can be implemented as an additional mitigation method.

A detailed quantification of flows in the pre- and post-development condition towards the existing

wetland, will be conducted at the detailed design stage to ensure the aforementioned mitigation measures are effective.

2.8 Outlet Capacity

As mentioned in previous sections, the site's quantity control design will consist of two (2) SWM Ponds, which will regulate flows to the two existing site outlets. These outlets include:

1. The North Outlet : 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; and
2. The South Outlet : A 600 mm diameter CSP culvert, crossing the Elora Cataract Trailway, to the existing Trafalgar Road minor storm sewer system, consisting of a 250 mm to 450 mm diameter storm sewer, draining to a headwall adjacent to Jane Street.

In order to ensure the existing outlets, have sufficient capacity to safely convey flows from the proposed development to the downstream watercourse, an analysis of the downstream storm infrastructure capacity was conducted. Flow master was used to estimate the capacity of both downstream culverts. The analysis results are summarized in Table 2-10.

Lastly, it should be noted that the flow controls proposed within each SWM Pond are to maintain post-development flow rates to pre-development levels at each of the above-mentioned outlets. Table 2-10 shows and compares the outlet capacity to the maximum pre-development flow rate estimated to drain to each outlet. Detailed capacity calculations are provided in Appendix B.

Table 2-10: Summary of Outlet Capacities

Outlet	Dimension	Classification	Full Flow Capacity (m^3/s)	Required Capacity for Post to Pre-Flow Matching (m^3/s)
North	1.0 x 1.8 m	CSP Culvert	4.35	4.91
South	600 mm dia.	CSP Culvert	0.46	2.04

Based on the estimated capacities of each outlet, capacity constraints are anticipated within the existing downstream stormwater conveyance system. In order to alleviate this issue, two solutions are recommended. These include:

1. Overcontrolling the release rates from Pond 1 (North) to within the maximum capacity of the existing 1.0 x 1.8 m culvert for storm events which are anticipated to exceed the existing capacity. This solution is described and accounted for in Section 2.3.2.

2. Upgrading of the existing 600 mm culvert to convey the greatest pre-development flow control level from Pond 2 (South).

Furthermore, it should be noted that the existing sewers along Trafalgar Road, downstream of the existing 600 mm culvert, range from 250 mm diameter up to 525 mm diameter at the existing sewer outfall. As these sewers are smaller than 600 mm diameter, it is anticipated that sewer upgrades will be required from the Pond 2 outlet up to the existing sewer outfall to ensure that the downstream municipal sewer system has capacity to convey flows from Pond 2 up to the existing watercourse.

This solution is recommended in favour of overcontrolling Pond 2 outflows. Based on the pre-development flow estimates the existing system currently does not have capacity to convey flows even in the existing site conditions. As such upgrading of the storm sewer capacities in this location is anticipated to alleviate an existing capacity constraint in this area.

The final design solution to be used to alleviate capacity constraints will be confirmed in consultation with the Town, to ensure a preferable solution is reached. Design of any and all associated storm sewer upgrades which are required will be provided at the detailed design stage once a preferred solution is agreed upon with the Town.

2.9 Proposed Major and Minor System Capacity

In addition to meeting the site's quantity control criteria, it is critical that the proposed development also provide sufficient conveyance capacity within the proposed major and minor drainage system to safely convey runoff to the proposed SWM facilities. As per the Town of Erin's municipal design criteria the major and minor system should provide sufficient capacity to ensure that ponding from runoff be limited along the proposed right of ways such that private properties are protected from flooding. Furthermore, when conducting such checks, the largest flow of the 100-year and Regional Storm Event should be considered.

As part of the hydrological analysis conducted using VO (described in Section 2.3.2) the incoming 100-year runoff and Regional Storm flows rates to each of the two (2) proposed SWM Ponds was estimated. These flows are presented in the following table.

Table 2-11: Summary of Site Retention Requirements

Storm Distribution	Flows to Pond 1 (North) (Catchments 01 + 10)	Flows to Pond 2 (South) (Catchments 02 + 20)
	Flow (m^3/s)	Flow (m^3/s)
100-yr 4hour Chicago	**13.360**	**10.684**
100-year 48hour Bloor SCS	8.909	6.340
Regional Event	7.993	3.714

Based on the above flow estimates, the most critical storm event was found to be the 100-year 4-hour Chicago Storm event, which had the highest flow rate. As a result, the proposed major and minor conveyance systems shall be sized to convey the flow from the 100-year 4-hour Chicago event. A detailed dual-drainage hydraulic model (such as an OTTSWM model) will be performed at the detailed design stage to confirm that the size of the minor sewer system's pipes and major overland conveyance route is adequate to safely convey flows to the proposed SWM facilities.

In addition to the major and minor conveyance systems, each SWM Pond will be equipped with an emergency spillway which will release excess flows to Trafalgar Road in the case that the pond's outlet clogging or a storm event in excess of the 100-year return period. At the detailed design stage each SWM Pond's emergency spillway will be sized for the most critical storm event peak flows as described above. Preliminary VO modeling output is provided in Appendix B.

DOUGLAS CRESCENT

DOUGLAS CRESCENT

CURRIE ROAD

SPRUCE STREET

EX. RESIDENTIAL

FULL CAPTURE POINT

STATION STREET

NORTH TANK AREA

SOUTH TANK AREA

EX. SCHOOL

TRAFALGAR ROAD

GUELPH STREET

JANE STREET

MARKET STREET

ELORA CATARACT TRAIL

WELLINGTON STREET

FULL CAPTURE POINT

101	0.63
	0.93 ha

01	0.62
	28.68 ha

02	0.58
	22.39 ha

201	0.53
	0.50 ha

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LEGEND

PROPERTY BOUNDARY
DRAINAGE BOUNDARY
PARK & BUFFER
SINGLE DETACHED
TOWNHOUSES

DRAINAGE AREA
AREA I.D. 100 | 0.50 | 1.00 ha
DESIGN RUNOFF COEFF.
DRAINAGE AREA

OVERLAND FLOW ROUTE
SWM BLOCK
RIGHT OF WAY
RETIREMENT BLOCK
WATER TOWER

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

22-0020ER	January 2024	SCALE: 1:3200

DOUGLAS CRESCENT

CURRIE ROAD

SPRUCE STREET

FULL CAPTURE POINT

STATION STREET

1.0m x 1.8m
BOX CULVERT

EX. RESIDENTIAL

EX. SCHOOL

3 STOREY SENIORS APARTMENT = 88 UNITS

3 STOREY SENIORS APARTMENT = 100 UNITS

RAFFAGAR ROAD

600mmØ
CULVERT

GUELPH STREET

JANE STREET

MARKET STREET

LAURA 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 POND
- BIORETENTION AREA
- FUTURE WHPA-A SOURCE WATER PROTECTION AREA

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

22-0020ER	January 2024	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, WSP is currently working on the design of a sanitary trunk sewer on behalf of the Town of Erin. At the time of writing, it is understood that WSP's preliminary design proposes 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. From here flows will be directed to a new wastewater treatment facility, located away from the proposed development. 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.

In addition to the standards set out by the Town of Erin's design criteria for sanitary services,

it is also known that a portion of the site will be located in a future Well Head Protection Area (WHPA). In accordance with comments received from Wellington Source Water Protection staff, a WHPA-A will be designated in the future, corresponding with the location of the new drinking water well at the northeast limit of the development.

In accordance with Policy SWG-13 for WHPA-A's, all sanitary sewers which are located within a 100-meter radius of the future well (see Figure 3-1) shall follow higher construction standards and inspection protocols by the owner in order to minimize and eliminate leaks. The specific standards to be applied in this development will be confirmed with the Issuing Director of Environmental Compliance Approval for these sewers at a later stage of the project.

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 towards 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 to the future wastewater treatment plant (WWTP). The site's sanitary outlets will be located at the two primary site access points located at the current termination of 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 and their design engineers will be held at future design stages to ensure that the future trunk sewer and WWTP design are compatible with the proposed development sewers.

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	2976	9.99	3.45	34.42	13.59	**48.01**

It should also be noted that the proposed sewer design has considered future support for gravity

sewer connections from potential future development lands to the south. Similarly, on the north side of the site consideration has been provided for connection points from existing areas to the north along Currie Road and Spruce Street, should it be determined that these areas will also be serviced to the proposed development's sewers. 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	376*	1.0	376
Townhouse	286	0.72*	206
Total	662	-	**582**

*Conversion rate for "Multiples" dwellings to one (1) SDE.

Based on the table above, as per the current draft plan, the proposed development's equivalent unit counts, considering the current Single Detached Home and Townhouse 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 to service the proposed Single-Detached homes and Townhouse blocks are expected to be provided by the Town's future wastewater treatment facilities.

Note that Capacity for the proposed seniors' residences (both low-rise and apartment) should be confirmed once unit counts are made available. A summary of the anticipated peak flow capacity associated with the 700 SDE units is provided in Table 3-3.

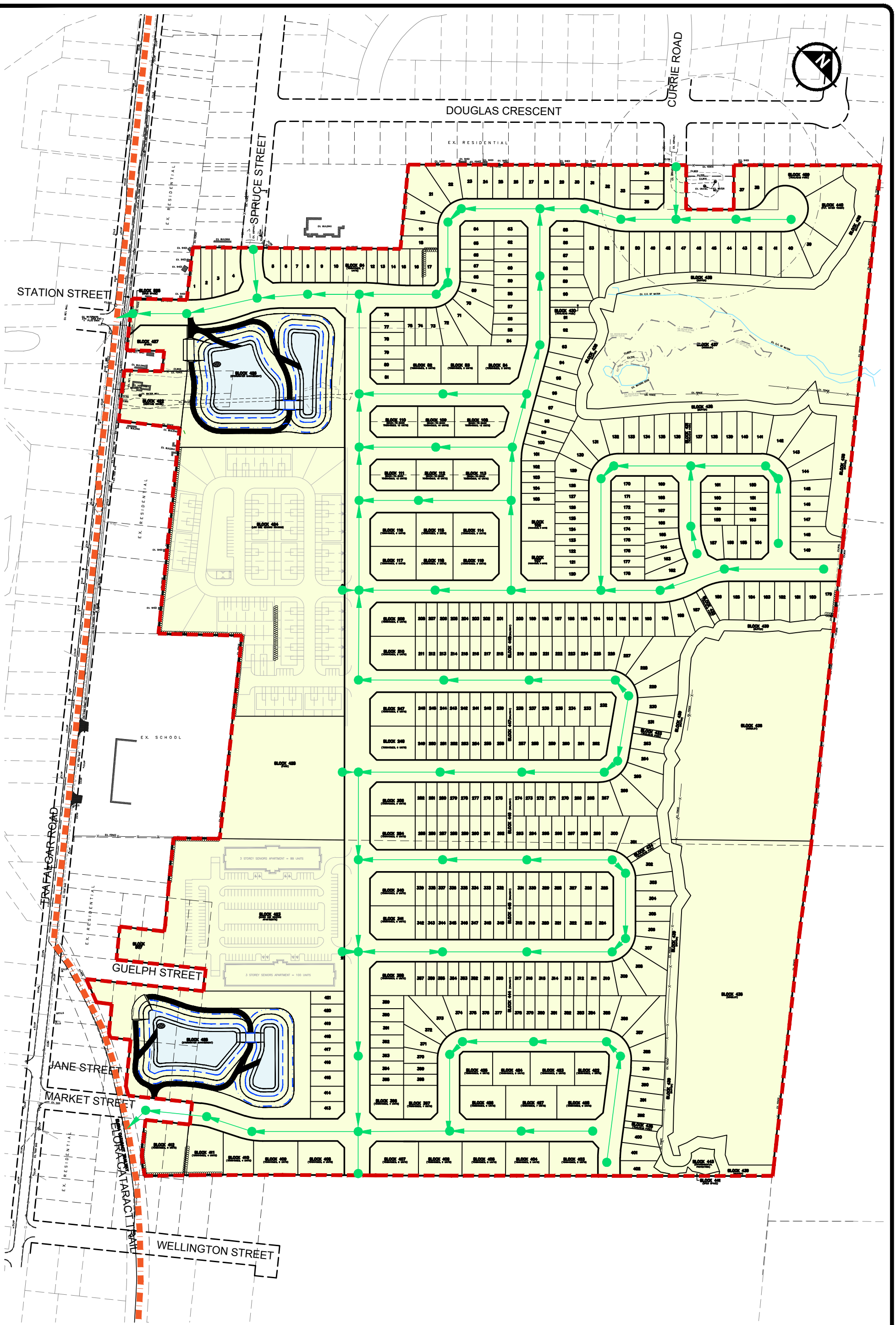
Table 3-3: SDE Allocation Sanitary Demand

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 seniors blocks 423 and 424 will be dependant on the proposed block design. At this time the final proposed block design is still to be determined. As a result, any additional allocation required for these blocks will be handled in the future by a separate site plan application for these blocks.



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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)
- FUTURE WHPA-A SOURCE WATER PROTECTION AREA

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

22-0020ER	January 2024	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 improvement 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 440), 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 by extending a watermain along future Street '2'. 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. Watermains will be extended from the water tower block throughout the site to distribute water services to each of the development blocks and proposed residences.

In addition, two (2) outside connection points are proposed to facilitate a connection to the future watermain to be constructed by the Town along Trafalgar Road. These points will be located at the site's primary site access points, where Station Street, and Market Street currently terminate. This scheme will allow adequate water distribution across the development, while integrating the

future water tower with the larger Town of Erin water supply system.

It is also 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. Therefore, details of the proposed water supply system, as well as potential outside improvements to existing infrastructure, will be confirmed at later design stages. When the Town model is available, a comprehensive analysis will be conducted at the detailed design stage to ensure that the existing and proposed water distribution system are sufficient to service the proposed development.

Furthermore, in order to ensure adequate servicing capacity is available for the proposed development, the construction timing of the subject development will be coordinated with the Town regarding the new municipal well, elevated water tower, and future watermain along Trafalgar Road, to ensure adequate measures are in place prior to completion of the project.

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

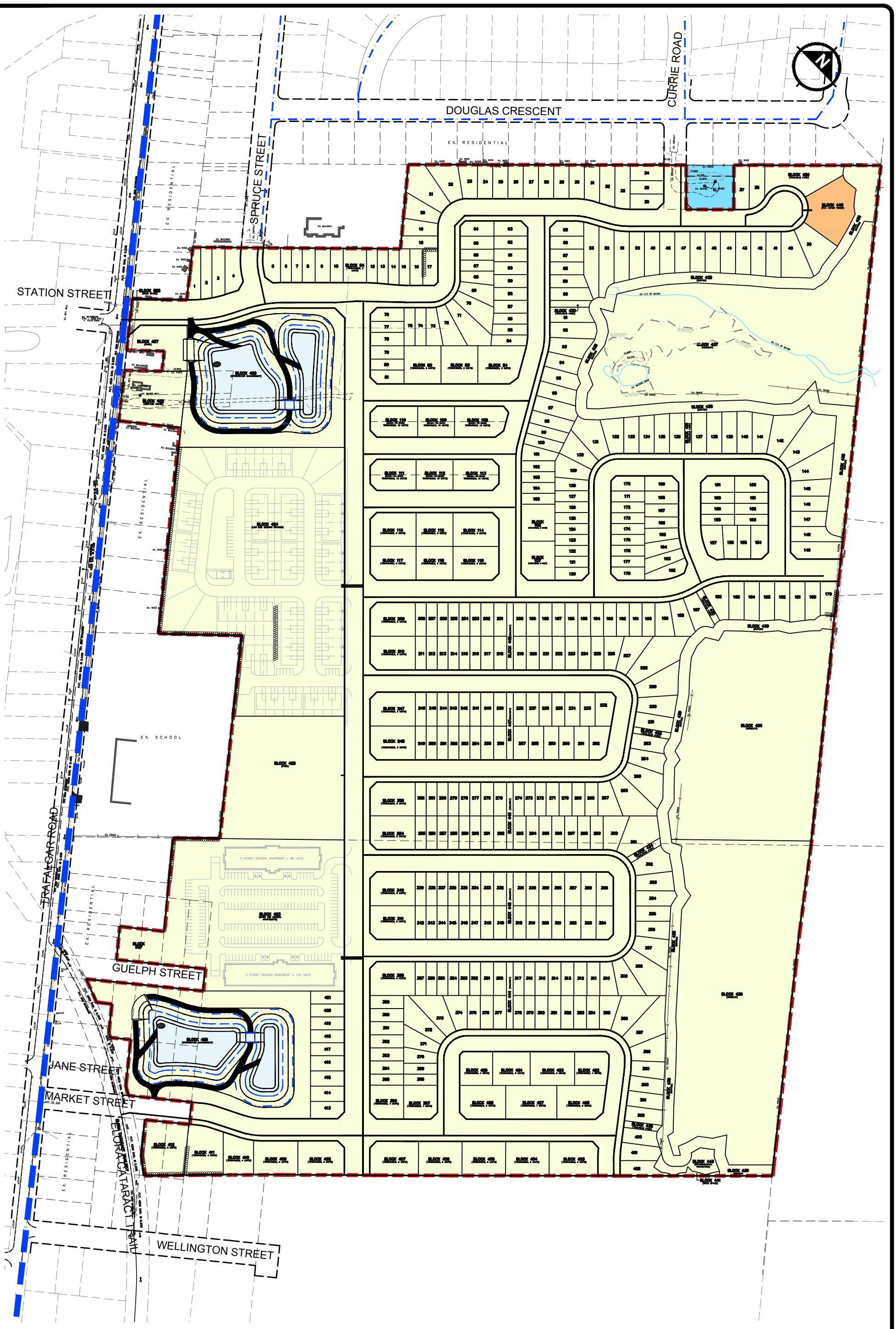
Table 4-1: Estimated Residential Water Supply Demands

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 & Mixed-Use	2976	9.99	41.25	2.75	76.00	104.47

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

Lastly, stub connections to the proposed water distribution system have been provided along the southern and eastern property lines to facilitate connections to future developments.



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LEGEND

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

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

22-0020ER	January 2024	SCALE: 1:3200

5.0 Floodplain

As part of the design of the proposed development, CVCA regulatory and flood plain mapping was consulted. The subject development is located within the West Credit River basin, and as such the associated flood mapping was reviewed. As per CVC Flood Risk Mapping, the site is depicted on West Credit River Map 08 and 09. Using these maps, a flood plain spill point was identified, located at the northwest corner of the site.

The impact of this feature on the proposed development was investigated in a memorandum produced by Urbanworks Engineering Corporation, dated June 2023. A one-dimensional hydraulic analysis was conducted and was discussed in this memorandum. As per the findings of this analysis, the existing floodplain exhibits spill of flows from Spruce Street towards the site.

Under the proposed condition, a steady state HEC-RAS analysis showed that no spill occurs during the 100-year event, but during the Regional even a maximum estimated flow of 5.05 m^3/s is anticipated to spill onto the site. At the time of writing the memorandum estimated that the proposed subdivision's right-of-way would have sufficient capacity (15 m^3/s) to convey flows from the regional storm event, while having a flow depth of 0.10 m above the proposed gutter elevation. As such the regional flood limit was anticipated to sit safely within the proposed right-of-way along Street 2, and away from proposed homes.

However, due to the complexity of this flood plain spill point it is proposed to conduct a detailed two-dimensional analysis to assess the impact of this spill point on the proposed development. This analysis is being conducted by Urbanworks Engineering Corporation and will be completed and submitted at a later design stage under separate cover. The results of this analysis will be used to inform the final design of the development and any required changes to the design will be made at that stage.

6.0 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 point; and
- cut-off swales;
- two (2) topsoil stockpiles, equipped with silt fencing;

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.

7.0 Utilities

In order to ensure the adequate servicing of the proposed development, a high-level investigation of other available infrastructure was conducted.

7.1 Existing Utilities

Based on existing site records, and those of adjacent roadways the following utilities were identified and available for future connections.

Hydro-Electric Distribution

- An above ground electric distribution line, by Hydro One, is located within the west boulevard of the Trafalgar Road right-of-way.

Gas

- A 100 mm diameter gas main, by Enbridge, is located along the east boulevard of the Trafalgar Road right-of-way.
- A 100 mm diameter gas main, by Enbridge, is located along Spruce Street.

Telecommunications

- Bell telecommunication lines along Trafalgar Road;
- Rogers telecommunication lines along Trafalgar Road;

The approximate locations of the existing utilities mentioned above are depicted on the preliminary servicing and grading plans provided in Appendix E. Utility providers and an authorized locates provider should be consulted when conducting any works on or nearby the above-mentioned infrastructure.

7.2 Future Considerations

As part of the considerations for the proposed development, each utilities provider (i.e., Hydro One, Enbridge, Rogers & Bell) will be consulted regarding extending services to the proposed subdivision. Any anticipated utilities upgrades needed to adequately service the proposed development shall be confirmed by their respective provider during the detailed design stage.

Furthermore, it is noted that at the time of writing, preliminary comments provided by Hydro One, Bell and Rogers, have suggested that there are no anticipated concerns with regards to the ability to provide adequate Hydro-Electrical or Telecommunications services for the proposed development. Design confirmation and coordination from each service provider regarding any required servicing upgrades required to service the site will be obtained during the detailed design stage.

8.0 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 two (2) conventional SWM Pond facilities. Flows draining from the SWM ponds will be regulated 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 will be provided using two (2) end-of-pipe Wet Cells within the proposed SWM Pond facilities. Each wet cell has been sized according to the MOE 2003 criteria to provide an enhanced level of protection (80% TSS removal) for each of their incoming drainage areas.
- 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. A detailed mitigation water balance will be provided at the detailed design stage.

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.
- The Sanitary capacity of the Trafalgar Sanitary trunk sewer will be confirmed and coordinated with the Town's wastewater treatment plant design during the detailed

design stage 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 will be established and designed by the Town as per the results of their upcoming Town water supply model. Pipe sizes to accommodate the water tower will be coordinated at the detailed design stage.
- Connection points from the site to the Town's water supply network will be provided to the future Town watermain extension along Trafalgar Road to the East, as well as to existing watermains to the north.
- Additional water distribution system stubs have been provided along the south and east property lines to facilitate connections to potential future developments.

Utilities

- Existing Gas, Telecommunication and Hydroelectric services are present along Trafalgar Road. Any required upgrades will be confirmed with service providers at the detailed design stage.

Respectfully Submitted,

Urbanworks Engineering Corporation

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

Michael Paulo, P.Eng.
Principal

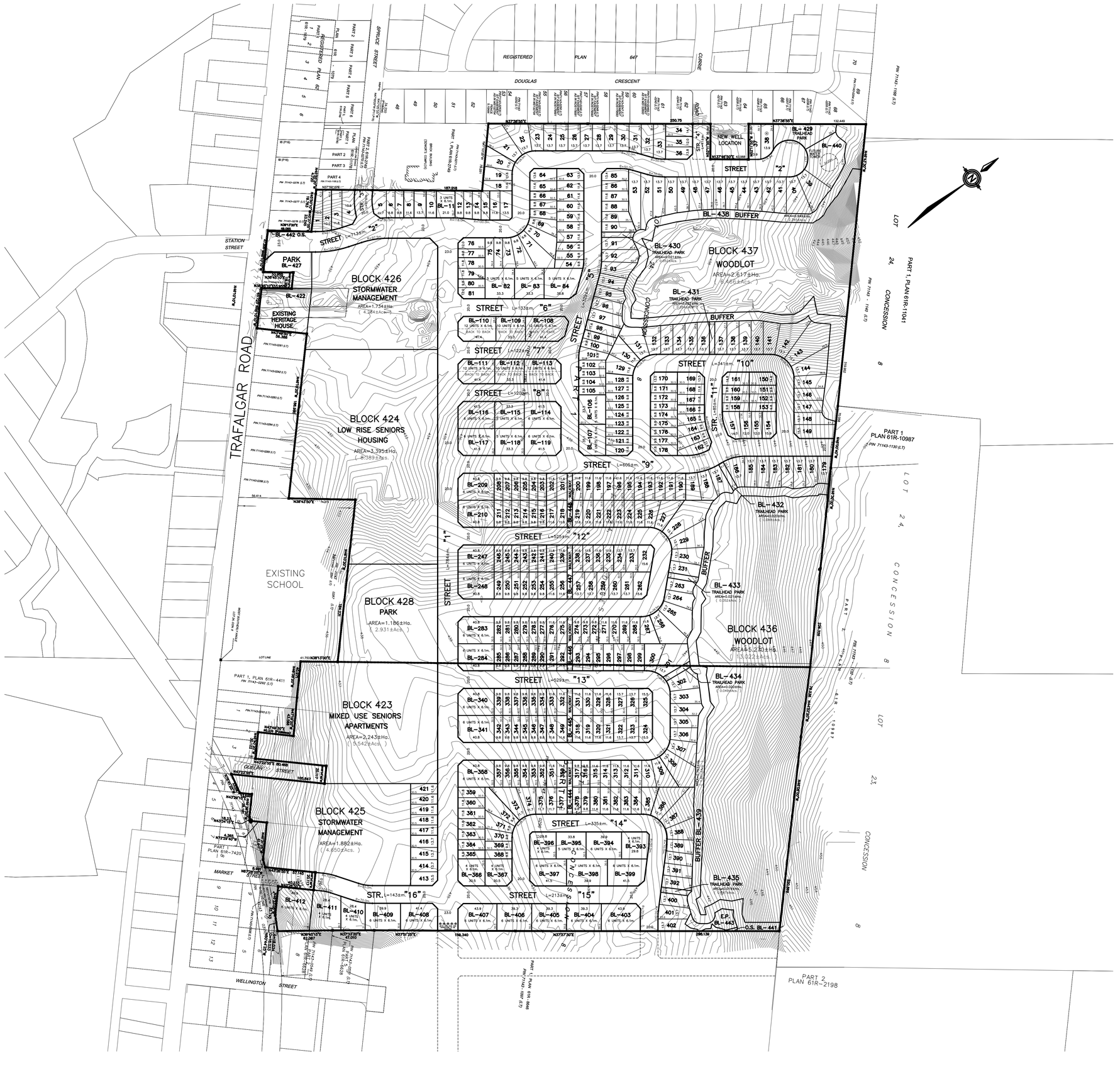
APPENDIX A

Background Information

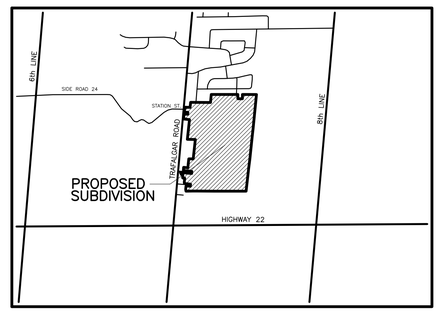
DRAFT PLAN

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 March 6, 2023

RAYMOND J. SIBTHORP
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

DETACHED DWELLINGS	BLOCKS	LOTS	UNITS	±Ha.	±Acs.
LOTS 9, 21–34, 37–53, 91–97, 131–149, 154, 179–189, 228–234, 257–266, 300–308, 322–327, 386–392, 400–402, and 413–416 MIN. LOT FRONTAGE=13.7m. MIN LOT AREA=417.8sq.m.		116	116	6.002	14.831
LOTS 3–4, 8, 10, 16–20, 35–36, 57–65, 78–79, 85–90, 98, 129–130, 150, 155–157, 161, 167–170, 190–202, 217–227, 235–240, 255–256, 267–271, 275–276, 291–299, 309–315, 318–321, 328–333, 348–351, 359–364, 373–377, 380–385 and 417–421 MIN. LOT FRONTAGE=11.6m. MIN LOT AREA=353.8sq.m.		131	131	5.110	12.627
LOTS 1–2, 5–7, 12–15, 54–56, 66–77, 80–81, 99–105, 120–128, 151–153, 158–160, 162–166, 171–178, 203–208, 211–216, 241–246, 249–154, 272–274, 277–282, 285–290, 316–317, 334–339, 342–347, 352–357, 365, 368–372 and 378–379 MIN. LOT FRONTAGE=9.8m. MIN LOT AREA=298.9sq.m.		128	128	4.170	10.304
STREET TOWNHOUSE DWELLINGS					
BLOCKS 11, 82–84, 106–107, 114–119, 209–210, 247–248, 283–284, 340–341, 358, 366–367, 393–399 and 403–412 MIN. UNIT FRONTAGE = 6.1m.	40		218	4.734	11.699
BACK TO BACK TOWNHOUSE DWELLINGS					
BLOCKS 108–113 MIN. UNIT FRONTAGE = 6.1m.	6		68	0.654	1.616
EXISTING HERITAGE HOUSE					
LOT 422		1	1	0.276	0.682
SUBTOTAL	46	376	662	20.946	51.759
BLOCK 423 – MIXED USE SENIORS HOUSING	1			2.243	5.542
BLOCK 424 – LOW RISE SENIORS HOUSING	1			3.395	8.389
BLOCKS 425–426 – STORM WATER MANAGEMENT	2			3.616	8.935
BLOCKS 427–428 – PARK	2			1.343	3.319
BLOCKS 429–435 – TRAILHEAD PARK	7			0.265	0.655
BLOCKS 436–437 – WOODLOT	2			7.887	19.488
BLOCKS 438–439 – BUFFER	2			1.702	4.206
BLOCK 440 – FUTURE WATER TOWER	1			0.191	0.472
BLOCKS 441–442 – OPEN SPACE	2			0.016	0.040
BLOCK 443 – ENVIRONMENTAL PROTECTION	1			0.074	0.183
BLOCKS 444–448 – WALKWAY	5			0.183	0.452
STREETS				10.411	25.726
23.0m. WIDE TOTAL LENGTH=1003±m. AREA= 2.307±Ha.					
20.0m. WIDE TOTAL LENGTH=4052±m. AREA= 8.104±Ha.					
TOTAL LENGTH=5055±m. AREA=10.411±Ha.					
TOTAL	72	376	662	52.272	129.166

NOTE – ELEVATIONS RELATED TO CANADIAN GEODETIC DATUM

NOTE – ⊛ SPECIAL DESIGN UNITS

PROJECT No. P-3304

SCALE 1:2000 NOV 14, 2023

(3304-DES12) X-REF: (3304MAS & 3304MTOPO)

DWG. No. - 23:2

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Planning ● Design ● Development

HYDROGEOLOGICAL INVESTIGATION

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
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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 542-2769

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

Digital Copy – Beachcroft Investments Inc. (Ballantry Homes)
Digital Copy - Soil Engineers Ltd (Missisauga)

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

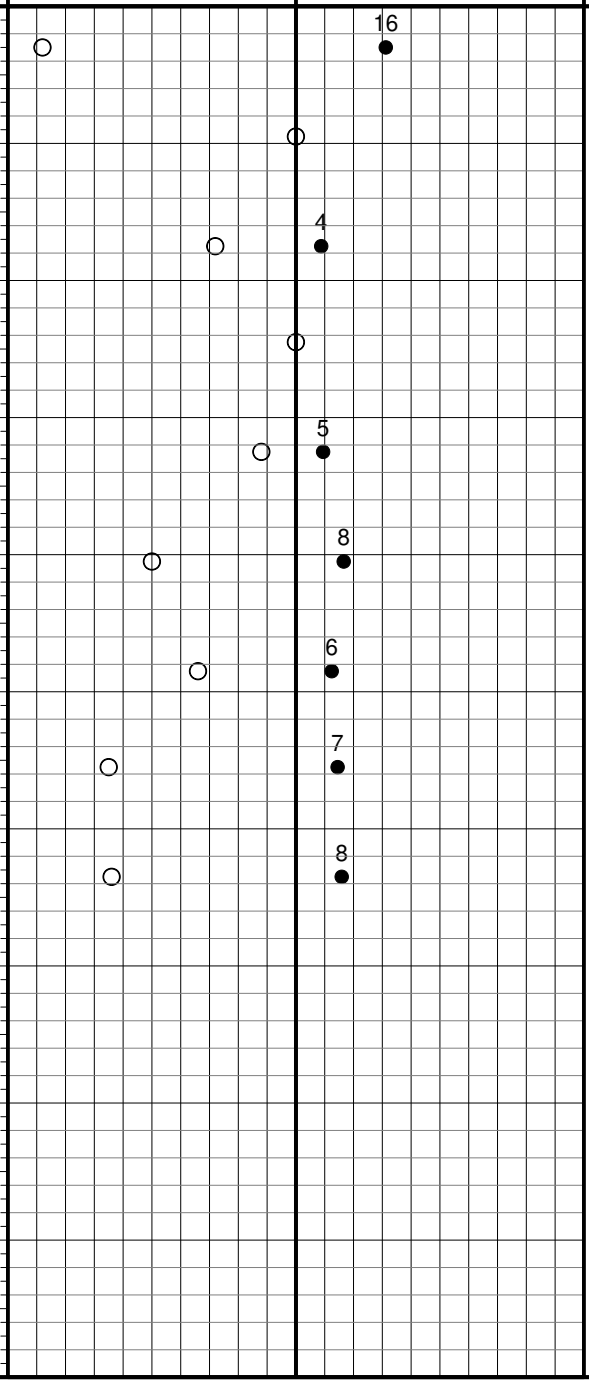
REFERENCE NO. 2206-W054

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	
		6	DO	50/15	4		5	
		7	DO	60	5		3	
429.7					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			Dry on Dec 01, 2022 Dry on Jan 05, 2023 Dry on Feb 08, 2023
					8			
					9			
					10			

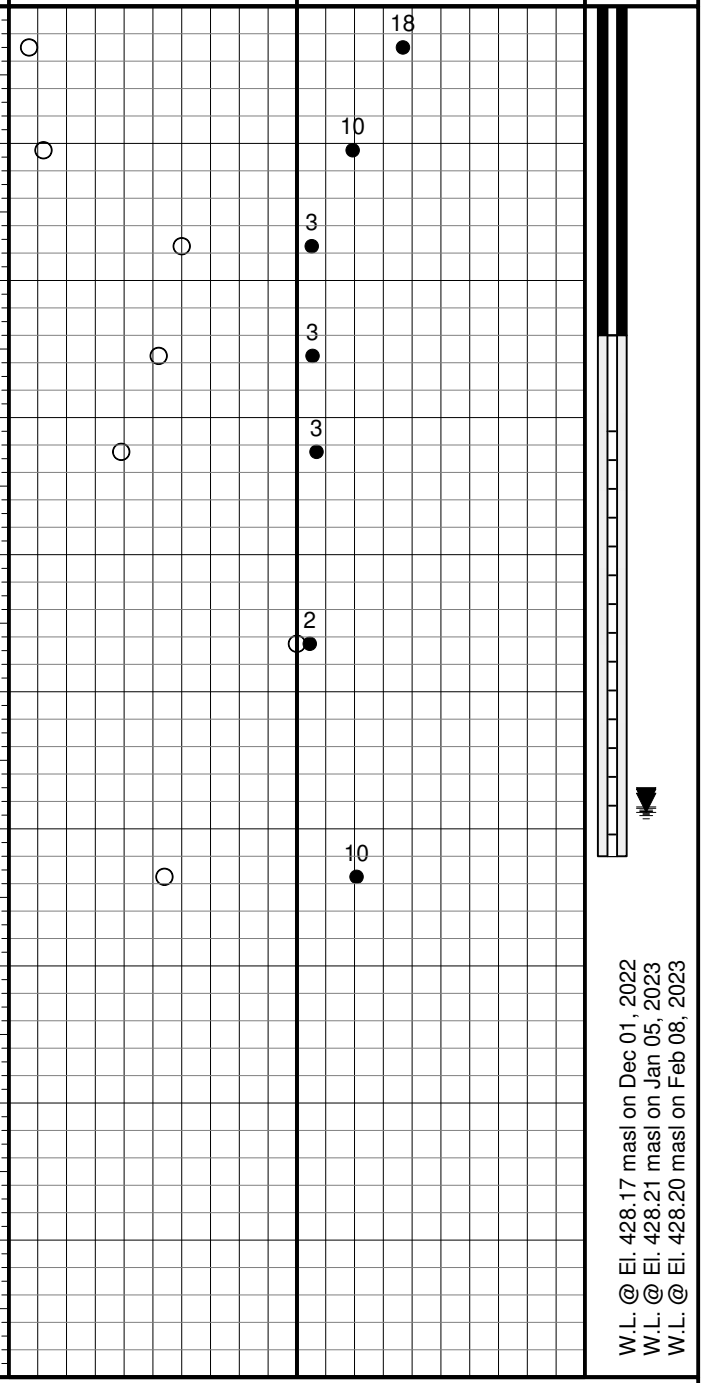
Soil Engineers Ltd.

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)
427.6	Ground Surface				
0.0	36 cm Topsoil	1	DO	11	0
	PLOUGHED SOIL Dark brown sand, occ. rootlets				
426.7		2	DO	50/5	1
0.9	Brown, dense to very dense				
	GRAVELLY SAND occ. cobbles and boulders	3	DO	50/15	2
		4	DO	34	3
		5	DO	38	
		6	DO	50/15	4
					5
421.2		7	DO	50/10	6
6.4	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

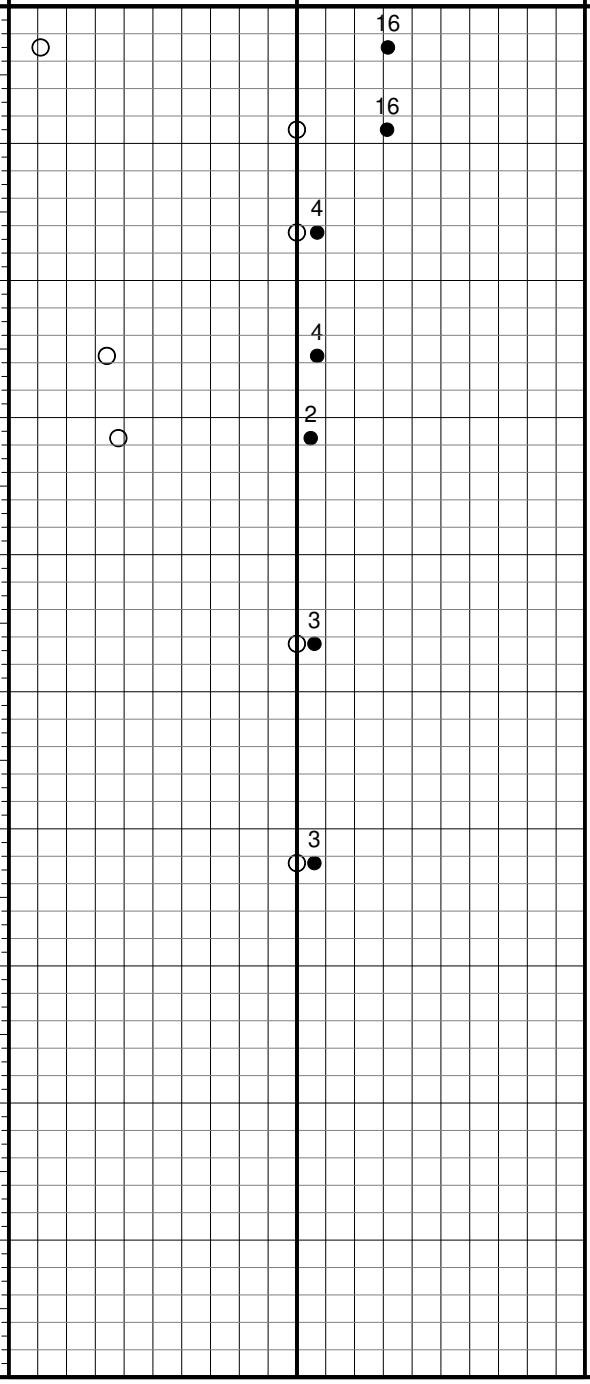
Dynamic Cone (blows/30 cm) 10 30 50 70 90

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



WATER LEVEL

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

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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

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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) 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
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

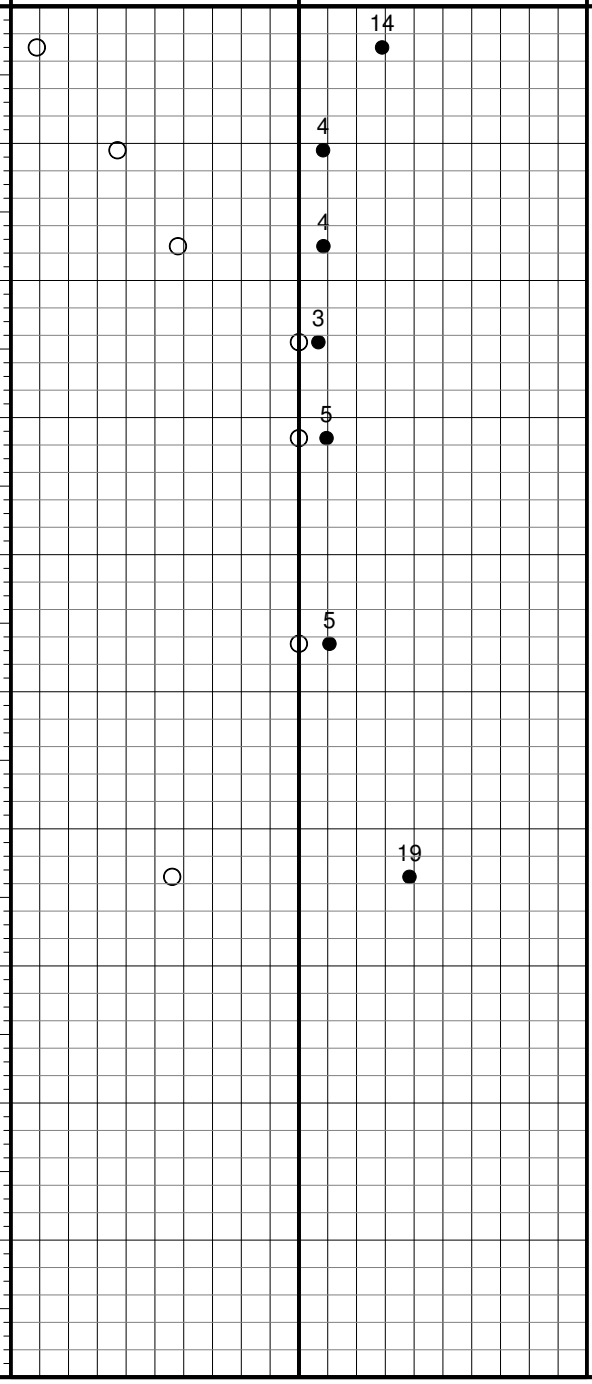
Dynamic Cone (blows/30 cm) 10 30 50 70 90

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	
		5	DO	50/10	3		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

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

17 7 7 4 6 3 4 12 12

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
	brown / grey	7	DO	38	6
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

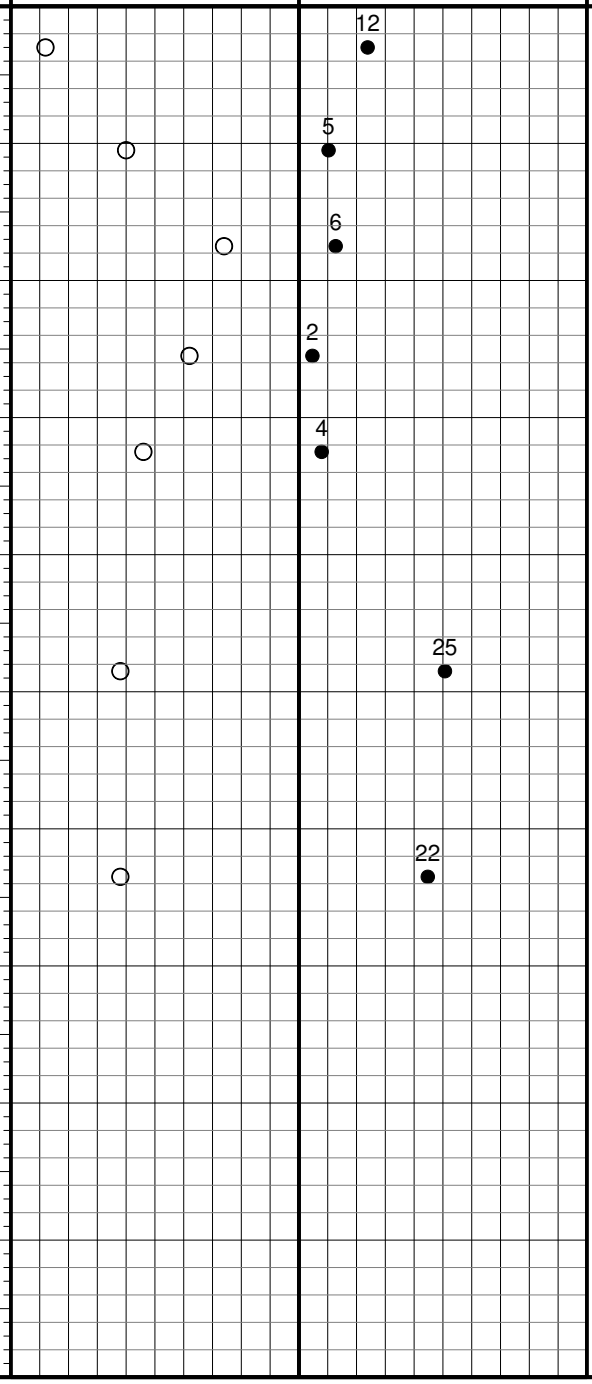
Dynamic Cone (blows/30 cm) 10 30 50 70 90

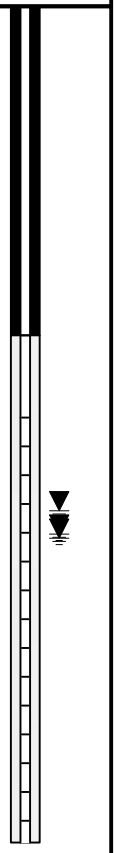
Shear Strength (kN/m²) 50 100 150 200

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

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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

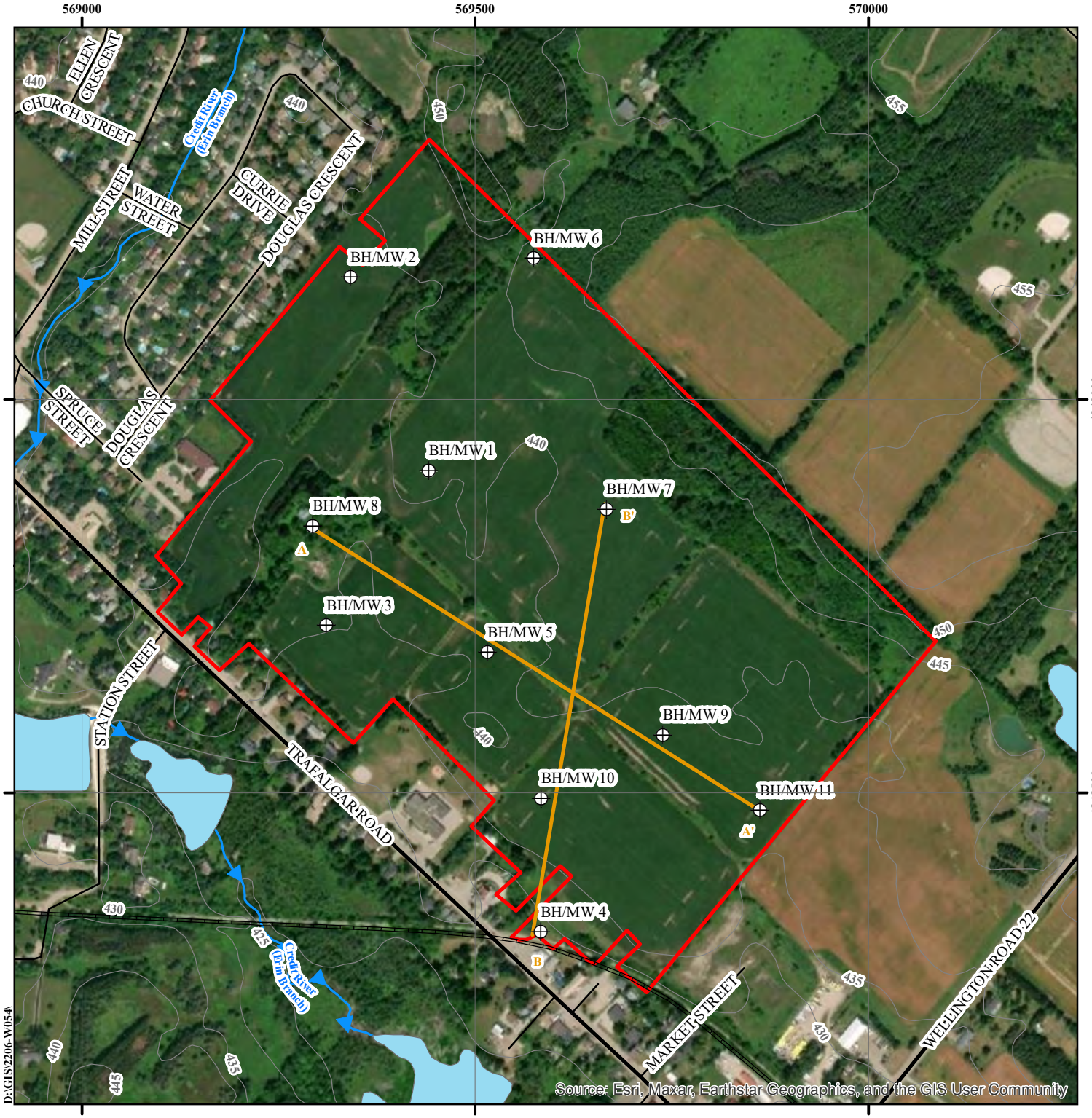
Date: December 21, 2022

Scale:

0 55 110 220 330 440 550

Metres

Drawing No. 3



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	LAND USE							% AREA
GROUP	1	2	3	4	5	6	7	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	WEIGHTED SOIL CONDITION						
GROUP	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	WEIGHTED SOIL CONDITION							% AREA	WTD
USE	A	AB	B	BC	C	CD	D	BY LAND	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
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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**

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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**

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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: December 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
*Parks and Open Space**	0.17	0.25	0.04	7%	0.01
SWM Block	1.89	0.50	0.95	43%	0.81
Townhomes	2.29	0.75	1.72	79%	1.80
Single Detached	10.21	0.60	6.13	57%	5.83
Retirement Block	3.40	0.85	2.89	93%	3.16
Right of Ways	6.55	0.80	5.24	86%	5.61
New Water Tower Area	0.19	0.80	0.15	86%	0.16
TOTAL	**29.62**	**0.62**	18.34	**60%**	17.74

**Includes lot outside of property, east of Currie Road, marked "Existing Well Area".*

TOTAL SOUTH OUTLET IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
School	0.00	0.75	-	-	-
Woodlots and Buffers	4.78	0.25	1.20	7%	0.34
Parks and Open Space	1.09	0.25	0.27	7%	0.08
SWM Block	1.88	0.50	0.94	43%	0.81
Townhomes	3.03	0.75	2.28	79%	2.38
Single Detached	6.11	0.60	3.67	57%	3.49
Retirement Block	2.12	0.85	1.80	93%	1.97
Right of Ways	3.88	0.80	3.10	86%	3.33
TOTAL	**22.89**	**0.58**	13.25	**54%**	12.39

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: December 2023
PREPARED BY: GV

101 - NORTH OUTLET UNCONTROLLED IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
School	0.00	0.75	-	-	-
Woodlots and Buffers	0.00	0.25	-	-	-
Parks and Open Space	0.00	0.25	-	-	-
SWM Block	0.21	0.50	0.11	43%	0.09
Townhomes	0.00	0.75	-	-	-
Single Detached	0.48	0.60	0.29	57%	0.27
Retirement Block	0.00	0.85	-	-	-
Right of Ways	0.24	0.80	0.19	86%	0.21
New Water Tower Area	0.00	0.80	-	-	-
TOTAL	**0.93**	**0.63**	0.59	**61%**	0.57

201 - SOUTH OUTLET UNCONTROLLED IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
School	0.00	0.75	-	-	-
Woodlots and Buffers	0.12	0.25	0.03	7%	0.01
Parks and Open Space	0.00	0.25	-	-	-
SWM Block	0.19	0.50	0.09	43%	0.08
Townhomes	0.19	0.75	0.14	79%	0.15
Single Detached	0.00	0.60	-	-	-
Retirement Block	0.00	0.85	-	-	-
Right of Ways	0.00	0.80	-	-	-
TOTAL	**0.50**	**0.53**	0.27	**48%**	0.24

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: December 2023
PREPARED BY: GV

01 - NORTH SWM TANK 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
*Parks and Open Space**	0.17	0.25	0.04	7%	0.01
SWM Block	1.68	0.50	0.84	43%	0.72
Townhomes	2.29	0.75	1.72	79%	1.80
Single Detached	9.73	0.60	5.84	57%	5.56
Retirement Block	3.40	0.85	2.89	93%	3.16
Right of Ways	6.30	0.80	5.04	86%	5.40
New Water Tower Area	0.19	0.80	0.15	86%	0.16
TOTAL	**28.68**	**0.62**	17.76	**60%**	17.17

**Includes lot outside of property, east of Currie Road, marked "Existing Well Area".*

02 - SOUTH SWM TANK IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
School	0.00	0.75	-	-	-
Woodlots and Buffers	4.66	0.25	1.17	7%	0.33
Parks and Open Space	1.09	0.25	0.27	7%	0.08
SWM Block	1.69	0.50	0.85	43%	0.73
Townhomes	2.85	0.75	2.13	79%	2.24
Single Detached	6.11	0.60	3.67	57%	3.49
Retirement Block	2.12	0.85	1.80	93%	1.97
Right of Ways	3.88	0.80	3.10	86%	3.33
TOTAL	**22.39**	**0.58**	12.99	**54%**	12.15

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 with External Areas

urbanworks
ENGINEERING CORPORATION

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

01 - NORTH SWM TANK + 10 - EXTERNAL IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
North Catchment 01	28.68	0.62	17.78	60%	17.21
External Catchment 10	42.94	0.25	10.74	7%	3.07
TOTAL	**71.62**	**0.40**	28.52	**28%**	20.28

02 - SOUTH SWM TANK + 20 EXTERNAL IMPERVIOUSNESS ESTIMATE

Land-use	Area	C	A*C	Imp.	Area*Imp.
South Catchment 02	22.39	0.62	13.88	60%	13.44
External Catchment 20	4.86	0.25	1.22	7%	0.35
TOTAL	**27.25**	**0.55**	15.10	**51%**	13.78

*Internal Site Catchments 01, and 02 assume minimum IMP of 60%

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**

STORAGE SUMMARY: VO MODELING

Bloor 24hr SCS Storm

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

urbanworks ENGINEERING CORPORATION

STORM EVENT	North Tank Pre-Dev Drainage = 31.29 ha Post-Dev Drainage = 28.68 ha Uncontrolled Post-Dev Drainage = 0.93 ha External Drainage = 42.94 ha				South Tank Pre-Dev. Drainage = 20.35 ha Post-Dev Drainage = 22.39 ha Uncontrolled Post-Dev Drainage = 0.50 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	0.104	1.207	4935	0.568	0.056	0.512	4100
5 YR.	1.777	0.124	1.653	5765	0.767	0.067	0.700	4800
10 YR.	2.987	0.180	2.807	7720	1.291	0.097	1.194	6510
25 YR.	3.922	0.224	3.698	8910	1.686	0.121	1.565	7575
50 YR.**	4.735	0.244	3.849	10470	2.019	0.131	1.888	8520
100 YR.**	5.152	0.270	4.000	**11220**	2.211	0.146	2.065	**8920**

*Controlled Release = Pre-Dev Release less the associated uncontrolled release.
** Release rate from Pond limited to within capacity of downstream Sewer for the North Pond.

STORAFE SUMMARY: VO MODELING

4hr Chicago Storm

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

urbanworks ENGINEERING CORPORATION

STORM EVENT	North Tank Pre-Dev Drainage = 31.29 ha Post-Dev Drainage = 28.68 ha Uncontrolled Post-Dev Drainage = 0.93 ha External Drainage = 42.94 ha				South Tank Pre-Dev. Drainage = 20.35 ha Post-Dev Drainage = 22.39 ha Uncontrolled Post-Dev Drainage = 0.50 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	0.169	0.761	6160	0.400	0.097	0.303	4880
5 YR.	1.672	0.247	1.425	8240	0.720	0.135	0.585	6440
10 YR.	2.263	0.300	1.963	9475	0.974	0.164	0.810	7425
25 YR.	3.090	0.362	2.728	10900	1.328	0.197	1.131	8650
50 YR.	3.753	0.409	3.344	11870	1.612	0.222	1.390	9530
100 YR.	4.420	0.454	3.966	**12760**	1.903	0.246	1.657	**10380**

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

Water Quality Storage Volume Requirement Calculation

North Pond

PROJECT:	Trafalgar Road, Erin
FILE No.:	22-0020ER
DATE:	Devember 2023
PREPARED BY:	GV

Water Quality Infiltration Requirements							
Parameter		**Comments**					
SWM Practice Type	**Wet Pond**						
Protection Level	**1**	**(80% TSS Removal)**					
Area (ha)	**71.620**						
		Quantity Reference (MOE Table 3.2)					
(1) Impervious Level	**28%**	0%	35%	55%	70%	85%	100%
(2) Storage Volume Req. (m^3/ha)*	**130**	90	140	190	225	250	275
*Interpolated based on MOE 2003, Table 3.2							

Water Volume Requirement		
Parameter	**Quantity**	**Calculation**
(3) Required Volume (m^3)	**9311.00**	**(3) = (1) x (2)**
(4) Active Storage Vol. Reduction (m^3)*	2864.80	**Active volume reduction by 40 m^3/ha.**
(5) Perm. Pool Vol. (m^3)	**6,446.20**	**(5) = (3) - (2)**

* For wet ponds, all of the storage, except for 40 m3/ha represents the permanent pool volume. The 40 m3/ha represents extended detention storage.

INFILTRATION LID SIZING CALCULATION

North Bioretention

urbanworks
ENGINEERING CORPORATION

PROJECT:	Hillsburgh Subdivision
FILE No.:	22-0020ER
DATE:	December 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	476	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	286	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	123.8	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	409.4	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 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.

INFILTRATION LID SIZING CALCULATION

North Infiltration Trenches

urbanworks ENGINEERING CORPORATION

PROJECT:	Hillsburgh Subdivision
FILE No.:	22-0020ER
DATE:	December 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	1110.00	m	Length of Infiltration Trenches proposed in Catchment 10
Width	1.50	m	
Area	1665.00	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	533	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	533	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.

Water Quality Storage Volume Requirement Calculation

South Pond

PROJECT:	Trafalgar Road, Erin
FILE No.:	22-0020ER
DATE:	Devember 2023
PREPARED BY:	GV

Water Quality Infiltration Requirements								
Parameter		**Comments**						
SWM Practice Type	**Wet Pond**							
Protection Level	**1**	**(80% TSS Removal)**						
Area (ha)	**27.250**							
		Quantity Reference (MOE Table 3.2)						
(1) Impervious Level	**51%**	0%	35%	55%	70%	85%	100%	
(2) Storage Volume Req. (m^3/ha)*	**180**	90	140	190	225	250	275	
*Interpolated based on MOE 2003, Table 3.2								

Water Volume Requirement		
Parameter	**Quantity**	**Calculation**
(3) Required Volume (m^3)	**4905.00**	**(3) = (1) x (2)**
(4) Active Storage Vol. Reduction (m^3)*	1090.00	**Active volume reduction by 40 m^3/ha.**
(5) Perm. Pool Vol. (m^3)	**3,815.00**	**(5) = (3) - (2)**

* For wet ponds, all of the storage, except for 40 m3/ha represents the permanent pool volume. The 40 m3/ha represents extended detention storage.

INFILTRATION LID SIZING CALCULATION

South Bioretention

urbanworks
ENGINEERING CORPORATION

PROJECT: Hillsburgh Subdivision
FILE No.: 22-0020ER
DATE: December 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	456	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	274	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	73.0	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	346.6	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

South Infiltration Trenches

urbanworks ENGINEERING CORPORATION

PROJECT:	Hillsburgh Subdivision
FILE No.:	22-0020ER
DATE:	December 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	788.00	m	Length of Infiltration Trenches proposed in Catchment 20
Width	1.50	m	
Area	1182.00	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	378	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	378	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.

OUTLET CAPACITY CALCULATIONS

Culvert Calculator Report
Guelph St Culvert

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	427.47	m	Headwater Depth/Height	1.20	
Computed Headwater Eleva	427.47	m	Discharge	0.4647	m³/s
Inlet Control HW Elev.	427.43	m	Tailwater Elevation	426.68	m
Outlet Control HW Elev.	427.47	m	Control Type	Outlet Control	

Grades					
Upstream Invert	426.74	m	Downstream Invert	426.68	m
Length	9.00	m	Constructed Slope	0.006667	m/m

Hydraulic Profile					
Profile	M2		Depth, Downstream	0.45	m
Slope Type	Mild		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.45	m
Velocity Downstream	2.03	m/s	Critical Slope	0.015962	m/m

Section					
Section Shape	Circular		Mannings Coefficient	0.020	
Section Material	24-inch (Corrugated Interior)		Span	0.61	m
Section Size	600 mm		Rise	0.61	m
Number Sections	1				

Corrugated Section Material: CSP 18-24 inch

Outlet Control Properties					
Outlet Control HW Elev.	427.47	m	Upstream Velocity Head	0.14	m
Ke	0.20		Entrance Loss	0.03	m

Inlet Control Properties					
Inlet Control HW Elev.	427.43	m	Flow Control	N/A	
Inlet Type	Groove end projecting		Area Full	0.3	m²
K	0.00450		HDS 5 Chart	1	
M	2.00000		HDS 5 Scale	3	
C	0.03170		Equation Form	1	
Y	0.69000				

Culvert Calculator Report
Station Street Culvert

Solve For: Discharge

Culvert Summary					
Allowable HW Elevation	432.30	m	Headwater Depth/Height	2.23	
Computed Headwater Elev	432.30	m	Discharge	4.3509	m³/s
Inlet Control HW Elev.	431.71	m	Tailwater Elevation	429.59	m
Outlet Control HW Elev.	432.30	m	Control Type	Outlet Control	

Grades					
Upstream Invert	430.03	m	Downstream Invert	429.59	m
Length	60.00	m	Constructed Slope	0.007333	m/m

Hydraulic Profile					
Profile	CompositeM2PressureProfile		Depth, Downstream	0.86	m
Slope Type	Mild		Normal Depth	N/A	m
Flow Regime	Subcritical		Critical Depth	0.84	m
Velocity Downstream	3.29	m/s	Critical Slope	0.024191	m/m

Section					
Section Shape	Arch		Mannings Coefficient	0.025	
Section Material	Aluminum Var CR Historic		Span	1.83	m
Section Size	1830 x 1020 mm		Rise	1.02	m
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	432.30	m	Upstream Velocity Head	0.38	m
Ke	0.50		Entrance Loss	0.19	m

Inlet Control Properties					
Inlet Control HW Elev.	431.71	m	Flow Control	N/A	
Inlet Type	90° headwall		Area Full	1.6	m²
K	0.00830		HDS 5 Chart	34	
M	2.00000		HDS 5 Scale	1	
C	0.03790		Equation Form	1	
Y	0.69000				

WATER BALANCE ASSESSMENT

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
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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)

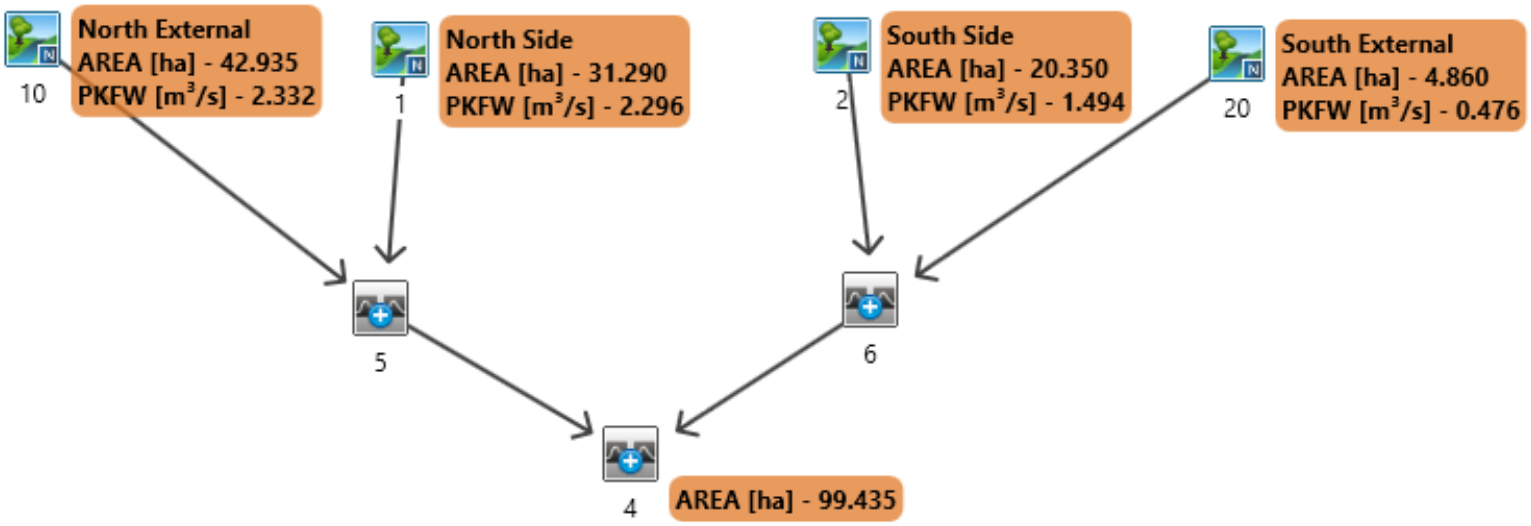
P	=	ET	+	I	+	R	+	ΔS		Check
878.78	=	**319.22**	+	**128.80**	+	**430.76**	+	0		**878.78**

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

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


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

USER:


COMMENTS: _____________________________________________________________


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

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| 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.

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--------------------
| ADD HYD  (  0005)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------           (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0001):    31.29   2.296     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
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```
     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.

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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

     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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 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\8ecae0e9-7beb-4dc6-ab2f-8be9a5ccd606\scena
  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: _____

--------------------------------------------------------------------------------
-------------------------
  ***********************************************
  ** 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 | Ptotal= 74.42 mm |

IDF curve parameters: A=1011.000
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 Curve Number (CN)= 64.2
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)= 1.604 (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 Curve Number (CN)= 64.2
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.

| 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 Curve Number (CN)= 64.2
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)= 1.043 (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-
8d27-4dd2e74404d1\c88f8bc9-aaec-46f4-be3d-62c85b1f6971\scena
  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\c88f8bc9-aaec-46f4-be3d-62c85b1f6971\scena

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

USER:


COMMENTS: _____

--------------------------------------------------------------------------------
-------------------------
  ********************************************
  ** 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-
8d27-4dd2e74404d1\5efaa604-4c4b-4157-b177-e56785d1d3ba\scena
  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\5efaa604-4c4b-4157-b177-e56785d1d3ba\scena


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

USER:
```

COMMENTS: _____

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------------------------
  ***********************************************
  ** 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    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   (  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)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        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-
8d27-4dd2e74404d1\c0fbb690-1937-4e13-bd17-141fa33177f4\scena
  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: _____________________________________________________________


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  ** 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)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(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

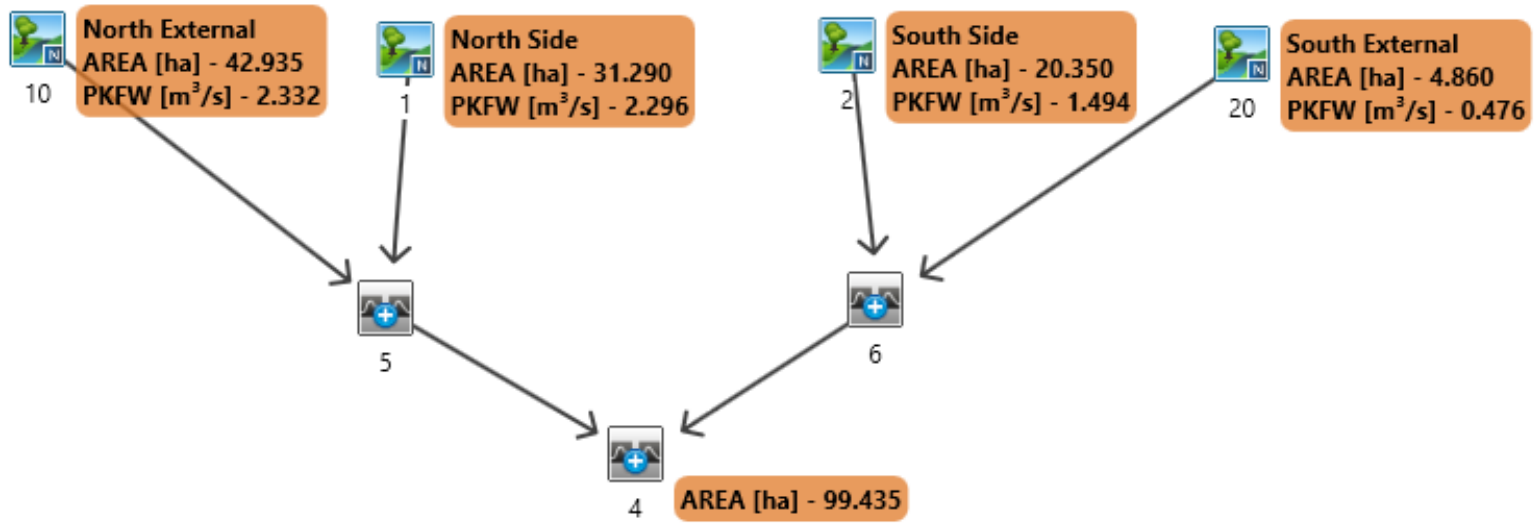
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

ADD HYD (0006)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(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)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(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
  Output  filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\e2a7be31-c928-4df1-be23-bc9ff0e59c27\scena
  Summary filename: C:\Users\gvolpe\AppData\Local\Civica\VH5\20d50a28-808a-41ec-
8d27-4dd2e74404d1\e2a7be31-c928-4df1-be23-bc9ff0e59c27\scena


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

USER:


COMMENTS: _____________________________________________________________


--------------------------------------------------------------------------------
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  ***********************************************
  ** 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

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

--------------------
| 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	0.51	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	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

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

```
       ================================================
       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.

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

--------------------
| 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.
--------------------------------------------------------------------------------

--------------------
| 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.
--------------------------------------------------------------------------------
================================================================================
========================

       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               **
  ********************************************


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|    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

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     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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| 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.
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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	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: _____

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**********************************************
** SIMULATION : bloor 24SCS025               **
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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
```

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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\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: _____

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

```
     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.
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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

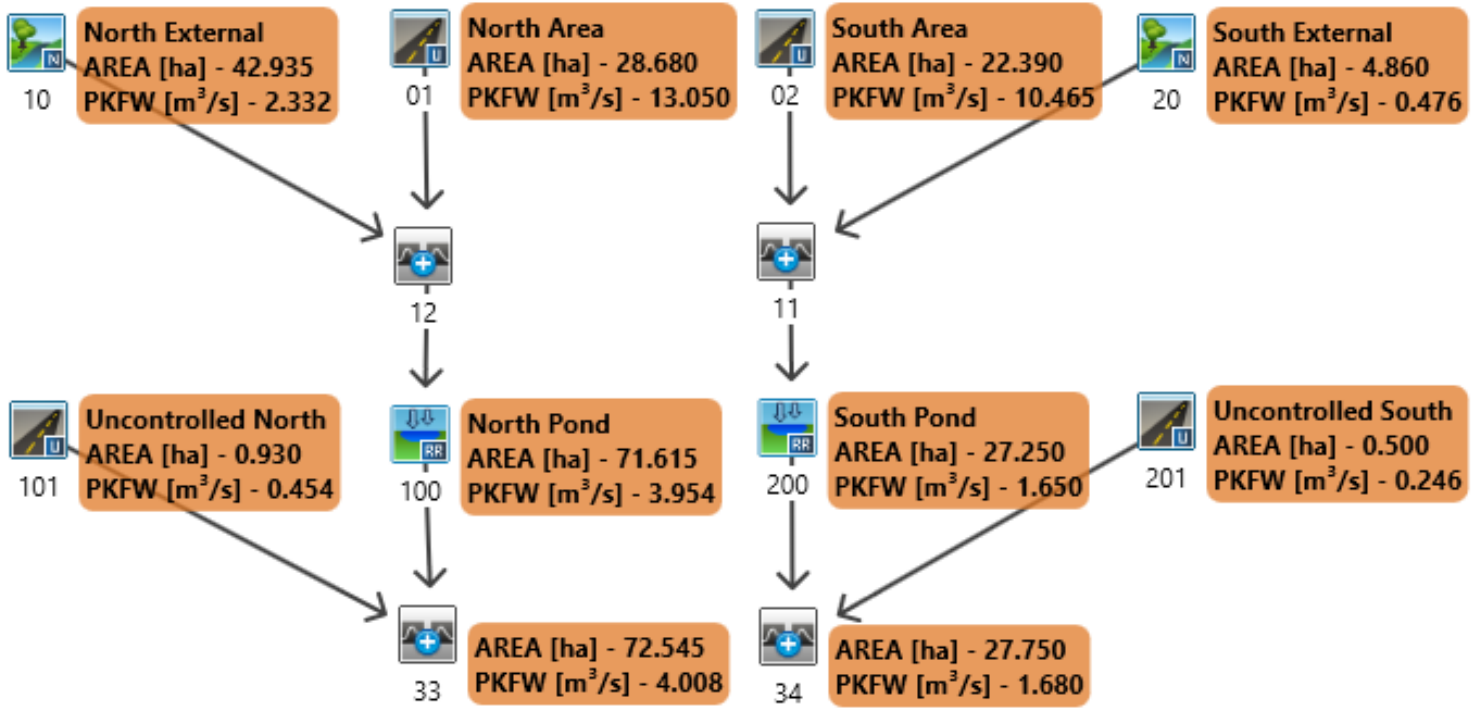
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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: December 2023**

****
** 2 - YEAR STORM **
****

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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   (  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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.39
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.43         8.96
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00

     Length            (m)=     386.35        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)   16.22 (ii)
     Unit Hyd. Tpeak (min)=       5.00        20.00
     Unit Hyd. peak  (cms)=       0.21         0.06
                                                          *TOTALS*
     PEAK FLOW       (cms)=       3.65         0.44          3.762 (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  (  0011)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    22.39    3.762     1.33    31.58
      + ID2= 2 (  0020):     4.86    0.098     1.58     7.62
        ==================================================
        ID = 3 (  0011):    27.25    3.800     1.33    27.31

     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    |   1.1310     0.8650
                         0.3030     0.4880    |   1.3900     0.9530
                         0.5850     0.6440    |   1.6570     1.0380
                         0.8100     0.7425    |   0.0000     0.0000

                                  AREA     QPEAK     TPEAK       R.V.
                                  (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)      27.250     3.800      1.33      27.31
   OUTFLOW: ID= 1 (  0200)      27.250     0.303      2.75      27.29

                PEAK   FLOW   REDUCTION [Qout/Qin](%)=  7.97
                TIME SHIFT OF PEAK FLOW          (min)= 85.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.4878

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
```

Surface Area	(ha)=	0.30	0.20	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	57.74	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.(mm/hr)	=	140.12	67.93	
over (min)		5.00	10.00	
Storage Coeff.	(min)=	1.61 (ii)	9.84 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	10.00	
Unit Hyd. peak	(cms)=	0.32	0.11	
				TOTALS
PEAK FLOW	(cms)=	0.08	0.02	0.097 (iii)
TIME TO PEAK	(hrs)=	1.33	1.42	1.33
RUNOFF VOLUME	(mm)=	40.21	22.13	30.25
TOTAL RAINFALL	(mm)=	41.21	41.21	41.21
RUNOFF COEFFICIENT	=	0.98	0.54	0.73

***** 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):		27.25	0.303	2.75	27.29
+ ID2= 2 (0201):		0.50	0.097	1.33	30.25
ID = 3 (0034):		27.75	0.309	2.67	27.35

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

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		

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.

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min				
Area	(ha)=	28.68		
Total Imp	(%)=	60.00	Dir. Conn.(%)=	60.00

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	17.21	11.47	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	437.26	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)=	5.41 (ii)	16.60 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	20.00	
Unit Hyd. peak	(cms)=	0.20	0.06	
				TOTALS
PEAK FLOW	(cms)=	4.51	0.56	4.656 (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)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0001):		28.68	4.656	1.33	31.58
+ ID2= 2 (0010):		42.94	0.496	1.92	7.37
ID = 3 (0012):		71.61	4.701	1.33	17.07

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0100) IN= 2---> OUT= 1 DT= 5.0 min — OVERFLOW IS OFF

OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
0.0000	0.0000	2.7280	1.0900
0.7610	0.6160	3.3440	1.1870
1.4250	0.8240	3.9660	1.2760
1.9630	0.9475	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0012)	71.615	4.701	1.33	17.07
OUTFLOW: ID= 1 (0100)	71.615	0.760	2.58	17.06

PEAK FLOW REDUCTION [Qout/Qin](%)= 16.18
TIME SHIFT OF PEAK FLOW (min)= 75.00
MAXIMUM STORAGE USED (ha.m.)= 0.6158

CALIB

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| STANDHYD (  0101)|   Area     (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      78.74        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     140.12        70.68
               over (min)         5.00        15.00
     Storage Coeff.  (min)=       1.93 (ii)   10.04 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.31         0.10
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.04          0.169 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.50           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):    71.61   0.760     2.58    17.06
     + ID2= 2 (  0101):     0.93   0.169     1.33    30.41
       ================================================
       ID = 3 (  0033):    72.55   0.773     2.50    17.24

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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****
**** 5 – YEAR STORM ****
****

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****************************************
** 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   (  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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.39
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.43         8.96
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     386.35        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)=       4.50 (ii)    9.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.23         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       5.06         1.04          5.613 (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):    22.39   5.613     1.33    43.55
      + ID2= 2 (  0020):     4.86   0.178     1.50    13.20
        ==================================================
        ID = 3 (  0011):    27.25   5.687     1.33    38.14

     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   |   1.1310     0.8650
                           0.3030     0.4880   |   1.3900     0.9530
                           0.5850     0.6440   |   1.6570     1.0380
                           0.8100     0.7425   |   0.0000     0.0000

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.250     5.687      1.33      38.14
   OUTFLOW: ID= 1 (  0200)     27.250     0.584      2.25      38.12

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.27
                  TIME SHIFT OF PEAK FLOW          (min)= 55.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.6438

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.30         0.20
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.74        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     184.73       103.61
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       1.44 (ii)    8.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.04        0.135 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42         1.33
     RUNOFF VOLUME    (mm)=      53.46        33.13        42.28
     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  (  0034)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0200):    27.25   0.584     2.25    38.12
      + ID2= 2 (  0201):     0.50   0.135     1.33    42.28
        ==================================================
        ID = 3 (  0034):    27.75   0.596     2.17    38.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area    (ha)=  28.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.21        11.47
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     437.26        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)=       4.84 (ii)    9.54 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.22         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       6.27         1.30        6.966 (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
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     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):    28.68   6.966     1.33    43.55
      + ID2= 2 (  0010):    42.94   0.891     1.92    12.80
        ================================================
        ID = 3 (  0012):    71.61   7.061     1.33    25.12

     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   |  2.7280      1.0900
                          0.7610     0.6160   |  3.3440      1.1870
                          1.4250     0.8240   |  3.9660      1.2760
                          1.9630     0.9475   |  0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)    71.615     7.061      1.33      25.12
   OUTFLOW: ID= 1 (  0100)    71.615     1.425      2.25      25.11

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.18
                  TIME SHIFT OF PEAK FLOW          (min)= 55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.8239

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area     (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      78.74        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)=       1.73 (ii)    8.59 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.12
                                                      *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.07          0.247 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      53.46        33.48          42.47
     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):    71.61   1.425     2.25    25.11
      + ID2= 2 (  0101):     0.93   0.247     1.33    42.47
        ================================================
        ID = 3 (  0033):    72.55   1.446     2.25    25.34

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

****
**** 5 – YEAR STORM ****
****

```
****************************************
** 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 hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN 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   (  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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.39
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.43         8.96
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     386.35        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)=       4.50 (ii)    9.19 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.23         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       5.06         1.04          5.613 (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):    22.39   5.613     1.33    43.55
     + ID2= 2 (  0020):     4.86   0.178     1.50    13.20
       ================================================
       ID = 3 (  0011):    27.25   5.687     1.33    38.14

     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    |  1.1310      0.8650
                         0.3030     0.4880    |  1.3900      0.9530
                         0.5850     0.6440    |  1.6570      1.0380
                         0.8100     0.7425    |  0.0000      0.0000

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.250      5.687      1.33       38.14
   OUTFLOW: ID= 1 (  0200)     27.250      0.584      2.25       38.12

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 10.27
                TIME SHIFT OF PEAK FLOW          (min)= 55.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  0.6438

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.30         0.20
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.74        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     184.73       103.61
               over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.44 (ii)    8.40 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.11         0.04          0.135 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      53.46        33.13          42.28
     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  (  0034)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0200):    27.25   0.584     2.25    38.12
```

```
      + ID2= 2 (  0201):     0.50   0.135     1.33    42.28
        ================================================
        ID = 3 (  0034):    27.75   0.596     2.17    38.20

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area     (ha)=  28.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.21        11.47
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     437.26        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)=       4.84 (ii)    9.54 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.22         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       6.27         1.30        6.966 (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):    28.68   6.966     1.33    43.55
     + ID2= 2 (  0010):    42.94   0.891     1.92    12.80
       ================================================
       ID = 3 (  0012):    71.61   7.061     1.33    25.12

     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    |   2.7280      1.0900
                         0.7610     0.6160    |   3.3440      1.1870
                         1.4250     0.8240    |   3.9660      1.2760
                         1.9630     0.9475    |   0.0000      0.0000

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)      71.615      7.061      1.33       25.12
   OUTFLOW: ID= 1 (  0100)      71.615      1.425      2.25       25.11

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.18
                  TIME SHIFT OF PEAK FLOW          (min)= 55.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.8239

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area     (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      78.74        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)=       1.73 (ii)    8.59 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.21         0.07        0.247 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42         1.33
     RUNOFF VOLUME    (mm)=      53.46        33.48        42.47
     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):     71.61   1.425     2.25    25.11
      + ID2= 2 (  0101):      0.93   0.247     1.33    42.47
        ================================================
        ID = 3 (  0033):     72.55   1.446     2.25    25.34

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

****
**** 10 - YEAR STORM   ****
****

```
****************************************
** 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 hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN 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   (  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.
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.39
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.43          8.96
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     386.35         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)     8.66 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=       0.24          0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       6.03          1.37       6.766 (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):     22.39   6.766     1.33    51.67
      + ID2= 2 (  0020):      4.86   0.242     1.50    17.48
        ================================================
        ID = 3 (  0011):     27.25   6.871     1.33    45.57

     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    |   1.1310     0.8650
                         0.3030     0.4880    |   1.3900     0.9530
                         0.5850     0.6440    |   1.6570     1.0380
                         0.8100     0.7425    |   0.0000     0.0000

                                    AREA     QPEAK     TPEAK       R.V.
                                    (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)        27.250     6.871      1.33      45.57
   OUTFLOW: ID= 1 (  0200)        27.250     0.809      2.08      45.56
```

```
                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 11.78
                TIME SHIFT OF PEAK FLOW          (min)= 45.00
                MAXIMUM  STORAGE   USED        (ha.m.)=  0.7422

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.30         0.20
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.74        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     214.66       128.90
               over (min)         5.00        10.00
     Storage Coeff.  (min)=       1.35 (ii)    6.31 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.13         0.06          0.164 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      62.26        40.78          50.44
     TOTAL RAINFALL   (mm)=      63.26        63.26          63.26
     RUNOFF COEFFICIENT   =       0.98         0.64           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  (  0034)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)      (mm)
        ID1= 1 (  0200):    27.25   0.809     2.08    45.56
      + ID2= 2 (  0201):     0.50   0.164     1.33    50.44
        ================================================
        ID = 3 (  0034):    27.75   0.825     2.08    45.65

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area     (ha)=  28.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                            IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.21        11.47
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     437.26        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)=       4.56 (ii)    8.98 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.23         0.12
                                                          *TOTALS*
     PEAK FLOW       (cms)=       7.48         1.72          8.410 (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):    28.68   8.410     1.33    51.67
      + ID2= 2 (  0010):    42.94   1.202     1.92    16.98
        ================================================
        ID = 3 (  0012):    71.61   8.548     1.33    30.87

     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    |   2.7280      1.0900
                         0.7610     0.6160    |   3.3440      1.1870
                         1.4250     0.8240    |   3.9660      1.2760
                         1.9630     0.9475    |   0.0000      0.0000
```

```
                              AREA      QPEAK     TPEAK       R.V.
                              (ha)      (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.615     8.548      1.33      30.87
   OUTFLOW: ID= 1 (  0100)     71.615     1.961      2.17      30.87

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 22.94
                  TIME SHIFT OF PEAK FLOW          (min)= 50.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.9475

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      78.74        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)=       1.63 (ii)    6.54 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.14
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.24         0.11          0.300 (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):    71.61    1.961     2.17    30.87
      + ID2= 2 (  0101):     0.93    0.300     1.33    50.65
        =================================================
        ID = 3 (  0033):    72.55    1.987     2.17    31.12

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

****
**** 25 - YEAR STORM   ****
****

```
****************************************
** 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    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
     hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   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   (  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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=  22.39
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.43         8.96
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     386.35        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)=       7.25         1.81          8.245 (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):    22.39   8.245     1.33    62.11
      + ID2= 2 (  0020):     4.86   0.331     1.50    23.46
        ================================================
        ID = 3 (  0011):    27.25   8.393     1.33    55.22

     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   |  1.1310      0.8650
                          0.3030     0.4880   |  1.3900      0.9530
                          0.5850     0.6440   |  1.6570      1.0380
                          0.8100     0.7425   |  0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.250     8.393      1.33      55.22
   OUTFLOW: ID= 1 (  0200)     27.250     1.129      2.00      55.21

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 13.45
                  TIME SHIFT OF PEAK FLOW         (min)= 40.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.8646

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.30         0.20
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.74        40.00
     Mannings n            =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     251.78       161.20
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       1.27 (ii)    5.92 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.16         0.07          0.197 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      73.42        50.76          60.95
     TOTAL RAINFALL   (mm)=      74.42        74.42          74.42
     RUNOFF COEFFICIENT   =       0.99         0.68           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)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0200):    27.25   1.129     2.00    55.21
      + ID2= 2 (  0201):     0.50   0.197     1.33    60.95
        ================================================
        ID = 3 (  0034):    27.75   1.149     2.00    55.31

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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)=   1.637 (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)=  28.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.21        11.47
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
```

```
     Length            (m)=     437.26        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)=      4.28 (ii)    8.43 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.23         0.12
                                                        *TOTALS*
     PEAK FLOW       (cms)=      9.02         2.27       10.262 (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):    28.68  10.262     1.33    62.11
     + ID2= 2 (  0010):    42.94   1.637     1.92    22.83
       ================================================
       ID = 3 (  0012):    71.61  10.467     1.33    38.56

     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   |   2.7280     1.0900
                           0.7610     0.6160   |   3.3440     1.1870
                           1.4250     0.8240   |   3.9660     1.2760
                           1.9630     0.9475   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.615    10.467      1.33      38.56
   OUTFLOW: ID= 1 (  0100)     71.615     2.723      2.08      38.56

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 26.01
                  TIME SHIFT OF PEAK FLOW         (min)= 45.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.0900

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
```

```
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.57         0.36
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     78.74        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)=      1.53 (ii)    6.14 (ii)
     Unit Hyd. Tpeak (min)=      5.00        10.00
     Unit Hyd. peak  (cms)=      0.33         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=      0.28         0.14        0.362 (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):    71.61   2.723     2.08    38.56
     + ID2= 2 (  0101):     0.93   0.362     1.33    61.18
       ================================================
       ID = 3 (  0033):    72.55   2.757     2.08    38.85

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

****
**** 50 – YEAR STORM   ****
****

```
****************************************
** 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 (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.

CALIB			
STANDHYD (0002)	Area (ha)= 22.39		
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 60.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	13.43	8.96	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	386.35	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)	7.79 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	10.00	
Unit Hyd. peak	(cms)=	0.25	0.13	
				TOTALS
PEAK FLOW	(cms)=	8.18	2.16	9.377 (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)		AREA	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
	ID1= 1 (0002):	22.39	9.377	1.33	69.69
	+ ID2= 2 (0020):	4.86	0.403	1.50	28.09
	ID = 3 (0011):	27.25	9.560	1.33	62.27

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	1.1310	0.8650
	0.3030	0.4880	1.3900	0.9530
	0.5850	0.6440	1.6570	1.0380
	0.8100	0.7425	0.0000	0.0000

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)		27.250	9.560	1.33	62.27
OUTFLOW: ID= 1 (0200)		27.250	1.389	1.92	62.26
PEAK FLOW REDUCTION	[Qout/Qin](%)=	14.53			
TIME SHIFT OF PEAK FLOW	(min)=	35.00			
MAXIMUM STORAGE USED	(ha.m.)=	0.9528			

CALIB			
STANDHYD (0201)	Area (ha)= 0.50		
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 45.00	

		IMPERVIOUS	PERVIOUS (i)	
Surface Area	(ha)=	0.30	0.20	
Dep. Storage	(mm)=	1.00	1.50	
Average Slope	(%)=	1.00	2.00	
Length	(m)=	57.74	40.00	
Mannings n	=	0.013	0.250	
Max.Eff.Inten.	(mm/hr)=	279.58	185.69	
over	(min)	5.00	10.00	
Storage Coeff.	(min)=	1.22 (ii)	5.68 (ii)	
Unit Hyd. Tpeak	(min)=	5.00	10.00	
Unit Hyd. peak	(cms)=	0.33	0.15	
				TOTALS
PEAK FLOW	(cms)=	0.17	0.09	0.222 (iii)
TIME TO PEAK	(hrs)=	1.33	1.42	1.33
RUNOFF VOLUME	(mm)=	81.43	58.07	68.57
TOTAL RAINFALL	(mm)=	82.43	82.43	82.43
RUNOFF COEFFICIENT	=	0.99	0.70	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):    27.25   1.389     1.92    62.26
      + ID2= 2 (  0201):     0.50   0.222     1.33    68.57
        ====================================================
        ID = 3 (  0034):    27.75   1.415     1.92    62.37

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area    (ha)=  28.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.21         11.47
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     437.26         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)=       4.10 (ii)     8.08 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=       0.24          0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=      10.18          2.72        11.683 (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  (  0012)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    28.68  11.683     1.33    69.69
      + ID2= 2 (  0010):    42.94   1.983     1.92    27.36
        ====================================================
        ID = 3 (  0012):    71.61  11.941     1.33    44.31

     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   |   2.7280      1.0900
                          0.7610     0.6160   |   3.3440      1.1870
                          1.4250     0.8240   |   3.9660      1.2760
                          1.9630     0.9475   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.615    11.941      1.33      44.31
   OUTFLOW: ID= 1 (  0100)     71.615     3.339      2.00      44.31

                PEAK   FLOW   REDUCTION [Qout/Qin](%)= 27.96
                TIME SHIFT OF PEAK FLOW          (min)= 40.00
                MAXIMUM  STORAGE   USED       (ha.m.)=  1.1866

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57          0.36
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=      78.74         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)=       1.47 (ii)     5.88 (ii)
     Unit Hyd. Tpeak (min)=       5.00         10.00
     Unit Hyd. peak  (cms)=       0.33          0.15
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.32          0.16          0.409 (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):    71.61   3.339     2.00    44.31
     + ID2= 2 (  0101):     0.93   0.409     1.33    68.82
       ================================================
       ID = 3 (  0033):    72.55   3.382     2.00    44.63

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

****
**** 100 – YEAR STORM ****
****

```
****************************************
** 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   (  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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.39
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------

                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      13.43         8.96
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     386.35        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)=       3.68 (ii)    7.51 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.25         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       9.07         2.51        10.465 (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):    22.39  10.465     1.33    76.75
     + ID2= 2 (  0020):     4.86   0.476     1.50    32.60
       ================================================
       ID = 3 (  0011):    27.25  10.684     1.33    68.88

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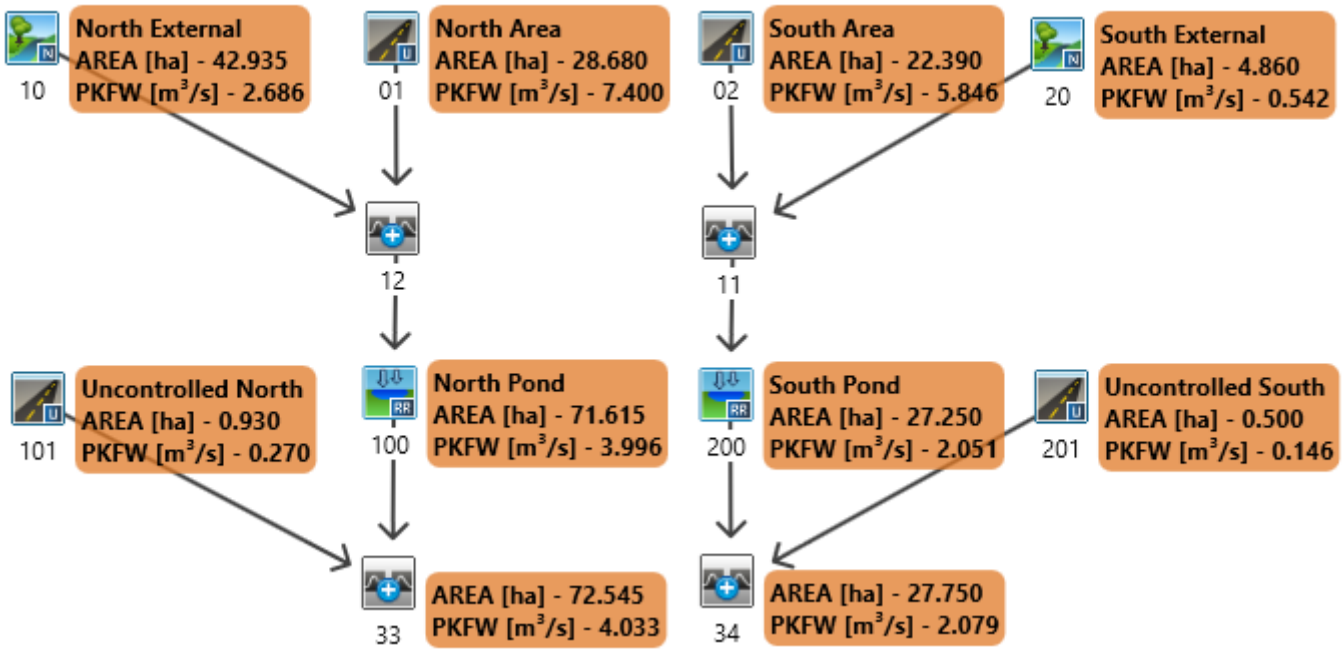

```
| RESERVOIR(  0200)|     OVERFLOW IS OFF
| IN= 2---> OUT= 1 |
| DT=  5.0 min     |     OUTFLOW    STORAGE   |  OUTFLOW    STORAGE
--------------------      (cms)     (ha.m.)   |   (cms)     (ha.m.)
                          0.0000     0.0000   |  1.1310      0.8650
                          0.3030     0.4880   |  1.3900      0.9530
                          0.5850     0.6440   |  1.6570      1.0380
                          0.8100     0.7425   |  0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.250    10.684      1.33      68.88
   OUTFLOW: ID= 1 (  0200)     27.250     1.650      1.92      68.86

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 15.44
                  TIME SHIFT OF PEAK FLOW          (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.0373

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.30         0.20
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.74        40.00
     Mannings n           =      0.013        0.250

     Max.Eff.Inten.(mm/hr)=     305.79       209.31
               over (min)          5.00        10.00
     Storage Coeff.  (min)=       1.18 (ii)    5.48 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.16
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.19         0.10          0.246 (iii)
     TIME TO PEAK    (hrs)=       1.33         1.42           1.33
     RUNOFF VOLUME    (mm)=      88.85        64.91          75.68
     TOTAL RAINFALL   (mm)=      89.85        89.85          89.85
     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)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0200):    27.25   1.650     1.92    68.86
      + ID2= 2 (  0201):     0.50   0.246     1.33    75.68
        ==================================================
        ID = 3 (  0034):    27.75   1.680     1.83    68.99

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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.

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0001)|   Area    (ha)=  28.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.21        11.47
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=     437.26        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)=       3.96 (ii)    7.80 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.24         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=      11.30         3.15         13.050 (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):    28.68  13.050     1.33    76.75
      + ID2= 2 (  0010):    42.94   2.332     1.92    31.78
        ==================================================
```

```
       ID = 3 (  0012):    71.61  13.362     1.33    49.79

     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   |   2.7280     1.0900
                           0.7610     0.6160   |   3.3440     1.1870
                           1.4250     0.8240   |   3.9660     1.2760
                           1.9630     0.9475   |   0.0000     0.0000

                                 AREA     QPEAK     TPEAK       R.V.
                                 (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.615     13.362      1.33      49.79
   OUTFLOW: ID= 1 (  0100)     71.615      3.954      1.92      49.79

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 29.59
                  TIME SHIFT OF PEAK FLOW         (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.2755

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
                             IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      78.74        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)=       1.42 (ii)    5.68 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.33         0.15
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.35         0.19          0.454 (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):    71.61    3.954     1.92     49.79
     + ID2= 2 (  0101):     0.93    0.454     1.33     75.94
       ================================================
       ID = 3 (  0033):    72.55    4.008     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: December 2023**

****
**** 2 – YEAR STORM ****
****

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

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\65d5ba1e-2e38-43e6-87a2-5ee8da67c05e\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)= 28.68		
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 60.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.21	11.47
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	437.26	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)=	7.57 (ii)	18.63 (ii)		
Unit Hyd. Tpeak (min)=	10.00	20.00		
Unit Hyd. peak (cms)=	0.13	0.06		
			TOTALS	
PEAK FLOW (cms)=	2.33	0.59	2.752 (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  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0001):    28.68   2.752    12.00    41.41
      + ID2= 2 (  0010):    42.94   0.681    12.33    11.76
        ================================================
        ID = 3 (  0012):    71.61   3.147    12.08    23.64

     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   |   3.6980     0.8910
                          1.2070     0.4935   |   3.8490     1.0470
                          1.6530     0.5765   |   4.0000     1.1220
                          2.8070     0.7720   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.615     3.147     12.08      23.64
   OUTFLOW: ID= 1 (  0100)     71.615     1.206     12.58      23.63

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 38.31
                  TIME SHIFT OF PEAK FLOW         (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4933

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--------------------
| CALIB            |
| STANDHYD (  0101)|   Area     (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.57         0.36
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     78.74        40.00
     Mannings n           =     0.013        0.250

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


                          ---- TRANSFORMED HYETOGRAPH ----
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TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	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	61.46	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.71 (ii)	11.28 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.29	0.09	
PEAK FLOW (cms)=	0.07	0.04	0.104 (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):		71.61	1.206	12.58	23.63
+ ID2= 2 (0101):		0.93	0.104	12.00	40.30
ID = 3 (0033):		72.55	1.222	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	1.917	0.51	7.917	1.02
5.417	1.02	11.417	7.31	17.417	1.02	23.42	0.51	2.000	0.51	8.000	1.02
5.500	1.02	11.500	13.21	17.500	1.02	23.50	0.51	2.083	0.51	8.083	1.52
5.583	1.02	11.583	13.21	17.583	1.02	23.58	0.51	2.167	0.51	8.167	1.52
5.667	1.02	11.667	25.80	17.667	1.02	23.67	0.51	2.250	0.51	8.250	1.52
5.750	1.02	11.750	28.96	17.750	1.02	23.75	0.51	2.333	0.51	8.333	1.52
5.833	1.02	11.833	41.55	17.833	1.02	23.83	0.51	2.417	0.51	8.417	1.52
5.917	1.02	11.917	60.45	17.917	1.02	23.92	0.51	2.500	0.51	8.500	1.52
6.000	1.02	12.000	60.45	18.000	1.02	24.00	0.51	2.583	0.51	8.583	1.52
								2.667	0.51	8.667	1.52
								2.750	0.51	8.750	1.52
								2.833	0.51	8.833	1.52
								2.917	0.51	8.917	1.52
								3.000	0.51	9.000	1.52
								3.083	0.51	9.083	1.52
								3.167	0.51	9.167	1.52
								3.250	0.51	9.250	1.52
								3.333	0.51	9.333	1.52
								3.417	0.51	9.417	1.52
								3.500	0.51	9.500	1.52
								3.583	0.51	9.583	1.52
								3.667	0.51	9.667	1.52
								3.750	0.51	9.750	1.52
								3.833	0.51	9.833	1.52
								3.917	0.51	9.917	1.52
								4.000	0.51	10.000	1.52
								4.083	1.02	10.083	3.05
								4.167	1.02	10.167	3.05
								4.250	1.02	10.250	3.05
								4.333	1.02	10.333	3.05
								4.417	1.02	10.417	3.05
								4.500	1.02	10.500	3.05
								4.583	1.02	10.583	3.05
								4.667	1.02	10.667	3.05
								4.750	1.02	10.750	3.05
								4.833	1.02	10.833	3.05
								4.917	1.02	10.917	3.05
								5.000	1.02	11.000	3.05
								5.083	1.02	11.083	4.06
								5.167	1.02	11.167	4.06
								5.250	1.02	11.250	5.13
								5.333	1.02	11.333	5.84
								5.417	1.02	11.417	7.31
								5.500	1.02	11.500	13.21
								5.583	1.02	11.583	13.21
								5.667	1.02	11.667	25.80
								5.750	1.02	11.750	28.96
								5.833	1.02	11.833	41.55
								5.917	1.02	11.917	60.45
								6.000	1.02	12.000	60.45

13.917	2.79	19.92	0.76								
14.000	2.79	20.00	0.76								
14.083	1.52	20.08	0.51								
14.167	1.52	20.17	0.51								
14.250	1.52	20.25	0.51								
14.333	1.52	20.33	0.51								
14.417	1.52	20.42	0.51								
14.500	1.52	20.50	0.51								
14.583	1.52	20.58	0.51								
14.667	1.52	20.67	0.51								
14.750	1.52	20.75	0.51								
14.833	1.52	20.83	0.51								
14.917	1.52	20.92	0.51								
15.000	1.52	21.00	0.51								
15.083	1.52	21.08	0.51								
15.167	1.52	21.17	0.51								
15.250	1.52	21.25	0.51								
15.333	1.52	21.33	0.51								
15.417	1.52	21.42	0.51								
15.500	1.52	21.50	0.51								
15.583	1.52	21.58	0.51								
15.667	1.52	21.67	0.51								
15.750	1.52	21.75	0.51								
15.833	1.52	21.83	0.51								
15.917	1.52	21.92	0.51								
16.000	1.52	22.00	0.51								
16.083	1.02	22.08	0.51								
16.167	1.02	22.17	0.51								
16.250	1.02	22.25	0.51								
16.333	1.02	22.33	0.51								
16.417	1.02	22.42	0.51								
16.500	1.02	22.50	0.51								
16.583	1.02	22.58	0.51								
16.667	1.02	22.67	0.51								
16.750	1.02	22.75	0.51								
16.833	1.02	22.83	0.51								
16.917	1.02	22.92	0.51								
17.000	1.02	23.00	0.51								
17.083	1.02	23.08	0.51								
17.167	1.02	23.17	0.51								
17.250	1.02	23.25	0.51								
17.333	1.02	23.33	0.51								
17.417	1.02	23.42	0.51								
17.500	1.02	23.50	0.51								
17.583	1.02	23.58	0.51								
17.667	1.02	23.67	0.51								
17.750	1.02	23.75	0.51								
17.833	1.02	23.83	0.51								
17.917	1.02	23.92	0.51								
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)= 22.39		
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 60.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.43	8.96
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	386.35	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

Max.Eff.Inten.(mm/hr)=	60.45	32.53		
over (min)	5.00	20.00		
Storage Coeff. (min)=	7.03 (ii)	18.09 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.17	0.06		
				TOTALS
PEAK FLOW (cms)=	2.01	0.47		2.344 (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

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     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):    22.39   2.344    12.00    41.41
     + ID2= 2 (  0020):     4.86   0.141    12.08    12.13
       ================================================
       ID = 3 (  0011):    27.25   2.470    12.00    36.19

     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   |   1.5650      0.7575
                         0.5120     0.4100   |   1.8880      0.8520
                         0.7000     0.4800   |   2.0650      0.8920
                         1.1940     0.6510   |   0.0000      0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.250     2.470     12.00      36.19
   OUTFLOW: ID= 1 (  0200)     27.250     0.511     12.58      36.18

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 20.69
                  TIME SHIFT OF PEAK FLOW          (min)= 35.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.4097

--------------------------------------------------------------------------------
--------------------
| CALIB            |
| STANDHYD (  0201)|   Area    (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------
                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.30         0.20
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      57.74        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	59.35	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.25 (ii)	10.94 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.30	0.09	
PEAK FLOW (cms)=	0.04	0.02	0.056 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	51.12	31.14	40.11
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 (0034)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0200):	27.25	0.511	12.58	36.18
	+ ID2= 2 (0201):	0.50	0.056	12.00	40.11
	ID = 3 (0034):	27.75	0.521	12.50	36.25

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
**** 5 - YEAR STORM ****
****

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

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\e8dab17a-f527-4400-bcc9-501ae90fc758\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)= 28.68
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.21	11.47
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	437.26	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)=	7.16 (ii)	16.73 (ii)	
Unit Hyd. Tpeak (min)=	5.00	20.00	
Unit Hyd. peak (cms)=	0.17	0.06	
PEAK FLOW (cms)=	2.95	0.78	3.518 (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)	

1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0001):	28.68	3.518	12.00	50.90
+ ID2= 2 (0010):	42.94	0.924	12.33	16.57
ID = 3 (0012):	71.61	4.011	12.00	30.32

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0100)| IN= 2---> OUT= 1 | DT= 5.0 min	OVERFLOW IS OFF			
	OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)
	0.0000	0.0000	3.6980	0.8910
	1.2070	0.4935	3.8490	1.0470
	1.6530	0.5765	4.0000	1.1220
	2.8070	0.7720	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0012)	71.615	4.011	12.00	30.32
OUTFLOW: ID= 1 (0100)	71.615	1.649	12.50	30.32

PEAK FLOW REDUCTION [Qout/Qin](%)= 41.12
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.5763

CALIB | STANDHYD (0101)| ID= 1 DT= 5.0 min	Area (ha)= 0.93 Total Imp(%)= 61.00 Dir. Conn.(%)= 45.00		
		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.57	0.36
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	78.74	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)=	2.56 (ii)	10.48 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.29	0.09	
			TOTALS
PEAK FLOW (cms)=	0.08	0.05	0.124 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	61.43	40.43	49.88
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):	71.61	1.649	12.50	30.32
	+ ID2= 2 (0101):	0.93	0.124	12.00	49.88
	ID = 3 (0033):	72.55	1.671	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)= 22.39
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.43	8.96
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	386.35	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)=	6.65 (ii)	16.22 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.18	0.06		
			TOTALS	
PEAK FLOW (cms)=	2.34	0.61	2.789 (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):	22.39	2.789	12.00	50.90
+ ID2= 2 (0020):	4.86	0.190	12.08	17.06
ID = 3 (0011):	27.25	2.961	12.00	44.87

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

RESERVOIR(0200) / IN= 2---> OUT= 1 / DT= 5.0 min	OVERFLOW IS OFF			
OUTFLOW (cms)	STORAGE (ha.m.)	OUTFLOW (cms)	STORAGE (ha.m.)	
0.0000	0.0000	1.5650	0.7575	
0.5120	0.4100	1.8880	0.8520	
0.7000	0.4800	2.0650	0.8920	
1.1940	0.6510	0.0000	0.0000	

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	27.250	2.961	12.00	44.87
OUTFLOW: ID= 1 (0200)	27.250	0.699	12.50	44.86

PEAK FLOW REDUCTION [Qout/Qin](%)= 23.61
TIME SHIFT OF PEAK FLOW (min)= 30.00
MAXIMUM STORAGE USED (ha.m.)= 0.4800

CALIB / STANDHYD (0201) / ID= 1 DT= 5.0 min	Area (ha)= 0.50		
	Total Imp(%)= 60.00	Dir. Conn.(%)= 45.00	
	IMPERVIOUS	PERVIOUS (i)	
Surface Area (ha)=	0.30	0.20	
Dep. Storage (mm)=	1.00	1.50	
Average Slope (%)=	1.00	2.00	
Length (m)=	57.74	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	72.56
over (min)	5.00	15.00
Storage Coeff. (min)=	2.12 (ii)	10.15 (ii)
Unit Hyd. Tpeak (min)=	5.00	15.00
Unit Hyd. peak (cms)=	0.31	0.10

			TOTALS
PEAK FLOW (cms)=	0.04	0.03	0.067 (iii)
TIME TO PEAK (hrs)=	12.00	12.08	12.00
RUNOFF VOLUME (mm)=	61.43	40.06	49.66
TOTAL RAINFALL (mm)=	62.43	62.43	62.43
RUNOFF COEFFICIENT =	0.98	0.64	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 (0034)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0200):	27.25	0.699	12.50	44.86
	+ ID2= 2 (0201):	0.50	0.067	12.00	49.66
	ID = 3 (0034):	27.75	0.710	12.50	44.95

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
**** 10 - YEAR STORM ****
****

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

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\2a0a5744-268c-4d72-957f-e6cf86155208\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

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.

CALIB			
STANDHYD (0001)	Area (ha)= 28.68		
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 60.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.21	11.47
Dep. Storage	(mm)=	1.00	1.50

Average Slope	(%)=	1.00	2.00
Length	(m)=	437.26	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)=	6.40 (ii)	14.66 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.18	0.08		
				TOTALS
PEAK FLOW (cms)=	3.88	1.27		4.840 (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)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0001):	28.68	4.840	12.17	69.71
	+ ID2= 2 (0010):	42.94	1.566	12.58	27.38
	ID = 3 (0012):	71.61	5.575	12.17	44.33

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	3.6980	0.8910
1.2070	0.4935	3.8490	1.0470

	1.6530	0.5765	4.0000	1.1220
	2.8070	0.7720	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0012)	71.615	5.575	12.17	44.33
OUTFLOW: ID= 1 (0100)	71.615	2.795	12.58	44.33

PEAK FLOW REDUCTION [Qout/Qin](%)= 50.14
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 0.7720

CALIB	
STANDHYD (0101)	Area (ha)= 0.93
ID= 1 DT= 5.0 min	Total Imp(%)= 61.00 Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.57	0.36
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	78.74	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	105.92		
over (min)	5.00	10.00		
Storage Coeff. (min)=	2.29 (ii)	9.18 (ii)		
Unit Hyd. Tpeak (min)=	5.00	10.00		
Unit Hyd. peak (cms)=	0.30	0.12		
				TOTALS
PEAK FLOW (cms)=	0.11	0.08		0.180 (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.

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--------------------
| ADD HYD  (  0033)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)     (cms)    (hrs)     (mm)
        ID1= 1 (  0100):     71.61    2.795    12.58    44.33
      + ID2= 2 (  0101):      0.93    0.180    12.17    68.83
        ================================================
        ID = 3 (  0033):     72.55    2.832    12.58    44.64
```

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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.

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

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--------------------
| CALIB            |
| STANDHYD (  0002)|   Area    (ha)=  22.39
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                                IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       13.43          8.96
     Dep. Storage     (mm)=        1.00          1.50
     Average Slope     (%)=        1.00          2.00
     Length            (m)=      386.35         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)=	5.94 (ii)	14.20 (ii)		
Unit Hyd. Tpeak (min)=	5.00	15.00		
Unit Hyd. peak (cms)=	0.19	0.08		
				TOTALS
PEAK FLOW (cms)=	3.08	1.01		3.839 (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 (0011)		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0002):	22.39	3.839	12.17	69.71
	+ ID2= 2 (0020):	4.86	0.310	12.25	28.10
	ID = 3 (0011):	27.25	4.094	12.17	62.29

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	1.5650	0.7575
	0.5120	0.4100	1.8880	0.8520
	0.7000	0.4800	2.0650	0.8920
	1.1940	0.6510	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	27.250	4.094	12.17	62.29
OUTFLOW: ID= 1 (0200)	27.250	1.193	12.58	62.28

PEAK FLOW REDUCTION [Qout/Qin](%)= 29.13
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 0.6505

CALIB	
STANDHYD (0201)	Area (ha)= 0.50
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.30	0.20
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	57.74	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	102.57	
over (min)		5.00	10.00	
Storage Coeff. (min)=		1.90 (ii)	8.88 (ii)	
Unit Hyd. Tpeak (min)=		5.00	10.00	
Unit Hyd. peak (cms)=		0.32	0.12	
				TOTALS
PEAK FLOW	(cms)=	0.06	0.04	0.097 (iii)
TIME TO PEAK	(hrs)=	12.17	12.25	12.17
RUNOFF VOLUME	(mm)=	81.45	58.08	68.58
TOTAL RAINFALL	(mm)=	82.45	82.45	82.45
RUNOFF COEFFICIENT	=	0.99	0.70	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.

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| ADD HYD  (  0034)|
|   1 +  2 =  3    |          AREA     QPEAK     TPEAK      R.V.
--------------------          (ha)     (cms)     (hrs)      (mm)
       ID1= 1 (  0200):     27.25    1.193     12.58     62.28
     + ID2= 2 (  0201):      0.50    0.097     12.17     68.58
       ================================================
       ID = 3 (  0034):     27.75    1.212     12.58     62.39

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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**********************
**  25 - YEAR STORM  **
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** SIMULATION:bloor 24SCS025  **
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|    READ STORM    |    Filename: C:\Users\gvolpe\AppD
|                  |              ata\Local\Temp\
|                  |              53f3c855-c4f2-4213-a281-e45b34351bc4\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)= 28.68		
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00	Dir. Conn.(%)= 60.00	

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.21	11.47
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	437.26	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)=       6.02 (ii)   13.57 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.19         0.08
                                                        *TOTALS*
     PEAK FLOW       (cms)=       4.72         1.62          6.117 (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)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0001):    28.68    6.117    12.00    82.60
     + ID2= 2 (  0010):    42.94    2.044    12.33    35.57
       ================================================
       ID = 3 (  0012):    71.61    7.252    12.00    54.40

     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    |  3.6980     0.8910
                         1.2070     0.4935    |  3.8490     1.0470
                         1.6530     0.5765    |  4.0000     1.1220
                         2.8070     0.7720    |  0.0000     0.0000

                              AREA     QPEAK     TPEAK       R.V.
                              (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)   71.615     7.252     12.00      54.40
   OUTFLOW: ID= 1 (  0100)   71.615     3.684     12.33      54.40

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 50.80
                  TIME SHIFT OF PEAK FLOW          (min)= 20.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.8910

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--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.93
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|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                              IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      78.74        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
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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	129.89	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.15 (ii)	8.51 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.31	0.12	
			TOTALS
PEAK FLOW (cms)=	0.12	0.10	0.224 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	94.96	71.09	81.83
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):		71.61	3.684	12.33	54.40
+ ID2= 2 (0101):		0.93	0.224	12.00	81.83
ID = 3 (0033):		72.55	3.730	12.33	54.75

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

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.

| CALIB |
| STANDHYD (0002)| Area (ha)= 22.39
|ID= 1 DT= 5.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.43	8.96
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	386.35	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)=       5.59 (ii)   13.14 (ii)
     Unit Hyd. Tpeak (min)=       5.00        15.00
     Unit Hyd. peak  (cms)=       0.20         0.08
                                                      *TOTALS*
     PEAK FLOW       (cms)=       3.73         1.28      4.837 (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  (  0011)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0002):    22.39   4.837    12.00    82.60
      + ID2= 2 (  0020):     4.86   0.414    12.08    36.45
        ================================================
        ID = 3 (  0011):    27.25   5.217    12.00    74.37

     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   |   1.5650     0.7575
                          0.5120     0.4100   |   1.8880     0.8520
                          0.7000     0.4800   |   2.0650     0.8920
                          1.1940     0.6510   |   0.0000     0.0000

                               AREA     QPEAK     TPEAK       R.V.
                               (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)    27.250     5.217     12.00      74.37
   OUTFLOW: ID= 1 (  0200)    27.250     1.563     12.33      74.36

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 29.97
                  TIME SHIFT OF PEAK FLOW          (min)= 20.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  0.7572

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--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
Surface Area     (ha)=       0.30         0.20
Dep. Storage     (mm)=       1.00         1.50
Average Slope     (%)=       1.00         2.00
Length            (m)=      57.74        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	125.96	
over (min)	5.00	10.00	
Storage Coeff. (min)=	1.79 (ii)	8.22 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.32	0.13	
			TOTALS
PEAK FLOW (cms)=	0.07	0.05	0.121 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	94.96	70.61	81.55
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 (0034)				
1 + 2 = 3	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0200):	27.25	1.563	12.33	74.36
+ ID2= 2 (0201):	0.50	0.121	12.00	81.55
ID = 3 (0034):	27.75	1.588	12.33	74.49

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

****
** 50 - YEAR STORM **
****

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

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\45d428b1-e8e5-426f-82e2-c47e118777e4\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)= 28.68
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.21	11.47
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	437.26	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

Max.Eff.Inten.(mm/hr)=     114.06        92.78
          over (min)          5.00        15.00
Storage Coeff.  (min)=        5.87 (ii)   13.15 (ii)
Unit Hyd. Tpeak (min)=        5.00        15.00
Unit Hyd. peak  (cms)=        0.19         0.08
                                                 *TOTALS*
PEAK FLOW       (cms)=        5.06         1.87          6.707 (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.

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--------------------
| ADD HYD  (  0012)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)      (mm)
       ID1= 1 (  0001):    28.68    6.707    12.00    94.24
     + ID2= 2 (  0010):    42.94    2.477    12.33    43.41
       ================================================
       ID = 3 (  0012):    71.61    8.134    12.00    63.76

     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   |   3.6980     0.8910
                          1.2070     0.4935   |   3.8490     1.0470
                          1.6530     0.5765   |   4.0000     1.1220
                          2.8070     0.7720   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK      R.V.
                                (ha)     (cms)     (hrs)      (mm)
   INFLOW : ID= 2 (  0012)     71.615     8.134     12.00     63.76
   OUTFLOW: ID= 1 (  0100)     71.615     3.846     12.50     63.76

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 47.29
                  TIME SHIFT OF PEAK FLOW          (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.0470

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--------------------
| CALIB            |
| STANDHYD (  0101)|   Area     (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------
                               IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      78.74        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	141.28	
over (min)	5.00	10.00	
Storage Coeff. (min)=	2.10 (ii)	8.25 (ii)	
Unit Hyd. Tpeak (min)=	5.00	10.00	
Unit Hyd. peak (cms)=	0.31	0.13	
			TOTALS
PEAK FLOW (cms)=	0.13	0.11	0.244 (iii)
TIME TO PEAK (hrs)=	12.00	12.00	12.00
RUNOFF VOLUME (mm)=	107.06	82.50	93.55
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	QPEAK	TPEAK	R.V.
1 + 2 = 3		(ha)	(cms)	(hrs)	(mm)
ID1= 1 (0100):		71.61	3.846	12.50	63.76
+ ID2= 2 (0101):		0.93	0.244	12.00	93.55
ID = 3 (0033):		72.55	3.889	12.42	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)=	22.39	
ID= 1 DT= 5.0 min	Total Imp(%)=	60.00	Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.43	8.96
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	386.35	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

Max.Eff.Inten.(mm/hr)=	114.06	92.78	
over (min)	5.00	15.00	
Storage Coeff. (min)=	5.45 (ii)	12.73 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.20	0.08	
			TOTALS
PEAK FLOW (cms)=	4.00	1.48	5.298 (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 (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
1 + 2 = 3	ID1= 1 (0002):	22.39	5.298	12.00	94.24
	+ ID2= 2 (0020):	4.86	0.491	12.08	44.43
	ID = 3 (0011):	27.25	5.753	12.00	85.36

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	1.5650	0.7575
0.5120	0.4100	1.8880	0.8520
0.7000	0.4800	2.0650	0.8920
1.1940	0.6510	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	27.250	5.753	12.00	85.36
OUTFLOW: ID= 1 (0200)	27.250	1.883	12.33	85.35

PEAK FLOW REDUCTION [Qout/Qin](%)= 32.72
TIME SHIFT OF PEAK FLOW (min)= 20.00
MAXIMUM STORAGE USED (ha.m.)= 0.8515

CALIB
STANDHYD (0201) | Area (ha)= 0.50
ID= 1 DT= 5.0 min | Total Imp(%)= 60.00 Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.30	0.20
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	57.74	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

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 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       137.10
                over (min)        5.00        10.00
     Storage Coeff.  (min)=       1.74 (ii)    7.96 (ii)
     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.32         0.13
                                                          *TOTALS*
     PEAK FLOW       (cms)=       0.07         0.06          0.131 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     107.06        81.99          93.26
     TOTAL RAINFALL   (mm)=     108.06       108.06         108.06
     RUNOFF COEFFICIENT   =       0.99         0.76           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.

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--------------------
| ADD HYD  (  0034)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0200):    27.25   1.883    12.33    85.35
     + ID2= 2 (  0201):     0.50   0.131    12.00    93.26
       ==========================================================
       ID = 3 (  0034):    27.75   1.911    12.33    85.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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**********************
** 100 - YEAR STORM  **
**********************

********************************
** SIMULATION:bloor 24SCS100  **
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--------------------
|    READ STORM    |    Filename: C:\Users\gvolpe\AppD
|                  |              ata\Local\Temp\
|                  |              6dac3424-ea35-45ec-b051-978a3ed9575b\c047ab91
| Ptotal=112.42 mm |    Comments: bloor 24SCS100
--------------------
                TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
                 hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   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

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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	1.27	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
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     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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--------------------
| CALIB            |
| STANDHYD (  0001)|   Area     (ha)=  28.68
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      17.21         11.47
     Dep. Storage     (mm)=       1.00          1.50
     Average Slope     (%)=       1.00          2.00
     Length            (m)=     437.26         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     1.27 | 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)=       5.64 (ii)   12.59 (ii)
  Unit Hyd. Tpeak (min)=       5.00        15.00
  Unit Hyd. peak  (cms)=       0.20         0.08
                                                    *TOTALS*
  PEAK FLOW       (cms)=       5.61         2.06       7.400 (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):     28.68    7.400     12.00     98.45
     + ID2= 2 (  0010):     42.94    2.686     12.33     46.33
       ================================================
       ID = 3 (  0012):     71.61    8.909     12.00     67.20

     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   |   3.6980      0.8910
                         1.2070      0.4935   |   3.8490      1.0470
                         1.6530      0.5765   |   4.0000      1.1220
                         2.8070      0.7720   |   0.0000      0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0012)     71.615     8.909     12.00      67.20
   OUTFLOW: ID= 1 (  0100)     71.615     3.996     12.50      67.20

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 44.85
                  TIME SHIFT OF PEAK FLOW          (min)= 30.00
                  MAXIMUM  STORAGE   USED       (ha.m.)=  1.1219

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--------------------
| CALIB            |
| STANDHYD (  0101)|   Area    (ha)=   0.93
|ID= 1 DT= 5.0 min |   Total Imp(%)=  61.00   Dir. Conn.(%)=  45.00
--------------------

                           IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=       0.57         0.36
     Dep. Storage     (mm)=       1.00         1.50
     Average Slope     (%)=       1.00         2.00
     Length            (m)=      78.74        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    1.27 | 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)=       2.01 (ii)    7.90 (ii)
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     Unit Hyd. Tpeak (min)=       5.00        10.00
     Unit Hyd. peak  (cms)=       0.31         0.13
                                                        *TOTALS*
     PEAK FLOW       (cms)=       0.15         0.12          0.270 (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.

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--------------------
| ADD HYD  (  0033)|
|   1 +  2 =  3    |         AREA    QPEAK    TPEAK     R.V.
--------------------         (ha)    (cms)    (hrs)     (mm)
       ID1= 1 (  0100):    71.61    3.996    12.50    67.20
     + ID2= 2 (  0101):     0.93    0.270    12.00    97.78
       ================================================
       ID = 3 (  0033):    72.55    4.033    12.42    67.59

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS 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.

                        ---- TRANSFORMED HYETOGRAPH ----
  TIME    RAIN |  TIME    RAIN |'  TIME    RAIN |  TIME    RAIN
   hrs   mm/hr |   hrs   mm/hr |'   hrs   mm/hr |   hrs   mm/hr
 0.083    1.27 | 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
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(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

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| CALIB            |
| STANDHYD (  0002)|   Area     (ha)=  22.39
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  60.00
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		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.43	8.96
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	386.35	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)	=	4.43	1.63	5.846 (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  (  0011)|
|   1 +  2 =  3    |
--------------------
```

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
ID1= 1 (0002):	22.39	5.846	12.00	98.45
+ ID2= 2 (0020):	4.86	0.542	12.08	47.40

```
       ================================================
       ID = 3 (  0011):    27.25   6.345    12.00    89.35

     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   |   1.5650     0.7575
                          0.5120     0.4100   |   1.8880     0.8520
                          0.7000     0.4800   |   2.0650     0.8920
                          1.1940     0.6510   |   0.0000     0.0000

                                AREA     QPEAK     TPEAK       R.V.
                                (ha)     (cms)     (hrs)       (mm)
   INFLOW : ID= 2 (  0011)     27.250     6.345     12.00      89.35
   OUTFLOW: ID= 1 (  0200)     27.250     2.051     12.33      89.34

                  PEAK   FLOW   REDUCTION [Qout/Qin](%)= 32.32
                  TIME SHIFT OF PEAK FLOW          (min)= 20.00
                  MAXIMUM  STORAGE   USED        (ha.m.)=  0.8915

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--------------------
| CALIB            |
| STANDHYD (  0201)|   Area     (ha)=   0.50
|ID= 1 DT= 5.0 min |   Total Imp(%)=  60.00   Dir. Conn.(%)=  45.00
--------------------
                          IMPERVIOUS    PERVIOUS (i)
     Surface Area     (ha)=      0.30         0.20
     Dep. Storage     (mm)=      1.00         1.50
     Average Slope     (%)=      1.00         2.00
     Length            (m)=     57.74        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     1.27 | 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       153.05
          over (min)         5.00        10.00
Storage Coeff.  (min)=       1.67 (ii)    7.63 (ii)
Unit Hyd. Tpeak (min)=       5.00        10.00
Unit Hyd. peak  (cms)=       0.32         0.13
                                                    *TOTALS*
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     PEAK FLOW       (cms)=       0.08         0.07          0.146 (iii)
     TIME TO PEAK    (hrs)=      12.00        12.00          12.00
     RUNOFF VOLUME    (mm)=     111.42        86.11          97.50
     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.

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--------------------
| ADD HYD  (  0034)|
|   1 +  2 =  3    |          AREA    QPEAK    TPEAK     R.V.
--------------------          (ha)    (cms)    (hrs)     (mm)
        ID1= 1 (  0200):    27.25   2.051    12.33    89.34
      + ID2= 2 (  0201):     0.50   0.146    12.00    97.50
        ====================================================
        ID = 3 (  0034):    27.75   2.079    12.33    89.49

     NOTE:  PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.
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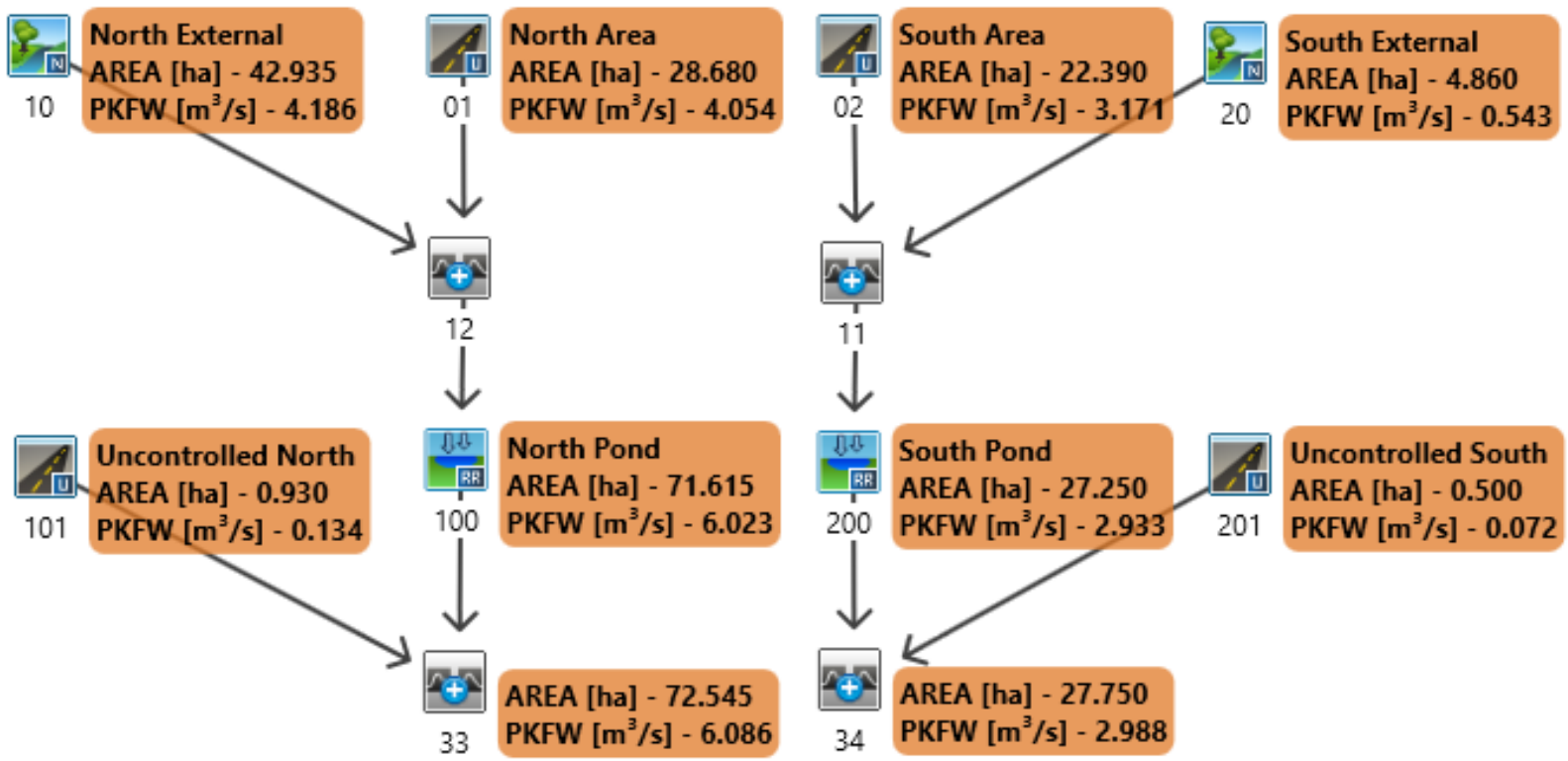

urbanworks
ENGINEERING CORPORATION

Visual OTTHYMO™ Schematic
POST-DEVELOPMENT

HILLSBURGH SUBDIVISION
(REGIONAL HURRICANE HAZEL STORM)

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

****
** HURRICANE HAZEL STORM **
****

****
** SIMULATION:Regional Hurricane Hazel Storm **
****

READ STORM	Filename: C:\Users\gvolpe\AppData\Local\Temp\d5017540-d815-403c-9469-b2a4f873be6e\05cbf8ef
Ptotal=212.00 mm	Comments: Hazel

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.00	6.00	3.00	13.00	6.00	23.00	9.00	53.00
1.00	4.00	4.00	17.00	7.00	13.00	10.00	38.00
2.00	6.00	5.00	13.00	8.00	13.00	11.00	13.00

CALIB 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	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 3.489

PEAK FLOW (cms)= 4.186 (i)
TIME TO PEAK (hrs)= 10.250
RUNOFF VOLUME (mm)= 122.896
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.580

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

CALIB STANDHYD (0001) ID= 1 DT= 5.0 min	Area (ha)= 28.68	Total Imp(%)= 60.00	Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	17.21	11.47
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	437.26	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00

1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=		53.00	50.33	
over (min)		10.00	20.00	
Storage Coeff. (min)=		7.98 (ii)	17.27 (ii)	
Unit Hyd. Tpeak (min)=		10.00	20.00	
Unit Hyd. peak (cms)=		0.13	0.06	
				TOTALS
PEAK FLOW	(cms)=	2.53	1.52	4.054 (iii)
TIME TO PEAK	(hrs)=	10.00	10.00	10.00
RUNOFF VOLUME	(mm)=	211.00	173.54	196.02
TOTAL RAINFALL	(mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT	=	1.00	0.82	0.92

(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):		28.68	4.054	10.00	196.02
+ ID2= 2 (0010):		42.94	4.186	10.25	122.90
ID = 3 (0012):		71.61	7.993	10.08	152.18

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	3.6980	0.8910
	1.2070	0.4935	3.8490	1.0470
	1.6530	0.5765	4.0000	1.1220
	2.8070	0.7720	0.0000	0.0000

**** WARNING : STORAGE-DISCHARGE TABLE WAS EXCEEDED.

		AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0012)		71.615	7.993	10.08	152.18
OUTFLOW: ID= 1 (0100)		71.615	6.023	11.17	152.18

PEAK FLOW REDUCTION [Qout/Qin](%)= 75.35
TIME SHIFT OF PEAK FLOW (min)= 65.00
MAXIMUM STORAGE USED (ha.m.)= 2.1299

CALIB		
STANDHYD (0101)	Area (ha)=	0.93
ID= 1 DT= 5.0 min	Total Imp(%)=	61.00 Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.57	0.36
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	78.74	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	72.59	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.85 (ii)	10.88 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.28	0.09	
			TOTALS
PEAK FLOW (cms)=	0.06	0.07	0.134 (iii)
TIME TO PEAK (hrs)=	9.75	10.00	10.00
RUNOFF VOLUME (mm)=	211.00	183.31	195.77
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.86	0.92

***** 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):	71.61	6.023	11.17	152.18
	+ ID2= 2 (0101):	0.93	0.134	10.00	195.77
	ID = 3 (0033):	72.55	6.086	11.08	152.74

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	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Unit Hyd Qpeak (cms)= 0.928

PEAK FLOW (cms)= 0.543 (i)
TIME TO PEAK (hrs)= 10.000
RUNOFF VOLUME (mm)= 124.843
TOTAL RAINFALL (mm)= 212.000
RUNOFF COEFFICIENT = 0.589

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

CALIB			
STANDHYD (0002)	Area (ha)=	22.39	
ID= 1 DT= 5.0 min	Total Imp(%)=	60.00	Dir. Conn.(%)= 60.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	13.43	8.96
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	386.35	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00

0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00
2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

Max.Eff.Inten.(mm/hr)=	53.00	50.33		
over (min)	5.00	20.00		
Storage Coeff. (min)=	7.41 (ii)	16.70 (ii)		
Unit Hyd. Tpeak (min)=	5.00	20.00		
Unit Hyd. peak (cms)=	0.17	0.06		
			TOTALS	
PEAK FLOW (cms)=	1.98	1.19	3.171 (iii)	
TIME TO PEAK (hrs)=	10.00	10.00	10.00	
RUNOFF VOLUME (mm)=	211.00	173.54	196.02	
TOTAL RAINFALL (mm)=	212.00	212.00	212.00	
RUNOFF COEFFICIENT =	1.00	0.82	0.92	

(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):		22.39	3.171	10.00	196.02
+ ID2= 2 (0020):		4.86	0.543	10.00	124.84
ID = 3 (0011):		27.25	3.714	10.00	183.32

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	1.5650	0.7575
	0.5120	0.4100	1.8880	0.8520
	0.7000	0.4800	2.0650	0.8920
	1.1940	0.6510	0.0000	0.0000

	AREA (ha)	QPEAK (cms)	TPEAK (hrs)	R.V. (mm)
INFLOW : ID= 2 (0011)	27.250	3.714	10.00	183.32
OUTFLOW: ID= 1 (0200)	27.250	2.933	10.42	183.32

PEAK FLOW REDUCTION [Qout/Qin](%)= 78.97
TIME SHIFT OF PEAK FLOW (min)= 25.00
MAXIMUM STORAGE USED (ha.m.)= 1.0887

CALIB	
STANDHYD (0201)	Area (ha)= 0.50
ID= 1 DT= 5.0 min	Total Imp(%)= 60.00 Dir. Conn.(%)= 45.00

		IMPERVIOUS	PERVIOUS (i)
Surface Area	(ha)=	0.30	0.20
Dep. Storage	(mm)=	1.00	1.50
Average Slope	(%)=	1.00	2.00
Length	(m)=	57.74	40.00
Mannings n	=	0.013	0.250

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

---- TRANSFORMED HYETOGRAPH ----

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
0.083	6.00	3.083	13.00	6.083	23.00	9.08	53.00
0.167	6.00	3.167	13.00	6.167	23.00	9.17	53.00
0.250	6.00	3.250	13.00	6.250	23.00	9.25	53.00
0.333	6.00	3.333	13.00	6.333	23.00	9.33	53.00
0.417	6.00	3.417	13.00	6.417	23.00	9.42	53.00
0.500	6.00	3.500	13.00	6.500	23.00	9.50	53.00
0.583	6.00	3.583	13.00	6.583	23.00	9.58	53.00
0.667	6.00	3.667	13.00	6.667	23.00	9.67	53.00
0.750	6.00	3.750	13.00	6.750	23.00	9.75	53.00
0.833	6.00	3.833	13.00	6.833	23.00	9.83	53.00
0.917	6.00	3.917	13.00	6.917	23.00	9.92	53.00
1.000	6.00	4.000	13.00	7.000	23.00	10.00	53.00
1.083	4.00	4.083	17.00	7.083	13.00	10.08	38.00
1.167	4.00	4.167	17.00	7.167	13.00	10.17	38.00
1.250	4.00	4.250	17.00	7.250	13.00	10.25	38.00
1.333	4.00	4.333	17.00	7.333	13.00	10.33	38.00
1.417	4.00	4.417	17.00	7.417	13.00	10.42	38.00
1.500	4.00	4.500	17.00	7.500	13.00	10.50	38.00
1.583	4.00	4.583	17.00	7.583	13.00	10.58	38.00
1.667	4.00	4.667	17.00	7.667	13.00	10.67	38.00
1.750	4.00	4.750	17.00	7.750	13.00	10.75	38.00
1.833	4.00	4.833	17.00	7.833	13.00	10.83	38.00
1.917	4.00	4.917	17.00	7.917	13.00	10.92	38.00
2.000	4.00	5.000	17.00	8.000	13.00	11.00	38.00
2.083	6.00	5.083	13.00	8.083	13.00	11.08	13.00

2.167	6.00	5.167	13.00	8.167	13.00	11.17	13.00
2.250	6.00	5.250	13.00	8.250	13.00	11.25	13.00
2.333	6.00	5.333	13.00	8.333	13.00	11.33	13.00
2.417	6.00	5.417	13.00	8.417	13.00	11.42	13.00
2.500	6.00	5.500	13.00	8.500	13.00	11.50	13.00
2.583	6.00	5.583	13.00	8.583	13.00	11.58	13.00
2.667	6.00	5.667	13.00	8.667	13.00	11.67	13.00
2.750	6.00	5.750	13.00	8.750	13.00	11.75	13.00
2.833	6.00	5.833	13.00	8.833	13.00	11.83	13.00
2.917	6.00	5.917	13.00	8.917	13.00	11.92	13.00
3.000	6.00	6.000	13.00	9.000	13.00	12.00	13.00

			TOTALS
Max.Eff.Inten.(mm/hr)=	53.00	70.68	
over (min)	5.00	15.00	
Storage Coeff. (min)=	2.37 (ii)	10.48 (ii)	
Unit Hyd. Tpeak (min)=	5.00	15.00	
Unit Hyd. peak (cms)=	0.30	0.09	
PEAK FLOW (cms)=	0.03	0.04	0.072 (iii)
TIME TO PEAK (hrs)=	9.58	10.00	10.00
RUNOFF VOLUME (mm)=	211.00	182.67	195.41
TOTAL RAINFALL (mm)=	212.00	212.00	212.00
RUNOFF COEFFICIENT =	1.00	0.86	0.92

***** 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):		27.25	2.933	10.42	183.32
+ ID2= 2 (0201):		0.50	0.072	10.00	195.41
ID = 3 (0034):		27.75	2.988	10.33	183.53

NOTE: PEAK FLOWS DO NOT INCLUDE BASEFLOWS IF ANY.

APPENDIX C

SANITARY SEWER CALCULATIONS

Servicing Allocations

Project No.: 22-0020ER

Proposed Subdivision: Hillsburgh

Single-Detached Equivalents 700 units

Sanitary Generation Rate (Single-Detached): **290** l/person/day†

Harmon Peaking Factor	
Max Peaking Factor	4.00
Minimum Peaking Factor	2.00

Building Type	Area or Unit Count	Pop. Density†	Population	Ave. Flow (L/s)	Harmon's Peaking Factor	Peak Flow (L/s)	Total Flow (L/s)
Single Detached	700 units	2.80 p.p.u.	1960	6.58	3.59	23.63	23.63

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 Block 422)	376 units	2.80 p.p.u.	1053	3.53	3.79	13.38	13.59	26.97
Residential (Townhouse)	286 units	2.80 p.p.u.	801	2.69	3.86	10.38	0.00	10.38
Low-Rise Senior Housing Block 424†††	136 units	2.80 p.p.u.	381	1.28	4.00	5.12	0.00	5.12
Mixed-Use Senior Apartment Block 423	2.24 ha	330 p.p.ha	741	2.49	3.88	9.65	0.00	9.65
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	2976	9.99	3.45	**34.42**	13.59	**48.01**

† As per Town of Erin Design Criteria
†† Factors in total site area for infiltration volume
††† Conservatively assumes 40 units per hectare for Townhomes, for Block 424

APPENDIX D

WATER SUPPLY CALCULATIONS

Water Supply Calculation

Project No.: 22-0020ER

Proposed Subdivision: Hillsburgh

Fire Flow:	**76**	L/s	(Prefered residential fire flow rate as per Town of Erin Standards)
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	662 units	2976	9.99
Commercial	0 sq.m.	-	0.00
Total		2976	9.99

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	9.99	0.40	4.00	4.13	41.25	2.75	27.47	**103.47**

Notes:

† As per Town of Erin Design Guidelines

APPENDIX E

ENGINEERING DRAWINGS
(See Submission Package)